

## KS-20778 HEAD TELEPHONE SETS AND ♦KS-21430 HEADSET♦

### 1. GENERAL

**1.01** This section covers the description, use, and maintenance of the KS-20778 L1 through L15 (Manufacture Discontinued) and L1A through L16A head telephone sets and the ♦KS-21430 headset♦. The KS-20778 L1 through L15 head telephone sets are intended for use by private branch exchange (PBX) and console attendants, attendant supervisors, Federal Aviation Agency (FAA) personnel in 4-wire and 6-wire circuits, and for customer use with jack-equipped station sets. The KS-20778 L1 through L15 head telephone sets are not approved for use at operator service positions. The KS-20778 L1A through L16A head telephone sets are intended for general use in the Bell System including FAA 4-wire and 6-wire circuits. ♦The KS-21430 headset is used at service observing desks♦.

The 20778 L1A through L16A head telephone sets are equipped with a new design amplifier and a smaller-diameter earpiece tube. The new amplifier and earpiece can be used as a conversion or direct replacement components on old-type KS-20778 head telephone sets now in use.

**Note:** ♦The earpiece cannot be replaced on older L1 through L15 units without also replacing the new amplifier♦.

The 20778 L1A through L16A head telephone sets may be used as an alternative for the 52-type head telephone sets in both operator and PBX-type applications.

**1.02** This section is reissued to include information on the KS-21430 headset. This reissue does not affect the Equipment Test List.

**1.03** The KS-20778 head telephone set ♦and the KS-21430 headset♦ (Fig. 1, 2, and 3) are lightweight sets which do not require headbands. The sets are held on the head by a flat, plastic capsule shaped to fit behind and around either outer ear or by a clip attached to the user's glasses. A cable clamp is provided to permit the user to anchor the cable to his clothing.

**1.04** The receiver unit of the KS-20778 head telephone set is acoustically coupled to the ear by a small plastic tube and ear tip. In the KS-20778 L1 through L15 and L1A through L16A, sound is conducted from the user's mouth to the transmitter unit by means of a colorless plastic tube which can be rotated and adjusted for length. A transistor amplifier increases the transmitter output to a level suitable for telephone use.

**1.05** Each head telephone set except the KS-20778 L16A is furnished with a box containing six plastic earpieces of graded sizes, two eyeglass mounting clips, and an instruction booklet. The KS-20778 L16A is furnished with an instruction book but not with earpiece kit or eyeglass mounting clips. A lanyard is provided with L1A through L3A and L16A sets. A cradle which may be clipped to a desk telephone set is included with L1, L2, L1A, and L2A sets. Each set is provided with a zippered, plastic pouch for storage. See Table A for other items provided with each list number.

**1.06** The FAA sets are available in black only. All other sets are available in beige only.

**1.07** The KS-20778 head telephone sets provide proper transmission levels when used with station equipment having 241A transmit amplifier on loops which do not exceed the **resistance design limit** of 1300 ohms. For use of head telephone set on loops which exceed the **resistance design limit**, it is recommended that a 241B amplifier be used as the internal transmit amplifier in the station equipment. When the head telephone sets are used with telephone sets or PBX consoles which contain internal transmit amplifiers, a 52- or 53-type headset should not be placed in parallel as the low impedance of the carbon transmitter will seriously reduce the gain of the head telephone set amplifier.

**1.08** When the KS-20778 head telephone set is used at 1- and 2-type attendant telephone consoles, it is necessary to remove the 68-ohm dummy loading resistors across the console head telephone set jacks. The dummy load resistors were originally provided to ensure a constant transmit level when either one or two head telephone sets were used. The resistors designated R1 and R2

