A 60 m Codar clone

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The Codar AT5 was a refinement of various 10 W DC input AM/CW transmitter circuits from the 1950's and 1960's. Codar's compact 160 m/80 m design was very popular and will be familiar to many VMARS members and older radio amateurs. The author has one with its matching mains power supply and thought it would be an interesting vintage circuit to modify for 60 m. However, to avoid spoiling the original, a new one was built.

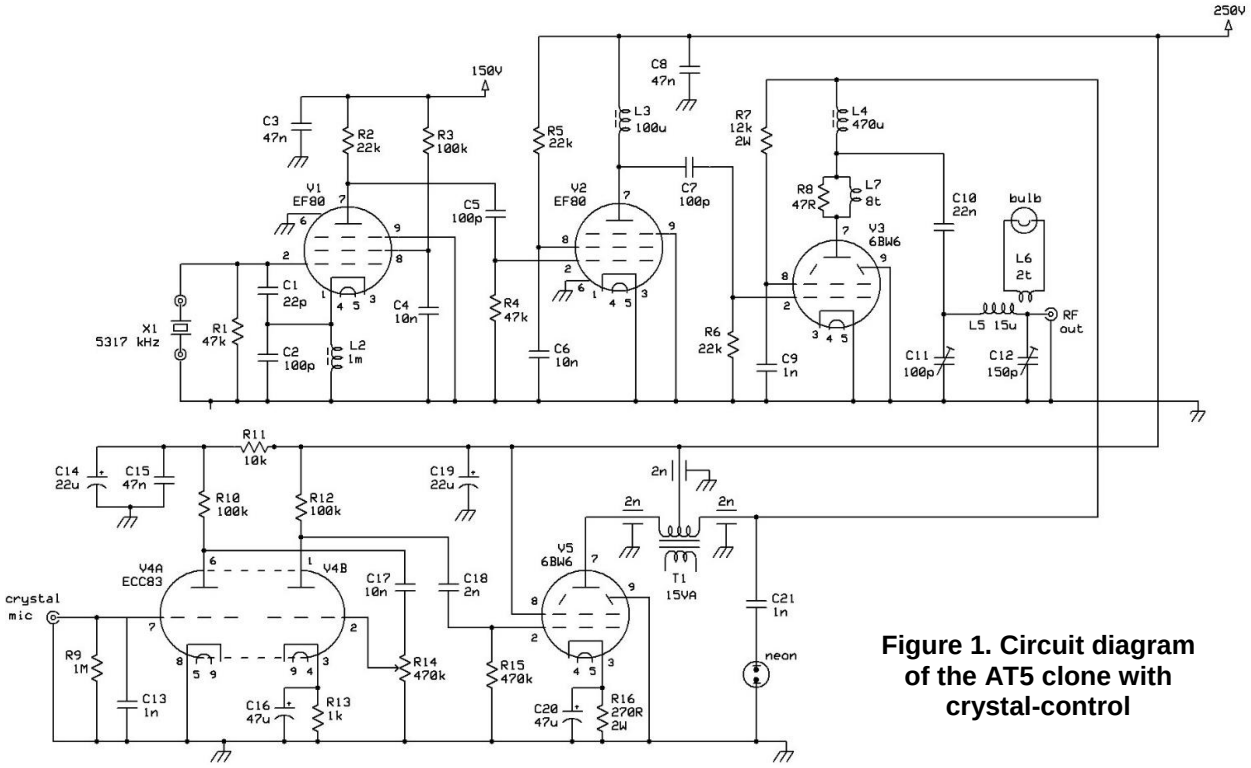

Figure 1. Circuit diagram of the AT5 clone with crystal-control

Initially, the 60 m version was built for both AM and CW modes, like the original AT5. While it should have been possible to build a 5 MHz VFO suitable for CW operation, the level of chirp generated by the VFO on this band was unsatisfactory. Perseverance might have resolved the issue. To that effect, a 'Super VXO' worked very well in the CW section around 5262 kHz with about 4.5 kHz shift but, after some contemplation and reassessing the gear to hand and future projects, it was decided to drop the CW capability and design the AT5 clone for AM only, with crystal control for the 60 m 5317 kHz AM channel.

A circuit diagram of the clone is shown in **Figure 1**. The modulation transformer is just a 15 VA centre-tapped mains primary, more or less what Codar originally used; not ideal for audio, but quite good enough for amateur AM and sounds better than might be expected. Some additional RF decoupling capacitors were added and feed-through capacitors for connections to the modulation transformer secured to the top of the chassis, although these are probably unnecessary. Trimmer capacitors were all that was needed for the π-network for fixed frequency output. For anyone unfamiliar with the AT5 circuit, the capacitor and neon bulb across the modulated HT line are used to give a rough but useful indication of modulation. The small bulb with L6 serves as an RF output indicator – but that is one of the author's additions.

Although the exposed nine-pin power plug and the Belling Lee coax connectors for RF output and microphone input are not ideal, they were retained for the 60 m version for compatibility with the original AT5 accessories. The layout of the finished transmitter is shown in **Figures 2 and 3**.

Output is around 7 W of carrier when driven from the matching Codar 250/S power supply – the same as the original 160 m/80 m circuit. About 75% of distortion-free modulation is achievable (**Figure 4**) although, like the AT5, it will give acceptable modulation over 80% and bursts of 100% if you 'surprise' it. With a few minor capacitor changes from the original design, modulation is approximately flat from about 250 Hz and drops away quite sharply at around 3 kHz.

