

## 52-TYPE HEAD TELEPHONE SETS

### PIECE-PART DATA, REPLACEMENT PROCEDURES, AND MINOR REPAIRS

#### 1. GENERAL

- 1.01** This section covers information necessary for ordering parts to be used in the maintenance of 52-type head telephone sets such as those used by operators and supervisors. It also covers approved procedures for replacing these parts and for repairing and cleaning these sets.
- 1.02** This section is reissued to revise the piece-part information for the headband and pad, to add information for the uses and identification of the head telephone sets, to add ordering information and replacement procedures for the 52E, 52K, 52FR, and 52GR head telephone sets, and to revise the method for screwing the caps on the cases. Detailed reasons for reissue will be found at the end of the section.
- 1.03** Part 2 of this section covers piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of the 52-type head telephone sets. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called Piece-Part Data.
- 1.04** Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2. This information is called Replacement Procedures.
- 1.05** Part 4 of this section covers the methods of cleaning various parts of the head telephone set. This information is called Cleaning Procedures.
- 1.06** Part 5 of this section covers the approved procedures for making minor repairs on the head telephone sets. This information is called Minor Repairs.
- 1.07** To avoid damage to the transmitter case, carry the head telephone set by some part other than the transmitter case. Care should be exercised not to scratch or nick the thermo-plastic parts.
- 1.08** Information on the 153A and 153B amplifiers to be used with these head telephone sets for persons with impaired hearing may be found in Section 981-280-100.
- 1.09** Table A lists the principal applications of the 52-type head telephone sets and the differences in equipment features of the various sets.

TABLE A — PRINCIPAL USES AND EQUIPMENT FEATURES OF 52-TYPE HEAD TELEPHONE SETS

| Head Telephone Set | Use   | Features  |
|--------------------|---|---|
| 52A                | Operators — Switchboard — 101-type key equipment              | 5-foot cord<br>Low-impedance receiver unit  |
| 52B                | Switchboard — 4 Order Turret, 331-type telephone set          | 10-foot spring cord<br>Push-to-talk locking switch<br>Low-impedance receiver unit                       |
| 52C<br>(See Note)  | Installations at airports — 102A, 109A, or 111A key equipment | 7-foot cord<br>High-impedance receiver unit   |
| 52D                | Night operator — Switchboard — 84A test set                   | 15-foot spring cord<br>Low-impedance receiver unit  |
| 52E                | For cable splicers — With 84A test set                        | 7-foot cord<br>Low-impedance receiver unit  |
| 52H                | Operators — Switchboard — 101-type key equipment              | 5-foot cord<br>Low-impedance receiver unit  |
| 52J                | Installations at airports — 102A, 109A, or 111A key equipment | 7-foot cord<br>High-impedance receiver unit   |
| 52K                | N, O, and ON-type Carrier Systems                             | 25-foot cord<br>High-impedance receiver unit<br>Sound power transmitter unit                            |
| 52FR               | FAA air route traffic control centers — 102A key equipment    | 7-foot spring cord<br>Push-to-talk locking or nonlocking switch<br>High-impedance receiver unit         |
| 52GR               | Switching System 300  | 7- and 12-foot spring cord<br>Push-to-talk locking or nonlocking switch<br>High-impedance receiver unit |

**Note:** 52C head telephone set may also be provided with a 7-foot spring cord or with a 7-foot spring cord and push-to-talk locking switch for use in CAA air traffic control centers — 102A key equipment.

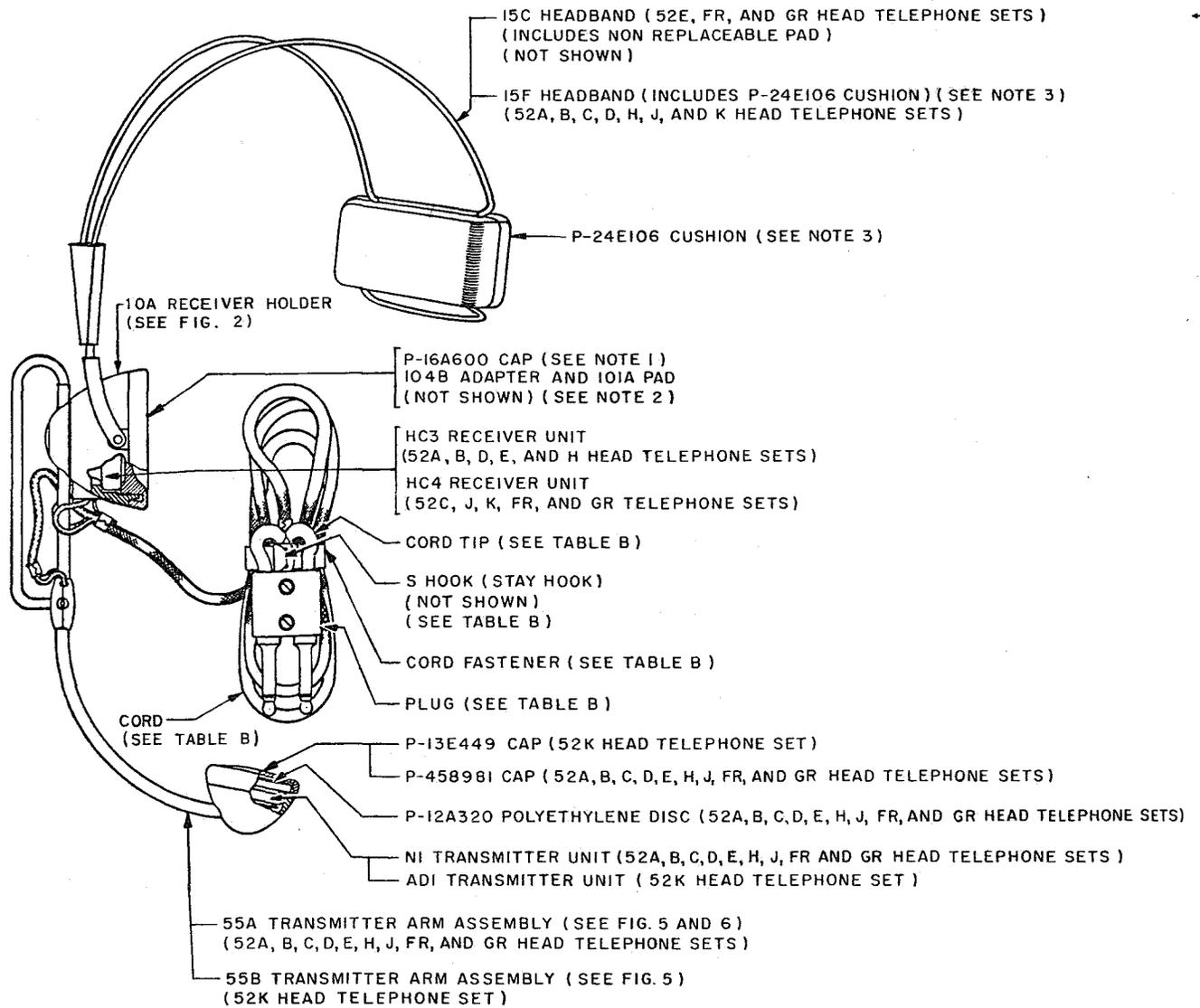
## 2. PIECE-PART DATA

**2.01** The figures included in this part show the various parts in relation to other parts of the telephone set. The piece-part numbers of the various parts are given together with the names of the parts as listed by the Western Electric Company Merchandise Department. Where these names differ from those in general use in the field, the latter names in some cases are shown in parentheses.

**2.02** When ordering parts for replacement purposes, give both the piece-part number and

the name of the part. For example, P-484150 Screw. Do not refer to the BSP number or to any information shown in parentheses following the piece-part number.

**2.03** Information enclosed by parentheses ( ) is not ordering information. This information may be references to notes, parts referred to in other portions of the section and not considered replaceable, or part names in general use in the field if these names differ from those assigned by the manufacturer.