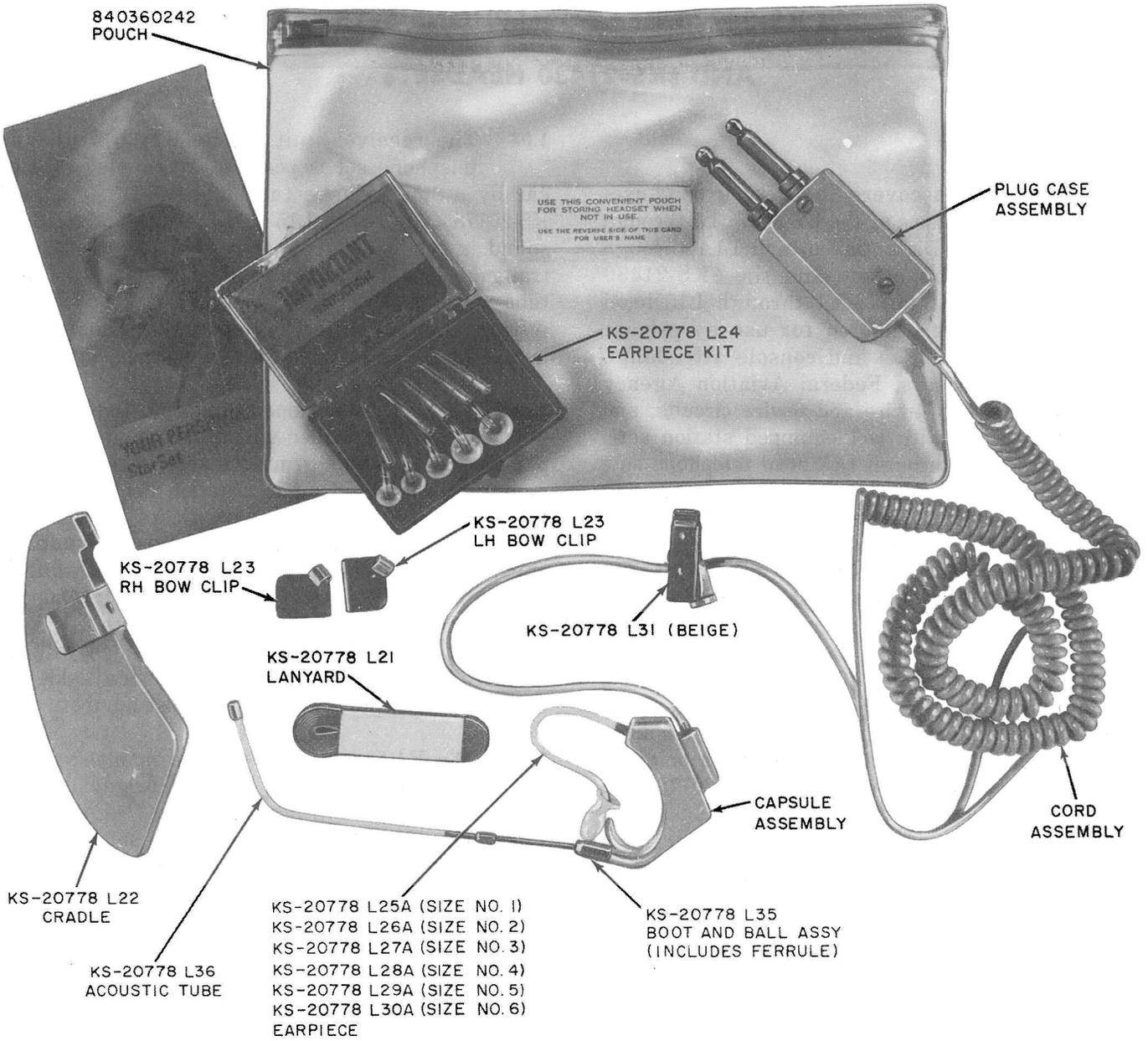


Fig. 1—KS-20778 L1, L2, L1A, L2A, and L16A Head Telephone Sets (L1 Shown)

