

Fix for FT-857/-897: S9 crashes in receiver, with or without antenna attached.

From posts here and elsewhere, the AM filter in the FT897 and FT857D frequently goes bad after a year or two, especially in rigs made from 2007 to 2009. This produces intermittent lightning-like S9++ static crashes in the receiver, with or without antenna attached, and on all bands. The AM ceramic filter is CF1005, a Toko ALFYM455H=K. Although worst on AM, the S9 crashes may couple into the filters used on other modes too. If the filter fails badly, it might also affect the proper switching to other filters.

There seems to be a Yaesu design error in the FT857/897 main board. The data sheet from Toko clearly states that this ceramic filter should be AC coupled, using DC blocking capacitors. There are no such capacitors in the Yaesu schematic. The full DC diode switching voltage is applied to both the input and the output of this filter.

If DC is applied to CF1005, against the filter manufacturer's recommendations, then occasional failures might not be surprising. I could well believe that some batches of filters may be more immune to failure from unwanted DC than others, so this failure mode might not occur in all rigs.

I had this problem in my own FT857D, purchased new in April 2008, after 23 months of operation. I have now added SMD capacitors (0.01 microF) in series with the input and output pins of CF1005. This blocks the DC voltage otherwise reaching the filter. This appears to have cured the problem, which is consistent it being a design error in the original circuit. I may have made the fix just in time, before the filter became permanently damaged.

This modification is not for the faint-hearted, or for those not experienced in SMD work. I was fortunate to have a skilled engineer friend (WA3HRM) perform the work for me, all under the microscope. I understand that the Vertex service center typically charges 1 hour of labor to replace this ceramic filter; considering what's involved, if that's true I'd rate it a bargain.

Good luck,

73, Darrel Emerson, aa7fv. 2010-04-28 (r1).

