

TYPE 187 TELEPHONE SET  
DESCRIPTION, INSTALLATION, AND FIELD MAINTENANCE

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1. GENERAL

1.01 This section contains the description and the installation and field maintenance procedures for the Type 187 telephone set.

1.02 This section is reissued to correct the information on the common audible signal unit and to add information on the plug-ended line cord and newer model telephone sets. Information formerly contained in Section 473-513-200 has been combined into this section. Changes are indicated by marginal arrows. Remove Issue 2 and its addendum from the binder and replace with this issue.

2. DESCRIPTION

2.01 The Type 187 telephone set is manufactured in both a desk and a wall-mounted configuration. Both configurations may be equipped with either a rotary dial or a Touch Calling unit. The rotary dial-equipped desk model set is shown in Figure 1. Figure 2 shows the same set equipped with a Touch Calling unit. Figures 3 and 4 show the wall-mounting configuration of the Type 187 with rotary dial and Touch Calling unit, respectively.



Figure 1. Type 187 Telephone Set, Desk Mounting, with Rotary Dial.



Figure 2. Type 187 Telephone Set, Desk Mounting, with Touch Calling Unit.



Figure 3. Type 187 Telephone Set, Wall Mounting, Rotary Dial.

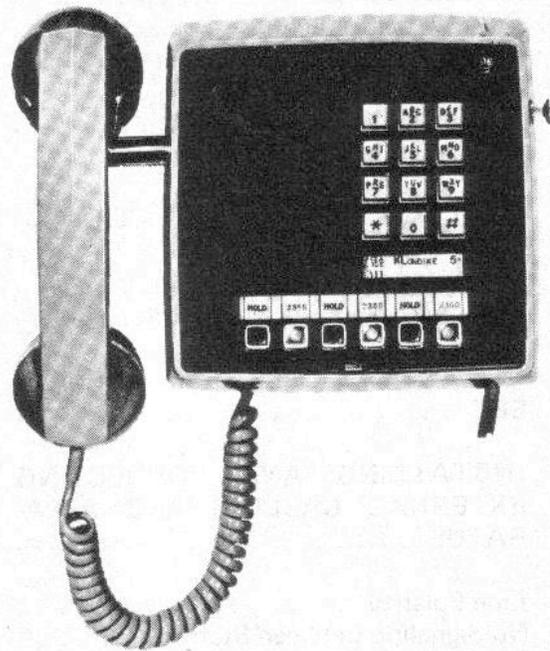


Figure 4. Type 187 Telephone Set, Wall Mounting, with Touch Calling Unit.

2.02 The desk configuration of the Type 187 is approximately 8-1/2 inches deep, 9-1/2 inches wide, and 4-1/2 inches high. In the wall-mounting configuration, the set is approximately 8-1/2 inches high, 9-1/2 inches wide, and 4-1/2 inches deep.

#### Intended Use

2.03 The Type 187 is a six-key set that can initiate, answer, and hold calls on a maximum of three central office, PBX, PABX, or intercom lines, without the need for auxiliary relay

apparatus or power supplies. This set is usually installed as part of a planned complement of apparatus marketed as a "convenience system." Four such arrangements have been adopted as standard for service offering within the GTE System. They are:

- (a) Access to two central office lines with hold.
- (b) Access to three central office lines with hold.
- (c) Access to two central office lines, with hold, and one intercom line (hold provided but not essential).
- (d) Access to two central office lines with hold, and one dial-selective-signalized intercom line (hold provided but not essential) with additional pushbutton signaling between stations if desired.

#### Dialing Provisions

2.04 The Type 187 may be equipped with either a rotary dial or a Touch Calling unit. Sets equipped with rotary dial use a modification of the Type 52 dial. In place of the usual extended number plate, the dial is equipped with a 3-inch-diameter white dial plate with black arrowheads, and with the finger stop completely external to the base diameter. The dial number and letter designations are molded in the surrounding telephone set faceplate. Touch Calling sets are equipped with the 12-button Touch Calling unit with metropolitan pushbutton designations molded in the front surface of the individual pushbuttons.

#### Housing

2.05 The housing is molded of plastic in separate versions for desk and wall sets. While both types are of the same general dimensions, and are attached to the telephone set mechanism in the same manner, they are not interchangeable. Bosses molded into the inner surface support two securing lugs along the shorter wall and the bracket for a shoulder-head securing screw in the center of the taller wall. The lugs and bracket are secured to the housing by means of self-tapping screws threaded into the bosses.

2.06 The difference in the two housings lies in

provisions for accommodating handset and line cords, and for clearance for the handset cradle or hanger. The desk set housing has two rectangular openings on the left side to clear the hookswitch cradle. A small entry slot for the handset cord is located at the left front, and a large slot at the right rear provides entrance for the line cord. The housing for the wall mounting set has a large slot for the shaft of the handset hanger on its left side. A small entry slot for the handset cord is located at the bottom left, and a large slot for admitting the line cord is located at the bottom right.

2.07 On the housing for the wall-mounting set, a ridge running from front to rear about an inch in from the right edge is molded onto the upper surface. This provides a storage position for the handset when the user must leave the telephone in the off-hook condition.

#### Faceplate

2.08 The faceplate is molded of clear plastic with a smooth outer surface. The undersurface is ribbed; and is painted to match the housing, or in beige, medium gray, white, silver, green, vermilion, yellow, blue, flamingo, gold, or brown. It is also available in clear plastic for special decor applications. The faceplate is not furnished with the telephone set, but must be ordered separately. Two versions are available for rotary dial models, one with metropolitan numbering and one with numbers only. One version is available for 12-button Touch Calling units.

2.09 The faceplate has an unpainted rectangular area above the opening for the key assembly, which provides a window through which the key designations may be read. In the faceplate for sets equipped with a touch calling unit, a rectangular opening is provided below the Touch Calling unit openings for inserting a telephone number card. A clear plastic cover, supplied with the telephone set, snaps into position in this opening.

2.10 The faceplate has a tab on its upper edge that engages a slot in the supporting ridges of the housing. A corresponding slot in the ridge on the opposite wall of the housing is equipped with a spring clamp that latches the faceplate into position.

Component Arrangement

2.11 Figure 5 is a front view of the rotary dial-equipped Type 187 with the housing and faceplate removed. Figure 6 is the rear view of the same set with the chassis raised and a common audible signal unit installed. Both the wall and the desk configurations of the Type 187 are constructed on the same type of pressed steel base to which are eyeleted two U-shaped brackets for support of the chassis. The bracket with the shorter vertical legs runs laterally near the edge of the base that forms the front of the desk telephone set and the top of the wall-mounting set. Two turned-up tabs with horizontal pierced slits extend forward from this shorter bracket and serve to engage securing lugs in the shorter wall of the housing. The taller bracket lies along the opposite edge of the base, and has a central turned-up tab with a vertical slot for engaging a housing securing screw located in the taller wall of the housing.

2.12 A printed wiring card transmission unit is fastened directly to the baseplate with two screws. The rotary dial set uses a Type WA-1154-A transmission unit. A WA-1155-A transmission unit is used in the Touch Calling set. The ringer, when used, is attached to the base with screws. When a common audible signal unit is included instead of the ringer, it is attached to the base and the tall U-shaped mounting bracketed with screws.

2.13 Two horizontal slots in the legs of the shorter mounting bracket, and two axial

slots in those of the longer one, are engaged by shoulderhead screws, which secure the chassis to the brackets. The dial or Touch Calling unit, key assemblies, and buzzer (when included) are mounted on the chassis. On the desk configuration, a hookswitch assembly is suspended below the left edge of the chassis by means of an angle bracket, and is actuated by the handset cradle. On wall-mounted sets, the hookswitch is mounted directly to the underside of the chassis, and is actuated by the rotating shaft of the handset hanger.

2.14 On rotary dial sets, the dial is mounted on a semicircular bracket having a slotted leg to engage a tab on the chassis at the left. It also has located holes and a slot for screw attachment to a vertical extension of the chassis at the right. Sets equipped with a Touch Calling unit are equipped with two angle brackets that are attached to the chassis in the same manner as the dial mounting bracket and are arranged with locating holes and slots for screw attachment to the body of the Touch Calling unit.

2.15 The buzzer, provided as an auxiliary signal on some sets, is mounted in a vertical position at the right end of the chassis adjacent to the dial or Touch Calling unit and key assembly.

2.16 The desk telephone set has four circular feet riveted to the base, one at each corner with the foot at the right rear corner positioned some distance in from the corner to avoid placing it

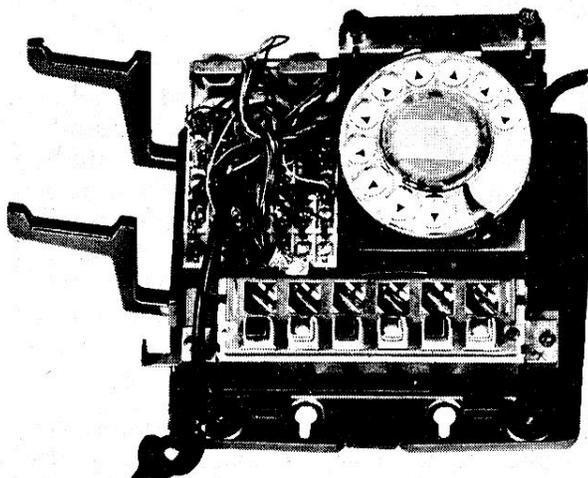


Figure 5. Front View of a Rotary-Dial-Equipped Type 187 Telephone Set with Housing and Faceplate Removed.

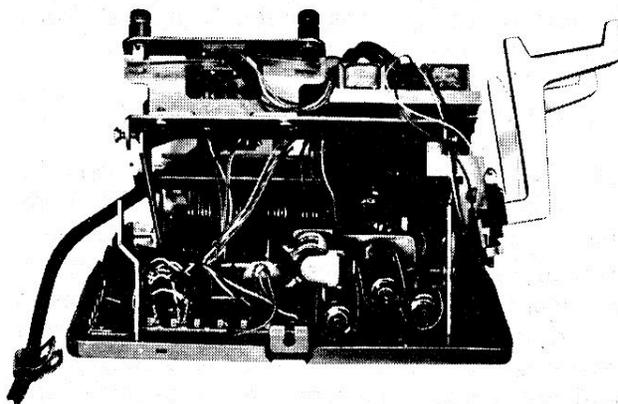


Figure 6. Rear View of Type 187 Telephone Set with Chassis Raised and Common Audible Signal Unit in Place.

below the terminals of the transmission unit. On wall-mounted sets, the base is used without feet to facilitate fastening it directly to the wall.

2.17 Conversion from desk configuration to wall-mounting configuration, and vice versa, is possible by changing the housing and hookswitch assembly, reversing the position of the chassis, and adding or removing the feet. However, these changes should be undertaken in the shop only.

#### Keys

2.18 A six-button key assembly is mounted at the front of the desk-type set, and at the bottom edge of the wall-mounted set. The keys are paired to provide three sets of hold and pickup keys, one set for each line. The hold keys are equipped with red pushbuttons, while the pushbuttons of the pickup keys are clear. Two sliding "ladders" are used to provide interlock among the pickup plungers. The ramps on the ladders at each position are arranged so that depressing the line 1 pickup plunger causes the rear of the plunger lock screw to force both ladders to the right. Depressing the line 3 plunger forces both ladders to the left, while depressing the line 2 pickup plunger forces the front ladder to the right and the rear ladder to the left. In each case, the force is transmitted to the other two pickup plungers if they are operated, and causes them to restore by action of the ladder ramp against the plunger screw.

2.19 Operation of any hold key connects a 330-ohm resistor and a series inductor with a dc resistance of 165 ohms across the associated line before releasing the interlocked pickup key and disconnecting the transmission unit from the line. This dc bridge holds the central office connection, but the audio-frequency impedance of the inductor is sufficiently high so that transmission is not impaired if conversation is resumed from another station before the hold key is restored.

2.20 An operated hold key is not affected by the operation of pickup or hold keys serving the other two lines. However, to ensure that no line can be left on hold unintentionally, a third sliding ladder is linked to the hookswitch actuator. This ladder is arranged so that restoring the handset forces it to the left. This causes one of its three ramps to bear against the lock screw of any operated hold key plunger, forcing it upward and thus removing the hold bridge from the line.

2.21 A set of break contacts, which are momentarily actuated by a black plunger, is situated above and to the left of the dial or Touch Calling unit. This key is provided as a recall button for disconnect and reseizure. It is also for attendant flash in PBX and PABX systems, and for consultation calls in those PABX systems providing this feature. It is wired in series with the hookswitch to avoid use of the latter for flashing when to do so would release a line from hold.

2.22 A set of make contacts, which are momentarily actuated by a red plunger with the designation SIG engraved in its top, is located above and to the right of the dial or Touch Calling unit. This key may be used for signaling between stations or for call transfer in PABX systems requiring a grounding key for this function.

#### Indicator Lamps

2.23 In the key assembly lamp jack, the positions associated with the pickup keys are equipped with K1D neon lamps and 27,000-ohm series resistors to light the associated pickup pushbuttons and line designations when ringing potential is applied to the lines. Each of these three lamp jacks, in series with this 27,000-ohm resistor, is wired across one of the lines to which the set has access. When ringing potential is applied from the central office, the lamp lights to indicate which pickup key should be operated to answer the incoming call. Lamp flashes will also be noted during dialing or other line surges.