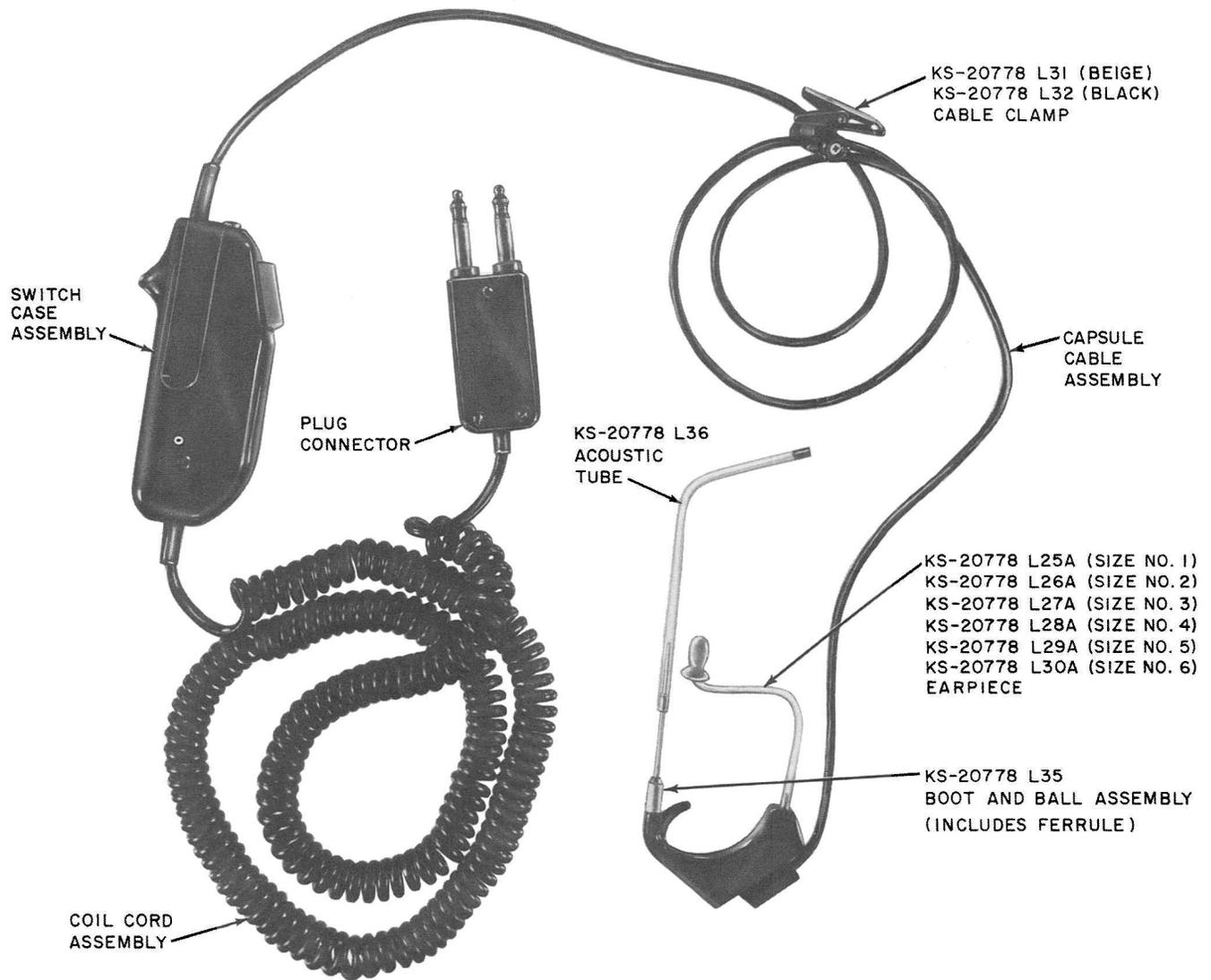


Fig. 2—KS-20778 L3 Through L15 and L3A Through L15A Head Telephone Sets (L14 Shown)

