

Note: You can confirm that the PA RF FETs are defective by removing the top cover and watching the fan that is mounted on the power supply assembly. If the fan does not start up when the unit is turned on, the FETs are shorting the 48V supply and the power unit output is inhibited.

*Throughout this document any reference to direction, left, right etc. assumes the reader is working at the back of the radio.*

I recommend the following items to be available before starting the following procedure:

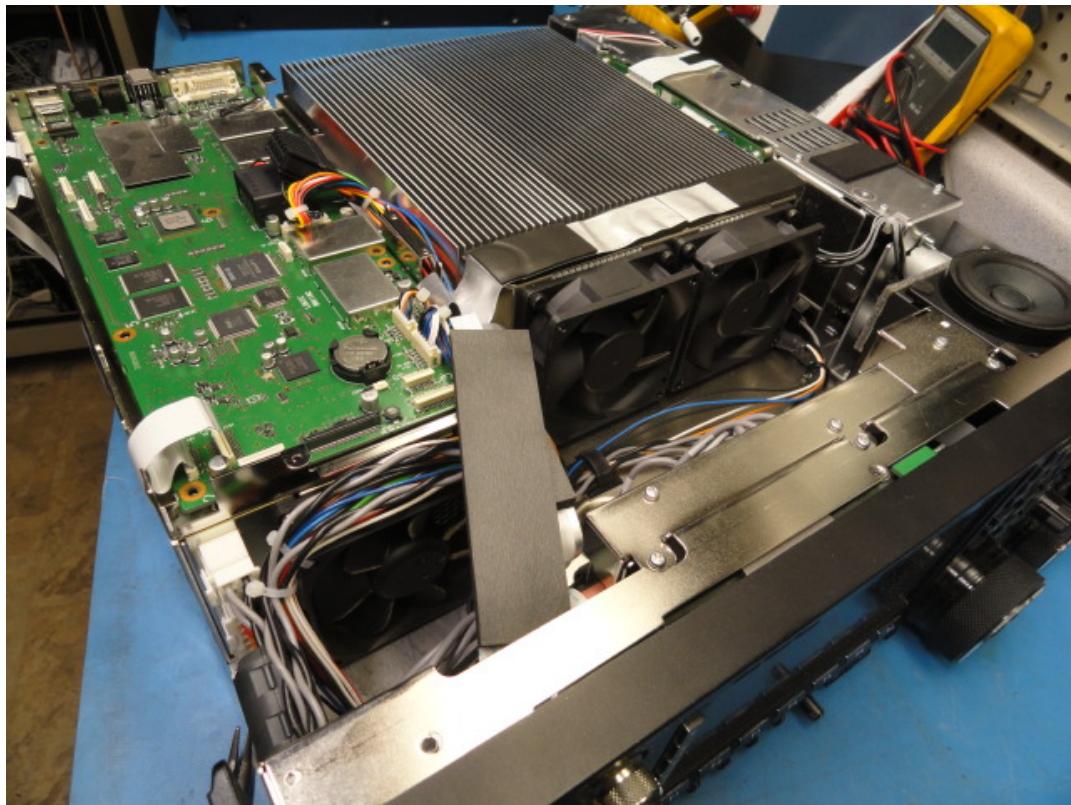
- A sharp metal spike, small enough to fit under the tabs of the FETs when they are unsoldered.
- Solder wick to help clean the FET tabs.
- A small quantity of Silicon heat sink grease
- Some Acetone to remove flux etc.
- A few Q Tips to help remove the old heat sink grease and solder flux.
- Small containers for the large number of screws that will be removed, (don't lose any, they are metric threads).
- 6-8 small cable ties

Start here....

- 1) Remove the power cable.
- 2) Remove the top and bottom covers followed by the rear panel. Note: there is a small self-tapping screw under the ALC-Relay phono sockets. During re-assembly be careful not to try to insert one of the machined screws in error. The page 1-12 in the 7851 instruction manual shows the location of all of the screws, there are quite a few of them...
- 3) The four SO239 antenna connectors are mounted on a short pcb, they will fall forward as the rear panel is removed, carefully set this assembly to the side, there is a thin flex cable that limits how far it can be moved.

