

## AUXILIARY SIGNALS CONNECTIONS

### 1. GENERAL

1.01 This section describes and illustrates typical connections for power relays and auxiliary signals.

1.02 This section is reissued to show that the control relay contacts are now in parallel in the circuit.

1.03 Certain auxiliary signals and power relay sets for use on telephone lines are equipped with a 0.5- or 0.45-mf capacitor in series with a relay which operates on telephone ringing current. The relay and capacitor constitute a high-impedance ringing bridge which is subject to provisions of the section covering ringing bridge limitations.

1.04 The total number of auxiliary signals connected to a power relay set should not exceed the current carrying capacity of the relay contacts. Individual signal-operating currents are covered in the section on auxiliary signals identification. Current carrying capacity of power-relay set contacts are covered in the section on power relay sets.

### 2. CONNECTIONS

2.01 Connections for KS-16301 signals and relays are shown in Fig. 1.

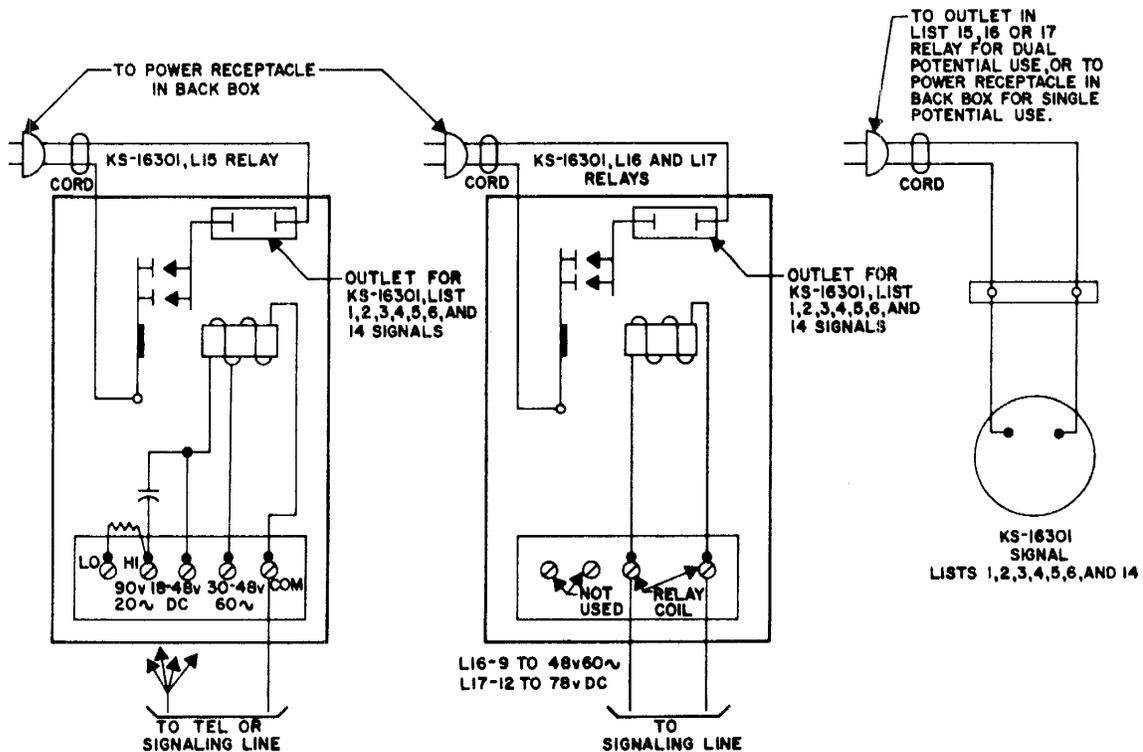


Fig. 1 - KS-16301 Signal and Relay

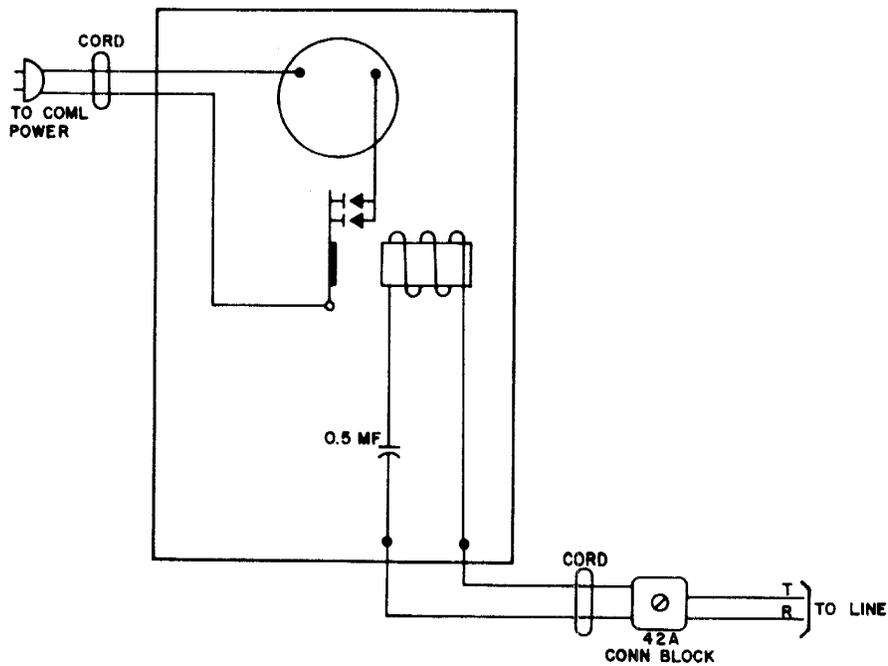
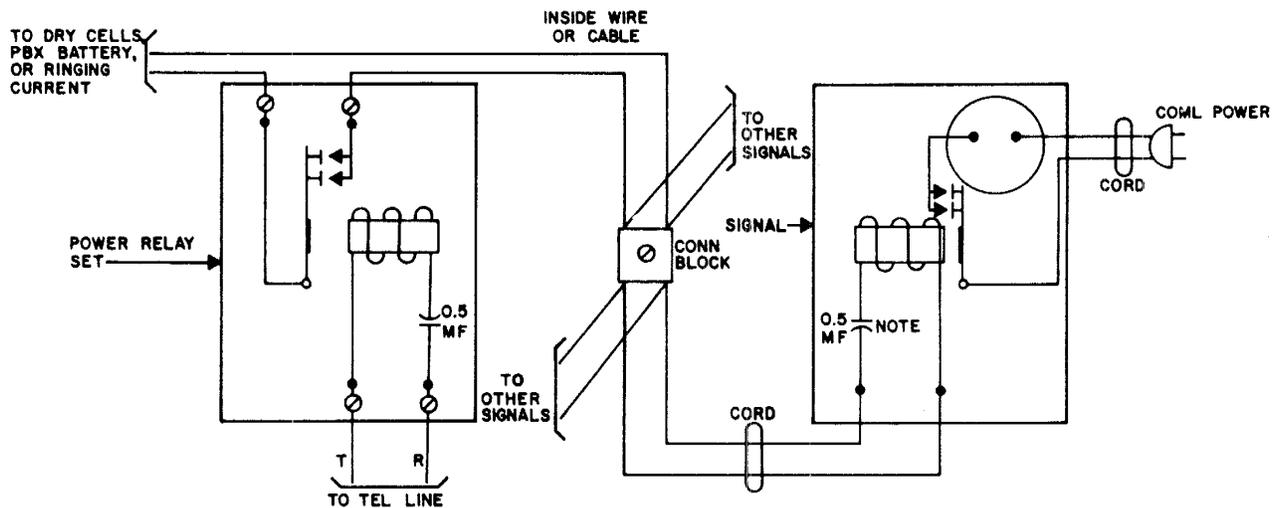


Fig. 2 - Typical Relay Equipped Signal

2.02 Connections for typical relay equipped signals are shown in Fig. 2.

2.03 Several signals may be connected as shown in Fig. 3. This has the advantage of only one ringing bridge on the telephone line for several auxiliary signals. Special commercial power wiring is not needed between relay set and signals.



NOTE: SIGNALS DESIGNED FOR USE WITH DC DO NOT CONTAIN A CAPACITOR.

