

DIAL-IN-HANDSET
F-56593 TELEPHONE HANDSET AND F-56594 TELEPHONE BASE
IDENTIFICATION, INSTALLATION, CONNECTION, AND MAINTENANCE

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1. GENERAL

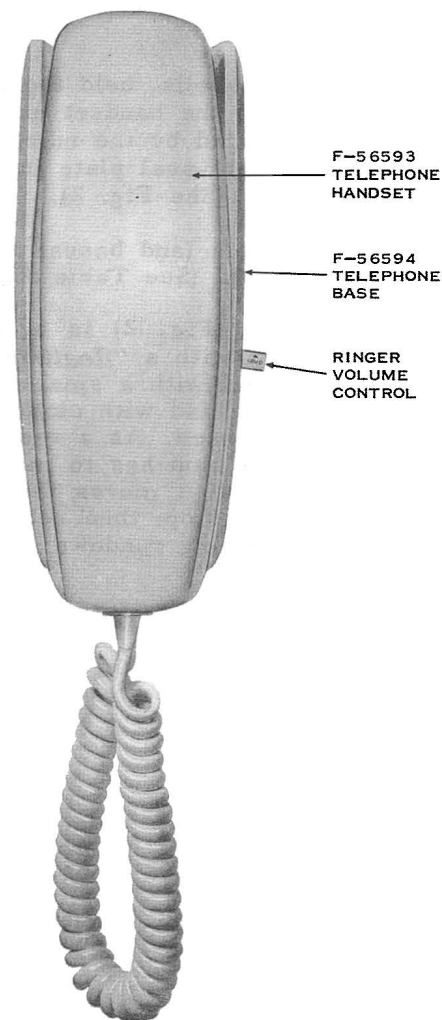
1.01 This section covers the installation and maintenance of the "TWO PIECE" Dial-In-Handset telephone (Fig. 1), which is similar to the F-56171 Dial-In-Handset.

1.02 It is reissued to delete all references to portable type installations. Since this reissue covers a general revision, marginal arrows ordinarily used to indicate changes have been omitted.

1.03 This handset is designed primarily for use in hospitals and other similar institutions. However, it may be installed elsewhere.

Note: Do not confuse this handset with *TRIMLINE* telephone sets.

1.04 The Dial-In-Handset is intended for wall installation only.



F-56594 Telephone Base With
F-56593 Telephone Handset
Fig. 1

2. DESCRIPTION

F-56593 Telephone Handset

2.01 Electrically, the F-56593 Handset is a complete telephone except for ringer and switch hook functions. It consists of the following components:

- LA1 receiver unit.
- T1 transmitter unit.

- 10A dial.
- 53A lamp (illuminates dial, number plate, and amber side light).
- 854A speech network mounted on a flexible printed wiring card.
- F-56666 9-foot plug-ended retractile handset cord.

2.02 Two molded shells, held together by two screws, form the handset exterior. The screws are concealed by the number card holder and dial light-seal plate just below the receiver heel. (See Fig. 2).

2.03 These handsets (and bases) are available in white (-58). (See Table A.)

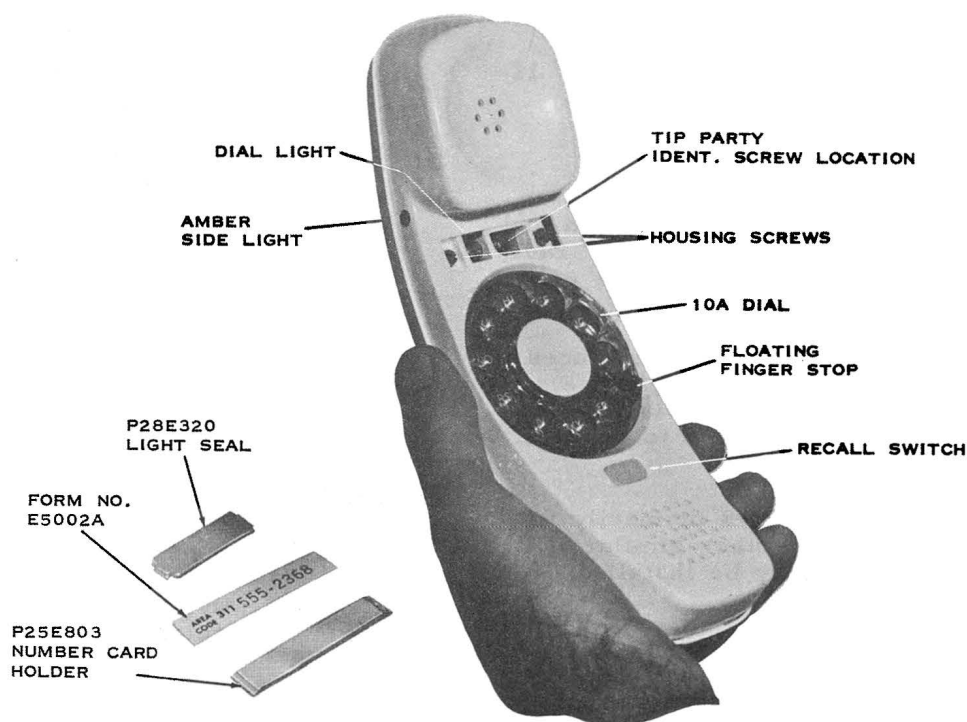
2.04 The 10A dial (Fig. 2) is a space-saver design with a "floating" finger stop. A fingerwheel with a smaller diameter than on other dials and with closer spacing of finger holes is used. As a result of closer spacing, the finger stop has to move. With each pull of the dial it moves through an arc of 52 degrees to a stop, then returns to its normal position during rundown.

2.05 Letters and numerals on the dial number plate and amber side lamp are illuminated by edge lighting from a 53A lamp. Power for the 53A lamp is supplied by a 2012A transformer or equivalent via line switch contacts in the telephone base. Illuminated side lamp indicates the handset is off-hook.

2.06 The number card holder (Fig. 2) accommodates Form E5002A number card. The clear plastic retainer may be removed by using a KS-16750, List 2 releaser or equivalent. An aluminum plate (Fig. 2) under the number card provides a light-seal for the 53A lamp.

