

TELEPHONE CONSOLES
1- THROUGH 6-, 10- THROUGH 12-, AND 14-THROUGH 16-TYPE
APPARATUS UNITS
12-, 14-, 31-, AND 32-TYPE
INSTALLATION AND MAINTENANCE

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- Add information on modification of contact strips used with 635BC5C keys in 10C, 10D, 11C, and 11D consoles and 31- and 32-type apparatus units
- Add new Fig. 4
- Add new Fig. 12.

1.03 This issue of the section is based on the drawings listed in Part 5. If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

2. INSTALLATION

CONSOLES

2.01 The work operations involved in the installation of these consoles are as follows:

- (a) **Selecting Location:** Avoid areas where direct sunlight or high levels of room illumination would obscure lamp signals.
- (b) **Connecting Plug-Ended Cords to Associated Connector Cables:** Refer to Division 461 for the installation of terminal boxes as used with plugs and connectors. Use of an appropriate KS-20458 cover, for protection of mounting cord connector, is recommended.
- (c) **Preparing and Installing Designation Strips:** See Section 501-150-102.

1. GENERAL

1.01 This section furnishes installation and maintenance information for the 1- through 6-, 10- through 12-, and 14- through 16-type telephone consoles and 12-, 14-, 31-, and 32-type apparatus units.

1.02 This section is reissued to:

- Include information on 31- and 32-type apparatus units
- Delete information on 2-piece DSS button
- Correct part number in paragraph 4.10(1)

NOTICE

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(d) **Testing Installation:** Refer to sections covering PBXs associated with these consoles for operation tests.

(e) **Inspecting and Adjusting the Console Direct Station Selection (DSS) Unit:**

On fully assembled consoles, depress each button of the DSS unit a minimum of three times to ensure that it operates freely. When depressing the buttons, apply pressure in a direction which approximates actual operating conditions. Depress the button to the limit of its travel and keep in that position for approximately 1 second. If binding occurs due to misalignment of the DSS buttons and the faceplate and/or the paper mat, remove the bezel assembly and correct the position of the DSS key assembly block for proper alignment. Reposition the dial mounting assembly for further adjustment. In addition, carefully bending the mounting tabs on the bezel may aid in the alignment. After adjustments have been made, check the console again for free operations as described previously. Binding should not occur when depressing two adjacent keys simultaneously on a sample basis.

Note: Buttons should not squeak when depressed. If this occurs, replace the DSS unit.

2.02 The external return spring for the pivot bar on 3- and 4-type consoles is not used. The 811058361 (P-10E836) latchbar return spring and 811358993 (P-13E899) pin must be retained on one 598A or 656A key (center position preferred). Remove from other keys. On 14- and 15-type consoles, remove the latchbar return spring and pin for the 598A or 656A and 599J or 657J keys. (See Fig. 1.)

2.03 Install the keys (590- and 650-series) in the early production telephone sets as follows:



Before installing additional keys or replacement keys, check for free pivot bar motion and proper return spring action (Fig. 2).

- (1) Install the desired key and tighten mounting screws. Check for clearance between pivot bar and connector mounting bracket on key.
- (2) Depress the top button (first line pickup) of the key in left-most position until its bar

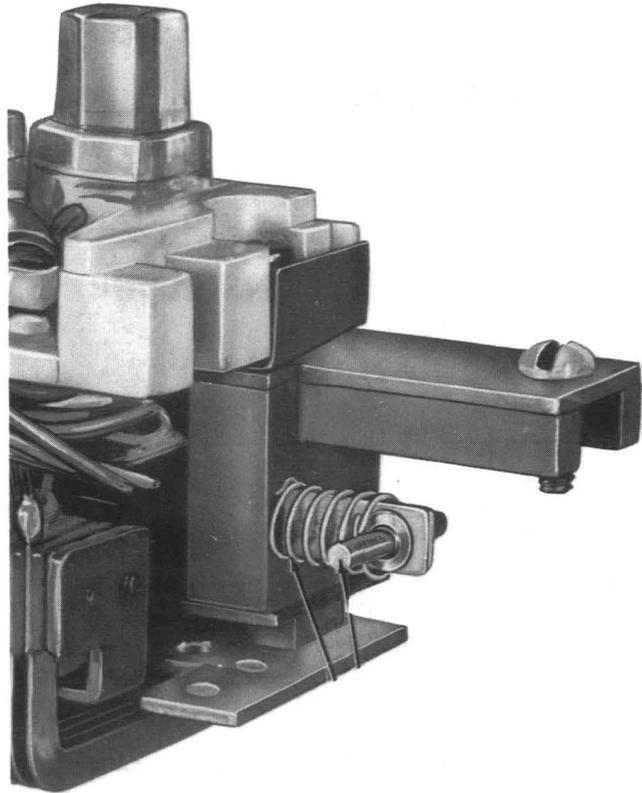


Fig. 1—Location of Latch Bar Return Spring and Pin

moves to its forward-most operating position and hold in this position. Do not lock down.

(3) While holding the (reference) key latchbar as in (2), slowly depress the top button of the key and observe the effect of its latchbar on the pivot bar. If the pivot bar moves significantly in the forward direction, the installed key is positioned too high. To correct, loosen the screws and slightly lower the key until the pivot bar has no perceptible forward motion. Retighten screws.

