

MAINTENANCE

1. INTRODUCTION

This section of the manual describes the disassembly and reassembly procedures, recommended repair procedures, special precautions regarding maintenance, and recommended test equipment. Each of these topics provides information vital to the successful operation and maintenance of the HT600 radio.

2. PREVENTIVE MAINTENANCE

The HT600 radio does not require a scheduled preventive maintenance program; however, periodic visual inspection and cleaning is recommended.

a. Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. A detailed inspection of the interior electronic circuitry is not needed or desired.

b. Cleaning

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the front cover, housing assembly, and battery case. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime. Internal surfaces should be cleaned only when the radio is disassembled for servicing or repair.

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent, such as JOY®, in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is ISOPROPYL alcohol (70% by volume).

CAUTION

The effects of certain chemicals and their vapors can have harmful results on certain plastics. Aerosol sprays, tuner cleaners and other chemicals should be avoided.

(1) Cleaning External Surfaces

(a) Polycarbonate Surfaces

The detergent-water solution should be applied sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. A soft, absorbent, lintless cloth or tissue should be used to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.

(b) Silverized Surfaces

A non-metallic, soft-bristled brush should be used to apply the detergent-water solution to silverized surfaces, and a second non-metallic soft-bristled brush (free of detergent or rinsed in clean water) should be used to remove the detergent-water solution.

Upon completion of the cleaning process, a soft, absorbent, lintless cloth or tissue should be used (with a blotting action) to dry the frame and covers. The blotting action will prevent damage to the silverized conductive coating.

(2) Cleaning Internal Circuit Boards and Components

Isopropyl alcohol may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The baked stroke should direct the dislodged material out and away from the inside of the radio.

Alcohol is a high-wetting liquid and can carry contamination into unwanted places if an excessive quantity is used. Make sure that controls or tunable components are not soaked with the liquid. Do not use high-pressure air to hasten the drying process, since this could cause the liquid to puddle and collect in unwanted places.

Upon completion of the cleaning process, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, front cover, or housing.

NOTE

Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).

3. DETAILED DISASSEMBLY PROCEDURE

(Refer to the exploded view in the back of this manual.)

Disassembly of the radio involves removal of the major components listed below, one at a time, in the sequence described in the following paragraphs.

NOTE

1. Several special tools are required to completely disassemble the radio. Refer to the "TEST EQUIPMENT AND SERVICE AIDS" paragraphs in this section of the manual. Also refer to the "TORQUE AND TOOL SPECIFICATIONS CHART."
2. Before proceeding, make sure that the radio is turned off.

a. Battery Removal

To remove the battery from the radio, proceed as follows:

- Step 1. Hold the radio with the front of the radio facing up.
- Step 2. Disengage the battery latch from the battery by pushing and holding the latch towards the top of the radio.
- Step 3. With the battery latch disengaged, slide the battery from left to right to remove it from the baseplate on the bottom of the radio housing.

b. Gaining Access to Internal Components

CAUTION

The HT600 radio contains complementary metal-oxide semiconductor (CMOS) devices, which are highly susceptible to damage in handling due to static discharge. The entire printed circuit board should be treated as static sensitive. Damage can be latent, resulting in failures occurring weeks or months later.

DO NOT attempt to disassemble the radio without first referring to the "SAFE HANDLING OF CMOS DEVICES" paragraph in this section of the manual.

- Step 1. Remove the battery as described in paragraph a.
- Step 2. Remove the two screws from the back of the radio.
- Step 3. Remove the two screws on the bottom of the radio (baseplate corners).
- Step 4. Lift the front cover from the radio housing, being careful not to pull against the speaker/microphone wires.
- Step 5. Disconnect the speaker/microphone connector from the controller flex by grasping the speaker wires (near the plug) and pulling the plug straight out and away from the circuit board.
- Step 6. Loosen the two captive screws on the bottom of the radio. Do not completely remove the captive screws from the baseplate.
- Step 7. With a thumb and forefinger, grasp the antenna at its base and pull lightly to remove the frame assembly from the radio housing. Do not press the PTT or monitor switches during removal.
- Step 8. Remove the antenna by unscrewing it counterclockwise.
- Step 9. Remove the screw that secures the front shield to the controller carrier.
- Step 10. Remove the front shield by pulling it straight out and away from the radio.