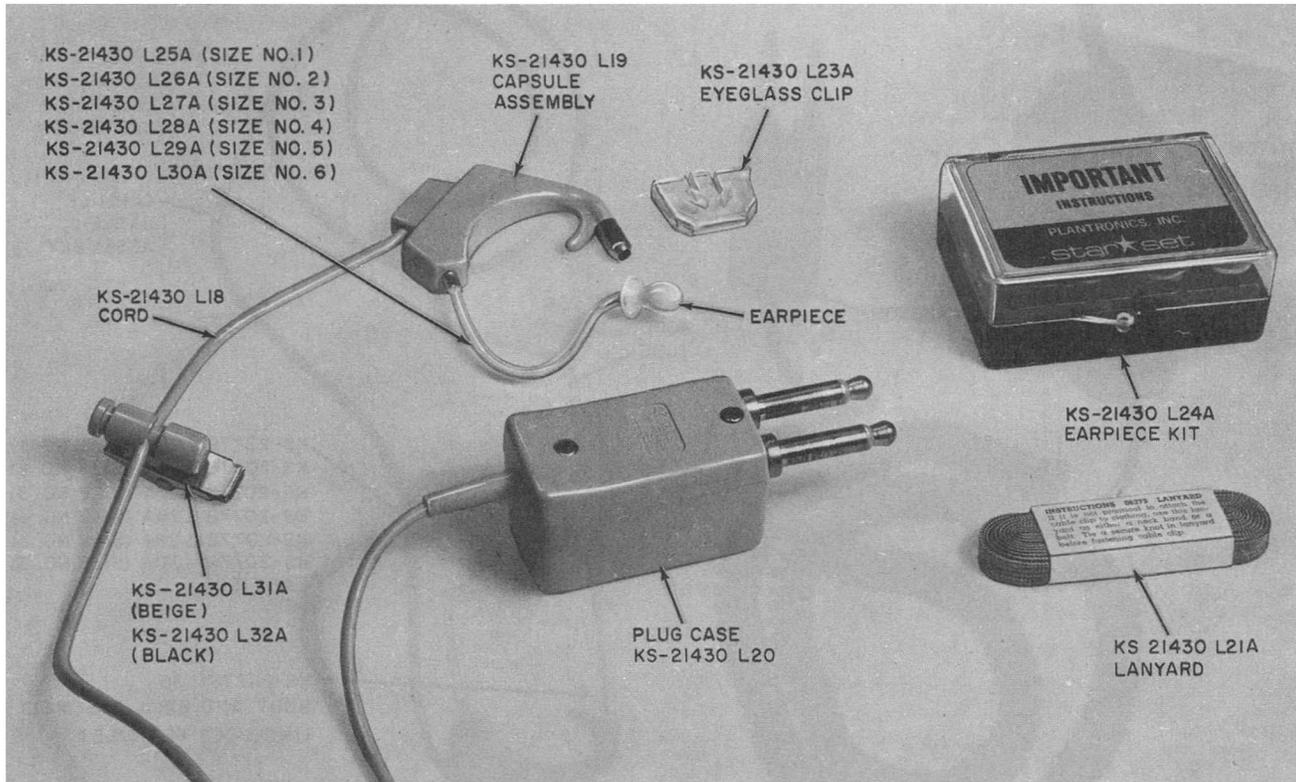


Fig. 3—KS-21430 Headset

on SD-67001-01 may be removed simply by cutting the resistor leads off as close to the jack as practicable. (See Fig. 4.) Removal of the resistors will also improve the transmit levels of the other types of head telephone sets.

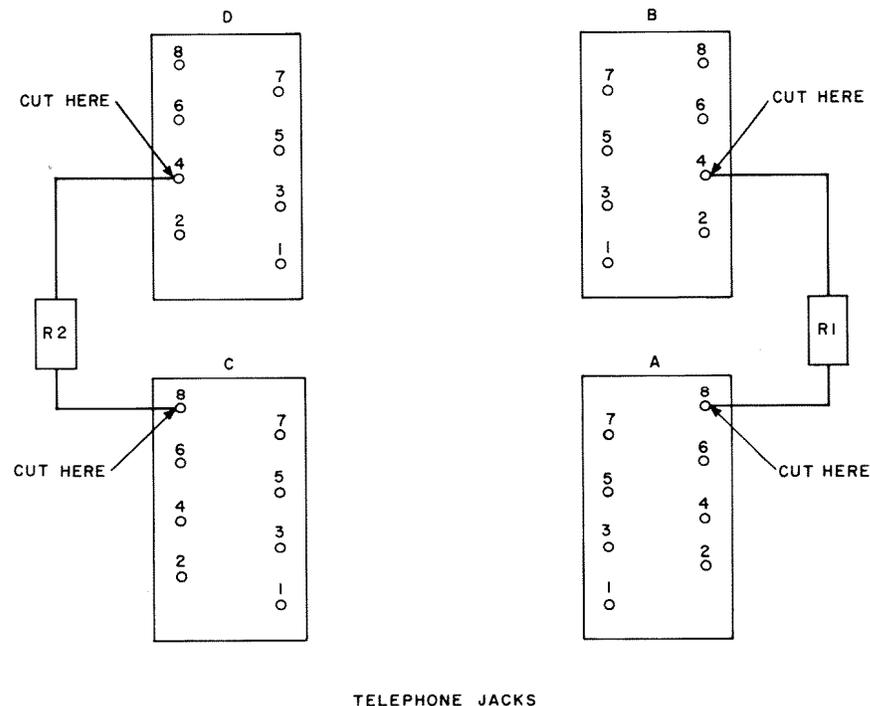
**1.09** Table A lists the principal applications of the KS-20778 head telephone sets and the differences in equipment features of the various sets.

