KS-21118 HEAD TELEPHONE SETS

1. GENERAL

1.01 This section covers the description, use, and maintenance of the KS-21118 L1 through L16 and L21 through L36 head telephone sets. These headsets are intended for general use in the Bell System including FAA 4- and 6-wire circuits.

1.02 This section is reissued for the following reasons:

- To add voice switching information in 1.04
- To revise Table A
- To replace the RS-1705 test fixture with the KS-21233 L1 assembly fixture in the tool list and 5.09
- To change the part number from P-90D260 to P-90D215 in 5.11
- To revise Fig. 1, 2, 3, 4, 8, 11, and 12
- To make minor changes, as required.

1.03 The KS-21118 head telephone sets (Fig. 1 through 4) are lightweight sets which are supported by the ear. Miniature magnetic transducers are used for the transmitter and receiver units. The L1 through L16 headsets are identical to the L21 through L36 headsets except for the shape of the plastic capsule. An instruction booklet is furnished with each headset illustrating how the headsets should be worn.

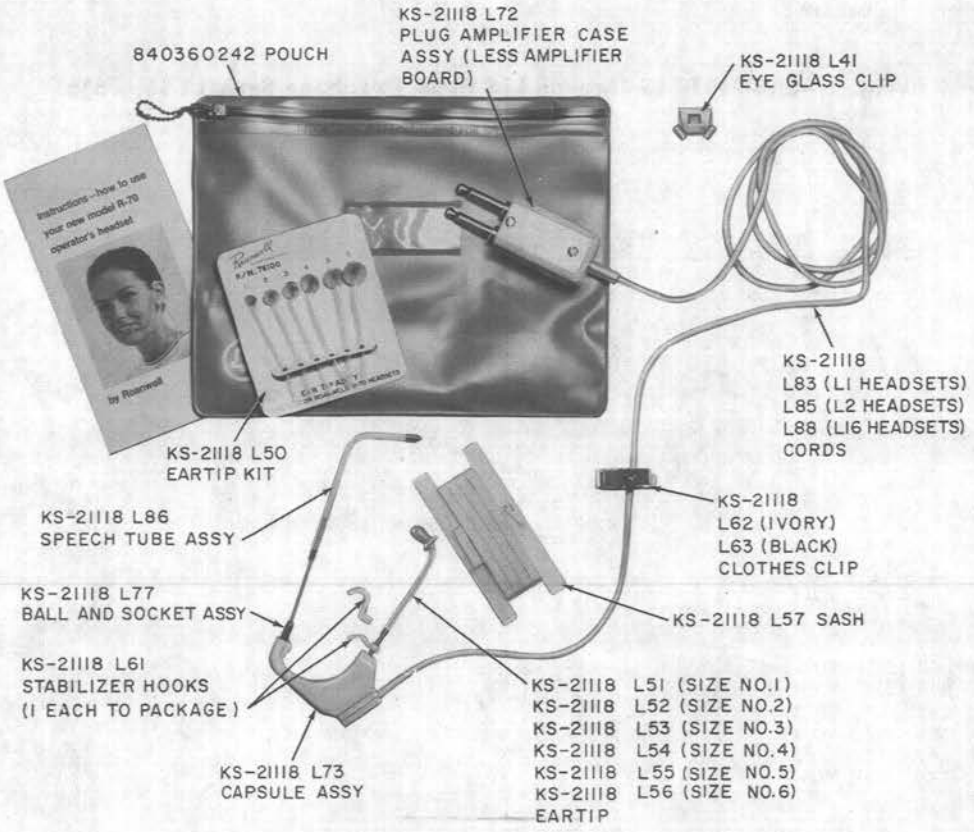

Fig. 1—KS-21118 L1, L2, and L16 Head Telephone Sets (L2 Shown)

