



Ben Nock G4BXD's Valve & Vintage

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Boxes of Surprises for Ben!

Ben Nock G4BXD has been busy moving home in the last few months and – as he and YL Gloria have been settling in – they've had a few surprises!

A very big welcome to Valve & Vintage (V&V) and a happy New Year from the 'Kidderminster Kollektion'.

I'm well into the laying out of the collection in its new home and I have amazed myself at the number of items I have managed to pack away into cardboard boxes over the years!

It's been a great delight opening some of the boxes and finding long forgotten treasures, even simple things like microphones for a particular set, or the right headphones for another. It will take quite some time though before all the boxes are opened and the parts reunited with their correct sets.

German 28 & 50MHz Transceiver

One of the boxes I recently opened had a German-made transceiver in it, which I had obtained quite some time ago but which had been packed up for transit.

The SEM-35 man-pack, **Fig. 1**, is a solid state set covering 26 to 69.95MHz in 50kHz steps.

The large frequency steps do mean the set is not that versatile, but it still can be used on the 28 and 50MHz (10 and 6m bands). The set is frequency modulated (f.m.) with a power output of 150mW or 1W.

The SEM-35 is a back-pack radio but it can be fitted into a carrier and used in vehicles, drawing power from the vehicle battery and using an automatic antenna tuner unit (a.a.t.u.) and vehicle mounted whip. In the back-pack role there are two antennas, a long sectional whip for the lower frequencies and a tape measure type blade for the higher frequencies.

The receiver section of the set is double conversion, the first intermediate frequency (i.f.) is 11.5MHz and the

second i.f. is 470kHz. There are two 'front ends' in the set, each with its permeability tuned circuits.

The tuned circuits are selected by the range knob and the antenna mounting has a clever feature. The long whip is switched to the low band tuner while the blade (if used) is switched to the higher band tuner. If no whip is fitted the input is directed to a front mounted BNC socket.

When I purchased the set it was under the (in)famous 'Yes, it's working fine' promise. Needless to say, when I tried the set there was no transmitted audio, the carbon microphone insert was well past its 'use by' date.

The insert in the H-33F/PT handset is very small, maybe an inch across, so finding a replacement would be difficult. As I contemplated what to do I recalled a trick I used when modifying modern Airlite headsets for use in the small aircraft I used to fly.

The radios in the light aircraft used carbon microphones so on the newer headsets I used a small piece of Veroboard with an Electret insert, one transistor, two resistors and a capacitor to provide a carbon insert replacement. Luckily, transmitters using a carbon insert provide a voltage which is supplied across the insert and measuring that voltage in the SEM-35 handset – I found it was about 5V, more than enough to power the little amplifier, **Fig. 2**.

Having built the small unit on the Veroboard strip, the handset fortunately had a suitable space in the bottom in which to place the board, **Fig. 3**. This allowed me to screw the outer cover back onto the handset and restore modulation to the transmitter.

While the basic circuit does work I feel I can do better – so I'll be trying an improved circuit shortly and present you the details of my trials in a future edition. The SEM-35 is simple to use and at least covers two of the Amateur bands but I must say that the power-to-weight ratio of the set is very poor. So in my opinion it's not a set you should go out of your way, or pocket, to obtain, unless you're specifically looking for one.

Direction Finding

In another box I found an interesting little direction finding, or DF loop antenna. The unit, an AT-339/PRC was intended to be used with the American



Fig. 1: The SEM-35 transceiver, simple clean lines and controls.

PRC8-9-10 radios on a frequency of 36 to 55MHz. The unit, **Fig. 4**, has a folding antenna section that is opened out and the end of one leg plugs into the end of the other leg to form the loop.

The controls of the loop, **Fig. 5**, consist of **Tuning**, **Sense** or **Normal** and an **Attenuator**. In use, the loop is tuned to the required frequency in the normal mode. The loop is then rotated to get a deep null on the station being received.

The null gives the direction of the transmitter but – because this is parallel to the loop this direction can be either forward or to the rear of the loop. The switch is then placed in the sense position and by rotating a quarter turn either way the position of the transmitter can be determined as being in front or behind the loop.

