

## **NOTES ON THE ICOM IC-781**

### **A. IC-781 FILTER MODIFICATION**

The stock FL-96 (455 kHz SSB: 2,8 kHz wide @ -6 dB) can be replaced with an FL-44A (2,4 kHz wide @ -6 dB) to improve adjacent-channel selectivity and sharpen Twin PBT operation. In addition, the stock FL-102 (9 MHz, AM) can be replaced with an FL-223 (9 MHz SSB: 1,9 kHz wide @ -6 dB) to provide an SSB-NARROW bandwidth setting.

Here is the filter installation procedure:

(I would suggest that you purchase an IC-781 service manual from Icom Parts for guidance, if you do not already have one. Icom Parts should also have the FL-44A).

1. Remove the top and bottom case covers.
2. Lay the radio upside down on a towel, with the front panel facing you.
3. Using a magnetic-tip manual screwdriver with a #2 Phillips tip having rounded blade edges, remove all eleven retaining screws from the IF board (the board with all the filters).
4. Unplug the multi-conductor header cables from the board, to allow the board to be moved aside.
5. Grab the inner edge of the board, and swing the board away from the chassis. Do not stress coax cables on board. Rest board on a stand (e.g. 2 phone books) next to radio.
6. Locate FL-96. Using a solder-sucker or wick, and a temperature-controlled pencil iron, desolder 4 filter pins.
7. Remove nuts & washers from filter mounting studs. (I think the nuts are M3 or M4.)
8. Remove FL-96, wiggling it gently to free pins. You may need to re-heat pins quickly to release filter. The board is G-10, and can take reasonable heat.
9. Place FL-44A on board; tighten down studs with nuts & washers.
10. Re-solder pins of FL-44A; clean excess flux with nylon brush & isopropyl alcohol. Also ensure that there are no solder blobs or slashes.
11. Re-install board and all cables unplugged in Step 4.
12. Pull FL-102; insert FL-223, and flip 2 dip switches (per user manual) from AM to SSB.
13. Test radio, then replace covers.

Good luck! The whole job should take about 30 minutes. I did the mod on an IC-781 which I owned from 1993 to 1998. Note that the FL-223 is selected in USB or LSB mode by pressing the [WIDE] button.

### **B. SERVICE PROBLEMS**

The IC-781 is subject to heat problems from two main sources:

1. The PI Unit (power regulator). This unit incorporates a shunt regulator - a kind of electronic bleeder which holds the DC voltage constant by shunting away current. The higher the DC voltage rises, the more current the regulator shunts away. Shunt regulators tend to dissipate a fair amount of power, and do run hot. The IC-781 was designed to run off the Japanese 100V mains; when the radio is powered from a U.S./Canadian 120V mains supply, the PI unit dissipates 20% more power, and runs correspondingly hotter. The same issue arises when the internal power supply is set to the 200V tap and the radio is run from 220V mains.
2. The CRT module. Air circulation around the cathode-ray tube, and its associated power converter, is very limited. The radio's cooling fan sucks in already hot air from inside the radio, and blows it out through the PA. As a result, eddies (still air zones) form around the CRT. I remember that when I had my IC-781, the PA/power supply heatsink would be too hot to touch (ca. 60°C) during a lengthy Icom net session, and the area over the CRT would also be very hot. This despite the fact that the radio was driving an IC-2KL with a mere 50W P.E.P. out.

Placing a 200mm dia. table-top fan to the left of the radio may be helpful. The fan can be positioned to blow air across the heatsink and the top of the case.

You could remove the internal speaker and mount a small 13,8V muffin fan under the speaker grill, so as to blow air onto the CRT. I think, though, that the external fan would suffice.

There is a discussion of IC-781 service problems (heat-related and other) on:

<http://www.icomamerica.com/support/troubleshooting/ic-781.html>

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