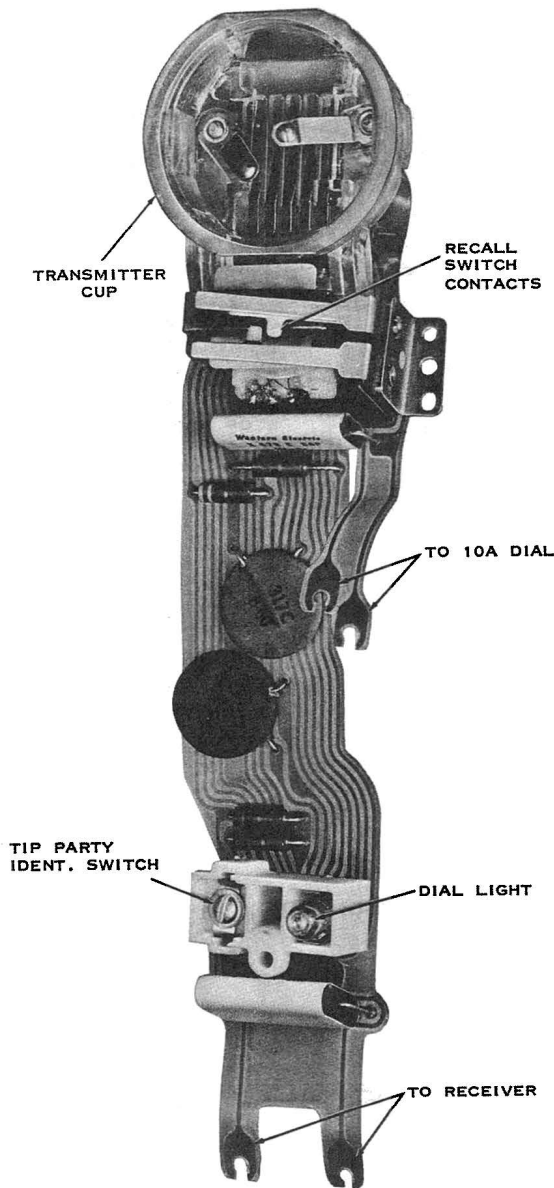
2.07 The recall switch (Fig. 2), when depressed, opens the tip and ring of the line by operation of the K1 recall relay located in the telephone base. Operation of the K1 relay also opens the lamp circuit. This recall switch is intended to release and regain a central office line in place of operating the line switch. With the recall relay operated, it is not necessary to restore the telephone handset on the base switch hook in order to call or be called.

Note: If recall switch is depressed during conversation or dialing, central office equipment may disconnect.



F-56593 Telephone Handset
Fig. 2

2.08 The 854A network (Fig. 3) used in the F-56593 handset provides transmission characteristics similar to a 500-type set. The network includes a jack for plugging in a five conductor handset cord, a recall switch, and a lamp socket for a 53A lamp.



854A Network (Flex-Strip)
Fig. 3

2.09 An F-56666 plug-ended retractile handset cord (Figs. 1 and 14) connects the handset to the telephone base. This cord is plug-ended for connecting to the handset, and is spade-tip ended for base connections. (Cord is packaged with each F-56593 handset.)

2.10 The handset cord (F-56666) is a five conductor cord. The five conductors are required for full party, lamp, and recall relay operation.

F-56594 Telephone Base

2.11 The F-56594 telephone base (Fig. 4) is wired for individual line service. Wiring changes are necessary for other services. (See appropriate Tables and Figs.)

2.12 The telephone base has a metal base on which are mounted:

- A card operated line switch (switch hook).
- P1A ringer with a 165A mounting adapter.
- K1 recall relay.
- Terminal board.
- A plastic housing (shell).

2.13 Two captive screws for fastening the plastic housing to the base are located beneath the P-82E858 **BELL SYSTEM** identification plate (Fig. 4). Use a KS-16750, List 2 releaser, or equivalent, for removal of plate.

2.14 The P1A ringer has a volume control operated by a lever extending from the right side of the base mounting. (See Fig. 6.) A ringer cutoff is made available by the removal of a stop screw through an opening in the gong. (See Fig. 5.)

2.15 Figs. 4, 5, and 6 show the P1A ringer with adapter. The figures also show the location of the stop screw and the bias spring. P1A ringers have 5 leads. The (BL) lead is used for part of the tip party identification circuit (refer to appropriate parts on connections). The (S) and (SR) leads are insulated and stored.

2.16 Mounting cords are available for this base in three lengths only. (See Table A.) These cords may be used in lieu of inside wire as required.

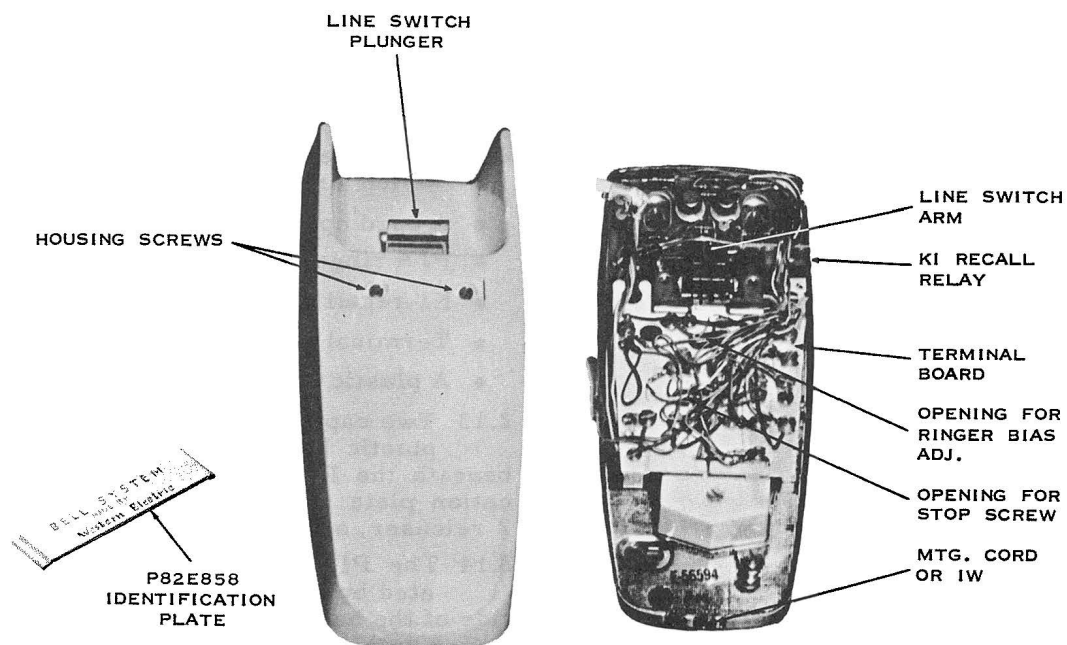
2.17 When connecting for 4-party full selective or 8-party semiselective ringing, a 426N diode may be installed in the base. Place the diode in the opening provided in the terminal board. (See Fig. 6.) Connect the leads as shown in the appropriate connection section.

3. INSTALLATION

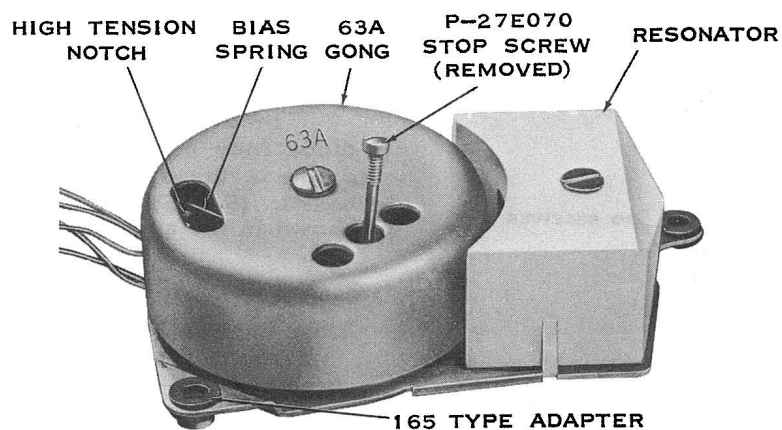
3.01 The handset (F-56593) and base (F-56594) are packaged separately. To receive a complete Dial-In-Handset telephone set, one each must be ordered, suffixed with -58. For example:

- 1 Base, Telephone, F-56594-58
- 1 Set, Telephone, Hand, F-56593-58 (A 9-foot retractile handset cord is included.)

