IC-7800 Headphone RFI on 20 Meters fix
Worked here but your results may vary.

After owning the 7800 for a week or so, I was disappointed by what seems to be a common problem of RFI in the headphones on 20-meters.

Researching including this Yahoogroups I found Federico IK3UMT found the source and fix. He talked about it in his message #8814. I found a few interesting things in the process I am passing on here.

IK3UMT found grounding the foil of the Phone-Key jack board eliminated the RFI and it does but there can be other contributors too.

I grounded the foil and it eliminated the distortion with the radio stand alone. Again, with the radio not connected to anything RFI was rampant in the headphones on 20-meters. After grounding the foil the RFI is gone. At last a fix!

Pictures of this mod are in the Photos section of this group. The album is named "RFI in Headphone Fix". Here is the URL::

http://groups.yahoo.com/group/ic7800/photos/album/452773180/pic/list

Then I put the radio back together including covers and connected everything up - it was back again!

See Other Source below.

So keep an eye out for other contributors but clearly the PCB foil on the Phone-Key jack needs to be connected to the chassis (metal front panel.

Two things -

1 - Don't connect the chassis to the ground tab of the 1/4" phone jack on the PCB. I did resulting in some audio distortion and no effect on the RFI.

2 - It is not necessary to remove the phone-key jack as seen in the pictures. I did because I wanted to understand what was going on. I found that the little trim rings around the phone and key jacks you see from the front of the radio are decorative. They are setting in a plastic sleeve. You can see this in the picture. They are not part of the circuit. The sleeve connection is about 1/4" inside the hole.

Have a look at the pictures and it should be clear as to what I did.

Front Panel Removal

1 - Be careful removing the video cable when removing the front panel.
The ribbon cable is wrapped in silver tape - very stiff. Its jack is a zero-insertion force jack with a small brown plastic latch that needs to be popped down to release and later after the cable is fully seated popped back up. Use your finger nail.

2 - Front panel removal requires top and bottom covers to be removed.
Then on each side of the panel remove the three large screws (used with the handles) and the two small counter sunk screws - on each side.
These two smaller screws are only visible when the top and bottom covers are off. The front panel fits snuggly so gently but firmly pull and gently disconnect all cables.

3 - Remove the four screws holding the shield on the back of the front panel. Then follow the pictures.

It is a little intimidating but after spending thousands of dollars on a dream radio I was committed.

Other Source:

It was the microphone cable.

First the pain:
I pulled this behemoth forward away from the wall and using a mirror and a print of the rear panel I tested each and every connection (eleven in use). I unplugged one at a time and tested and listened for a change in the RFI in the headphones. No change. Everything was disconnected and still huge amounts of RFI (1500 watts with beam pointed over the house - worst case).

I was frustrated and tired so I sat down. Looking at the 7800 I see this big mic connector on the FRONT of the radio! I unplugged it and the RFI was gone! What?!

It is a Heil connector with Heil Wire bought wired from the manufacturer. So what is going on? Mic wiring troubles usually impact RF on the SSB TX audio but this was TX carrier (CW) producing RFI in the headphones - and only on 20 meters...??

There are some questions in my mind about this.

1 - Why no SSB audio distortion on 20 meters or other band? I still don't know the answer to that.

2 - What is going on in the mic cable - both ends?

Number 2 is perplexing. It is one of those situations where you are working with little tiny connections including a blocking capacitor in a very small space inside the connector's shell.

What was found:

I don't think Heil wired the connector correctly. Note: I'm using a dynamic mic - balanced. Here is how Heil wired the connector. Keep in mind I'm using a balanced mic. Studying the schematic ICOM's mic input looks balanced to me.

Look at the schematic - the ground (pin 7) never goes to ground. It is an audio return line.

Pin 1 is one side of the mic audio and 7 the other. These are located on the left and right side respectfully of the keyway.

There is a PTT ground on pin 5 and the shell which is connected to the chassis - if you fixed it. Keep in mind I had added a ground bond from the jack's PCB foil to the chassis behind the front panel. Now the mic shell, headphones and paddle jacks are connected to the chassis. Look at the pictures in the Photo section of this reflector.

Here is how the Heil connector was wired:
Heil wired one audio conductor to pin 1 with a blocking capacitor - correct. The audio return instead of using the second shielded conductor used the shield instead going to pin 7 - (?).

The mic element return should use the second conductor within the shield, not the shield. That audio return lead has to go to pin 7. The shield needs to be terminated to chassis ground – via the mic connector's shell, not pin-7 or 5 (PTT). (Pin 5 isn't really ground either. I tried it.)

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Rewiring the connector so the two shielded audio leads from the mic go to pins 1 and 7 and the shield to the shell of the connector eliminated the RFI – this time with all eleven cables connected to the radio.

NOTE: If you do this make sure you check the other end of the mic cable to be sure the two mic element audio leads go to the two shielded leads (black and white) and the shield is either floating or connected to the mic's housing.

My conclusion - moving the shield to the chassis puts the RF on the chassis and not into the circuit inside.

Now my IC-7800 is RFI free - until something changes...:)

Remember this stuff is magic so your results may vary... Good luck.

73,

Bob – W6OPO