

The Heathkit HW17

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The Heathkit HW17 is a 2m AM transceiver which was sold as a kit in the 1960's. It was designed to Heathkit's usual high standard and provided a way onto the 2m band in the "CQ and tuning high to low" days for those with the ability to read a manual and use a soldering iron, and with a deepish pocket, but without the time or nous to "roll their own".



Built on two pcb's, one for the receiver and one for the transmitter, all the aspiring operator had to do was follow the very detailed manual and insert the components into the pre-marked positions of the pcb's, assemble these and the remaining components (controls, psu components etc.) into the ready-made case, which was styled in the usual attractive two-tone blue used by Heathkit for many years. Success was virtually guaranteed, and any non – functioning kit would be sorted out by Heathkit for a nominal amount. These turn up now and again for fairly low prices, I found the one pictured above on Ebay for £25, in almost immaculate condition.

Transmitter

Crystal controlled on any one of four frequencies (one supplied) or external VFO the transmitter uses three very unusual (to me anyway) American valves. Starting off with the usual 8Mc/s crystal, V1 (7059) pentode section is the oscillator/tripler, followed by the triode section as a tripler to 72Mc/s. V2 (12GN7) is a pentode doubler, and V3 (8156) is a single pentode PA. This stage provides a very potent 10 watts and is stable, the 'tune' and 'load' controls are brought out to the front panel. The efficiency of the design surprises this old hand, used to struggling to get enough drive with the standard "Pye" four-valve circuit!

The modulator is transistorised and doubles up as the receiver audio. A high impedance input is fed from the wired in Heathkit ceramic microphone and provides excellent quality audio with near to 100% modulation.

Receiver

Fully transistorised, this starts off with a pre-manufactured front end which resembles a broadcast FM receiver tuner head, containing two FET's (RF amp and mixer) and a bipolar oscillator. This tunes 144 – 148 Mc/s, and outputs at the first IF of 24.695 Mc/s. This is immediately converted down to 2 Mc/s and amplified by two further stages. Two avc loops control the gain: the front end has its own avc detector and the IF stages and squelch are operated from the AM detector as is usual practice. The IF selectivity is given as 27kHz at 6db down – too wide really for today's conditions unless you live in a quiet area, but good for it's era and adequately wide for the vfo controlled tuner. The audio stages are fairly conventional and provide plenty of volume to the internal speaker, and also serve as the modulator for the transmitter.

Sensitivity is not good by today's standard, but when carefully 'tweaked', the squelch will open with about 1.5 μ V of input signal.

T-R switching

This is the advanced bit – there are no relays! A two pole changeover switch in the mic has its wiper earthed. On receive, this earths the negative end of the loudspeaker winding on the audio output transformer, and the second pole short-circuits the microphone input. On transmit, the speaker winding is disconnected, the microphone connected, and the cathodes of the transmitter valves are earthed, via a tortuous path that passes the transmitter HT current through two diodes, one arranged to short the receiver aerial input and the other to connect the transmitter to the aerial when the current is flowing. It looks awfully lossy on paper, but in fact I found no perceptible improvement in the receiver sensitivity when I connected a signal generator directly to the receiver. An ingenious system, but it produces a very loud howl of feedback if the button is partly pressed, as the mic is switched in before the speaker is switched out. No doubt this could be improved on by modification to the switch.

Power

An internal transformer and silicon rectifiers supply 320 volts HT and 12 volts DC for the valves and transistors respectively. A separate winding feeds the heaters at 12V ac.

For mobile operation, the HWA17-1 inverter unit can be connected, and an octal socket is provided on the rear panel for this purpose. A jumper plug has to be fitted for ac operation.

Operation

As always, I have my HW17 operational on 145.8. there are no crystal trimmers provided, the exact frequency wasn't critical at the time the set was produced because of the wide receiver bandwidths used, but nowadays it may be necessary to fit a small trimmer to bring the tx exactly onto frequency if it is to be used with a narrow receiver. A front panel switch will bring the crystal on in the "spot" position so the transmitter frequency can be found on the receiver.

Faults

My set received on switch-on but had a continual background noise, which I found was coming from the mic amplifier, which is always on and fed into the audio amplifier. I mitigated this by fitting a low noise BC109 into the mic amp stage. There had obviously been an explosion at some time past and the HT rectifier had been replaced with four silicon diodes and non-original electrolytic capacitors were fitted. It is more common for the capacitors fitted by Heathkit to go open - circuit though.

On fitting an 8100 crystal, the transmitter produced output and a tweak of the tune and load controls soon brought the output up to 10 watts into a dummy load. As mentioned above, it was necessary to add a trimmer across the crystal to bring it onto frequency.

A word of warning!

The HT is 'always on', and remains there for some time after disconnecting the power. A nasty surprise awaits anyone delving into one of these, even if it's been off power for some time. You can discharge it safely by keying the transmitter immediately the power is disconnected.

Info

A copy of the circuit and spec are available from the author by email or on paper.