

RECEIVER

The Fareham Radio Club 80m Transceiver

The Fareham radio club transceiver project consists of three sections. The first contains a complete direct conversion receiver for the 80m band. ~~The second consists of an amplifier that takes the VFO output from the receiver and produces a 1 watt CW signal. This section also contains the necessary control circuitry for transmit/receive switching and PTT. The third section is a direction finding antenna, to be used for club "foxhunt" events.~~

Circuit Description.

On receive, signals are routed via the TR switch to the preselector filter. This is a fixed tuned design, covering 3.5 MHz to 3.8MHz. This serves to reject any out of band signals which might cause overloading problems.

The mixer multiplies the incoming signals with the output from the variable frequency oscillator (VFO). The VFO frequency is arranged to be either on the carrier frequency for single sideband use, or offset from the carrier frequency for CW reception. If the incoming signal is on a frequency of 3.5MHz, the VFO could be set to 3.501MHz to give a 1kHz note.

The VFO is a conventional colpitts design covering roughly 3.4MHz to 3.9MHz. It is followed by a buffer amplifier which prevents changes in load impedance from pulling the oscillator frequency. These can occur due to keying the transmitter, or to changes in antenna impedance.

The mixer output is amplified by IC2A to make sure that the received signals are above the noise level of the following stages. IC2B is a low-pass filter rejecting frequencies above 3kHz. This serves to reject high pitched whistles and some adjacent channel signals. For CW work, IC2C can be switched in giving fairly sharp filtering centred on 600Hz to pick signals out from the general band noise. IC2D operates as a variable gain stage. This gives superior gain control to a potentiometer when the incoming signal is strong. Under these conditions, there is little gain in the receiver so that signals are not amplified up sufficiently to cause overloading. Also little noise is produced which can make listening unpleasant at low gain settings.

The output stage is a simple emitter follower. This does not produce sufficient output to drive a loudspeaker, but will comfortably drive any impedance headphones. Loudspeakers are not as effective as headphones with simple receivers as they do not exclude background noise. A further problem with loudspeaker amplifiers is that they draw pulses of current from the power supply which can cause instability with this type of receiver.