#### Busy Visual Indication

2.24 The three lamp jacks adjacent to the hold keys are equipped with incandescent lamps. By use of an externally mounted L-7048 power supply (Figures 7 and 8), these lamps can be made to indicate a line busy condition. When a pickup or hold key on any of the interconnected sets is operated with the set in the off-hook condition, the lamps will light in the corresponding hold key position on all the interconnected sets, indicating that the associated line is busy.

#### Cables and Connections

2.25 The wiring diagrams of the rotary dial-equipped Type 187 are shown in Figures 9 and 10. Figures 11 and 12 show the wiring diagrams of the Type 187 equipped with a Touch

Calling unit. Interconnections between set components and line cord conductors are made at a 26-point terminal board mounted on the chassis to the left of the dial or Touch Calling unit. Six additional terminals without screws are used to connect three inductors for the line holding bridges, which are mounted on the top of the terminal board. Their associated resistors are mounted underneath the terminal board. These connections and connections to the key assemblies are soldered to lug protrusions of the terminals beneath the terminal board. All other connections are made by means of screws and spade lugs. The handset cord is equipped with a J-hook strain relief clamp at its point of exit from the telephone set.

2.26 The line cord exits from the telephone set base at the right rear on desk sets, and at the lower right on the wall-mounted set. It is fastened to a leg of the taller mounting bracket by means of a cable clamp. The 16-conductor line cord is terminated on its free end in two Type 44A connecting blocks as shown in Figures 9 and 11. The new 24-conductor line cord terminates in a 50-terminal plug. On older wall-mounted sets, the main portion of the keyhole-shaped knockout located near the right edge of the base serves as an entry point for concealed inside wiring that is used in place of the line cord. On the currently manufactured sets, the keyhole-shaped knockout has been replaced with a larger rectangular knockout.

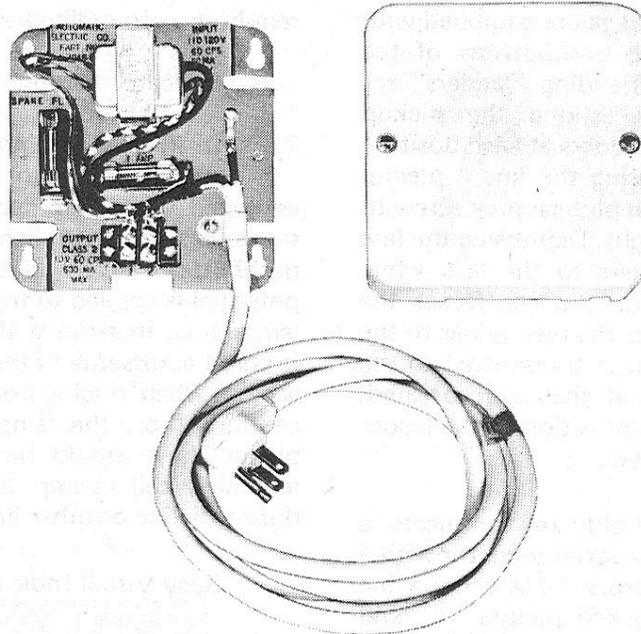


Figure 7. L-7048 Power Supply with Cover Removed.

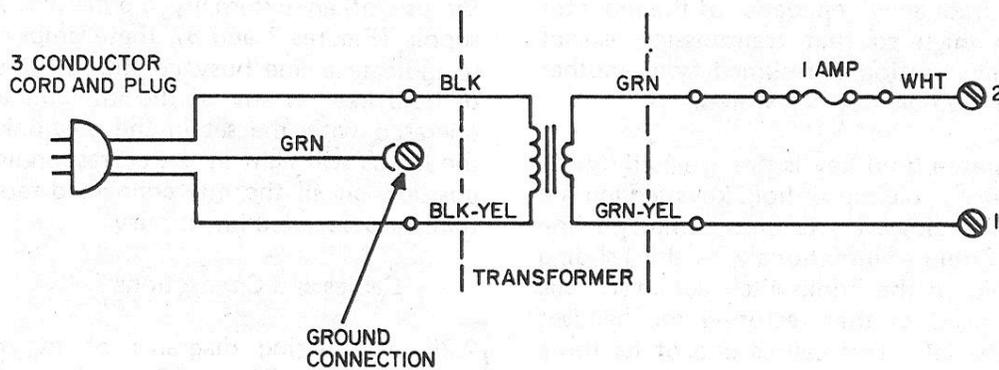
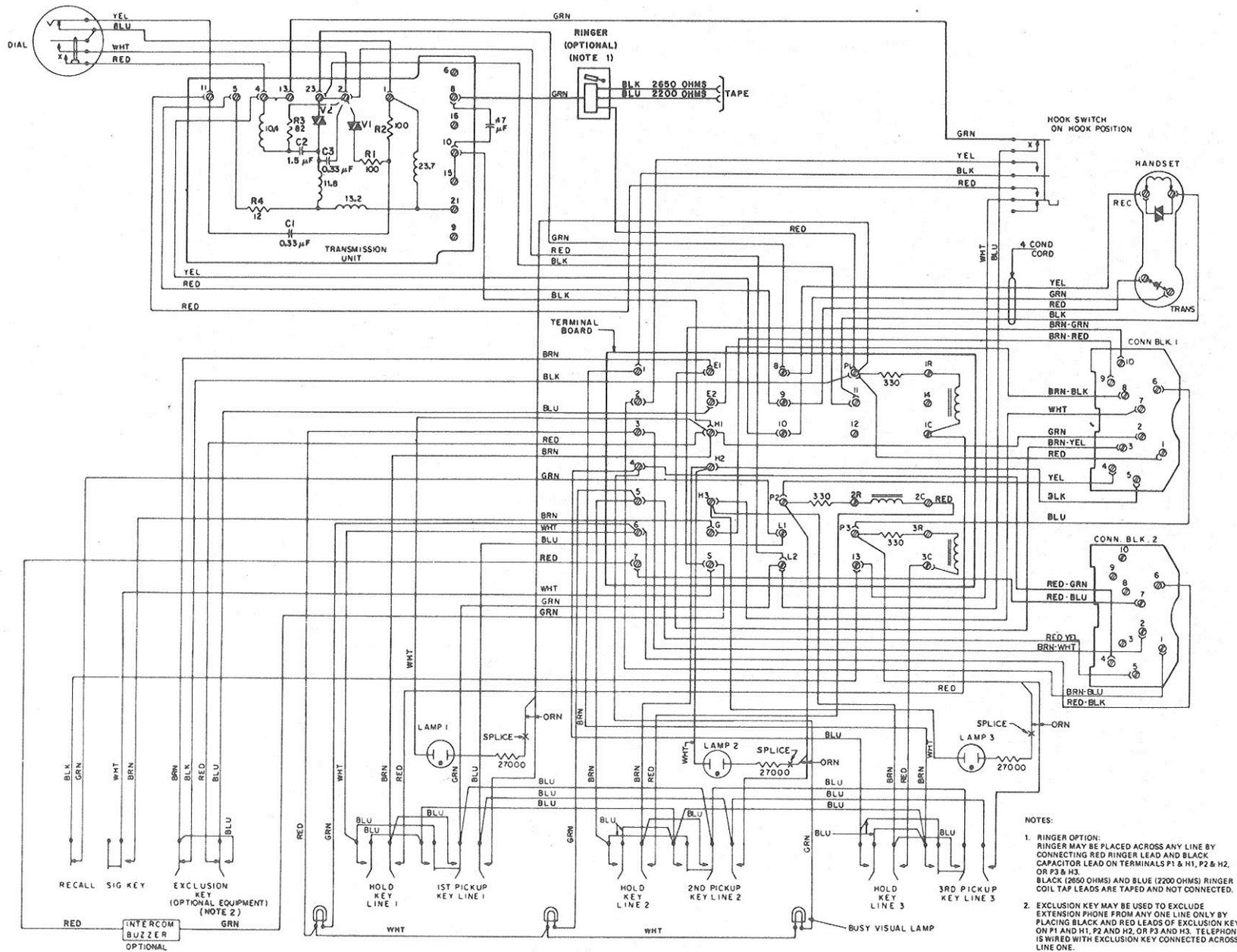


Figure 8. L-7048 Power Supply Schematic Diagram.



- NOTES:
1. RINGER OPTION:  
RINGER MAY BE PLACED ACROSS ANY LINE BY CONNECTING RED RINGER LEAD AND BLACK CAPACITOR LEAD ON TERMINALS P1 & H1, P2 & H2, OR P3 & H3.  
BLACK (2650 OHMS) AND BLUE (2200 OHMS) RINGER COIL TAP LEADS ARE TAPED AND NOT CONNECTED.
  2. EXCLUSION KEY MAY BE USED TO EXCLUDE EXTENSION PHONE FROM ANY ONE LINE ONLY BY PLACING BLACK AND RED LEADS OF EXCLUSION KEY ON P1 AND H1, P2 AND H2, OR P3 AND H3. TELEPHONE IS WIRED WITH EXCLUSION KEY CONNECTED ACROSS LINE ONE.
  3. LEADS ON CAPACITORS AND RESISTORS ARE PART OF RESPECTIVE COMPONENT. (SLEEVE PIGTAIL LEADS).
  4. X CONTACTS ON HOOKSWITCH BREAK LAST.

Figure 9. Wiring Diagram of Type 187 Telephone Set with Rotary Dial and 16-Conductor Line Cord.

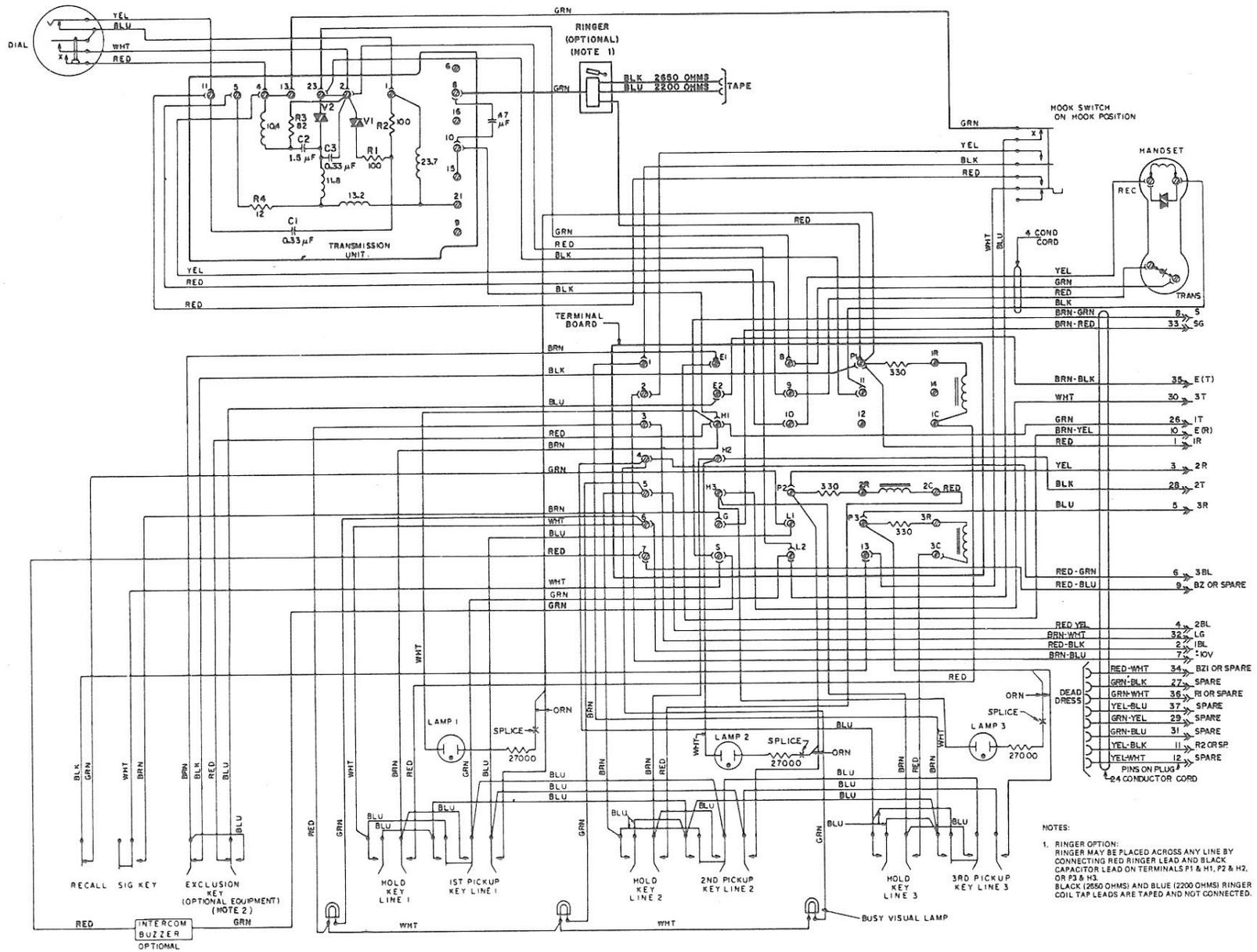
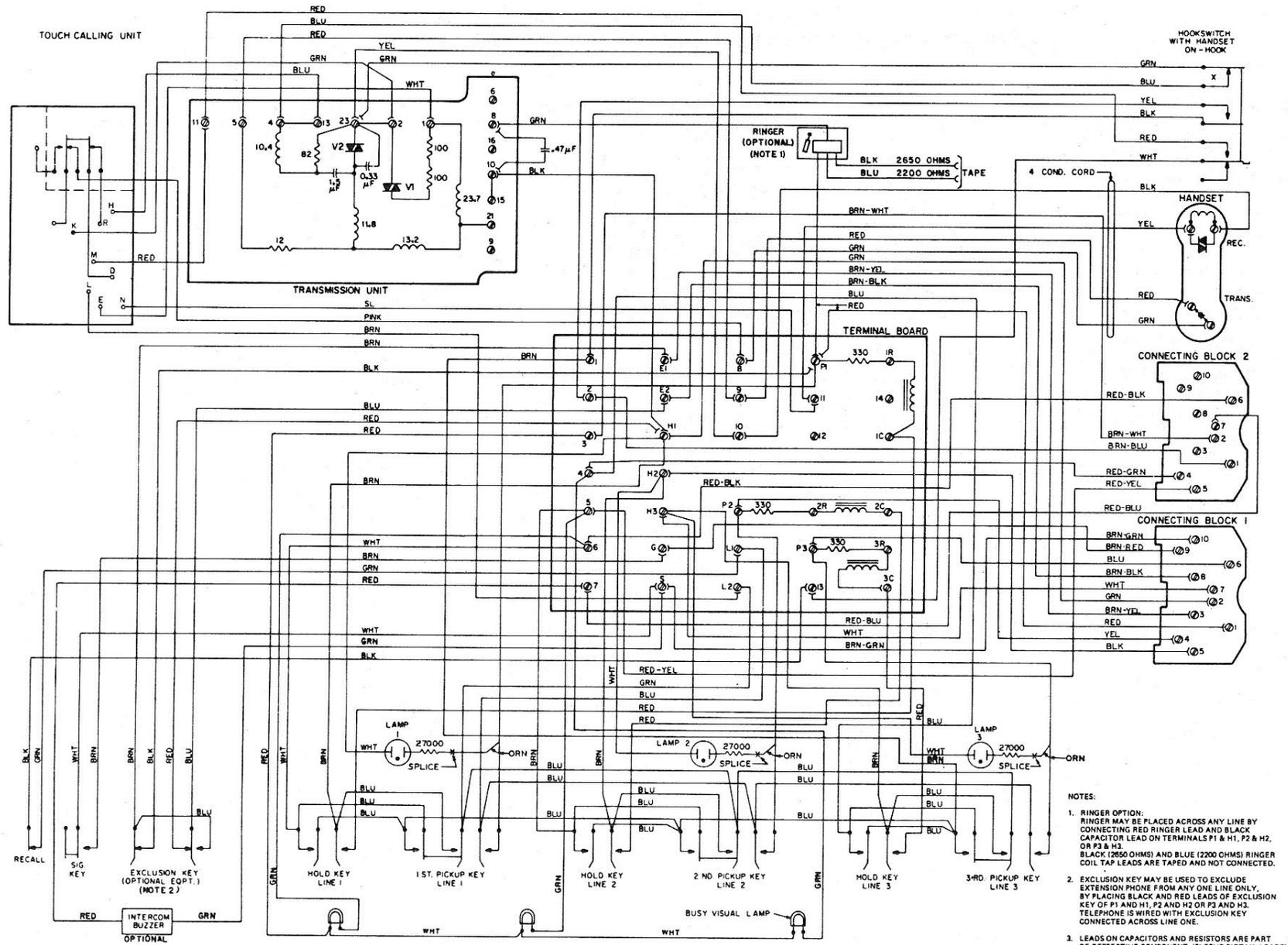


