through only the end section.

Frankly, a massive chain of filters like this defies mathematical analysis, and the only comment that can be made about performance is of an observed, empirical nature. It works and is easy to construct. Attenuation of harmonics is satisfactory on 10m and excellent on all lower bands. Loss is under a dB without excessive pass-band ripple. Since each section presents an attenuation of 18dB/octave beyond cut-off, lower-band harmonic suppression is limited by leakage around the physical layout rather than network attenutation.

There is one last spin-off in the *Omega* system. The output filters also act as a low-pass filter to the incoming (receive) signal augmenting further the operation of the preselector circuit. **G4JST**

Construction

The complete low pass filter is built on one double-sided printed circuit board, of similar size to the CIFPU unit. We do not consider it vitally necessary to mount this in any form of screening, but if you wish to obtain the ultimate attenuation from the filter, it will fit inside one of the diecast boxes used for the VCO or CIFPU units. If this option is chosen, then SO239 sockets should be used for the input and output connections, together with feedthrough capacitors for the +12V connections. The circuit of the low-pass filter is shown in **Fig. 2**.

As some of the capacitor values required are non-standard, these are made from combinations of capacitors as shown on the circuit. Silver mica types are required, rated at 350V DC or above.

Construction should be tackled as follows:

1. Insert and solder from the underside the 14 connection pins used for relay selection and RF I/P or O/P.
2. Insert and solder six connection pins at the points marked (see the key) These link the earthy side of the relay coils to the PCB ground plane, and should be soldered both sides of the PCB surface.
3. Insert and solder the seven 1N4148 diodes, ensuring correct orientation.
4. Insert and solder the silver-mica capacitors. It is important that they are mounted slightly proud of the PCBs – not for any electrical reason but simply that the leads are fragile and are less likely to break if inadvertantly knocked. About 1mm of lead above the PCB surface is all that is needed. The earthed lead should be bent at right angles to the body, cropped to about 3mm in length and then soldered.
5. Inductors – each inductor is wound on two Amidon dust iron cores for the required power handling capacity. At the maximum power envisaged here (100W), no additional insulation is needed around the cores and the windings are made directly onto a pair of cores simply held side by side while winding. The component list gives the wire lengths required to wind each, with a total of about four metres of 20swg enamelled wire (1.0mm) needed. Note that the six lowest frequency inductors are wound on grade-2 cores (red) and the other six on grade-6 (yellow) cores.

When winding of each is complete, space the turns out over about 3/4 of the core's circumference as indicated in the drawing. Each pair of inductors that comprise one filter should be wound similarly with the windings as tight as possible on the cores. Winding with 20swg wire is a litle awkward but the knack will come after a few have been done.

The complete inductor should then be inserted through its mounting holes until the cores rest on the PCB. Cut off excess wire leaving about 3mm protruding on the underside, remove the inductor, strip off 4mm or so of insulation, then replace and solder.

6. If you intend running the high-power PA, and may be using either FM, or RTTY (i.e. 100% duty cycle modes) it is advisable to remove the top half of the plastic covers on the relays supplied. Some dielectric heating does take place at high power, and the additional ventilation will be worthwhile. For QRP work this is not necessary. The relays may now be inserted and soldered.

This completes construction of the unit. Wiring into circuit is quite simple, as shown on the layout – selection of each band is made via wiring direct to the bandswitch con-

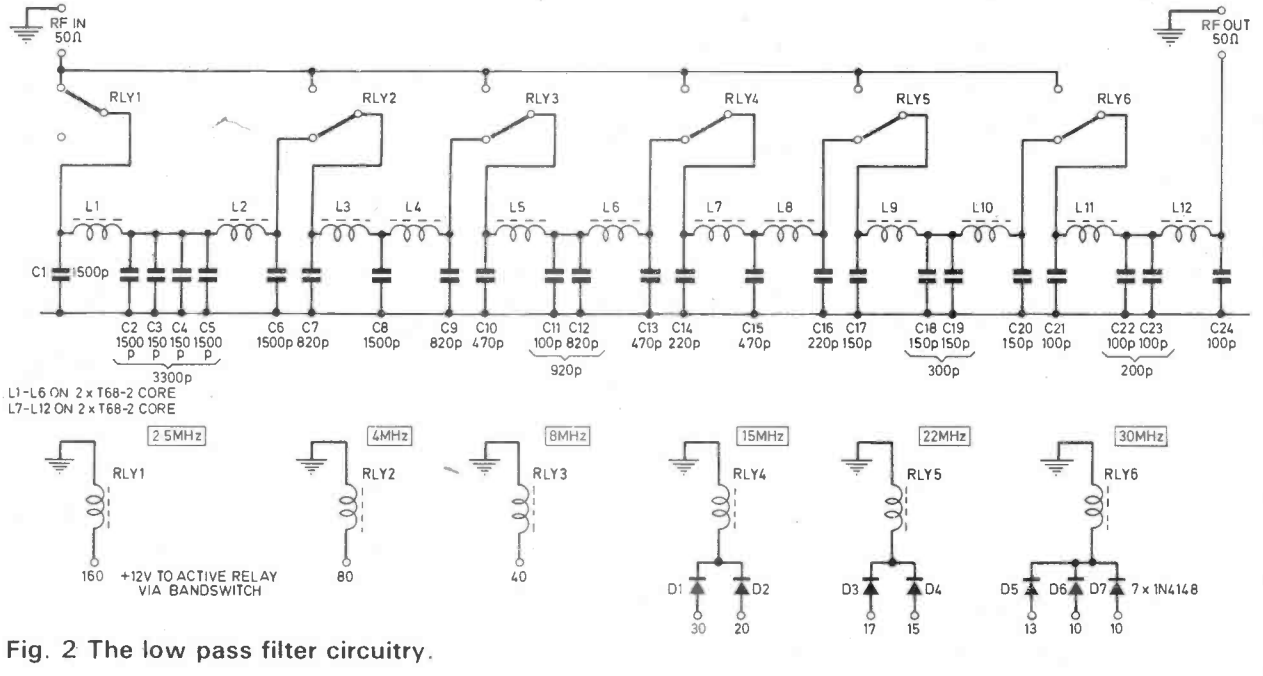

Fig. 2 The low pass filter circuitry.