NOTES:

1. USE COMBINATIONS OF PARTS AS SHOWN IN THE FOLLOWING TABLE FOR 52A, B, C, AND D HEAD TELEPHONE SETS.

| CAP      | RECEIVER UNIT | USED ON CASE       |
|----------|---------------|--------------------|
| P-458982 | HC1, HC2      | UNLIPPED           |
| P-16A600 | HC3, HC4      | LIPPED OR UNLIPPED |

2. 104B ADAPTER AND 101A PAD (USED IN PLACE OF CAP) MAY BE ORDERED SEPARATELY.

3. ORDER P-240421 PAD (SYNTHETIC RUBBER), P-204166 PAD (FOLDED LEATHER), OR P-10E121 PAD (FOAM RUBBER) AS REQUIRED WHERE THE HEAD TELEPHONE SET IS EQUIPPED WITH THE 15A HEADBAND OR ORDER P-24E106 CUSHION WHERE THE HEAD TELEPHONE SET IS EQUIPPED WITH THE 15F HEADBAND.

Fig. 1 - 52-Type Head Telephone Sets (52A head telephone set equipped with stop bar illustrated)

TABLE B — CORDS AND ASSOCIATED PARTS FOR 52-TYPE HEAD TELEPHONE SET

| HEAD TELEPHONE SET | CORD   |                    | PLUG                 | SWITCH  | CORD TIP (sleeve) | S HOOK   | CORD FASTENER | CONNECTING BLOCK |
|--------------------|--------|--------------------|----------------------|---------|-------------------|----------|---------------|------------------|
|                    | TYPE   | LENGTH (feet)      |                      |         |                   |          |               |                  |
| 52A                | L4BM   | (5)<br>(nonspring) | 289B<br>(see Fig. 8) |         | 77                | P-360424 | P-478356      |                  |
| 52B                | L4AH   | (10)<br>(spring)   | 289B<br>(see Fig. 8) | KS-8010 | 77                | P-360424 | P-478356      | 29A              |
| 52C                | L4BM   | 7†<br>(nonspring)  | 289B<br>(see Fig. 8) |         | 77                | P-360424 | P-478356      |                  |
|                    | L4AK   | 7†<br>(spring)     | 289B<br>(see Fig. 8) |         | 77                | P-360424 | P-478356      |                  |
|                    | L4BA   | (7)<br>(spring)    | 289B<br>(see Fig. 8) | KS-8010 | 77                | P-360424 | P-478356      |                  |
| 52D                | L4AK   | (15)<br>(spring)   | 289B<br>(see Fig. 8) |         | 77                | P-360424 | P-478356      |                  |
| 52E                | L2Y*   | (7)<br>(nonspring) |                      |         |                   |          |               |                  |
| 52H                | L4BL   | (5)<br>(nonspring) | 396A<br>(see Fig. 7) |         |                   |          | P-478356      |                  |
| 52J                | L4BL   | 7†<br>(nonspring)  | 396A<br>(see Fig. 7) |         |                   |          | P-478356      |                  |
| 52K                | L4BP†† | 25†<br>(spring)    |                      |         |                   |          | P-17E761†††   |                  |
| 52FR               | L4BK   | 7***†<br>(spring)  | 289B<br>(see Fig. 8) | 225A    | 77<br>126         | P-360424 |               |                  |
| 52GR               | L6G    | 7****†<br>(spring) | 338A<br>(see Fig. 9) | 225A    |                   |          |               |                  |

† When ordering the cord, specify the code and the length of the cord as shown in the table.

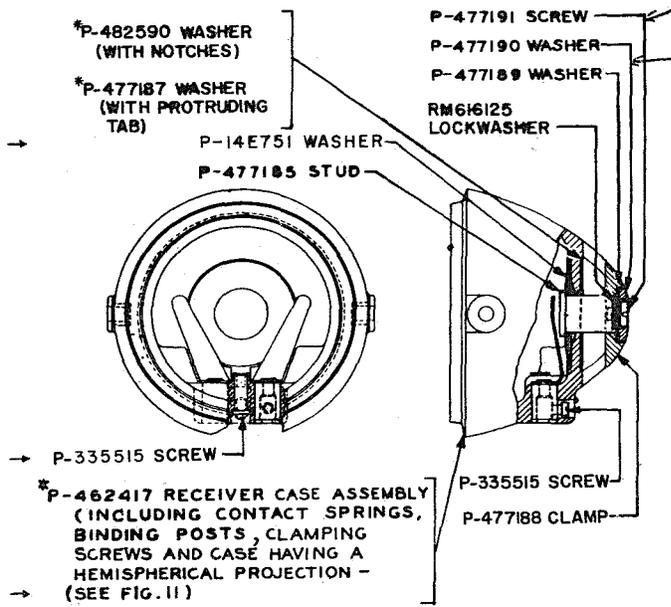
†† The code of the cord includes a 422A plug, a P-17E761 cord fastener and a P-360125 plain band used for securing the cord fastener to the cord.

††† When ordering the P-17E761 cord fastener, order one P-360125 plain band used for securing the fastener to the cord.

\* The code of the cord includes two 3 Test Clips (AT-6828) and a 516A capacitor.

\*\* May also be supplied in 10 foot length when specified in the order.

\*\*\* May also be supplied in 12 foot length when specified in the order.



\* WHEN A RECEIVER CASE ASSEMBLY IS TO BE REPLACED AND THE WASHER AT THE BACK HAS A PROTRUDING TAB (P-477187), ORDER THE P-482590 WASHER AS WELL AS THE RECEIVER CASE ASSEMBLY.

Fig. 2 - 10A Receiver Holder

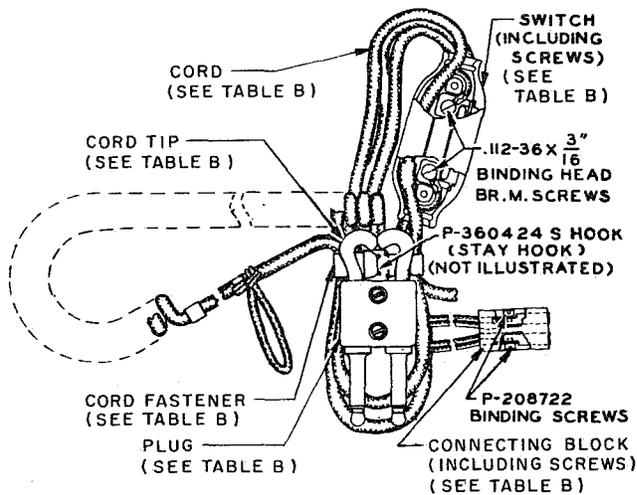


Fig. 3 - Cord Assembly (52B and 52C head telephone set)

