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Tony Jones G7ETW

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As anyone who knows me knows, I am a sucker for a radio of character that needs a bit – but only a bit – of work. **Photo 1** shows an Icom IC290A, a 2m multimode from before I was licensed. It came to the Radio Society of Harrow as part of a large silent key sale. After clean-up – it spent many years in a garden shed – and testing, it was found to be working, but not fully.

*"It receives fine",* my friend **Peter Marcham G3YXZ** told me. *"And it transmits, but there is no audio".*

To be honest, I wasn't that interested at this point. But when I received the update that with an Icom SM05 desk microphone plugged in the transmit audio was restored, this radio promoted itself to 'G7ETW-repairable' status and for £25 it became mine.

I found it remarkable that a radio nearly 40 years out of production would work with a microphone of today, but Icom have a standard for their eight-pin microphones, I have learned, and – hearty thanks from me – they stick to it.

## Restoring an Icom 290A

Tony Jones G7ETW gets a real 'oldie' working again.

### Fault finding

The fault really had to lie in the HM7 strangely futuristic-looking microphone. **Photo 2** shows the circuit diagram and **Photo 3** shows the internals. This microphone has a dynamic moving-coil insert with a one transistor amplifier. I had never heard of a 2SD661 but the application is simple enough and I thought almost any NPN would do if the original had failed.

The first thing to do with any simple transistor circuit is check the DC conditions. I found 8V DC on pin 1 of the plug, on the collector and at the top of the 10kΩ resistor. But on the base and emitter there was no voltage.

Assuming the board wasn't cracked, that gave me two possibilities. Perhaps the 1.8kΩ resistor was a short and consequently there was no bias voltage? (It wasn't – there was 1.15V there and on the 'bottom' of the microphone capsule.) Or, unlikely as it may be, the capsule had gone open

circuit. I removed it and checked – yes, it had!

The capsule being in series with the base looks odd, but makes sense. Had it been connected base-to-ground, its 6000Ω would complicate the bias conditions.

There appears to be no output in this design. It's not an emitter-follower circuit, nor is it a classic class A. Only one wire, the DC supply line, can possibly be the output, and, sure enough, this goes direct to the non-inverting input of an op-amp, so a voltage must arise there. Somehow. I didn't need to touch this, so I gave the matter no more thought.

### The repair

New dynamic capsules are available, and not expensive. But as **Photo 4** shows, there was a problem. The original, left in the photo, is 25mm in diameter and 25mm deep. The new one is the same width but 9mm deeper. By removing an internal fixing into which the back-of-

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Photo 1: An Icom IC290A.

Photo 2: The microphone circuit.

Photo 3: Microphone internals.

Photo 4: Microphone capsules.

Photo 5: FM channel spacing by US state.

microphone hanger was secured, I found there was just room without resorting to amateur surgery.

This radio now works – very well actually. The buttons operate, all of them, and the volume control isn't even scratchy (it must have been a dry shed!). Power out is 12W (high) and 4W (low) on FM and SSB. The original specifications quote 10W and 1W, so this may have been tweaked at some point. My repaired microphone works perfectly and I've been getting compliments on my transmitted audio.

A successful repair then. All that said, I fear this radio is more of a conversation piece than a practical communication device.

It is an 'A' model, where 'A' stands for America. With 5kHz VFO steps and what we'd call wide deviation, one would expect the USA to have 20kHz channel spacing for 2m. There is an FCC bandplan, and it does indeed say this, but it appears not to be followed.

Idaho, for example, uses 20kHz, but Colorado gets by with 15kHz. (Hmmm. Perhaps Carson's Law is a European thing. With 5kHz FM deviation that is very tight indeed.) For repeaters, sometimes 30kHz is used. I found a map, **Photo 5**, showing what individual states do. This must be a nightmare on long trips, surely? Any American readers, please feel free to email me.