(4) Depress the top button of the installed key as in (2) and hold its latchbar in the forward-most position as in (3). Observe the effect of the latchbar of the (reference) key on the pivot bar while slowly depressing its top button. If the pivot bar moves significantly in the forward direction, the installed key is positioned too low. To correct, loosen the screws

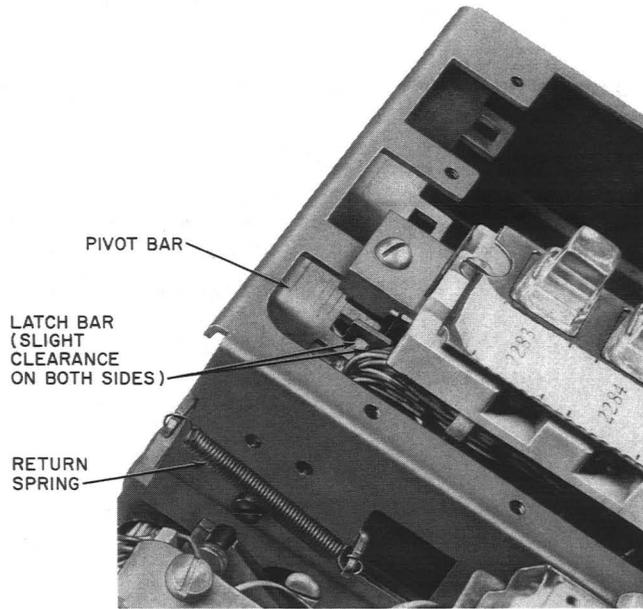


Fig. 2—Positioning 590 and 650 Series Keys

and very slightly raise the key until the pivot bar has no perceptible forward motion. Retighten screws and recheck (3).

Note: If an installed key does not meet the requirement (no perceptible latchbar movement) using this procedure, and there is reason to suspect that the reference key is out of position, reposition all keys by performing Steps 5 through 7.

(5) Loosen the screws of the (reference) key. With no buttons down and the latchbar held in, shift the reference key until latchbar notch is centered over edge of pivot bar (Fig. 2). Tighten screws while maintaining key and latchbar position.

(6) Moving from left to right, progressively position and check each key relative to the reference key as in (3) and (4).

Note: If the installed key still does not meet the requirement (no perceptible latchbar movement), replace key. It should not be necessary to apply undue force to move and position the 590- and 650-series keys.



Remove latchbar return spring and retaining pin on key when adding or replacing keys.

(7) Install key designation strip, light shield, housing, mat, and faceplate as required.

2.04 Keys on 4B-type consoles equipped with an 802695643 (P-269564) alignment bar should be aligned as follows:

- (1) Locate the 590- and 650-series keys in their respective positions.
- (2) Butt the top of each key to the bottom of the alignment bar.
- (3) Tighten the retaining screws on each key.

If the console is not equipped with an 802695643 (P-269564) alignment bar, follow the procedures in paragraph 2.03.

APPARATUS UNITS

2.05 The 12-, 14-, 31-, and 32-type apparatus units are designed for flush mounting in a desk or table. Follow local instructions concerning arrangements with the customer for installing these units. Required size openings are shown in Fig. 3 and 4.

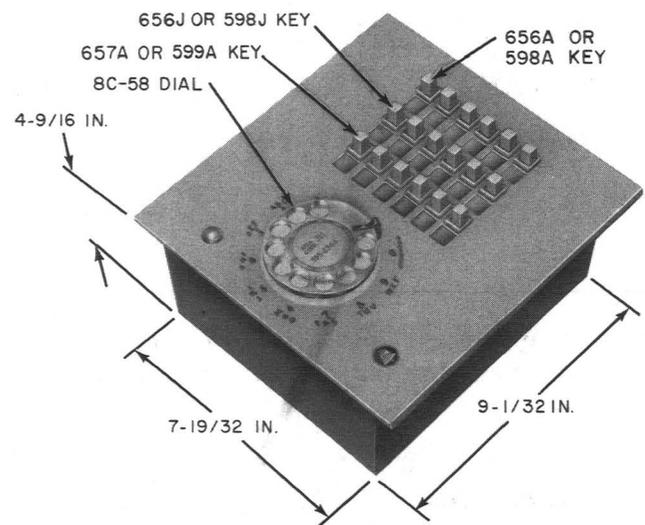


Fig. 3—12A or 14A Apparatus Unit

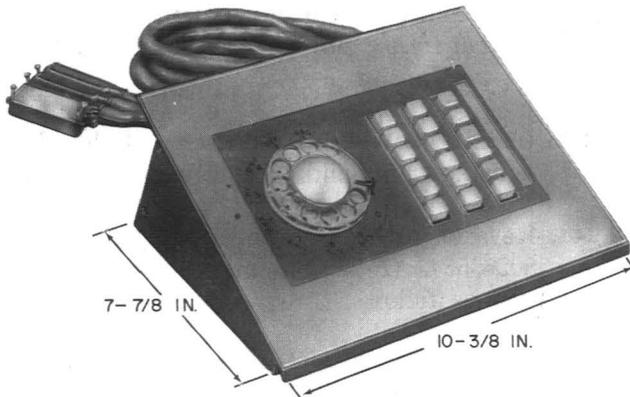


Fig. 4—31- or 32-Type Apparatus Unit

2.06 To install and dismantle the apparatus unit:

- (1) Place connector cables, as required, through entrance hole in housing.
- (2) Fasten connector cables to modular key units and make connections as necessary on the terminal boards.
- (3) Insert frame and component assembly into housing and fasten with mounting screws.
- (4) Place combined assembly in cutout and fasten to supporting surface using holes in mounting flanges.
- (5) Slide faceplate into bezel and mat.
- (6) Press the bezel assembly snaplock fasteners over mounting screwheads.
- (7) Dismantle by lifting out faceplate, mat, and bezel as a unit to expose frame and component assembly mounting screws.

2.07 Connection information for consoles and apparatus units can be found in sections and schematic drawings (SDs) covering the associated PBX.