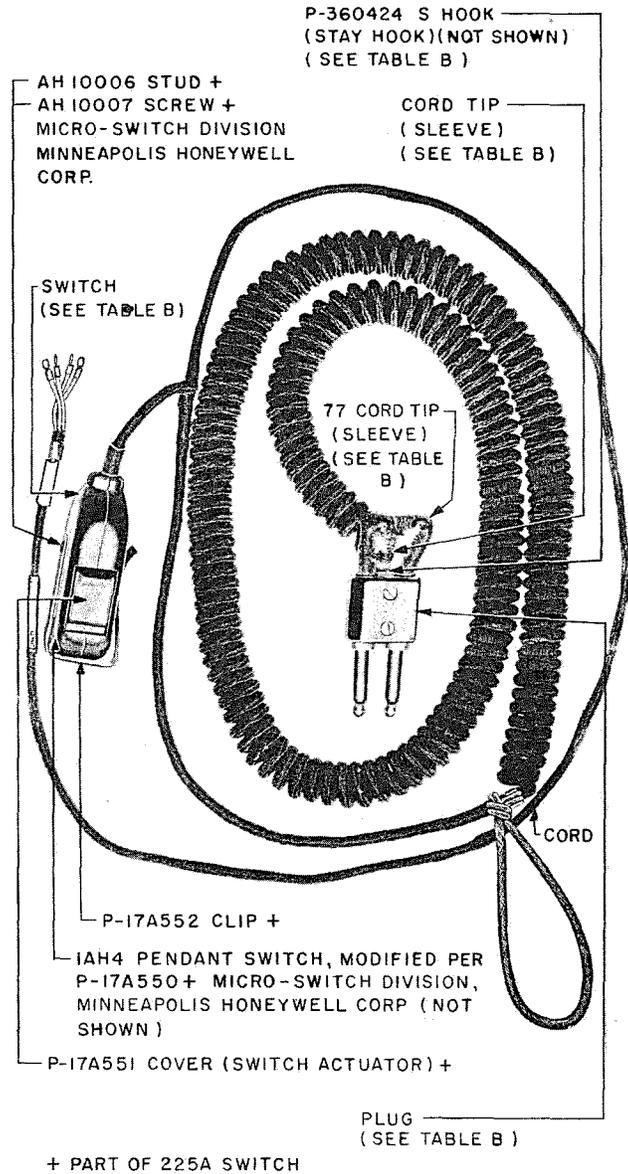
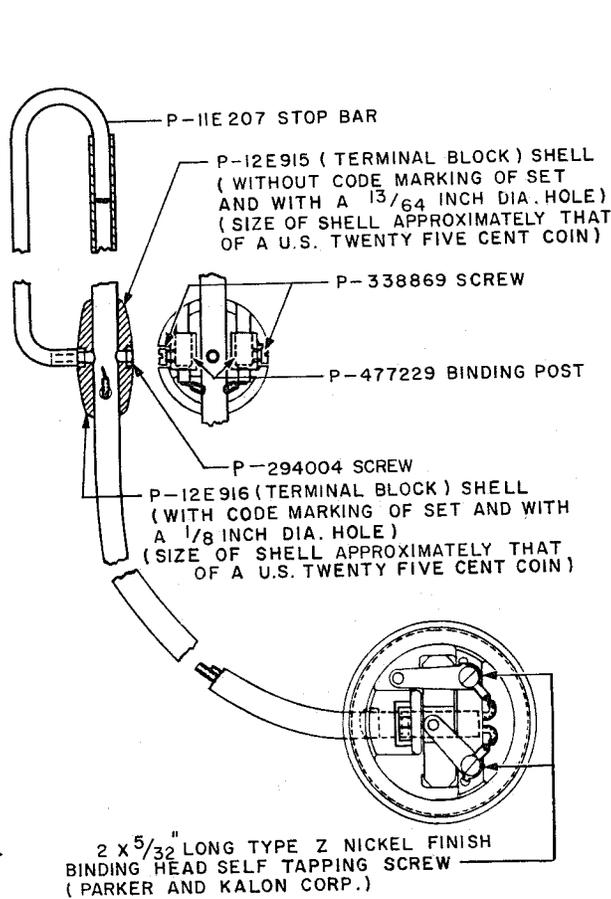


Fig. 4 - Cord Assembly (52FR and 52GR head telephone set)



→ Fig. 5 - 55A and 55B Transmitter Arm Assembly (later type 55A transmitter arm equipped with stop bar illustrated)

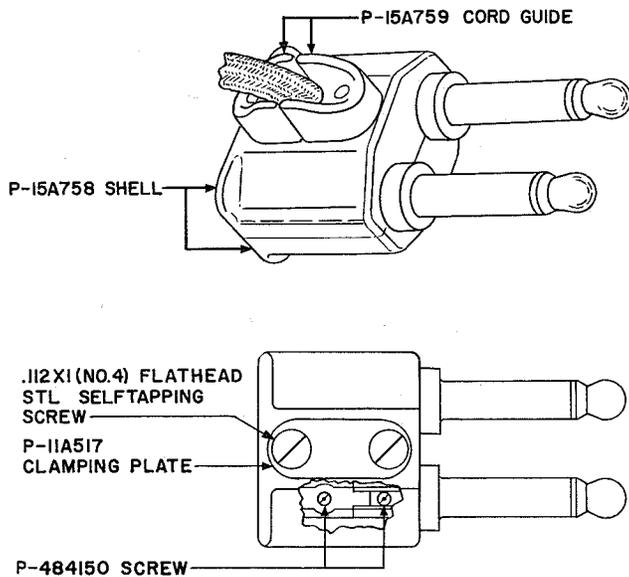
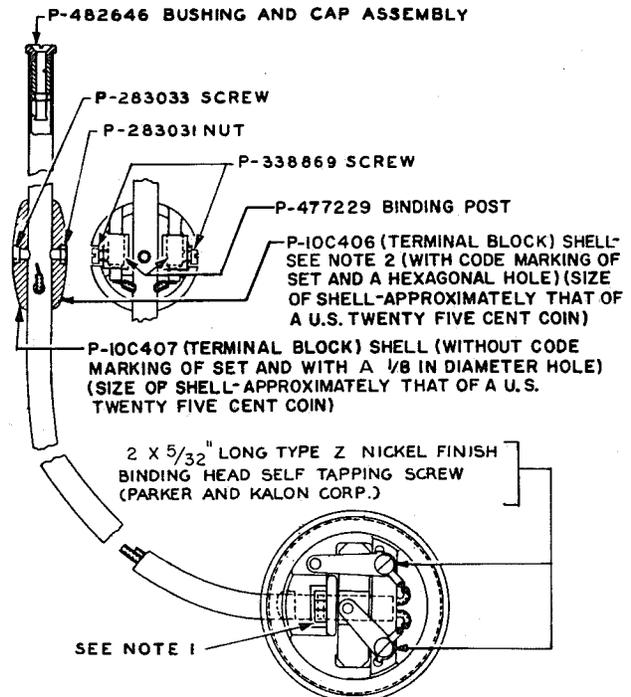


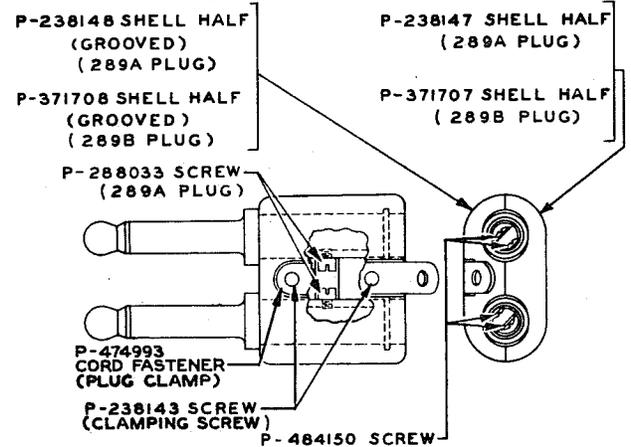
Fig. 7 - 396A Plug



NOTE 1: IF TRANSMITTER ARM IS EQUIPPED WITH A COLLAR INSTEAD OF A STOP AND CLIP AND A COLLAR CLAMPING SCREW IS TO BE REPLACED, ORDER THE P-478435 SCREW.

NOTE 2: WHEN A TERMINAL BLOCK SHELL IS TO BE REPLACED PROCEED AS FOLLOWS  
 IF THE SHELL IS  $\frac{13}{16}$  INCH IN DIAMETER (APPROXIMATELY THE SIZE OF A U.S. FIVE CENT COIN) ORDER P-10C406 AND P-10C407 SHELLS AND REPLACE BOTH SHELLS.  
 IF THE SHELL IS  $\frac{15}{16}$  INCH IN DIAMETER (APPROXIMATELY THE SIZE OF A U.S. TWENTY FIVE CENT COIN) ORDER AND REPLACE ONLY THE PART REQUIRED.

