

General view of the Miniature Patrol Set, Experimental Model.



Miniature Patrol Set

Experimental Model

Country of origin: England

DATA SUMMARY

Organisation: British Army.

Design/Maker: Signals Experimental Establishment.

Year of development/trials: 1942.

Purpose: Short range patrol HF communication.

Frequency range: 7.3 to 8.3 MHz.

Receiver: Mixer/Osc., IF 2x, Det./AF, AF output. AM R/T and MCW only.

Sensitivity: 1-2uV for 0.1 mW AF out.

Intermediate frequency: 1.73MHz.

Transmitter: Receiver osc., 1.73MHz osc/mixer, RF power amplifier, 1st and 2nd microphone amplifier.

Aerial: 4ft and 12ft 'B' sections rods.

Valves: Type 1T4, 7x.

Power Supply: Dry batteries LT 1½V type U2 2x; HT 120V layer type Minimax type 30132.

Current consumption: Receive LT 250mA; HT 5.6mA.
Transmit LT 300mA; HT 12mA.

Range: 2 miles with 4ft aerial and 5 miles with 12ft aerial.

Size (cm): Height 25.7, length 8.9, width 10.7.

Weight: Set only 2kg. Complete set with spare batteries 3.5kg.

Accessories: Set carrier with straps, headphones/throat microphone assembly, spare batteries, aerials.

Acknowledgements:

- Many thanks to the director and staff of the Royal Signals Museum, Blandford Forum, UK, for granting permission to take photocopies of possibly the only existing document of the Miniature Patrol Set.

References:

- Signals Experimental Establishment Pamphlet No. 323A, Miniature Patrol Set, Experimental Model, General description and working instructions, March 1942.

Remarks

The Miniature Patrol Set never went beyond the experimental model shown here. However, its design and features were interesting and novel, so a more detailed description was deemed justified.

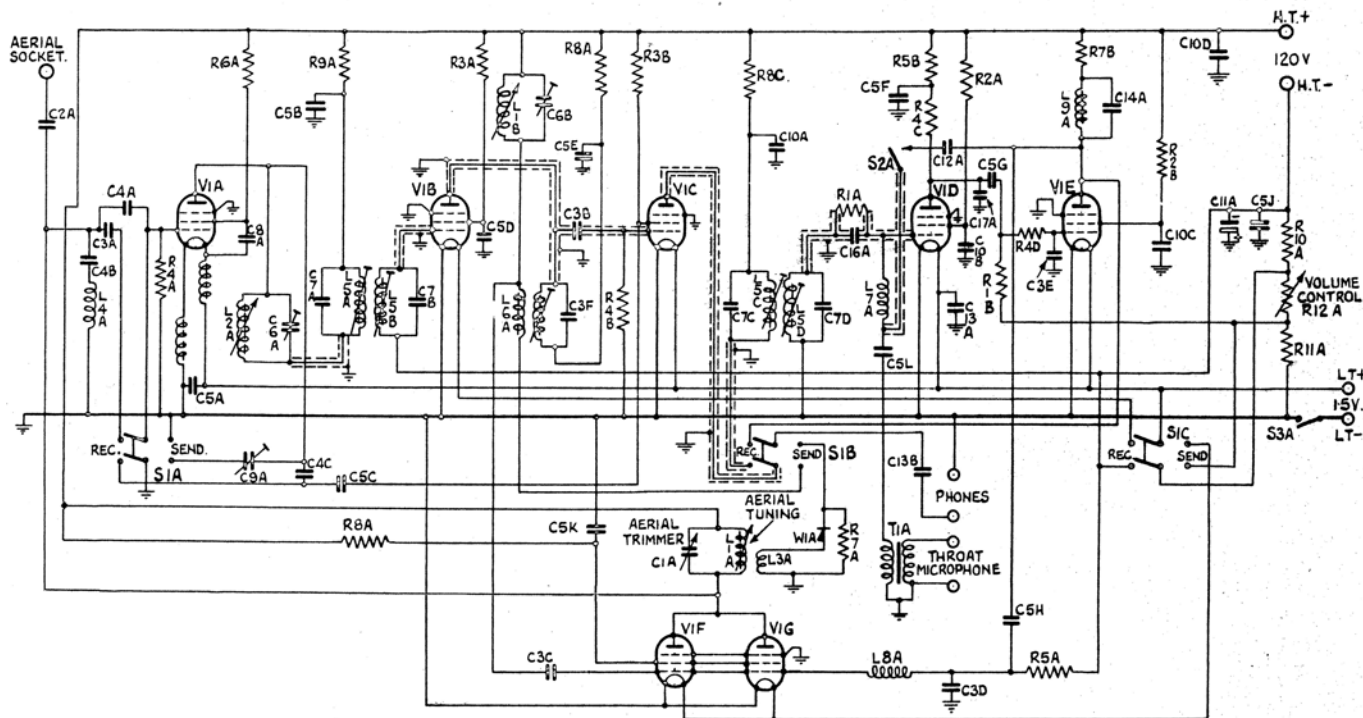
The Miniature Patrol Set, Experimental Model, was a self-contained, lightweight, and miniaturised portable AM HF R/T transmitter-receiver intended for short-range patrol communication. When communication by R/T was difficult, MCW facilities were provided for slow-speed Morse communication. It was carried on the left breast next to the respirator during operations. Two alternative, almost identical methods of securing the set were used, one of which featured a quick-release mechanism.