3. MAINTENANCE

3.01 Work done on customer premises should be limited to verification and analysis of the trouble, readily made adjustments, and replacement

of easily accessible parts which are normally available through supply channels.

3.02 The following general requirements shall be met:

- (a) The exterior parts must be clean, not marred or chipped. Remove dirt or smudges with a water-dampened cloth or RS-13045 cleaner or equivalent. Use soap or detergent on faceplates.

DANGER: Ensure that adequate ventilation is available before using RS-13045 cleaner or equivalent.

- (b) Clean faceplates with nonglare finishes with No. 00 steel wool applied with a circular motion. Remove the faceplate from the console to prevent steel shavings from falling into the set. This process is recommended for removing cosmetic stains, pencil markings, and ink.
- (c) The base pan must adhere firmly to the base and should not be cut or embedded with foreign material which would scratch surfaces upon which the console may be placed.
- (d) The clips on the back of the bezel must snap firmly into place and hold the faceplate firmly against the housing.
- (e) The colored plastic strips on the back of the bezel assembly must not be loose, cracked, or discolored.
- (f) All keys, pushbuttons, or switches must operate smoothly without binding or sticking.
- (g) The electrical components and keys should meet the requirements of, and be maintained in accordance with, the sections covering the individual component.

The maintenance of modular type keys is covered in Section 512-230-100.

3.03 Matching color mounting cords are MD and replaced by cords of satin-silver (-87) color only.

3.04 Should it become necessary to replace a mounting cord, proceed as follows for all consoles except 10- and 11-types.

- (1) Remove faceplate, mat, and bezel as a unit.

The bezel is fastened to the housing with spring clips. Disengage the top edge of the bezel first. The lower edge is fastened with spring clips (Fig. 5) on some consoles; others have a hook arrangement. If clips are used on the lower edge, the bezel may be lifted straight up and off. If the hook arrangement is used, the top edge must be raised far enough to permit unhooking the lower edge before the bezel can be removed.

- (2) Loosen the captive screws holding the housing and remove the housing (Fig. 6).

- (3) Remove screws holding key frame assembly to base of set and swing the assembly up (Fig. 7).

- (4) Apply four turns of electrical tape to the end of the cord jacket (Fig. 8). Assemble cord clamp on cord and fasten to set base with screw provided. Figure 8 shows a Tinnerman-type clamp used on some consoles and a method of engaging the snap-in feature.

- (5) Terminate spade-tipped conductors. Refer to section covering connections for assignment of conductors.

- (6) Identify cord plugs and secure to cord frame with screws provided.

- (7) Insert plugs for dial, lamp fields, etc, into their associated connectors.

- (8) Dress cord conductors to avoid interference with set components and frame assemblies. Figure 9 shows a typical arrangement.

Note: If cord replacement is performed on a 1B-type console, D-180571 kit of parts must be installed. See 4.02.

- (9) Lower key frame assembly and secure to base of set.

- (10) Replace housing.

- (11) Replace faceplate, mat, and bezel as a unit.