**1.10** In the KS-21430 headset, a miniature, magnetic transducer is used for the receiver unit. The receiver unit is coupled to the ear by a small, plastic tube and tip. The KS-21430 headset can be used as an alternate for 1020B or 1026A headset.

**1.11** Excessive mechanical abuse, including raps against a hard surface, can damage components in the capsule and amplifier.

**1.12** Spare head telephone sets should be substituted for sets which are reported as being in trouble several times during a period of 30 days, and on which the tests and inspections covered herein have disclosed no defects. These sets should be returned to Western Electric for repair and tagged "Intermittent Trouble."

**1.13** Most of the head telephone sets will be stamped on the amplifier case with the Bell System emblem and the legend, "Bell System Property—Not for Sale." All Bell System head telephone sets date stamped 12-70 and after will have the letter B immediately after the stampings on both the capsule and amplifier case. If the head telephone set is identified as non-Bell System, follow the local procedure for reporting this as a suspected illegal installation.



**Fig. 4—1- and 2-Type Attendant Telephone Consoles—Partial Wiring Diagram**

TABLE A  
 PRINCIPAL USES AND FEATURES OF KS-20778  
 HEAD TELEPHONE SETS

KS-20778, LIST NO.	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L1A	L2A	L3A	L4A	L5A	L6A	L7A	L8A	L9A	L10A	L11A	L12A	L13A	L14A	L15A	L16A	
Station Set	X															X																
Operator*	X	X														X	X															X
Supervisor*			X															X														
Color Beige	X	X	X													X	X	X														X
Color Black				X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	
FAA Personnel 4-Wire Circuits				X	X	X	X	X	X										X	X	X	X	X	X								
FAA Personnel 6-Wire Circuits											X	X	X	X	X										X	X	X	X	X	X		
Coil Cord 10'	X															X																
Straight Cord 5' Long																																X
Wrist Loop			X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Straight Cord 7' Long		X															X															
Coil Cord (4 Cond) 10'			X	X														X	X				X									
Coil Cord (4 Cond) 15'					X			X												X			X									
Coil Cord (4 Cond) 25'						X			X												X			X								
Coil Cord (6 Cond) 10'										X			X												X			X				
Coil Cord (6 Cond) 15'											X			X													X			X		
Coil Cord (6 Cond) 25'												X			X												X			X		
Amplifier & Case/Plug	X	X														X	X															
Capsule Cord 45"			X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Amplifier & Case With Locking Switch			X	X	X	X				X	X	X						X	X	X	X				X	X	X					
Amplifier & Case With Nonlocking Switch							X	X	X				X	X	X								X	X	X				X	X	X	
Plug 425A 6-Wire										X	X	X	X	X	X											X	X	X	X	X	X	
Plug 464A 4-Wire			X	X	X	X	X	X	X									X	X	X	X	X	X	X								
Receiver 300 Ohm	X	X	X													X	X	X														X
Receiver 600 Ohm				X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	
Eyeglass Clips	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Headset Cradle	X	X														X	X															
Earpiece Kit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Pouch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lanyard	X	X	X													X	X	X														X
Instruction Booklet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

\* See 1.01.

