A. E. CO. TYPE 83 TELEPHONE INSTALLATION AND FIELD MAINTENANCE

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1. GENERAL

1.01 This Section provides installation and field maintenance information for the Type 83 telephone (Figure 1) manufactured by Automatic Electric Company. These compact units are arranged for mounting on an edge of a desk, a wall, or other flat surface such as a post or column. The sets can be used with a ringer unit as a standard telephone, or as an extension telephone with or without a ringer unit.

1.02 This telephone is no longer in production, and manufacture of some of the replacement parts has been discontinued; therefore, the application is confined to reinstallation and maintenance. For maintenance purposes, it may be necessary to dismantle some units to secure parts as replacements for other units.

2. DESCRIPTION

2.01 The Type 83 telephone measures 6-3/4" high, 5-1/8" wide (including handset hook), and 3-1/4" deep, and is available in a variety of decorator colors. A handset hook extends through the left side of the telephone housing (front view) and a matching handset with retractile cord is an integral part of the telephone. The housing and cover of the telephone are made of a die cast material. The telephone can be supplied with a dial blank, 1-0 dial, metropolitan ABC dial, SATT A or SATT B dial. A series rheostat is a part of the telephone transmission circuit to permit adjustment for optimum performance of the unit over various lengths of line loops.

2.02 The handset hook, terminal strip, induction coil, capacitor, rheostat, hookswitch, and dial (or dial blank) are mounted on the die cast housing of the telephone. The housing of the telephone has three knockout holes, and the cover has six knockout holes which are used for mounting the telephone.

2.03 An "L" shaped mounting bracket (part number D-731134-A) is available for mounting the telephone.

Figure 1. Type 83 Telephone.

3. MODIFICATIONS

Installing Dial Blank

3.01 If the Type 83 telephone is equipped with a dial and a dial blank is desired, a dial blank, part number D-49609, is required. This dial blank can be obtained in a color to match the color of the telephone. Specify color when ordering.

3.02 Use the following procedure to install a dial blank.

(1) Loosen the cover screw (Figure 2) and remove the cover.

(2) Loosen the two dial screws and lift the dial assembly from the housing. Remove the dial wires from the dial terminals. Do not remove the dial wires from the terminal strip terminals.

(3) Remove the two dial studs (Figure 2) from the dial assembly and insert these studs into the two tapped holes in the dial blank.

(4) Place the YEL and BL dial leads under the screw in the dial blank and tighten the screw. Tape the RED and WH dial leads separately to insulate them from the circuit. If the dial has a BR lead, tape this lead separately.

(5) Place the dial studs which have been installed on the dial blank, into the dial stud holes of the housing and lower the dial blank into the housing. Fasten the dial blank with the two dial screws.

(6) Replace the telephone cover.

Installing Dial

3.03 The following parts are required to install a dial in a Type 83 telephone.

(a) Two dial studs (part number D-76838-D). If the telephone is equipped with a dial blank, the dial studs from the dial blank may be used.

(b) BR dial wire (part number D-543069-N) if SATT dial is to be installed.

(c) Dial. See Table 1 for dial part number.

3.04 Use the following procedure to install the dial in the Type 83 telephone.

(1) Loosen the cover screw (Figure 2) and remove the cover.

(2) Loosen the two dial screws and lift the dial blank or dial assembly from the housing.

