

## HANDSETS MAINTENANCE

### 1. GENERAL

1.01 This section outlines the procedures and methods to be employed in maintaining handsets and their component parts.

1.02 This section is reissued to convert it to letter size and to incorporate material from the addendum in its proper location. In the process of this conversion, marginal arrows have been omitted.

1.03 The E- and F-type handsets used at stations subject to radio interference should be equipped with 129-type capacitors bridged across the transmitter as shown in Fig. 1. To equip an F-type handset with the 129F capacitor, the outer terminal of the capacitor (with eyelet) is assembled under mounting screw of the center contact spring. The inner terminal is placed under the outer contact spring.

1.04 Broken or cracked parts of handsets should be replaced. If difficult to disassemble, replace the entire handset.

1.05 Transmitter and receiver units should be placed in cartons when returned to the shop for repairs.

1.06 When applying the procedures of this section to colored handsets, use extreme care to avoid marring the finish. If the cleaning procedure does not result in a satisfactory appearance (stains not removed), replace the handset.

### 2. TOOLS

#### 514-type

2.01 The 514B tool is a multipurpose tool, replacing the 514A tool, and is used primarily to loosen the transmitter and receiver caps of handsets. The 514A tool is for F-type handsets only.

2.02 The 514-type tool shall not be used to tighten transmitter and receiver caps, except where locking devices are employed on F-type handsets.

2.03 The 514B tool has an adjustable strap and may be applied to all types of handsets. Avoid excessive force when employing the 514B tool, otherwise the threads are apt to be damaged.

2.04 When using the 514B tool, the strap should be of sufficient length to be wrapped around the cap once and folded over the end of the tool against the area of the handle opposite the strap-positioning ears. Under this condition there will be a thickness of the strap between the cap and the tool handle, and no projections will extend toward the cap (see Fig. 2).

#### 438A Tool (Modified Collar)

2.05 The 438A tool fits the receiver and transmitter cases, caps, and lock rings of E-type handsets.

2.06 Use the 438A tool on lock rings or metal cases, and the 514B tool on transmitter and receiver caps. The 439A tool will not be required.

2.07 On all operations where the 438A tool is employed, the two pins in the end of the tool should be placed in the holes of the part to be turned, and the clamping collar adjusted as shown in Figs. 3 and 4. The clamping collar is pushed toward the held part as far as possible to prevent slipping which could result in damage to the handset.

2.08 To aid in removing lock rings which have jammed on the cases of 395- and 625-type units, employ a 460A tool with the 438A tool.

### 3. CLEANING

3.01 Caps, grids, and mouthpieces may be cleaned by wiping with a clean cloth moistened with water; if clogged, the grids of the caps should be cleaned. The 557-type receiver diaphragm shall be cleaned by wiping with a clean cloth.

3.02 Do not use cleaning fluids or antirust compounds on transmitter or receiver units or other component parts of handsets.

3.03 Discoloration or tarnish on the silver-plated contact surfaces or component parts of the handset is not objectionable and no attempt should be made to remove it.

### 4. E-TYPE HANDSETS

#### To Remove Transmitter

4.01 Employ the 514-type or 438A tool to disassemble the component parts. If locking ring is jammed against aluminum adapter, use the 438A and 460A tool in combination, or apply rubber tape to surface of the unit so that the 514-type and 438A tools may be applied.

#### To Replace Transmitter

4.02 Reassemble the component parts of the transmitter making sure the mouthpiece is tightened by tool. Then screw assembly to the handle and tighten lock ring with the 438A tool.

4.03 If there is alignment difficulty, proceed as follows:

- Back off assembled unit approximately 1/8 of a turn.
- Hold mouthpiece firmly in position to tighten lock ring against the handle (hand tight).
- Apply the 438A tool and tighten.

#### Replacement of 395B Transmitter

4.04 The 395B transmitter shall be replaced by the 625A transmitter.

#### To Remove Receiver

4.05 Disassemble the receiver and component parts by hand, otherwise employ the 438A or 514-type tool; if pin holes are missing apply rubber tape to the unit to provide a gripping surface.

#### To Replace Receiver

4.06 After screwing locking ring to the aluminum case by hand with the large bevel side toward the diaphragm, proceed as follows:

- The receiver should be screwed to the handle and tightened with the proper tool.
- The locking ring should be slightly tightened against the handle with the proper tool.
- The diaphragm and cap should be reassembled and tightened by hand.

