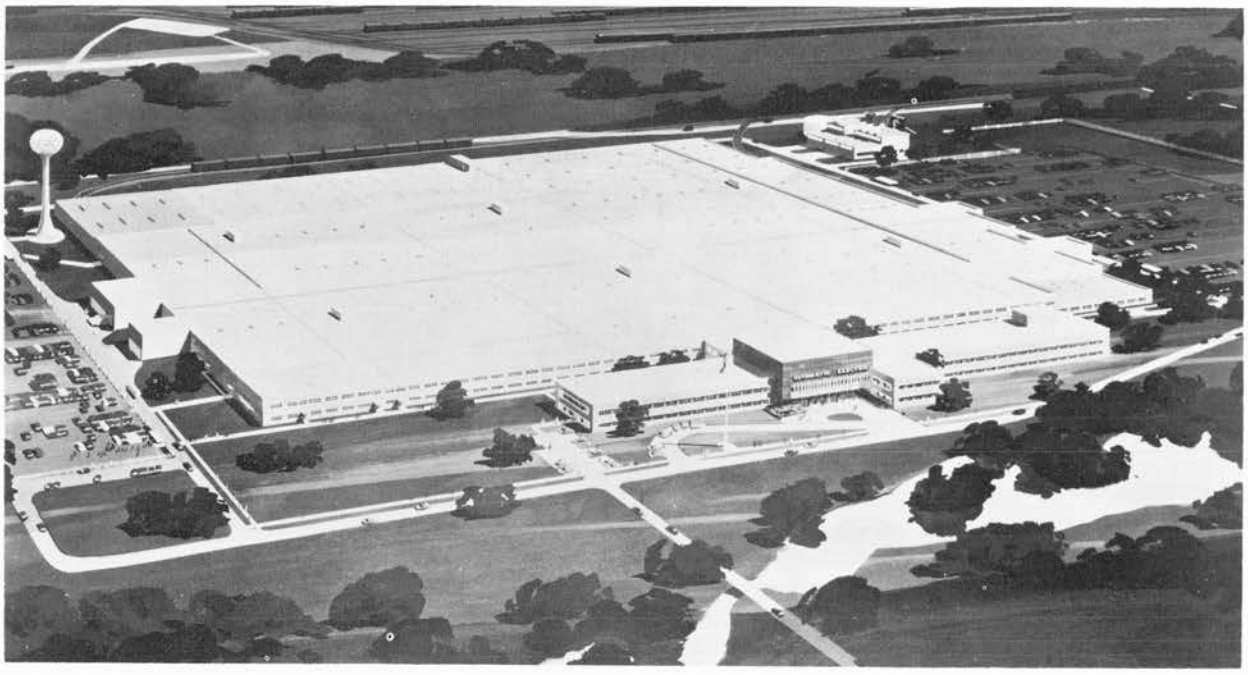
TYPE 85 TELEPHONE

Technical Bulletin 473-914

AUTOMATIC ELECTRIC
SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS GT&E



Automatic Electric Company General Offices, Laboratories and principal manufacturing facilities are located in this new 37 acre plant in Northlake, Illinois, a suburb of Chicago. Branch factories are located in Genoa, Illinois and Waukesha, Wisconsin.

These modern facilities are devoted exclusively to the manufacture of a complete line of automatic telephone equipment, electrical control components and systems.

A.E.CO. TYPE 85 TELEPHONE
INSTALLATION AND FIELD MAINTENANCE

CONTENTS

1. GENERAL

1.01 The Type 85 telephone (Figure 1) is a self-contained desk set that provides the transmission quality, features, and design of the Type 80 telephone. A combination push-turn key and an optional exclusion key provide a variety of special services and special features.

2. PHYSICAL DESCRIPTION

2.01 The Type 85 telephone weighs approximately 6-1/4 pounds and measures 9'' long, 4-3/4'' high, and 5'' wide. There are four rubber cushions located on the baseplate (one at each corner) that protect the desk or table top from scratches. The Type 85 telephone is available in Black and five colors (Sand Beige, Dawn Gray, Jade Green, Turquoise, and Gardenia White). The line cord and retractile handset cord are colored to match the telephone. Either a standard metropolitan dial or a plain numbered dial may be specified. All dials have clear plastic finger plates. A dial blank, in the colors listed above, may be substituted for the dial by the installer.

3. FEATURES

3.01 There are three Type 85 telephones: Type 85A, Type 85B, and Type 85C; they differ in the number and combination of services extended to the customer. The following services or combination of services are provided by one or more of the three Type 85 telephones:

(a) Exclusion of one or more extensions from the line.

(b) Two-line pickup and one-line hold - permits access to two lines from the same desk set.

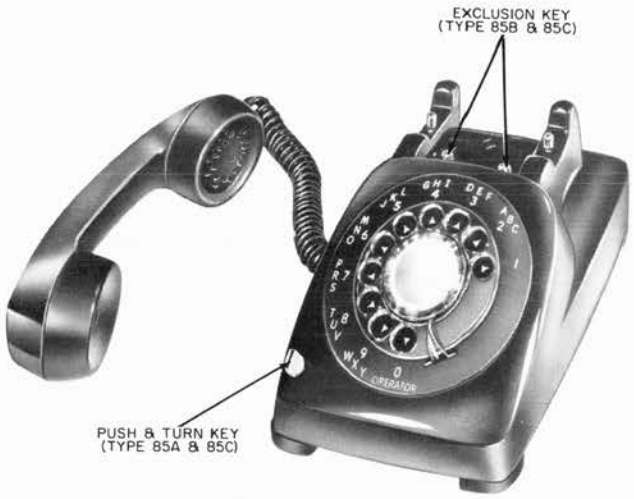


Figure 1. Type 85C Telephone.

(c) Ringer cutoff - for locations requiring uninterrupted quiet.

(d) Single line extension cutoff with ringer transfer - allows switching calls and/or ringing to and from an extension telephone.

(e) Headset control - permits secretarial monitoring of conversations at discretion of telephone user.

(f) External signal control - provides switching to include an outside signaling device.

(g) Exclusion with line shorting - for maximum privacy; provides shorting out of all extensions and prevents line tapping on these lines.

3.02 The Type 85 telephones have either a self-compensating or manually adjusted transmission unit. In a self-compensating telephone, the transmission unit automatically balances the impedance characteristics of the line, and reduces sidetone. In a manually adjusted telephone, a rheostat (loop compensator) is used to balance the impedance characteristics of the line, and reduce sidetone. Presently, the transmission unit used is a printed wire card; previous models used a potted type transmission unit. The circuit of both transmission units is the same, but the physical location of the various terminals differ. The physical location of the terminals of a printed wiring card transmission unit is shown in Figure 2. The schematic for both units is shown in Figure 3. The schematic used in manually adjusted telephones is shown in Figure 4.

Type 85A Telephone

3.03 The Type 85A telephone is factory wired for two-line pickup and one-line hold, and is equipped with a combined push-turn key located below and to the left of the dial (Figure 1). The locking "turn" feature permits the customer to answer or originate a call on either of two lines. The nonlocking "push" feature is used to operate an external signaling device. The Type 85A telephone is equipped with one ringer wired across line one. Should a ringer be required for line two, any standard ringer box can be installed.

3.04 With the minor wiring changes described in Table 1 (self-compensating telephones, Table 2 manually adjusted telephones), the combined push-turn key may provide the following additional features for the Type 85A telephone. Refer to applicable Figure (10, 11 or 13) when making changes.

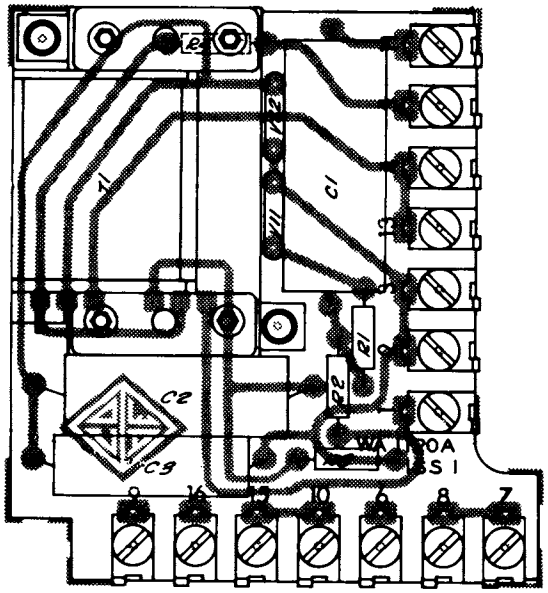


Figure 2. Printed Wiring Card, Self-Compensating Transmission Unit.

(a) Single-line ringer cutoff. This feature is designed for use in an extension telephone in a location requiring silence. By turning the push-turn key, the user can cut off the ringer, but leave the line open for use.

(b) Single-line extension cutoff with ringer transfer. With this wiring option, the turn key on the parent telephone is used to connect an extension telephone and its ringer to the line of the parent telephone and simultaneously disconnect the ringer of the parent telephone. When the key is turned back to reconnect the ringer of the parent telephone, the extension is cutoff.

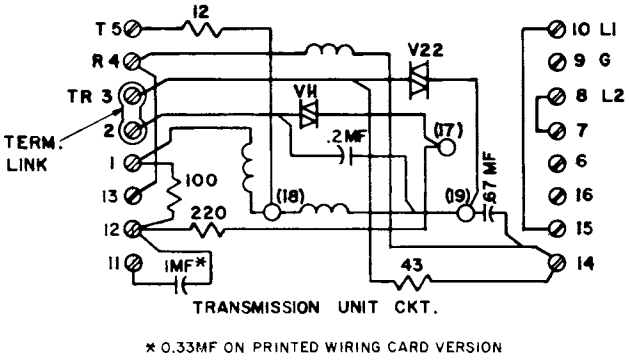


Figure 3. Schematic, Self-Compensating Transmission Unit.