(3) Remove the dial wires from the dial

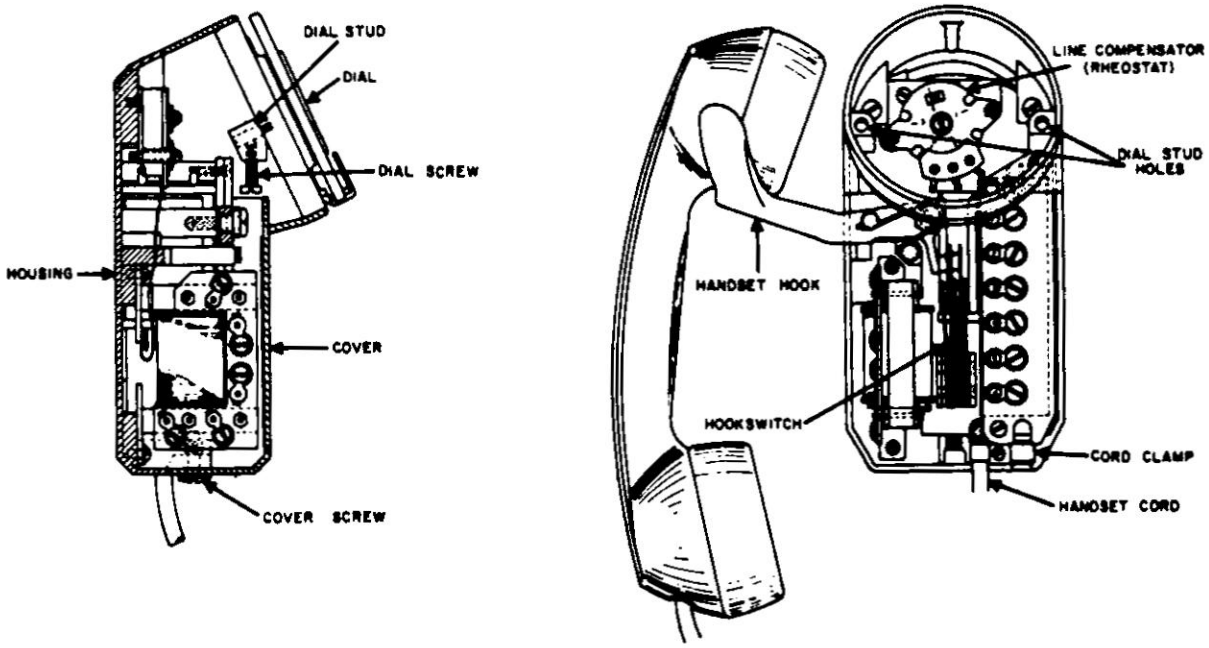


Figure 2. Type 83 Telephone (Interior Views).

Table 1. Dial Part Numbers.

Dial Description	Part Number
1-0	D-84820-C
Metropolitan (ABC)	D-84821-C
SATT B Pos. 1	D-84887-A1
SATT B Pos. 2	D-84887-A2
SATT B Pos. 3	D-84887-A3
SATT B Pos. 4	D-84887-A4
SATT B Pos. 5	D-84887-A5
SATT B Pos. 6	D-84887-A6
SATT B Pos. 7	D-84887-A7
SATT B Pos. 8	D-84887-A8
SATT B Pos. 9	D-84887-A9
SATT B Pos. 0	D-84887-A0
SATT A Pos. 8	D-84885-A1
SATT A Pos. 8 and 9	D-84885-A2
SATT A Pos. 8, 9, and 0	D-84885-A3
SATT A Pos. 8 and 0	D-84885-A4
SATT A Pos. 0	D-84885-A5

blank or dial assembly terminals. If the telephone is equipped with a dial blank, several of the dial wires will be taped and stored.

(4) Fasten the dial studs into the dial assembly to be installed.

(5) Fasten the dial wires to the dial terminals, referring to Figure 3.

NOTE: If the dial to be installed is a SATT dial, and the telephone is not equipped with a BR dial wire, order dial wire part number D-543069-N. Connect this wire to the dial terminal and terminal strip, referring to Figure 3.

(6) Place the dial studs into the dial stud holes in the housing and tighten the dial screws (Figure 2).

(7) Replace the telephone cover.

4. INSTALLATION

4.01 The installation of the Type 83 telephone consists of mounting the unit and wiring the station wires to the unit. In locating the telephone set, the installer should be guided by the customer's wishes. If the customer's wishes cannot be followed, explain the reason to the customer.

Mounting

4.02 For desk mounting, the preferred position is the front left corner as shown in Figure 4. For mounting in this position, the cover has six knockout holes. These holes permit the mounting of the telephone so the dial will be at the desired level above the desk top. Remove the cover from the telephone and knock out two of the knockout holes from the inside of the cover as required. Fasten the cover to the side of the desk with two No. 8 screws. After the station wires have been connected to the telephone, slide the telephone housing into the mounted cover and tighten the cover screw.

