

# Fixing the "Audio Drop-out" problem of the Icom IC-R72

My beloved R72 eventually developed the "audio-dropout" problem, that seems to be a very common failure of these receivers. What I will describe here is a simple procedure to fix it. But first let me state it very clearly: do it at your own risk. I will accept no liability for any damage you will do to your radio, to yourself or to this sector of the Universe by following the procedure outlined in this document.

## **The symptom**

The symptom is simple and scaring: there are audio dropouts in various segments of the bands; actually, the receiver stops receiving for few kHz; these "mute" segments of bands are periodically repeated every 512 kHz. Sometimes the problem goes away after few minutes of warm-up. It gets worse and worse with passing time.

## **The diagnosis**

The cause is the DDS (direct digital synthesizer) losing lock because of drift, due to aging. Let me be more specific: in the PLL loop there is a VCO (called sub-loop) that spans 512 kHz of frequency, from 62.05 MHz to 62.56119 MHz; because of aging this VCO drifts so much that the PLL is no longer able to make it work at the right frequencies, and it stops working.

Luckily the solution is VERY simple, it takes no more than 15 minutes and the only tools you need are a DVM (Digital Volt Meter) and screwdrivers to open the radio.

## **The cure**

What you have to do is described at page 7-2 of the Service Manual, at the paragraph entitled "DDS LOOP" (middle-page); actually, you can connect a DVM to L42 instead of the oscilloscope, since what we are measuring is the DC voltage that drives the varicap of the VCO.

In my case at 14.12650 the DVM reading was 0.1 V DC (instead of 1.0 V), and at 14.12649 the reading was 1.1 V (instead of 2.0 V). Guess what: when cold my R72 was loosing lock around 14.12650...

To fix it I had to gently squeeze L30 with two fingers to bring the values of the DC voltage back in spec; obviously when you touch L30 with your fingers (or with a non-plastic tool) the oscillator stops working; so the procedure is:

- 1) Get a copy of the Service Manual, a DVM and a set of screwdrivers
- 2) Open your radio to access the PCB below the power supply (Figure 1)
- 3) Remove the cover of the DDS oscillator (circled in Figure 1 and Figure 2); you can simply pull it out, since it is not soldered in place
- 4) Connect a DVM to L42 (red arrow A in Figure 3) and ground
- 5) slightly squeeze with your fingers (or expand, depending on the actual situation of your VCO) L30 (arrow B in Figure 3)
- 6) Remove your fingers or tools
- 7) Read the DVM
- 8) If the reading is still far from the specifications repeat from point 5)

You can refer to the photos below to help you in the process. Feel free to contact me if you want to exchange ideas at: [iz2eas@arrl.net](mailto:iz2eas@arrl.net). Enjoy your R72 !

Michele IZ2EAS ([iz2eas@arrl.net](mailto:iz2eas@arrl.net))

