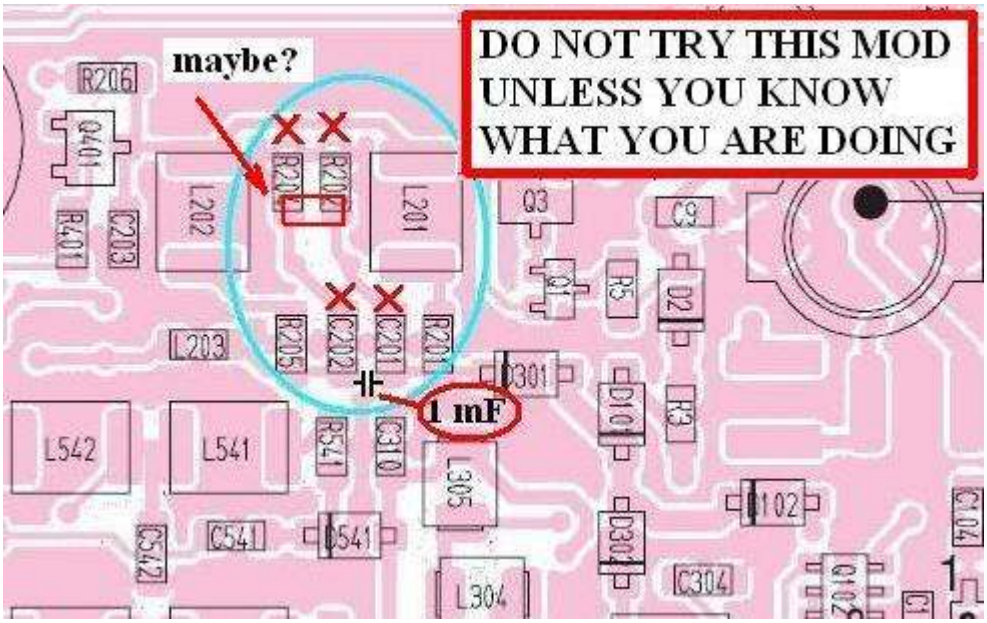
IC-703 MW And LW Attenuator Removal Mod

Dallas Lankford, 11/29/05

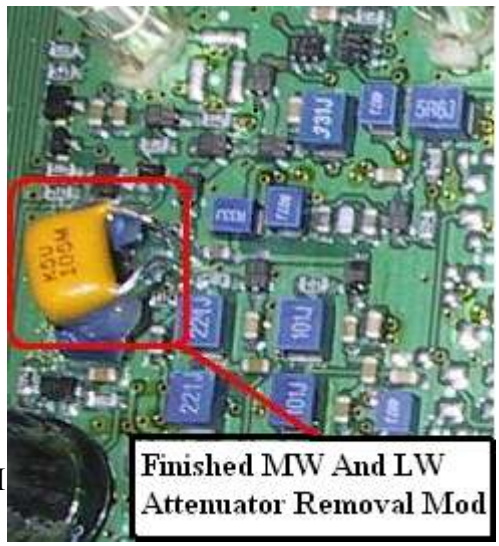


The ATTN mod was worse than hair raising... it was cardiac arrest... considerably more difficult than the corresponding IC-746Pro mod. The problem was that there are no reasonable tie points to wire in a 1.0 mF capacitor or even a jumper.

First, I considered removing two of the ATTN resistors and installing a jumper between two plate throughs. The resistors came out easy enough (and they had to come out regardless of the other details of the ATTN mod). But then the plate through diameters turned out to be smaller than #24. Using smaller wire didn't bother me, but getting solder to flow in such tiny plate throughs seemed to be asking for trouble.