Figure 10. Wiring Diagram of Type 187 Telephone Set with Rotary Dial and 24-Conductor Plug-Ended Line Cord.



- NOTES:
1. RINGER OPTION:  
RINGER MAY BE PLACED ACROSS ANY LINE BY CONNECTING RED RINGER LEAD AND BLACK CAPACITOR LEAD ON TERMINALS P1 & H1, P2 & H2, OR P3 & H3. BLACK (2650 OHMS) AND BLUE (2200 OHMS) RINGER COIL TAP LEADS ARE TAPED AND NOT CONNECTED.
  2. EXCLUSION KEY MAY BE USED TO EXCLUDE EXTENSION PHONE FROM ANY ONE LINE ONLY, BY PLACING BLACK AND RED LEADS OF EXCLUSION KEY OF P1 AND H1, P2 AND H2 OR P3 AND H3. TELEPHONE IS WIRED WITH EXCLUSION KEY CONNECTED ACROSS LINE ONE.
  3. LEADS ON CAPACITORS AND RESISTORS ARE PART OF RESPECTIVE COMPONENT. (SEE VE PIGTAIL LEADS).
  4. X CONTACTS ON HOOKSWITCH BREAK LAST.
  5. Y CONTACTS ON HOOKSWITCH BREAK FIRST.

Figure 11. Wiring Diagram of Type 187 Telephone Set with Touch Calling Unit and 16-Conductor Line Cord.

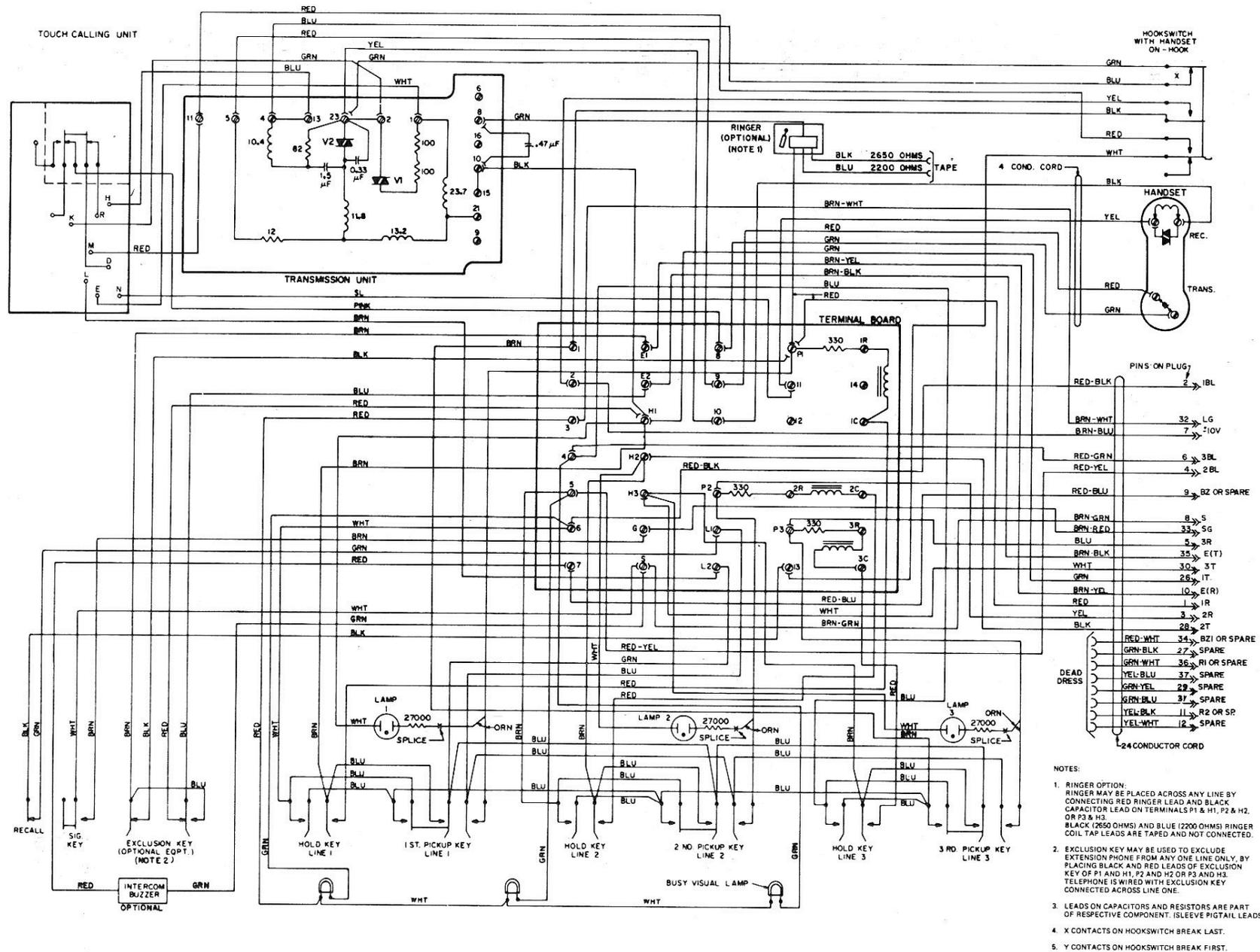


Figure 12. Wiring Diagram of Type 187 Telephone Set with Touch Calling Unit and 24-Conductor Plug-Ended Line Cord.

### Signaling Provisions

2.27 In installations in which access is limited to central office lines and special pushbutton signaling is not included no special signaling apparatus is required. When ringers for all but one of the lines are included elsewhere and are audible at the Type 187 location, a ringer for the remaining line may be installed in the Type 187. If other stations having access to part of the lines are all located beyond earshot of the Type 187, or if there are no additional sets with access to any of the lines, either of two options may be used as follows:

- (a) A common audible signal unit (Figure 13) to serve all lines may be installed in the Type 187.

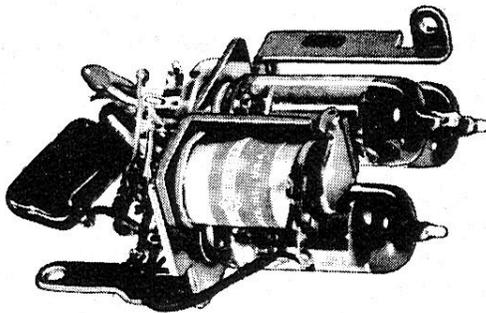


Figure 13. Common Audible Signal Unit.

- (b) One ringer may be mounted in the Type 187 with one or two additional ringers mounted in external ringer boxes.

2.28 In cases where an intercom line with pushbutton signaling is required, all buzzers and all pushbuttons in a group are connected in parallel. Pushing a signaling pushbutton on any station sounds the buzzers at all stations in the group. In this signaling arrangement, an intercom power supply unit such as the Proctor Model P400BT is required. This unit supplies filtered 8.2 volts dc to serve as talking battery for up to five stations on the intercom line. It also has 9- and 18-volt ac taps for supplying power to buzzers. For information concerning the Proctor Model P400BT power supply, see the 490-101 series of GTE Practices.

NOTE: In applications requiring busy visual signal, talking battery, and intercom signaling, a single Proctor P-411 power supply may be used to replace both the L-7048 and the Proctor P400BT power supplies.

2.29 In cases where signaling is desired without intercom service, only a signal transformer such as the Model S-9883 is required. This unit supplies 6, 12, or 18 volts ac for buzzers. Control of the buzzer is provided by the SIG key in the station normally answering calls, with the buzzer located at a station that answers only in response to sounding of the buzzer.

2.30 Where a dial-selective-signaled intercom line is to be provided, a key telephone system power supply unit is required as a source for talking battery and buzzer power, and also for the 18 to 28 volts dc required for the selective signaling apparatus. The latter, an H-883002-70 dial intercom key telephone unit, requires an H-884900 bracket assembly for mounting. For further information about this unit see the 484-400 series of GTE Practices. In this arrangement, up to nine stations may have access to a common intercom talking path and an individual lead is run to each station for buzzer operation.

2.31 Where additional signaling must be provided at the station for each line accessed, a common audible signal unit (Figure 13) may be mounted in the space provided for the ringer.

### Signaling Methods

2.32 The common audible signal unit circuit as wired at the factory with X and Y straps connected provides, for each of three lines terminated in the subset, a 5823 cold-cathode triode connected in common to a relay buzzer that sounds whenever one or more of the stations are signaled by ringing. The cathodes are connected individually to the line conductor on which the ringing signal is received. The main anodes are connected in parallel through a current-limiting R-C network and the relay buzzer to earth ground. Early versions provided a 0.5-microfarad capacitor across the relay. Thus, the circuit presents a polarized load, responding only to potentials that are negative with respect to ground.

2.33 The tubes serve a dual purpose: to connect the ringing signal from one or more of the

lines to the buzzer, and to isolate the lines except during ringing. The circuit functions as an OR logic gate, responding to line-to-ground potential. When the potential on a line exceeds approximately  $\pm 70$  volts, the associated tube conducts between the cathods and starter anode through its 100-kilohm resistor to ground. On the negative half cycles, conduction is transferred from the starter to the main anode, operating the relay buzzer, which then pulses and sounds once during each cycle of the ringing signal.

2.34 In all versions of the circuit, connecting both the X and the Y strap provides maximum sensitivity, and this connection would be used for unusually low level (75 to 85 volts) ringing signals from central offices in which the common side of the ringing generator is grounded (ground-connected generator). The ringing signal may be sent over either side of the line to operate either bridged or divided (grounded) ringers. Then battery is applied through the ring-trip relay to the other side of the line. Since the ringing current through the common audible signaling unit returns to the generator via earth ground, the ring-trip relay is unaffected, and there is no chance of false ring tripping. Typical average direct current drawn from a 90 Vrms, 20- to 50-Hz generator is 3 mA. However, since the current is proportional to the voltage, it is recommended that the X strap be cut unless it is needed to make the signal audible. This is for the purpose of reducing the generator load, particularly if several units are used to monitor the same line.