- Step 11. Remove the four screws that secure the main back shield to the frame.

- Step 12. Remove the main back shield by pulling it straight out and away from the radio.

c. Removing the Controller Assembly

- Step 1. Perform steps 1 through 10 of paragraph b.
- Step 2. Remove the plastic retainer clip that holds the two connectors at the top of the controller in place.
- Step 3. Remove the four screws (two on each side) that secure the controller carrier to the frame.

NOTE

Be careful to pull each connector straight out and away from the mating socket so as not to bend or break the connector pins.

- Step 4. Disconnect the two bottom flex connectors by carefully sliding them away from the synthesizer.
- Step 5. Lift the controller circuit (nearest the bottom of the radio) away from the radio just enough to gain access to the connector under the controller.
- Step 6. Disconnect the connector under the controller.
- Step 7. Disconnect the two connectors at the top of the controller.
- Step 8. Lift the controller assembly totally away from the radio.

d. Gaining Access to the Controller Flexible Circuit

- Step 1. Perform steps 1 through 7 of paragraph c.
- Step 2. Remove the screws that secure the bottom shield to the top flex carrier.
- Step 3. Along the top edge of the controller assembly (edge nearest speaker clearance indentation), gently pry the bottom shield away from the top flex carrier.
- Step 4. Pull the bottom shield completely away from the top flex carrier and remove the controller flexible circuit.
- Step 5. Remove the flex from the top (flex carrier). Remove the small plastic spacer from the carrier (spacer is near J5).

e. Removing the Transceiver Board from the Frame

- Step 1. Perform steps 1 through 7 of paragraph c.
- Step 2. Remove the four screws that secure the main back shield, and remove the shield. On vhf radios, remove the small back shield.

- Step 3. Unsolder four contacts (two pins and one frame ground connection) located next to the screw (back, top-center of transceiver board), and the antenna ferrule located on the back, top-left corner of the transceiver board.
- Step 4. Remove one screw (back, top-center of transceiver board) that secures the transceiver board to the frame.
- Step 5. Unsolder and remove the red B+ wire (controller side of radio) from the On-Off/volume switch pot.

CAUTION

Always place the On-Off/Volume switch pot in the "On" position before soldering to this switch, and return to the "Off" position when finished soldering.

- Step 6. Gently pull the transceiver circuit board straight out and away from the frame.

f. Removing the Control-Top Panel Components

- Step 1. Perform steps 1 through 5 of paragraph e.

NOTE

All control-top panel components, except the antenna jack, are connected on two flexible circuits, which are connected together and should be removed as one unit.

- Step 2. Remove both control knobs by pulling straight out and away from the control-top panel.
- Step 3. The escutcheon is stuck to the top surface of the control-top panel with adhesive. Gently pry one corner of the escutcheon away from the control-top panel and then peel the escutcheon completely away. Notice that two washers are stuck on the back side of the escutcheon.
- Step 4. Using a 5/16" nut driver, remove the hex nuts and washers from the frequency switch and volume potentiometer.
- Step 5. Using a spanner wrench, remove the spanner nut and washer from the PL switch.
- Step 6. Unsolder and remove the black wire from the volume pot flex.
- Step 7. Unsolder the (nine) solder joints between the flex and the universal connector pins, then remove the flex.
- Step 8. Unsolder the three legs of the LED and pull the flex away from the LED's legs.

- Step 9. Unsolder the (nine) solder joints between the PC board and the universal connector pins. Remove the PCB.

NOTE

Be careful not to apply too much heat to the pins.

- Step 10. The frequency switch flex connects to the PTT/B+ flex with five solder tabs located along the side of the frame near the monitor popple switches.

