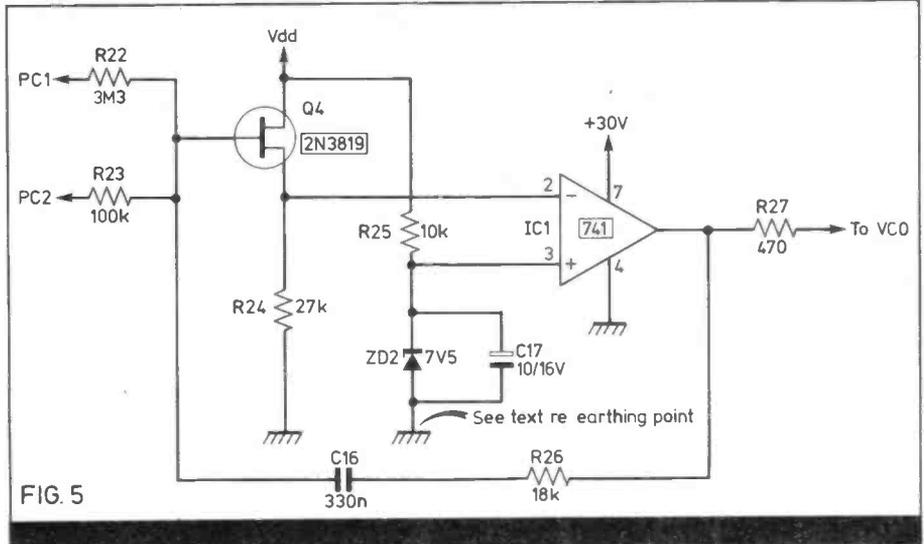


automatically from the tuning logic (Fig 6) IC7, Q7, Q8.

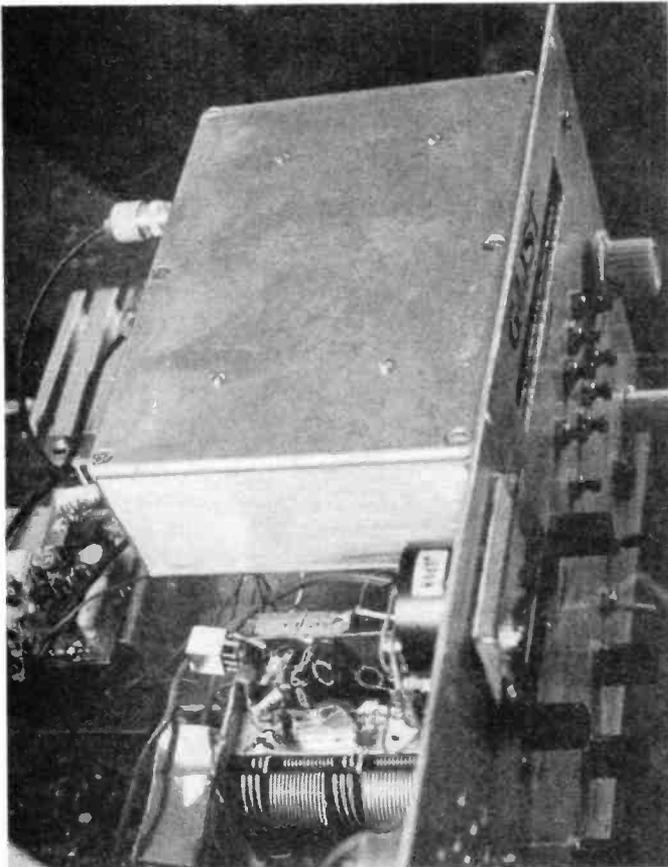
The switching points have been chosen as 20MHz and 60MHz signal frequency (LO 29MHz and 69MHz). The oscillator inductors are progressively put in parallel with each other by the reed relays. Up to 20MHz is covered by L1, 20 turns on a T37-6 core; up to 60MHz is covered by both L1 and L2, 10 turns on a T37-6 core; up to 91MHz is covered by L1, L2 and L3, 7 turns on a T37-12 core. 24 SWG wire is used for all three inductors.

The VCO signal is taken from the source of Q9 to IC20, a relatively high power, low noise buffer amplifier which has been biased to provide about 10mW of saturated power output right across the frequency range. It provides a very high degree of isolation and provides more than enough power for the Schottky ring mixer. The VCO signal is picked off one of the intermediate outputs on the buffer amp to drive IC3, the divide by 10/11 ECL prescaler circuit. Although there is more than

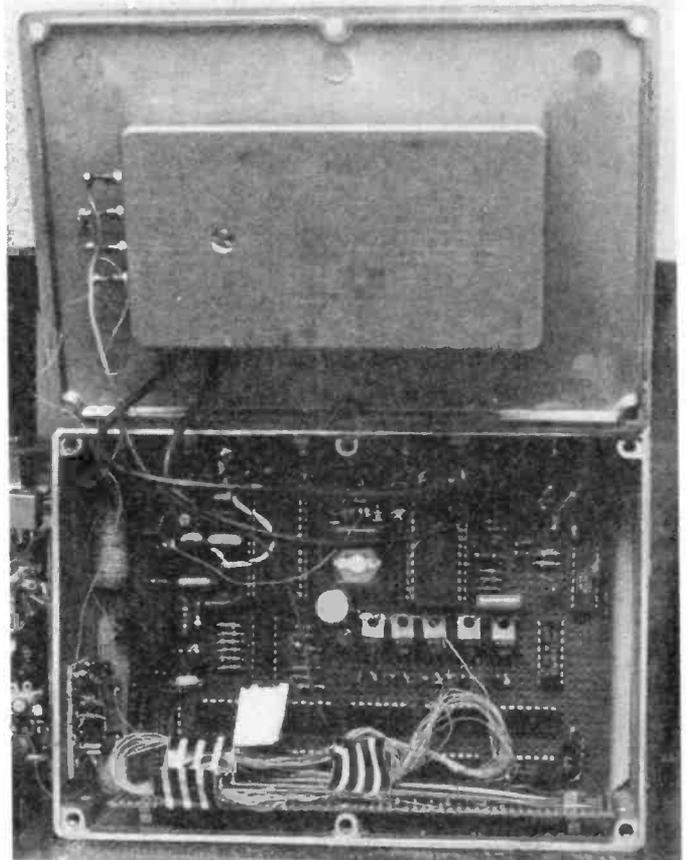


enough signal available to drive IC3 directly, the circuit is buffered by Q10, another dual gate MOSFET. You have to do this because the high internal switching speeds of the prescaler chip produce quite a lot of noise at the input pins which could be coupled back to the VCO output. From the constructional point of view, the VCO was built on a piece of double sided copper

laminated with one side divided up into small squares. The individual components are then soldered to the squares. The result is a bird's nest comprising Q9, Q10, the three toroids and the SL560C buffer amplifier, IC20. This complete lump of circuitry is mounted inside a small diecast aluminium box fitted with bolt type feedthrough capacitors. All earth connections are made directly



The complete synthesiser module needs to be built inside an RF tight box. This is to stop the RF envelope getting in and digital RFI getting out.



The VCO module is a box within a box for best stability and noise performance. The digital board fits in the bottom of the box. The complete synthesiser module is, in effect, a high power (10mW) VFO unit delivering a local oscillator signal ranging from 10 to 99MHz.