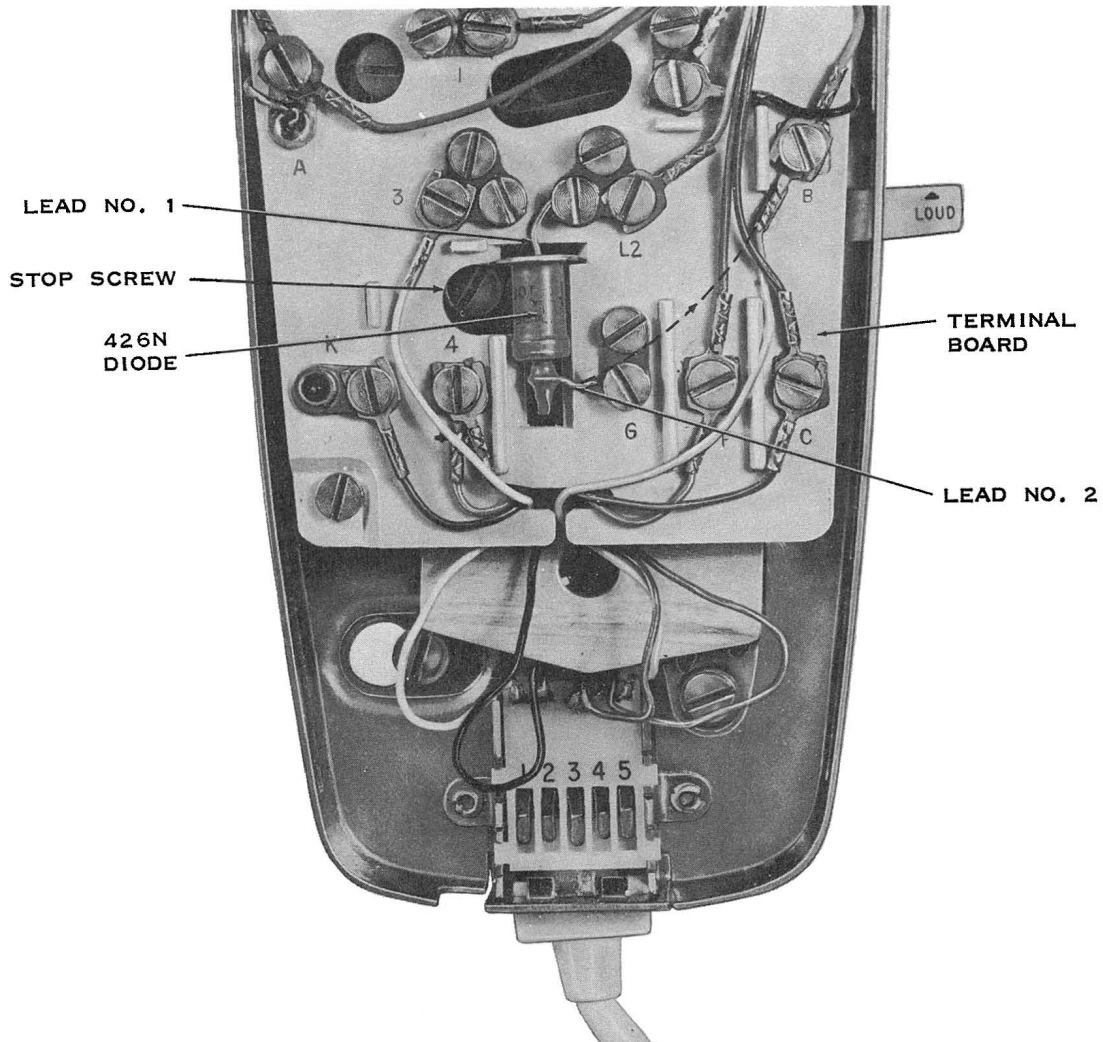
Note: Mounting cords are not included with either the handset or base. They must be ordered separately as required. (See Table A.)



F-56594 Base
Fig. 4



P1A Ringer With Adapter
Fig. 5



426N Diode Installation (See Table D)
Fig. 6

3.02 When placing the instrument, consider the following:

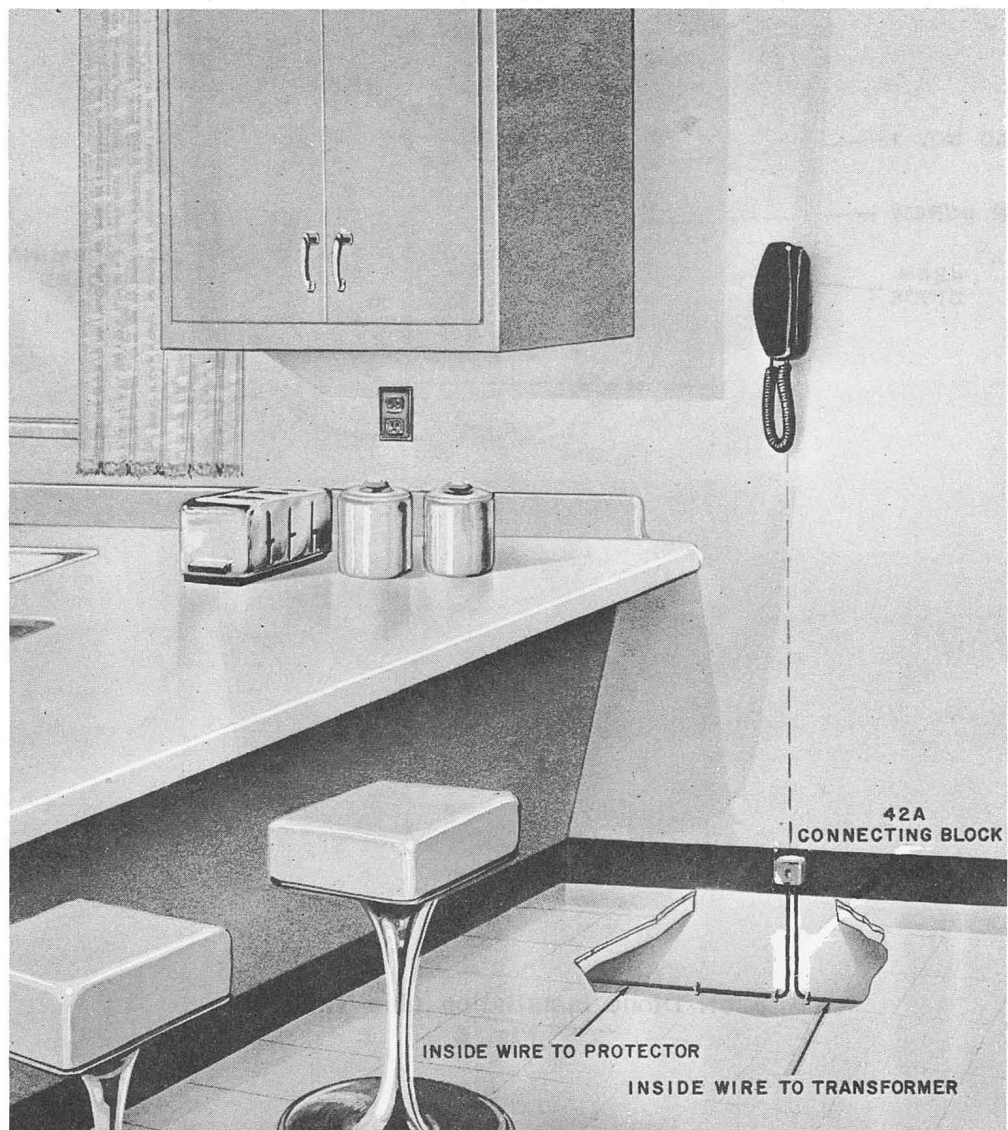
- Safety for yourself, customer, and maintenance personnel.
- Availability of AC power outlet for 2012A or equivalent transformer.
- Location of telephone base so ringer volume is adequate for area.
- General appearance of installation.