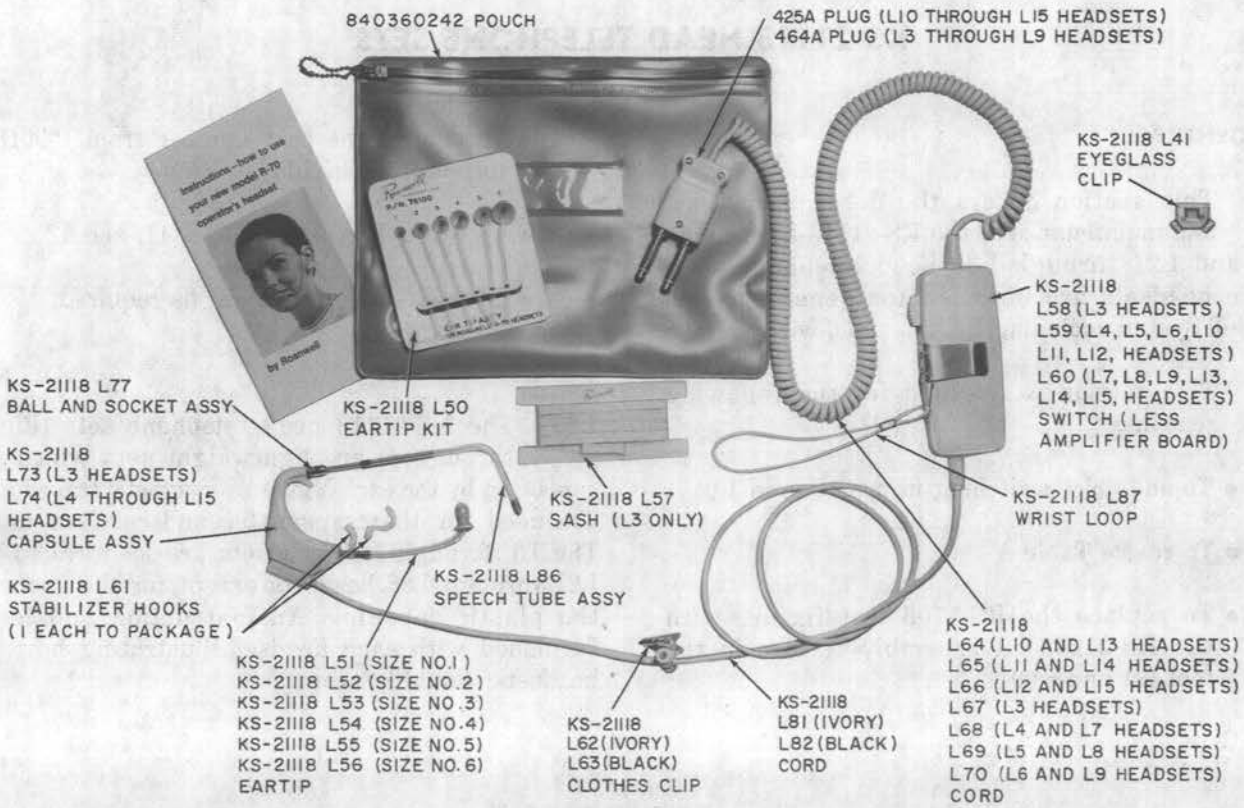

Fig. 2—KS-21118 L3 Through L15 Head Telephone Sets (L3 Shown)

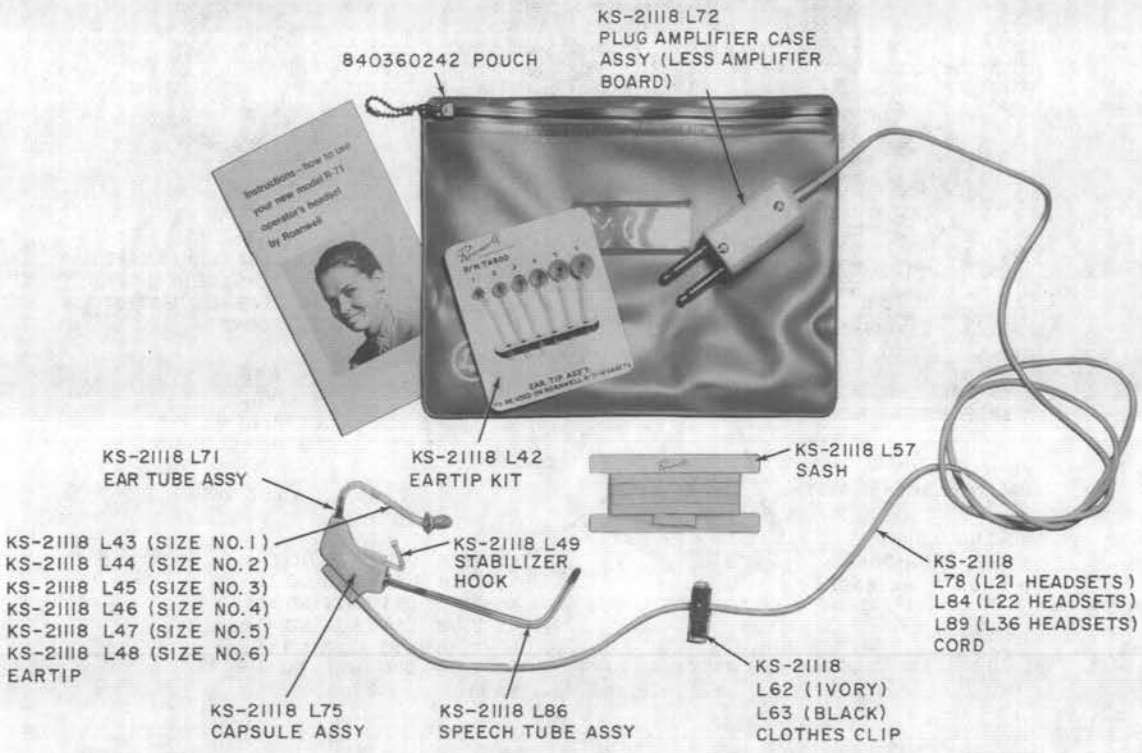

Fig. 3—KS-21118 L21, L22, and L36 Head Telephone Sets (L22 Shown)