(c) Single-line extension cutoff. The turn key may be used to connect and disconnect an extension telephone.

(d) External signal control. The turn key may be wired to allow the user to connect an external signal (lamp, buzzer, etc.) in parallel with the ringer in the telephone. Restoring the key cuts off the external signal.

(e) Headset control. The turn key can be used to connect a secretary's headset to the line to allow her to take notes on a telephone conversation.

(f) Exclusion of extension with line shorting. The turn key feature may be wired to permit exclusion of all extensions and shorting-out of all extension lines to assure complete privacy.

Type 85B Telephone

3.05 The Type 85B telephone is supplied with an exclusion key (Figure 1) located near

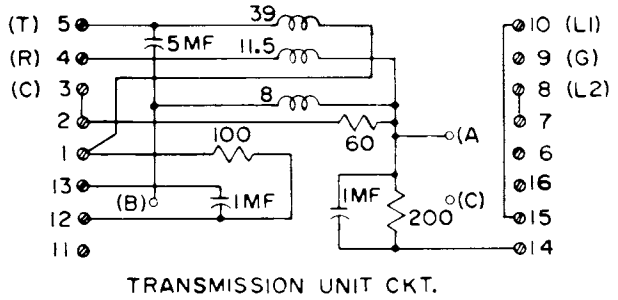


Figure 4. Schematic, Transmission Unit For Manually Adjusted Telephone.

the handset. The exclusion key is used for extension exclusion and is comprised of two pushbuttons, one red and one chrome. The user excludes all extensions from the line by pushing the chrome button and may restore the extensions to the line, during the same conversation, by pressing the red button. The chrome button is automatically restored when the handset is replaced, returning all extensions to the line.

3.06 Optional wiring described in Table 3 (self-compensating telephones, Table 4 manually adjusted telephones) is used to convert the Type 85B telephone to provide two-line pickup. Refer to applicable Figures (15, 16 or 18) when making changes. The chrome button is used to gain access to line two. Replacing the handset automatically restores the circuit to line one. Extension exclusion is not possible when two-line pickup is used.

Type 85C Telephone

3.07 The Type 85C telephone is factory wired to provide two-line pickup and extension exclusion. It is equipped with both the combined push-turn key and the exclusion key (Figure 1). The "turn" feature of the push-turn key gives the customer access to either of two lines. The "push" feature enables him to signal his secretary by means of a lamp or a buzzer. The exclusion key, located near the handset, provides exclusion of all extensions on one line. The schematic and wiring diagrams of the Type 85C telephones are shown in Figures 20, 21 and 23.

3.08 The exclusion key of the Type 85C telephone may be converted to provide a holding feature on line 1. The holding bridge is connected into the telephone in such a way that when the chrome button of the exclusion key is operated, the combined resistance of the holding bridge (495 ohms) is placed across the line. This will draw a sufficient amount of current through the exchange to hold the line. When the line is in the hold position the turn key can be turned to line two, allowing calls to be initiated or received on line two. If, when returning to the held line, the customer does not remove the hold or if the call is picked up at another telephone, the choke coil's high impedance to voice frequencies prevents any noticeable loss of transmission quality. Therefore, when left in a line during a conversation, the inductive holding bridge will not have a detrimental effect on the quality of transmission.

3.09 Installation of the holding bridge is a field conversion requiring the mounting of the holding bridge (order number H-885525-1) inside the telephone, and making electrical connections. Installation instructions are contained in paragraph 4.11.

4. INSTALLATION

4.01 The installation procedure for all Type 85 telephones (self-compensating and manually adjusted units) is basically the same, that is, placing the telephone in the desired location and connecting the interior wires to the terminal block. Some wiring modifications may have to be made at the individual telephones to obtain the desired services. Any installation differences between the self-compensating and manually adjusted telephones are referred to in the applicable paragraphs.

Mounting

4.02 Place the telephone in the desired position and mount the line cord terminal block in an inconspicuous location, allowing ample line cord length. Check the polarity of the interior wires before connecting to the terminal block.

4.03 Line polarity of the interior wires is important because connection information, including the wiring diagrams, assumes that the interior wires between the protector and the telephone location in the customer's premises have their polarities identified by these standard tracers:

(a) Red - negative (ring)

(b) Green - positive (tip)

(c) Yellow - ground

Wiring and Wiring Modifications

4.04 The Type 85 telephones are factory wired for a particular service or services. The following paragraphs explain the telephone wiring modifications for changing the service and the interior wire connections to the terminal block for the various Type 85 telephones. All wiring modifications are made at terminal strip "B" and/or transmission unit terminals located inside the telephone.

Type 85A Self-Compensating Telephone

4.05 The Type 85A self-compensating telephone is furnished with a six- or ten-conductor line cord which is terminated on a ten-terminal, terminal block. If a ten-conductor line cord is used, four of the conductors are spares and terminate on the spare terminals of the terminal block. This telephone is usually furnished wired for two-line pickup, but it can be modified for other types of service. When making modifications, refer to Table 1 and Figures 10 or 11. The standard line cord and interior wire terminations at the terminal block for the Type 85A self-compensating telephone are shown in Figure 12.

Type 85A Manually Adjusted Telephone

4.06 The Type 85A manually adjusted telephone has a six-conductor line cord which is terminated on a six-terminal, terminal block. The telephone is usually wired for two-line pickup, but it can be modified for other types of service. When making modifications, refer to Table 2 and Figure 13. The standard line cord and interior wire terminal block connections for a Type 85A manually adjusted telephone are shown in Figure 14.

Type 85B Self-Compensating Telephone

4.07 The Type 85B self-compensating telephone is furnished with a six- or ten-conductor line cord which is terminated on a ten-terminal, terminal block. If a ten-conductor line cord is used, four of the conductors are spares and terminate on the spare terminals of the terminal block. This telephone is usually furnished wired for the exclusion feature, but it can be modified for other services. When making modifications, refer to Table 3 and Figures 15 or 16. The standard line cord and interior wire terminations at the terminal block are shown in Figure 17.

Type 85B Manually Adjusted Telephone

4.08 The Type 85B manually adjusted telephone has a six-conductor line cord which is terminated on a six-terminal, terminal block. This telephone is usually wired for the exclusion feature, but can be modified for other services. Refer to Table 4 and Figure 18 when making modifications. Figure 19 shows the standard line cord and interior wire connections at the terminal block.

Type 85C Self-Compensating Telephone

4.09 The Type 85C self-compensating telephone is furnished with a ten-conductor line cord which is terminated on a ten-terminal, terminal block. This telephone is usually wired for two-line pickup and exclusion feature, and is not usually modified with the exception of adding a holding feature (paragraph 3.08). The schematic and wiring diagrams for this telephone are shown in Figures 20 and 21. Refer to Figure 22 for line cord and interior wire terminations at the terminal block.

Type 85C Manually Adjusted Telephone

4.10 The Type 85C manually adjusted telephone is furnished with a ten-conductor line cord which is terminated on two six-terminal, terminal blocks. This telephone is wired for two-line pickup and the exclusion feature, and it is not usually modified with the exception of adding a holding feature (paragraph 3.08). The schematic and wiring diagram for this telephone is shown in Figure 23. Refer to Figure 24 for line cord and interior wire connections at the terminal blocks.

Installing Holding Bridge, Type 85C Telephone

4.11 The inductive holding bridge kit (consisting of a choke coil, resistor, three terminals, and two 6" spaded leads mounted on a 1-5/8" x 1-1/4", "L" shaped component

board) can be mounted in the Type 85C self-compensating and manually adjusted telephones.

4.12 The inductive holding bridge assembly mounts on the telephone baseplate to the right and in front of the ringer with the long portion of the "L" shaped component board parallel to the side of the baseplate. The shorter portion will be directly below the exclusion key springs and parallel to the back of the transmission unit. Use the following procedures to install the holding bridge, referring to Figure 5.

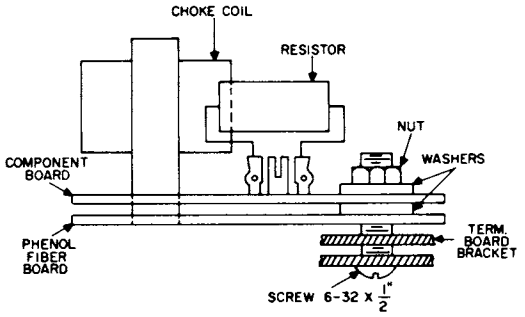


Figure 5. Installing Holding Bridge in Type 85C Telephone.

(1) Replace the 6-32 x 1/4" screw with the 6-32 x 1/2" screw.

(2) Place the blank phenol fiber board (supplied with the holding bridge kit) in the position described above so the 6-32 x 1/2" screw fits up through the hole.

(3) Place a washer over the screw.

(4) Place the component board in place.

(5) Place the second washer in place and tighten the nut to hold the bridge assembly in place.

4.13 After the holding bridge has been secured in place, make the following wiring modifications at terminal strip "B":

(1) Remove the red and black exclusion key wires from terminals B2 and B1, respectively, and tape.

(2) Move the blue exclusion key wire from terminal B10 to terminal B2.

(3) Move BRN-YEL line cord wire from terminal B9 to terminal B10.

(4) Connect BLK and YEL holding bridge wires to terminals B1 and B9, respectively.

5. MAINTENANCE

5.01 The maintenance procedures for the Type 85 self-compensating and manually adjusted telephones are basically the same. The exceptions will be described in the applicable paragraphs.