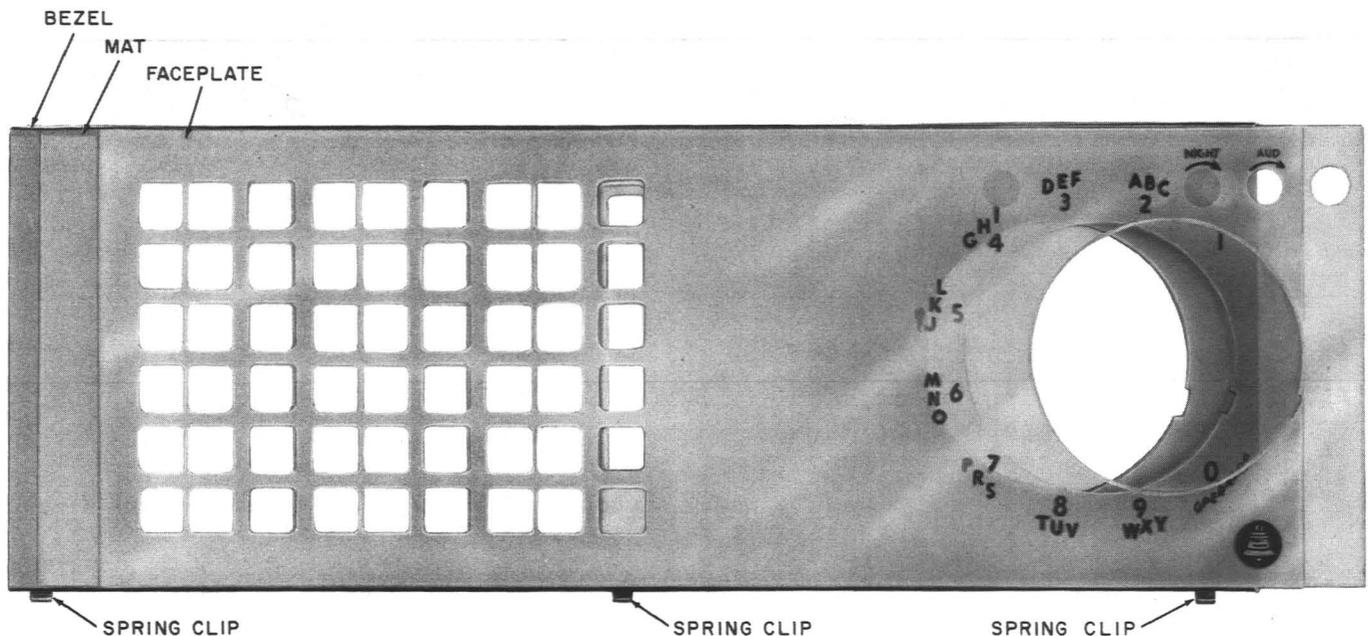


Fig. 5—Typical Faceplate, Mat, and Bezel Unit

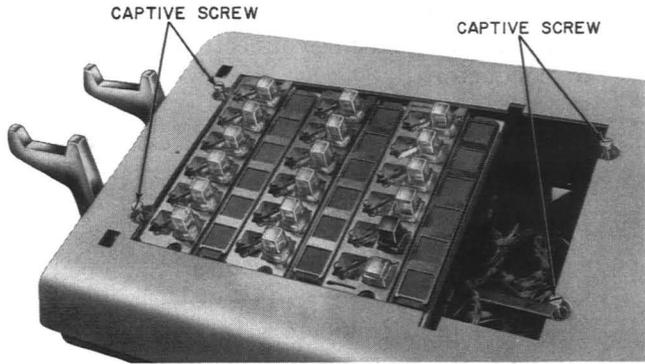


Fig. 6—Typical Housing



The spring clips on the back of the bezel must be aligned very carefully with the holes in the housing. Failure to align the clips with the holes will result in damage to the clips when the bezel is pressed into place.

DSS Key Block Assembly

3.05 Field maintenance of this unit is limited to the cleaning of contacts and replacement of lamps and buttons. The unit may be replaced when defective by removing four mounting screws

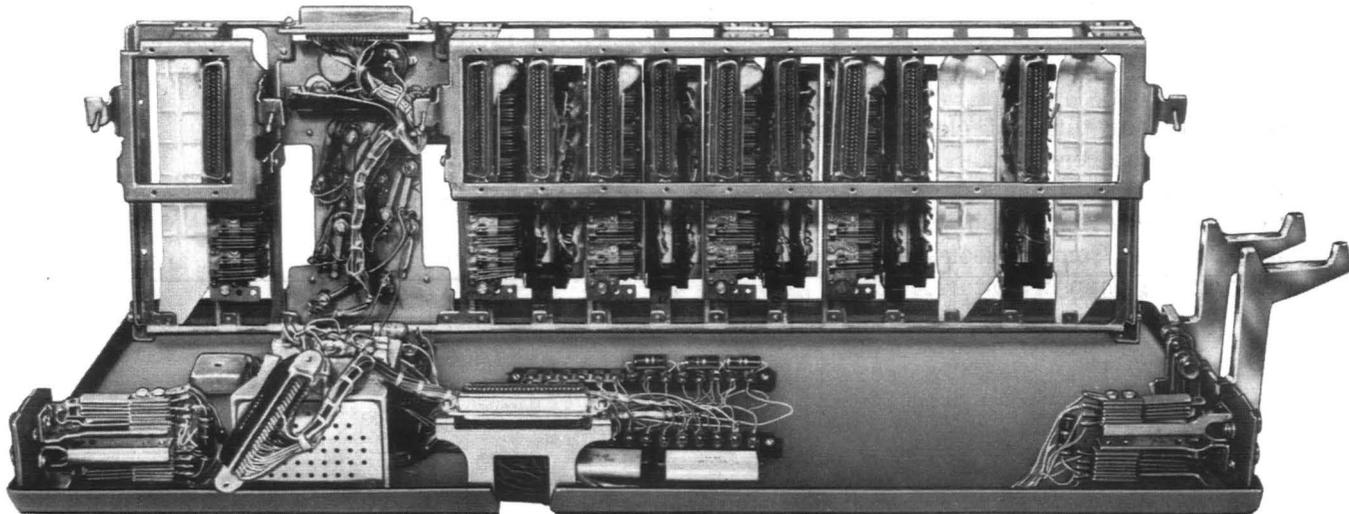


Fig. 7—Typical Console, Less Cord

and disconnecting the associated 50-point plugs and spade-tipped leads.

(b) Operation of any plunger should actuate the vertical and horizontal contacts of the rows associated with the plunger.

(c) For inspection and adjustment of DSS key unit, refer to paragraph 2.01(e).

3.07 If objectionable noise is heard in the attendant receiver when dialing from a 1- or 2-type console equipped with a dc pushbutton dial, install a locally provided 61A filter and connect as indicated in SD-67001-01.

3.08 To replace a lamp or button (Fig. 10):

(1) Remove faceplate, mat, and bezel as a unit.



Handle the unit very carefully to avoid damage to the spring pileups.

3.06 The key block assembly should meet these requirements:

(a) All moving parts must operate freely in their bearings.



Fig. 8—Engaging Hook on Tinnerman-Type Clamp

- (2) Remove retainer.
- (3) Remove button.
- (4) Remove lamp with 553A tool.
- (5) Assemble in reverse order.

CAUTION: When replacing lamps, use only lamps specified in Section 504-216-101, Table A. Use of higher voltage lamps may cause plastic buttons to melt.



Do not use screwdriver when removing buttons—use KS-16750,L2 tool or equivalent.

4. FIELD MODIFICATIONS

4.01 These modifications may be accomplished upon initial installation or on a routine maintenance visit per local instructions.

4.02 To prevent or correct shorting of spade-tipped mounting cord conductors in 1B consoles, installation of a D-180571 kit of parts is required. Install in the following manner:

- (1) Place insulator over the top of the two terminal strips in the base of the console with the hooks of the insulator snapped around the handset cradle support bracket.
- (2) Redress any capacitors, etc. that may prevent the insulator from resting directly on the terminal strips.