3.03 Selection of location and method of installing shall be consistent with existing standard practices. (See Figs. 7 and 8.)

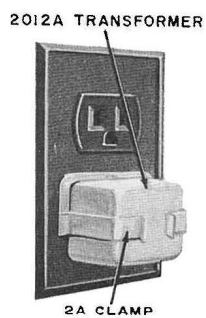
3.04 The telephone handset (F-56593) is shipped from the factory with the tip party identification screw in an open position. (See Fig. 2.)

3.05 When tip party identification is required, the screw-type switch shall be tightened firmly. When no longer required, the screw shall be backed off until tension is felt (approximately 1-1/2 turns). (See Figs. 2, 17 and Table C.)

3.06 When required, the 155A adapter and/or 182B backboard shall be used to mount the telephone base.



Typical Wall Installation
Fig. 7

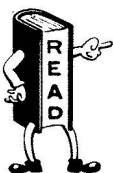


Transformer Installation
Fig. 8

3.07 A 155A adapter plate may be used to wall-mount these bases over a conduit outlet box or 63-type bracket. The letters TOP stamped near one end of the plate indicates the proper positioning. After plate is fastened, secure base (housing removed) with two machine screws furnished with the adapter. (See Fig. 9.)

3.08 A 182B backboard may be used to wall-mount the base. This backboard is available in white to match the telephone base.

3.09 When base wiring is exposed, terminate line and transformer wiring at a common bridging point, such as a 42A or 1044 type connecting block. Run one quad and one paired or equivalent (5 conductors) from connecting block to the base. Wiring may enter the base from openings at the bottom, top, or through the backplate.



Note: Five (5) conductors are always required when this Dial-In-Handset is installed on two or more party services. **AT NO TIME SHALL THE STATION PROTECTOR OR SIGNALLING GROUND BE BRIDGED TO THE AC TRANSFORMER GROUND.**

3.10 In cases where an inside wire is already in place through a wall, an exposed wire run may be necessary between the telephone base and the transformer. If a 155A adapter plate is used, the exposed wire may enter the base through openings at top or bottom. If a 182B backboard is used, the exposed wire may enter the base through the backplate from behind the backboard.

AC and DC Power Supply

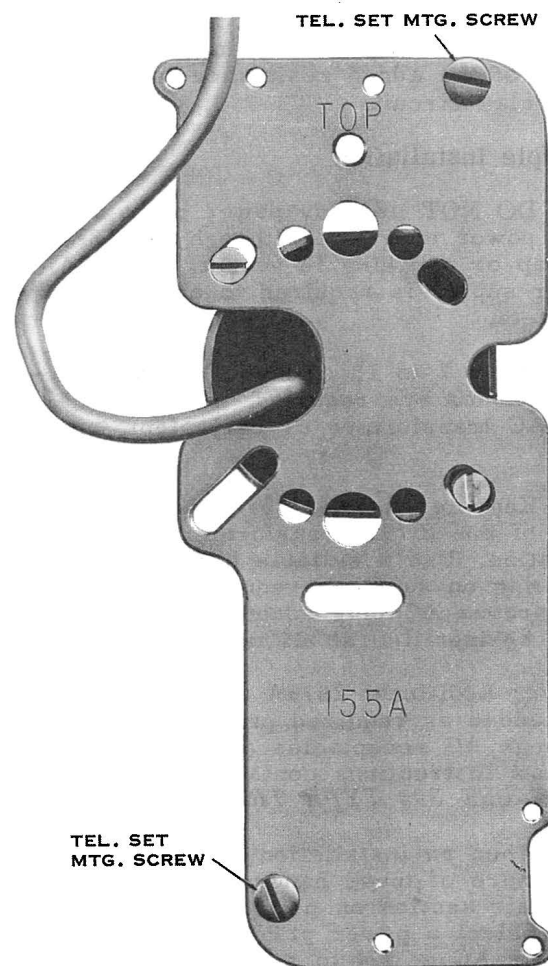
3.11 Power for the 53A lamp and K1 recall relay is furnished from the same 10- or 18-volt AC power transformer. This AC voltage is rectified to DC (11 to 20 volts) in the F-56594 base.

3.12 The 53A lamp is a 10-volt AC lamp, while the K1 recall relay requires 11 to 24 volts DC for proper operation. The minimum DC voltage for operation of the K1 relay is 11 volts. The DC voltage must be measured across the KS-16390, List 6 capacitor. It is located in the telephone base on the left side below the terminal board.

3.13 The correct power supply (AC) is governed by the type of installation involved. As follows:

Single Installations

3.14 Where a single Dial-In-Handset is involved, use a 2012A transformer. Select



155A Adapter Typical Installation
Fig. 9

a 105- to 120-volt AC receptacle that is not on a circuit controlled by a switch. A 2A clamp (Fig. 8) is available to secure the transformer to the AC outlet.

3.15 For proper illumination of one dial and the operation of one K1 relay, the length of wire between the transformer and telephone base (F-56594) should not exceed 250 feet. (In the event a 2012A is inadequate, use a 2075A transformer and follow installation instructions contained in 3.17 through 3.23.)



Note: Use a 2012A transformer, not a 2012B. The power output of the 2012B is not adequate for simultaneous operation of the lamp and K1 recall relay. (Maximum current drain occurs at this time.)

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3.16 Do not use a 25-foot mounting cord on any Dial-In-Handset installation because of the added resistance to the lamp and relay circuit.

Multiple Installation

3.17 **DO NOT** use any power plant furnishing power to a KTS, although the 18-volt AC tap or punching is vacant. A **SEPARATE** power supply is required to operate these handsets.

3.18 When 2 to 10 of these handset telephones are required, a 2075A, 15- to 18-volt AC transformer or equivalent, must be used.

3.19 Keyhole slots are provided at the rear of the 2075A transformer for easy installation. Use a suitable backboard when mounting on surfaces requiring backboards. The proper AC plug adapter and retainer must be installed at all times.

Note: Additional 2075A transformers shall be added as required, providing there are enough AC receptacles available. Otherwise follow instructions contained in 3.20. (**DO NOT USE 393 TYPE TRANSFORMERS.**)

3.20 When an installation requires 11 or more of these handsets, refer to appropriate section on power plants for selection. Select a power plant furnishing 15 to 20 volts AC at 1.4 to 3.0 amps.

3.21 A maximum of 35 handsets can be operated properly from one 18-volt AC 2.0 amp fuse or tap. This single power supply must be fused again (201D KTU) in groups of five. Each group must be protected by a .5 amp fuse (24-E).