Fig. 6 - 55A Transmitter Arm Assembly - Earlier Type Equipped With Bushing and Cap Assembly



→ \* EARLIER 52A, 52B, 52C, AND 52D HEAD TELEPHONE SETS MAY BE EQUIPPED WITH 289A PLUGS.

Fig. 8 - 289A\* and 289B Plugs

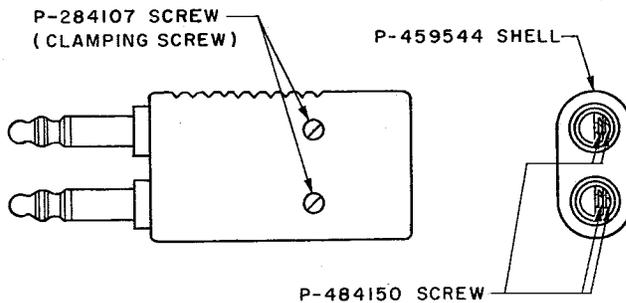


Fig. 9 - 338A Plug

### 3. REPLACEMENT PROCEDURES

#### 3.01 List of Tools and Materials

| CODE OR SPEC NO.        | DESCRIPTION   |
|-------------------------|---|
| <b>TOOLS</b>            |   |
| 567B (or replaced 567A) | Pad Assembly Tool   |
| KS-2348                 | Cord Repair Screwdriver (equipped with P-484700 bit)                            |
| KS-6854                 | 3-1/2 Inch Screwdriver  |
| R-1005                  | Jewelers Screwdriver  |
| R-8950                  | Syringe   |
| —                       | Long-Nose Pliers  |
| —                       | 3-Inch B Screwdriver  |
| —                       | 3-Inch C Screwdriver  |
| <b>MATERIALS</b>        |   |
| KS-2423                 | Cloth   |
| KS-8496                 | 3 Lubricating Compound  |
| —                       | Black Ceresin, C-244 Eimer and Amend, New York, N. Y. (Ozokerite) or Equivalent |
| —                       | Clear Petrolatum  |
| —                       | Bell System Paste Metal Polish  |
| —                       | Bell System Powdered Soap   |
| —                       | Friction Tape   |
| —                       | Mild Detergent  |

3.02 After making replacement of parts which affect transmission, check the telephone set to see that it meets the tests specified in Section 028-360-501.

3.03 No replacement procedures are specified for screws or other small parts where the procedure consists of a simple operation.

3.04 When making any replacement on a head telephone set, make sure that the association of the set and its means of identification is retained.

3.05 In order to avoid the possibility of electric shock after making any replacement of parts on a head telephone set equipped with a transmitter arm provided with the bushing and cap assembly shown in Fig. 6, proceed as follows. Determine whether the terminal block is the earlier or the later type. The earlier-type terminal block may be recognized by the diameter of the terminal shell which is that of the U.S. 5-cent coin; the diameter of the later-type shell is that of a U.S. 25-cent coin. If the terminal block is of the earlier type, check the terminal block cord clamping screws to make sure that they are covered with Ceresin at least flush with the surface of the terminal block. If not covered as specified above, in order to insulate the terminal screws, apply Ceresin over the screws flush with the surface of the terminal block. To facilitate applying Ceresin, work it with the hands to make it pliable.

3.06 **Receiver Unit:** To replace the receiver unit, shown in Fig. 10, unscrew the receiver cap from the receiver holder and remove the receiver unit. Mount the new receiver unit so that the code marking on the unit is at the opposite side of the receiver case from the binding posts. Screw the receiver cap finger tight. When properly tightened, there will be a slight gap between the rims of the case and cap. If difficulty is encountered in screwing the cap on the case, apply clear petrolatum very sparingly to the threads of the case.

#### 10A Receiver Holder

3.07 To replace the receiver holder, proceed as follows. Remove the headband from the receiver holder. Disconnect the cord from the receiver holder by removing the three cord clamping screws, using the KS-2348 cord repair screwdriver, and then remove the cord terminals and the stay cord.

**SECTION 028-360-811**

**3.08** Unscrew the receiver cap and remove the receiver unit.

**3.09** Remove the clamp and associated washers from the receiver holder by removing the receiver holder clamp mounting screw shown in Fig. 11 using the 3-inch C screwdriver and proceed as covered in 3.10 or 3.11, as applicable.

**3.10** Where the transmitter arm is equipped with a stop bar, back off the terminal block clamping screw, using the KS-6854 screwdriver, until the lower end of the stop bar can be removed from the terminal block. Remove the stop bar from the transmitter arm tube. With the fingers pressing on the stud from the inside of the receiver holder shown in Fig. 11, slide the tube through the hole in the stud.

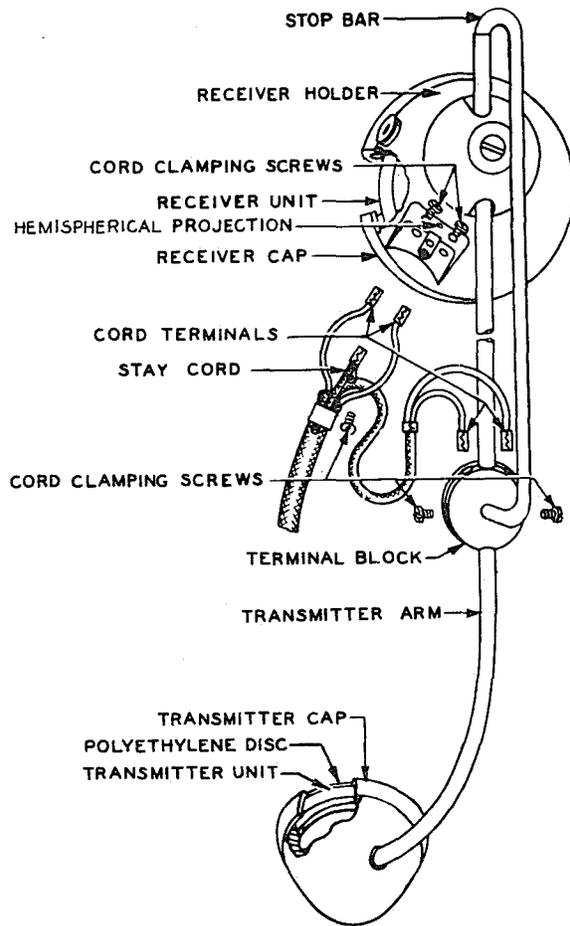
**3.11** Where the transmitter arm is equipped with the bushing and cap assembly, remove the end cap assembly from the transmitter arm tube after loosening the end cap assembly screw with the KS-6854 screwdriver. With the fingers pressing on the stud from the inside of the receiver holder, slide the tube through the hole in the stud.

**3.12** Remove the clamp and associated washers from the new receiver holder by removing the receiver holder clamp mounting screw, shown in Fig. 11 using the 3-inch C screwdriver.

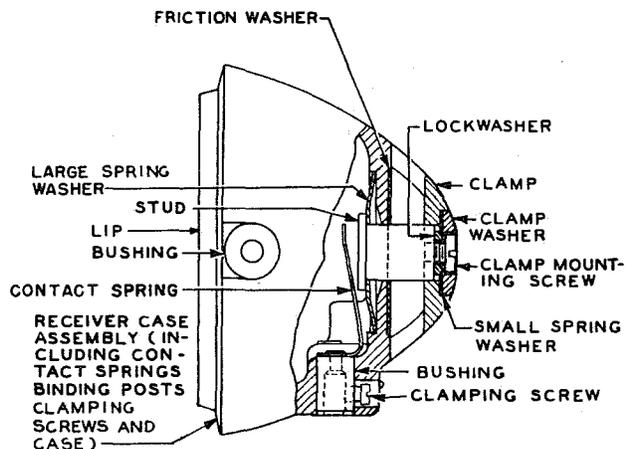
**3.13** When assembling the receiver holder, hold it in one hand and insert the large spring washer under the contact springs with the concave side of the washer toward the back of the holder as shown in Fig. 11. Then insert the stud through this washer and the hole in the back of the receiver holder so that the transmitter arm tube hole is outside the receiver holder. Mount the friction washer over the stud so that it is flat against the receiver holder as shown in Fig. 11. Press on the stud from the inside of the receiver holder and slide the transmitter arm tube back into the stud. Reinsert the stop bar or end cap assembly, as applicable, and tighten the screw.