1- OR 2-TYPE CONSOLE

No. 101 ESS Application

4.03 When these consoles are used with No. 101 ESS and an improvement in attendant audio transmission is required, the gain setting resistor R9 (SD-67001-01) on printed circuit board 812557668 (P-25E766) must be bridged with a KS-16645-L1, or equivalent, 62-ohm resistor. Carefully solder the additional resistor to the leads of the original resistor R9 on the component side of the printed wiring board as shown in SD-67001-01.

4.04 To further improve transmission quality, it is recommended that in all consoles manufactured prior to SD-67001-01, Issue 7B, resistors R1 through R5 (on terminal strip near front of console) be removed from the circuit as shown in SD-67001-01.

No. 1 ESS Application

4.05 Use of 1- or 2-type consoles in a No. 1 ESS System equipped with TOUCH-TONE (option G) and 4-wire equipment (option Y) requires installation of a 10-ohm 1/2-watt resistor in series with the dial contact as shown in SD-67001-01.

757A PBX Application

4.06 During a power failure condition in the 757A PBX, the trunk answer from any station feature, if in use, is disabled and remains disabled

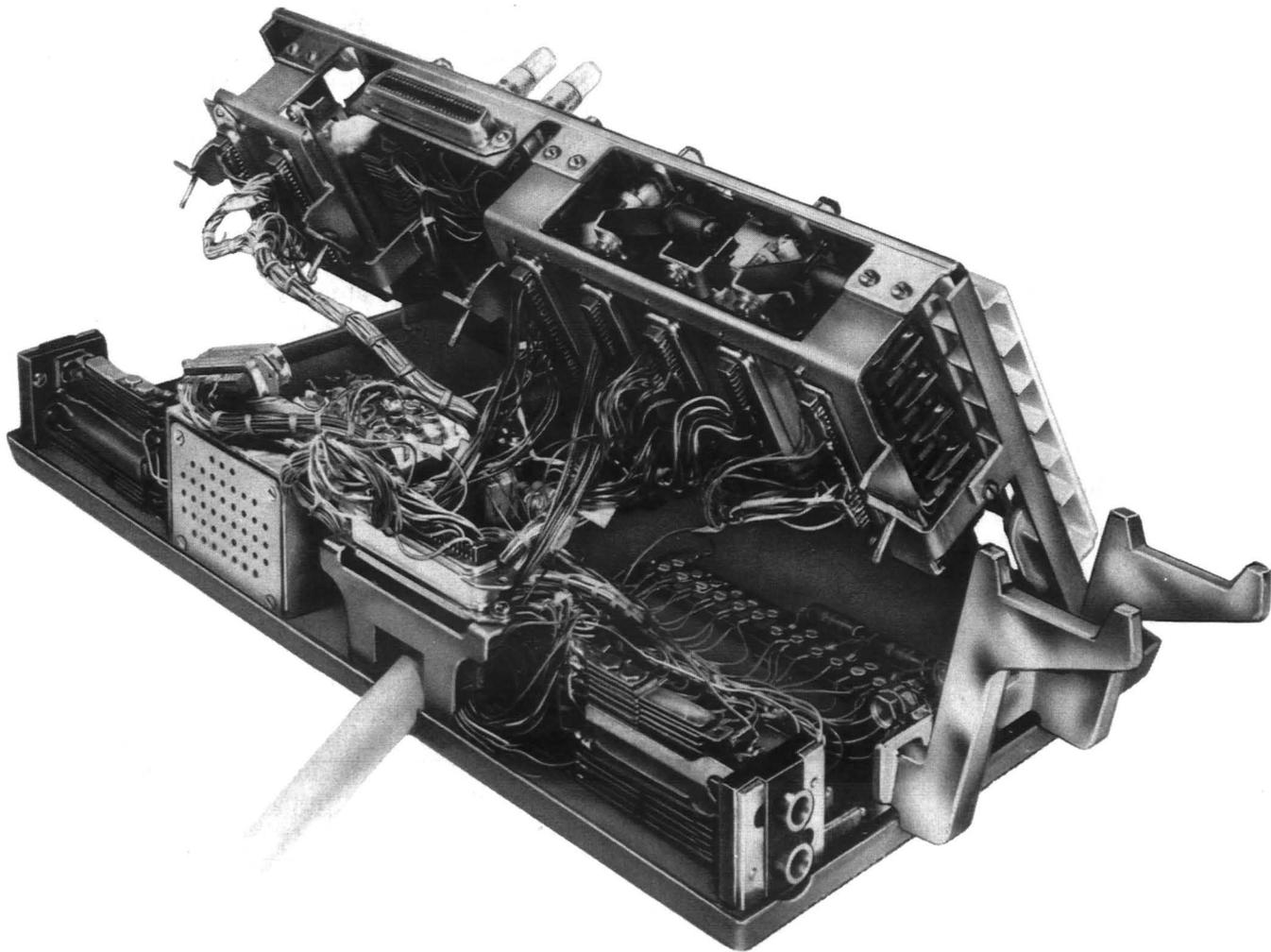


Fig. 9—Typical Cording

unless the remote answer (REM ANS) key is operated after restoration of power. If automatic restoration of the remote answer feature is desired, the REM ANS key (third from top on a 598F key assembly) may be modified locally to a turnlocking key for this purpose.

Note: Consoles equipped with a 656F key (substitute for the 598F) must have it replaced with a 598F key to permit the automatic restoration modification. 656F keys cannot be modified for this purpose.

4.07 Order the following parts:

- 811257278 (P-12E727) stop plunger assembly

- 811257252 (P-12E725) plunger
- 814834198 (P-48C419) coiled spring
- 811258193 (P-12E819) bushing
- 811257286 (P-12E728) button
- 811257245 (P-12E724) cam.

4.08 Perform the following:

- (1) Ensure that modification parts are provided as ordered.
- (2) Remove 598F key from console.