### 5. F-TYPE HANDSETS

#### To Remove Transmitter or Receiver Units

5.01 The caps shall be turned off by hand, or with the 514-type tool.

#### To Reassemble Transmitter or Receiver Units

5.02 Place the unit with grid side against the grid of the inverted cap and screw to the handle; tighten by hand.

**Note:** Unless locking device is employed, do not use the 514-type tool to tighten cap.

#### Locking Devices

5.03 Due to repeated loss of either the caps or units, two locking devices are available for use with the F-type handsets: The KS-14200 lock is used with the transmitter cap, and the 24A lock with the receiver cap (the 24A lock may also be used on the 706-type receiver).

#### Installation of the KS-14200 Lock

5.04 The procedure recommended for installing these locks (two are required) is as follows:

- (a) Place one lock in the inverted transmitter cap.
- (b) Place transmitter unit in the cap (normal position).
- (c) Place second lock on the transmitter unit.
- (d) Assemble on the handle and tighten with the 514-type tool. See Fig. 5.

5.05 If trouble is encountered in engaging the first thread of the transmitter cap with the handset handle, the following steps are recommended:

- (a) Place one lock on the seating surface of the transmitter end of the handle.
- (b) Insert transmitter unit.
- (c) Thread on transmitter cap and tighten with the 514-type tool to compress the tines of the lock and reduce over-all thickness.
- (d) Disassemble.
- (e) Reassemble using standard procedure and a second lock (new) between the transmitter unit and cap.

**Installation of 24A Lock**

5.06 With the receiver unit in the receiver bowl of the handle, the lock should be located on the rim of the bowl adjacent to the receiver unit. Then the cap should be threaded on and tightened with the 514-type tool (see Fig. 6).

**Removal of Lock-equipped Caps**

5.07 The 514-type tool should be used to remove transmitter and receiver caps equipped with locks.

**F1-type Lightweight Handsets**

5.08 Lightweight (thermoplastic) handsets having any broken plastic parts should be replaced by a complete lightweight handset or a regular E- or F-type handset (phenol plastic).

**Note:** The lightweight handsets have a hollow handle and are molded of thermoplastic; a dot following the handle code of the F1 type distinguishes it from other F-type handsets. The phenol plastic caps do not fit the thermoplastic handles.

**Caution:** A lightweight handset should never be used to replace a regular E- or F-type handset, because the mountings for the latter type handset contain springs which are too stiff to be operated reliably by the lightweight handset.

**F3-type Handsets (Push-button Switch in Handle)**

5.09 The F3-type handsets should be serviced the same as other type handsets, except that repairs or adjustments of push-button contact spring should not be made in the field. Handsets having defective springs or contacts requiring adjustment should be replaced by an equivalent handset.

5.10 The F4- and F5-type handsets are available as alternate equipment where it is necessary to change a handset in order to comply with zoning requirements as covered in Section C30.002 (C63.002), Transmission Zoning of Station Apparatus.

5.11 These handsets are equipped as follows:

Handset Types	Units	
	Transmitter	Receiver
F4 and F5 (new)*	T1	U1
F4 and F5 (old)**	F1	U1

**Note:** Transmission complaints in the past have been remedied by replacing the HA1 receiver unit with an HC5 receiver unit on F1- and F2-type handsets. If an HC5 receiver unit is not readily available, replace the F1- or F2-type handset with an F4- or F5-type handset, respectively. See Fig. 8 for assembly of the HC5 receiver unit.

\*See Fig. 7 for assembly of T1 transmitter unit.

\*\*When it is necessary to replace the F1 transmitter unit, replace with a T1 transmitter unit and two 18A529 rings

(the contact springs in the handle should be adjusted, if necessary, to insure satisfactory contact with the T1 transmitter unit) or replace handset with a new F4- or F5-type handset.

5.12 Handsets may be substituted as indicated in Table A for the purpose outlined in 5.10 of this section.

TABLE A

Handsets*		Used With
Regular	Substitute	
F1G-3	F4A-3	Telephone Sets
F1B-3	F4B-3	Coin Collectors having 3-conductor cords
F2E-3	F5A-3	Coin collectors having 4-conductor cords

\*See Section C32.203, Handsets, Description, for replacement parts.

**6. G-TYPE HANDSETS**

6.01 The G-type handsets, in general, should be maintained in accordance with the procedures outlined for F-type handsets.