4.03 For mounting the telephone on a wall or other flat surface, the housing has three knockout holes. To reach two of these holes, the dial or dial blank must be removed. The third hole is located in the lower part of the housing. A typical wall mounting is shown in Figure 5.

4.04 Figure 6 shows two mounting arrangements using the L-bracket. Arrangement A protects the telephone, keeping it out of a busy aisle. In arrangement B, the telephone sticks out where people can find it readily and the telephone is equally convenient to people on either side of the wall.

4.05 Use the following procedure for L-bracket mounting.

(1) Locate and mount the L-bracket with three No. 8 screws.

(2) Remove the telephone cover and dial assembly.

(3) Knock out the two knockout holes located behind the dial in the housing.

(4) Mount the telephone to the bracket using the two No. 8-32 x 5/16" long RHIM screws furnished with the

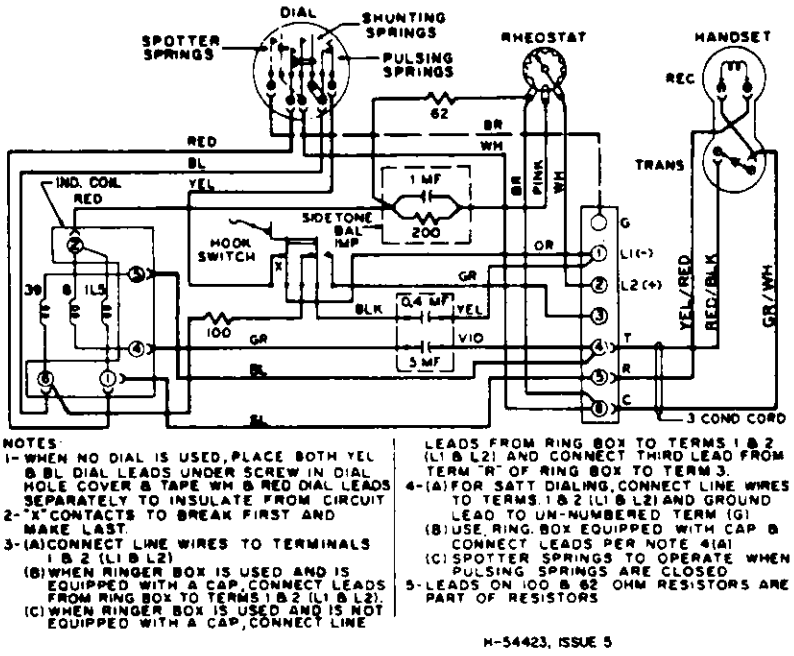


Figure 3. Wiring Diagram, Type 83 Telephone.

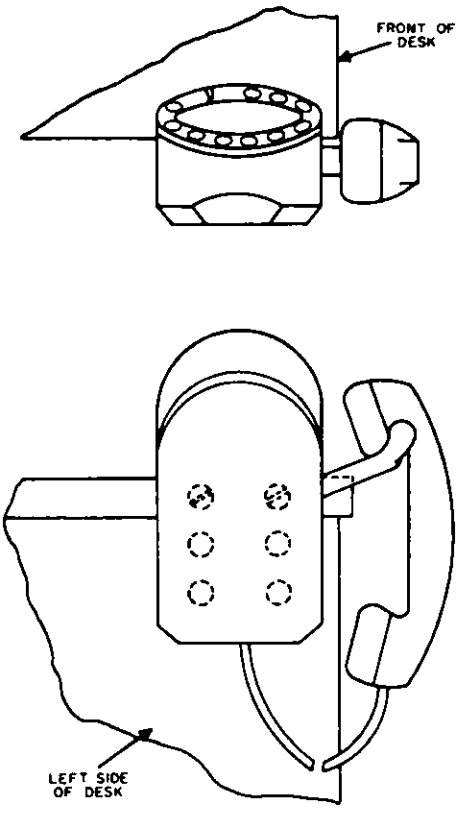


Figure 4. Desk Mounting.