Once the general direction of the station is found the operator could 'home' in on it by careful rotation of the loop, using the attenuator to reduce signal strength as required. Though it was produced to go with the PRC8 to 10 sets, the loop can be used on any set with a BNC connector, such as the SEM-35 and by using this system I now know the location of a local baby monitor on 49MHz!

Displaying Heavy Equipment

Back to the display problems next. As many of you will know there's one really evident drawback with military sets – well two drawbacks really...the size and weight! Many sets are 20kg, or more in weight while being three or four times the size of a modern 'plastic' radio. So, when you are trying to display several sets you can be looking at a mass of over 100kg and a bench or shelf of 2–3m long.

I noticed I had several receivers designed for rack mounting, which have metal plates or an extra wide front plate with holes or notches down the edge. I thought it would be ideal to replace a 3m long bench with a floor space of just 508 x 508mm or so. Luckily, I noticed some racking being advertised fairly locally and there was a nice unit some 1.8m tall. With another bit of luck it just went in the back of our car with the rear seats down!

The rack needed a good clean, a rub down with a wire brush and a coat of paint, green of course! I then installed the rack in one corner squeezed in between the wall and the WS53 transmitter and proceeded to 'populate' the rack with the suitable receivers.

Lifting the heavy sets into the rack and fixing the bolts was easy at the bottom but got progressively harder the



Fig. 2: The Electret replacement amplifier (right) built by Ben G4BXD using Veroboard.



Fig. 3: The H-33F/PF handset showing the space for the microphone.



Fig. 4: The hand-held loop antenna – with it, Ben located a nearby baby alarm on 49MHz!

higher up I went. Adjustable straps are a great help in holding up the rear of the set so the bottom bolts can be inserted at the front. The rack, **Fig. 6**, worked very well and soon I had six quite heavy sets installed with just the minimum of floor space used.

Starting at the bottom of Fig. 6, there's the CZC-46209, part of the American made RCH equipment for shore or marine installation, tuning 80-560kHz and 1.9-24MHz, also known as AN/SRR-3 Radio receiving set, 11 valves, 533 x 533mm (21 x 21 x 14in, and 48kg (106lb). I have yet to restore this set. Above it is the National NC-240S receiver, with 12 valves, covering 49kHz to 30MHz and a mere 27kg (60lb) in weight.

Next is an old favourite, the National HRO-M 9-valved receiver, famed for its plug-in coil packs, giving a great tuning range of 50kHz to 30MHz and the odd tuning dial where you have to read off a chart on each coil pack to see what frequency your receiving on. There's a great web site for the HRO: www.radioblvd.com/National%20HRO.htm with loads of great information.

Above the HRO I mounted my SP-600-JX-14, or rather the R-542 military version of this nice Hammarlund double conversion 540kHz to 54MHz receiver. Above that is the very well known RA-17 by Racal, another 30kg, and finally another Racal, the RA-1772 receiver. I have another rack mountable set, an Australian AR-7 but annoyingly the gap left in the rack was about 10mm too small to fit it in!

I wanted to be able to turn on a set so visitors could tune around. I felt the valved sets would take too long to warm up so the I plugged the RA-1772 into the mains and connected a short length of wire, maybe 2m long, to the antenna socket. I turned on the set and tuned around 14MHz and was flabbergasted to hear a ZL2 station booming out of the speaker, loud and clear. I think I shall be removing my main 40m long doublet and replacing it with a short length of wire draped down the back of the radiator to work the DX!

And Finally

Well readers, that's about it for this stint at the V&V shop. I hope you've enjoyed the selection I have bought you and there are more pictures at www.qsl.net/g4bxd and more pictures of the progress in the museum layout in the 'Museum status' page. As always I can be contacted by E-mail, but now at my new E-mail address ben@radiomuseum.plus.com Cheerio for now and a belated happy New Year!



Fig. 5: Close-up view of the controls of the hand-held loop.



Fig. 6: The Receiver rack at the re-located and newly-commissioned 'Kidderminster Kollection'.