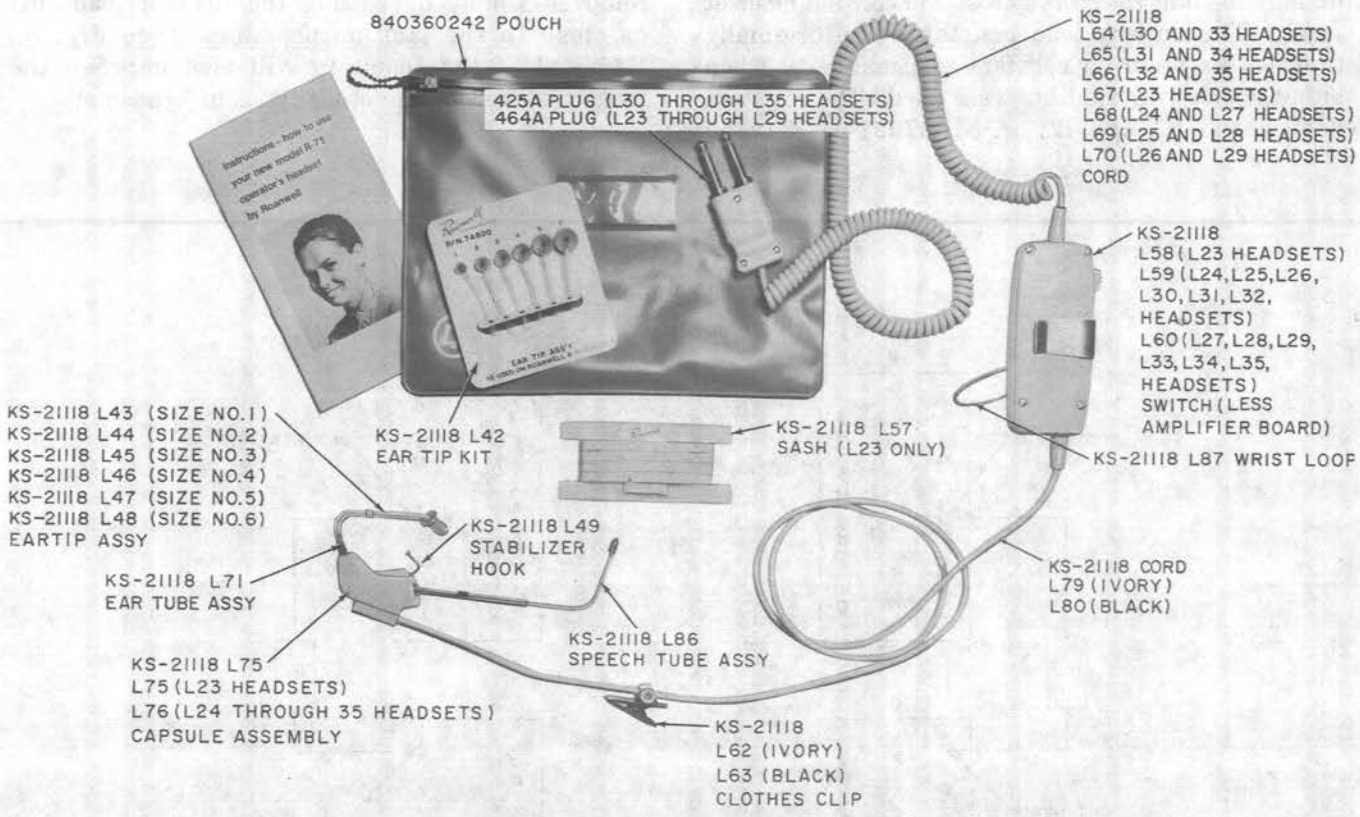

Fig. 4—KS-21118 L23 Through L35 Head Telephone Sets (L23 Shown)

1.04 The head telephone set receiver is coupled to the ear through a flexible tube and eartip assembly. Speech is transmitted through an adjustable plastic tube to the transmitter in the ear capsule. A cord connects the ear capsule to a plug containing a transmitting amplifier. The amplifier automatically adjusts its gain to provide the proper level for either the operator telephone circuit or jack-equipped telephone/PBX circuits. Voice switching is provided to suppress background noise.