The set was designed to ensure that no servicing must be undertaken in the field, except for battery changes, which could be completed in a few seconds. One reason for this was that all seven 1T4 valves were soldered into the circuit to achieve the miniature dimensions. In the prototype, the set and batteries were housed in a single case: the top and bottom were made of sheet metal, while the sides were a single moulding made from special shock-resistant Bakelite.

One side of the case was hinged to provide access to the batteries. The controls were protected from damage by raised ribs on the control panel. The tuning scale was mounted on a drum with markings every 10 kHz, driven by a band connected to the tuning control.

Netting occurred automatically, as for a given setting of the Tune and Aerial Trim controls, the transmitter was always tuned to the same frequency. The set was permeability-tuned, which was achieved by the longitudinal movement of an iron-dust core.

The Miniature Patrol Set was one of the smallest patrol sets at the time of its development in 1941. It was smaller and much lighter than the Wireless Sets No. 38 and 46. The S.E.E. pamphlet explicitly stated that the production model would be fully waterproofed. No reports on trials or assessments have been found; it may be assumed that the design was abandoned due to its compact construction with wired-in valves, high production costs, difficulties in sourcing miniature valves, and—above all—the anticipated challenges of maintenance and repair by the RAOC (M). (REME was not formed until October 1942).

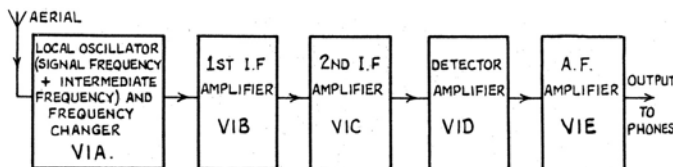


Circuit diagram of the Miniature Patrol Set, Experimental Model.

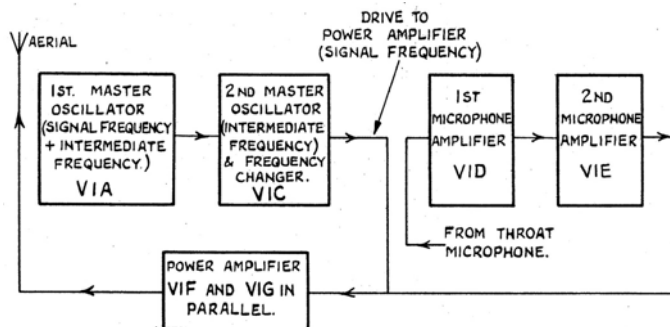
All valves were miniature type 1T4, directly soldered into the circuit. The B7G base was the first miniature base for all-glass valves and was first reported by RCA in April 1940. Battery types 1R5, 1T4, 1S5, and 1S4 were the first to be produced. The conversion from the

acorn 954 to the B7G-based 9001 took place in early 1941, and the CV138 was first manufactured in 1944/45. B7G base valves were not produced in the UK until 1947.