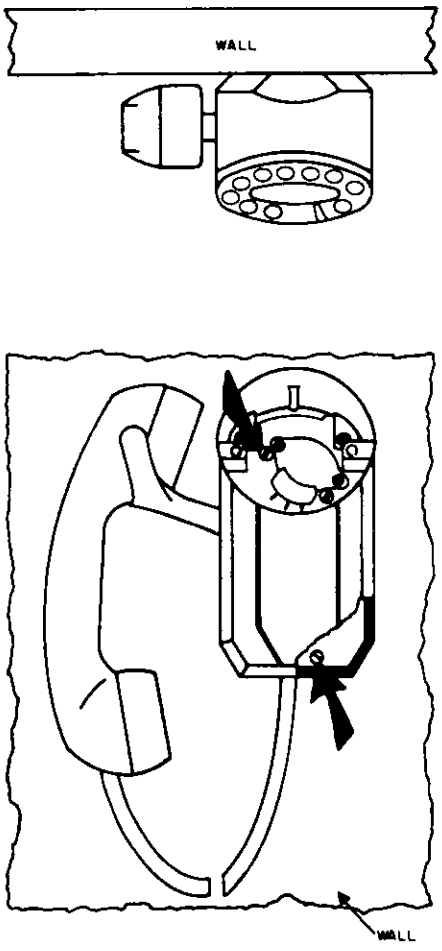


Figure 5. Wall Mounting.

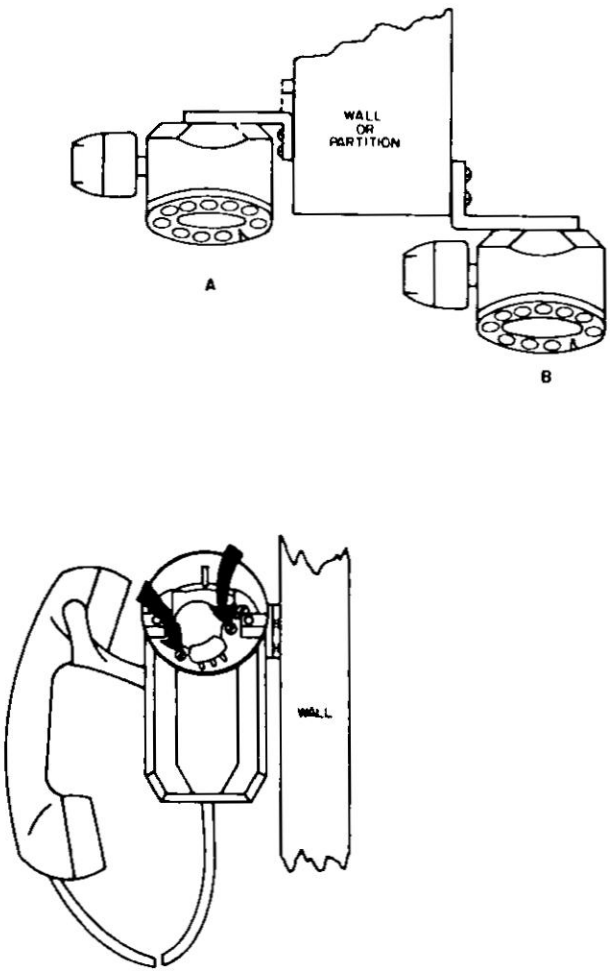


Figure 6. L-Bracket Mounting.

bracket. Insert the screws through the inside of the telephone and then into the bracket. Tighten the screws securely.

Wiring Connections

4.06 After the telephone has been mounted, extend and connect the station wires to the telephone. Typical connections to a station protector and cable terminal are shown in Figure 7. Station wires are then extended from the station protector to the telephone. The station wire entry opening in the telephone is located at the bottom of the telephone.

4.07 The station wires are connected to the terminals on the terminal strip inside the telephone or to the terminals in the ringer box, if used. If a ringer box is required, the station wires are terminated on the terminals of the ringer box, and the ringer box and telephone are interconnected with another set of station wires. The wiring connections for the various services are described in the following paragraphs. The ringer boxes can be supplied equipped with tuned (harmonic, synchromonic, decimonic) ringers or untuned (straight-line) ringers.