1.05 Each head telephone set except the L16 and L36 is furnished with a card containing six eartips of graded sizes and an instruction booklet. Each List 1 through List 16 headset contains an eyeglass mounting clip. An adjustable clothes clip attached to the cord protects the operator from forces on the cord being transmitted to the ear. The clothes clip may also be attached to the sash provided with Lists 1, 2, 3, 16, 21, 22, 23, and 36 headsets. Each headset and its accessories are contained in a zippered plastic pouch.

1.06 The FAA headsets are available in black only. All other headsets are available in ivory only.

1.07 The KS-21118 headsets provide proper transmission levels when used with either operators' circuits or station equipment having a 241-type transmit amplifier on loops which do not exceed the ***Resistance Design Limit*** of 1300 ohms. For use of headsets 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 headsets 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 resistance of the carbon transmitter will seriously reduce the gain of the headset amplifier.

1.08 When the KS-21118 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 headset jacks. The dummy load resistors were originally provided to ensure a constant transmit level when either one or two headsets were used. The resistors designated R1 and R2 on SD-67001-01 may be removed simply by cutting the resistor leads off as close to the jack as possible. (See Fig. 5.) Removal of the resistors will also improve the transmit levels of the other types of headsets.

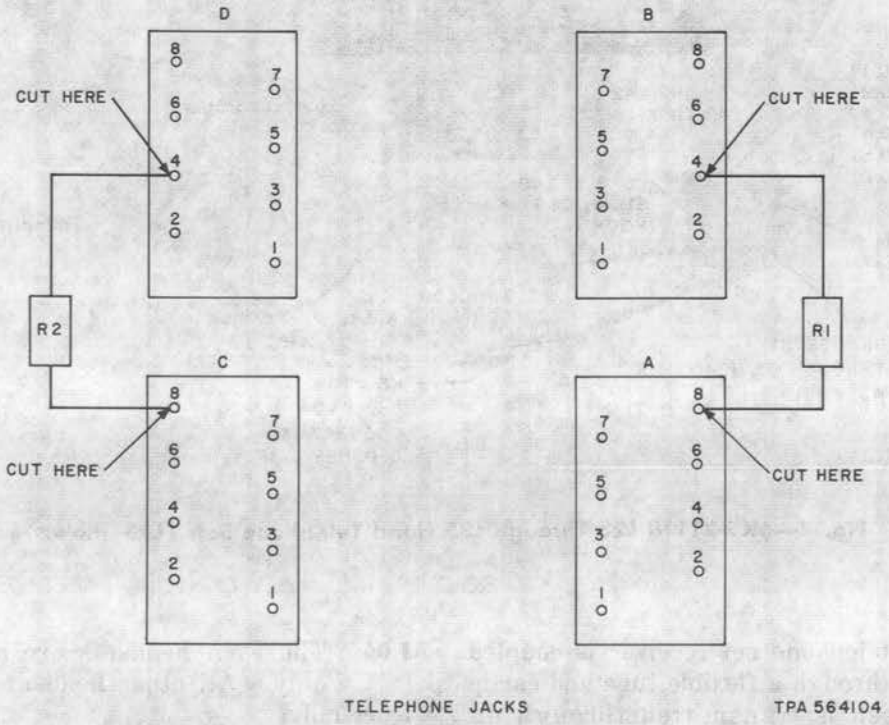

Fig. 5—1- and 2-Type Attendant Telephone Consoles—Partial Wiring Diagram

1.09 Table A lists the principal applications of the KS-21118 head telephone sets and the differences in equipment features of the various sets.

◗ TABLE A ◖

PRINCIPAL USES AND FEATURES OF KS-21118 HEAD TELEPHONE SETS

KS-21118, LIST NO.	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36
Attendant	X	X														X	X	X														X
Supervisor			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	X	
Color ivory	X	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	
Cord, 10′ coil, 30″ straight	X																X															
Straight cord, 5′ long																X																X
Straight cord, 7′ long		X																X														
Coil cord (4 Cond), 10′			X	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 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	
Amplifier & case/plug	X	X														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	
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													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	
Eyeglass clip	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																
Eartip 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	
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
Sash	X	X	X													X	X	X	X													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	

1.10 Excessive mechanical abuse, including raps against a hard surface, can damage components in the capsule and amplifier. The lightweight headsets are inherently not as rugged as the 52-type headset.

1.11 Spare head telephone sets should be substituted for headsets 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 headsets should be returned to Western Electric for repair and tagged "Intermittent Trouble."

1.12 The amplifier and switch housings will be marked with the Bell System emblem and the legend, "Bell System Property—Not for Sale—KS-21118." The plastic capsule housing will be marked with the manufacturer's model number, a date stamp, and "KS-21118." If the headset is identified as non-Bell System, do not repair but dispose of the headset according to local procedures.

