

91A TEST SET

DESCRIPTION AND MAINTENANCE

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1. GENERAL

1.01 This section describes the 91A test set used for identifying wires and fault location in toll and exchange cable.

1.02 This section is reissued to revise method of operating 79- and 93-type test sets and to delete information on 572B tool. The 147B will be retained in this section due to the large number in use.

1.03 The 91A set consists of a 147C amplifier, a 723A receiver, a 513A tool (probe), cords and plugs in a KS-14132 L2 carrying case. The 147C amplifier is intended to facilitate testing and fault locating work with exploring coils and other testing apparatus where an amplifier is required. The amplifier with the 513A tool is intended for identifying wires in toll and exchange cables without making metallic contact with the conductors at a splice or sheath opening.

1.04 Information on the use of the amplifier is covered in Section 634-020-502.

2. DESCRIPTION

2.01 The 91A test set is illustrated in Fig. 1.

2.02 The 147C amplifier shown in Fig. 2 is a battery operated amplifier that is 4 inches by 4 inches by 1 1/2 inches and weighs about 1-1/4 pounds. The external design is identical to that of the 147B amplifier. The three stages of amplification are provided by solid state devices with tuned input and output transformers. These devices are mounted on a printed wiring board and is enclosed in a metal case.

**Reprinted to comply with modified final judgment.

2.03 The 147C amplifier is equipped with a volume control calibrated from 0 to 100. The input and output jacks are labeled INPUT and REC. Each amplifier is equipped with a carrying strap and belt clip. The amplifier should be carried upside down to prevent rain from entering the jack opening when the plugs are not inserted. The amplifier is automatically turned on by inserting the headset plug into the REC jack.

2.04 A single 22 1/2 volt KS-14773 battery is required and must be ordered separately.

2.05 In the 91A, the 723A receiver is equipped with a 15A headband and a 2W50A cord. (The 2W50A cord consists of a W2FT cord equipped with a 310 plug.) The cord is a spring cord with a retracted length of 10 inches and a nominal usable length of 4 feet.

2.06 The 513 tool is equipped with a W2BJ cord and a 347B plug for connection to the 147C amplifier.

2.07 The KS-14132 L2 carrying case is a lightweight black plastic case with a hinged cover, a carrying handle on top, and a snap catch in front. Interior compartments along the front side of the case hold the amplifier and spare batteries. The case measurements over the hardware are 13-1/4 inches by 8 inches by 6 inches.

3. USE WITH OTHER TEST SETS

3.01 *101A, 105A, 105B, and 105C test sets (rated Manufacture Discontinued):* With these test sets the switch of the amplifier should be set either at COIL or PROBE depending on which gives the better pickup.

3.02 *101B, and 105D Test Sets:* With these sets the switch of the amplifier should be set at COIL.

3.03 *79-Type Test Set:* These sets can be used in the usual manner with the amplifier switch at PROBE position or COIL position, for identifying battery wires and checking for power on coaxials.