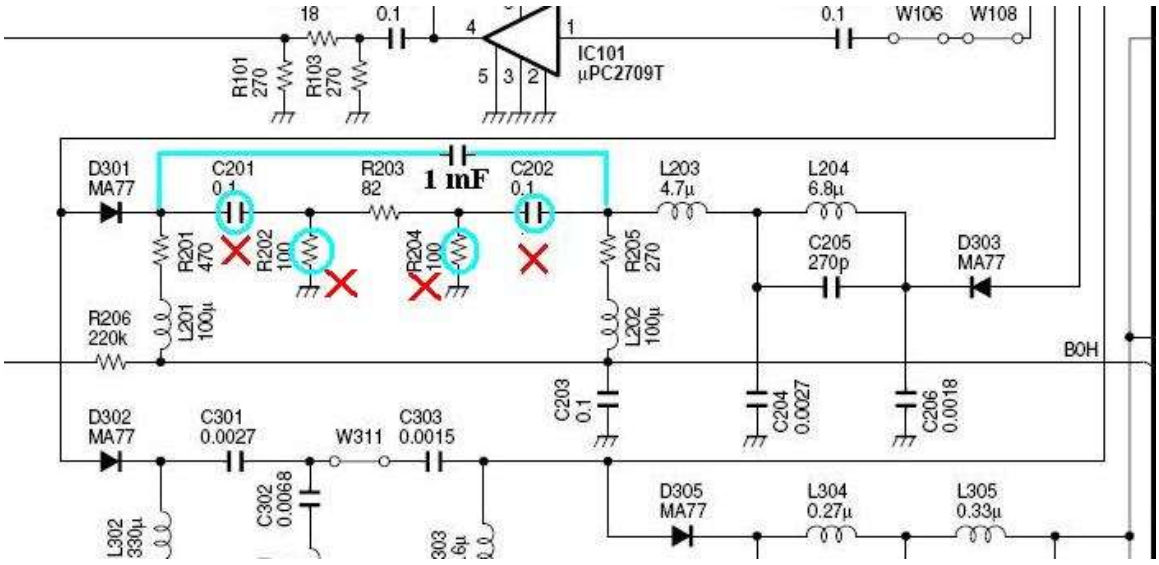
Second, I tried wiring the 1.0 cap leads in between adjacent surface mounts. That didn't work because I kept getting solder bridges due to the extremely small distances between components. At one point I broke off part of the solder pad on the end of one of the existing 0.1 mF caps. So it had to come out, and I took the other 0.1 out also. Now my only remaining option was to somehow solder the leads of a 1.0 mF capacitor to the PC board solder pads where ends of the 0.1 caps had been. I bent the ends of the 1.0 cap appropriately (at right angles where they came out of the capacitor body, and then closer together, the same as the distance between the pads), tinned the ends with solder, formed solder blobs of the PC board pads, placed the 1.0 cap in position, and heated one of the 1.0 cap leads with my soldering iron tip while pressing the lead down onto one of the pads with a solder blob. When the lead got hot enough to flow the solder on the pad, the lead slid into to the solder blob on the pad, I removed the iron tip, and held the 1.0 cap in place until the solder solidified. Then I did the same thing with the other lead.

Measured AM sensitivity (30% modulation, 400 Hz) for the 8 kHz BW with the preamp on before the mod was about 1.6 uV at 1599 kHz and about 2.0 uV at 510 kHz. After the attenuator was removed via the mod above, sensitivity was about 0.60 uV at 1599 kHz and 0.85 uV at 510 kHz.



The PC board pads and traces are extremely delicate, and any pressure applied to this added 1.0 cap could break off one or both pads, or one or both traces. So I used some clear (translucent) silicone adhesive to affix the 1.0 cap to some surface mount inductors underneath the 1.0 cap. I let that dry over night and some time this morning I will reflow the solder on lead of the 1.0 cap that I soldered first (that 1st joint could go "cold" because only my finger was holding it in place). The finished mod is shown in the photo above. The photo is about 2.5X magnification (when the article is printed on an 8.5 by 11 page), which gives you an idea of how tiny the parts are.

When I examined the 1st solder joint of the 1.0 mF capacitor with rested eyes and my super duper home made magnifier, I could see that the solder had not flowed well. After maybe an hour and three tries, I finally got the solder to flow down the 1st lead and onto the pad. Whew! I measured the MW AM sensitivity again; it was the same as before. I declared the attenuator removal mod a success.



A 1.0 mF capacitor was used where it was used in order to to maximize the modified 703 sensitivity at its lowest frequencies. However, after the mod was done it was found that an internal noise source of unknown origin quickly degrades AM sensitivity from about 1

uV at 250 kHz to 6 uV or worse at 200 kHz and lower frequencies. Hindsight being 20-20, it is now clear that the 703 is not an acceptable LF receiver, and so other, perhaps simpler, ways of removing the MW and LW attenuator may be feasible if restored LW sensitivity is not an issue. For example, it might be possible to put a 0 ohm surface mount 0603 resistor across the pads of the removed R202 and R204 as indicated above and not remove C201 and C202. But a high performance hot air solder rework station and accessories might be required because of the cramped positions of the solder pads between two surface mount inductors. Alternately, with C201 and C202 removed, it might be possible to put a 0.1 surface mount 0603 capacitor where the 1.0 leaded capacitor is shown. Again, a high performance hot air solder rework station and accessories might be required. These considerations suggest that mods such as these are quite difficult to do, and are beyond the means and/or abilities of many hobbyists.

rev. 12/3/05