Fig. 3 - Multiple Signal

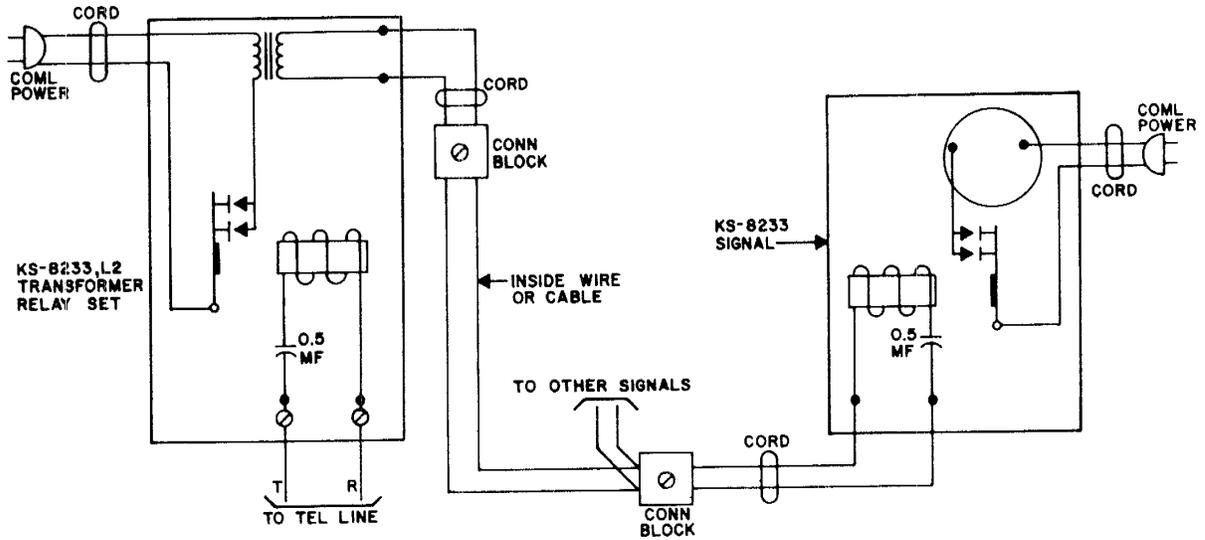
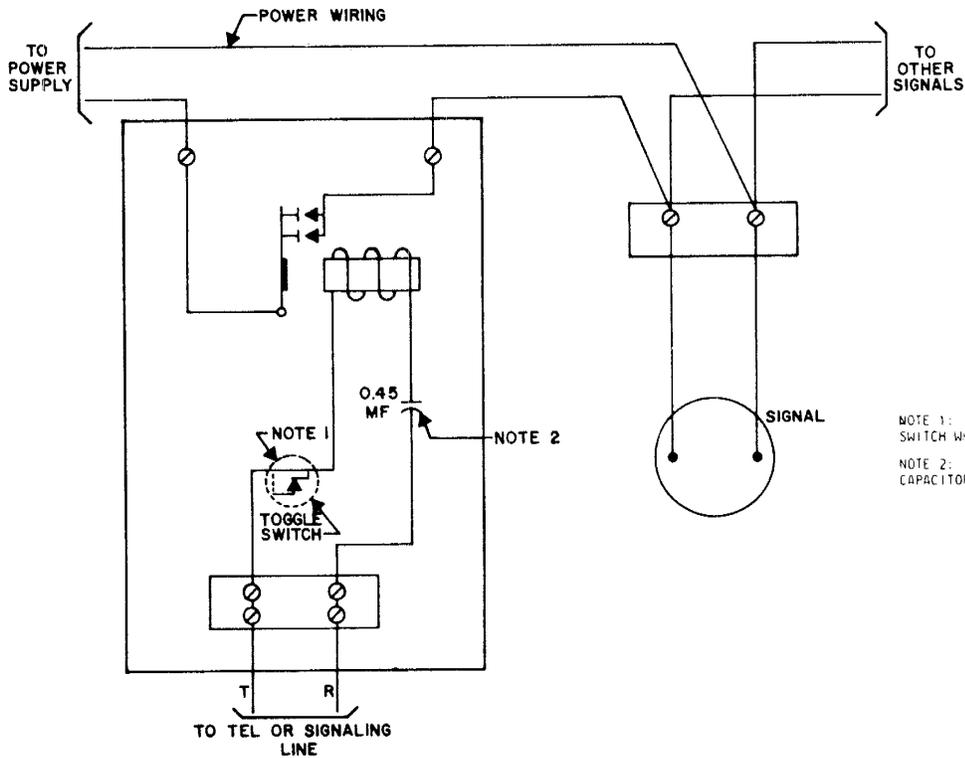