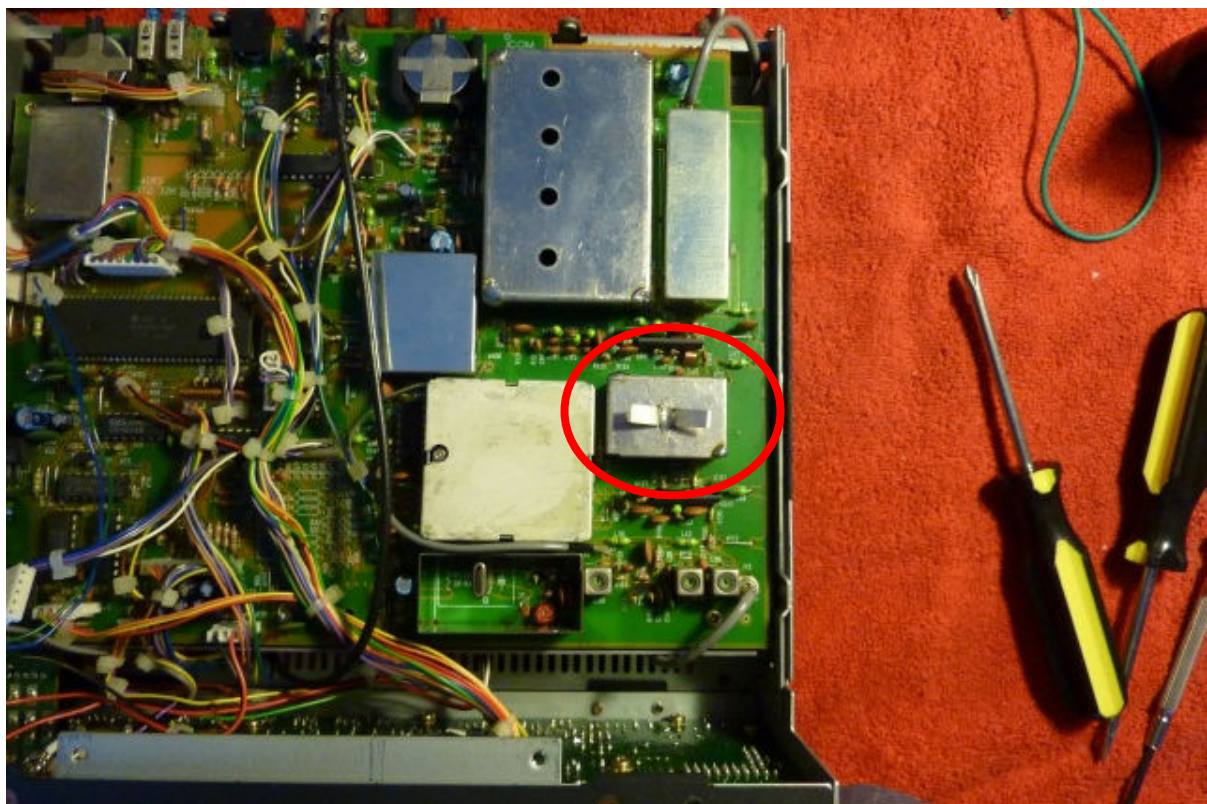


Figure 1. Circled is the cover of the DDS that must be removed; just pull it out, it is not soldered in place.