6.02 Assembling and disassembling methods applied to the G-type handsets are similar to those used on the F-type handsets. In addition, note the following:

- (a) Do not use the 514-type tool to tighten caps.
- (b) Check seating surfaces of the component parts for foreign substances, burrs, etc., prior to assembly to insure a tight acoustic chamber, and to provide moisture protection.
- (c) Be certain that the key in the transmitter cap engages the handle slot.
- (d) The lower edge of the gripping portion of the 514B tool, when used to loosen the cap, should be kept above the joint between the cap and the handset handle.
- (e) Caps should be hand tight.
- (f) Locking devices are not available.

**G2 Handsets (Push-button Switch in Handle)**

6.03 The G2-type handsets should be serviced the same as other G-type handsets, except that repairs or adjustments of push-button contact springs should not be made in the field. Handsets having defective switches should be replaced by an equivalent handset.

**G3 Handsets (Colored)**

6.04 The G3-type handsets are serviced the same as other G-type handsets, except that the cotton ball must be reinserted approximately as shown in Fig. 9, when replacing handset cord.

**G-type Handset with Coin Collector**

6.05 Where transmission zoning in long-loop areas creates a maintenance problem, the G1B-3 handset may be used with coin collectors which have been modified to include the new switchhook spring assembly. Such coin collectors are designated by a red star after the code marking, e.g., 191G★, or a letter N in the code number, e.g., 191GN. On other types of handset coin collectors, those that have not been modified, it will be necessary to use the F4- or F5-type handset as noted in 5.10.

6.06 The G1B-3 handset should be equipped with an H4BJ-3 cord when used with a coin collector. The red and long white conductors shall be connected to the R terminal of the induction coil, and the remaining conductors to their respective terminals.

6.07 The G-type handset may be used with G- and M-type mountings where transmission problems exist. Refer to Section C32.524, G-type Handset Mounting and M-type Telephone Set Mountings with G1A Handset Cording.

## 7. HANDSET CORDS

### To Remove E- and F-type Handset Cords

7.01 Remove transmitter, disengage cord tips and fastener, then pull cord through hole in handle.

### To Replace E- and F-type Handset Cords

7.02 Reverse procedure in 7.01, connect to the proper terminals, and check for tight connections.

#### Notes:

1. On E-type 4-conductor handsets, the green conductor (stay cord hook) is connected to the unmarked terminal.
2. When changing a 4-conductor cord on an E-type handset, replace U-shape transmitter contact bracket with the Z-type (P-247667).
3. On F-type 4-conductor handsets, the red conductor (stay cord hook) is connected to the unmarked terminal and the green conductor to the R terminal

### To Remove G-type Handset Cord

7.03 Remove transmitter and receiver units, disengage cord tips and grommet, and then pull cord outward through hole in handle.

### To Replace G-type Handset Cord

7.04 When placing cords on the G-type handsets, the following method is recommended:

- (a) Pass the free conductors of the handset end of the cord through the hole in the handle.
- (b) Advance the cord through the hole by turning it with a threading motion until the grommet is in line with the anchoring posts. Due to an occasional snug fit, it may be necessary, after advancing the cord through the hole, to grasp it firmly by the groove on the grommet with a pair of long-nose pliers, and, using the pliers as a lever inside the bowl, pull the grommet into position.
- (c) Fold back one free white receiver conductor at the tie, guide other into the hollow handle and feed slowly until lead conductor appears in receiver well, then grasp and draw through.
- (d) Anchor cord by inserting grommet between posts.
- (e) Reassemble the transmitter and receiver units. If an H4B-F cord (11-inch long white conductors) has been used, withdraw the slack of the white conductors into the transmitter well. Dress the slack around the transmitter well as shown in Fig. 10; check for tight connections and screw the caps in place, by hand. Make certain the slack of the white conductors is dressed into the transmitter well when the receiver unit has been removed for maintenance.
- (f) On G3-type handset make certain the cotton ball is replaced in the handle as shown in Fig. 9.

## 8. HANDSET HANDLES

### Replacement

8.01 To replace the handset handle, remove the component parts and assemble them on a new handle of the same type; otherwise replace the complete handset.

## 9. TESTS

9.01 After reassembling the transmitter and receiver, the handset should be shaken to determine if the units are properly clamped in place. If either of the units rattle, replace the cap or unit with another part.

9.02 Receiver and transmitter caps shall be checked for tightness at time of installation and on subsequent station visits.

9.03 On completion of maintenance work, make tests with test desk as covered in Section C61.711, Tests with Test Desk, Common Battery Stations.