Fig. 4 - KS-8233, L2 Transformer Relay Set

2.04 The KS-8233, L2 transformer relay set has been used to connect several signals to one telephone line, as shown in Fig. 4. This may be encountered in some existing installations.

2.05 Connections for signals which do not have a self contained power relay are shown in Fig. 5. These signals require commercial power wiring between relay set and signal.



NOTE 1: LIST 9 RELAY IS EQUIPPED WITH A TOGGLE SWITCH WHICH WILL DISCONNECT RELAY FROM LINE.  
 NOTE 2: LIST 11 AND 12 RELAYS DO NOT CONTAIN A CAPACITOR.

Fig. 5 - KS-16626 Power Relay Set

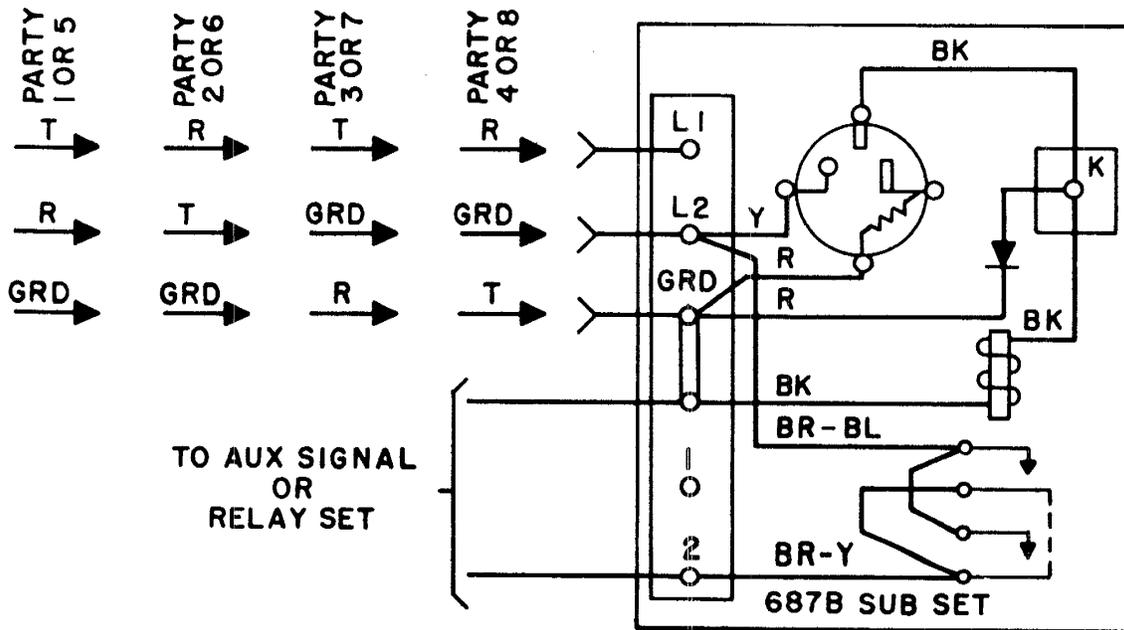


Fig. 6 - Auxiliary Signals on Party Lines

2.06 Auxilliary signals may be installed on 4-party full selective or 8-party semiselective lines by connecting a 531C or 687B subscriber set as shown in Fig. 6.