NOTE

A capacitor is placed across the last two tabs.

Unsolder the five contact tabs, and with "solder wick," remove the solder and separate the two flexes.

- Step 11. Push the switch shaft(s) until clear of the mounting holes, and remove the flex circuits and control-top panel components away from the frame.

g. Removing the Control-Top Panel and LED

- Step 1. Perform steps 1 through 8 of paragraph f.
- Step 2. Unsolder the ground pin of the universal connector contacting the frame (near the antenna bushing).
- Step 3. Remove the screw and washer located near the antenna receptacle.
- Step 4. Gently pull the control-top panel away from the frame.
- Step 5. Push the LED and rubber boot out of the control-top panel.
- Step 6. Pull the LED out of the rubber boot.

h. Removing the Battery Latch

- Step 1. Perform steps 1 through 7 of paragraph b.
- Step 2. Remove the ground contact screw that holds the negative battery contact. Be careful not to lose the lockwasher, contact, and rubber pad (under the contact).
- Step 3. While holding the latch slide, carefully pull the baseplate assembly away from the housing.
- Step 4. Carefully slide the latch out of the housing.
- Step 5. Remove the exposed latch springs.

i. Removing the PTT / B+ Flex

- Step 1. Perform steps 1 through 7 of paragraph b.
- Step 2. Two corners of the PTT/B+ flex are soldered to the frame. Remove the solder, using "solder wick."
- Step 3. The PTT/B+ flex connects to the frequency switch flex with five solder tabs located along the top side of the frame near the PL switch. Unsolder the five contact tabs, and with "solderwick," remove the solder and separate the two flexes.

NOTE

A capacitor is placed across the last two tabs.

- Step 4. The PTT/B+ flex is stuck to the frame with adhesive. Carefully peel the PTT/B+ flex away from the frame.

4. REASSEMBLY *(Refer to the exploded view in the back of this manual.)*

CAUTION

1. DO NOT attempt to reassemble the radio without first referring to the "SAFE HANDLING OF CMOS DEVICES" paragraph in this section of the manual.
2. DO NOT attempt to reassemble the radio without first referring to the appropriate vhf or uhf service manual "TORQUE AND TOOL SPECIFICATIONS CHART."
3. Inspect all O-rings and replace if obvious damage exists.

a. Reinstalling the Battery Latch and Base Plate

- Step 1. Insert the two springs into their proper holes, and replace the slide latch.
- Step 2. Position the base plate and hold it firmly to compress the springs.
- Step 3. Holding the base plate in place, install the negative battery contact, being sure that the rubber pad is in place in the cup of the contact.
- Step 4. Reinstall the screw and lockwasher in the negative battery contact. Tighten the screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."

b. Reinstalling the PTT/B+ Flex

- Step 1. Position the PTT/B+ flex to the frame such that the five contact tabs line up with the corresponding tabs on the frequency switch flex. Note that a little oval hole in the corner of the flex (near the solder tabs) mates with a round dot on the frame.

- Step 2. Press the flex to the frame. Note that two more places, holes in the flex correspond with dots on the frame.
- Step 3. Resolder the five solder tabs connecting the PTT/B+ flex to the frequency switch flex.

NOTE

A capacitor is placed across the last two tabs. Also, ensure that a solder spot connection is made near and connecting the first two tabs (making the two switches common).

- Step 4. Resolder the two corners of the flex to the frame.

c. Reinstalling the LED and Control-Top Panel

- Step 1. Insert the LED into the rubber boot such that the flat edge of the LED's base mates with the flat edge inside the boot.
- Step 2. Insert the LED and boot into the control-top panel.
- Step 3. Place the control-top panel on the frame.
- Step 4. Reinstall the screw and washer located near the antenna receptacle, and tighten the screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 5. Resolder the ground pin of the universal connector to the frame.

