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Troubleshooting Guides: IC-751 and IC-751A

Unless otherwise noted, the following applies to both models.

- Symptom:** Distorted, or no RX/TX on one or more bands. Problem may be temperature related.
- Probable Cause:** 1) Bad trimmer capacitors on PLL unit. 2) Noisy variable resistor on PLL unit.
- Cure:** Replace plastic trimmer capacitors C78, C88, C97, and C107 with equivalent ceramic types. Remove excessive wax from around replacement trimmers to prevent wax contamination. We suggest using a 12 pF trimmer capacitor for C97 instead of a 7 pF as listed in the service manual. This will allow you to properly adjust the HPL lock voltage for that band. Modification: If variable resistor R43 on the PLL unit is the 470 ohm type, replace it with a fixed-value 220 ohm version. If it's the 2.2 K type, replace it with a fixed-value 1.2 K resistor.
- Remarks:** While the PLL unit is lifted, we recommend soldering all joints in the regulator section as this area runs hot. Also, inspect electrolytic capacitors C128, C129, C132, and C137 in the regulator circuit for discoloration caused by overheating. Replace all overheated capacitors to prevent future failures.
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- Symptom:** Erratic display i.e., frequency listed will be out of the normal operating range of the radio. Rotating the VFO knob may cause strange characters to appear in the display. Radio does not work properly. Cycling the power switch a few times may restore operation temporarily. Problem may be temperature related.
- Probable Causes:** 1) Cracked solder on RAM unit is causing logic errors. 2) Program in RAM unit is corrupted. 3) Burned/overheated R20 resistor on logic unit is causing low voltage in logic unit.
- Cure:** Check for burned R20 resistor (10 ohm, 1/2 watt) on logic unit. If it looks OK, resolder cracked solder joints at J1 and J2 connectors on RAM unit, then reprogram. If this does not help, then the RAM unit must be replaced. If the substitute RAM unit does not cure the problem, there may be noise from the DC-DC converter causing the logic unit to glitch. Follow instructions for "No frequency display" problem.
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- Symptom:** No RX audio in any mode except FM. No TX. Unit is not unlocked.
- Probable Cause:** PBT oscillator is not running.
- Cure:** Verify absence of 9.4665 MHz signal at W86 test point on main unit in 751A, or W134 test point in the IC-751. Replace faulty X7 crystal on main unit in IC-751A, or X5 crystal in the IC-751.
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- Symptom:** Frequency instability in USB mode.
- Probable Causes:** Bad trimmer capacitor in BFO section on main unit.
- Cure:** Replace plastic trimmer capacitor with a 30 pF ceramic trimmer capacitor and realign.
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- Symptom:** Drastic change in audio frequency response between USB and LSB., i.e. USB audio has too much bass while LSB audio has too much treble. TX frequency response is also poor.