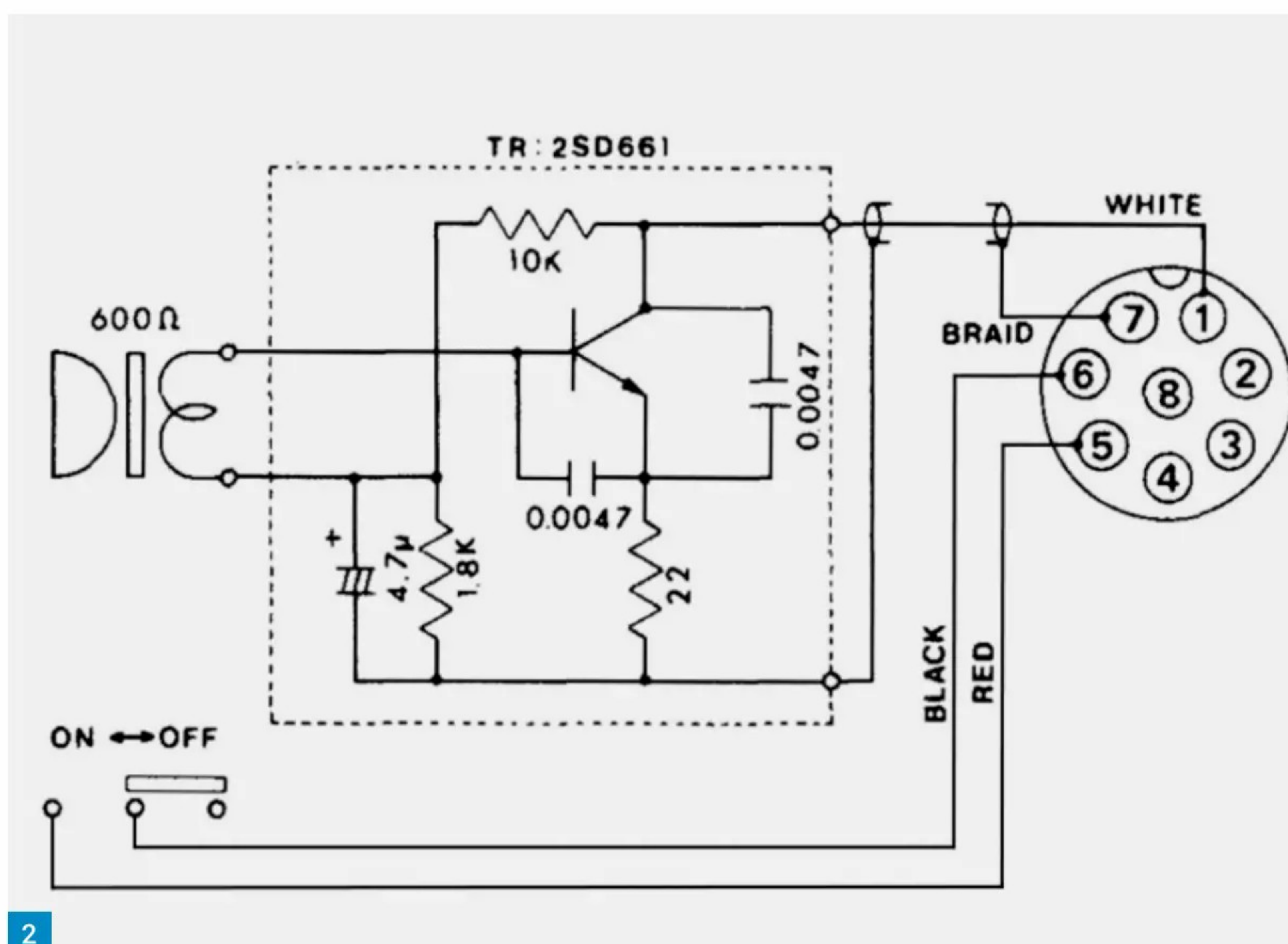
But back to my model 'A'. I can tune to the UK's old 'S' 25kHz channels, no problem, but not quite the new 'V' ones on the half-channels. I can get close, though, because the radio has 1kHz steps. There is also a front panel plus and minus 800Hz RIT control, but this only comes into effect on SSB.

Then there is the fact that the deviation is set to 5kHz. 40 years ago, there was no need for narrow deviation on 2m anywhere. Reducing this to 2.5kHz could be done, but I would have to do this 'by ear'.