Housing Removal

5.02 To remove the telephone housing, locate the three base mounting screws (Figure 6) and loosen the screws. Lift and remove the housing. If the telephone is connected to a line, push the switchlever (Figure 7) down to its locked (hooklock) position. This keeps the transmission circuit off the line and the ringer on the line while the telephone is being worked on. When the housing is replaced, the actuating lever is unlocked automatically. This will restore the switchlever to its normal position, placing the hookswitch under the control of the plungers.

Replacing Dial Assembly

5.03 To remove the dial assembly, first remove the telephone housing. The dial

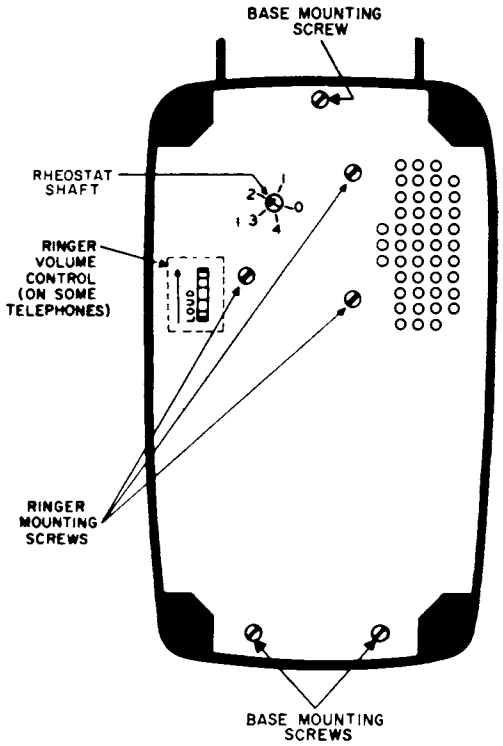


Figure 6. Baseplate.

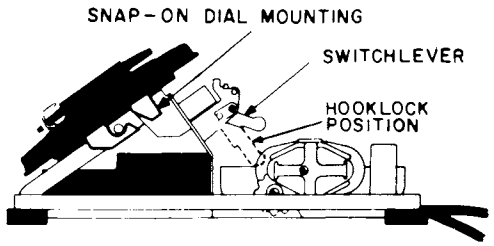


Figure 7. Hooklock and Dial Mounting.

in the Type 85 telephones has a snap-on bayonet lug pin mounting as shown in Figure 7. To remove the dial, press down on the dial and at the same time slide the dial down until the lugs are disengaged from the pins. Tip up the bottom of the dial to expose the wiring and transparent cover over the working parts of the dial. Do not remove any dial wires unless the dial is to be replaced. If the dial is to be replaced, remove the dial wires from the transmission unit terminals and remove the dial. Remove the mounting bracket from the old dial assembly and fasten it to the new dial assembly. Fasten the dial wires to the dial springs and their respective terminals on the transmission unit. To replace the dial into the telephone, place the dial mounting lugs over the mounting pins and press down, exerting an upward pressure until the dial snaps in place.

Replacing Ringer Assembly

5.04 Remove the telephone housing and terminal strip "B." At terminal strip "B," disconnect the red ringer wire and black capacitor wire. At the transmission unit, disconnect the green ringer wire and white capacitor wire. Remove, through the bottom of the baseplate, the three ringer mounting screws (Figure 6). Remove the ringer assembly and replace with new ringer assembly using the same mounting screws. Connect the red ringer wire and black capacitor wire to terminal strip "B" terminals, and green ringer wire and white capacitor wire to transmission unit terminals, referring to applicable schematic and wiring diagrams.

Handset Maintenance

5.05 Most handset difficulties can be remedied by replacing the transmitter and receiver capsules and/or the handset cord.

5.06 For capsule replacement, and/or handset cord replacement (at the handset), refer to the related publication in the 473 series. The Type 85 self-compensating telephones utilize a Type 810 handset and the Type 85 manually adjusted telephones utilize a Type 81 handset.

5.07 To replace the handset cord in Type 85 self-compensating telephones, remove the telephone housing and disconnect the handset cord conductors from the transmission unit terminals. Unhook the cord hook from the baseplate and pull out the old cord.

NOTE: Some Type 85 telephones have a cord clamp. To remove the cord, loosen the cord clamp and pull out the old cord.

Connect the conductors of the new cord to the transmission unit terminals, pull out the cord slack, and fasten the strain relief clamp or hook the cord hook to the baseplate.

5.08 To replace the handset cord in Type 85 manually adjusted telephones, use the same procedure as described in paragraph 5.07.

Stamping Dial Number Card

5.09 The dials of Type 85A telephones are equipped with either one- or two-piece clear plastic finger wheels. To access the dial number card of a one-piece clear plastic finger wheel, the wheel must be removed from the dial assembly. In the two-piece plastic finger wheel, the dial escutcheon ring must be removed. For removal and replacement procedures of dial finger wheels, refer to the related publication in the 473 series.

Line Cord Replacement

5.10 Type 85A and 85B telephones are furnished with either six- or ten-conductor line cords. These line cords are interchangeable. If a ten-conductor line cord is used, four of the conductors are spares. The Type 85C telephone is furnished with a ten-conductor cord.

5.11 To replace the line cord, remove the telephone housing and refer to the applicable schematic diagram; check if the line cord terminations at terminal strip "B" are standard for this type of telephone or whether the wiring has been modified for a particular service. Disconnect the line cord conductors from the terminals of terminal strip "B." Loosen the line cord clamp, and withdraw the old cord. Pass the end of a new cord through the slot in the baseplate until the covered portion of the cord extends two inches into the base. Insert the cord clamp lug into the baseplate hole, and adjust the cord in the clamping bracket until the covered cord end fits securely between the ringer capacitor and the upright portion of the cord clamp bracket. Tighten the cord clamp screw. Connect the line

cord conductors to the terminals of terminal strip "B" and the terminal block. In accordance with the service provided, refer to the applicable wiring and schematic diagrams when making connections.

6. TESTS AND ADJUSTMENTS

6.01 Performance should be checked and final adjustments made after installation, modification, and electrical connections have been completed. The following tests and adjustments should be made by the installer.

Straight-Line Ringer

6.02 Call the central office for a ringing test. If the telephone has a straight-line ringer with an adjusting wheel, adjust the volume of the ringer to a level suitable to the customer. To adjust the volume of a straight-line ringer, turn the plastic adjusting wheel which protrudes through the baseplate (Figure 6) in the direction indicated by the arrow.

6.03 Occasionally, when two or more straight-line ringers are connected to the same line, the ringer gongs may tap when another station dials. This is due to the charge and discharge of the ringer capacitor during dialing. To correct this, remove the housing of the tapping telephone and reverse the ringer leads.

Transmitter Current Rheostat

6.04 Prior to the development of the automatic sidetone compensating feature, Automatic Electric Company telephones were equipped with a slotted shaft rheostat to limit the transmitter current on short loops. These telephones can be identified by codes beginning with the letter N, stamped on the baseplate.

6.05 The rheostat is mounted on the baseplate with its slotted shaft accessible through a hole in the underside of the baseplate (Figure 6). The shaft slot has an arrowhead shape to permit indexing with designations from 0 to 4 which appear in a circle surrounding the shaft hole. These index points correspond roughly to rheostat settings of zero through 400 ohms of series resistance inserted into the loop.

6.06 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 in this part since the application of such telephones may be limited to loops requiring very little or no rheostat adjustment.

6.07 When adjustment of transmitter current is required, refer to the methods presented in the following paragraphs. These methods include rough and close approximation procedures in addition to an accurate means of adjustment. Exceptions are also explained.

Rough Approximation Method

6.08 When no portable milliammeter is available and installation is being made at a station served by a tributary central office with no direct testboard trunks, and the resistance of the loop (exclusive of the telephone instrument) is known only very approximately, set the rheostat according to the following rule of thumb:

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

(b) If the loop is greater than 200Ω, set the rheostat at its 0 setting, and note the limitation set forth in paragraph 6.16.

Close Approximation Method

6.09 When no portable milliammeter is available and installation is being made at a station served by a tributary automatic central office with no direct testboard trunks, and the resistance of the loop (exclusive of the telephone instrument) is known fairly close, set the rheostat on the following basis:

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

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

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

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

(e) If the loop is over 330Ω, set the rheostat at its 0 setting, and note the limitation set forth in paragraph 6.16.

Accurate Methods

6.10 Paragraphs 6.08 and 6.09 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 200Ω 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, when required, on the basis of actual current measurements.

6.11 When installation is being made in an automatic or manual central office served by a testboard, call the testboard and ask for assistance in adjusting the rheostat. The testboardman 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 zero position and leave it there for a short time. If the testboardman 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 6.16.

6.12 If the testboardman does not advise that the loop current is already below 60 milliamperes, advance the rheostat slowly until advised by the testboardman that current is within limits.

6.13 Should the testboard for some reason not be equipped for current readings, the testboardman 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 200Ω 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.

6.14 When installation is being made at a station served by a tributary office with no direct testboard trunks, an accurate adjustment can still be made by connecting a portable milliammeter in series with one of the line conductors at the connecting block or at the transmission unit in the telephone.

Exceptions

6.15 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 the next paragraph.

6.16 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 setting of the rheostat an internal contact closes which connects a fixed resistance and capacitance across the sidetone balancing resistance in the receiver circuit. This 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), nor for a long open-wire loop, nor for a station on a loaded cable loop which lies less than one loading section from the nearest load coil. If a 0 setting is required in such cases, disconnect the violet rheostat wire from terminal 14 of the transmission unit and connect it to terminal 7. Do not attempt to open the rheostat contact by choosing a setting between 0 and 1, as this introduces unnecessary loop resistance.

6.17 Should any transmission complaint be received involving a set with the manually adjusted series rheostat, replace the instrument with one which provides automatic sidetone compensation.

