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TS-2000 Receiver Sensitivity Mystery Solved

Discussion in 'Radio Circuits, Repairs & Performance' started by K9BF, Jun 29, 2018.

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K9BF
Ham Member

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TS-2000 Receiver Sensitivity mystery solved:

It seems like there has been discussion about the sensitivity of the TS-2000 for a long time. I've seen threads where someone asked about it and by the time the discussion is over, one or more comments are posted referring to the original post as just non-sense. Well I can tell you that there are probably thousands of TS-2000s in the field that have degraded receiver sensitivity. There are even videos on YouTube comparing the TS-2000 to other radios with the presenter mocking those who claim a degradation.

Here's what's going on:

Kenwood screwed up, plain and simple, they screwed up. The pre-amplifier transistors, Q12 and Q705, on the TX-RX1 board don't have sufficient copper to remove the heat they generate. A new TS-2000 will have full sensitivity, but over time, heat from the transistors will cause the solder connection between the source and the circuit board to become resistive. When this happens, the current through the transistor decreases and so does the gain. But there seems to be a point of equilibrium where heat generated from the transistor decreases because of the reduction in current. The preamps have roughly 15 dbm of gain when new. The radios that I have worked on lost about 10 dbm of gain before equilibrium occurred. This degradation will happen to every TS-2000. It's very easy for an owner to determine if this has happened to their radio. Simply turn the pre-amp off and on and note the change in the S meter reading. In a properly functioning radio, there will be a 4 to 5 bar difference between pre-amp on verses pre-amp off. One with the problem will show less. The Q12 preamp is used below 21.5 MHz and Q705 is used

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above. Be sure and check both ranges.

The solution:

The easy solution is to simply take the top off the radio and re-solder the connections. I fix it by cutting a small piece of copper foil to fit under the transistor with as large an area of it as I can get bent up at a 90 degree angle. I then solder a new transistor back in place with the copper foil underneath to draw out heat. This seems to be a permanent fix. One thing of note, the 2SK2596 transistors are getting hard to get. Kenwood has the 2SK2596-E for replacement. That's fine but if your old transistor is still good, you can probably get away with re-using it. I like to repair with new transistors if I can.

Good Luck and 73

Ben K9BF

Ben K9BF

K9BF, Jun 29, 2017 Report

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Might also be worth pointing out to the community, that the sensitivity can be improved on the low frequency bands, ie. MW and below by switching a link to 'DX', by default I understand it is set to 'Local'.

This can be found by turning the radio upside down, removing the bottom cover and looking in the top right hand corner.

This does not affect 160m or 177 bands, just the bands below 160m.

Dave

G4COE, Jun 29, 2017 Report

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K9BF said: ↑

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While I agree as to the problem, I think you can blame the engineer that didn't realize the the garbage they called "lead-free" solder doesn't tolerate heat as well as regular 60/40. It seems to crystallize much easier and cause problems. Of course when the radio was designed the lead-free solder wasn't mandated.

Enough room to point fingers in all directions. My 2 cents.

City 3841 and 3843277

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Nov 28, 2017 Report

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