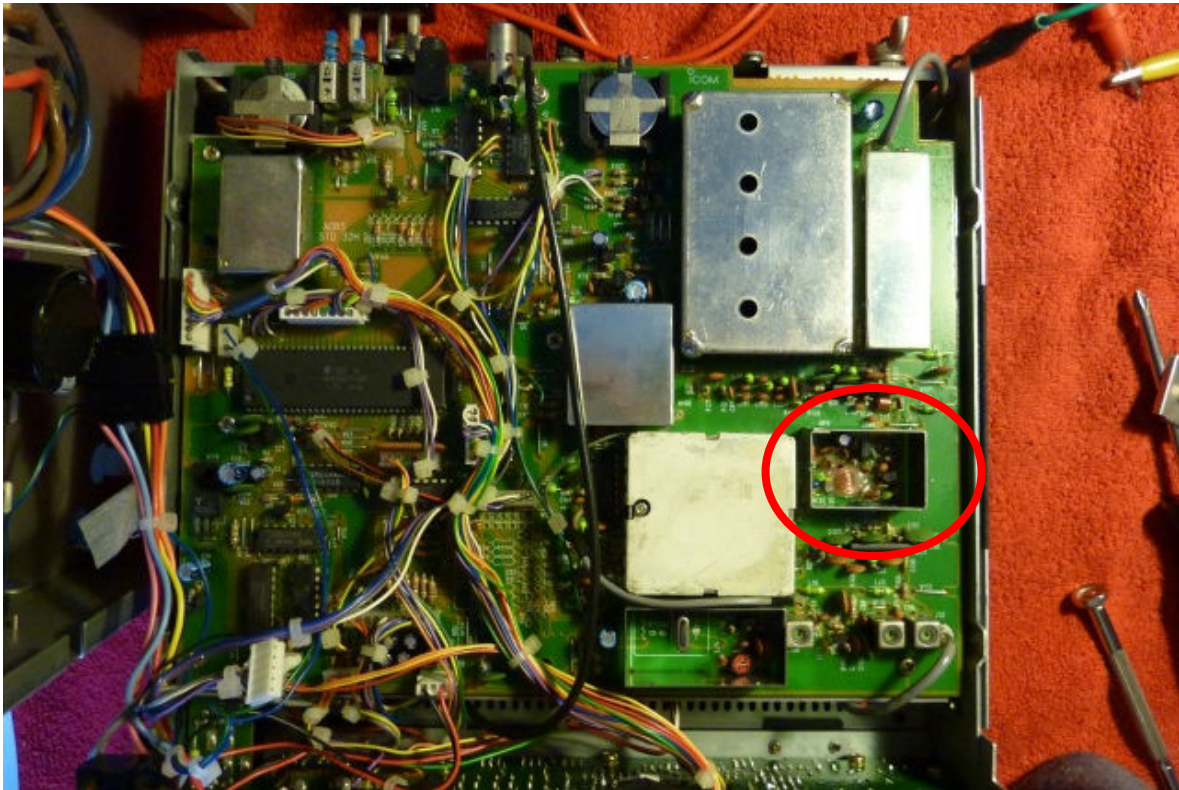


Figure 2. Circled is the DDS with its cover removed.

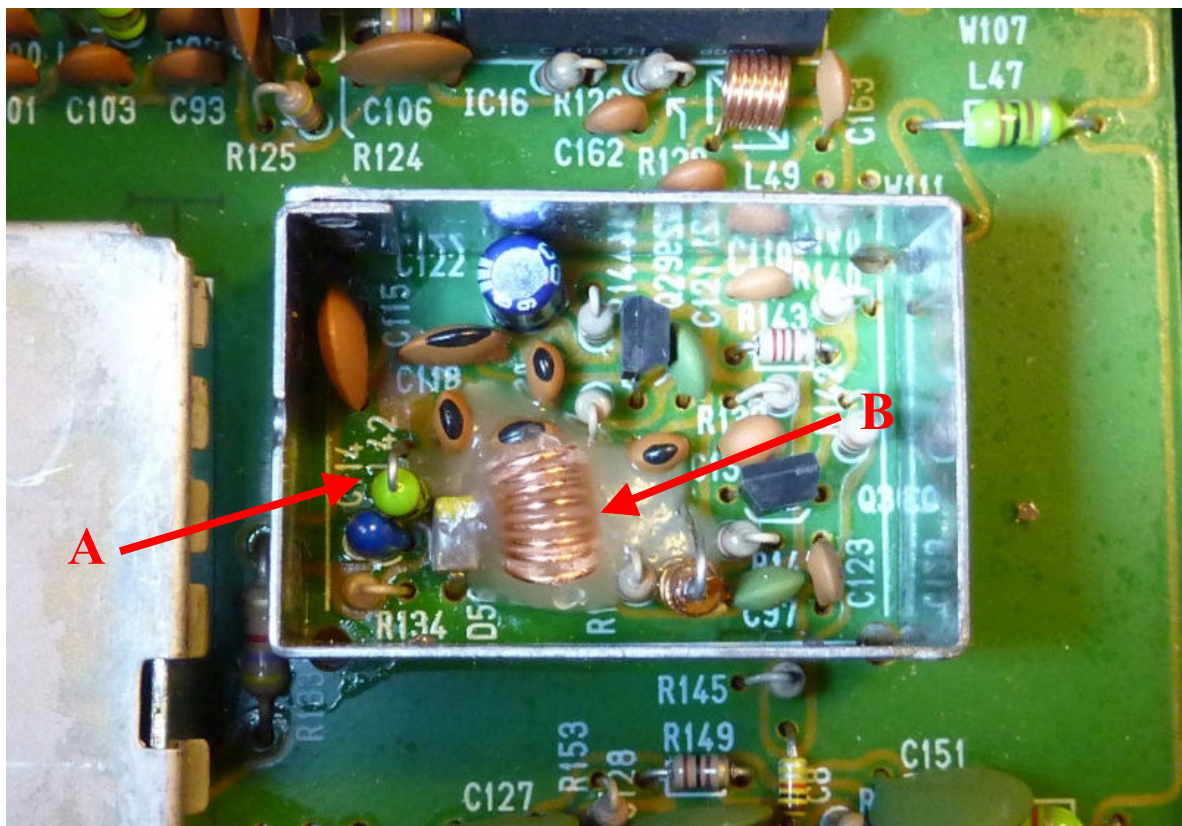


Figure 3. Zoom-in of the DDS circuit. Connect the (+) terminal of the DVM to A (L42), and squeeze (or expand) the coil B (L30). Note that there is no need to remove the original paraffin.