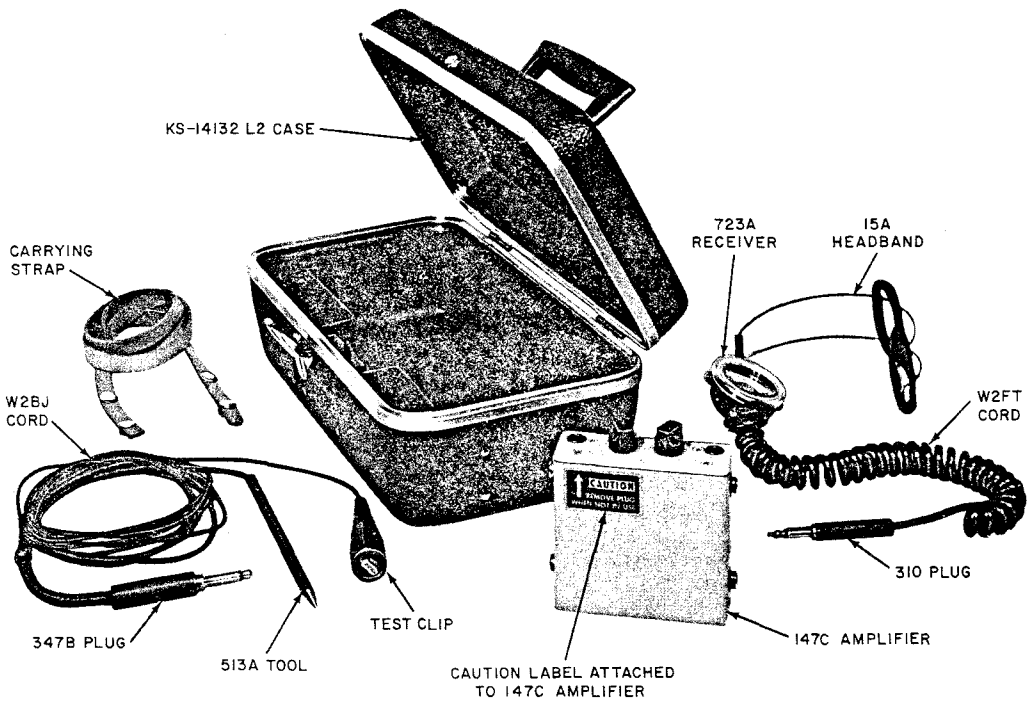


Fig. 1—91A Test Set

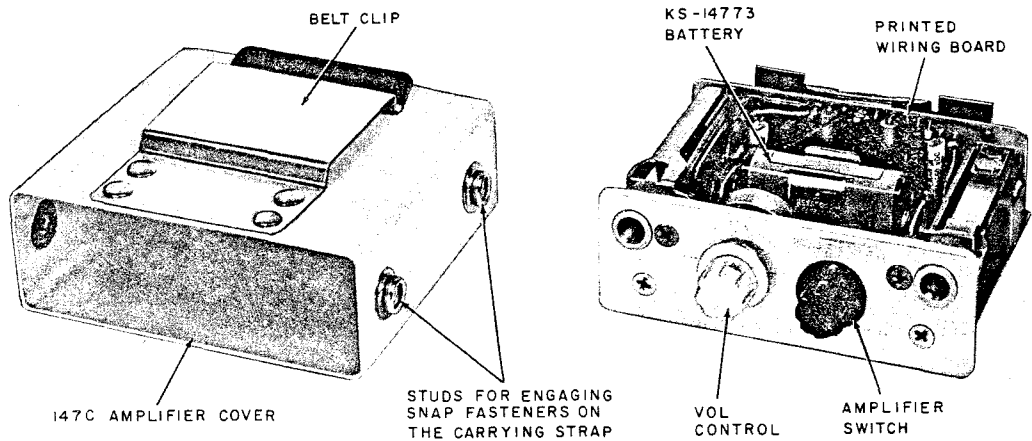


Fig. 2—147C Amplifier

3.04 93-Type Test Sets: These sets can be used in the usual manner with the amplifier switch at **COIL** position or **PROBE** position, for determining the path and depth of buried conductors.

4. MAINTENANCE

4.01 No maintenance other than replacing the battery and cords should be performed in the field. If the set fails to function properly after replacing the battery, the amplifier should be returned in accordance with local procedures.

4.02 *Parts for Field Replacement:*

Battery—KS-14773
Cord—W2BJ
Cord—2W50A
Headband—15A
Receiver—723A
Carrying Strap—P339786

5. SUPERSEDED 147B AMPLIFIER

Description

5.01 The 147B amplifier shown in Fig. 3 is a three-tube dry battery operated amplifier. It is 4 inches by 4 inches by 1-1/2 inches and weighs about 1-1/4 pounds. The three stages of amplification are contained in a network, coded the KS-14556 network. The network consists of a ceramic plate approximately 1-1/4 inches by 1-1/8 inches by 1/16 inch thick on which the resistors and conductors are printed and to which the subminiature electron tube sockets and disc-type capacitors are attached. One CK533AX and two CK534AX (Raytheon) electron tubes are used in the network.

5.02 Two KS-14368 dry batteries are used for the amplifier filament supply and a KS-14773 dry battery for the plate supply. These batteries must be ordered separately.

Maintenance

5.03 Voltage measurements, using 1000-ohm-per-volt voltmeter, should be made at the network terminals to determine whether it is defective. With the receiver plug in the jack, terminal 8 should measure 1-1/2 volts negative with respect to the chassis (terminal 2); terminals 4 and 5 should measure 22-1/2 volts positive with respect to the chassis. The continuity of the filament circuit between terminals 2 and 8 can be checked with an ohmmeter when the receiver plug is removed from the jack. The resistance should measure between 30 and 65 ohms. The continuity of the wiring can also be tested with the ohmmeter. The

low windings of both transformers have a resistance of about 5 ohms; the high windings are about 1200 ohms.