Note: E-type handsets are shop equipped.

Fig. 1—F-type Handset with 129-type Capacitor



Fig. 2—Correct Positioning of the 514B Tool

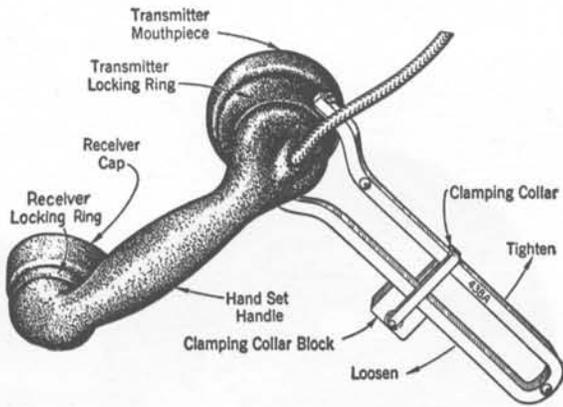


Fig. 3—Correct Positioning of a Single 438A Tool



Fig. 6—24A Receiver Cap Lock Assembly Position

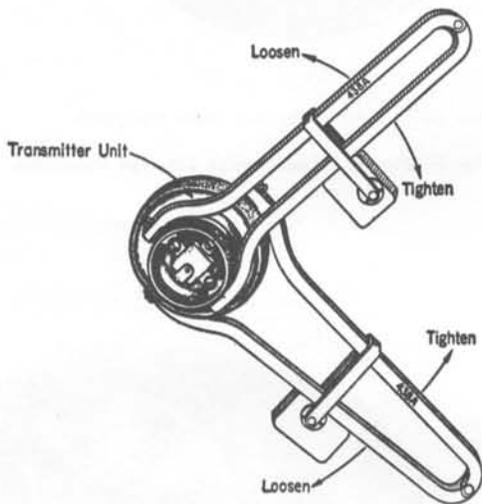


Fig. 4—Correct Positioning of Two 438A Tools

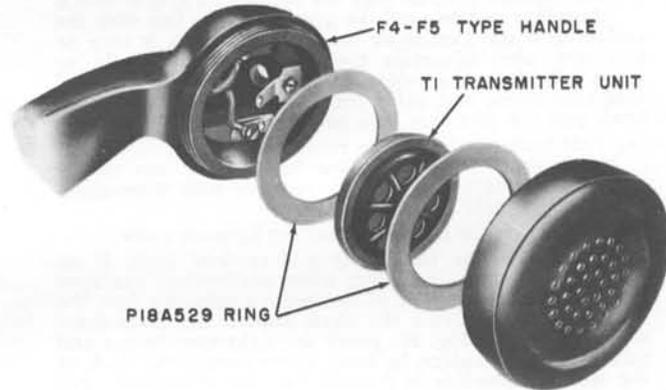


Fig. 7—F4- and F5-type Handset, Order of Assembly of the T1 Transmitter Unit Rings and Cap



Fig. 5—Lock KS-14200, Order of Assembly of Lock Transmitter Unit and Cap

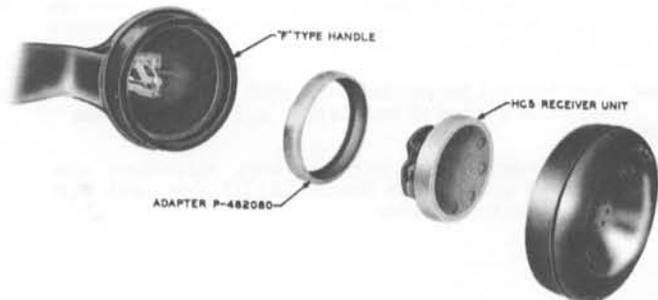


Fig. 8—HC-5 Receiver Unit and Adapter, Order of Assembly

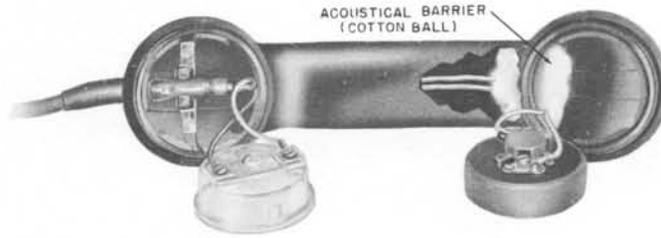


Fig. 9—G3 Handset, Placement of Acoustical Barrier



Fig. 10—G-type Handset Cording