Push-Turn Key and Exclusion Key

6.18 Figures 8 and 9 are line drawings of the exclusion key and combination push-turn key, intended to help the installer insure that the keys are operating properly. They will also aid in making minor readjustments of the keys. Figure 8a shows the positions of the exclusion key and buffer with red and chrome buttons normal. Figure 8b shows the exclusion key when the chrome button is operated and with the handset off-hook. Figure 9a shows the push-turn key at normal. Pressing the key closes the lower set of contacts only, as shown in Figure 9b. Turning the key should close the upper set of contacts as shown in Figure 9c. The operations shown in Figures 9b and 9c can be combined.

Figure 8. Typical Exclusion Key Operation.

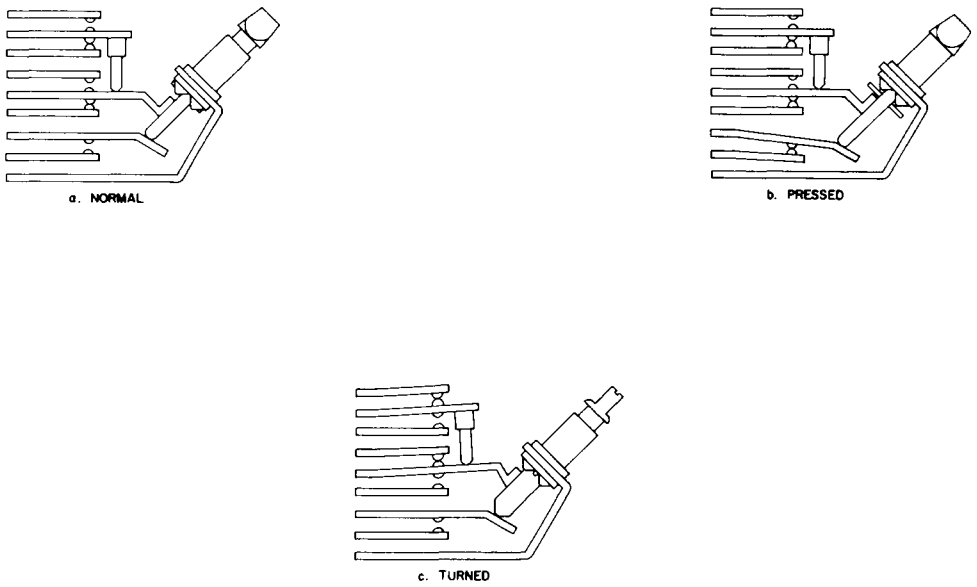


Figure 9. Push-Turn Key Operation.

Table 1. Service Variations for Type 85A Self-Compensating Telephones.

FEATURES	LINE CORD CONNECTIONS								SET WIRING			
	TO LINE 1		TO LINE 2		TO EXT. STA. OR EXT. RINGER OR HEADSET		TO SIG. CKT.		RINGER LEADS		TURN KEY LEADS	
	RED	GRN	YEL	BLK	YEL	BLK	BLU	WHT	BLK	RED	BLU	ORN
TWO LINE PICKUP	B1	B2	B3	B4			B7	B8	B1	B2	[10]	[8]
SINGLE LINE RINGER CUTOFF (RINGER IN SET)	B9	B10	B3*	B4*			B7	B8	B1	B2	[10]	[8]
SINGLE LINE EXTENSION CUTOFF W/RINGER TRANSFER	B9	B10			B3	B4	B7	B8	B1	B2	[10]	[8]
SINGLE LINE EXTENSION CUTOFF OR EXTERNAL RINGER CONTROL OR HEADSET CONTROL	B9	B10			B3	B4	B7	B8	B9	B10	[10]	[8]
EXCLUSION OF EXTENSION WITH LINE SHORTING	B1	B2			B4	B5	B7	B8	B9	B10	B4	B5
	STRAP TERM. B1 TO TERM. B9 STRAP TERM. B2 TO TERM. B10											

* NOT USED

[ ] TERMINALS ON TRANSMISSION UNIT

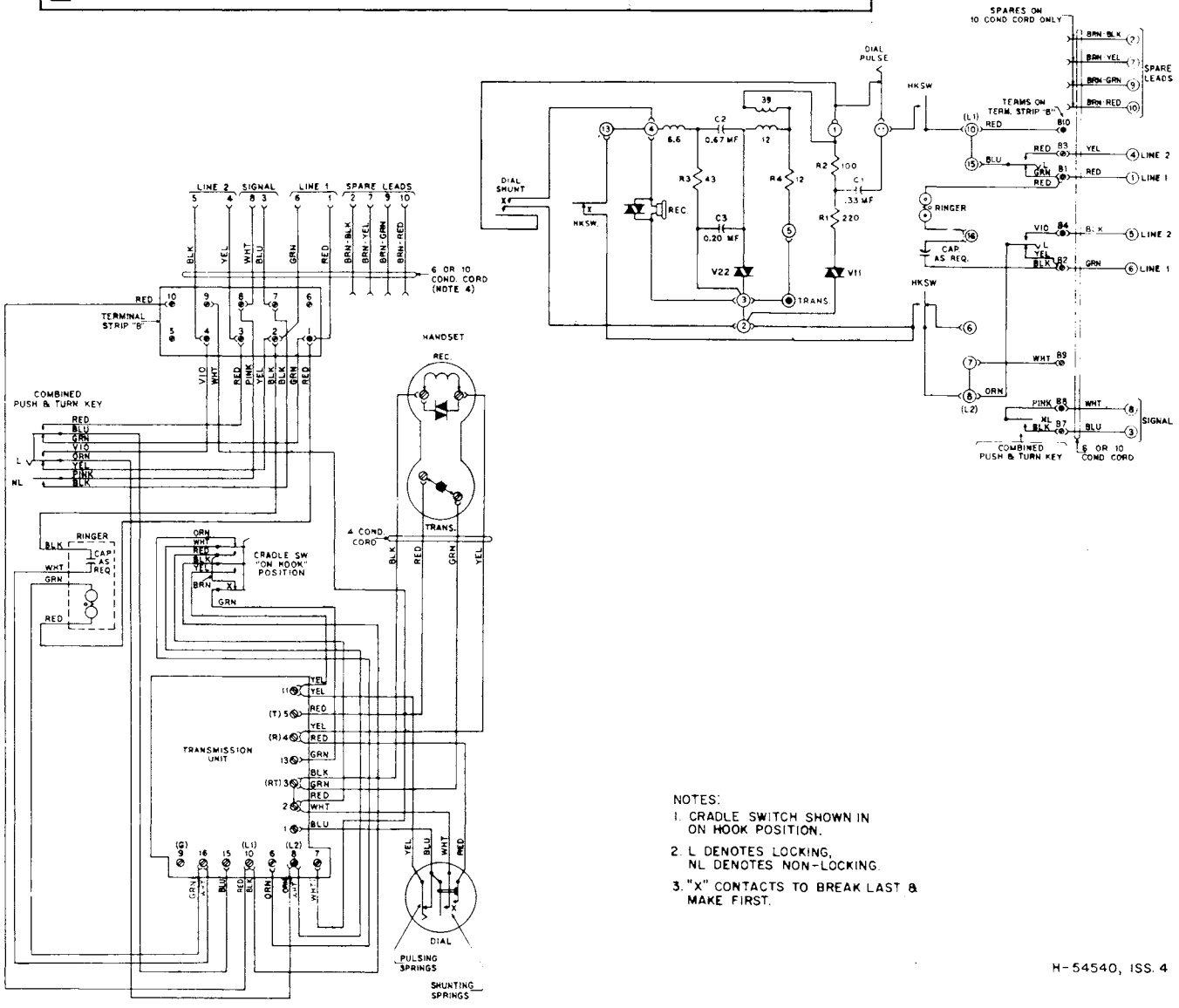
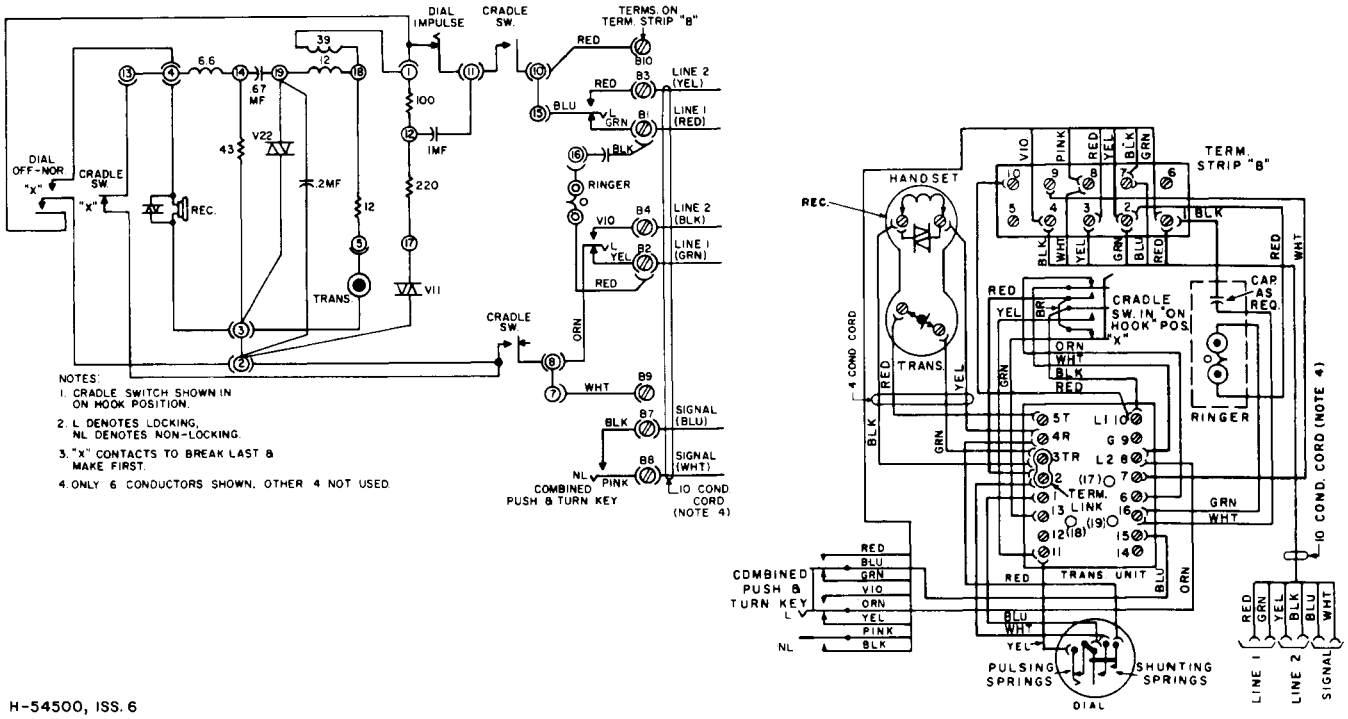


Figure 10. Schematic and Wiring Diagram, Type 85A Self-Compensating Telephone with Printed Wiring Card Transmission Unit.