5.04 A defective KS-14556 network should be replaced as a unit. For this purpose the amplifier should be returned in accordance with local routine for making such repairs, or, if authorized, the network can be replaced in the field. To make the replacement, remove the amplifier from the case after turning the lock on the bottom, 1/4 turn counterclockwise. Then position the amplifier as shown in Fig. 3. The defective network should be removed by removing the clamp and unsoldering the seven wire leads from the terminals. The new network should be placed so that the bottom edge is in alignment with the location marks on the terminal strips. Cut the wire leads to the required length and sleeve them with No. 20 varnished tubing. Solder the leads to the same numbered terminals as the defective network without disturbing other solder connections. Insert the CK533AX tube in the left-hand socket and the two CK534AX tubes in the center and right-hand sockets. The red dot on the tubes should align with the red marking on the sockets. New tubes are equipped with 1-1/2 inch leads; these should be cut to 1/4 inch before the tube is placed in the socket. Then replace the clamp.

5.05 *Batteries:* The batteries are held in place in the amplifier by means of spring clips on the reverse side of the amplifier chassis. The filament and plate batteries should be discarded when their voltages reach 1.0 and 17.0 volts, respectively. The filament voltage should be measured with the battery in the amplifier and the receiver plug in the jack; the plate battery should be measured with the amplifier turned off.

5.06 *Parts for Field Replacements:*

Amplifier, 147B
Battery, Dry, KS-14773 (Plate battery)
Battery, Dry, KS-14368 (2 required) (Filament battery)
Cord, W2BJ
Cord, 2W50A
Network, * KS-14556
Receiver—723A
Strap, Carrying, for 147B Amplifier—P339686
Headband—15A
Tube, Electron, CK533AX (1 required)
Tube, Electron, CK534AX (2 required)

*The KS-14556 Network is supplied without tubes.

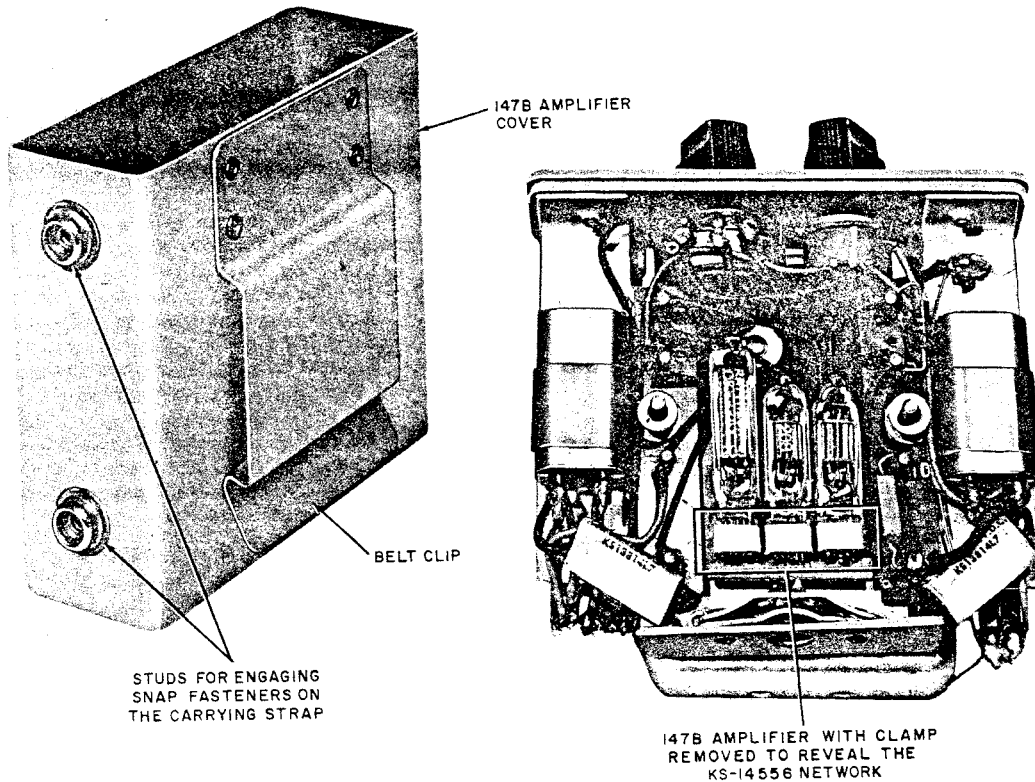


Fig. 3—147B Amplifier (MD)