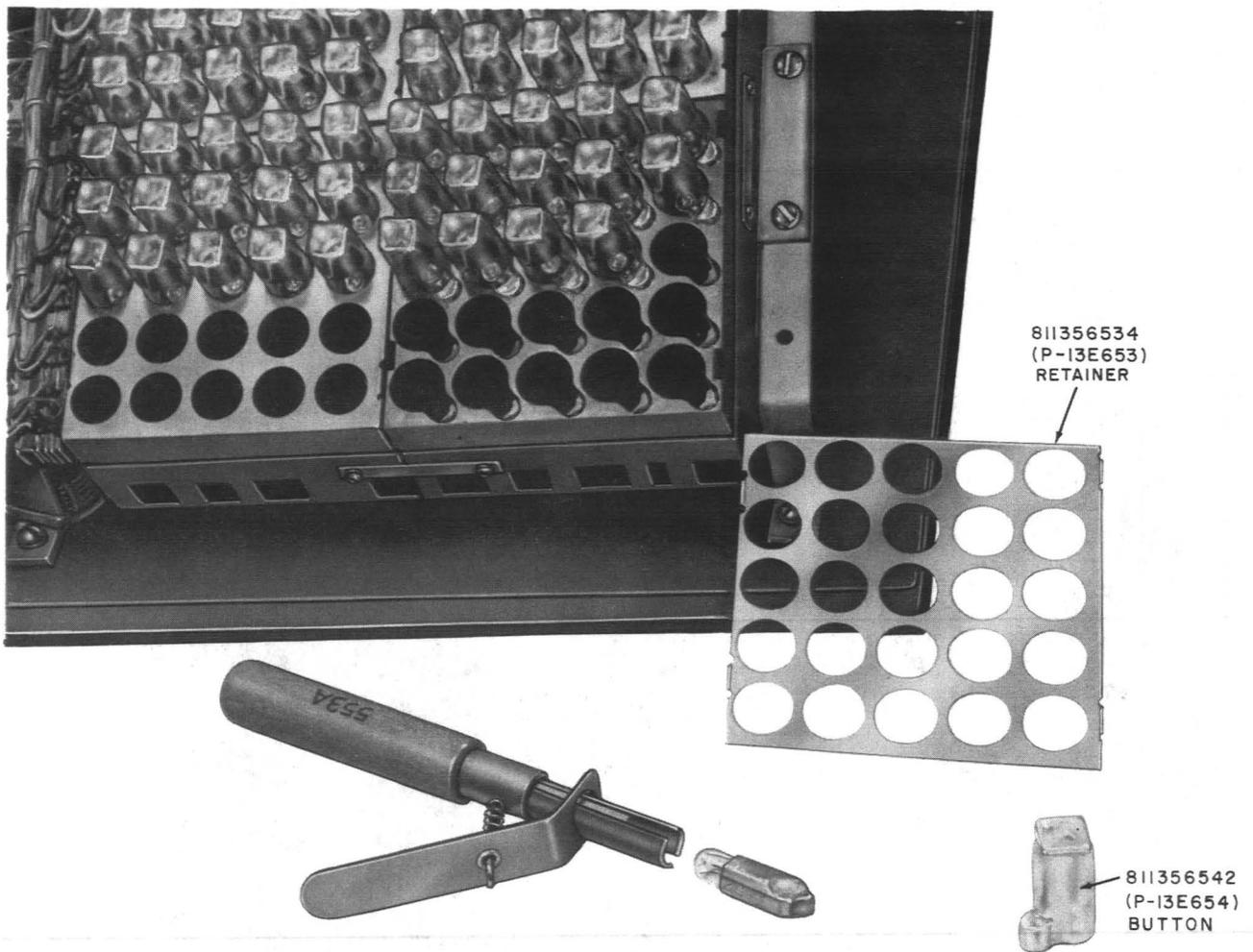


Fig. 10—DSS Key Block Assembly

Note: For following steps, refer to Fig. 11.

- (3) Remove 811058668 (P-10E866) light shield.
- (4) Remove two screws holding lamp block assembly to plunger assembly and turn back lamp block assembly.
- (5) Remove 811058353 (P-10E835) retainer from bottom of lamp block assembly.
- (6) Remove 811058643 (P-10E864) button (pushbutton-type) from 811058635 (P-10E863) collar.
- (7) Insert, and snap if necessary, 811257286 (P-12E728) button (turnlocking-type) in collar.
- (8) Insert 811257245 (P-12E724) cam, slot-side up, into bottom of button, aligning blade of cam in slot of button.
- (9) Place 811258193 (P-12E819) bushing on top of cam.
- (10) Place collar (with turnlocking button) back in lamp block assembly.
- (11) Replace retainer removed in (5).