H-54500, ISS. 6

Figure 11. Schematic and Wiring Diagram, Type 85A Self-Compensating Telephone with Potted Transmission Unit.

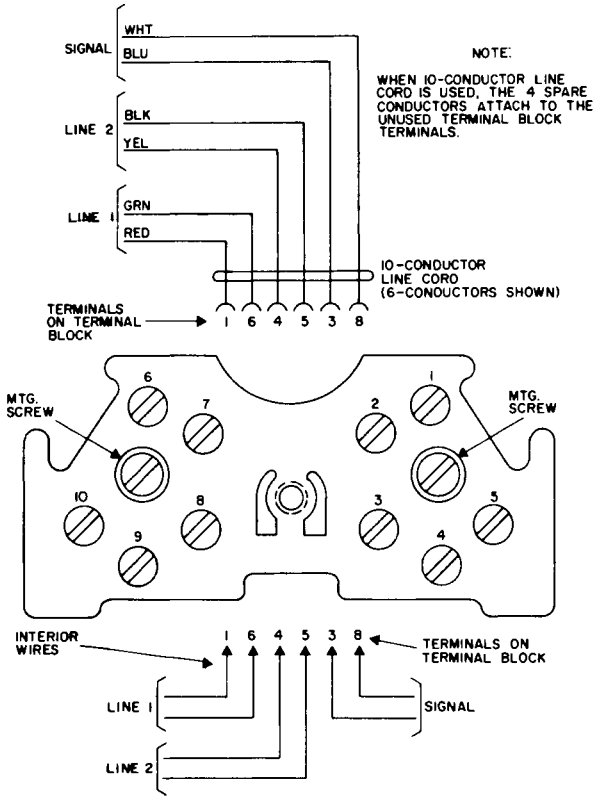
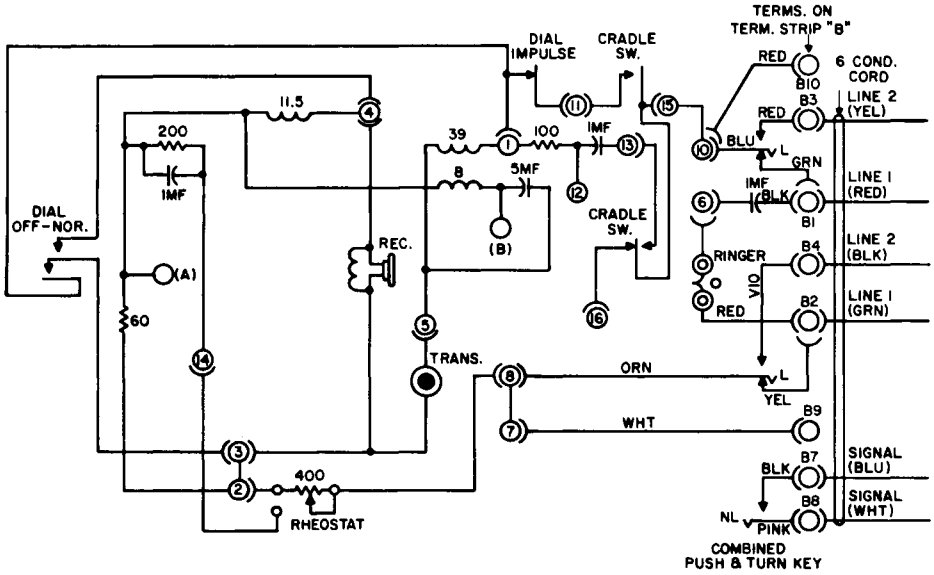
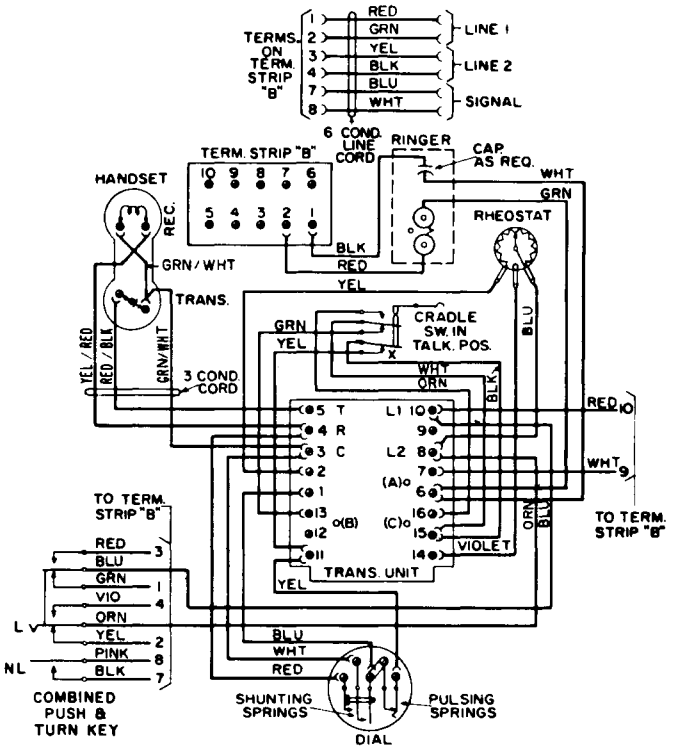


Figure 12. Standard Terminal Block Wiring for Type 85A Self-Compensating Telephone.



NOTES:

1. CRADLE SWITCH SHOWN IN ON HOOK POSITION.
2. L DENOTES LOCKING, NL DENOTES NON-LOCKING.



H-54420, ISS. 4

Figure 13. Schematic and Wiring Diagram, Type 85A Manually Adjusted Telephone.

Table 2. Service Variations for Type 85A Manually Adjusted Telephones.

FEATURES	LINE CORD CONNECTIONS TERMINAL STRIP "B"								SET WIRING TERMINAL STRIP "B"			
	TO LINE 1		TO LINE 2		TO EXT. STA. OR EXT. RINGER OR HEADSET		SIG. CKT.		RINGER LEADS		TURN KEY LEADS	
	RED	GRN	YEL	BLK	YEL	BLK	BLU	WHT	BLK	RED	BLU	ORN
TWO LINE PICKUP	B1	B2	B3	B4			B7	B8	B2	B1	[15]	[8]
SINGLE LINE RINGER CUTOFF (RINGER IN SET)	B10	B9	B3*	B4*			B7	B8	B2	B1	[15]	[8]
SINGLE LINE EXTENSION CUTOFF W/RINGER TRANSFER	B10	B9			B3	B4	B7	8	B2	B1	[15]	[8]
SINGLE LINE EXTENSION CUTOFF OR EXTERNAL RINGER CONTROL OR HEADSET CONTROL	B10	B9			B3	B4	B7	8	B9	B10	[15]	[8]
EXCLUSION OF EXTENSION WITH LINE SHORTING	B1	B2			B5	B4	B7	B8	B9	B10	B4	B5
	STRAP TERM. B1 TO TERM B10 STRAP TERM. B2 TO TERM B9											

* NOT USED

[ ] TERMINALS ON TRANSMISSION UNIT

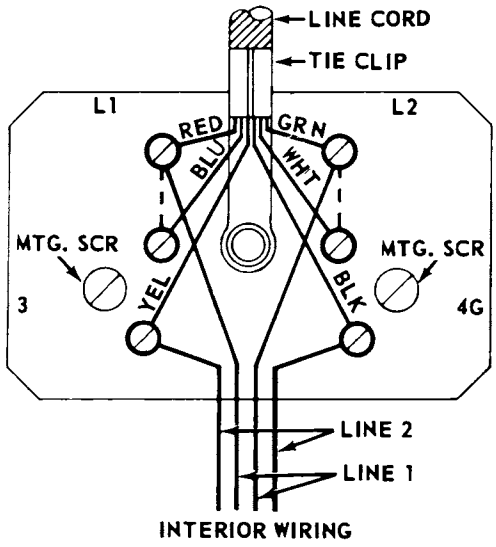


Figure 14. Standard Terminal Block Wiring for Type 85A Manually Adjusted Telephone.

Table 3. Service Variations for Type 85B Self-Compensating Telephones.