2. VISUAL INSPECTION

2.01 The headsets should be inspected according to the following procedure.

STEP	ACTION	VERIFICATION
1	Inspect for the presence of all parts. (See Fig. 1 through 4.)	Replace headset 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 headset 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 eartip.	Clean or replace eartip.
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 L58 through L60 switch for easy operation and locking.	Replace defective switch.

3. ELECTRICAL TEST

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 headset 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 headset plug and repeat. ◗Trouble location can best be isolated by interchanging capsule and amplifier from known good headset.◖ The information included in this paragraph is given to aid in determining the cause and correction of any troubles.

STEP	TROUBLE SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1	No sidetone, intermittent sidetone.	Loose connections in amplifier, amplifier switch (if used), or plugs.	Check and tighten connections.
		Defective cord.	Replace.
		Defective capsule.	Replace.
		Defective amplifier.	Replace.
		Defective switch on amplifier (if used).	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.	Check and tighten connections.
		Defective cord.	Replace.
4	Crackling noises in receiver when switch on L58 through L60 amplifier is operated.	Loose connections at amplifier switch.	Check and tighten connections.
		Defective switch.	Replace.

4. REPLACEMENT PARTS

4.01 Fig. 1 through 4 and 6 through 9 show the relationship of the various parts of the head telephone sets. The replacement part numbers of these parts are given together with the names as listed by the Western Electric Company Merchandise Department.

4.02 A KS-21118 L41 Universal Eyeglass Clip is available for mounting the capsule to the eyeglass frame (List 1 through List 16 headsets only).

4.03 When ordering replacement parts, give both the replacement part number and the name; for example: Eartip, KS-21118 L51. Do not refer to the BSP number.