2.35 Removing the X strap increases the resistance in series with the buzzer, thus reducing the average direct current so as to prevent false ring cutoff on high-voltage signals over short loops where the ring-trip relay operates in series with the signal unit. This arrangement is found in central offices where the common lead of the generator is connected to the negative battery (battery-connected generator). Then the negative voltage peaks applied to the line are 100 volts higher than the positive peaks and 50 volts higher than both peaks of the ground-connected generator signal.

2.36 In the first production units, prior to 1969, removing the X strap inserts the parallel combination of 10 kilohms and 2 microfarads in series with 2200 ohms and the relay buzzer, as shown in Figure 14. This relatively high resistance was necessary to prevent false operation with the

96 V booster battery used in SATT systems and also to allow monitoring of a line with several signaling units. Direct current is typically 4 mA for a 125 V generator.

2.37 Subsequent reduction in the scope of applications eliminated the need for SATT system compatibility so that, in the common audible signaling units manufactured between 1969 and 1972, only a 2200-ohm resistor is inserted by cutting the X strap (Figure 15). This change simplified installation and favored exchanges with low ringing voltage. In these units, typical direct current for a 125 V generator is 10 mA. The relatively low resistance circuit increases the chances of false ring cutoff, particularly when a line is monitored by more than one unit.

2.38 Current production units (Figure 16) use a high-impedance circuit similar to the original version. Typical direct current for high generator voltage (battery-connected, 125 V at 20 Hz) is less than 4 mA if the X strap is removed. A reasonably wide operating range is provided, with sensitivity at approximately 90 V. (As mentioned before, the X strap should be used only with ground-connected generator ringing and when that generator voltage is too low to operate the signal unit.) Thus, in nearly all telephone exchanges encountered today, at least three units may be connected in such a way as to monitor the same line. In extreme situations where false ring cutoff problems occur, the only recourse is to increase substantially the resistance of R3.

2.39 Since there is a wide variation in ringing and ring cutoff schemes, the best installation procedure is to attempt operation on the least possible amount of power; i.e., cut the X strap, check the ring detection performance, and not reconnect the X strap unless necessary.

2.40 Removing the Y strap (Figures 15 and 16) inserts 0.02 microfarad in the starter anode circuit, blocking dc to prevent response to dial pulses. (Older units, as shown in Figure 14, designated this strap also as Y.) This option is necessary only when the signal unit is connected between the ring (-) conductor and ground (items B and D in Table 1). When dialing, the first of the negative line surges will charge the capacitor, fire the tube, and pulse the relay once. With the capacitor charged, subsequent surges from the remainder of the dial pulses will be ineffective, and the relay buzzer will remain silent.

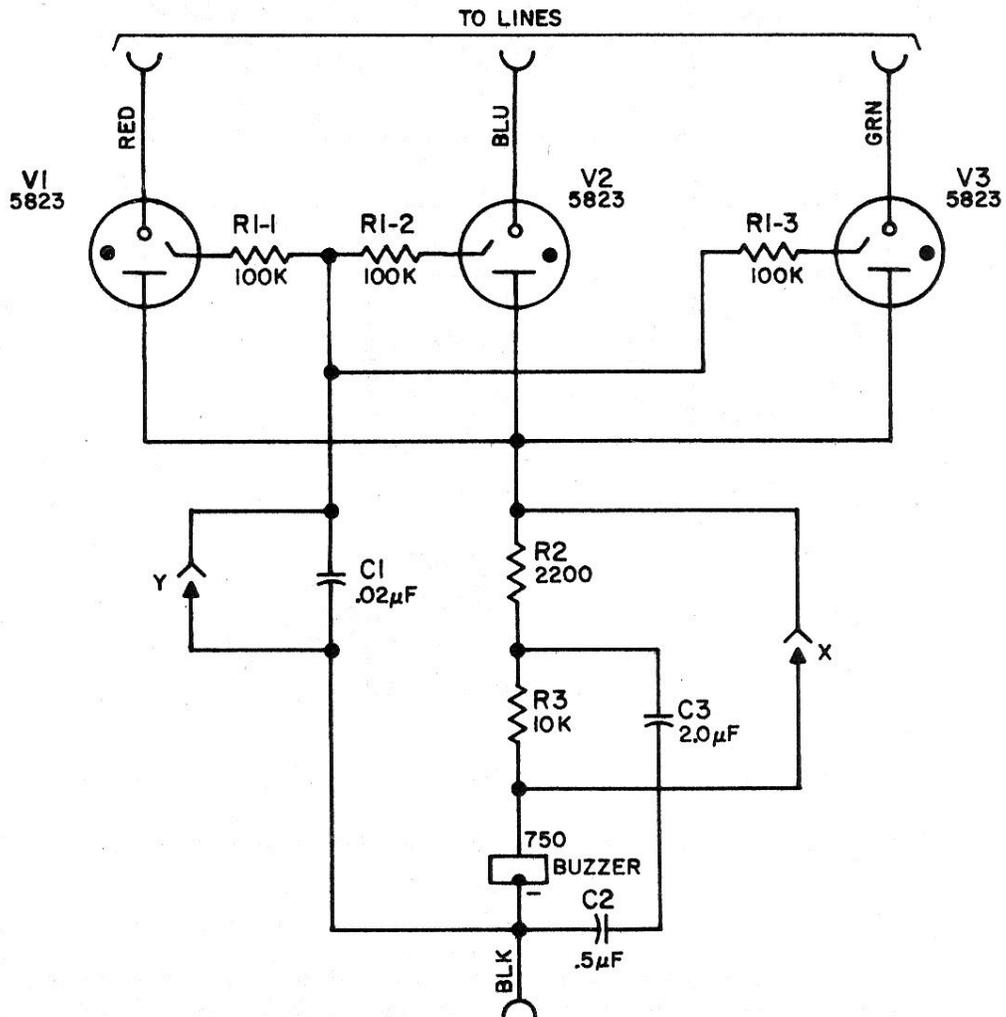


Figure 14. Circuit of First Production of Common Audible Signal Unit.

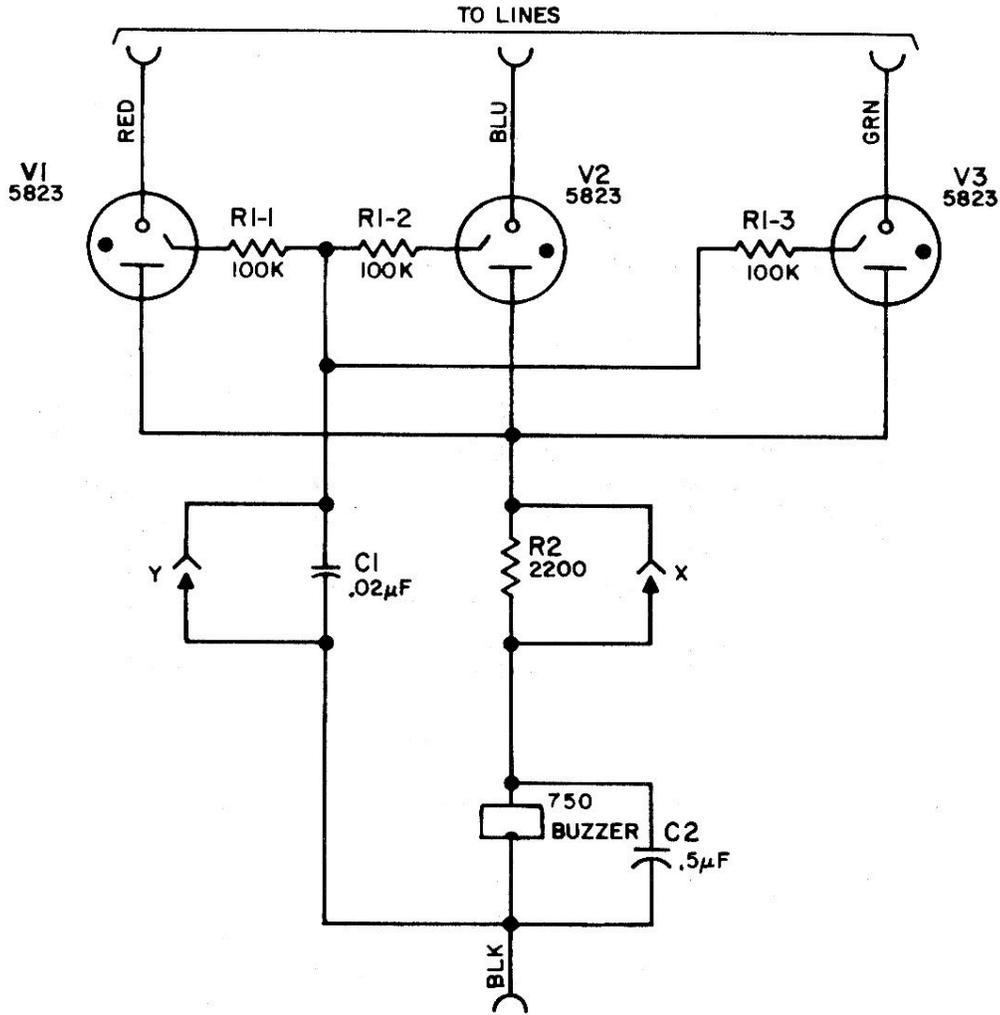


Figure 15. Circuit of Common Audible Signal Unit (1969-1972).

2.41 Use of the common audible signal unit should be restricted to installations in which each line accessed by a given Type 187 is served by switching equipment using the same type of ringing generator connection. Problems may arise in cases where one line is terminated on a PABX or foreign exchange and others are served from the local central office. Although terminal-per-station connectors in exchanges with battery-connected generator common leads are usually arranged to apply ringing potential to the ring (-) conductor of the called line, and those in exchanges with ground-connected generator commons usually ring over the tip (+) conductor, no general rule can be applied to equipment of all manufacturers. In addition, the ringing assignment of a station in a

terminal-per-line exchange may vary, depending upon the grade of service or on ringing lead balance requirements. For this reason, the cathode of each 5823 tube should be connected, by way of its spade-ended lead, to whichever conductor of the associated line a conventional ringer would have to be connected for divided ringing, rather than in accordance with any rule based upon the use or removal of the X strapping option. The common return lead (BLK) should always be connected to earth ground.

2.42 The number of common audible signal units that may be installed on a given line depends upon the ringing potential available at the central office ringing generator terminals, and upon the

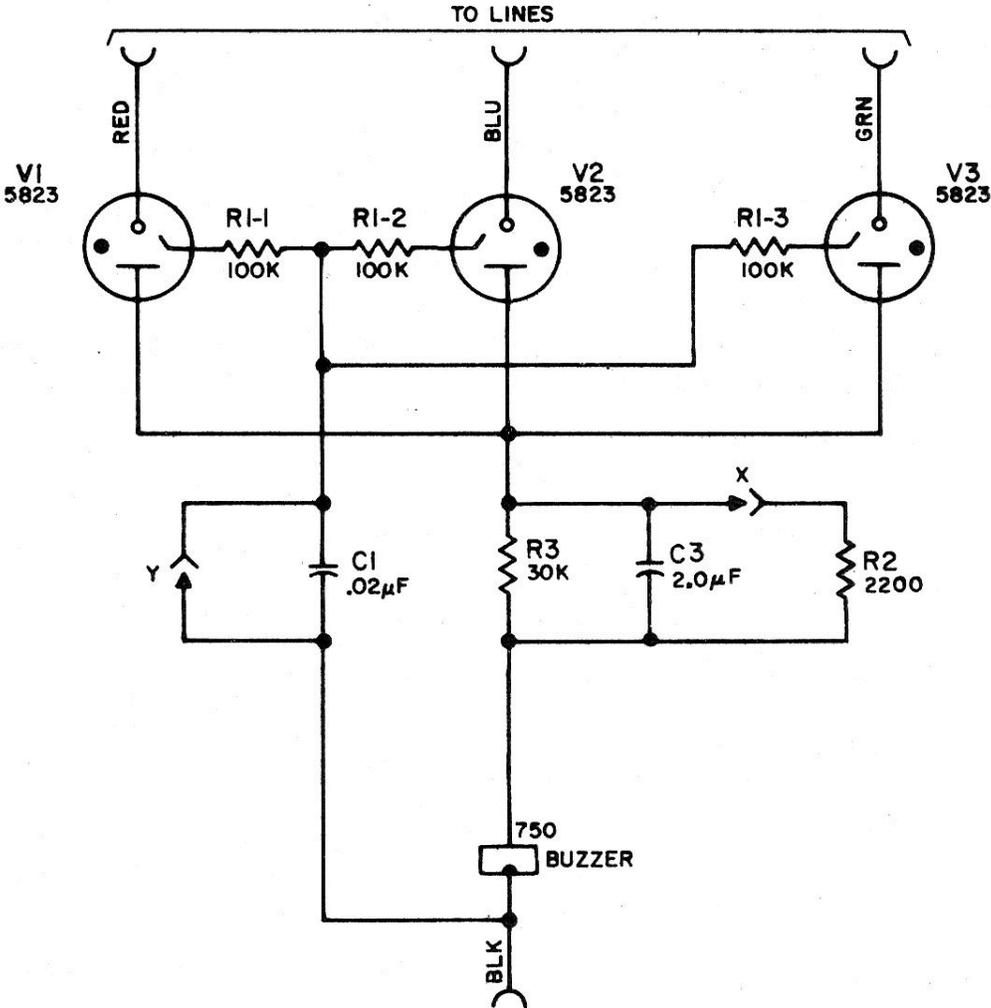


Figure 16. Circuit of Current Common Audible Signal Unit.

