four poles of crystal filtering

Synthesised VFO: provides high level local oscillator signal (+23dBm, 13dB pad) for up to ten 1MHz wide user defined bands. Digital readout and analogue style tuning. Single loop system provides output 10.7MHz above signal frequency for single conversion IF systems

SSB generator: USB/LSB signal at 10.7MHz for injection on CIFPU

FM board: detection and generation of NBFM. Interfaces with CIFPU

AM board: AM signal generator and full 6kHz AM receiver subsystem

Speech processor: for use with all voice transmission modes. Improved baseband system with VOGAD

Logic control unit: enables VOX changeover and full CW break-in capability. Copies between dots at up to 40wpm+.

Preselector filter: single control lowpass filter based unit

TX PA QRP: 5W power MOSFET system. Full ALC for hands-off operation. Acts as driver for

TX PA QRO: 50/100W PEP output system. Full ALC

PIN switch: PIN diode aerial changeover system for use with CW break-in operation

Output filter: operated automatically via bandswitch

With a system as ambitious as *Omega*, it is impossible to publish designs for all of the modules in one go. We estimate that availability will be one per month. What we do promise is that nothing will be published until it is fully debugged and ready to build. We aim to start with a core receiver system: CIFPU, VFO, Preselector followed by PAs and SSB generator. This also gives you a chance to get each module built, tested and debugged before starting on the next..

To give a better idea of what the system is about we have included a number of possible Omega permutations. See **Figs. 1** to **4**.

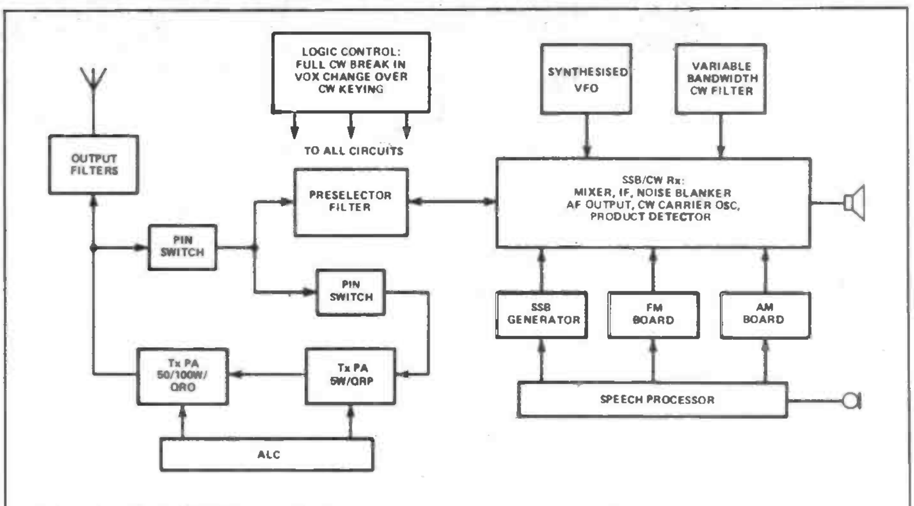

Fig 1. G4JST/G3WPO Omega transceiver system

Central IF processing unit

The theory of operation was described generally in the *Technicalities* column of the April issue. We won't therefore go into the subject in great depth but simply note a few aspects concerning the operation. A number of changes have been made to the original circuit as a result of prototyping.

Fig. 5 shows the block diagram of the module. The incoming signal is converted to the 10.7MHz IF by the ring mixer DBM1. The roofing filter comprising IFT1 and 2 limits the bandwidth of the signal before passing it to the IF pre-amp Q1. Here, the signal path splits into two. The main path passes through the noise blanker switch D2, D3 and Q2 to the high quality SSB filter F2 via a delay line F1. The delay filter F1 gives the noise blanker switch a chance to open before interference spikes can hit the main filter, F2.

The other signal path travels to the noise blanker side chain amplifier Q8, Q9. These two MOSFET amplifier stages raise interference pulses and crashes to a high enough level to turn off Q2 following rectification by D4 and 5.

Cutting the rubbish

This noise suppression circuit — block diagram detail in **Fig. 6** — received as much development time as the rest of the IF system put together. The result is excellent. It takes out interference of the 'woodpecker' variety completely just leaving 'holes' in the signal. It is quite possible to copy S2 SSB signals through S9+30dB woodpecker. To offer some idea just how effective the overall system is, we spent some time one afternoon just trying to find the woodpecker until we discovered that we had left the noise blanker switch 'on'. It also takes out random ignition noise and household interference such as the switching of domestic central heating thermostats.

Another pair of dual gate MOSFETs provide the main bulk of IF amplification (Q4, Q5) before passing the signal to the product detector (Q6) and the AF amplifier IC1.

The AGC generator IC2, D7 and D8 provides a direct AGC signal to the IF amplifiers and delayed AGC to the IF pre-amp. The S meter signal, derived from the AGC line can be applied directly to the meter, or through an optional 6dB/division correction network (to be detailed later). The AGC decay

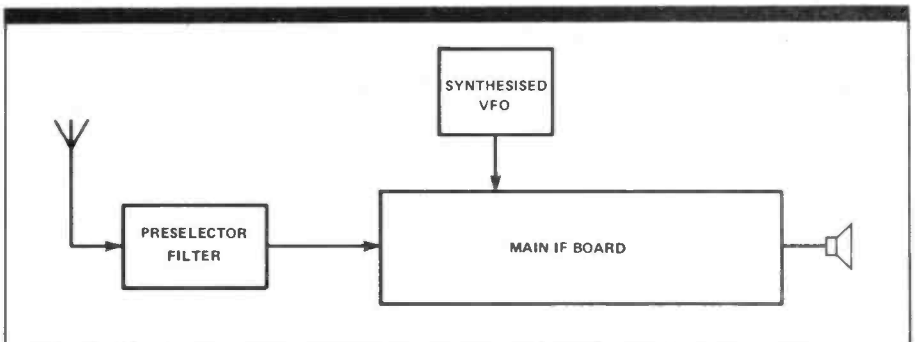

Fig 2. Minimum configuration amateur band receiver system