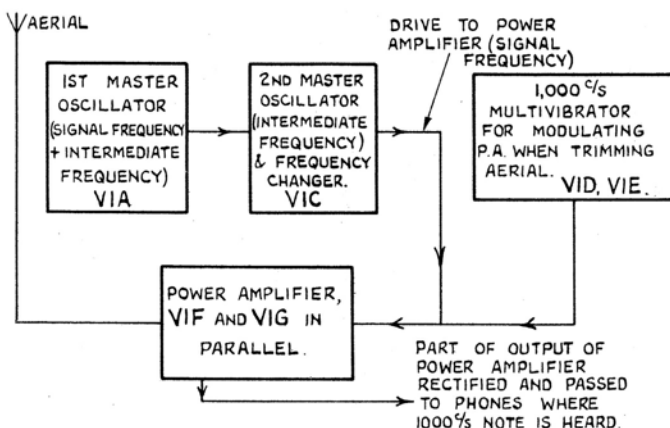
The receiver was a conventional single superheterodyne, with a local oscillator/mixer and two IF stages at 1.73 MHz. Manual volume control was applied to the control grid of the first IF stage.



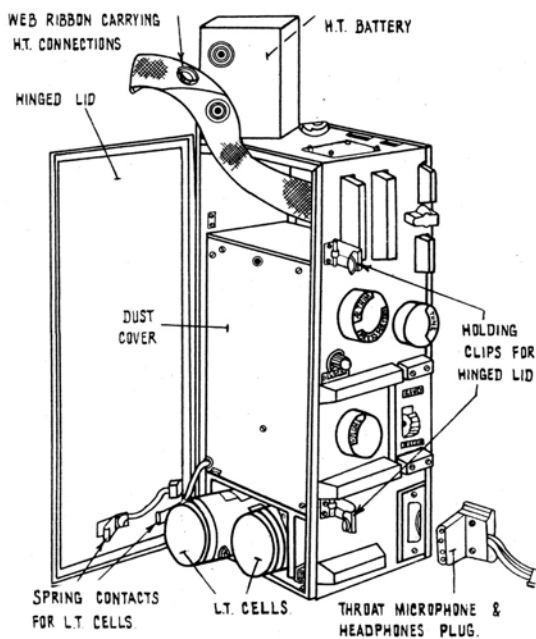
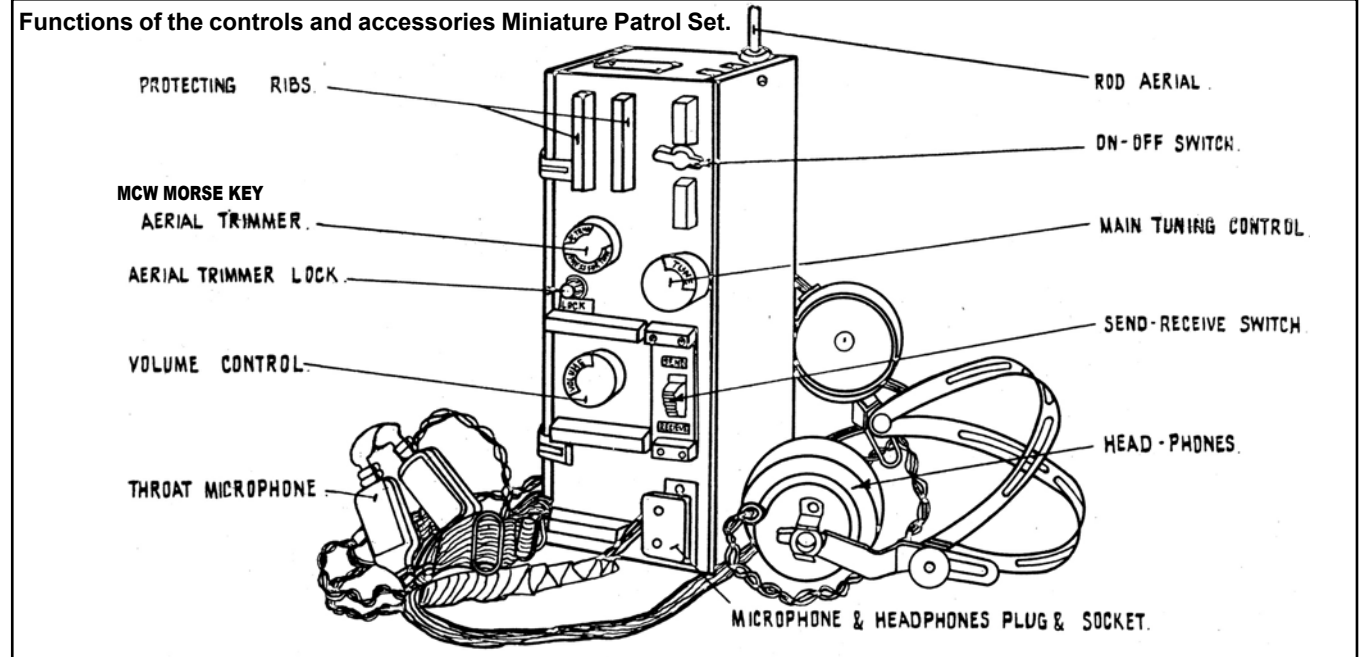
In transmitter mode, the receiver local oscillator V1A was used as the master oscillator, mixed with a second oscillator operating at the intermediate frequency. The radiated, or signal, frequency was taken from the anode of V1C to drive the RF output amplifiers V1F and V1G. V1D and V1E were used to amplify the output of the microphone for grid modulation of the RF power output valves.