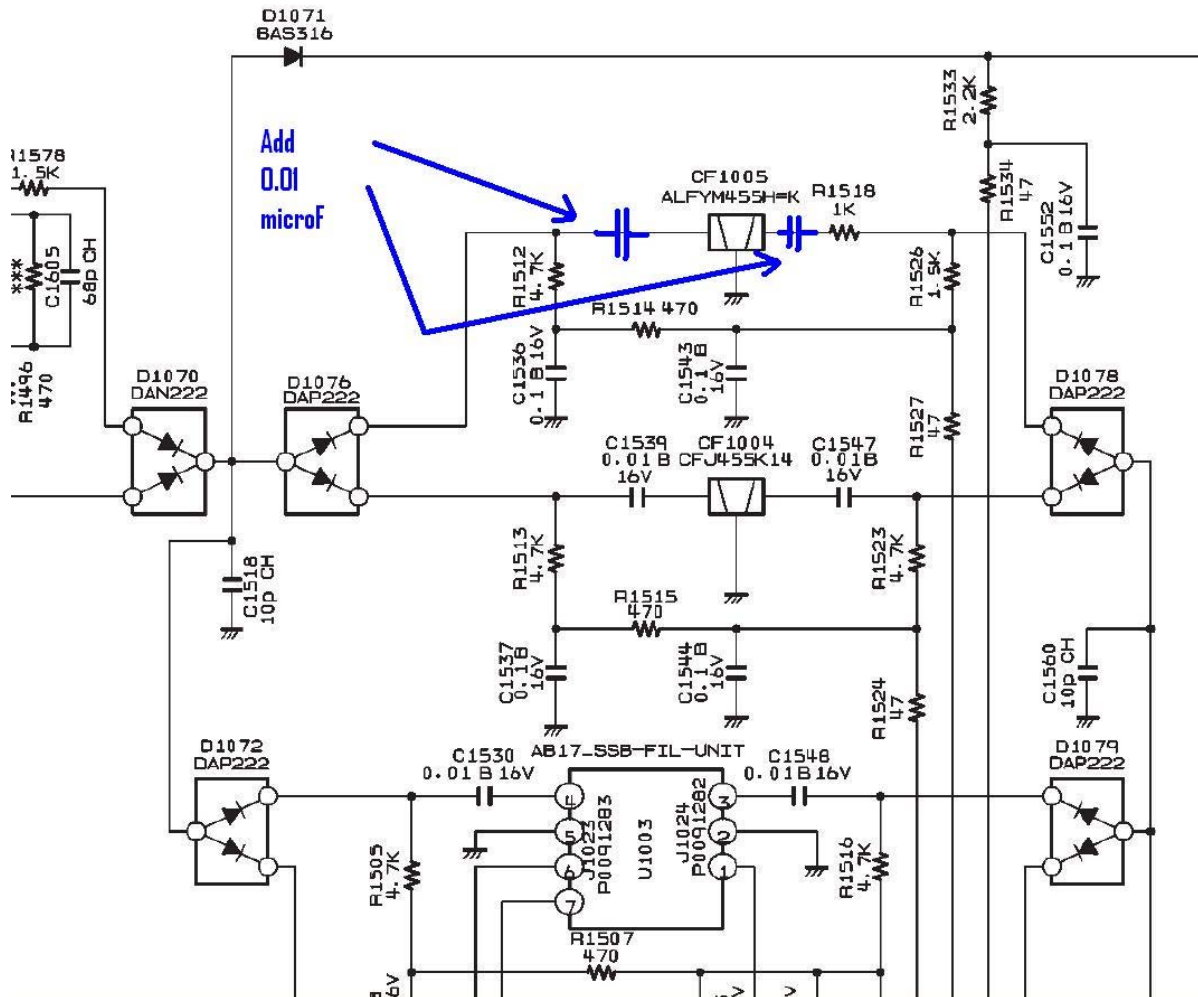


Figure 1: Two added capacitors in series with the input and output of CF1005.

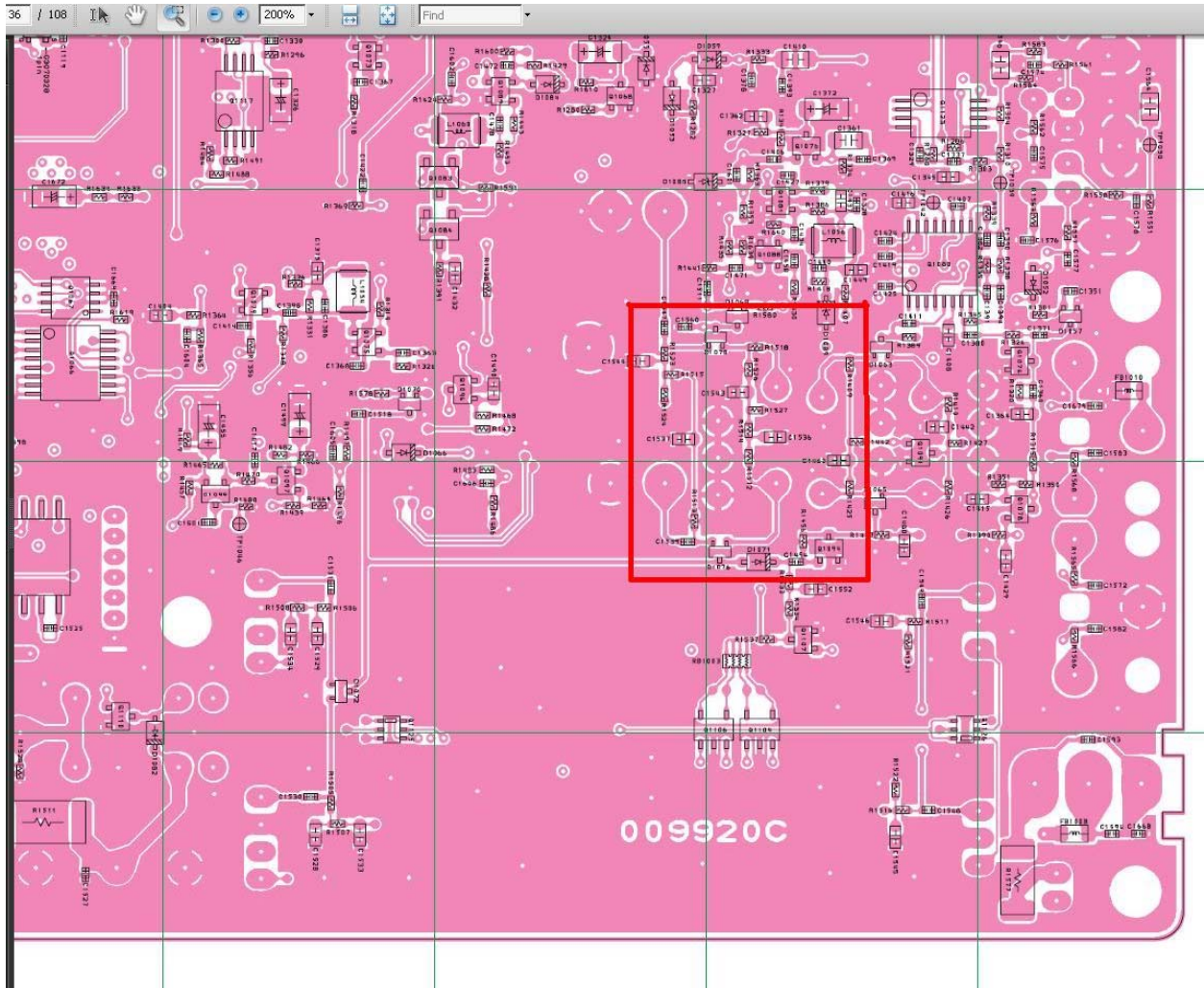


Figure 2. The bottom right corner of the underside of the Main board. This is part of page 36 of the FT-857/-857D Technical Supplement EH007M90C. The red rectangle marks the area of the board to receive the mods.

