

The second was installed on the Isle of Man.

A further two units were made and housed in SkiMaster portable buildings, literally on skis! These were deployed to Wick and Wigtown. As the permanent TV stations were commissioned the ET4336s were moved on.

In 1968 I recommissioned the Bournemouth DF site on 1484kHz to improve the coverage of the Radio One service in that area. This site was of interest as it bounded a graveyard with some of the original earth mat extending into the cemetery."

(So it was you, Denis, who was to blame for years of Bournemouth-bred Tony Blackburn saying on his Radio One programme "This is Radio One on 247 metres and on 202 metres in the Bournemouth, Poole and surrounding areas". Denis has also contributed to the recently published book by Ellen and Shacklady, *On Air – A History of BBC Transmission*. ISBN 0 9544 0770 9. Within that contribution the politics (particularly on the Isle of Man) of the temporary VHF transmitter roll-out programme are examined along with the Ladies Stocking Factory near Kirk o' Shotts. I'm obliged to him for the specific, ET4336 information some of which is also detailed in the book.)

As you can see from the above the "they may come in useful" ET4336 were put to great use over a range of frequencies from 647kHz through to 68MHz, but what *exactly* did Francis McLean actually purchase and what was needed to make them suitable for BBC use?

Engineering Aspects

Billed in the RCA handbook as a High Frequency Communications Transmitter MI-8167K/L with Speech Amplifier MI-11220J/K, part of Type ET4336 Transmitting Equipments, the electrical specifications were basic with no mention of the frequency response. For communications service it might only have been 300Hz to 3kHz. Fortunately for the BBC, the separate speech amplifier was exactly as described and was where the frequency shaping took place. The main unit's modulation transformer was suitable for broadcast service and with the Leak preamp the modulator was satisfactory from 40Hz to 10kHz \pm 3dB.

The mechanical specifications are of interest as the weight of the main unit

was 570lbs so the 150 units in the consignment to Droitwich weighed in at about 38 tons and that's without the shipping crates! The HF height was about 60 inches and was just over 18 inches wide by 24 inches deep. Mention has been made of the BBC 'stretching the unit' this added about 12 inches vertically but neatly accommodated the Leak preamp on two angle iron runners.

In all the stretched examples I saw, the welded joints were hard to detect from the outside. One would guess that the large radius corners would be difficult to bend exactly so did the BBC Equipment Department cannibalise some units to obtain suitable metal-work? If so, the ample supplies of available spares could testify to the fact.

Original Colour

As supplied by RCA they were painted brown, the BBC resprayed them Air Ministry grey and sometimes where necessary, overspray had been removed from the inside to re-expose the copper plated steel and allow good chassis contacts for components.

RB readers familiar with editions of the *US ARRL Handbook* from the 1940s would recognize the top quality components employed by RCA. There were variable capacitors from EH Johnson, fixed mica block capacitors from Cornell-Dubilier and Faradon. James Millen and National supplied the RF chokes.

On HF to achieve the 350W CW output and the 250W AM output a large ceramic switch was employed to alter the taps on the main HT transformer from 2000V to 1500V. For MF this was removed and the taps hard-wired. Similarly, the keying relay was bypassed. The 807 penultimate RF stage 30 μ H max roller-coaster was left in circuit and extra padding capacitors, obtained from the total re-work of the HF output stage were added.

The 2 \times 813 output stage, oddly on HF was parallel, not push-pull and so the move to MF only required appropriate coils with series roller-coasters for tuning and banks of fixed mica block capacitors in a double pi-configuration to achieve a 120 ohm unbalanced output. Surprisingly, particularly for HF, was that none of the RF valves had anti-parasitic anode stoppers fitted – one wonders why an instability

problem didn't occur – none were added by the BBC either.

An eight-inch long neon-type vertical indicator tube was fitted, fed with a small sample of the modulation transformer secondary voltage to show mod depth, though I have to say I have never seen one that worked!

Another item worthy of mention was the subtle change of wiring of the main HT smoothing by the BBC Equipment Department. RCA originally had the rectifier DC output to a pair of 10H chokes in series then to a bank of two 10 μ F capacitors for conventional choke-input smoothing. The BBC split the bank of capacitors adding one to the junction of the 10H chokes making a double choke input arrangement and improving the hum and noise by 6dB.

Later Modifications

Later modifications replaced the RCA 866A mercury vapour rectifiers by plug-in silicon units and changed the Robertson lamps for two non-inductively wirewound 240 ohm 180W resistors in parallel.

Low power 100W output, was possible by the rather inelegant solution of switching into the primary of the main HT transformer a series pair of 110V 660W firebowl resistance elements! Grid bias was generated effectively from the main HT supply by the simple expedient of returning the negative from the rectifier through a series stabilising resistor to chassis. Another section of this finned resistor, which RCA called Thyrite, was used in conjunction with three 180W wirewound resistors in series to drop the main HT to about 500V for the 807 anode and again to 300V for the 807 screen – an early attempt at VDRs?

Certain of the outboard VFO and crystal oscillator/multiplier units were made, not by RCA, but by the Wilcox-Gay Corporation of Charlotte, Michigan. How the designer got away with using an 807 power beam tetrode for a VFO beats me! Also one wonders how many quartz crystals were cracked by the possible grid current on the CO unit! For operational convenience the BBC added metering of the 805 modulator valves and separate cathode metering of the two 813s. Surprisingly, grid current metering of the 813s was omitted by both RCA and the BBC.

To be continued in RB88