4.08 When a harmonic, synchromonic, or decimonic tuned ringer is required, use a Type 32 or Type 33 ringer box (Figure 8). The ringer boxes include the correct ringer capacitor for the particular ringer frequency. Mount the ringer box under the desk, on the wall, or in any convenient location. Connect red (or 1-ridge) wire from telephone terminal 1 to ringer box terminal L1. Connect green (or smooth) wire from telephone terminal 2 to ringer box terminal L2. See Figure 8 notes for ringer box party-line (divided ringing) connections.

4.09 If an untuned (straight-line) ringer is required, a Type 32 ringer box without a ringer capacitor or a Type 33 ringer box may be used (Figure 9). If the Type 32 ringer box is used, the 0.4 MF capacitor on the telephone base is utilized for ringing. Connect per Figure 9. With the Type 33 ringer box, this capacitor is not used for ringing. Connect per Figure 9. See Figure 9 notes for ringer box party-line connections. For the wire between ringer box terminal L1 and telephone terminal 1, use the same tracer as for the wire between ringer box terminal L1 and the protector or PBX switchboard. For L2, use the same tracer throughout, as with L1.

4.10 Connect station wires from main station to Type 83 extension telephone terminals 1 and 2 for an extension station without ringer box.

4.11 For an isolated station without ringer box, connect station wires to terminals 1 and 2 of the Type 83 telephone.

4.12 Normally, the telephone for a SATT installation (with a SATT dial) will have been drawn from the storeroom. If, however, the telephone has a standard dial, the dial must be removed and replaced with a SATT dial; see Paragraph 3.03. Connect a ground wire from the telephone to the ringer box (if used) and then to the protector as illustrated by the dashed line in Figure 8.

4.13 Check that the party identity pulse is on the plus (+) line (Figure 3). At ringer box terminals L1 and L2 (or telephone terminals 1 and 2), attach the clips of a hand test telephone and with handset of the Type 83 telephone on-hook, dial 0 on the Type 83 telephone. As the dial returns to normal, listen through the receiver of the hand test

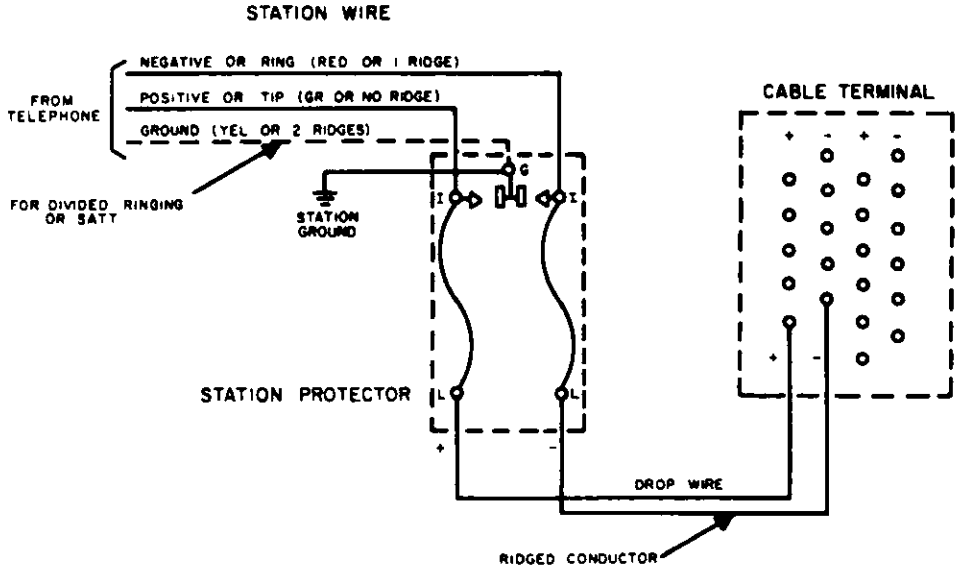
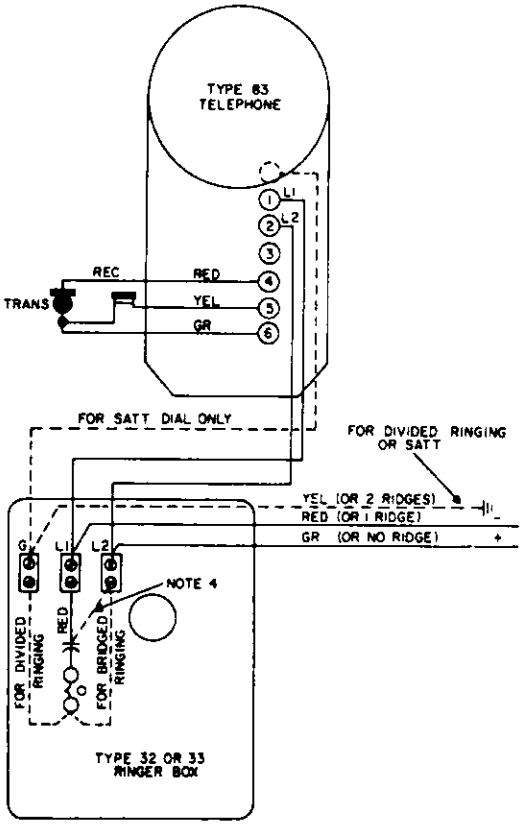