FEATURES	LINE CORD CONNECTIONS TERMINAL STRIP "B"								SET WIRING TERMINAL STRIP "B"					
	TO LINE 1		TO LINE 2		TO EXTENSION STATION		RINGER LEADS		RINGER LEADS		SET LEADS		EXCLUSION KEY LEADS	
	RED	GRN	YEL	BLK	YEL	BLK	BLU	WHT	BLK	RED	WHT	GRN	SL	RED
EXCLUSION	B1	B2			B7	B4	B5	B6	B6	B5	B1	B2	B4	B7
TWO-LINE PICKUP	B1	B2	B3	B4			B7*	B8*	B2	B1	B9	B10	B9	B10

* NOT USED

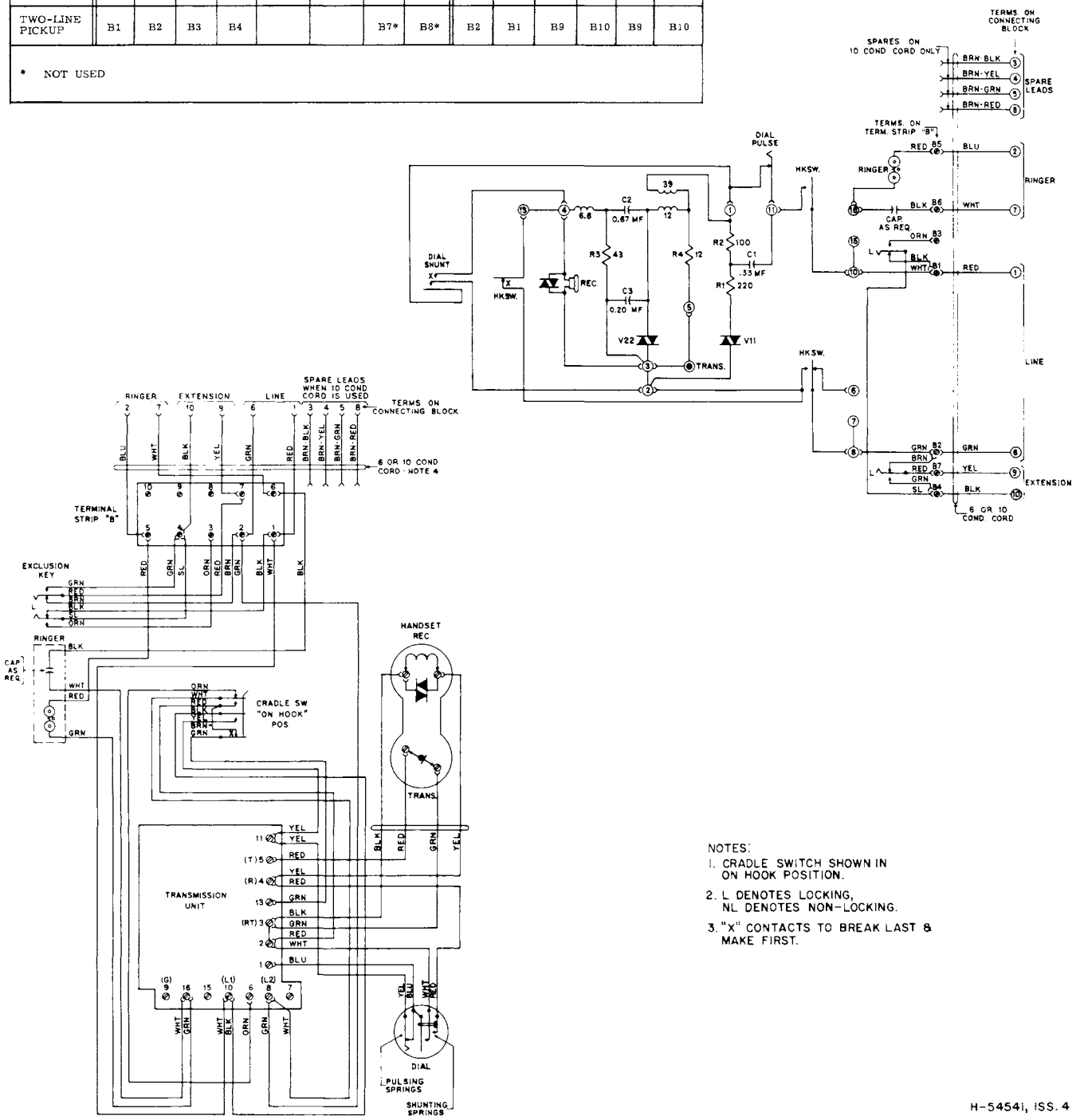


Figure 15. Schematic and Wiring Diagram, Type 85B Self-Compensating Telephone with Printed Wiring Card Transmission Unit.

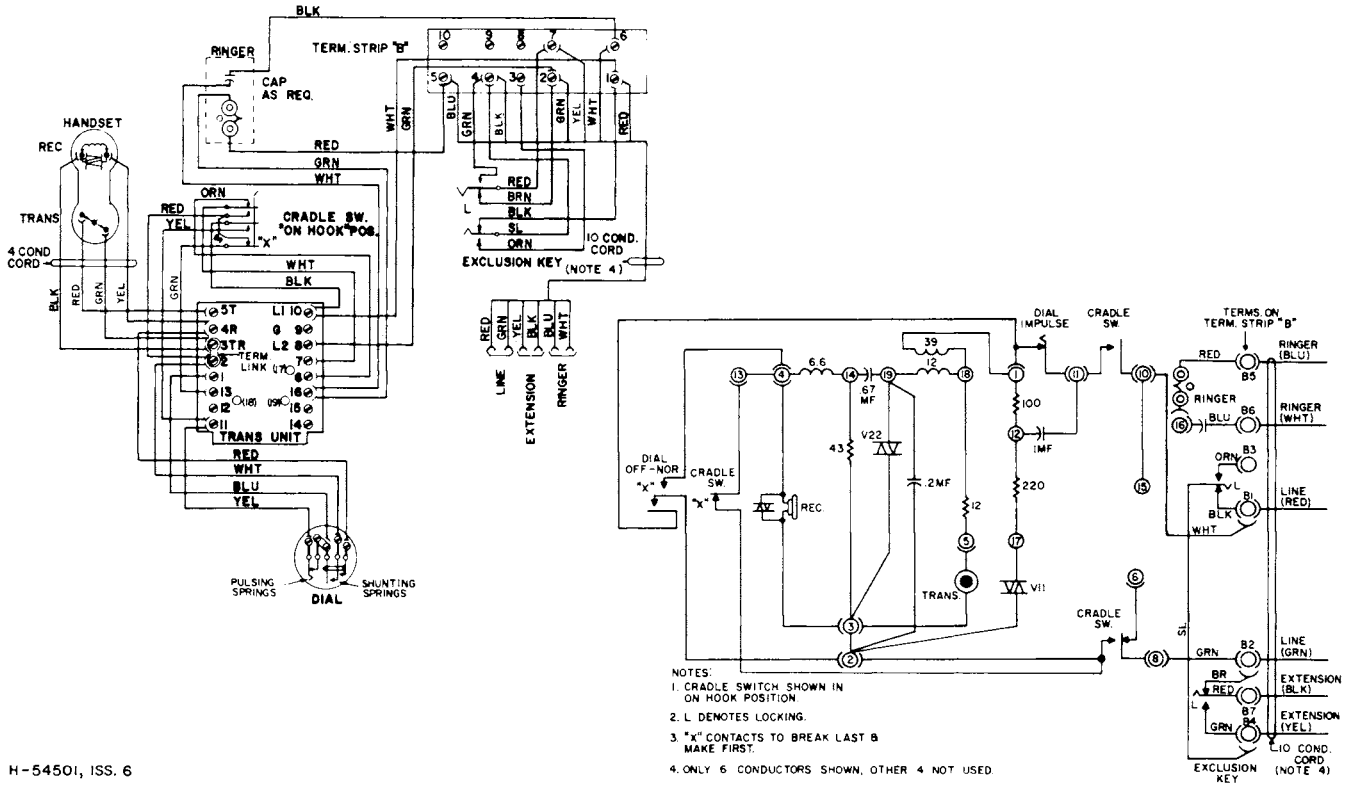


Figure 16. Schematic and Wiring Diagram, Type 85B Self-Compensating Telephone with Potted Transmission Unit.

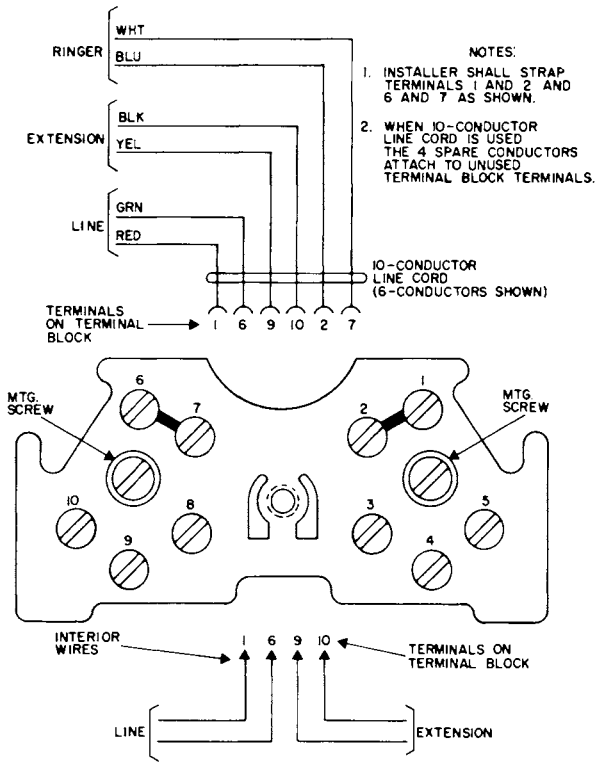


Figure 17. Standard Terminal Block Wiring for Type 85B Self-Compensating Telephone.