**3.14** Assemble the clamp and three associated washers as shown in Fig. 11.

**3.15** Insert the cord terminals so that the smooth surface of the metal tip is in contact with the screw. Tighten the screws securely.



**Fig. 10 – Transmitter Arm Assembly and Receiver Holder**



**Fig. 11 – 10A Receiver Holder**

**3.16** Mount the receiver unit in the receiver holder. When mounting an HC1 or HC2 receiver unit, position it so that the receiver terminals are in the position nearest the ends of the contact springs. When mounting an HC3 or HC4 unit, position it so that the code marking on the unit is at the opposite side of the receiver case from the binding posts. Screw the receiver cap finger tight. When properly tightened, there will be a slight gap between the rims of the case and cap. Then remount the headband.

**Receiver Case Assembly, Large Spring Washer, and Friction Washer**

**3.17** To replace any of these parts, proceed as covered in 3.07 through 3.16 substituting new parts as required.

**Receiver Holder Clamp, Clamp Mounting Screw, Clamp Washer, Small Spring Washer, and Lockwasher**

**3.18** To replace any of these parts, remove the clamp, clamp washer, small spring washer, and the lockwasher from the receiver holder by removing the receiver holder clamp mounting screw shown in Fig. 11 using the 3-inch C screwdriver.

**3.19** After replacing the part, assemble the clamp and three associated washers as shown in Fig. 11 and tighten the clamp mounting screw.

**101A Pad and 104B Adapter**

**3.20** Unscrew the adapter from the receiver holder. To replace the pad, place a new pad on the 567B tool with the plastic washer side toward the tool. Then place the nipple part of the 104B adapter over the central part of the plunger of the tool, substituting a new adapter, if necessary. Press the adapter firmly toward the tool with a slight turning motion to snap the washer on the pad over the nipple of the adapter. Screw the adapter on the receiver holder.

**3.21** The receiver pad may be left on the receiver until the four layers of tissue with which it is arranged have been used. A layer of tissue is removed while the pad is on the adapter by breaking the top layer near the outer edge, peeling the tissue from the whole outer edge first, and then from around the plastic washer.

**Transmitter Unit**

**3.22** To replace the transmitter unit shown in Fig. 10, unscrew the transmitter cap and carefully lift the unit from the case. Where the unit is not provided with leads, proceed as covered in 3.23. Where the unit is provided with leads, proceed as covered in 3.24.

**3.23** Remove the transmitter unit. If the polyethylene disc is torn, dirty, wrinkled, or otherwise damaged, replace it. Hold the transmitter cap with the threaded side up and place the polyethylene disc in it so that it is centrally located in the cap. Place the new transmitter unit, membrane side down, on top of the disc in the cap. Place the transmitter case, threaded side down, over the cap. While maintaining the cap and case in this position, screw the cap on the case, finger tight. When properly tightened, there will be a slight gap between the rims of the cap and case. If difficulty is encountered in screwing the cap on the case, apply petrolatum very sparingly to the threads of the case.

*Caution: In removing or replacing the transmitter unit, hold it between the thumb and one or two fingers on the outer edge of the unit. Pressing against the moisture-resistant membrane may result in excessive sag of the membrane impairing the transmission characteristics of the unit. This precaution applies to both the replacing unit and the unit removed for repair. In packing the unit to be returned for repair, use the box in which the new unit was received. Take care that no packing material presses against the membrane.*

**3.24** Remove the clamping screws with the KS-6854 screwdriver and remove the transmitter unit. Substitute the new unit. With the new transmitter unit lead terminals in place, insert the clamping screws and tighten them securely using the KS-6854 screwdriver. Position the new transmitter unit in the case and screw the cap on the case finger tight. When properly tightened, there will be a slight gap between the rims of the cap and case. If difficulty is encountered in screwing the cap on the case, apply petrolatum very sparingly to the threads of the case.

**Polyethylene Disc**

3.25 To replace the polyethylene disc, remove the disc and place the new one in position following the procedure covered in 3.23.

**Transmitter Arm Assembly**

3.26 *General:* If it is necessary to replace a transmitter case, replace the transmitter arm assembly.

3.27 To replace the transmitter arm assembly, unscrew the transmitter cap and carefully lift the transmitter unit from the case. Where the unit is not provided with leads, remove the unit and polyethylene disc as covered in 3.23. →Where the unit is provided with leads, remove →the unit as covered in 3.24. Then disconnect the cord from the terminal block by removing the two cord clamping screws, using the KS-6854 screwdriver, and remove the cord terminals.

3.28 Remove the receiver holder and mount it on the new transmitter arm assembly as covered in 3.08, 3.09, 3.13, 3.14, and 3.16.

3.29 Insert the cord terminals from the outside of the transmitter arm into the holes in the terminal block so that the smooth surface of the metal tip is in contact with the screw. Take care that the cord tips are seated on the bottom of the binding post holes; then tighten the screws securely.

↗3.30 Where the transmitter unit is not provided with leads, place the polyethylene disc and transmitter unit in the transmitter cap and screw the cap in place on the new transmitter arm assembly as covered in 3.23. Where the transmitter unit is provided with leads, mount the unit in the transmitter case as covered in 3.24.

**Transmitter Contact Spring and Terminal Clamping Screws**

3.31 To replace the clamping screws that hold the transmitter contact springs in place, proceed as covered in 3.32 and 3.33. To replace the clamping screws that hold the transmitter terminals in place, proceed as covered in 3.34.

3.32 Remove the transmitter cap, transmitter unit, and polyethylene disc as covered in 3.22 and 3.23. Remove the clamping screws shown in Fig. 12B with the KS-6854 screwdriver.

3.33 With the contact springs in their proper position as shown in Fig. 11, insert the new clamping screws and tighten them using the KS-6854 screwdriver. Place the polyethylene disc and transmitter unit in the transmitter cap and screw the cap in place as covered in 3.23.

↗3.34 Remove the transmitter cap, transmitter unit and clamping screws, shown in Fig. 12C, as covered in 3.22 and 3.24. Insert the new clamping screws through the terminals and remount the parts as covered in 3.24.

**Transmitter Terminal Block Parts Associated With Transmitter Arm Equipped With End Cap Assembly Shell Half, Binding Post, Clamping Screw, and Nut**

3.35 To replace any of these parts, remove the terminal block clamping screw and nut shown in Fig. 12A using the R-1005 jewelers screwdriver, and remove the shells. When the shells are of the earlier type, discard them. The earlier-type shells may be distinguished from the later-type shells by their diameter. The earlier shells have a diameter of a U.S. 5-cent coin and the later-type shells have a diameter of a U.S. 25-cent coin.

3.36 When it is necessary to replace a binding post, remove the cord clamping screw, as required, using the KS-6854 screwdriver. Unsolder the binding post from the associated wire, and solder the new binding post to this wire.

3.37 Substitute new parts as required. Place the shell halves on the binding posts as shown in Fig. 12B. Insert the clamping screw and nut and tighten securely.

3.38 Insert the cord terminals into the new binding posts so that the smooth surface of the metal tip is in contact with the screw. Take care that the cord tips are seated on the bottom of the binding post holes, then tighten the screws securely.

**Transmitter Terminal Block Parts Associated With Transmitter Arm Equipped With Stop Bar — Shell Half, Binding Post, and Clamping Screw**

3.39 To replace any of these parts, remove the screw shown in Fig. 12B, using the KS-6854 screwdriver, and remove the shells.

