

Sony ICF-6500W Selectivity Modification

by Gerry Thomas

As I noted in an earlier review of the Sony ICF-6500W, this portable has many positive features and only one major shortcoming---insufficient IF selectivity. What follows are the details for installing a narrower IF ceramic filter to correct this drawback.

What you'll need....

- (1) Communications receiver quality ceramic IF filter. The muRata CFS455J is recommended (3 kHz @ -6dB, 9 kHz @ -60 dB) but a Vernitron VTD-4-I (4 kHz @ -6 dB, 10 kHz @ -60 dB) can be substituted. The former is available at muRata dealers around the country as well as Shortwave Horizons, 6815 12 Ave., Edmonton, AB T6K 3J6 (ed note: also at Ambient International, 200 N. Service Rd., Brentwood, Essex CM14 4SG, England; they also carry the cheaper CFG455I), while the latter is available (or was) from Radio West as well as Shortwave Horizons. (The CFG455I is comparable to the Vernitron). I don't have prices from the preceding dealers but would guess either filter would be around \$30-35.
- (1) DPDT toggle switch (Radio Shack #275-1546 is ideal because it comes with different colors of toggle covers and the green one perfectly matches the trim of the 6500; \$2.65)
- ** About 2 feet of stranded 20-22 gauge wire (the shielded RG-174U is recommended but unshielded works OK)
- ** About 2" of #18 solid wire
- ** Razor blade or X-acto knife
- ** Drill and $\frac{1}{8}$ " bit
- ** Soldering iron, solder, wire cutters/stripper, Phillips head screwdriver

Procedure....

1. Remove batteries and/or unplug 6500
2. Pull knobs straight off front of radio. The tuning knob is easy; the others may require wrapping a length of wire (e.g. AC line cord) to provide a better grip. Pry off with a screw driver only as a last resort.
3. Remove the five screws from the back of the cabinet.
4. Carefully lift back away (there may be some glue offering resistance) and note attached whip antenna wire (blue)
5. Desolder whip antenna wire from circuit board (note location for resoldering)
6. Carefully turn radio over and gently lift off front panel (glue again could be present)
7. Release the three claws holding in the speaker and remove speaker from mounting hole. (You can desolder the speaker wires if you want, but it isn't necessary if you are careful with the speaker throughout the modification. You are now looking down into the chassis of the radio and should see the conductor side of the main circuit board.
8. Look to the upper left of the speaker mounting hole (about the "10 o'clock position) and find on the the circuit board a printed, vertically bisected rectangle with a "T3" in the right-hand half (see Figure 1)
9. Note that there is conductor material running diagonally across the mid-section of the rectangle (labelled "A" and "B" in Figures 1 and 2).
10. With your razor blade or X-acto knife, cut this conductor at two points (see Figure 2) and carefully scrape away the conductor between the two cut points, thereby creating two "floating" points.
11. Now carefully solder on end of a 6-8" length of stranded wire to "floating" point "A" and another 6-8" length to "floating" point "B". If you are using shielded wire you can ground the shields by scraping away the coating on a point on the grounded portion of the PC board (shaded area) and soldering.
12. Now take the ceramic filter you've chosen and solder a short length of bare, solid wire to the filter's ground poles (i.e. a single length of wire connects the poles). On the MuRata, the two ground terminals are on the same (lengthwise) side of the filter ("3" and "4" in Figure 3) as the tab ("5") on the shielded case. On the Vernitron, the two grounds are on the lengthwise side opposite the corner of the filter with a notch. (See Figure 3) Allow about a $\frac{1}{2}$ -1" "tail" of the bare wire to extend from one of the ground terminals of the filter so that it can be soldered to a ground point on the circuit board or shield.
13. Now solder a 6-8" length of wire to pole #1 (input) on the filter and another similar length of wire to pole #2 of the filter. The filter is now ready for mounting.
14. I mounted the muRata by laying it on its side on the shield covering the PC board (visible in Figure 1) and spot soldering the tab to the shield, and the "tail" wire (connecting the ground poles) to a ground point (shaded area) on the circuit board. This was sufficiently sturdy that adhesive wasn't necessary. It might however, be necessary to glue the Vernitron to the shield because of its plastic casing.
15. After you've mounted the filter, there should be four loose wires in the speaker hole (two from the filter, and one each from points "A" and "B"). Gather these wires and thread them through the slot in the speaker housing cylinder so that

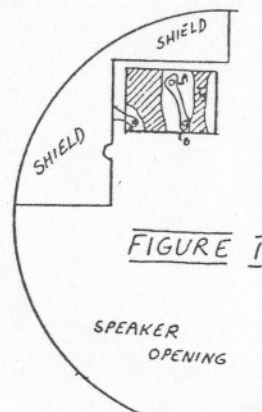


FIGURE 1

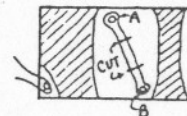


FIGURE 2

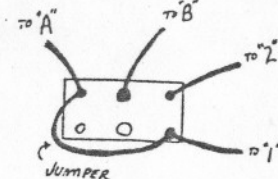
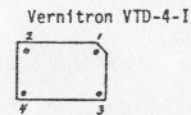
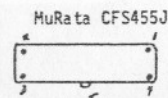


FIGURE 4

Figure 3 (underside)



- 1 = input
- 2 = output
- 3 = ground
- 4 = ground
- 5 = ground tab

they protrude into the general area of the volume, tone, and band selection controls.