3.22 The length of the individual feeder pairs from the power source to the telephone base shall not exceed 19 ohms.

Lamp Circuit Modification

3.23 When an 18 volt AC transformer or power plant supply is used, modify the 53A lamp circuit only. This required modification is done in the F-56594 base. The modification will lower the AC voltage to accommodate the 53A lamp. To modify the 53A lamp circuit:

- Move the (BK) lamp lead on punching 7 to spare (G) punching.
- Connect a 124 ohm .5 watt resistor (No. 227A), or equivalent, between punchings (7) and (G).

- In the event the (G) punching is being used for party identification and ringer connections, use a D-161488 connector to bridge the resistor and (BK) lamp leads.

- Dress resistor wiring in such a manner that they will not contact other punchings of the terminal board.

3.24 To separate housing from base (F-56594) and shells of (F-56593) telephone handset, proceed as follows:

(a) *Base (F-56594).* (See Fig. 10.)

(1) Remove housing:

- Remove cover plate (BELL SYSTEM identification plate) below switch hook with a KS-16750, List 2 releaser.
- Loosen the two captive screws which are now exposed.
- Lift housing off.

(2) Replace housing:

- Hold the housing upside down so that line switch plunger is exposed.
- Place finger on front of the exposed plunger to hold it in place.
- While holding plunger, turn housing upright and place in position over the backplate.
- The plunger may now be released as it will not rest on the line switch arm.
- Tighten housing screws and replace cover plate by inserting one end of it in recess. Put light pressure on the other end to cause a slight outward bow and snap into recess.

(b) *Telephone handset (F-56593).* (See Fig. 2.)

(1) Remove deck and shell:

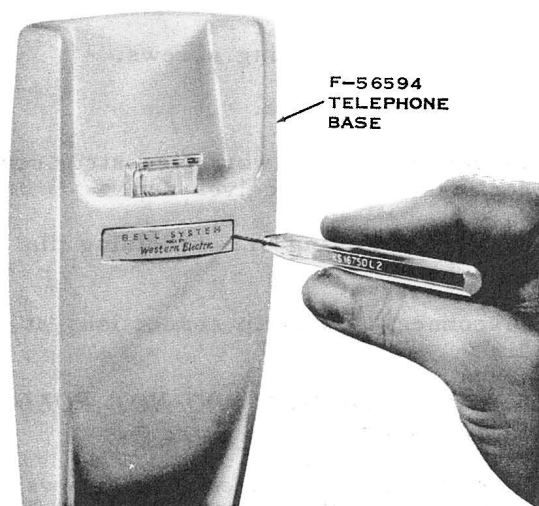
- Remove number plate card retained with a KS-16750, List 2 releaser.
- Remove number card and light shield.
- Loosen two captive screws which are now exposed. (53A lamp and tip identification screw are also exposed.)

Note: Do not tighten or loosen captive screws while holding handset. Place it on flat smooth surface while working with the captive screws.

- Lift deck and shell off. Exercise caution not to damage shell area around handset cord jack or plug retainer guide.

(2) Replace deck and shell:

- Engage deck and shell at the handset cord and jack opening first.
- Align the two captive screws in decking so they will line up with their threaded anchors inside the shell.
- Gently engage remaining surfaces of shell and deck.
- Fasten captive screws and replace light seal, number card, and card retainer.

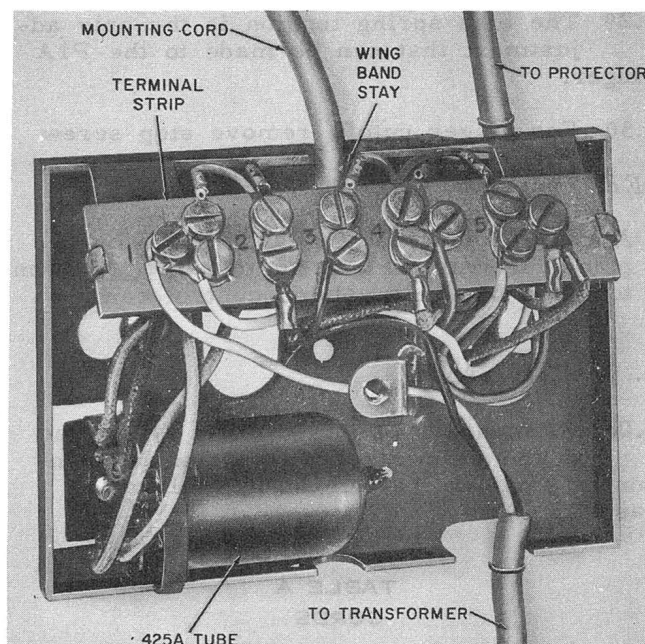


Removing Identification Plate
Fig. 10

3.25 A 426 diode (Fig. 6) must be installed in the base mounting when connecting for 4-party full selective or 8-party semi-selective ringing. Place the diode in the opening provided in the terminal board and dress leads to terminals and D-161488 connector. (See Table D.)

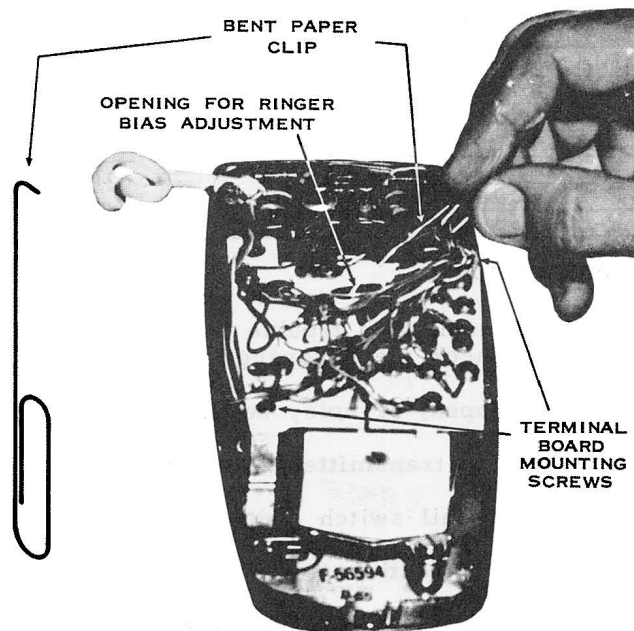
3.26 If an extension ringer is required, use a 687B subscriber set or equivalent. Refer to connection information in this section (Fig. 15) and appropriate sections covering subscriber sets and polarized ringing.

3.27 When extreme noise inductions exist (a condition which usually requires the use of a 3-element tube connected without the control gap across the line), use a 74A connecting block rather than the 426N diode. The 74A connecting block (Fig. 11) contains a 425 tube (4-element) and a terminal strip. Five conductors are required between connecting block and base mounting. Refer to Fig. 16 for connections.



74A Connecting Block - Cover Removed
Fig. 11

3.28 The biasing spring in the P1A ringer is set in the high tension notch at the factory. Use long-nose pliers or a bent paper clip to lift the bias spring and move it to the right of the notch (Fig. 12) through opening in terminal board.



Adjusting Bias Spring in P1A Ringer
Fig. 12

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3.29 The bias spring tension is the only adjustment that can be made to the P1A ringer.