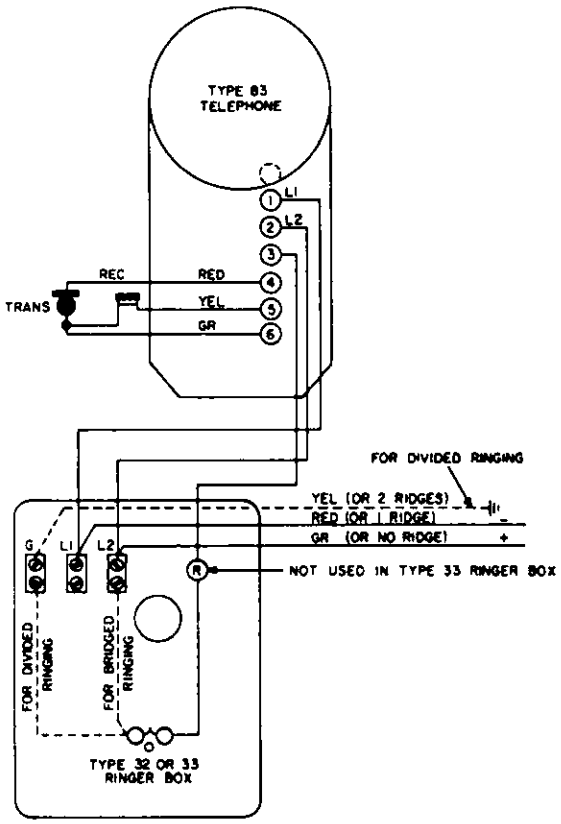
Figure 7. Typical Connections to Protector, Cable Terminal, Etc.



NOTES:

1. FOR BRIDGED RINGING, CONNECT AS SHOWN, EXCEPT OMIT "YEL (OR 2 RIDGES)" GROUND CONNECTION.
2. FOR BRIDGED-RINGING SATT-DIAL STATION, CONNECT AS SHOWN.
3. FOR PARTY ON -LINE, CONNECT AS SHOWN FOR DIVIDED RINGING AND REMOVE WIRING FOR BRIDGED RINGING.
4. FOR PARTY ON +LINE, CONNECT AS SHOWN FOR DIVIDED RINGING, EXCEPT INSIDE THE RINGER BOX, MOVE FROM TERMINAL L1 TO TERMINAL L2 THE RED WIRE WHICH COMES FROM THE RINGER-BOX CAPACITOR

Figure 8. Connections for Type 32 or Type 33 Ringer Box for Harmonic, Synchromonic, and Decimonic Ringers.