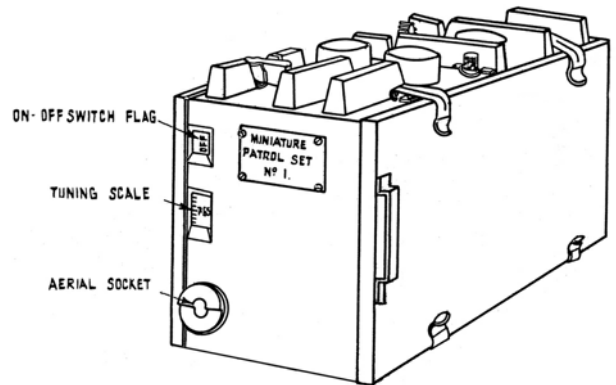
Tuning the aerial during transmission was carried out by rotating the Aerial Trim control after first pressing it. This activated the transmitter and caused V1D and V1E to function as a multivibrator circuit with a frequency of about 1000 Hz, which modulated the RF power amplifier. Part of the RF output was rectified by the Westector metal rectifier W1A and passed to the headphones, where a 1000 Hz tone was heard. The Aerial Trim control was then rotated until maximum volume was heard in the headphones.



The Aerial Trim control was also used as a Morse key for low-speed MCW. This control was fitted with a lock to prevent it from going out of adjustment when used as a Morse key.



View of the set with the hinged lid opened, showing the positions of the batteries (Above).



Top view of the Miniature Patrol Set, with two small windows showing the On-Off switch flag, tuning scale and aerial socket.

An alternative method of securing the Miniature Patrol Set with a body belt, in addition to the supporting sling, was secured to the harness by a ring and clip (Right).

A comparison of dimensions between the Miniature Patrol Set and two other man-pack sets manufactured during the same timeframe.



Miniature Patrol Set.

WS No. 38 Mk.II

WS No. 46.