Table 1. Installation Wiring of Common Audible Signal Unit.

REF. ITEM	GENERATOR CONNECTION	RINGING CONDUCTOR	TERMINAL BLOCK CONNECTIONS				STRAPS CUT*	STRAPS USED
			RED	BLU	GRN	BLK		
A	BATTERY	TIP (+)	H1	H2	H3	G	X	Y
B		RING (-)	P1	P2	P3	G	X & Y	NONE
C	GROUND	TIP (+)	H1	H2	H3	G	X	Y
D		RING (-)	P1	P2	P3	G	X & Y	NONE

\* RECONNECT X STRAP IF RINGING VOLTAGE IS TOO LOW TO SOUND BUZZER.

resistance of the line conductor over which the signal units are operated. If all common audible signal units are the same distance from the central office ringing generator, these variables are correlated as in Table 2.

#### Code Number Identification

2.43 The stock list code number stamped on the base of the Type 187 identifies color and operational characteristics originally provided at the factory. It does not indicate repair shop alterations or field modifications unless appropriate code changes have been made at the time such work was performed.

2.44 The stock list code number consists of a two-letter prefix, a base number, and a group of numerical and alphabetical suffixes. A typical stock list code number is NC-873000-AXX. Each component of this number has its own special significance with regard to the makeup of the represented telephone set.

2.45 The two-letter prefix NC indicates a self-compensating telephone set with a printed wiring card transmission unit.

→ 2.46 The base number may be one of four three-digit numbers with individual significance as follows:

- (a) 873 indicates a desk-type telephone set with handset, retractile handset cord, and 16-conductor line cord.
- (b) 973 indicates a wall-mounted telephone set with handset, retractile handset cord, and 16-conductor line cord.
- (c) 874 indicates a desk-type telephone set with handset, retractile handset cord, and 24-conductor, plug-ended line cord.
- (d) 974 indicates a wall-mounted telephone set with handset, retractile handset cord, and 24-conductor, plug-ended line cord.

2.47 The fourth and fifth digits of the stock list code number (immediately following the base number) indicate the color of the set as follows:

- (a) 00 – Black
- (b) 10 – Sand beige.
- (c) 19 – Gardenia white.

2.48 The sixth digit of the stock list code number refers to an optional key for exclusion of extension stations as follows:

- (a) 0 – The extension exclusion key is not provided.
- (b) 1 – The extension exclusion key is provided.

2.49 The first letter suffix of the stock list code number indicates the type of calling device (rotary dial or Touch Calling unit) with which the set is equipped:

- (a) A – Rotary dial.
- (b) J – Touch Calling unit.

2.50 The last two-letter suffix indicates the type of signaling provisions incorporated in the set:

- (a) CA – Common audible signal.
- (b) CB – Common audible signal and buzzer.
- (c) RB – Straight line ringer and buzzer.
- (d) XX – No signaling device included.
- (e) SL – Straight line ringer.

### 3. WALL-MOUNTED INSTALLATION

3.01 Either of two general methods of installing the wall-mounted Type 187 may be used. One method consists of mounting the set on a plain wall. With this method, the attached line cord may be used and routed along the surface of the wall, or inside wiring or running cable may be brought in through the wall to enter the telephone set through an opening in its base. The second method consists of mounting the telephone set over an electrical outlet box.

Table 2. Minimum Ringing Potential (Measured at the Generator) Required to Operate Common Audible Signal Units.

Battery Connected Generator					
Line Loop (ohms)	Number of Units				
	1	2	3	4	
0	97V	104V	116V	122V	
600	108V	116V	122V	133V	
1000	111V	118V	128V		
1200	113V	120V	130V		
Ground Connected Generator					
Line Loop (ohms)	Number of Units				
	1	2	3	4	5
0	74V	74V	74V	76V	80V
600	77V	80V	82V	85V	86V
1000	77V	82V	89V	97V	100V
1200	78V	82V	90V	101V	112V
Line Loop (ohms)	Number of Units				
	6	7	8	9	10
0	80V	87V	87V	87V	87V
600	95V	100V	102V	109V	130V
1000	101V	118V	126V	135V	
1200	119V	125V	135V		

Installing on a Plain Wall

3.02 To install a Type 187 on a plain wall with the line cord routed along the surface of the wall:

- (1) Remove the telephone set housing as instructed in Paragraph 7.08.
- (2) Hold the telephone set in its final position against the wall, and mark the locations of the upper and lower mounting holes (Figure 17).
- (3) If the material of the wall permits the use of wood screws, drill starting holes for No. 10 screws at the mounting hole locations marked in step 2. If screw anchors are required, drill the necessary holes and install them at the mounting hole locations. Use anchors of the proper size to accommodate No. 10 wood screws.
- (4) Install a 5/8-inch-long No. 10 wood screw at each of the upper mounting hole locations. Run them down to within one-fourth inch of tight.
- (5) Hang the telephone set on the two upper mounting screws, and position it squarely on the wall. Install a 5/8-inch-long No. 10 wood screw in the lower mounting hole. Tighten all three mounting screws.
- (6) If the 16-conductor line cord is used, disconnect the line cord conductors from the two connecting blocks and follow steps 7, 8, and 9.
- (7) Route the line cord along the surface of the wall to the desired location of the connecting blocks. Attach it to the wall with fasteners appropriate for the type of surface.
- (8) Mount the two connecting blocks on the wall as follows:
  - (a) If a flat wood or fiber surface is available, mount the connecting blocks directly to the wall using 5/8-inch-long No. 8 wood screws.

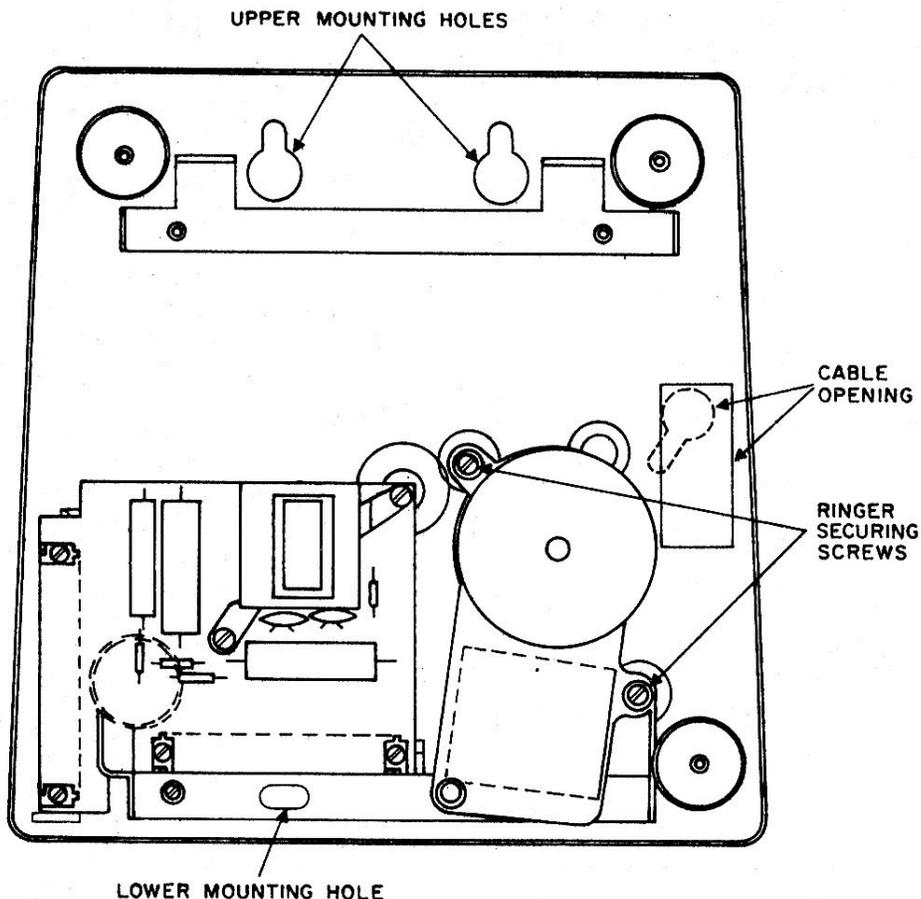


Figure 17. Wall Mounting Hole Location and Ringer Mounting Details.

- (b) If the wall surface is irregular, or not suitable for direct fastening of the connecting blocks, first install a 168E backboard, then mount the connecting blocks to the backboard using the screws supplied with the backboard.
- (9) Reconnect the line cord conductors to the connecting blocks in accordance with Table 3, as applicable. Proceed to step 13.
- (10) If the 24-conductor line cord is used, install an appropriate cable bridging adapter.
- (11) Route the line cord along the surface of the wall to the cable bridging adapter. Attach it to the wall with fasteners appropriate for the type of surface.
- (12) Plug the line cord into the cable bridging adapter.
- (13) As required:
  - (a) Install an internally mounted ringer as instructed in Paragraph 7.14.
  - (b) Install a common audible signal unit as instructed in Paragraph 7.16.
  - (c) Install a signaling buzzer as instructed in Paragraph 7.18.
  - (d) Install externally mounted ringers as instructed in the appro-

Table 3. Line Cord Connection Data.

TERM. BD. TERM.	LEAD DESIGNATION	SETS MFG'R'D BEFORE 3/68			SETS MFG'R'D 3/68 AND AFTER			AMPHENOL PLUG TERMINAL NO.
		WIRE COLOR	CONN. BLK. NO.	TERM. NO.	WIRE COLOR	CONN. BLK. NO.	TERM. NO.	
2	Lamp Battery	Brn Blu	2	1	Brn Blu	2	1	7
3	Lamp Ground	Brn Wht	2	1	Brn Wht	2	2	32
4	Line 3 Busy Lamp	Red Grn	2	3	Red Grn	2	4	6
5	Line 2 Busy Lamp	Red Yel	2	4	Red Yel	2	5	4
6	Line 1 Busy Lamp	Red Blk	2	5	Red Blk	2	6	2
7	Intercom Buzzer	Red Blu	2	6	Red Blu	2	7	9
E1	Extension Exclusion	Brn Grn	1	3	Brn Yel	1	3	10
E2	Extension Exclusion	Brn Red	1	8	Brn Blk	1	8	35
H1	Line 1 Tip (+)	Grn	1	2	Grn	1	2	26
H2	Line 2 Tip (+)	Yel	1	5	Blk	1	5	28
H3	Line 3 Tip (+)	Blu	1	7	Wht	1	7	30
G	Ground	Brn Blk	1	9	Brn Red	1	9	33
S	SIG Key	Brn Yel	1	10	Brn Grn	1	10	8
P2	Line 2 Ring (-)	Blk	1	4	Yel	1	4	3
P1	Line 1 Ring (-)	Red	1	1	Red	1	1	1
P3	Line 3 Ring (-)	Wht	1	6	Blu	1	6	5

priate section in this division of  
GTE Practices.

- (14) Connect the telephone set into the system as instructed in the applicable paragraphs of Part 5 of this section.
- (15) Install the housing on the telephone set as instructed in Paragraph 7.10.

3.03 To install the Type 187 on a plain wall using concealed wiring:

- (1) Remove the telephone set housing as instructed in Paragraph 7.08.
- (2) Remove the material from the cable opening in the telephone set base (Figure 17).
- (3) If the line cord is of the 16-conductor type, disconnect and remove it from the telephone set. If it is of the 24-conductor type, leave it connected.
- (4) Perform the operations of Paragraph 3.02, step 13, as applicable.
- (5) Hold the telephone set in its final position against the wall, and mark the location of the upper and lower mounting holes and cable opening (Figure 17).
- (6) In the wall at the cable opening location, drill a hole of adequate size to permit pulling in the inside wiring or running cable.
- (7) If the material of the wall permits the use of wood screws, drill starting holes for No. 10 screws at the mounting hole locations marked in step 4. If screw anchors are required, drill the necessary holes and install them at the mounting hole locations. Use anchors of the proper size and type to accommodate No. 10 wood screws.
- (8) Install a 5/8-inch-long No. 10 wood screw at each of the upper mounting hole locations. Run them down to within one-fourth inch of tight.

- (9) Bring in the inside wiring cable or running cable through the hole drilled in step 5. Leave about 1 foot of cable extending from the hole. If the line cord is plug-ended, proceed to step 13.

- (10) Pass the free end of the cable through the cable opening in the telephone set base from the back, hang the telephone set on the two upper mounting screws, and position it squarely on the wall. Install a 5/8-inch-long No. 10 wood screw in the lower mounting hole. Tighten all three mounting screws.

- (11) Remove the jacket from the exposed end of the cable (step 9), leaving approximately 2 inches of the jacketed cable extending from the wall. Strip the ends of the conductors for screw connections.

- (12) Connect the inside wiring cable to the telephone set terminal board, using Table 3 and any existing system wiring plan as guides. See Figure 18 for the locations of the terminal board terminals. Proceed to step 16.

- (13) Pass the plug-ended line cord through the cable opening in the telephone base.

- (14) Connect the line cord to the running cable and pass the connector back into the wall.

- (15) Hang the telephone set on the two upper mounting screws, and position it squarely on the wall. Install a 5/8-inch-long No. 10 wood screw in the lower mounting hole. Tighten all three mounting screws.