NOTES:

1. FOR BRIDGED RINGING, CONNECT AS SHOWN, EXCEPT OMIT "YEL (OR 2 RIDGES)" GROUND CONNECTION.
2. FOR PARTY ON -LINE, CONNECT AS SHOWN FOR DIVIDED RINGING AND REMOVE WIRING FOR BRIDGED RINGING.
3. FOR PARTY ON +LINE, CONNECT AS SHOWN FOR DIVIDED RINGING, EXCEPT FROM RINGER-BOX TERMINAL L1 RUN GR OR SMOOTH WIRE TO PROTECTOR FROM RINGER-BOX TERMINAL L2 RUN RED OR 1-RIDGE WIRE TO PROTECTOR.

Figure 9. Connection for Type 32 or Type 33 Ringer Box with Untuned (Straight-Line) Ringer.

telephone. If no click or very faint clicks are heard, the telephone is connected correctly. If one or more loud clicks are heard, reverse the red and green station wires at the ringer box or telephone terminals, or reverse the drop wires at the station protector (Figure 7).

5. MAINTENANCE

Dial Replacement

5.01 Dial replacement procedures are described in Paragraph 3.03.

Handset Cord Replacement

5.02 Use the following procedure to replace the handset cord in the Type 83 telephone:

(1) Loosen the cover screw and remove the telephone cover.

(2) Disconnect the following handset cord leads from their terminal strip terminals (Figure 3):

(a) RED/BLK from terminal 4.

(b) GR/WH from terminal 6.

(c) YEL/RED from terminal 5.

(3) Release the handset cord clamp from the telephone and pull out the old cord.

(4) Insert the new cord and align it with the groove for this cord in the telephone housing.

(5) Connect the handset cord leads to the proper terminal strip terminals. Refer to step (2) for lead connections.

(6) Pull out the slack, engage the cord clamp, and dress the leads.

(7) Replace the telephone cover.

5.03 For instructions pertaining to the connection of the newly installed handset cord at the handset, refer to the related Section in the 473-802 series of General System Practices.

Stamping Number Card

5.04 The Type 83 telephone is equipped with a metal dial finger wheel. For dial number card removal procedures, refer to the related Section in the 473-870 series of General System Practices.

6. ADJUSTMENTS

6.01 The telephone is adjusted at the factory and no further adjustment is required, except to adjust the series rheostat in the telephone to keep the transmitter current below 60 milliamperes.

Series Rheostat

6.02 The series rheostat is mounted behind the dial, requiring the removal of the dial to gain access to it. The rheostat shaft slot has an arrowhead shape to permit indexing with designations from 0 to 4 which appear in a circle surrounding a shaft hole. These index points correspond roughly to rheostat settings of 0 through 400 ohms of series resistance inserted into the loop.

6.03 The installation of sets with the manually-adjusted rheostat may be subject to restrictions imposed by transmission zoning. These restrictions may make unnecessary some or all of the rheostat adjustments specified, since the application of such telephones may be limited to loops requiring very little or no rheostat adjustment.

6.04 When adjustment of transmitter current is required, refer to the methods presented in the following paragraphs. These methods include coarse and fine adjustment procedures in addition to a precise means of adjustment. Exceptions are also explained.

6.05 When a portable milliammeter is not available and installation is being made at a station served by a tributary central office with no direct test board trunks, and the resistance of the loop (exclusive of the telephone instrument) is known only approximately, it is possible to provide coarse adjustment by setting the rheostat according to the following rule of thumb:

(a) If the loop does not exceed 200 ohms, set the rheostat at its 2 setting;

(b) If the loop is greater than 200 ohms, set the rheostat at its 0 setting, and note the limitation set forth in Paragraph 6.13.

6.06 When a portable milliammeter is not available and installation is being made at a station served by a tributary automatic central office with no direct test board trunks, and the resistance of the loop (exclusive of

the telephone instrument) is known closely, a fine setting of the rheostat is made on the following basis:

(a) If the loop is under 30 ohms, set the rheostat at its 4 setting;

(b) If the loop is over 30 ohms, set the rheostat at its 3 setting;

(c) If the loop is over 130 ohms, set the rheostat at its 2 setting;

(d) If the loop is over 230 ohms, set the rheostat at its 1 setting;

(e) If the loop is over 330 ohms, set the rheostat at its 0 setting, and note the limitation set forth in Paragraph 6.13.