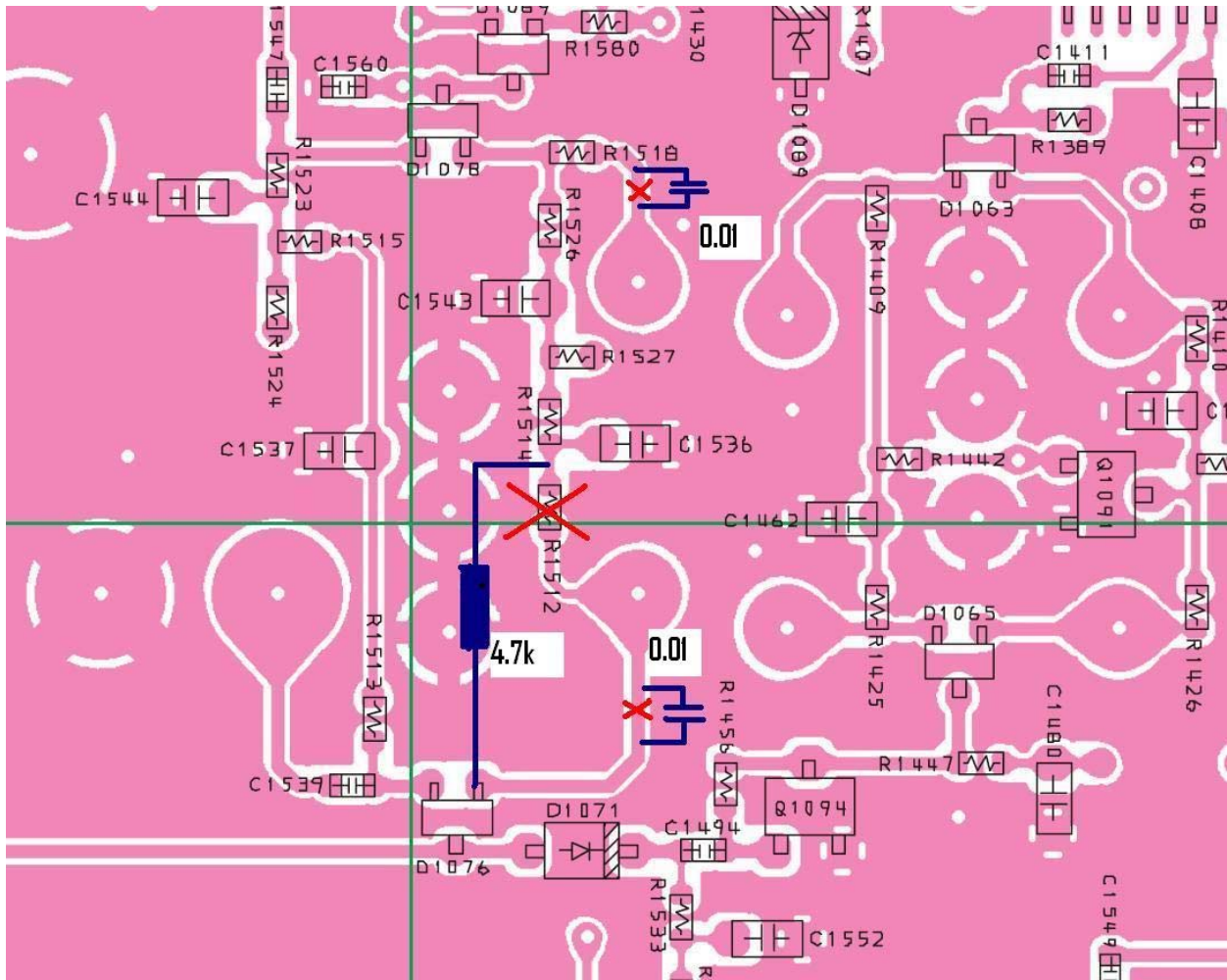


Figure 3. An enlargement of that part of the board inside the red rectangle of Figure 2, showing the modifications.

- (1) Remove the SMD resistor R1512, marked with a large red cross.
- (2) Add a 1/8-watt 4.7k resistor as shown in blue. This replaces R1512.
- (3) Cut the traces marked with the small red crosses, once below R1518, and once in the trace from D1076.
- (4) Put 0.01 microF SMD capacitors across the two cut traces, as shown in blue.