3.40 When it is necessary to replace a binding post, proceed as covered in 3.36.

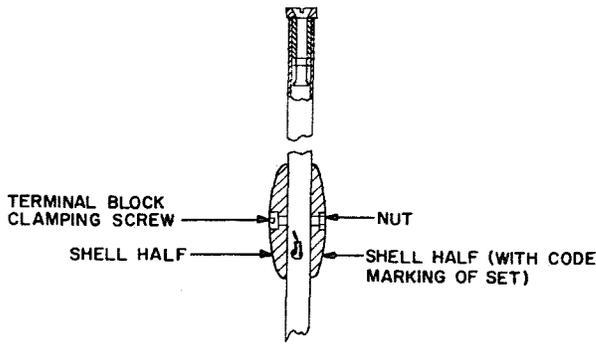


Fig. 12A

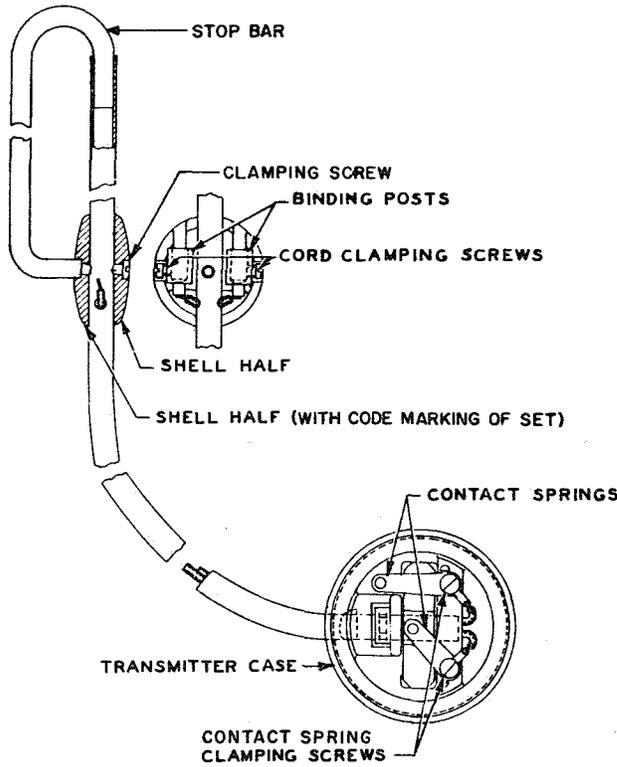


Fig. 12B

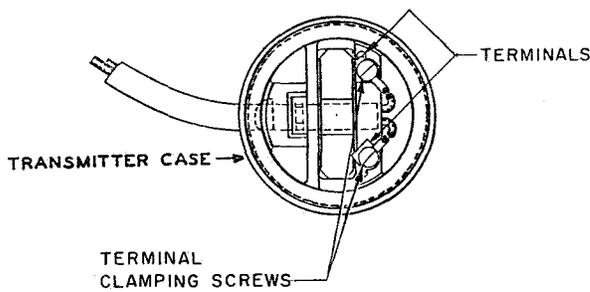


Fig. 12C

Fig. 12 - 55A and 55B Transmitter Arm Assembly

3.41 Substitute new parts as required. Place shell halves on the binding posts as shown in Fig. 12B, insert the lower end of the stop bar, and tighten the screw securely.

*Caution: After assembly of the stop bar, the stop bar and associated screw should be examined for projecting burrs or sharp edges.*

3.42 Insert the cord terminals into the new binding posts as covered in 3.38.

**Plug Clamp, Stay Hook and 126 Cord Tip Associated With 289A or 289B Plug**

3.43 Where the cord is provided with a cord fastener, to replace the plug clamp or stay hook, proceed as follows. Remove the clamping screws using the 3-inch C screwdriver. Remove the cord fastener. If the stay hook is equipped with a 126 cord tip (sleeve), remove the sleeve and discard it. (Do not replace the cord tip.) Open the loops of the stay hook with the long-nose pliers. Substitute new parts as required. Make sure that the small loop of the hook is connected to the cord. In closing the loops of the hook, take care that the ends do not overlap the straight portion of the hook. Remount the cord fastener, attaching it as covered in 3.48 through 3.50. Reassemble the plug, tightening the clamping screws securely.

3.44 Where the cord is not provided with a cord fastener, to replace the plug clamp, stay hook, or 126 cord tip (sleeve), proceed as follows. Remove the clamping screws using the KS-6854 screwdriver. Remove the 126 cord tip. Open the loops of the stay hook with the long-nose pliers. Substitute new parts as required. Make sure that the small loop of the hook is connected to the cord. In closing the loops of the hook, take care that the ends do not overlap the straight portions of the hook. Place the 126 cord tip (sleeve) in position over the plug clamp and stay hook. Reassemble the plug tightening the clamping screws securely.

**289A, 289B and 338A Plugs and 77 Cord Tips**

3.45 Remove the clamping screws using the 3-inch C screwdriver. Remove the cord terminal screws using the KS-2348 screwdriver and pull the cord from the plug. Substitute new parts

as required. Insert the cord terminals into the plug fingers taking care not to twist the cords more than 180 degrees. Insert and securely →tighten the terminal screws. Reassemble the plug →tightening the clamping screws securely.

### 396A Plug

3.46 Remove the clamping screws using the 3-inch C screwdriver. Remove the cord terminal screws using the KS-2348 screwdriver and pull the cord from the shell. Substitute new parts as required. Insert the cord through the shell and secure the cord tips to the plug fingers with the terminal screws. Tighten the screws securely.

Γ3.47 **225A and KS-8010 Switches:** To replace the 225A switch, remove the screws from the switch housing and clip using the 3-inch B screwdriver. Remove the clip and open the housing. To replace the KS-8010 switch, remove the clamping screws of the switch using the KS-6854 screwdriver and separate the switch halves. Using the KS-6854 screwdriver, loosen the terminal and cord fastening screws and remove the cord from the switch. Substitute the new switch, connect and fasten the cord to the switch, and assemble the parts in the reverse order of removal.

### Cord Fastener

3.48 **Cord Fastener (leather strap) Associated With 289A or 289B Plug:** To place a new cord fastener around the stay hook of the plug, proceed as follows. Form the fastener by slipping the E end of the fastener through slot 3 as shown in Fig. 13(B), and the F end through slots 1 and 2 as shown in Fig. 13(C).

3.49 Loosen the clamping screws of the plug with the 3-inch C screwdriver to free the clamp. Remove the old cord fastener. If the stay hook is equipped with a rubber sleeve, remove the sleeve and discard it. Do not replace the rubber sleeve. Slip the new cord fastener over the clamp and stay hook so that it is positioned as shown in Fig. 13(D). Mount the clamp on the plug and tighten the clamping screws securely.

3.50 Pull both ends of the cord fastener until it fits tightly around the stay hook.

Γ3.51 **Cord Fastener (plastic strap) Associated With 422A Plug:** To place a new P-17E761 cord fastener around the cord, proceed as follows. Secure the cord fastener to the cord with the P-360125 band as shown in Fig. 14, using the long-nose pliers. Form the cord fastener by slipping the E end of the fastener through slot 3 as shown in Fig. 13(B), and the F end through slots 1 and 2 as shown in Fig. 13(C).