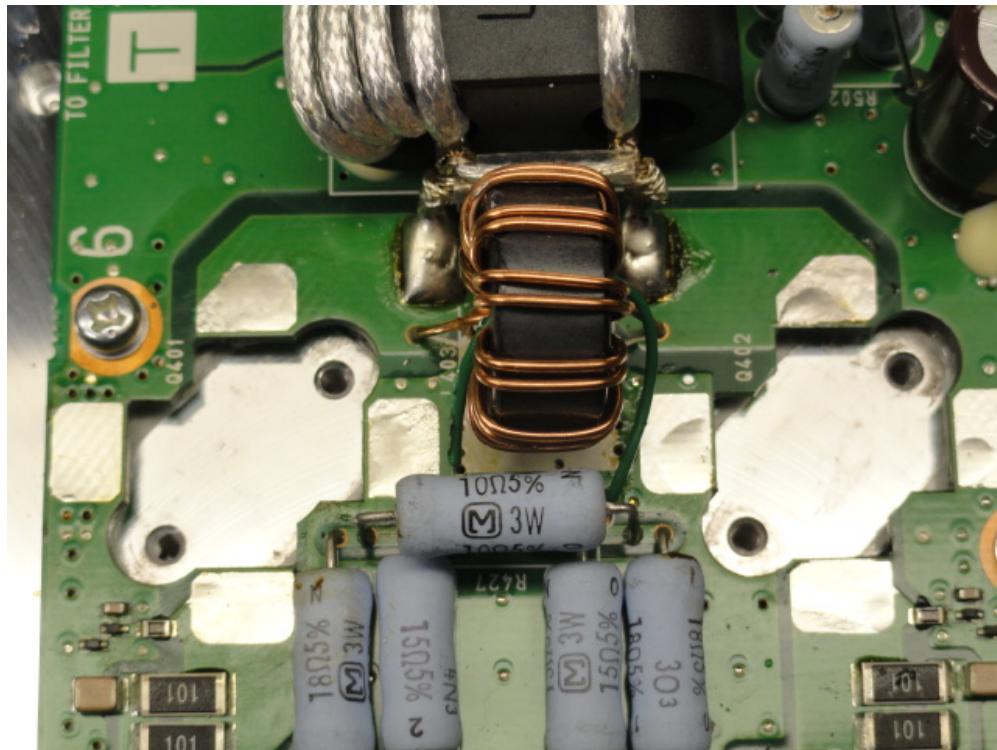


- 4) There is a one inch wide flex cable that runs across the top of the PA heatsink assembly very close to the two fans. It is stuck down with double sided adhesive tape. One end of this cable has to be disconnected and moved aside. I chose to disconnect the right hand side but with hindsight I think the other end would make the re-assembly of the PA easier. Either way, these flex cables have a small reinforced area on the opposite side to the contacts. Pull firmly, straight up, on this small area, keep the contact strip horizontal to avoid damaging the contacts...it sounds harder than it is but you do have to be careful.



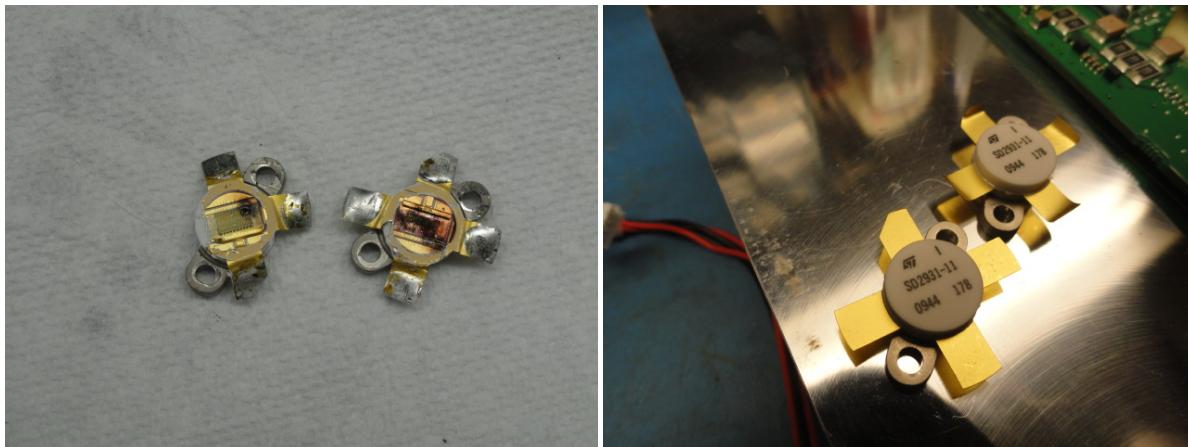
- 5) At the front end of the power supply (situated on the right hand side, it has a fan on the front end). Unplug the top white connector that carries the thick grey and black wires and a large ferrite core. Two black clips hold these wires in place as they cross in front of the heatsink , they have to be opened to release the wires. These clips they are not easy to open...I used a wide blade screwdriver and lots of patience
- 6) Two screws at the front, bottom of the heatsink hold it in place, remove both and rotate the heat sink backwards. Disconnect the two phono plugs and the small white connector. The RF assembly can now be removed completely.
- 7) Remove the metal cage that encloses the RF pcb (5 self-tapping screws) and remove the two screws from both of the SD2931 FETs.
- 8) Unsolder all 4 tabs on each FET using the Solder Wick to absorb as much of the solder as possible. The small pick can be pushed under the tabs to bend them up and enable the FETs to be removed.

- 9) Clean the old Silicon grease from the heatsink and the remainder of the solder / flux on the pcb pads. Acetone can applied using the Q tips, be careful to avoid breathing in any fumes created by the soldering or Acetone.



- 10) Apply a small amount of new Silicon grease to each FET, spread it evenly across the base and fit them into place. Screw them down to the heatsink BEFORE soldering them.
- 11) Replace the metal cage over the pcb and reverse the process from step 6 back to step 1.

I removed the caps from the two FETs that came out of my 7851...you can see the damage they sustained when I turned the radio on...I don't know why it happened...



The second photo shows a small turn-up I put on the new FETs so that they are easier to remove if / when this failure happens again!

I tested the radio after repair before I put the covers back on, you may consider doing the same just to make sure everything is working...200W into a 50 Ohm load



I apologise for this process description being rather long and hopefully not too condescending, I justify it by trying to make sure you succeed in repairing your very expensive radio.

Please feel free to email me at [aa0rs@freng.com](mailto:aa0rs@freng.com) if you have any questions.

Thank you.

Dave AA0RS (ex G3SZA)