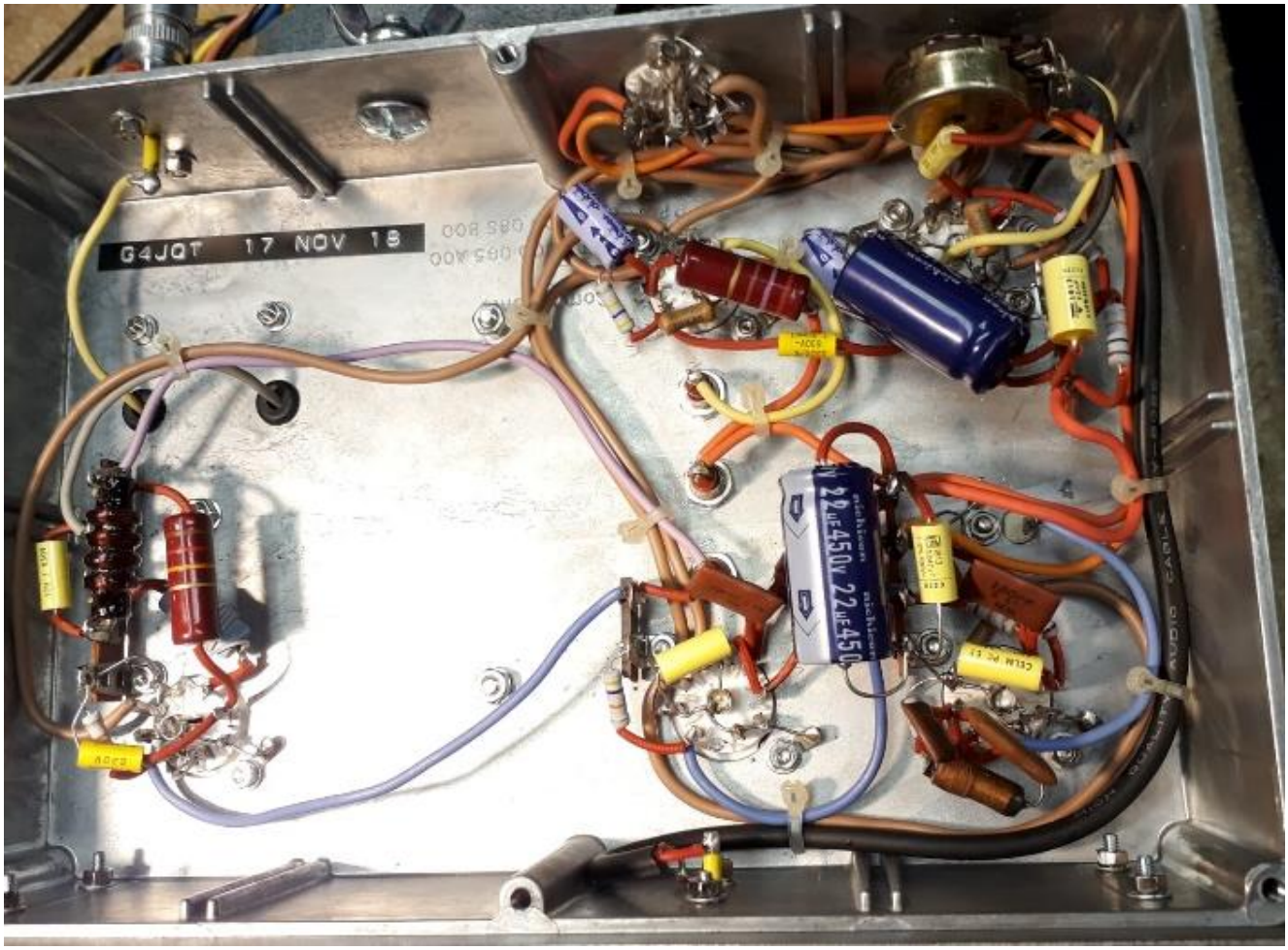

Figure 2. Under-chassis layout of the AT5 clone

Figure 3. Above chassis layout of the AT5 clone

It is not really a practical project, unless a suitable power supply, a good junk box and plenty of time are available, because it is quite a lot of work for just 7 W of AM. For the past 50 years, at least, solid state has been the way to go but the author approached the task as a sort of nostalgia project which he rather enjoyed, naming the transmitter, the AM60b – for obvious reasons.

With regard to other ways of getting onto 60 m, the author has a pair of Heathkit DX40s and matching VF1 VFOs. One of the pairs is in need of some serious attention, but there is no problem in modifying the transmitter circuit or that of the VFO to cover 60 m, although at the expense of a band from the DX40. It will make a change to get some reasonable power out on 60 m and the subject of a future article for *Signal*.

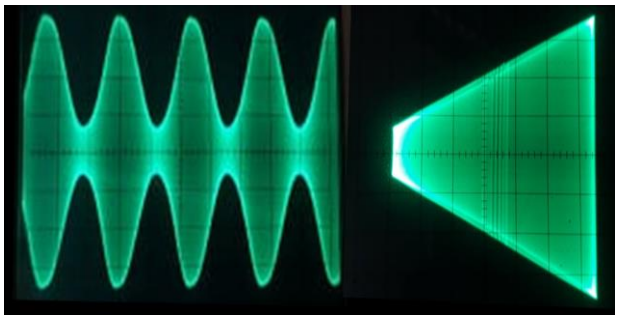

Figure 4. Modulated waveform and the corresponding trapezoid display confirming good linearity

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