- (16) Connect the opposite end of the inside wiring cable into the system as instructed in the applicable paragraphs of Part 5.

- (17) Install the housing on the telephone set as instructed in Paragraph 7.10.

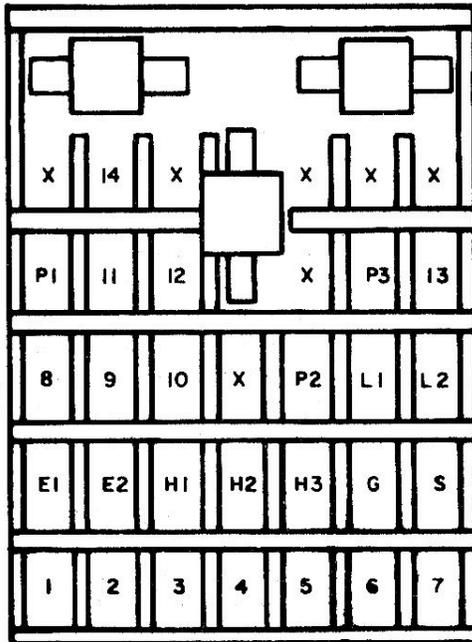
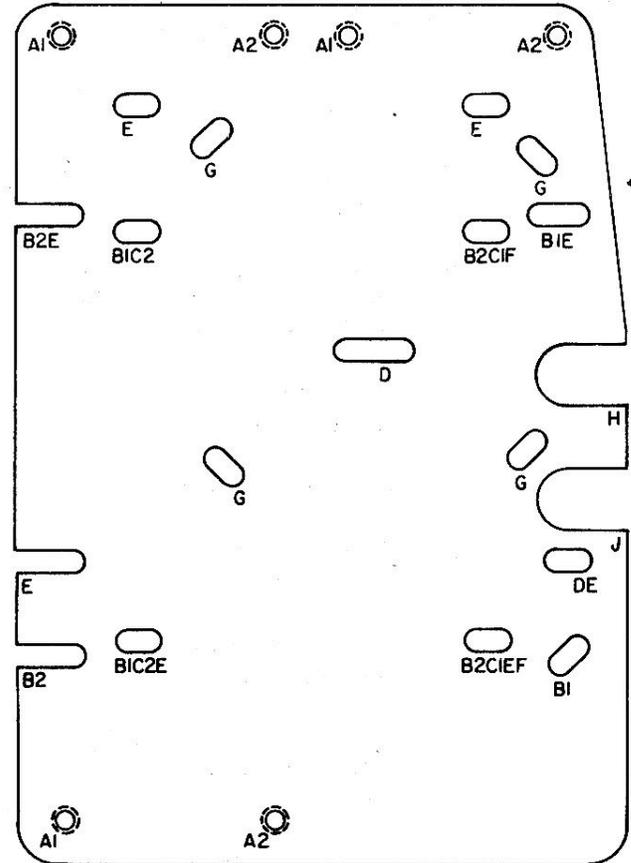


Figure 18. Type 187 Telephone Set Terminal Board Layout.



MOUNTING HOLE IDENTIFICATION

TO MOUNT	CABLE	TYPE OF BOX					
		4"X4"	2X4"	63A	4 11/16" X 4 11/16"	PLASTER RING	4"X4" OCT.
ADAPTER TO BOX	RAW-ENDED	B1	C1	D	E	F	G
	CONNECTOR-ENDED	B2	C2	D	E	F	G
TELEPHONE TO ADAPTER		A1, A2*	A1	A1	A1	A1	A1, A2*

\*USE A2 WHEN ROUTING CONNECTOR-ENDED CABLE INSIDE WALL.

Figure 19. Adapter Plate.

Installing on an Electrical Outlet Box

3.04 When mounting a Type 187 to an electrical conduit box, an adapter plate mounting kit (HH-880008-1) is required. This kit facilitates mounting of the telephone set on a variety of conduit boxes. Figure 19 shows the adapter plate and indicates the proper holes for mounting the adapter plate to the conduit box and the telephone set to the adapter plate. The adapter plate may be mounted on the conduit box so that the line cord or running cable comes through the conduit box or along the side of the box.

3.05 To install a Type 187 using an electrical conduit box, proceed as follows:

- (1) If a concealed running cable is going to be outside the conduit box, temporarily mount the adapter plate on the conduit box, and mark on the wall the area of the cable entry hole. The length of this area is from the top of notch H to the bottom of notch J, and the width is the depth of the notch. Remove the adapter plate and cut the cable entry hole in the wall.

- (2) Install the running cable.
- (3) Insert two 10-32 x 3/16-inch screws in the proper upper mounting holes of the adapter plate (Figure 19).
- (4) If concealed connector-ended cable is used, pass the line cord through the knockout in the base of the telephone and connect the line cord to the running cable.

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- (5) If connector-ended cable is used:
  - (a) Pass the connector back into the wall.
  - (b) Route the line cord through notch J of the adapter plate.
  - (c) Install the adapter plate on the conduit box and pass the line cord back into the wall.
  - (d) Mount the telephone set on the adapter plate.
- (6) If raw-ended cable is used:
  - (a) Route the cable through notch H of the adapter plate.
  - (b) Install the adapter plate on the conduit box.
  - (c) Pass the cable through the cable entry hole in the telephone base plate.
  - (d) Hang the telephone set on the adapter plate.
- (7) Insert the 10-32 x 5/16-inch screw in the lower mounting hole and tighten the three mounting screws.
- (8) Connect the leads of the raw-ended running cable to the telephone set per Figure 9 or 11.
- (9) If the line cord is to be surface mounted, connect the line cord to the running cable, cable bridging adapter, or connecting block, and fasten the line cord to the surface.
- (10) Perform the operations of Paragraph 3.02, steps 13, 14 and 15.

4. INSTALLING THE DESK VERSION SET

4.01 To install the test version of the Type 187:

- (1) Determine from the customer the location in which the telephone set is to be placed.

- (2) Place the telephone set on a flat surface at the location designated in step 1.
- (3) Mount the 16-conductor line cord connecting blocks in an inconspicuous place as follows:
  - (a) On metal desks with a mounting detail provided in a pedestal base or in the back panel of the knee well, use machine screws and nuts or self-tapping screws to fasten the connecting blocks to the desk.
  - (b) If no mounting detail is provided in a desk, use a 738 adhesive mounting plate and the machine screws supplied with it for mounting the connecting blocks to the desk.
  - (c) For installations in which neither a nor b apply, mount the connecting blocks to a wall or other surface, using the appropriate type of fastener for the type of mounting surface involved.
- (4) For the plug-ended line cord, install an appropriate cable bridging adapter or connector housing.
- (5) Bring in station wire, inside wiring cable, or running cable as required for the type of service to be provided.
- (6) Connect the station wires to the connecting blocks, using Table 3, the applicable paragraphs of Part 5, and the system wiring plan as guides. Connect the plug-ended line cord and running cable as appropriate.
- (7) Remove the housing from the telephone set as instructed in Paragraph 7.07.
- (8) Install the necessary signaling apparatus as instructed in Paragraph 3.02 step 13.

- (9) Install the housing on the telephone set as instructed in Paragraph 7.09.

## 5. INSTALLING AND CONNECTING EXTERNAL CABLING AND APPARATUS

5.01 After all the telephone sets in the system are installed, run station wire or inside wiring cable between the station connecting blocks for interconnections between stations. Interconnect the system as instructed in the paragraphs that follow, as appropriate.

### Line Polarity

5.02 Line polarity must be observed when connecting the incoming lines to the lines to the Type 187. To determine the polarity of the line conductors when a ground wire is readily available, use a Type 801 Hand Test Telephone Set or equivalent and:

- (1) Move the slide switch of the hand test telephone set to the MON. position to avoid disturbing parties using the line.

NOTE: Do not test on a busy line.

- (2) Clip one lead of the hand test telephone set to the ground wire.

- (3) Alternately touch one and then the other of the two line wires with the other clip of the hand test telephone set while listening for clicks in the receiver. The wire producing the loudest click is the negative (ring) side of the line.

NOTE: The positive (tip) side of the line will usually produce a weak click due to earth potential difference.

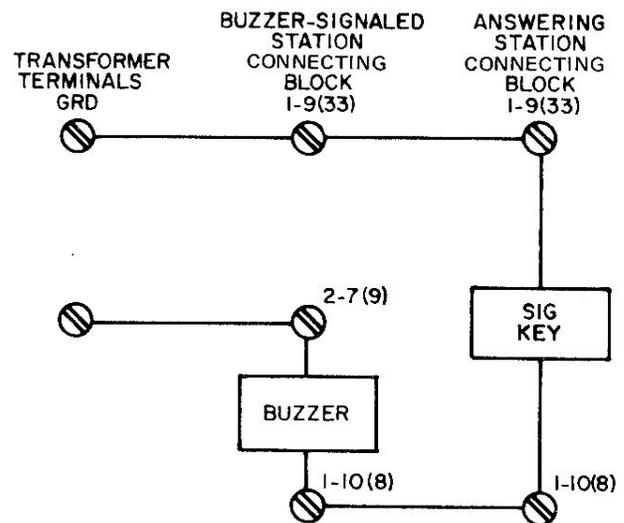
### No Signaling Between Stations

5.03 When the system using Type 187 telephone sets requires no signaling between stations, connect the connecting block terminals of all stations in multiple, and connect the incoming lines to the system as instructed in the service order.

### Manual Signaling by Buzzer

5.04 For systems in which one station answers all incoming calls and signals a second station by buzzer when it is required to answer a call:

- (1) Install an appropriate signal transformer at the station to be signaled. Use station wire to connect the transformer to the signaled station connecting block or cable bridging adapter as shown in Figure 20.
- (2) Connect the line cord leads of the buzzer in the signaled set and the line cord leads of the SIG key of the control station as shown in Figure 20. Use conductors of the interconnecting cable, or run in extra station wire.
- (3) Connect the remaining terminals of the station connecting blocks in multiple.
- (4) Connect the incoming lines to the system as instructed in the service order.



NOTE:  
NUMBERS IN ( ) ARE TERMINAL NUMBERS OF THE 50-TERMINAL PLUG OF THE PLUG-ENDED LINE CORD.

Figure 20. Connections for a Two-Station System with Single Buzzer and No Intercom.

5.05 When it is desired for each station of a two-station system to answer calls and signal the other stations:

- (1) Install a signal transformer at either station as instructed in Paragraph 5.04, step 1.
- (2) Using conductors of the interconnecting cable or separate station wire, connect the line cord leads of the buzzers and SIG keys of the two stations as shown in Figure 21.
- (3) Connect the remaining terminals of the station connecting blocks in multiple.
- (4) Connect the incoming lines into the system in accordance with instructions contained in the service order.

Common Coded Signaling Without Intercom

5.06 When the system is to provide common coded signaling to and from several stations but no intercom line is included, perform the operations of Paragraph 5.05, but refer to Figure 22 for connection data.

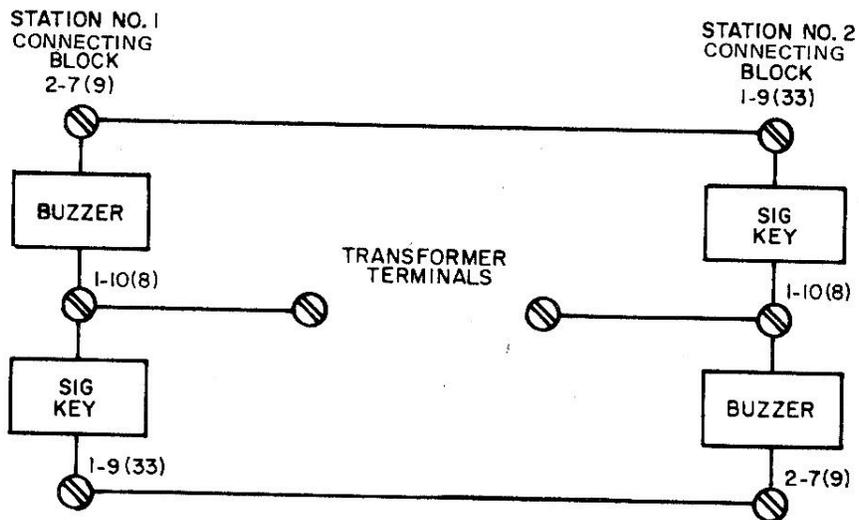
Intercom Line With Manual Coded Signaling

5.07 When the system is to provide an intercom line with manual coded signaling:

- (1) Install an FD-1040-EB power supply unit at any convenient station and, using station wire, connect the power supply output terminals to the station connecting block or cable bridging adapter as shown in Figure 23.
- (2) Connect the line cord leads of the buzzers, SIG keys, and intercom line at all stations as shown in Figure 23.
- (3) Connect the remainder of the terminals on the station connecting blocks in multiple.
- (4) Connect the incoming lines into the system as instructed in the service order.