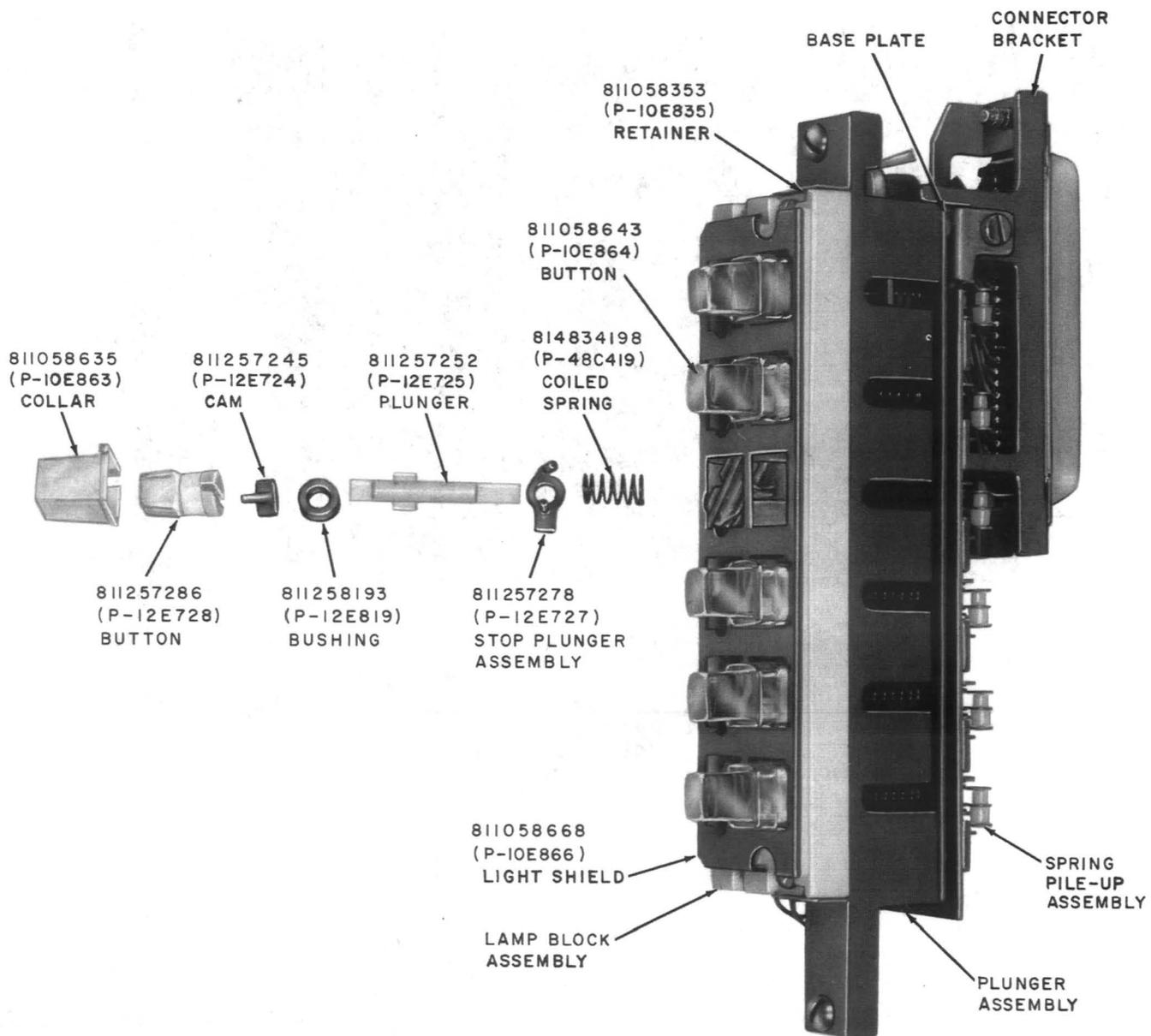


Fig. 11—Modified 598F Assembly

- (12) Remove screw holding connector bracket to key assembly and turn bracket back.
- (13) Remove two screws holding plunger assembly to spring pileup assembly and separate plunger assembly from spring pileup assembly.
- (14) Remove two screws holding baseplate to bottom of plunger assembly and separate baseplate for plunger assembly.
- (15) Remove old plunger (pushbutton-type) and spring.
- (16) Insert 811257252 (P-12E725) plunger through 811257278 (P-12E727) stop plunger assembly. Align pin on stop plunger assembly between lobes on plunger body.
- (17) Insert plunger (end having stop plunger assembly) through 814834198 (P-48C419) coiled spring.

- (18) Insert new plunger spring-end up, tab on stop plunger assembly aligned in slot of plunger assembly frame.
- (19) Replace baseplate and screws removed in (14).
- (20) Align plunger assembly in spring pileup assembly and replace screws removed in (13).
- (21) Fasten connector bracket removed in (12).
- (22) Align plunger assembly to lamp block assembly and fasten with screws removed in (4). It may be necessary to rotate two turnlocking buttons until plungers engage.
- (23) Replace light shield removed in (3).
- (24) Mount and connect 598F key in console.
- (25) Remove any lubricant deposited on pushbuttons and collars.

Note: If difficulties are encountered in assembling the turnlocking key, check the first key (turnlocking) in the 598F assembly.

701B PBX With PICTUREPHONE® Application

4.09 For a 701B PBX used in conjunction with PICTUREPHONE service (850A PBX), the alarm (AL) lamp and key designation must be changed. Perform the following:

- (1) Remove faceplate, mat, and bezel as a unit.
- (2) Remove retainer on key assembly.
- (3) Remove 51A lamp associated with AL designation.
- (4) Install a KS-20673 type lamp in place of 51A lamp removed in (3).
- (5) Designate lamp installed in (4) ALP.
- (6) Assemble in reverse order.

End-to-End Signaling Application

4.10 For consoles equipped with TOUCH-TONE dials and where end-to-end signaling is

required, install an 819040122 (P-90D012) guard assembly as follows:

- (1) Remove ~~814934196~~ (P-49C419) screw from left side of terminal block 2 (TB2) near front of console.
- (2) Insert screw removed in (1) through 819040122 (P-90D012) guard assembly, left side of terminal strip, and tighten.
- (3) Connect 819040122 (P-90D012) guard assembly (option E) as indicated in SD-67001-01.

10B AND 11B CONSOLES/12- AND 14-TYPE APPARATUS UNITS

4.11 When provided, the conference key (part of the 599A or 657A key) on 10B- and 11B-type consoles and 12B- and 14B-type apparatus units may be modified to a nonlocking key (if not already modified by the factory). Remove the screw pin from the plunger of the button next to the hold (red) button. If the conference function is assigned to another key on the 599A or 657A key assembly, remove the screw pin from the plunger associated with that key.