3.30 For ringer cutoff, remove stop screw and move volume control to extreme *LEFT* position. (Fig. 5.)

Note: If stop screw is to be put back in place, set volume control to *LOUD* position to avoid breaking volume control cam.

4. MAINTENANCE

4.01 Maintenance of this handset is limited to the following (Table A and B) component parts of the telephone handset and base:

TABLE A
CORDS

| HANDSET CORD | MOUNTING CORD | CORD LENGTH |
|--------------|---------------|-------------|
| *F-56666-58 | F-55604-58 | 5-1/2 Foot |
| | F-55731-58 | 9 Foot |
| | F-55732-58 | 13 Foot |

*Available in 9-foot length only.

TABLE B
REPLACEABLE PARTS

| F-56593 HANDSET | F-56594 BASE |
|---------------------|----------------------|
| 10A Dial | P1A Ringer |
| T1 Transmitter Unit | B-696796-58 Housing |
| LAI Receiver Unit | P-82E858 Cover Plate |
| 53A Lamp | |
| P-25E803 Retainer | |
| P-28E320 Light Seal | |
| P-88E658 Dial Blank | |

Transmission

4.02 If transmission trouble is in the handset, check the following:

- Worn, open, or noisy cord.
- Defective transmitter or receiver unit.
- Dirty recall switch contacts.
- Loose connections.
- Defective 854A network, flex circuit, or components. (See Fig. 3.)
- Dirty or worn dial contacts.

- Transformer or power supply.

- 74A Connecting block.

4.03 If transmission trouble is in the 854A network, replace the handset.

Dial

4.04 Parts replacement is limited to finger-wheel and finger stop. Refer to section on 10A Dials.

4.05 To replace a defective 10A dial, it is necessary to:

- Remove number card and light-seal plate.
- Loosen two mounting screws.
- Separate the shells.
- Disconnect the network flex-strip connections at the receiver cup.
- Remove mounting screw holding dial light block.
- Disconnect flex-strip connections at 10A dial.
- Lay flex-strip back. **DO NOT FOLD FLEX STRIP.**
- Remove three dial mounting screws; then remove dial.
- Connect the two flex-strip connections to replacement dial before fastening dial to shell.
- Follow above steps in reverse order to reassemble.

Ringer

4.06 To replace a defective P1A ringer:

- Disconnect ringer leads.
- Remove terminal board mounting screws.
- Raise end of terminal board.
- Remove ringer mounting adapter from base.
- Remove mounting adapter from ringer.
- Fasten mounting adapter to new ringer.
- Engage ringer volume control with adjusting lever before fastening ringer mounting adapter to base.

(h) Reposition and fasten terminal board.

Dial Lamp and Recall Relay

4.07 If lamp and/or K1 recall relay fails to operate correctly, check for the following:

- Open lamp (Fig. 13).
- Defective or unplugged transformer or power supply.
- Commercial power failure or power turned off.
- Loose connections.
- Dirty or improperly adjusted switch hook contacts.
- DC voltage to K1 relay is less than 11 volts. (Measure this voltage across the KS-16390, List 6 capacitor only.)
- 124 ohm resistor; it may be defective or installed incorrectly in the circuit. (See 3.23.)

4.08 If illumination is poor and the recall relay fails to operate at times, check that the length of inside wire does not exceed 250 feet or 19 ohms.

Cords

4.09 To replace the plug-ended handset cord:

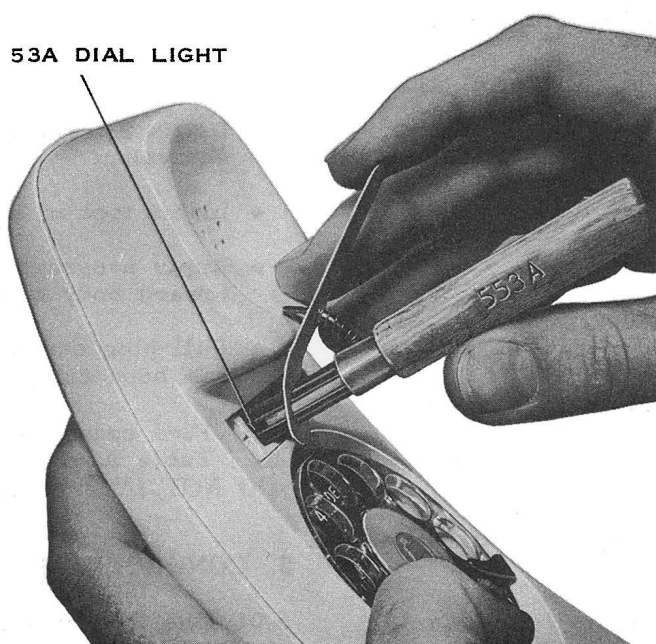
- Use a KS-16750, List 2 releaser or equivalent.
- Insert tool in space provided.
- Apply pressure against spring clip toward body of plug. (See Fig. 14.)
- Pull plug out of jack when spring clip has been compressed.

4.10 Five conductor mounting cords from Table A (or equivalent) are required. *(DO NOT INSTALL A 25-FOOT CORD.)*

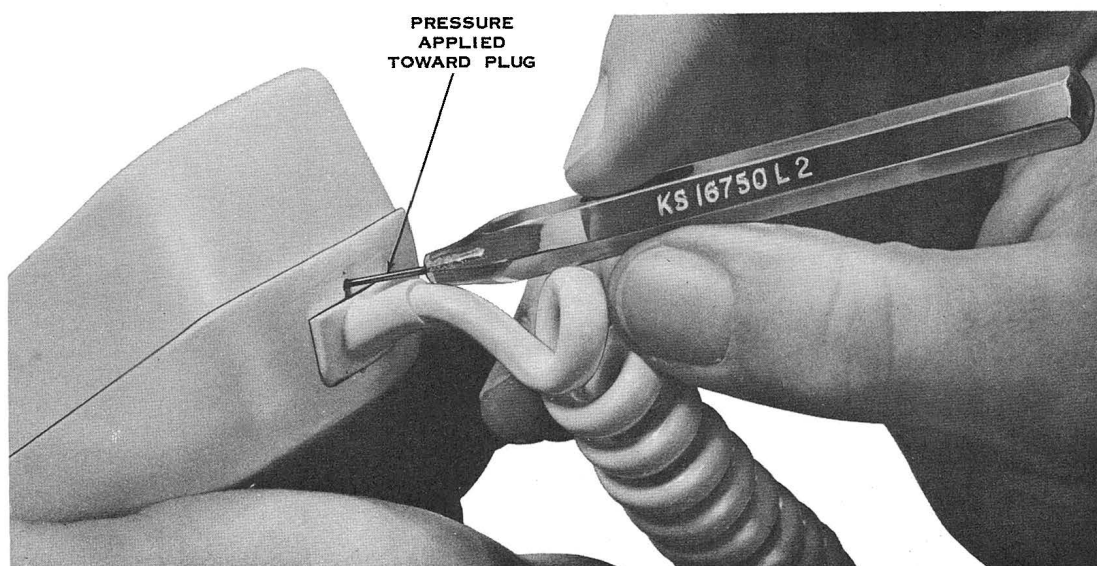
5. CONNECTIONS

5.01 The following (Figs. 15, 16, and 17 and Tables C and D) furnish additional required wiring changes for the type of service and equipment involved.