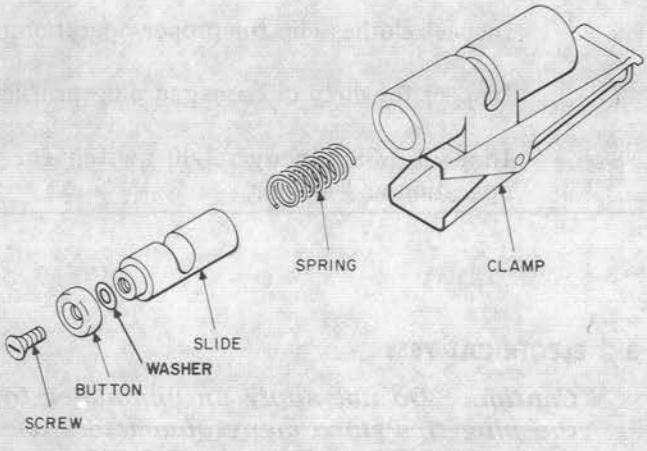

Fig. 6—Clothes Clip—Exploded View

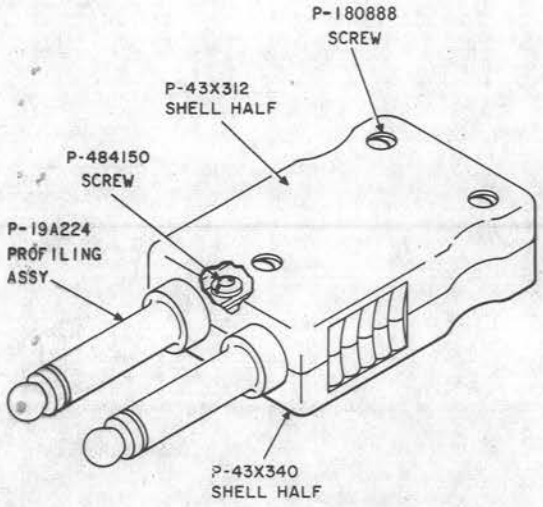

Fig. 7—464A Plug

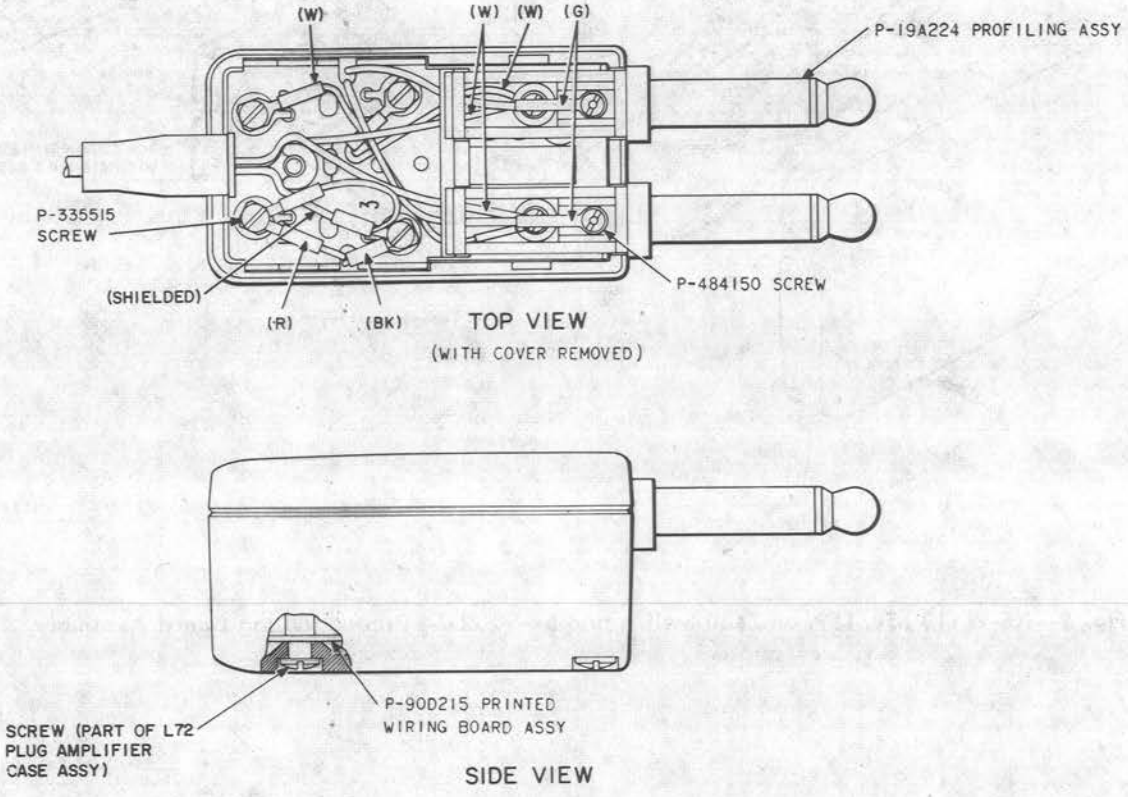

Fig. 8—P-90D215 Printed Wiring Board Assembly and Associated Parts

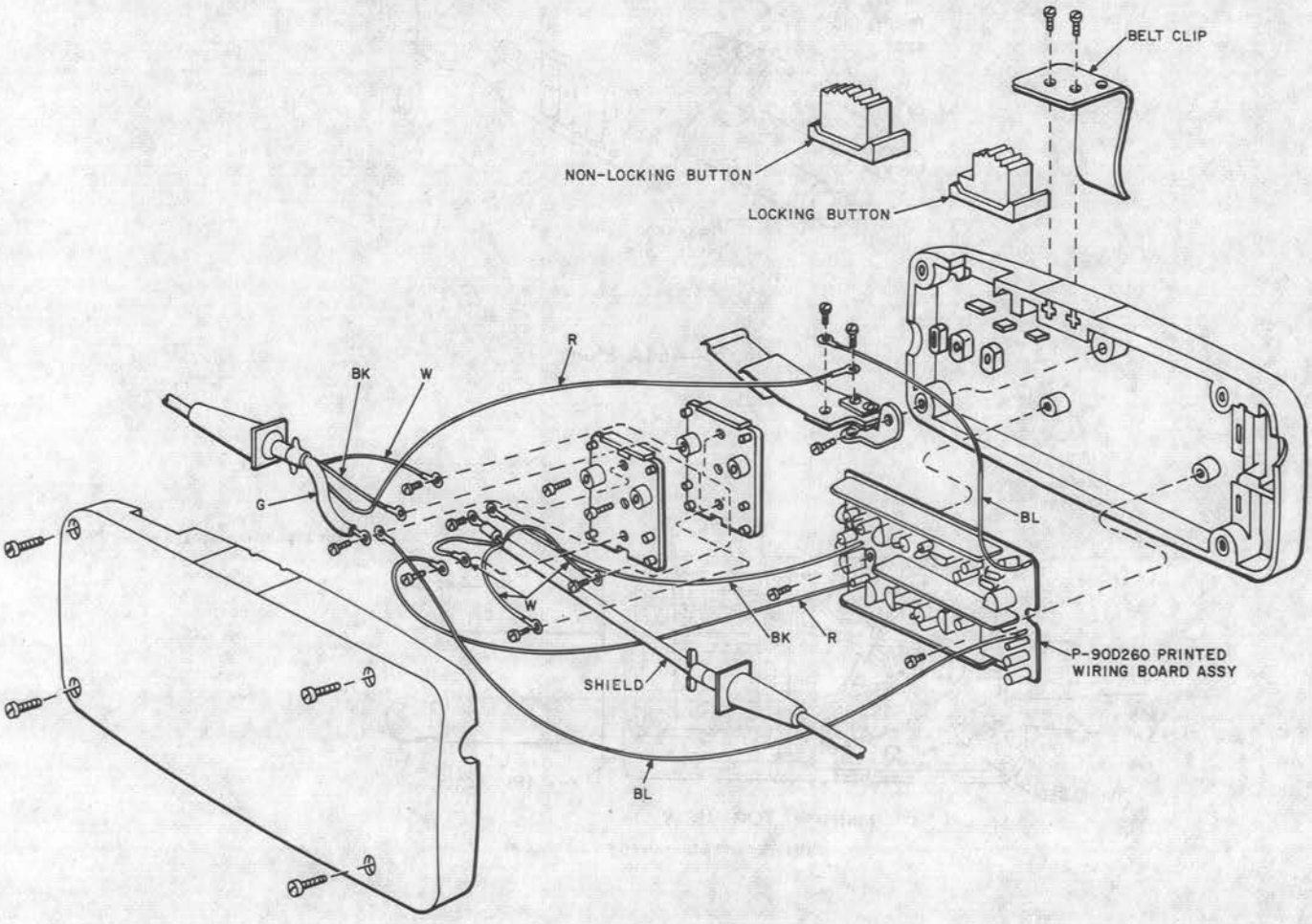

Fig. 9—KS-21118 L58, L59, and L60 Switch and ◗P-90D215◖ Printed Wiring Board Assembly

4.04 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.

5. REPLACEMENT PROCEDURES

5.01 ***List of Tools and Materials***

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
KS-2348	Cord repair screwdriver (equipped with P-484700 bit)
KS-6854	3-1/2 inch screwdriver
▶KS-21233 L1◀	Assembly◀ fixture (for convenient servicing of plug amplifier)
—	R-8950 syringe
—	Long-nose pliers
—	3-inch C screwdriver
—	Watchmaker's screwdriver, William Dixon Inc., No. 5 or equivalent
MATERIALS	
KS-2423	Cloth

5.02 The receiver and transmitter units cannot be replaced since they are contained in a sealed capsule. No attempt shall be made to repair either the printed wiring board or speech tube assembly since these components are replaceable as complete units. These items should be returned in accordance with local instructions to the Western Electric Company.

5.03 After replacing any parts which affect transmission, check the headset to see that it meets the tests specified in Part 3.

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

5.05 ***Speech Tube:*** Remove the plastic speech tube by sliding it off the metal tube of the ball and socket assembly. Substitute the new plastic tube and, using a rotary motion, slide it on the metal tube. If it is difficult to slide the new plastic tube on the metal tube, the opening of the plastic tube may be enlarged by using the tip of a pencil.

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