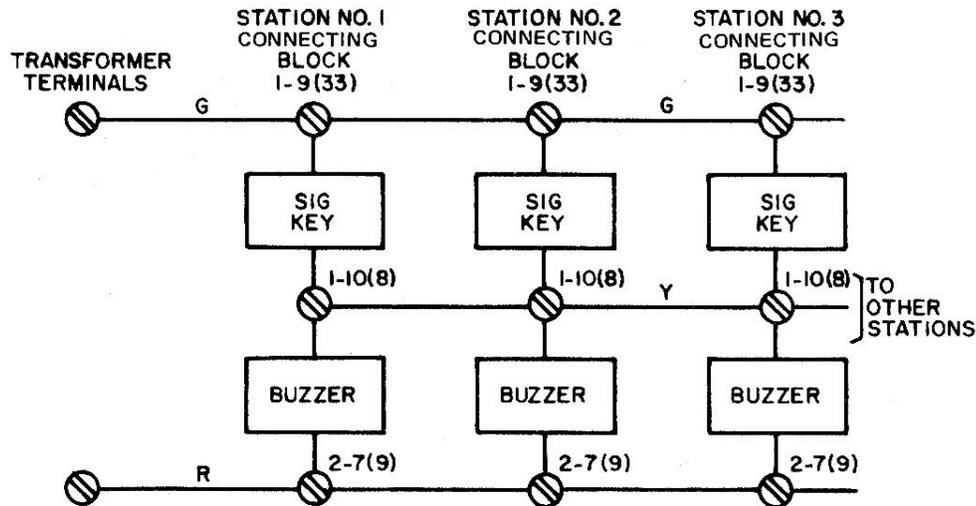
Dial-Selective Intercom Line

5.08 In systems that include a dial-selective intercom line:



**NOTE:**  
NUMBERS IN ( ) ARE TERMINAL NUMBERS OF THE 50-TERMINAL PLUG OF THE PLUG-ENDED LINE CORD.

Figure 21. Connections for Independent Signaling Between Two Stations.



**NOTE:**

NUMBERS IN ( ) ARE TERMINAL NUMBERS OF THE 50-TERMINAL PLUG OF THE PLUG-ENDED LINE CORD.

Figure 22. Connections for Common Coded Signaling Without Intercom Line.

- (1) Install an H-883002-70 dial intercom key telephone unit at a location where equipment noise will not disturb the customer. Use an H-884900-1 mounting bracket for mounting the unit.
- (2) Install a key telephone system power supply adjacent to the dial intercom key telephone unit.
- (3) Interconnect the two units of steps 1 and 2 as specified in the appropriate sections in the 484-400 series of GTE Practices.
- (4) Connect the remainder of the station connecting block terminals in multiple.
- (5) Connect the incoming lines into the system as instructed in the service order.

**6. TESTS**

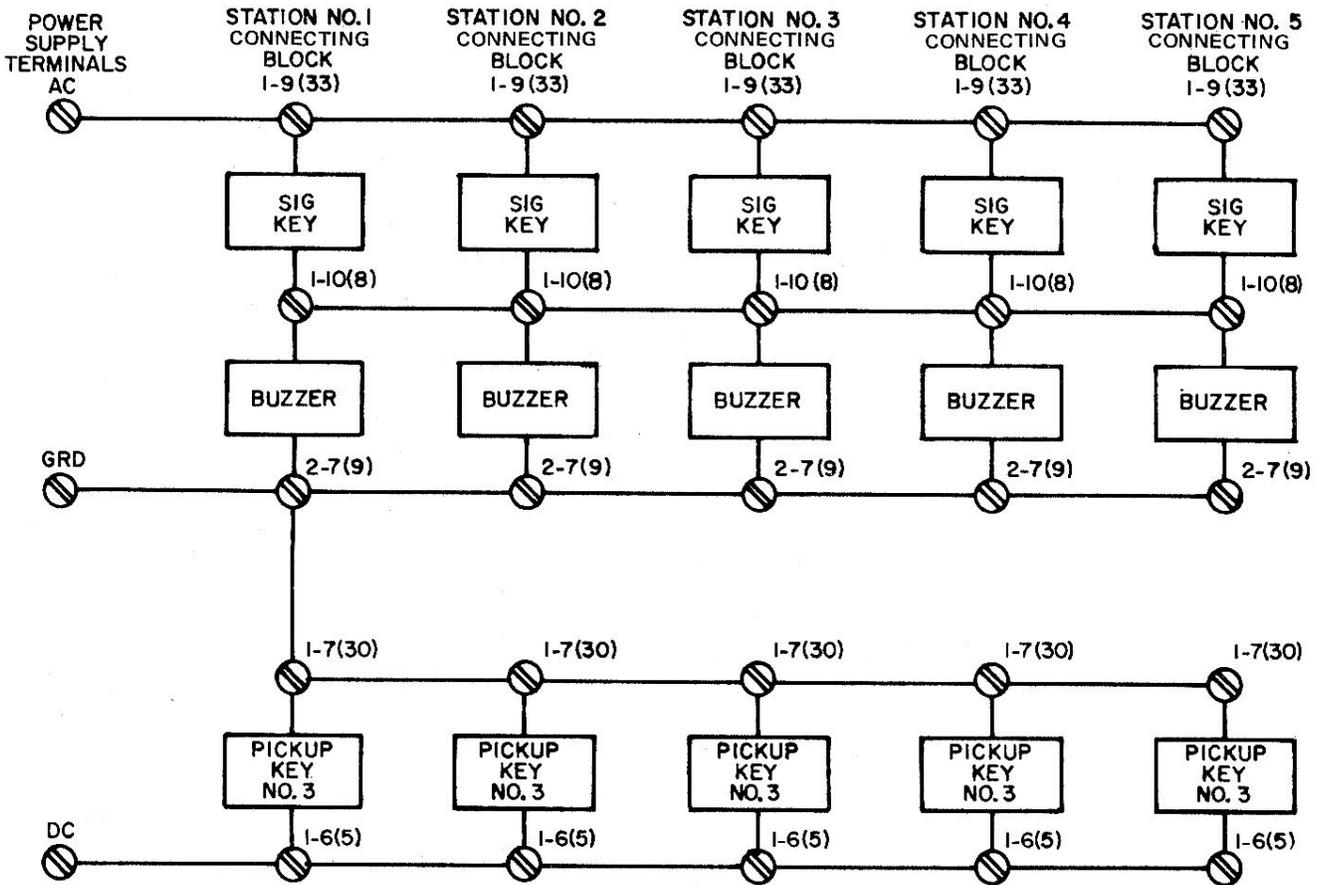
6.01 After completing the installation of the system, test each of the associated Type 187's as instructed in the applicable paragraphs of

this part. Make the recommended corrections of discrepancies indicated by the test results.

Automatic Central Office

6.02 If the system using Type 187's is located in a dial automatic central office, at each station in turn:

- (1) Lift the handset from its cradle or hanger, depress and pickup key for line 1, and wait for dial tone.
- (2) When dial tone is received, dial the number for the testboard and observe whether or not the ringer taps when the set is dialed. If the ringer taps during dialing, inform the testboardman that you are checking for ringer tap, hang up the phone, and perform the following corrective measures in the order listed, checking for dial tap after each step, until the tapping condition is eliminated:
  - (a) Check the line connections for reversal at the station, protector, and at all intermediate connecting blocks.



**NOTE:**  
NUMBERS IN ( ) ARE TERMINAL NUMBERS OF THE  
50-TERMINAL PLUG OF THE PLUG-ENDED LINE CORD.

Figure 23. Connections for Common Coded Signaling with Intercom Line.

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>(b) Reverse the ringer lead connections.</li> <li>(c) Increase ringer bias by moving the bias reed into the outer notch on the armature.</li> <li>(d) Replace the ringer.</li> </ul>   | <ul style="list-style-type: none"> <li>(b) lights each time the telephone rings.</li> </ul>  |
| <ul style="list-style-type: none"> <li>(3) When no ringer tapping occurs when dialing the testboard, ask for a ringing check, restore the handset, and wait for the incoming ring.</li> <li>(4) When the ring is received:             <ul style="list-style-type: none"> <li>(a) Notice that the lamp associated with the line 1 pickup key</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>(b) Depress the hold key for this line and check that this restores the associated pickup key.</li> <li>(c) After a few seconds, reoperate the pickup key, and check that the hold key restores.</li> </ul> |

**NOTE:** The connection to the testboard should be maintained. If dial tone is heard, the hold bridge is open or the hold key contacts are out of adjustment.

- (d) If no dial tone is heard, operate the hold key again, then depress the handset cradle or hanger. The hold key should restore as the cradle or hanger reaches the bottom of its travel.

- (5) Repeat steps 1 through 4 for each of the remaining central office lines.

6.03 With Touch Calling telephone sets, ringer tap is not a problem. Therefore, at a Touch Calling system station, perform the tests of Paragraph 6.02, steps 3 through 5 only.

#### Manual Office

6.04 When the system using Type 187's is located in a manual office, test each of the telephone sets as follows:

- (1) Lift the handset from the cradle or hanger and depress the pickup key for line 1. When the operator answers, ask for a ringer check and return the handset to the cradle or hanger.
- (2) When the ringing occurs, test in accordance with Paragraph 6.02, step 4, enlisting the aid of the operator in checking the hold function.
- (3) Repeat steps 1 and 2 for each of the remaining central office lines.

#### Intercom and Signaling Circuits

6.05 If an intercom is provided, at any station depress the pickup key assigned to the intercom line and check for sidetone. With the help of an assistant, check intercom transmission between this station and every other station in the installation. If dial-selective signaling is provided, dial each assigned digit from one station, and check for proper operation of the buzzer at the corresponding called station. Dial at least one digit from each of the other stations to check that each has proper control of the intercom pulsing circuit.

6.06 If manual signaling is provided between stations, check that operation of any given SIG key sounds the buzzer at the appropriate station or stations, as indicated on the service order.

6.07 If the customer requests that the volume of a buzzer be adjusted, turn the adjustment screw on the side of the buzzer case to obtain the desired volume.

## 7. FIELD MAINTENANCE

7.01 Limit field maintenance of the Type 187 to tests and adjustments and the replacement of major components and assemblies. Do not perform on the customer's premises any repairs requiring the unsoldering or soldering of leads.

### Number Card Removal and Installation

7.02 To remove the telephone number card from the Touch Calling Type 187:

- (1) Insert the point of a fingerwheel tool into the hole at the right-hand end of the number card cover.
- (2) Move the handle of the tool to the right just enough to bow the center of the number card cover out of the recess in the faceplate.
- (3) Grasp the edges of the number card cover with the fingers of the left hand, and bow it further until the right-hand end comes free of the faceplate.
- (4) Lift the number card cover off the telephone set faceplate.
- (5) Lift the telephone number card out of the recess in the faceplate.

7.03 To install the telephone number card on the Touch Calling Type 187:

- (1) Pass the ends of the telephone number card through the slits at either end of the telephone number card recess in the telephone set faceplate.
- (2) Press the telephone number card down and center the number in the recess.
- (3) Insert the unpierced end of the telephone number card cover into the slit at the left end of the telephone number card recess.

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- (4) Bow the cover outward, insert the pierced end into the slit at the right end of the telephone number card recess.
- (5) Release the cover and let it snap into place over the telephone number card.

7.04 On the rotary dial-equipped Type 187, the telephone number card is located at the center of the dial fingerwheel. To remove or install the card, see the appropriate section in the 473-820 series of practices.

Faceplate Removal and Installation

7.05 To remove the telephone set faceplate:

- (1) Engage the point of a fingerwheel tool in the semicircular nick at the lower edge of the housing clip.
- (2) Force the housing clip aside until the clip and fingerwheel tool clear the edge of the faceplate.
- (3) Using the fingerwheel tool, lift the edge of the faceplate away from the telephone set housing.
- (4) Disengage the upper faceplate tab from the slot in the housing, and lift it off the telephone set.

7.06 To install the faceplate on the telephone set:

- (1) Insert the tab at the upper edge of the faceplate into the slot in the telephone set housing.
- (2) Insert the point of a fingerwheel tool into the nick in the edge of the housing clip.
- (3) Lower the faceplate over the dial or Touch Calling unit and key pushbuttons until it touches the fingerwheel tool.
- (4) Using the fingerwheel tool, force the housing clip down until it clears the edge of the faceplate.
- (5) Press the faceplate down onto the

housing while gently lifting the housing clip outward with the fingerwheel tool.

- (6) Remove the fingerwheel tool to permit the housing clip to snap into place over the edge of the faceplate.

Housing Removal and Installation

7.07 To remove the housing from a desk version Type 187:

- (1) Remove the faceplate as instructed in Paragraph 7.05.
- (2) Loosen the housing securing screw located at the rear of the set at lower center until the housing retaining bracket clears the shoulder head.
- (3) Lift the rear of the housing slightly and move it forward to disengage the front retaining lugs.
- (4) Lift the housing off the telephone set mechanism.

7.08 To remove the housing from a wall-mounting Type 187:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Loosen the housing securing screw located in the bottom of the set at the rear center until the shoulder head clears the housing retaining bracket.
- (3) Move the housing slightly forward and upward to disengage the upper housing retaining lugs.
- (4) Lift the housing clear of the telephone set mechanism.

7.09 To install the housing on the desk model Type 187:

- (1) Place the housing over the telephone set mechanism.
- (2) Lift the rear of the housing slightly and, while observing through the

opening around the dial or Touch Calling unit, engage the housing retaining lugs with the slots in the mounting brackets.

- (3) Lower the rear of the housing to engage the housing securing screw with the slot in the rear housing retaining bracket.
- (4) Tighten the housing securing screw.
- (5) Install the faceplate on the telephone set as instructed in Paragraph 7.06.