16. Now take the front half of the cabinet and drill a $\frac{1}{8}$ " hole about $\frac{7}{8}$ " from the center of the "TONE" control hole and toward the "one o'clock" position. This will locate the DPDT selectivity switch in the vacant area bordered by the speaker grill, band selector switch, and tone control (see illustration in earlier article.)
17. Lay the front of the cabinet on top of the chassis to get an idea of how long the four wire leads need to be to attach to the DPDT switch. Remove cabinet and trim wires to correct length.
18. Solder the wires to the terminals as shown in Figure 4 (which is an underside view of the DPDT switch). Attach the jumper as illustrated and, if you are using shielded wire, solder shields together.
19. Replace speaker
20. Replace cabinet front and mount DPDT switch (you might attach a length of scrap wire to the switch, thread it through the hole, and pull the switch through).
21. Re-solder whip antenna wire.
22. Secure back (be careful of power tab on top of cabinet) and replace knobs.

Now apply power and switch back and forth between wide and narrow positions and you should hear a "darkening" of audio in the narrow mode. To appreciate the improvement provided by the narrow filter, tune to a local station with the selectivity switch in the narrow mode and continue to slowly tune away from the station until the audio just loses intelligibility. Now switch in the wide filter...clear as a bell audio. Note the respective frequencies; the narrow filter should be 2-3 kHz narrower per sideband (depending on filter type, strength of signal etc.)

About the only potential trouble spot with this modification is the mounting of the switch. If the radio is dead in one or both selectivity positions, the switch might be touching the tone control pot and grounding out; if so, loosen switch and rotate until clear.

Although I don't find the insertion loss of the narrow filter unduly high (listed at 8 dB), some DXers might want to add a single stage of amplification to boost the signal.

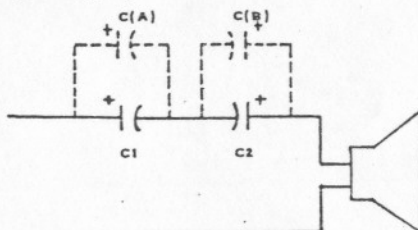
After completing the modification, I'm sure you'll find DXing the 5 kHz spacing MW and SW stations a much more enjoyable (and profitable!) pasttime.

A SIMPLE HIGH-PASS AF FILTER

Gerry Thomas

"Compromise" is the operative word in the design of many of the multi-band portables that are available today ("flexibility" raises costs). As a result, we see radios with single (too-wide) IF passbands, one tone control instead of two, and so on.

In this regard, the Sony ICF-6500W was designed with a speaker with a pronounced low frequency peak which sounds great on the FM band but is murder if you are trying to ID the weak, undermodulated voice signals that often characterize good DX. The single tone control on the 6500 is really a low-pass filter that exerts noticeable control over the treble, but has little effect on the bass. If you are bothered by the excessive bassiness of the 6500 (or, to a lesser extent, the Uniden CR-2021), try the following simple high-pass filter.



C1 & C2 ... 47 uF ELECTROLYTIC 25VDC
C (A & B) .. 10 uF ELECTROLYTIC 25VDC

Installation is easy on the 6500---remove the five screws from the back of the Sony; pull the knobs off the front and remove the front cover; and release the claws holding down the speaker. De-solder one speaker lead and solder one end of the capacitor circuit to the wire and the other end to the speaker terminal.

Try different capacitor values. Start with just the two 47 uF caps; if you want more bass, increase the value; less bass, decrease it. Realize that as you decrease the amount of bass in the audio, the apparent loudness of the signal decreases, so experiment around. For my ears, "perfect audio" resulted with between 50 uF and 60 uF capacitance. A value of 57 uF was attained by adding the 10 uF caps (CA and CB) across (dotted lines) the 47 uF caps.

The improvement in readability is quite satisfying, especially on weak stations that reside under the loud, thumping powerhouses.

Best DX.

73-GT

Two Sony Modifications

by Dennis Kibbe

1/ While you have the Sony 6500 apart to put in a sharper filter (DX Monitor Feb 5/83), here is a cure for the muffled tone of the radio. Remove C99 from the tone and volume control board. The leads can be snipped or the board carefully removed and the leads desoldered. You've just gotten rid of the Sony's head cold!