5.06 ***Ball and Socket Assembly ▶(L1 Through L16 Headsets)◀ :*** To remove the ball and socket assembly, grip the ferrule and push it toward the headset 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 ball and socket assembly and install in the reverse order of removal.

5.07 ***Clothes Clip:*** The clothes clip may be slipped up and down the cord by squeezing the ends of the clip together. To replace the clothes clip, remove the associated screw using the KS-2348 cord repair screwdriver and remove the clothes clip. Substitute the new clothes clip and install in the reverse order or removal. (See Fig. 6.)

> ***Note:*** Clipping the clothes clip to a stationary object will facilitate the removal and replacement of the clip.

5.08 ***464A Plug:*** Fig. 7—Remove the plug housing screws with the KS-6854 screwdriver. Note the color of the cord conductor connections to the terminals. Remove the cord terminal screws using the KS-2348 cord repair screwdriver and remove the cord from the profiling assembly and plug shell. Insert the new cord terminals through the hole in one half of the plug shell and connect to cord terminals, as shown in Fig. 11 or 12. Place profiling assemblies in shell half and reassemble the parts in the reverse order of removal.

5.09 ***Profiling Assembly Associated With L72 Plug Amplifier Case Assembly:*** Remove the housing screws using the 3-inch C screwdriver and remove the cover. Remove the lead and cord terminals connected to the profiling assembly using the KS-2348 cord repair screwdriver and remove the profiling assembly. Place the new profiling assembly in the shell half and reassemble the parts in reverse order of removal, connecting the cord terminals as shown in Fig. 10. Dress the leads as originally positioned.

Note: ▶Assembly fixture KS-21233 L1◀ is available to assist in the disassembly and assembly of the plug amplifier. The test fixture traps all loose parts.