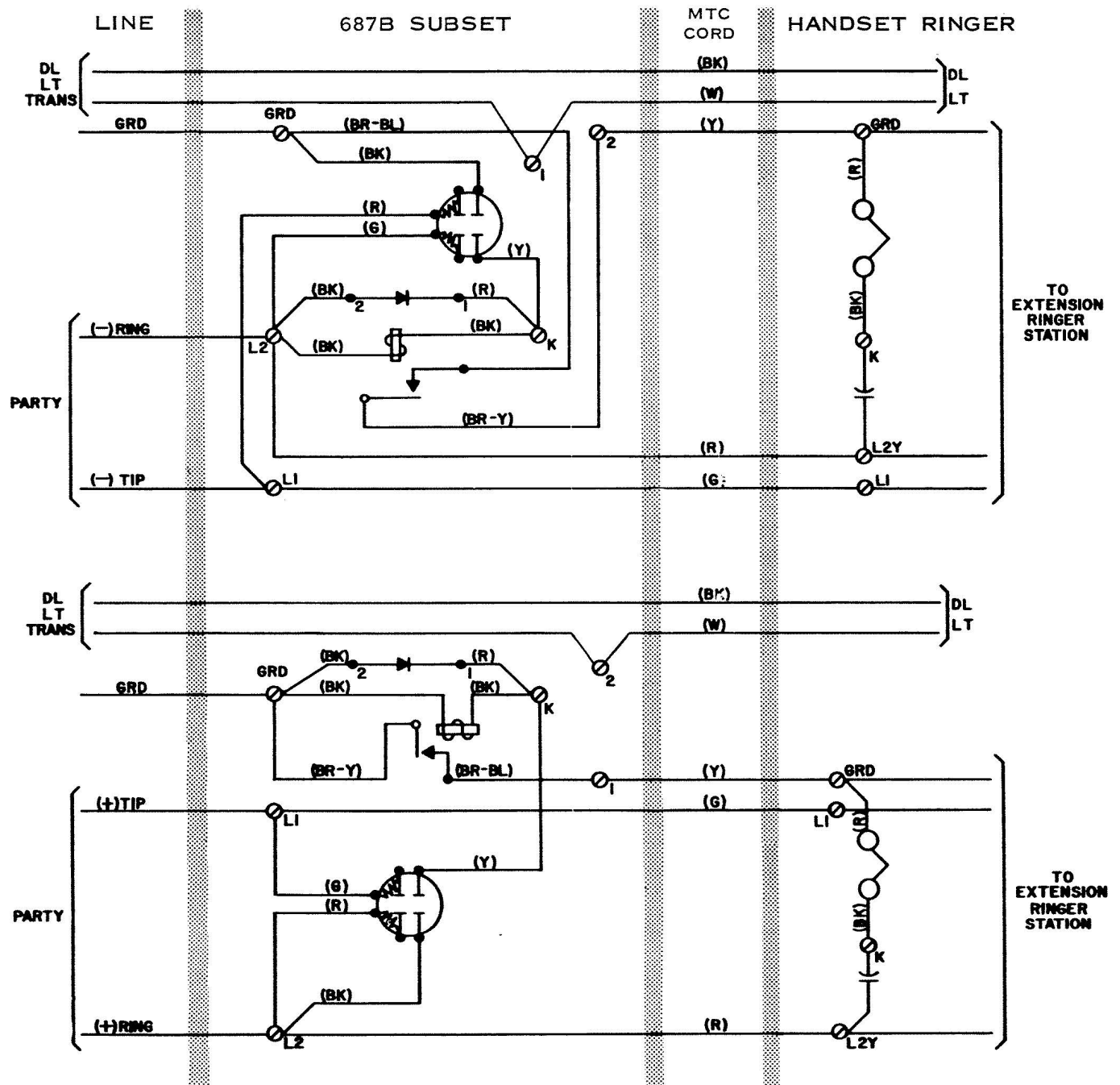
5.02 If this instrument is used as a key telephone extension, a **213B K-T-U-** must be used. Use appropriate practice for terminal designations. Connect T and R leads so "L" relay operates on station short. This method removes need for "A" and "A1" leads.