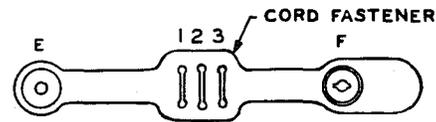


Fig. 13A

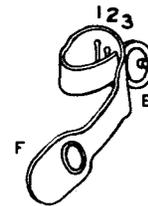


Fig. 13B

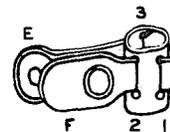


Fig. 13C

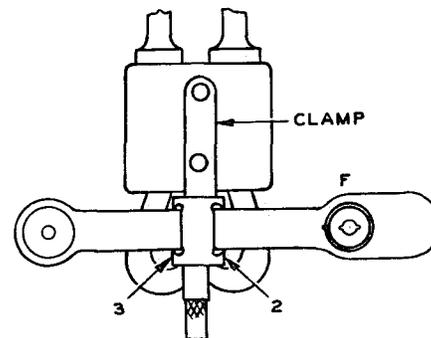


Fig. 13D

Fig. 13 – Method of Mounting Cord Fastener (leather strap)

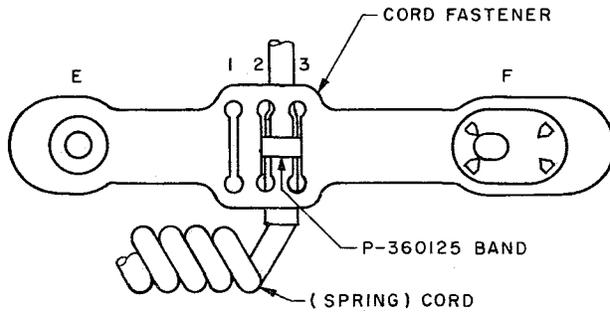


Fig. 14 - Method of Mounting Cord Fastener (plastic strap)

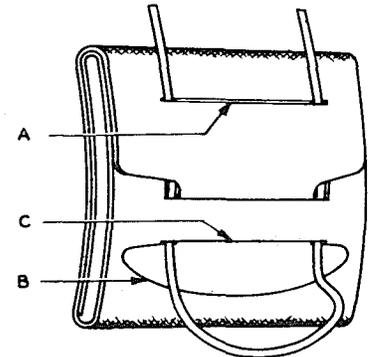


Fig. 16 - Folded Leather Headband Pad

**Headband Pad**

**3.52 Synthetic Rubber Headband Pad:** To place a synthetic rubber headband pad on the headband, pass the free end of the headband through slots A and B and then through slots C and D as shown in Fig. 15.

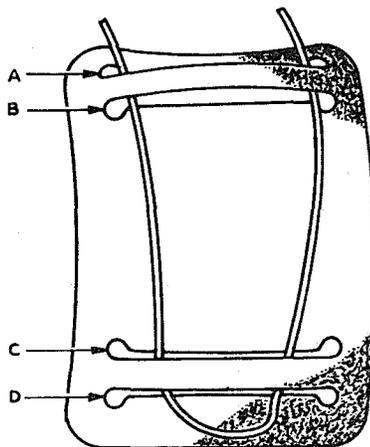


Fig. 15 - Synthetic Rubber Headband Pad

**3.53 Folded Leather Headband Pad:** To remove a folded leather pad from the headband, pull the tabs of flap B as shown in Fig. 16 from under the wire headband, and pull the band out of the pad through slots A and C.

**3.54** To place a folded leather headband pad on the headband, pass the free end of the headband through slot A shown in Fig. 16. The band will come out through slot C and under flap B. Slip the tabs on flap B under the wire headband to fasten it in place.

**3.55 Foam Rubber Headband Pad:** To remove a foam rubber pad from the headband, un-snap fastener C shown in Fig. 17 and pull the pad off the headband through slots A and B.

**3.56** To place a foam rubber pad on the headband, un-snap fastener C shown in Fig. 17 and pass the free end of the headband through slot A and out through slot B. Snap fastener C to hold the headband in place.

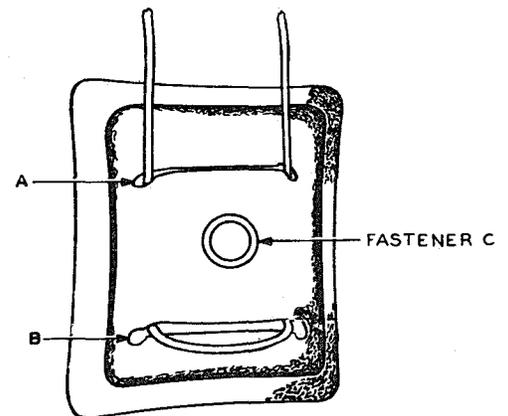


Fig. 17 - Foam Rubber Headband Pad

**3.57 Synthetic Foam Headband Pad:** To place a synthetic foam headband pad on the headband, pass the free end of the headband through the slot of the pad, making sure that the thicker half of the pad is on the inner side of the headband as shown in Fig. 18.

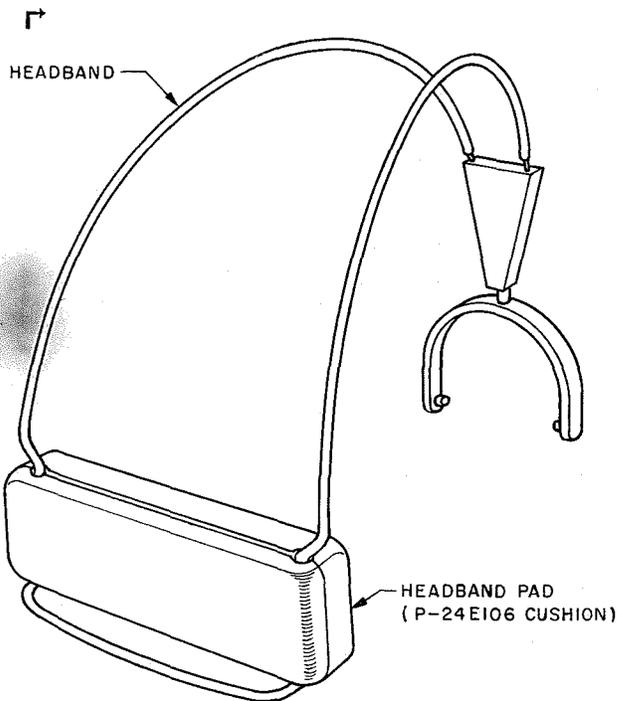


Fig. 18 - Synthetic Foam Headband Pad

#### 4. CLEANING PROCEDURES

##### Plugs

4.01 Clean plugs in accordance with practices covering this apparatus.

##### Transmitter Caps and Cases

#### 4.02 *Cloudy or Discolored Transmitter Caps:*

Remove transmitter caps which are cloudy or discolored from the transmitter cases. Clean the caps with a small amount of Bell System metal polish applied to a slightly dampened KS-2423 cloth. Take care that the metal polish does not clog the holes in the caps. Wash the caps in a solution of soap and lukewarm water. If the metal polish did clog the holes and was not removed by washing, blow it out with the R-8950 syringe and wash the caps again.

4.03 *Dirty Transmitter Caps:* Remove caps which are dirty but not cloudy or discolored and wash in a solution of soap and lukewarm water. If the caps cannot be released for washing, wipe them with a clean KS-2423 cloth slightly dampened with water.

4.04 *Transmitter Cases:* Shake or blow dirt and dust out of the transmitter cases with the R-8950 syringe and wipe the exteriors with a cloth slightly dampened with water.

4.05 Dry the cases and caps before the transmitter units are assembled in the cases as covered in 3.23 or 3.24, as applicable. If difficulty is encountered in screwing the caps or the cases, apply clear petrolatum very sparingly to the threads of the cases.

*Caution: Do not use alcohol or a chloride base cleaner as these will attack the case and cap material and may render the set flammable.*

##### Receiver Caps and Cases

4.06 *Cloudy or Discolored Receiver Caps:* Remove receiver caps which are cloudy or discolored from the receiver cases. Clean the caps with a small amount of Bell System metal polish applied to a slightly dampened KS-2423 cloth. Take care that the metal polish does not clog the holes in the caps. Wash the caps in a solution of soap and lukewarm water. If the metal polish did clog the holes and was not removed by washing, blow it out with the R-8950 syringe and wash the caps again.