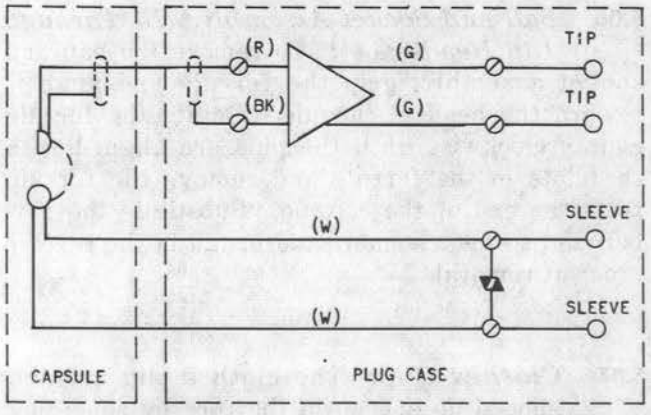

Fig. 10—KS-21118 L1, L2, L16, L21, L22, and L36 Headset Schematic

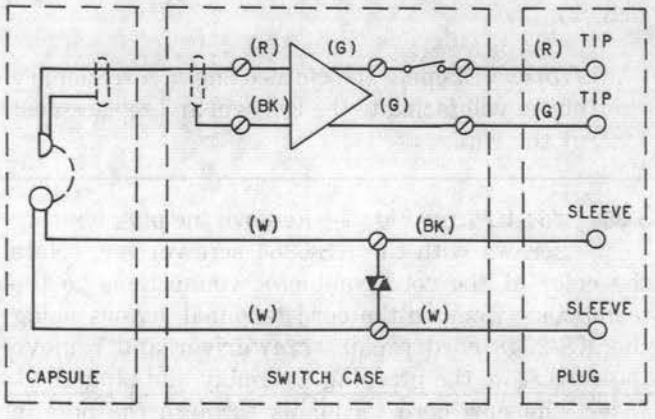

Fig. 11—▶KS-21118 L3 Through L9 and L23 Through L29 Headset Schematic◀

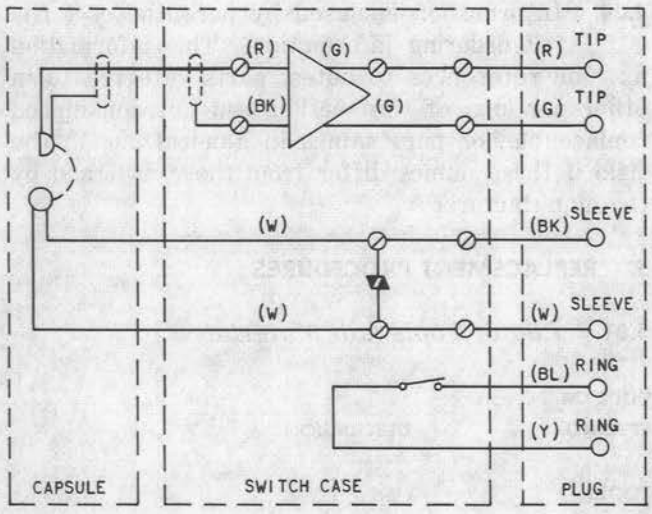

Fig. 12—▶KS-21118 L10 Through L15 and L30 Through L35 Headset Schematic◀

5.10 ***P-90D215 Printed Wiring Board Assembly—▶Plug Amplifier Case◀ :*** Remove the housing screws using the 3-inch C screwdriver and remove the cover. Note the dress of the leads. Using the KS-2348 cord repair screwdriver, remove the screws securing the four printed wiring board leads. Remove the terminal board assembly and the printed wiring board. Substitute the new printed wiring board, connect the leads, as shown in Fig. 10, and assemble the parts in the reverse order of removal. Dress the leads as originally positioned. (See note above.)

5.11 ***▶P-90D215 Printed Wiring Board Assembly—Switch Amplifier Case◀ :*** Remove the housing screws using the 3-inch C screwdriver. Open the housing and remove the spring clip. Note the dress of the leads. Using the KS-2348 cord repair screwdriver, remove the terminal screws holding the printed wiring board terminals and remove the board. Substitute the new board and reassemble in reverse order of removal, connecting the terminal leads, as shown in Fig. 11 or 12. Dress the leads as originally positioned.

5.12 ***Cords:*** Remove the housing screws from the amplifier or remove the plug housing screws from the 464A plug using the 3-inch C screwdriver. Remove the cord terminals using the K-2348 cord repair screwdriver. Remove the cord associated with the capsule assembly by

removing the capsule screw using the watchmaker's screwdriver. Substitute the new cord and connect the cord terminals, as shown in Fig. 10 through 12. Reassemble the parts in the reverse order of removal. Dress the leads as originally positioned.

6. CLEANING PROCEDURE

Note: It is the responsibility of the operator or customer to keep the eartip clean by following procedures described in the instruction booklet.

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

6.02 Mild hand soap and water are recommended as cleaning agents. 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. Throughly rinse the earpiece and wipe dry. Check that the openings are not obstructed by soap accumulations.