- Probable Cause:** Misadjustment of the BFO or PBT oscillator, or a faulty crystal filter FL-30 (or FL-80 in 751A) on the main unit.
- Cure:** Check adjustment of the BFO and PBT oscillator. If these are OK, then the problem is most likely in the filter.
- Remarks:** If the problem is intermittent, and the radio is an IC-751 (not "A" version), then the ground return path for the -5 V supply between the display and main units may be poor. To cure this, connect a short wire jumper between the unused pin 2 at J2 connector on the display unit and chassis ground at the closest mounting screw of the main unit PCB. If no spare pin is handy for the connector at J2, the jumper may be soldered to the shield of T1 transformer instead.
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- Symptom:** AC hum or buzz in transmit and receive audio when an internal power supply is installed.
- Probable Cause:** AC is being induced into the PLL from the AC wires and power supply case.
- Cure:** Twist the AC wires that run from the rear panel to the power switch and route them away from the PLL unit. Tape them up against the chassis if necessary.
- Remarks:** In some radios, especially older IC-751s, it is not possible to completely eliminate all AC hum when using the internal power supply.
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- Symptom:** No, or very low RX sensitivity.
- Probable Cause:** Bad components on RF unit, probable result of RF overload. To verify this, check DC voltages at D47 diode on RF unit. Correct voltages are: Cathode side- RX: 8.5 V, TX: 13.8 V. Anode side- RX: 9.0 V, TX: 9.5 V.
- Cure:** Replace all of these components on the RF unit: D42, D44, D45, D46, D47 diodes, Q15 transistor. Check C174 and C179 capacitors for leakiness. There may be other failures. Unit is not repaired until listed voltages at D47 diode are correct.
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- Symptom:** Distorted RX on strong signals. BC band RX sensitivity may be low or marginal.
- Probable Cause:** Q15 transistor on the RF unit has become leaky.
- Cure:** Check and replace Q15 transistor. If Q15 transistor is leaky, there may be other problems on the RF unit. See cure for RX problem listed above.
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- Symptom:** RX disappears when outer conductor of coax is connected to antenna jack. Inspection reveals 6 volts DC at the center conductor of the antenna jack.
- Probable Cause:** Shorted DC-blocking capacitor C40 on the ANT SW unit.
- Cure:** Replace the capacitor.
- Remarks:** There are probably other problems on the RF unit if this capacitor is bad. Check the voltages at D47 diode on the RF unit. Radio may have been struck by lightning or sustained a large RF overload through the antenna jack.
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- Symptom:** RX cuts out randomly when turning VFO knob in IC-751A with UX-14 installed.
- Probable Cause:** Incompatibility between UX-14 and 751A is causing the PLL to unlock.
- Cure:** Turn off transceive mode on UX-14 (bank S1, switch #3 to OFF position).
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- Symptom:** Hash noise in RX, birdies.
- Probable Causes:** 1) Voltage regulators on PLL unit are oscillating, producing noise on VCC line. 2) Overheated components and/or loose screws are causing the power supply to run noisy. 3) Noisy DC-DC converter on display unit.
- Cure:** Replace overheated C129, C132, and C137 regulator filter capacitors on PLL unit. Inspect power supply for overheated components, tighten the screws that hold

down the reg. unit. Don't forget to tighten the screw hidden beneath the wire bundle where the DC output lines leave the case. If none of these help, and radio is a IC-751 (not A version), then the display DC-DC converter may need modification. Contact Icom Technical support for update information.

Symptom: No receiver audio at all in IC-751A. Signals can be seen on S-meter.
Probable Causes: Cracked solder joint on main unit is causing no VCC to the audio amp.
Cure: Resolder cracked solder joint at L46 coil on main unit. Repair damaged foil trace, if necessary. Re-route ferrite beads so they will not press down on L46 coil (or any other components) when the top cover is reinstalled.

Symptom: RX audio seems low in IC-751.
Probable Causes: Unit needs update to audio amp circuitry on main unit.
Cure: Contact Icom Technical Support for update bulletin.

Symptom: No TX output in all modes. Problem is traced to no output at J8 connector on the RF unit.
Probable Causes: Bad Q14 transistor amplifier on RF unit.
Cure: Replace Q14 transistor. There may be other problems on the RF unit. Check the DC voltages at D47 diode.

Symptom: Distorted/raspy sounding SSB TX. Average talk power is low, even at higher mic gain levels. CW, RTTY and FM seem normal. RX in all modes is OK.
Probable Causes: 1) External 3rd party power supply needs additional RF decoupling. 2) No bias voltage to driver or PA transistors.
Cure: Install RF decoupling capacitors on 3rd party power supply (if used). If this does not help, measure voltage at bases of driver and PA transistors in TX SSB mode. Should be around 0.67 volts. 0 volts indicates trouble and probably a bad Q6 transistor. If problem is intermittent, check for bad solder at the legs of Q6 transistor, or D2 diode.
Remarks: The driver and PA idle current are set too high in some IC-751s (not A version). Align the idle current as per the service manual after repairs are made.

Symptom: When using an internal power supply, the power to the radio flutters on and off when the TX power output is increased toward maximum. Unit runs fine when the internal power supply is substituted with an external supply.
Probable Causes: Cracked solder in the current sensing circuit of the power supply is shutting it down prematurely.
Cure: Resolder joints at the R26 resistor (0.0012 ohm) inside the power supply.
Remarks: This resistor appears as a metal bar soldered to the bottom PC board. Solder the edges of the bar BEFORE the holes at either end.