2.07 Connections for noncontinuous low voltage signals such as bells, buzzers, and lamp indicators are shown in Fig. 7.

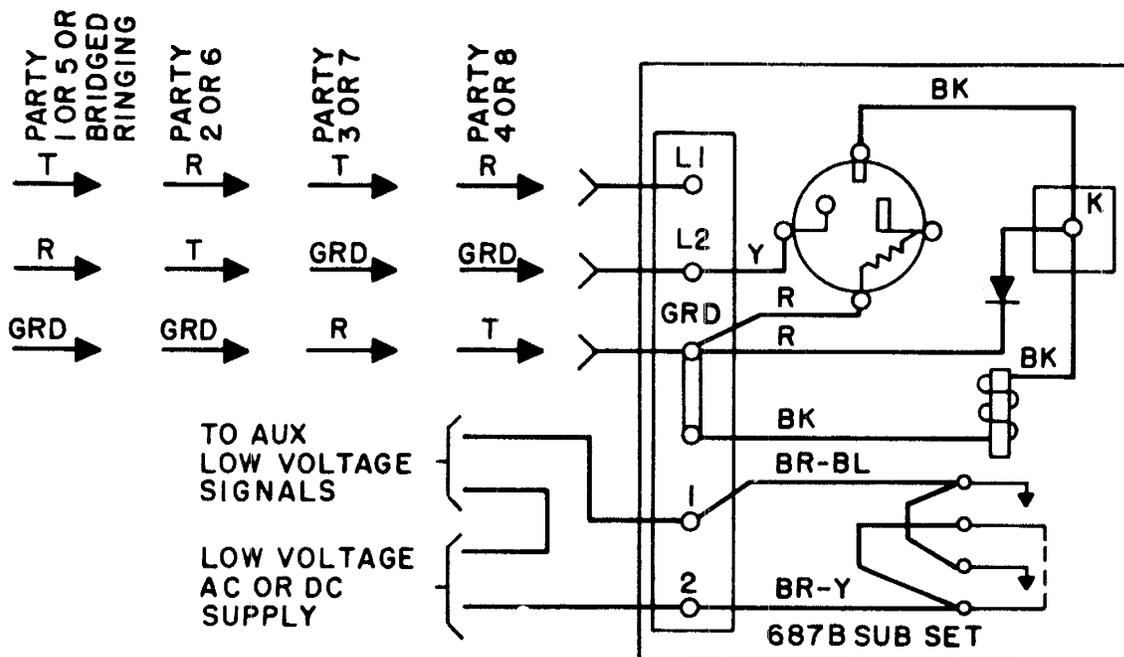


Fig. 7 - Noncontinuous Low Voltage Auxiliary Signals

**2.08** Continuous operating signals, either low voltage or power operated, should be connected as shown in Fig. 8. Low voltage signals connect directly to the 15C key telephone unit.

### **3. CIRCUIT OPERATION**

**3.01** The circuit operates as follows (Fig 8):

- (a) Ringing current applied to line operates R relay through its secondary winding, through top contacts 1 and 2 of SR relay to ground.
- (b) R relay locks operated by battery through its primary winding, through its own top contacts 1 and 2, through bottom contacts 3 and 2 of SR relay, through bottom contacts 1 and 2 of TO relay (Z wiring) to ground, or to switch to ground (Y wiring).
- (c) R relay operated completes circuit through its own top contacts 3 and 4 to operate auxiliary relay or signal.
- (d) Bottom contacts 1 and 2 of R relay may be used to operate a line lamp indicator.
- (e) When call is answered, B relay operates by central office or PBX battery through station.
- (f) SR relay operates by battery through its winding through contacts of B relay (operated), and through bottom contacts 1 and 2 of TO relay to ground (Z wiring).
- (g) Operation of SR relay opens locking circuit of R relay which releases.
- (h) Circuits to auxiliary signal and line lamps open when R relay releases.
- (i) Unanswered calls are handled by a time-out feature. When R relay operates, ground is connected through bottom contacts 3 and 4, through 112-ohm heater winding of TO relay (Z wiring), and through top contacts 3 and 2 of TO relay to battery. After approximately 30 seconds, thermally operated bottom contacts 1 and 2 of TO relay will open. This opens locking circuit of R relay, and circuit restores to normal.
- (j) If call is answered, SR relay operates as previously described. Circuit is completed from battery through TO relay, through bottom contacts 1 and 2 of SR relay (operated), and through bottom contacts 1 and 2 of TO relay to ground. This opens heater winding circuit of TO relay.