6.07 Paragraphs 6.05 and 6.06 set forth methods which give only approximate settings for the rheostat, based on an assumed central office battery potential of 50 volts and a battery feed coil resistance (to be added to the loop resistance in figuring current) of 200 ohms in each winding. The objective is to limit the current flowing in the loop and through the transmitter to a maximum of 60 milliamperes. This limits the transmitted speech to a maximum level which is not likely to cause crosstalk between circuits in the DDD network. It is much more desirable to adjust the rheostat according to a precise method based on actual current measurements when required.

6.08 When installation is being made in an automatic or manual central office served by a test board, call the test board and ask for assistance in adjusting the rheostat. The test board man will arrange to feed battery to the line in series with coils which are typical of those used in regular central office circuits, and in series with a milliammeter. Set the rheostat at its 0 position and leave it there for a short time. If the test board man finds that the loop current does not exceed 60 milliamperes, he will so notify you. In this case, no further adjustment is necessary, except to observe the limitation set forth in Paragraph 6.13.

6.09 If the test board man does not advise that the loop current is already below 60 milliamperes, advance the rheostat slowly until advised by the test board man that current is within limits.

6.10 Should the test board not be equipped for current readings, the test board man can connect his voltmeter across the line and determine the potential drop in the battery feed coil by subtracting the line reading from a reading taken directly across the office battery. If the resistance of the battery feed coil is known, the correct drop for a 60-milliampere drain can be calculated. For example, if the battery potential is 50 volts and the battery feed coil resistance is 200 ohms per winding, a current of 60 milliamperes produces a drop of 200 x .060 = 12 volts per winding in the coil, resulting in a line potential of 50 - 2(12) = 26 volts.

6.11 When installation is being made at a station served by a tributary office with no direct test board trunks, a precise adjustment can still be made by connecting a portable milliammeter in series with one of the line conductors at the transmission unit in the telephone (Figure 10).

6.12 Limitation of the transmitter current to 60 milliamperes applies only to installations in which all sets having access to the same line, whether installed at the same location or off the premises, are of the type with a manually-adjusted series rheostat. If instruments of other circuit types are to be used on the same line with a manually-adjusted model, the rheostat must be set at its 0 setting, subject to the limitation listed in Paragraph 6.13.

6.13 The simple induction coil used in conjunction with the manually-adjusted series rheostat does not provide sidetone compensation for changes in line impedance with increasing loop length; that is, there is no element which can counteract each variation in impedance as it occurs. However, at the 0

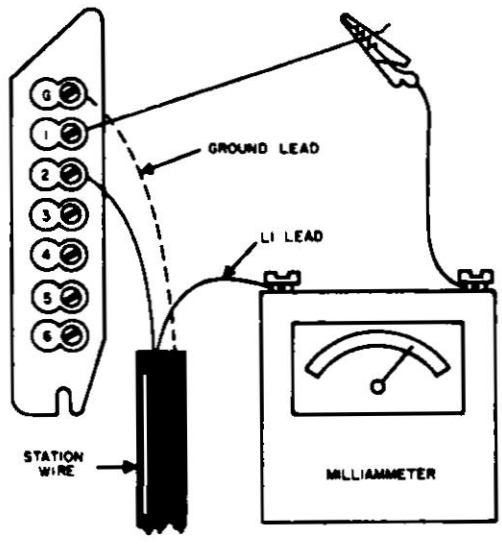


Figure 10. Line Current Measurements at Customers' Premises.

setting of the rheostat an internal contact closes which connects a fixed resistance and capacitance across the sidetone balancing resistance in the receiver circuit. The change in the balancing impedance is intended to match the rather capacitive impedance of a long cable loop. It is not appropriate for a short cable loop (one which is only slightly higher in resistance than the value which reduces loop current to 60 milliamperes and thus requires the 0 setting of the rheostat), or for a long open-wire loop, or for a station on a loaded cable loop which lies less than one loading section from the nearest load coil.