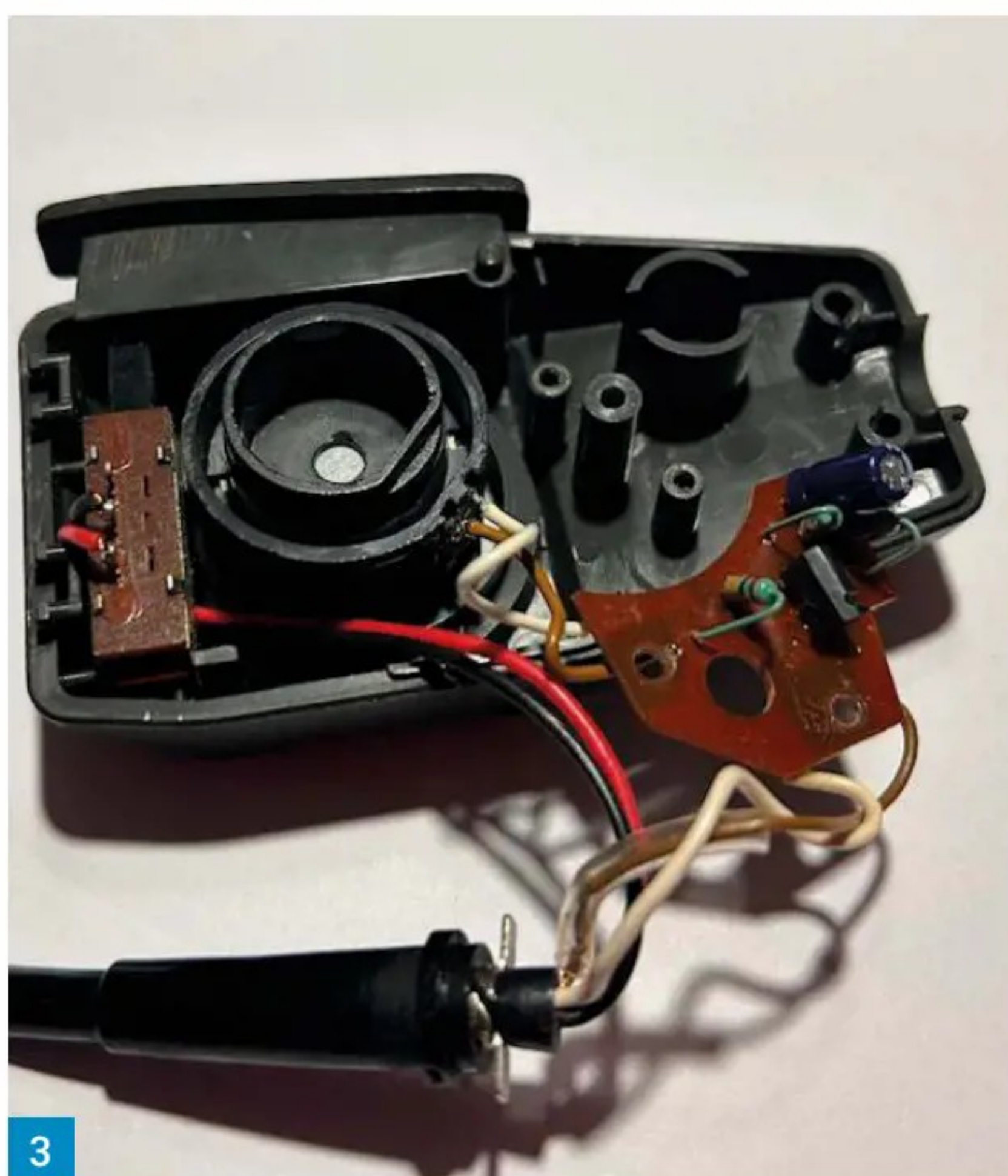
Repeaters too, are an issue. The radio does have a 600Hz shift – both up and down! – from the front panel, but there is no CTCSS or 1750Hz toneburst.

The radio is not ideal then. But it works, and I enjoyed fixing it. A radio of old, its receive audio is a joy to the ears. Everything is controlled by proper buttons; there are no menus here. And 5W out beats my FT-817.

This lovely old Icom can certainly have a home in my shack. For a while at least. I daresay another interesting but minorly faulty radio will come along before too long. **PW**



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