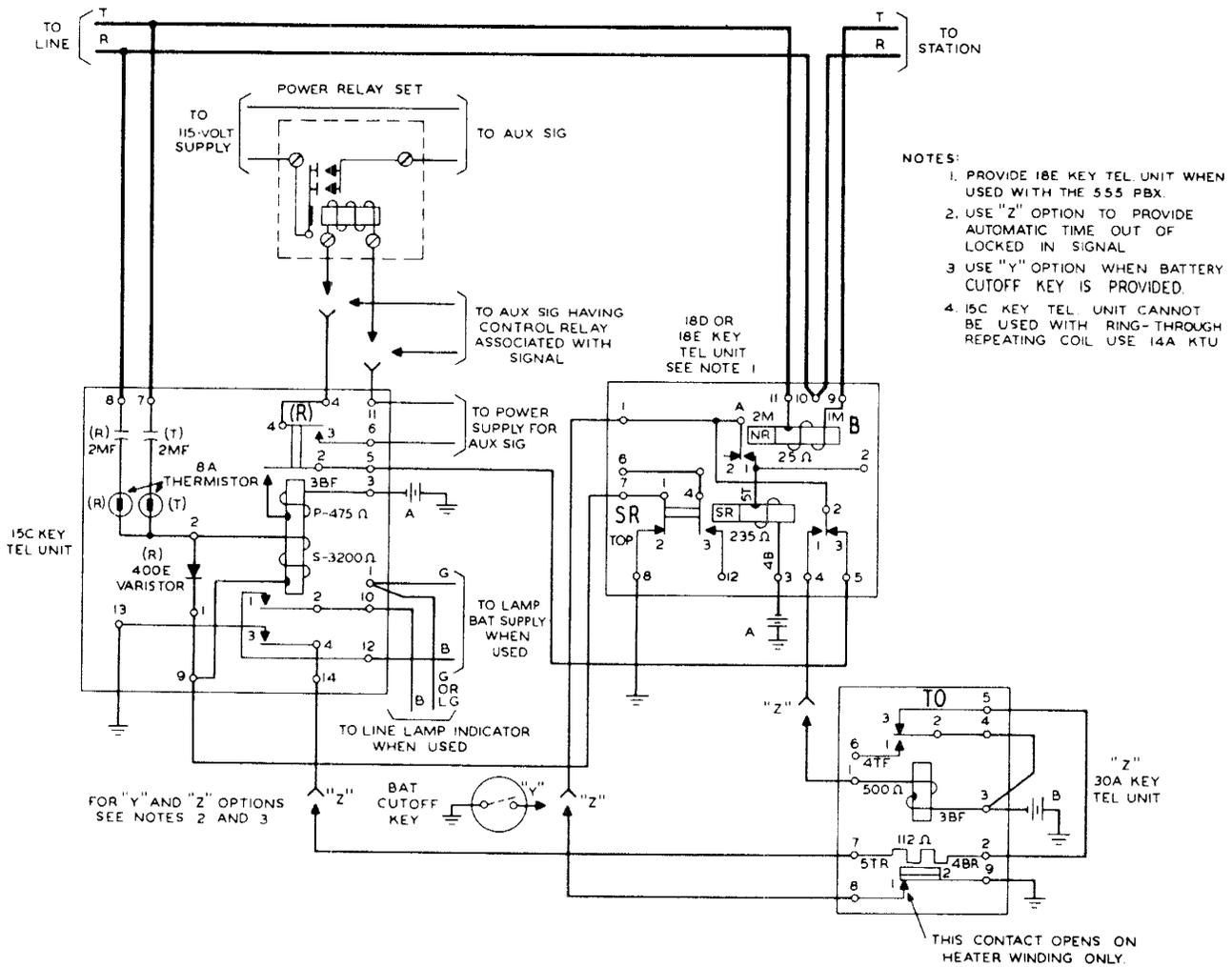


Fig. 8 - Connections and Circuit Operation for Continuous Auxiliary Signals