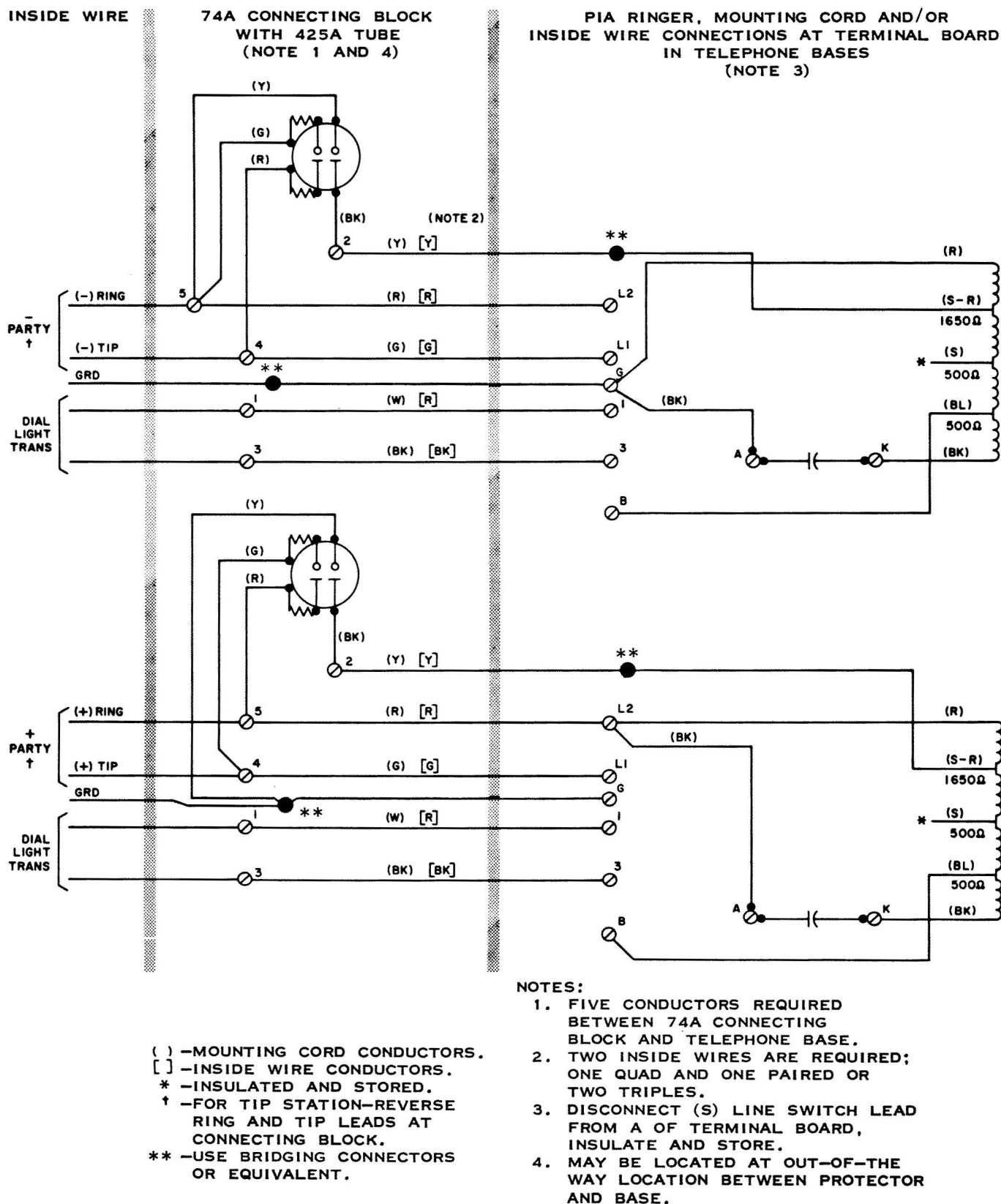
Replacing Dial Light
Fig. 13



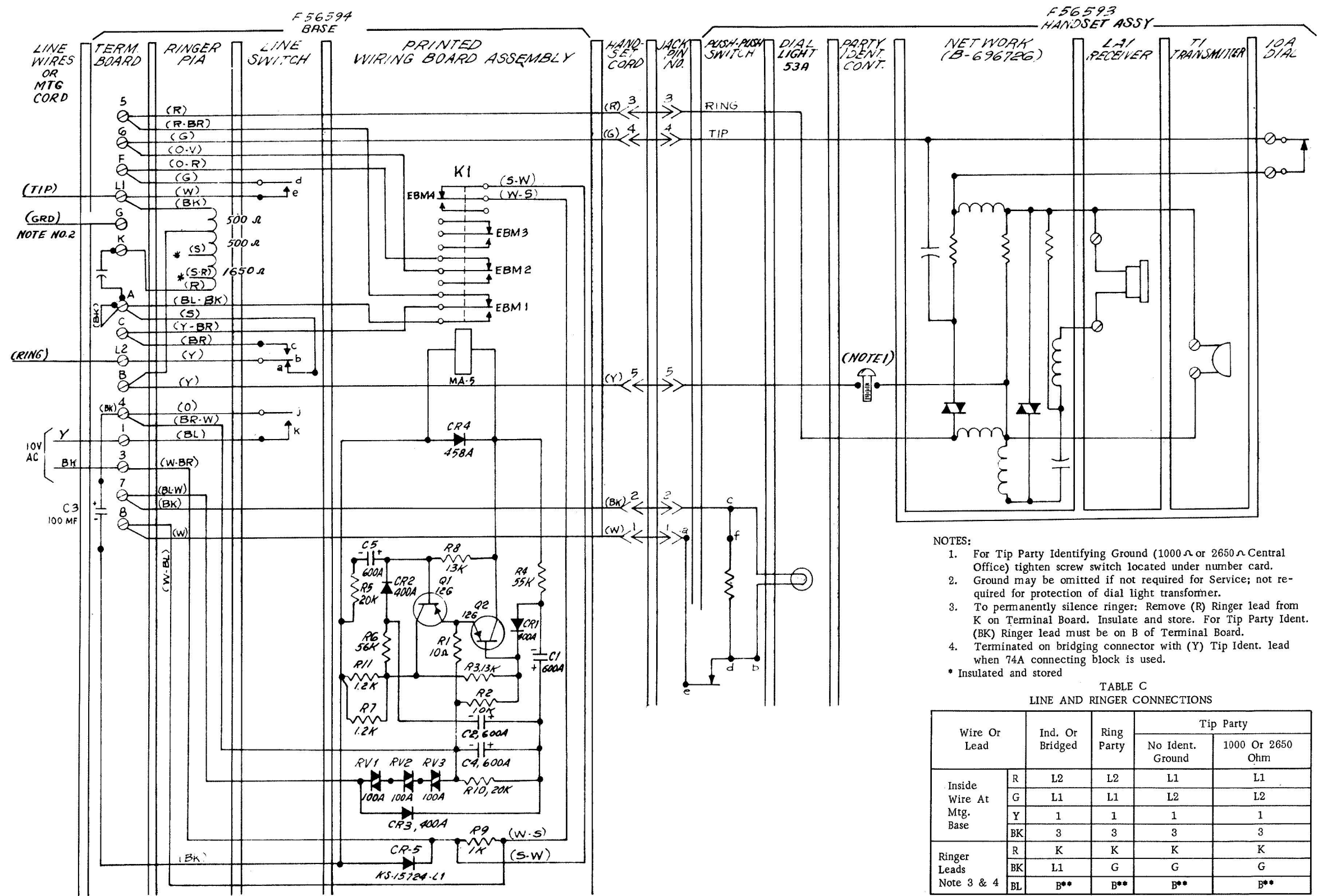
Removing Cord from Handset Assembly
Fig. 14



687B Subscriber Set, Connections
Fig. 15



74A Connecting Block and Ringer Connections
 For Extreme Inductance Interference
 Fig. 16

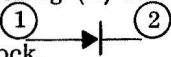


F-56594 Base and F-56593 Handset Connections
Fig. 17

TABLE D
CONNECTIONS FOR 4-PARTY FULL SELECTIVE OR 8-PARTY SEMISELECTIVE RINGING

| Party | Line Wire Connections at Conn Block | | | Dial Lt Trans Leads | | Mounting Cord at Connecting Block | | | | | Mounting Cord or Inside Wire at Terminal Block | | | | | 426N Diode † | | Ringer Leads | | | | | Strap from A | Tip Ident Lead |
|----------|-------------------------------------|---|---|---------------------|---|-----------------------------------|----------|----------|----------|----------|------------------------------------------------|-----|---|---|----|--------------|---|--------------|----|----------------------|------|-----|---------------------|----------------|
| (Note 1) | R | G | Y | 1 (Note 2) | 3 | R | G | Y | W | BK | R | G | Y | W | BK | ① | ② | BK | R | S | BL** | S-R | BK | Y** |
| - RING | R | G | Y | Y | B | R (1) | G (2) | Y (3) | Y (4) | B (5) | L2 | L1 | G | 1 | 3 | L2 | B | K | 3 | Insulated and stored | G | G | Insulate and stored | |
| | | | | | | | | | | | L2* | L1* | | | 3* | | | | | | | | | |
| - TIP | R | G | Y | Y | B | G (2) | R (1) | Y (3) | Y (4) | B (5) | L2 | L1 | G | 1 | 3 | L2 | B | K | 3 | | G | G | | |
| | | | | | | | | | | | L1* | L2* | | | 3* | | | | | | | | | |
| + RING | R | G | Y | Y | B | R (1) | G (2) | Y (3) | Y (4) | B (5) | L2 | L1 | G | 1 | 3 | G | B | K | L2 | | G | L2 | | |
| | | | | | | | | | | | L2* | L1* | | | 3* | | | | | | | | | |
| + TIP | R | G | Y | Y | B | G (2) | R (1) | Y (3) | Y (3) | B (5) | L2 | L1 | G | 1 | 3 | G | B | K | L2 | | G | L2 | | |
| | | | | | | | | | | | L1* | L2* | | | 3* | | | | | | | | | |

Note 1: Disconnect (S) line switch lead from punching A of terminal board, insulate and store.
2: Do not connect station ground or AC transformer ground together at any time.

* Connection in base (F-56594).
** Removal of these leads clears punching (B) for diode termination.
† Must be installed in this position 
() Punchings on 1044A Connecting Block.