



FIG. 6

through to the groundplane side of the copper laminate. Having established that the module works, the entire diecast box is filled with molten candle wax to give the highest degree of mechanical stability once it sets. This rather oddball method of construction gives complete electrical stability without any tendency towards microphony. Anything that wobbles in an oscillator circuit is definitely to be avoided.

VCO noise problems

The good design of the VCO local oscillator is so critical to the performance of any communications receiver worthy of the name that it deserves a bit more discussion. The trouble with just about any synthesiser system is that the VCO circuitry has far bigger noise sidebands than almost any free running oscillator circuit that you can care to name. The effect is not quite so evident when listening to SSB or FM; the comparatively wider bandwidths and continually changing modulation content mask a really rather unpleasant effect. However, listen to a CW signal on a synthesiser set and then compare it with the same signal received on an AR88 or HRO valve radio and you wouldn't know you were listening to the same station. Where a strong CW signal sounds 'clean' on one, it sounds a 'pure DC note' on the other.

In spite of having spent some 15 months putting this transceiver together, the spectral purity of this, and other transistorised gear still does not equal the old valve communications sets (or even a KW2000) because the signal levels are so much lower with transistor circuitry. The problems become even worse when you control the frequency of an LC circuit with any kind of varicap diode. Not only do the signal levels have to be even lower for them to operate at all, but they have a substantial noise contribution all of their own. The result is that the circuit given here, and those of most other synthesiser designs, is a very poor compromise.

It would be marvellous to wave a magic wand and reproduce the clarity of my old HRO but I can't. The circuit given here represents