4.12 To remove housing on 10B- and 11B- consoles, proceed as follows.

- (1) Locate 840154793 clips at lower rear of console, close to each corner.
- (2) Using a screwdriver, pry the clips open to release their grip on console base pan.
- (3) When both clips have been freed, lift housing from base.
- (4) To replace housing, place over base and push down firmly on housing until clips make firm contact with base pan.

Replacing VAI Strip in 10D and 11D Consoles and 31B and 32B Apparatus Units

4.13 When any light-emitting diode (LED) in the strip will not light, the entire strip must be replaced. For ordering information, see Section 504-216-101, Table A, and proceed as follows.

10D and 11D Consoles:

- (1) Remove housing as directed in paragraph 4.12.
- (2) Loosen captive screws in VAI strip.
- (3) Disconnect spade-tipped leads from screw terminals (see Table A) and remove old strip.
- (4) Mount new VAI strip and connect leads as shown in Table A.

TABLE A

LEAD CONNECTIONS FOR VAI STRIP

VAI STRIP LEAD COLOR	CONNECT TO SCREW TERMINAL
R	52
R-G	51
BL-Y	55
BL-R	54
O-BK	56
W-BL	44

- (5) Test to ensure all VAI indicators are working properly.
- (6) Replace housing as shown in paragraph 4.12.

31B and 32B Apparatus Units:

- (1) Remove faceplate.
- (2) Remove rear plate.
- (3) Loosen captive screws in VAI strip.
- (4) Pivot key bracket assembly.
- (5) Disconnect spade-tipped leads from screw terminals (see Table A) and remove old strip.

- (6) Mount new VAI strip and connect leads as shown in Table A.
- (7) Test to insure that all VAI indicators are working properly.
- (8) Reassemble unit.¶

Modifying Contact Strips on 635BC5C Keys in 10C, 10D, 11C, and 11D Consoles and 31- and 32-Type Apparatus Units

4.14 Consoles manufactured from July through September of 1977 contain contact strips on the 635BC5C keys which must be modified for proper operation. In addition, the contact strips used with 635BC5C keys manufactured after June 1, 1977, must be modified before the keys are used for replacement purposes in 10C, 10D, 11C, and 11D consoles and 31- and 32-type apparatus units. The modification consists of cutting off a tab on each of the contact strips mounted on the bottom of the key (Fig. 12). To modify keys already installed in consoles, follow this procedure:

- (1) Remove the console housing as described in paragraph 4.12.
- (2) Remove the two screws which hold down the 635BC5C key (the left key, nearest the dial).
- (3) Carefully lift the key out of the console and disconnect the six colored plugs on the bottom of the key. (Note the positions of the plugs so that they can be reinstalled correctly.)
- (4) Lift the lead end of each contact strip up and use diagonal cutters to snip off the last tab (Fig. 12).
- (5) Press the contact strips back down flat on the bottom of the key.
- (6) Reconnect the colored plugs to the key in their original positions.
- (7) Put the key back into the console, being sure that the latch arm at the upper end of the key has its notch properly engaged with the pivot bar.
- (8) Secure the key to the console with the two screws.

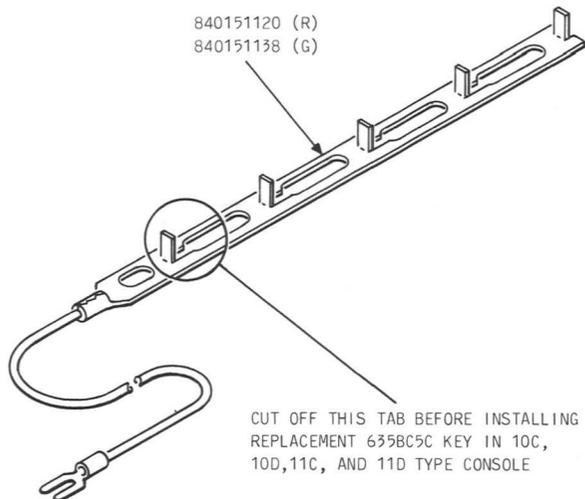


Fig. 12—Modification of Contact Strips on 635BC5C Key

(9) Replace the housing.

4.15 To modify replacement keys before they are installed in consoles, simply lift up each contact strip and snip off the tab nearest the lead end. Then press the contact strip back down flat against the key.

KEY SUBSTITUTIONS

4.16 When replacement is required, the following key substitutions may be made:

Specified Key	Substitute
599A	657A
598A	656A
598J	656J

5. REFERENCES

5.01 This issue of the section is based on the following drawings:

NUMBER	TITLE
SD-67001-01	Universal Telephone Console, 1- and 2-Type, Telephone Console Circuit
SD-65990-01	Automatic Call Distributing System, No. 2A and 3A, Supervisor Telephone Console Circuit, 12A and 12B Telephone Console
SD-66907-01	Telephone Consoles, 3C- and 4B-Type, Telephone Console Circuit
SD-66927-01	Telephone Consoles, 5B- and 6B-Type, Telephone Console Circuit
SD-65965-01	Automatic Call Distributing System, No. 2A and 3A, Attendant Telephone and Key Circuit (10 and 11 Consoles)
SD-66937-01	Automatic Call Distributing System No. 2A, 2B, and 3A, Attendant Telephone Circuit
SD-1E055-01	No. 800A PBX, Attendant Telephone and Key Circuit (16A Console)
SD-1E073-01	No. 800A PBX, Attendant Telephone and Key Circuit (14A and 15A Consoles)