#### 7.10 To install the housing on a wall-mounted Type 187:

- (1) Place the housing over the telephone set mechanism.
- (2) Move the top of the housing slightly out from the wall and, while observing through the opening around the dial or Touch Calling unit, engage the housing retaining lugs with the slots in the lower mounting brackets.
- (3) Move the top of the housing toward the wall to engage the housing securing screw with the slot in the upper housing retaining bracket.
- (4) Tighten the housing securing screw.
- (5) Install the faceplate on the housing as instructed in Paragraph 7.06.

#### Raising and Lowering the Chassis

#### 7.11 To raise the chassis to gain access to apparatus mounted on the telephone set base:

- (1) Loosen the four chassis securing screws as follows:
  - (a) Loosen the screws in the shorter mounting brackets approximately one-half turn.
  - (b) Loosen the screws in the taller mounting brackets until their

shoulder heads clear the mounting brackets.

- (2) If the set is equipped with an internally mounted ringer, disconnect the red ringer lead at the terminal board.
- (3) Lift the chassis away from the taller mounting brackets, pivoting it on the screws attaching it to the shorter mounting brackets.
- (4) Disconnect any transmission unit leads that are too short to permit the chassis to be raised enough for access to the base-mounted components.
- (5) Raise the chassis to the desired height and retighten the securing screws in the shorter chassis mounting brackets to hold the chassis in the raised position.

#### 7.12 To lower the chassis on the telephone set:

- (1) Loosen the two securing screws holding the chassis in the raised position.
- (2) Lower the chassis about half-way and retighten the two securing screws loosened in step 1.
- (3) Referring to Figure 9, 10, 11, or 12, as appropriate, connect any leads that may have been disconnected to permit the chassis to be raised.
- (4) Loosen the two securing screws again as in step 1, and lower the chassis into position.
- (5) Tighten all four securing screws.

#### Ringer Removal and Installation

#### 7.13 To remove the internally mounted Type 46 ringer from the telephone set:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Disconnect the red ringer lead from the terminal board terminal.

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- (3) Raise the telephone set chassis as instructed in Paragraph 7.11.
- (4) Disconnect the green ringer lead from transmission unit terminal 8.
- (5) Disconnect the ringer capacitor from transmission unit terminals 8 and 10 and remove it from the set.
- (6) Remove the ringer securing screws (Figure 17), and lift the ringer out of the telephone set base.

7.14 To install a Type 46 ringer in the Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Raise the telephone set chassis as instructed in Paragraph 7.11.
- (3) Place the Type 46 ringer into position on the baseplate as shown in Figure 17, and install the ringer securing screws provided.
- (4) Connect the green ringer lead to transmission unit terminal 8.
- (5) Connect the ringer capacitor to transmission unit terminals 8 and 10, supporting it on its leads.
- (6) Thread the red ringer lead up through the chassis to exit at the outer edge of the terminal board.
- (7) Lower the telephone set chassis as instructed in Paragraph 7.12.
- (8) Connect the red ringer lead to terminal P1, P2, or P3, as appropriate for use with line 1, 2, or 3, respectively.
- (9) Reinstall the telephone set housing as instructed in Paragraph 7.09 or 7.10, as applicable.

Common Audible Signal Unit Removal and Installation

7.15 To remove the common audible signal unit from the Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Disconnect the common audible signal unit leads from the terminal board.
- (3) Raise the telephone set chassis as instructed in Paragraph 7.11.
- (4) Remove the two common audible signal unit securing screws (Figure 24).
- (5) Lift the common audible signal unit out of the telephone set base and carefully pull the wires free of the telephone set.

7.16 To install a common audible signal unit in the Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Raise the telephone set chassis as instructed in Paragraph 7.11.
- (3) Place the D-56613-A common audible signal unit in the telephone set base as shown in Figure 24. Fasten it in place with the two securing screws supplied with it.
- (4) Thread the common audible signal unit leads up through the chassis to the terminal board.
- (5) Lower the telephone set chassis as instructed in Paragraph 7.12.
- (6) Connect the common audible signal unit leads to the terminal board terminals as shown in Table 1 for the type of the central office ringing generator connection involved.
- (7) Reinstall the telephone set housing as instructed in Paragraph 7.09 or 7.10, as applicable.

Buzzer Removal and Installation

7.17 To remove a buzzer from a Type 187:

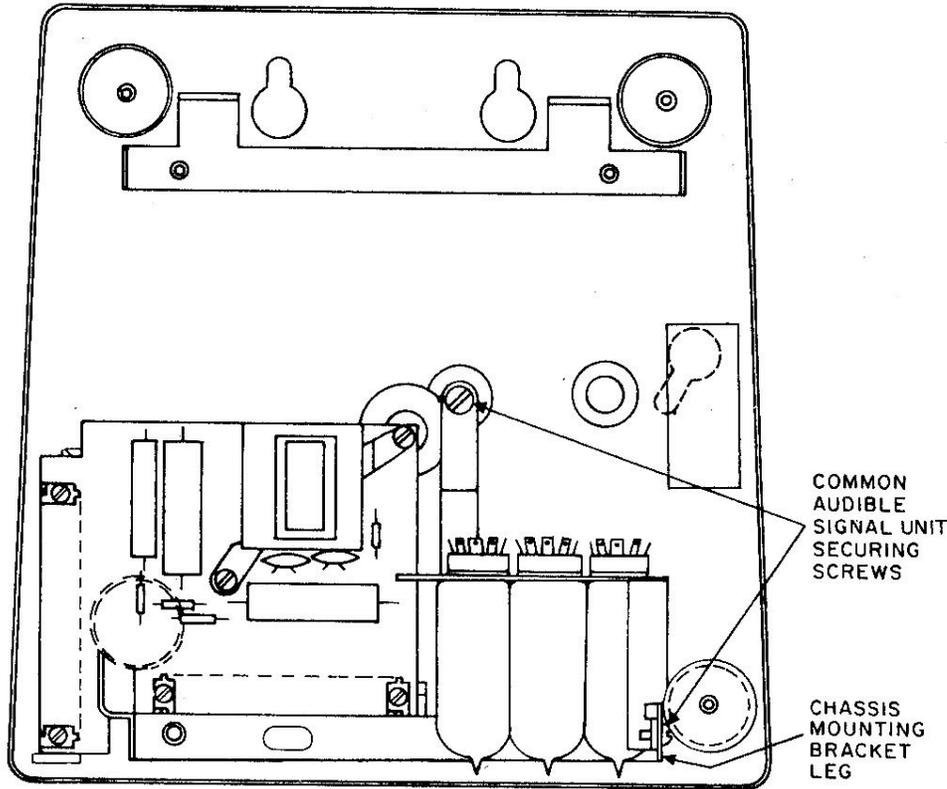


Figure 24. Common Audible Signal Unit Installation.

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Disconnect the two buzzer leads from terminal board terminals 7 and S.
- (3) Loosen the two buzzer mounting screws and lift the buzzer away from the chassis.
- (4) Reinstall the housing on the telephone set as instructed in Paragraph 7.09 or 7.10, as applicable.

7.18 To install a buzzer in the Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Using the two securing screws supplied with the buzzer, mount the buzzer on the telephone set chassis as shown in Figure 25.
- (3) Connect the red and green buzzer leads to terminal board terminals 7 and S, respectively.

Key Designation Strip Removal for Models Made Prior to Second Quarter 1973

7.19 To remove the key designation strip from the Type 187 sets manufactured prior to second quarter 1973:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Lift off the metal light shield (with designation strip attached) from the key assembly.
- (3) Using your fingers, pull the adhesive-backed key designation strip off the metal light shield.
- (4) Reinstall the metal light shield on the key assembly.

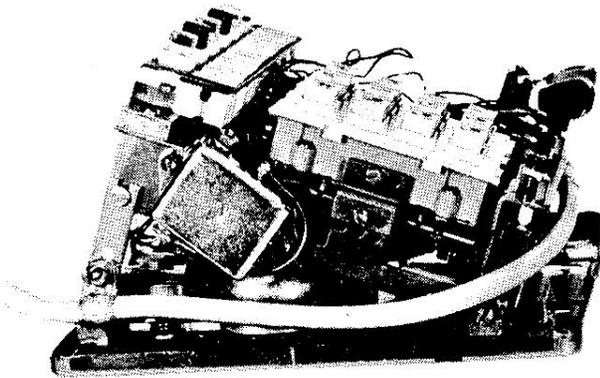


Figure 25. Buzzer Location in the Type 187 Telephone Set.

- (5) Reinstall the faceplate on the telephone set as instructed in Paragraph 7.06.

Key Designation Strip Installation for Models Made Prior to Second Quarter 1973

7.20 To install a key designation strip on the Type 187 sets manufactured prior to second quarter 1973:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Stamp or write the desired designations on the new key designation strip.
- (3) Lift the metal light shield off the telephone set key assembly, and remove any old key designation strip as instructed in Paragraph 7.19.
- (4) Remove the protective covering from the adhesive backing of the key designation strip, and press the strip down firmly onto the metal light shield.
- (5) Reinstall the metal light shield on the key assembly.

Key Designation Strip Removal for Models Made Since Second Quarter 1973

7.21 To remove the key designation strip from the Type 187 set manufactured since second quarter 1973:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Lift off the designation strip from the key assembly.
- (3) Reinstall the faceplate on the telephone set as instructed in Paragraph 7.06.

Key Designation Strip Installation for Models Made Since Second Quarter 1973

7.22 To install a key designation strip on the Type 187 set manufactured since second quarter 1973:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Stamp or write the desired designations on the new key designation strip.
- (3) Place the new key designation strip into the proper position over the lamps.
- (4) Reinstall the faceplate on the set as instructed in Paragraph 7.06.

Lamp Replacement

7.23 To replace a lamp in the key assembly of the Type 187 set:

- (1) Remove the telephone set faceplate as instructed in Paragraph 7.05.
- (2) Lift the metal light shield off the key assembly on sets manufactured prior to second quarter 1973. For newer sets, remove the designation strip.
- (3) With an orange stick or narrow-bladed screwdriver, remove the defective lamp by prying its base out of the socket.
- (4) Press a new lamp of the proper type into place.

NOTE: Install K1D neon lamps at pickup key locations and



10ESB/R incandescent lamps  
in the hold key positions.



- (5) Reinstall the metal light shield on the key assembly or designation strip, as required.
- (6) Reinstall the telephone set faceplate as instructed in Paragraph 7.06.

#### Handset Replacement

7.24 To replace a defective handset on a Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08 as applicable.
- (2) Disconnect the handset cord leads from the terminal board terminals.
- (3) Pull the handset cord out from beneath the cord clamp on the end of the key assembly.
- (4) Unhook the J-hook strain relief clamp from the telephone set base to separate the handset from the telephone set.
- (5) Hook the J-hook strain relief clamp of the replacement handset cord through the slit in the telephone set base.
- (6) Pass the handset cord leads under the cord clamp on the end of the key assembly.
- (7) Connect the handset cord leads to the telephone set terminal board terminals as follows:
  - (a) Green - terminal 8.
  - (b) Red - terminal 9.
  - (c) Yellow - terminal 10.
  - (d) Black - terminal 11.
- (8) Reinstall the housing on the telephone set as instructed in Paragraph 7.09 or 7.10, as applicable.

#### Dial Replacement

7.25 To replace a defective dial on the rotary dial-equipped Type 187:

- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Loosen the dial securing screw and lift the dial and mounting bracket assembly off the telephone set chassis. Untwist the dial leads to permit the dial to clear the telephone set.
- (3) Disconnect the dial leads at the transmission unit terminals.
- (4) Remove the screws fastening the dial mounting bracket to the dial, and lift off the mounting bracket.
- (5) Install the dial mounting bracket on the replacement dial, using the three screws obtained in step 4.
- (6) Thread the dial leads down through the dial opening in the chassis, and connect them to the transmission unit terminals as follows:
  - (a) Red - terminal 4.
  - (b) White - terminal 2.
  - (c) Blue - terminal 1.
  - (d) Yellow - terminal 11.
- (7) Twist the dial leads together along with the other leads of the telephone set.
- (8) Place the dial and mounting bracket assembly into position on the telephone set and tighten the securing screw.
- (9) Reinstall the housing on the telephone set as instructed in Paragraph 7.09 or 7.10, as applicable.

#### Touch Calling Unit Replacement

7.26 To replace the Touch Calling unit on a Touch Calling Type 187:

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- (1) Remove the telephone set housing as instructed in Paragraph 7.07 or 7.08, as applicable.
- (2) Loosen the Touch Calling unit mounting screw located on the right side of the chassis, and lift the Touch Calling unit off the telephone set.
- (3) Untwist the leads to permit the Touch Calling unit to be moved a workable distance from the telephone set.
- (4) Disconnect the Touch Calling unit leads from the transmission unit and terminal board terminals.
- (5) From the mounting brackets supplied with the replacement Touch Calling unit, select a set equal to those attached to the old unit. Using the screws provided, attach them to the replacement Touch Calling unit.
- (6) Connect the leads of the replacement Touch Calling unit to the telephone set terminal board and transmission unit terminals as follows:
  - (a) White - transmission unit terminal 1.
  - (b) Red - transmission unit terminal 11.
  - (c) Green - transmission unit terminal 23.
  - (d) Slate - terminal board terminal 11.
  - (e) Brown - terminal board terminal L2.
  - (f) Pink - terminal board terminal 8.
- (7) Twist the Touch Calling unit leads together for neatness and place the Touch Calling unit into position on the telephone set chassis.
- (8) Tighten the Touch Calling unit securing screw.
- (9) Reinstall the housing on the telephone set as instructed in Paragraph 7.09 or 7.10, as applicable.