

The A41 No 3 – back in captivity

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General View

The Dunstable Downs 'boot fair' is always worth a visit, as the all-important ratio of classic to computer junk is pretty high. Wandering around the stands last year, I noticed a very clean example of an A41 which rated a second look, even though VHF manpacks aren't my main area of interest. There was also something odd about it, and eventually the penny dropped - the battery box was about half the normal height. Closer inspection of the name plate proclaimed it to be the near mythical A41 No 3 but, before parting with my money, I had a quick look inside. This confirmed that the set was all solid state and definitely the real thing.

Background

Murray McCabe - to whom I am most grateful for advice and encouragement - has given an excellent description of this rare development of the well known A41, in itself an Anglicized version of the US PRC-8, -9, -10 series. The likelihood is that the No 3 version was a (probably cheap and cheerful) private venture which tried to bring the A41 up to date with the transistor age, using the minimum of redesign. Its working principles are essentially those of the earlier sets, substituting transistors for valves.

My own example bears the serial number 4. From the absence of much wear and tear on the outside, I guess that it was a prototype used to test out the electronics, rather than one subjected to full user trials. It is fairly obvious that it did not come from a long production run. The hardware specific to the No 3 version is well made but isn't always an exact fit: some metal bodging can be seen in one or two places.

Getting started

The manual for this set is available and, as a start, I set about working out the various connections to headset and batteries - needless to say, it hadn't come with any accessories. It was even missing the battery plug.

Equally needless to say, the headset wiring is completely different from any of its known contemporaries, although physically and electrically the headset seems to be the same as that for the A13 or A14. A spare headset was rewired to suit. (Don't worry! This can be done very easily and reversibly, by opening up the pressel box.)

At first sight there didn't seem much wrong internally, although the PA transistor was obviously missing. Initial tests showed very little sign of life, however. I should have carried out a much more thorough visual inspection in the first place (some things are never learned) and it wasn't until I opened some of the diecast boxes that I discovered that the connections between practically every circuit board had been

unsoldered. There was no obvious reason for this, as the original wires were still in place; it was just that their ends were flapping about.

Receiver

Immediate first aid brought about much better results, at least on receive, but there were still some obvious deficiencies. The first of these was the calibrator function, which was restored by replacing the 1 Mc/s crystal. This also entailed an adjustment to the 50 kc/s divider, which had to be done by trial and error: you simply fiddle around until 20 calibration points appear from 1 Mc/s marker to the next, rather than 16 or 25!

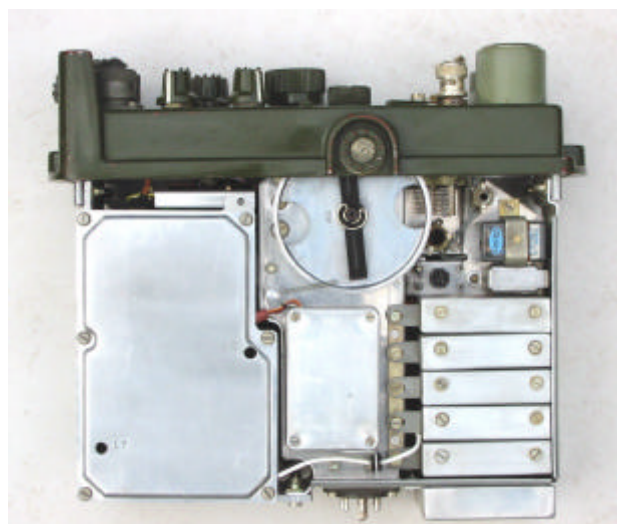
A properly working calibrator was a great help in adjusting the local oscillator, which was quite seriously adrift. But before sorting this out, measurement of the stabilized 5.1V line to the local oscillator, mixer and AF circuits showed that it was a couple of volts low, which had obviously not helped. An obsolete PNP transistor was identified as the culprit and rather than look for a replacement I decided, for the time being, to put in a modern 5V regulator.



Control panel

The results were most gratifying, as the receiver burst into action with a deafening hiss. The squelch circuits, I was just as delighted to find, were fully effective. The only remaining problem is broadcast interference, mainly around the 40 - 45 Mc/s dial marks. After spending a few minutes with a calculator, I concluded that this was the second harmonic of the local oscillator mixing with the BBC and assorted local radio stations.

I wouldn't have expected the RF circuits to give much

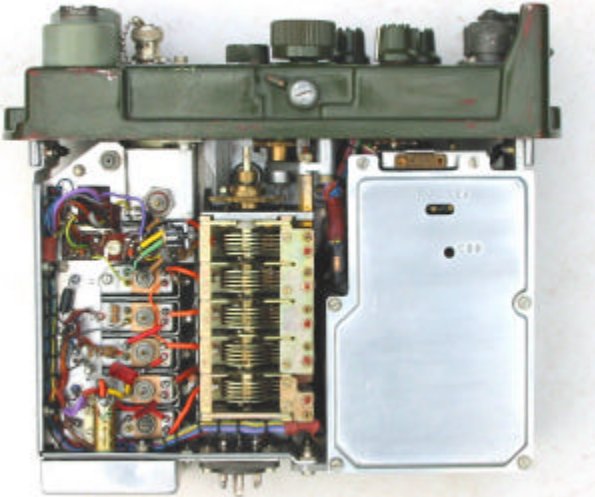


Top view as found

protection against a strong broadcast signal, but it does say something about the waveform of the local oscillator, which I haven't yet tackled.

It is possibly the result of components going off spec and altering the bias. However, the inside of the LO module is difficult to get at and the manual doesn't give test voltages, even if one could get at the test points. Further investigation would thus require some quite extensive surgery, with all the attendant risks.

Murray has reported a similar problem with the SEM 35, although in that instance the main cause seems to be poor decoupling, which allows the signal to creep in via the battery leads. In mine, the signal is clearly coming through the aerial



Bottom view as found

socket. Both cases indicate that the LO isn't as pure as it might be, and I do slightly wonder if it might not come from pushing 1960s technology to the limit. I don't recall a similar problem with the A41 No 2, which has essentially the same RF stages, although the numbers are a bit different.

Perhaps someone who knows about these things could comment before I go any further. The transistor is a 2N3227 and, as it happens, the same type is used in the Master Oscillator, which may not bode too well for transmitter spuriae!

Transmitter

As already noted, the PA transistor (a 2N2950) was no longer present. Tests showed, however, that the master oscillator was working and that it very closely tracked the receiver setting, so that the sweep oscillator and AFC functions must be working as well. The microphone amplifier also seemed to be OK.

A simple buffer amplifier, not shown in the manual, had been added between the MO and PA stages, using a 2N3866. This had been very neatly done and was most probably added during the development stage. Its usefulness could not be assessed in the absence of a properly functioning PA, however, and I have removed the unit until I can sort that problem out.

I have so far been unable to locate a replacement for the PA transistor. As an initial attempt to get things going, I used the transistor which I had removed with the buffer amplifier and which has a specification in the right sort of range. The result was a just measurable RF output, but nothing like the rated 0.75W.

So - plenty more to do. Working on this set has been a new experience, as I normally stick to valves and HF, but it has still been a fascinating exercise. It's never too late to take on another challenge!