d. Reinstalling the Control-Top Panel Components

- Step 1. Insert the switch shafts into the proper holes.
- Step 2. Slide the universal connector PC board over the interconnect pins and solder the board to the (nine) pins.
- Step 3. Resolder the three LED legs to the frequency switch flex.
- Step 4. Solder the volume pot flex to the (nine) universal connector pins.
- Step 5. Resolder the black ground wire to the volume pot flex (center pin).
- Step 6. Resolder the five solder tabs of the frequency switch flex to the corresponding tabs of the PTT/B+ flex.
- Step 7. Reinstall the PL switch washer and spanner nut, and tighten per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 8. Reinstall the frequency switch and volume pot washers and hex nuts, and tighten each screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 9. Reinstall the escutcheon.
- Step 10. Reinstall the switch knobs.

e. Reinstalling the Transceiver Board

- Step 1. With the frame's backside lying down, and viewing the transceiver board from the solder side with the assembly upright, slightly spread the sides of the frame and slide the transceiver into the frame.
- Step 2. Turn the unit over and resolder the loose end of the red B+ wire to the On-Off/Volume switch pot.

CAUTION

Always place the On-Off/Volume switch pot in the "On" position before soldering to this switch, and return to the "Off" position when finished soldering.

- Step 3. Reinstall one screw (back, top-center of transceiver board) that secures the transceiver board to the frame, and tighten securely.
- Step 4. Resolder four contacts (two pins and one frame ground connection) located next to the screw (back, top-center of transceiver board), and the antenna ferrule contact (back top-left corner of board). Reinsert small back shield.
- Step 5. Press the main back shield (edges over the frame) flush to the transceiver board.
- Step 6. Reinstall the four screws that secure the main back shield to the frame, and tighten each screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."

f. Reassembling the Controller Assembly

CAUTION

Make sure that the flex insulator is installed around the controller flex before placing the controller flex into the carrier.

- Step 1. With the outside surface of the carrier lying down, and the controller flex folded over (shield-to-shield), align the holes in the flex with corresponding holes in the carrier, and place the flex into the carrier. Make sure that the P1 and P2 jack's grooves slide into the tabs of the carrier. Also, make sure that the J5 jack is seated properly in the carrier.
- Step 2. Replace the small clear plastic spacer adjacent to J5.
- Step 3. Align the controller bottom shield to the controller flex and carrier. In the J5 jack area, slide the tab of the shield under the slot in the carrier, and press the bottom shield into

place (sides of the bottom shield fit inside the sides of the carrier).

- Step 4. Reinstall the screws that secure the bottom shield to the controller carrier, and tighten each screw per the "TORQUE AND TOOL SPECIFICATIONS CHART".