Symptom: TX oscillations/spurious output.
Probable Causes: 1) Open resistor or faulty electrolytic capacitors on PA unit. 2) PA unit needs modification. 3) Bad drivers or PA transistors. 4) Burned components on the ANT SW unit.
Cure: Check the value of R22 resistor (4.7 ohms) on PA unit. (This resistor may look OK but still be open.) Replace C18 and C25 capacitors on the PA unit if they appear swollen or overheated. Modification for old IC-751: Install a metal film, 220-ohm 1/2 watt resistor parallel to C6 capacitor on PA unit if there isn't one installed already. Inspect the D4 area of the ANT SW unit and replace any burned components. If

none of these solutions solve the problem, disconnect the J10 connector on the RF unit and see if the problem goes away. If it does, then there is a problem with the TX/RX switching on the RF unit. If disconnecting J10 connector doesn't help, then most likely either the drivers or PA transistors are bad, especially if the ALC meter deflection is low.

Remarks: The spurious output may also be caused by incorrect band switch voltage to the low-pass filter unit, or even faulty/burned components on the filter unit itself. The above causes should be ruled out first since low-pass filter failures are uncommon in the IC-751(A).

Symptom: Intermittent low FM TX output power in IC-751.

Probable Causes: Bad relay RL1 on FM unit.

Cure: Replace bad RL1 relay (221-D009-M).

Symptom: No TX output at all in RTTY or CW modes. SSB and AM are OK.

Probable Causes: Bad carrier generator crystal on main unit.

Cure: Replace bad X1 crystal on main unit.

Symptom: No frequency display, only decimal points. Problem may be intermittent or temperature related.

Probable Causes: Display DC-DC converter has noisy output.

Cure: Replace all of the following dried-out electrolytic capacitors on the display unit: C17, C18, C20, C21, C22, C23, C24, and C25. (These capacitors are light yellow when they are new. Capacitors that have turned brown are old and dried-out).

Remarks: While servicing the DC-DC converter section, be on the lookout for cracked solder joints, as this section of the radio tends to run hot. Also, it would be a good idea to reprogram the RAM card after servicing the DC-DC section.

Symptom: Poor carrier suppression in SSB mode in IC-751. Will not adjust properly.

Probable Causes: Main unit needs factory update.

Cure: Contact Icom Technical support for update bulletin.

Symptom: Low garbled audio sound in speaker/headphones in SSB TX, even with monitor turned off.

Probable Causes: RF feedback. 1) Inadequate station ground. 2) External 3rd party power supply needs RF decoupling. 3) Main unit needs factory update (IC-751 only).

Cure: Check station ground. If a 3rd party power supply is being used, add RF decoupling capacitors to output terminals to prevent regulation problems. If the problem occurs in an IC-751, a factory update may need to be installed to the main unit. Contact Icom Tech Support for this information.

Symptom: Radio seems to be stuck in "scan" mode.

Probable Causes: Bad IC2 chip on the logic unit.

Cure: Replace IC2 integrated circuit (RP5G01-007).

Symptom: Loud, high pitched squeal emanates from inside radio.

Probable Causes: DC-DC converter transformer has a loose core.

Cure: Replace T1 transformer (TO-9) on display unit.

Symptom: VFO tuning is erratic, sometimes skips when changing frequencies or bands. Display does not increment smoothly when VFO knob is turned slowly.

Probable Causes: Dirty rotary encoder.

Cure: Remove white plastic cover from back of rotary encoder and spray clean the carbon track with Blue Shower solvent. Spin VFO knob vigorously while spraying.

Remarks: Do not let solvent saturate the display unit or allow it to come into contact with the plastic display lens. Stuff a paper towel between the rotary encoder and display unit to catch spray run-off.

Symptom: Missing segments or mode indicators on display. Problem may be intermittent.

Probable Causes: Bad connection between logic and display units.

Cure: Check the connectors J5 and J13 on the logic unit where the flex cables to the display unit are attached. If they look OK, and none of their connector spring contacts flattened, replace the flex cables.

Symptom: Low mic gain when using Heil mic element.

Cure: Install modification: In 751, change value of R264 resistor on main unit to 200 K. In 751A, change value of R21 resistor on AF-VR unit to 47 K.

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