## 2. VISUAL INSPECTION

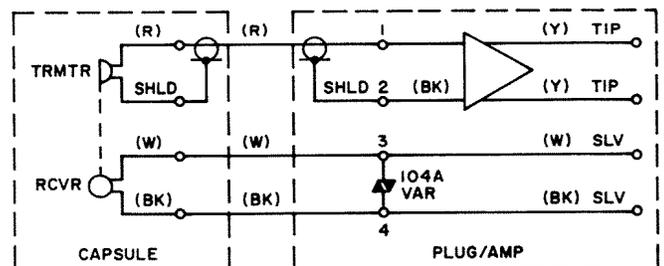
**2.01** The head telephone set or headset should be inspected according to the following procedure.

STEP	ACTION	VERIFICATION
1	Inspect for the presence of all parts. (See Fig. 1 through 3.)	Replace head telephone set or parts.
2	Inspect for soiled, cut, crushed, kinked, or abraded cord and wrist loop (if used).	Clean or replace defective cord or wrist loop.
3	Inspect for stained, broken, cracked, or chipped plastic parts.	Clean or replace head telephone set or defective parts.
4	Inspect for deformed, mutilated, plugged, or loose speech tube assembly.	Replace defective speech tube assembly.
5	Inspect for cracked or plugged tube and ear tip.	Clean or replace ear tip.
6	Inspect clothes clip for proper operation.	Replace defective clothes clip.
7	Inspect for dirty or damaged plug profiles.	Clean or replace damaged parts.
8	Inspect amplifier switch for easy operation and locking.	Replace defective switch.

## 3. ELECTRICAL TESTS

**Caution:** Do not apply an ohmmeter to the plug tips since many ohmmeters use battery supplies in excess of 6 volts and could damage amplifier components.

**3.01** Connect head telephone set to suitable 4- or 6-wire circuit and activate. Most troubles can be found by talking, whistling, or blowing into the speech tube and listening to the receiver response. Reverse head telephone set plug and repeat. Trouble location can best be isolated by interchanging capsule and amplifier from known good head telephone set. The information included in this paragraph is given to aid in determining the cause and correction of any trouble (Fig. 5, 6, and 7).