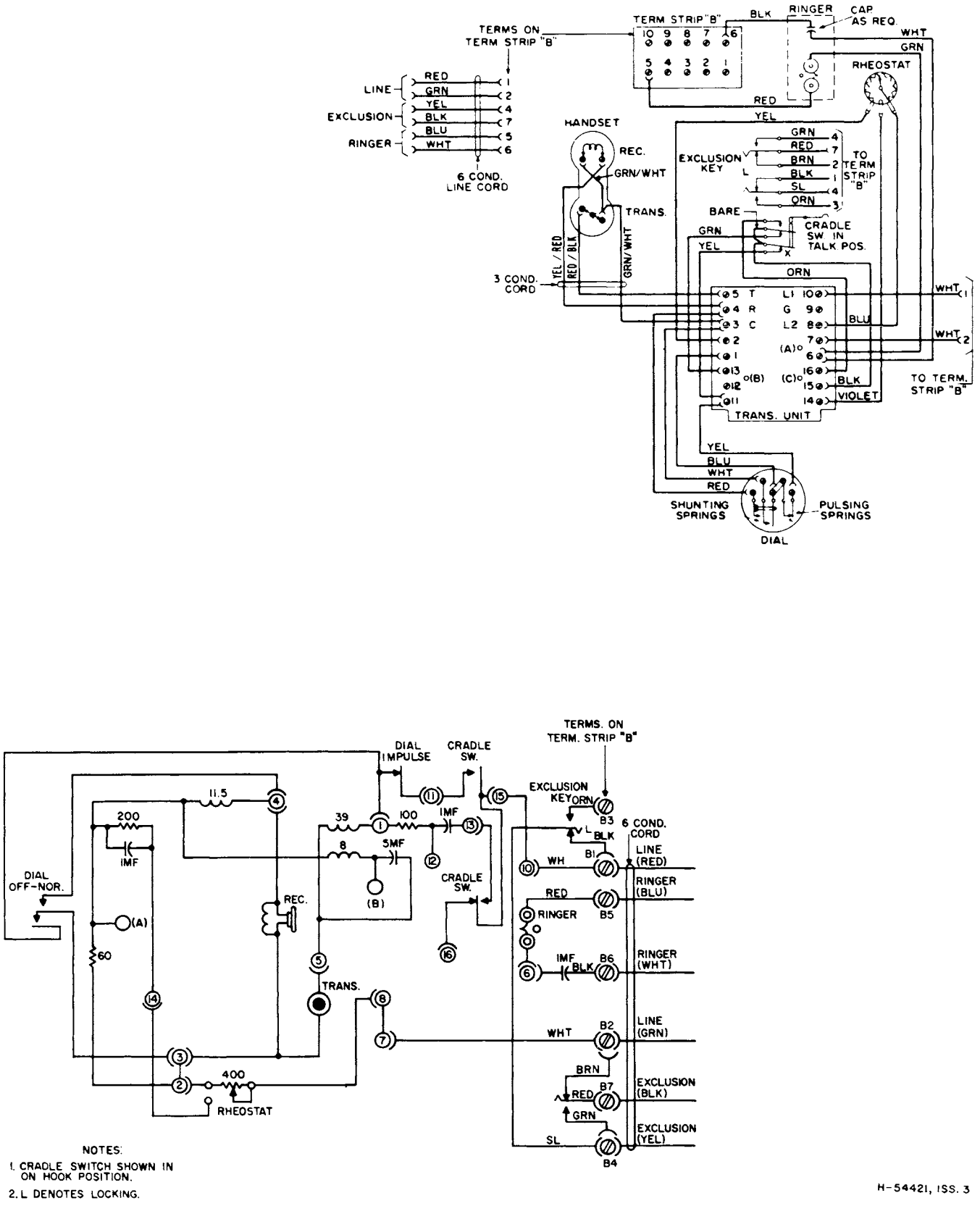


Figure 18. Schematic and Wiring Diagram, Type 85B Manually Adjusted Telephone.

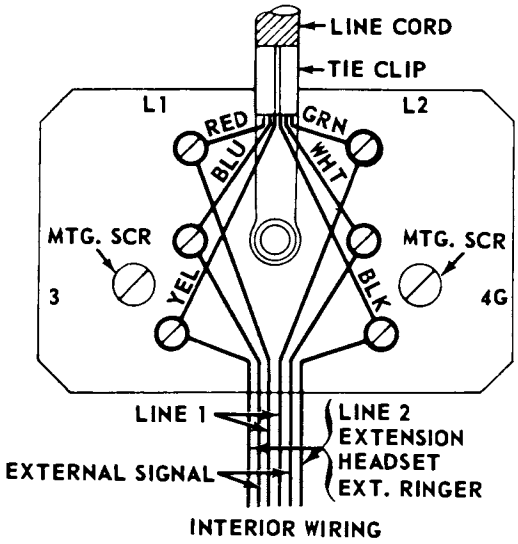


Figure 19. Standard Terminal Block Wiring for Type 85B Manually Adjusted Telephone.

Table 4. Service Variations for Type 85B Manually Adjusted Telephones.

FEATURES	LINE CORD CONNECTIONS								SET WIRING					
	TO LINE 1		TO LINE 2		TO EXCLUDED STATION		RINGER LEADS		RINGER LEADS		SET LEADS		EXCLUSION KEY LEADS	
	RED	GRN	YEL	BLK	YEL	BLK	BLU	WHT	BLK	RED	WHT	WHT	SL	RED
EXCLUSION (STANDARD)	B1	B2			B4	B7	B5	B6	B6	B5	B1	B2	B4	B7
TWO-LINE PICKUP	B1	B2	B3	B4			B7*	B8*	B1	B2	B9	B10	B9	B10

* NOT USED

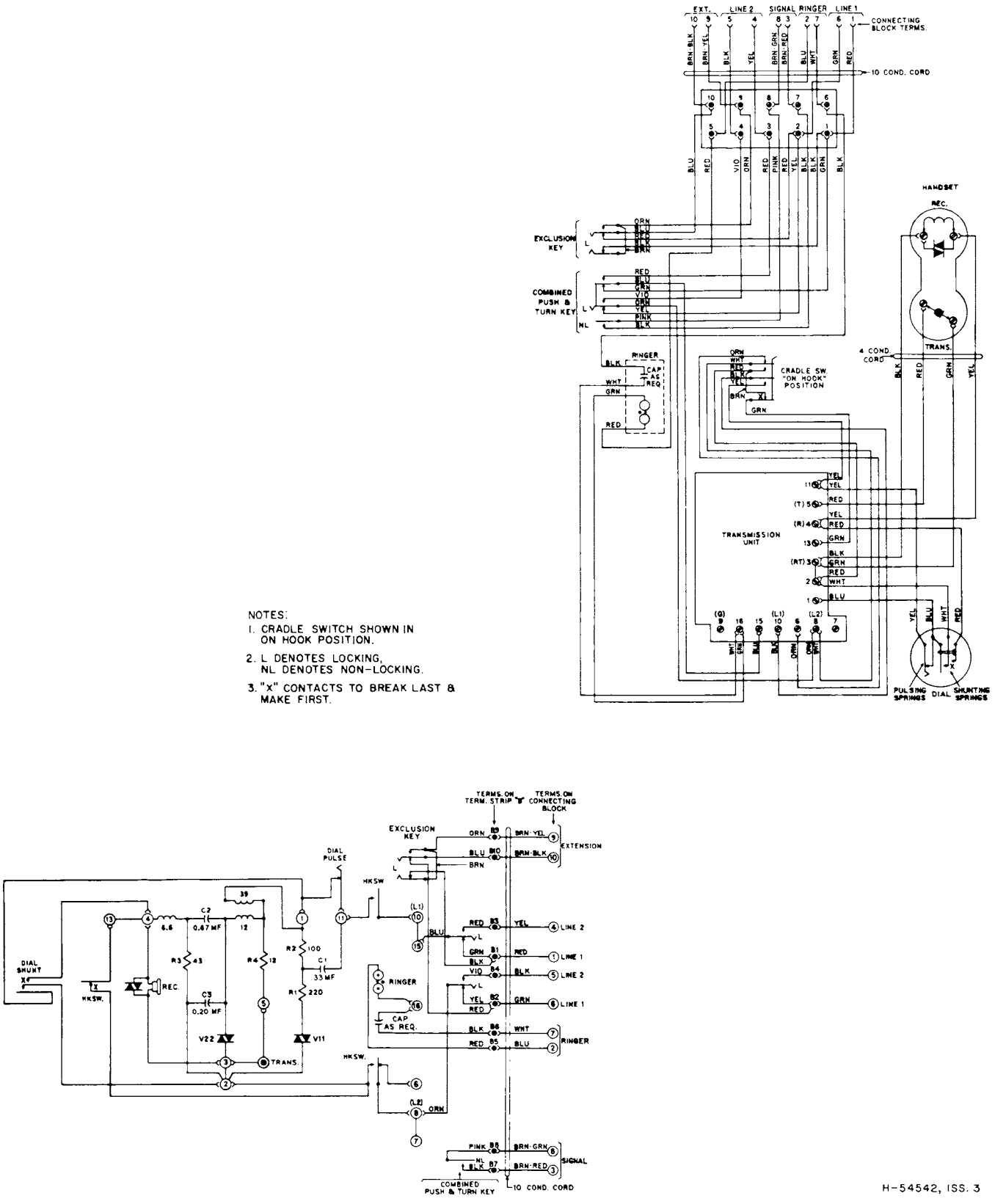


Figure 20. Schematic and Wiring Diagram, Type 85C Self-Compensating Telephone with Printed Wiring Card Transmission Unit.