4.07 *Dirty Receiver Caps:* Remove caps which are dirty but not cloudy or discolored and wash in a solution of soap and lukewarm water. If the caps cannot be released for washing, it will be satisfactory to wipe them with a clean, dry KS-2423 cloth.

4.08 *Receiver Cases:* Shake or blow dirt and dust out of the receiver cases with the R-8950 syringe and wipe the exteriors with a cloth slightly dampened with water.

4.09 Dry the holders and caps before the receiver units are assembled in the cases. When positioning an HC1 or HC2 receiver unit in the case, mount it so that the receiver terminals are in the position nearest the ends of the contact springs. When positioning an HC3 or HC4 unit, mount it so that the code marking on the unit is at the opposite side of the receiver case from the binding posts. If difficulty is encountered in screwing the caps on the cases, apply clear petrolatum very sparingly to the threads of the cases.

**Caution:** Do not use alcohol or a chloride base cleaner as these will attack the case and cap material and may render the set flammable.

**Removable Synthetic and Foam Rubber Headband Pads (15A headband) and Synthetic Foam Headband Pad (15F headband)**

4.10 Remove the pad from the headband. Wipe with a clean KS-2423 cloth slightly dampened with a solution of mild detergent and water. Care should be exercised when wiping the pad so as not to let the water get into the slots of the pad. After wiping the foam rubber pad, allow it to dry with the slots down. Remount the dry pad on the headband.

**Nonremovable Headband Pad (15C headband)**

4.11 Wipe with a clean KS-2423 cloth slightly dampened with a solution of mild detergent and water. Care should be exercised when wiping the pad so as not to let the water get on the inside surface of the pad at the ends. Allow to dry before using.

**5. MINOR REPAIRS**

**KS-8010 Switch**

5.01 If the cord is not gripped securely by the retaining walls of the KS-8010 switch, proceed as follows. Remove the clamping screws of the switch using the KS-6854 screwdriver and separate the switch halves. Build up the cord with several turns of friction tape at a position between the two green or yellow conductors and approximately 1/4 inch from the conductor nearer the cord body. The buildup should allow the cord to be held firmly in the switch, but not so tightly that there is a possibility of the switch walls breaking. Reassemble the switch and tighten the screws securely.

**Headband**

5.02 Reform any badly bent headband wires. Take care when doing this that the wires will hold any adjusted positions but can still be moved through the cradle without bending.

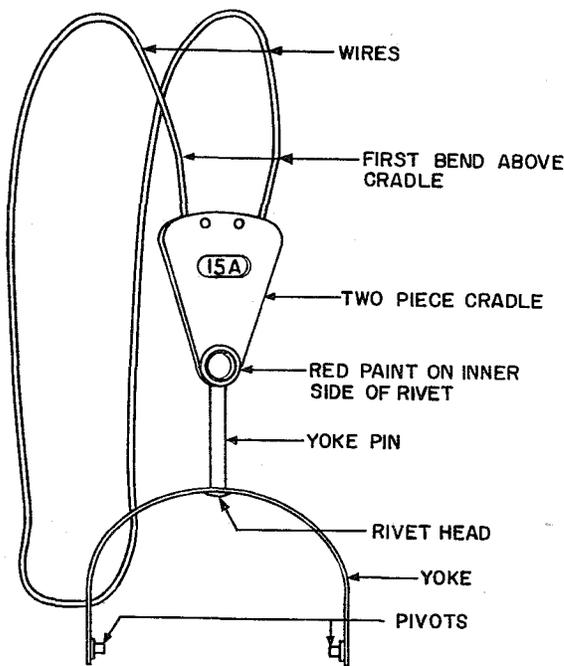


Fig. 19A

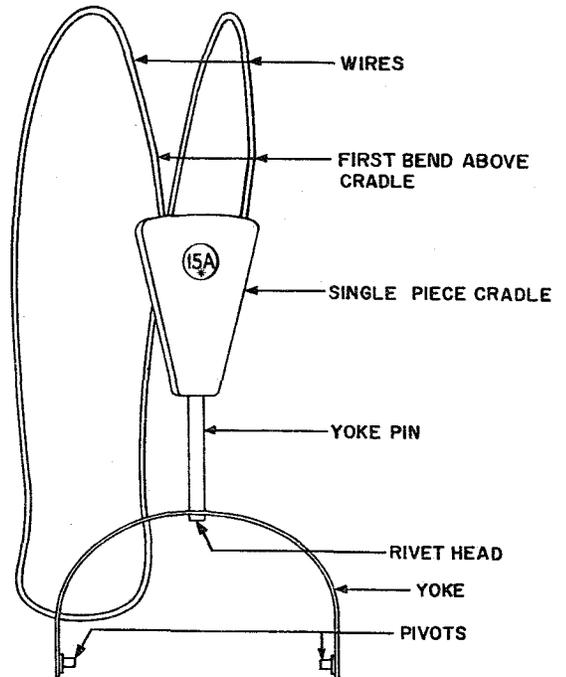


Fig. 19B

Fig. 19 - Headband

**5.03** Where the yoke pin binds in the one-piece cradle (except cradles that have an asterisk under the code marking), lubricate it as follows. Pull the pin out from the cradle as far as possible. With the yoke pin in the fully extended position, apply a thin film of KS-8496 lubricating compound to the shaft of the pin for a distance of 1/2 inch from the cradle. Work the pin back and forth through the cradle to check that it no longer binds.

**5.04** Where a yoke pin is so loose in the cradle that the receiver holder can no longer be held in an adjusted position, replace the headband.

**5.05** When a headband is new, the joint between the yoke and the yoke pin is tight. With use this joint may become loose, allowing some play between the yoke and the yoke pin. Eventually the yoke pin may break away from the yoke, particularly if the yoke pin is riveted by the earlier method as shown in Fig. 19(A), where the riveted part is thin at the edges. Where there is play between these parts and it appears that the yoke pin may break away from the yoke, replace the headband. Do not attempt to repair the riveted joint.

**5.06** Do not attempt to repair headbands when the headband wires are marked sufficiently to impair their strength. Disregard nicks or cuts of a minor nature, such as rub marks or flattened areas at the first bend just above the cradle as shown in Fig. 19. Replace any headband on which nicks are deep enough to snag the fingernail as it is run along the wire.

**5.07** If a yoke does not hold a receiver, adjust the yoke as required. To do this, hold the yoke between the fingers and apply pressure taking care not to distort the yoke. Excessive bending of the yoke may weaken it in the section riveted to the yoke pin.

#### REASONS FOR REISSUE

1. To add a paragraph covering the information for handling the sets (1.07).
2. To add a paragraph covering the use of the 153A and 153B amplifiers (1.08).
3. To add the information covering the principal uses of the sets (1.09 and Table A).
4. To revise Fig. 1, 2, 3, 5, 6, and 12.
5. To add Fig. 4, 9, 14, and 18.
6. To add Table B.
7. To revise the procedures for replacing the receiver unit (3.06).
8. To revise the procedures for replacing the transmitter unit (3.22, 3.23, and 3.24).
9. To revise the procedures for replacing the transmitter arm assembly (3.27 and 3.30).
10. To add the procedures for replacing the transmitter terminal clamping screws (3.31 and 3.34).
11. To revise the procedures for replacing the plug clamp, stay hook, and 126 cord tip associated with the 289A and 289B plugs (3.43 and 3.44).
12. To amplify the procedure for replacing the plugs to cover the 338A plugs (3.45).
13. To add the procedure for replacing the switches (3.47).
14. To add the procedure for replacing the cord fastener associated with the 422A plug (3.51).
15. To add the procedure for replacing the synthetic foam headband pad (3.57).
16. To revise the procedure for cleaning the headband pads to cover the synthetic foam headband pad (4.10).
17. To add the procedure for cleaning the non-removable headband pad (4.11).