**Fig. 5—KS-20778 L1, L2, L1A, L2A, and L16A Headset Schematic**

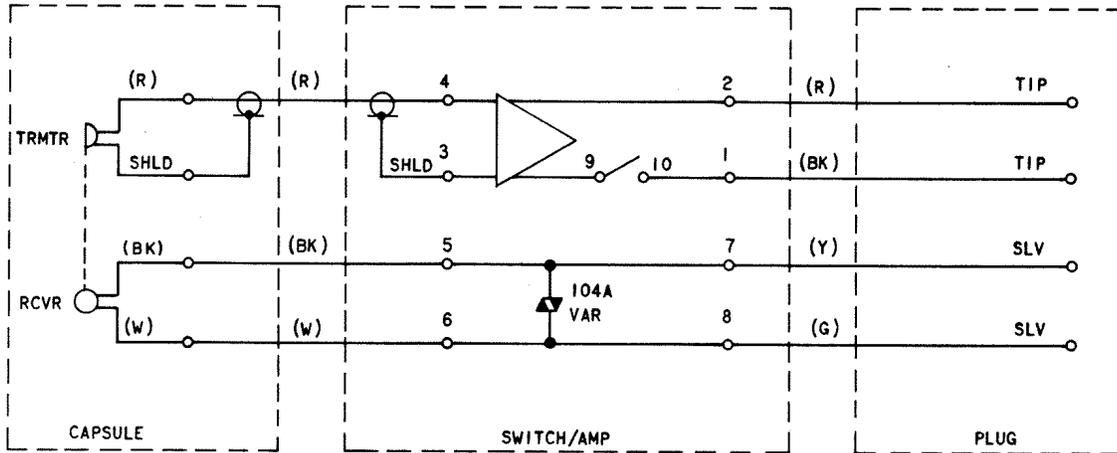


Fig. 6—KS-20778 L3 Through L9 and L3A Through L9A Headset Schematic

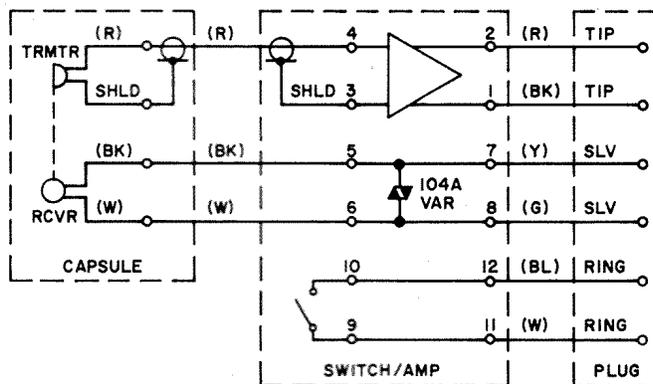
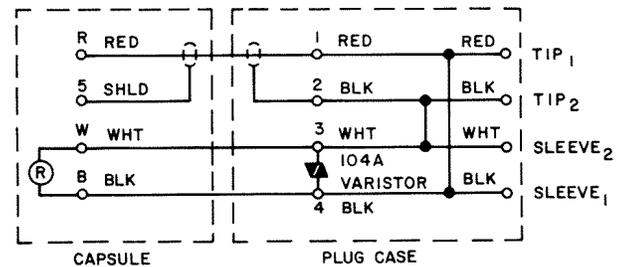


Fig. 7—KS-20778 L10 Through L15 and L10A Through L15A Headset Schematic

**ELECTRICAL TEST FOR KS-20778 L1 THROUGH L15  
AND L1A THROUGH L16A**

STEP	TROUBLE SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1	No sidetone, intermittent sidetone.  <i>Caution: For hygienic reasons do not insert operator's personal earpiece into ear.</i>	Loose connections in amplifier, switch, or plugs.  Defective cord.  Defective capsule.  Defective amplifier.  Defective switch on amplifier (if used).	Check and tighten connections.  Replace.  Replace.  Replace.  Replace.
2	No sidetone when telephone set plug is reversed.	Defective amplifier.	Replace.
3	Receiver noisy when cord is twisted or shaken.	Loose connections at amplifier or plugs.  Defective cord.	Check and tighten connections.  Replace.
4	Crackling noise in receiver when push-to-talk amplifier switch is operated.	Loose connections at amplifier switch.  Defective switch.	Check and tighten connections.  Replace.

**3.02** While listening in the headset receiver, insert the plug into a suitable attendant circuit (Fig. 8).



**Fig. 8—Schematic for KS-21430 Headset Plug**

**ELECTRICAL TEST FOR KS-21430**

STEP	TROUBLE SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1	No click or circuit noise.	Loose connections at receiver end or plug end.  Defective cord.  Defective plug.  Defective receiver.	Check and tighten connections.  Replace.  Replace.  Replace.

#### 4. REPLACEMENT PARTS

**4.01** Fig. 1, 2, and 3 show the relationship of the various parts of the head telephone sets and headset. The replacement part numbers of these parts are given together with the names as listed by the Western Electric Company Merchandise Department.

**4.02** Except for L18, L19, and L20, KS-20778 and KS-21430 components are interchangeable and can be ordered by the same list number under either specification.

**4.03** When ordering replacement parts, give both the replacement part number and the name; for example, Tube, Acoustic, KS-20778 L36. Do not refer to the BSP number.

#### 5. REPLACEMENT PROCEDURES

**5.01** The only items to be replaced in the field are shown and identified by part number on Fig. 1, 2, and 3. Do not attempt to replace or repair the capsule assembly, switch case assembly, plug case assembly, or cords. These items shall be returned in accordance with local instructions to the Western Electric Company for exchange or repair by the manufacturer. If the receiver, transmitter, and amplifier circuit board fail from normal usage during the 2-year warranty period, the manufacturer will repair or replace the defective item. The date of shipment stamped on the amplifier and capsule cases indicate the warranty effective date. Where field replacement of cords may be locally authorized such as large or attended installations, the KS-21733 L1 test fixture will greatly aid in assembly. For authorized locations, a detailed service manual is available from the manufacturer through Western Electric Company as "Starset\* Service Manual 06480-00."

\* Registered trademark of Plantronics, Inc.

**5.02 Earpiece:** To remove the earpiece for replacement, grasp the tube adjacent to its attachment at the capsule and pull it off the projecting insert. Substitute the new earpiece and push it on the projecting insert.