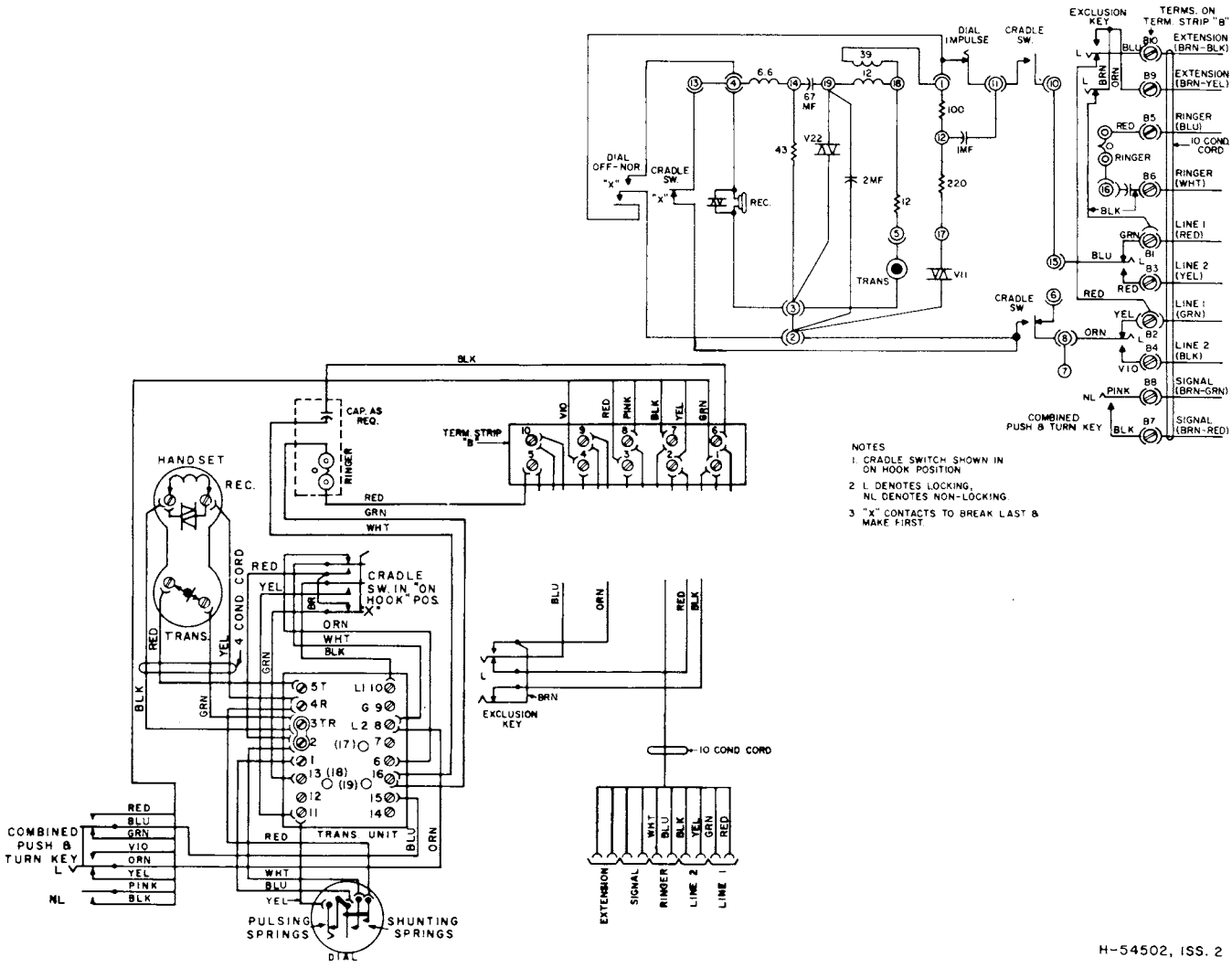


Figure 21. Schematic and Wiring Diagram, Type 85C Self-Compensating Telephone with Potted Transmission Unit.

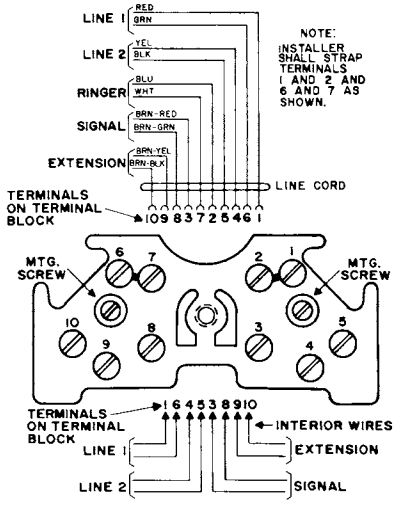


Figure 22. Standard Terminal Block Wiring for Type 85C Self-Compensating Telephone.

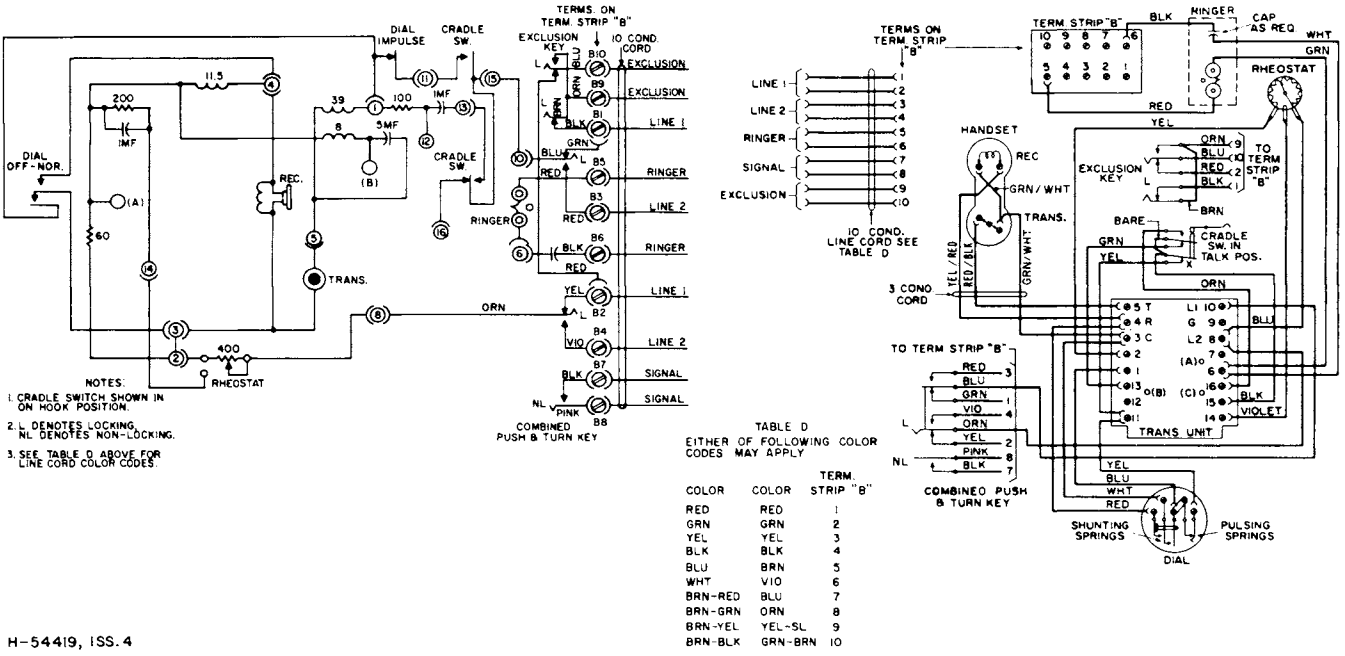


Figure 23. Schematic and Wiring Diagram Type 85C Manually Adjusted Telephone.

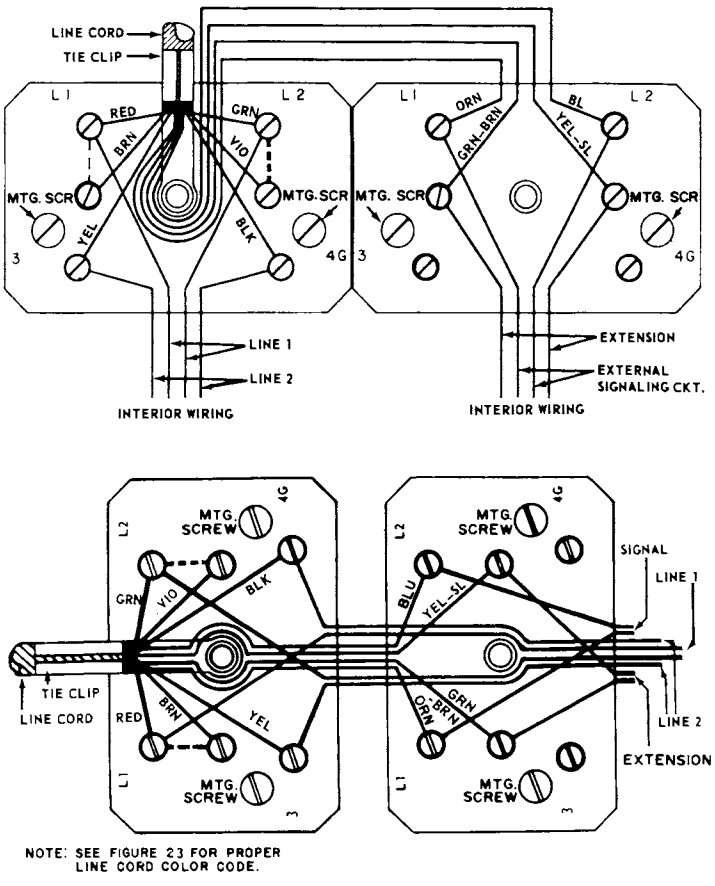


Figure 24. Standard Terminal Block Wiring for Type 85C Manually Adjusted Telephone.

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