g. Reinstalling the Controller Assembly

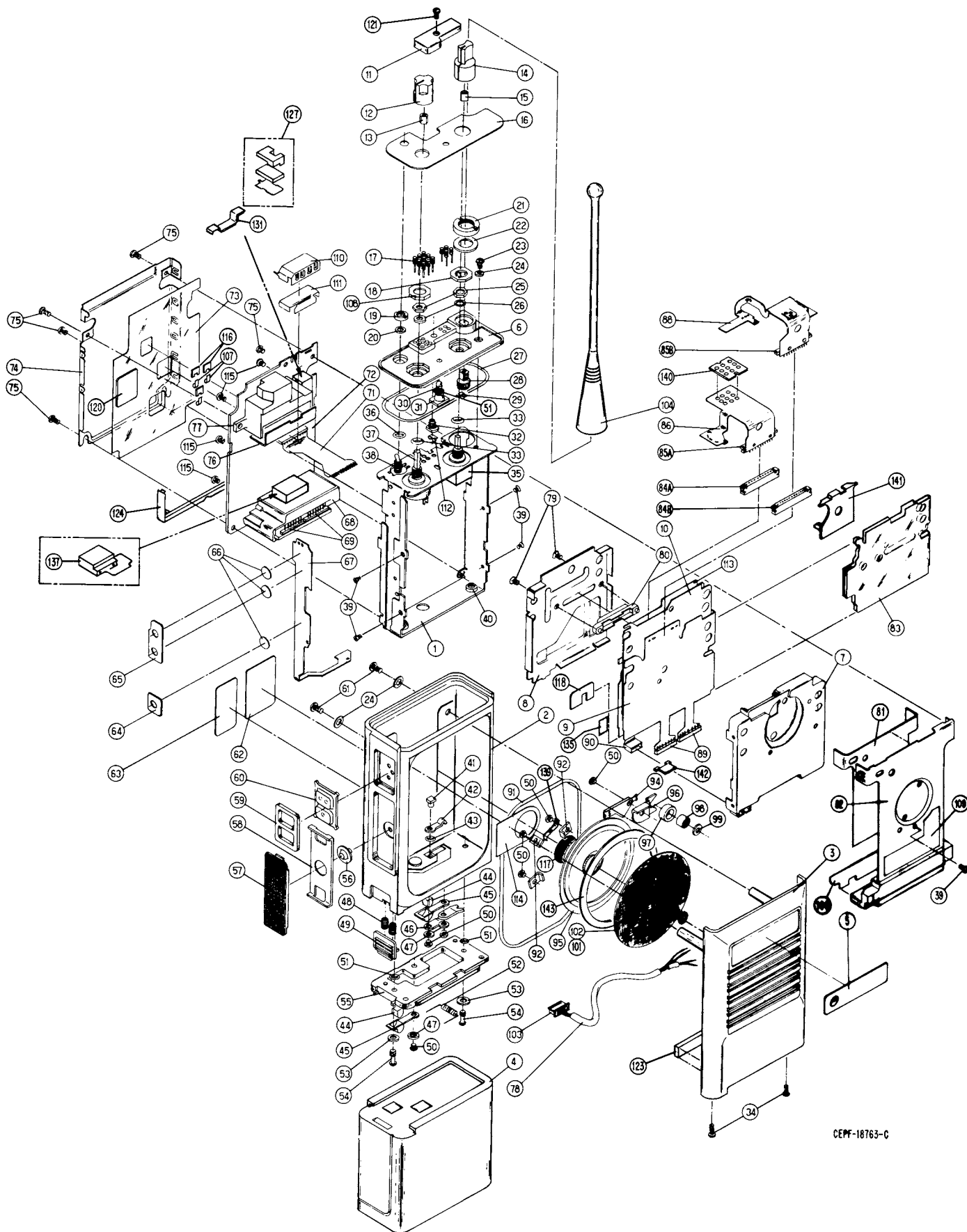
CAUTION

Be careful to push each connector straight into the mating socket so as not to bend or break the connector pins.

- Step 1. Reconnect the two top flex connectors, firmly seating both plug/jack connections.
- Step 2. Reconnect the connector under the controller, firmly seating the plug/jack connection.
- Step 3. Press the controller into place (inside of frame sides).
- Step 4. Reconnect the two bottom flex connectors, firmly seating both plug/jack connections.
- Step 5. Reinstall the four screws (two on each side) that secure the controller carrier to the frame, and tighten each screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 6. Insert the plastic retainer that holds the top two connectors in place.
- Step 7. Reinstall front shield (shield edges fit inside the frame).
- Step 8. Reinstall the screw that secures the front shield to the controller carrier, and tighten the screw per the "TORQUE AND TOOL SPECIFICATIONS CHART."

h. Final Reassembly

- Step 1. Insert the internal radio unit into its housing, and tighten the two screws on the baseplate per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 2. Reconnect the speaker/microphone connector, being careful to push the connector straight into the mating socket so as not to bend or break the connector pins.
- Step 3. Reinstall the front cover.
- Step 4. Reinstall the two screws on the bottom of the radio (baseplate corners), and tighten the screws per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 5. Reinstall the two screws that secure the front cover to the housing, and tighten each screws per the "TORQUE AND TOOL SPECIFICATIONS CHART."
- Step 6. Reinstall the antenna.
- Step 7. Reinstall the battery.



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