**5.03 Acoustic Tube:** Remove the plastic acoustic tube by sliding it off the metal tube of the ball assembly. Substitute the new plastic tube, and using a rotary motion, slide it on the metal tube.

**Caution:** Do not bend the acoustic tube since it has been shaped by the manufacturer for best results.

**5.04 Boot and Ball Assembly:** To remove the boot and ball assembly, grip the ferrule and push it toward the head telephone set capsule. Rotate the ferrule counterclockwise until the pins are aligned with the slots in the ferrule, and remove the ferrule from the end of the capsule. Substitute the new boot and ball assembly, and install in the reverse order of removal.

**5.05 Cable Clamp:** The cable clamp may be slipped up and down the cord by squeezing the ends of the clamp together. To replace the cable clamp, remove the associated screw using a B screwdriver, size 1, and remove the cable clamp. Substitute the new cable clamp, and install in the reverse order of removal. (See Fig. 9.)

**Note:** Clipping the cable clamp to a stationary object will facilitate the removal and replacement of the clamp.

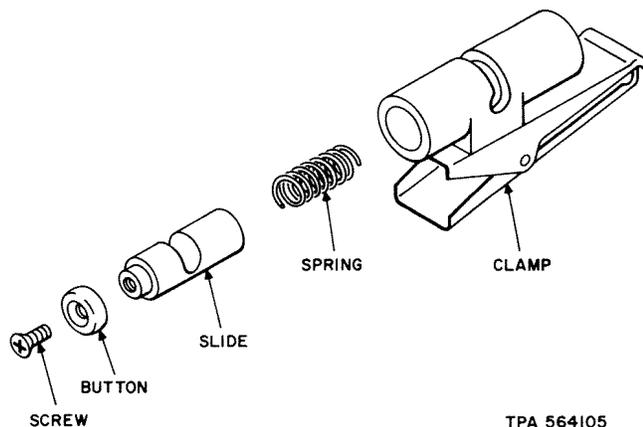


Fig. 9—Cable Clamps—Exploded View

**6. CLEANING PROCEDURE**

**Note:** It is the user's responsibility to keep his earpiece clean by following procedures described in the instruction book.

**6.01** The earpiece assembly should always be kept clean. Particular attention should be paid to keeping the sound opening unobstructed (free from wax).

**6.02** Soap and water are recommended as a cleaning agent. Do not use cleaning solvents or detergents.

**6.03** Where possible, visible contaminants should be removed with clean tissue, cloth, or cotton. Further cleaning or washing should be done with the earpiece removed from the capsule. Do not use electric polisher on the plugs.

**6.04** The cleaning agent should be wiped dry and accumulations thereof should not be allowed to obstruct the openings. Blowing through the tube will remove the agents.

KS-20778 HEAD TELEPHONE SETS  
AND KS-21430 HEADSET

1. GENERAL

1.001 This addendum supplements Section 028-351-501.

1.002 It is reissued to delete all reference to the KS-21430 Headset in the main section.

1.003 Descriptive and ordering information for a socket cover replacement on the capsule assembly covered in the previous addendum is retained.

1.004 The KS-21430 Headset is nonstandard for Pacific Telephone (PAC) use. The PAC standard headset, for Service Observers, is the Plantronics HS-0140. Information on this headset is found in Section 028-350-900PT.

4. REPLACEMENT PARTS

The following change applies to Part 4 of the section:

- (a) 4.04 — added

4.04 A new capsule assembly socket cover can be obtained for field replacement of previously broken socket covers. The replacement socket cover is being manufactured from a polyvinylchloride material, rather than the old lexan material, and can be identified by an "X" molded into the inside of the cover near the cord entry slot. The replacement socket cover can be ordered as follows:

Cover, Socket, 06907-10

5. REPLACEMENT PROCEDURES

The following change applies to Part 5 of the section:

- (a) 5.06 — added

5.06 **Socket Cover:** The socket cover can be removed from the capsule assembly by removing the center screw on the socket cover using an appropriate type screwdriver. Substitute the new socket cover and reinsert the center screw until cover is tightly secured.