

11) Insert and solder F1, F2, X2, and X3 with the cans against the PCB. F1 can be inserted either way round (the centre lead is earthed via C4 on the underside). F2 has its input and output marked — the input goes adjacent to T2. A short tinfoil screen (6mm x 30mm) connected on the underside of the PCB along the long axis of the filter between the earthed pins will be advantageous in preventing the pins 'seeing' each other.

Solder the case of F2 to the top foil in the same manner as the IF transformers.

12) Insert and solder the SBL1 mixer — pin 2 is located underneath the letter 'M' of MCL stamped on the top, or pin 1 may have blue insulation on the underside). Its earth connections are made via tracks on the underside.

All the components should now be in place with the exception of Q2 and T1/T2.

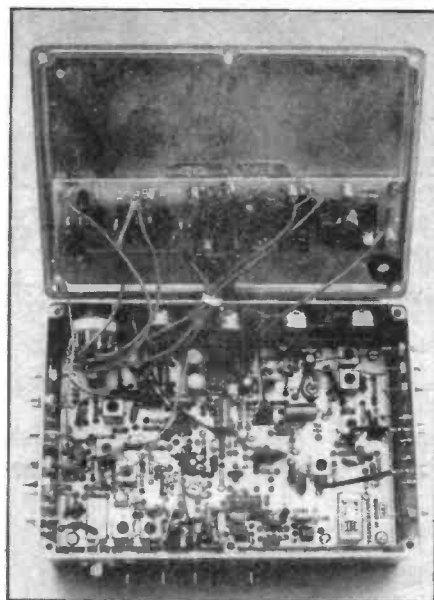
### Winding T1/2

Both these are wound on small ferrite balun cores using the following procedure.

a) T1. Take a 130mm length of 0.25mm enamelled copper wire and strip 5mm insulation off one end. With 10mm of wire protruding from the core, carefully wind 6 complete turns through the core — one turn counts as a wire inserted through one hole and then back through the other — i.e. the wire goes through each hole once for one turn, and they should both end up at the same end after 6 turns. Keep the wire tight while winding but be careful not to strip off any insulation by rubbing against the core itself. Reduce the remaining wire to 10mm length and strip off 5mm.

Now take 2 lengths of the same wire, each 40mm long, and strip 5mm on one end of each. Twist the two stripped ends together and solder. Insert the free ends (one into each hole) of the core *from the end which currently does not have any free wire protruding*, and push the wires through until the join is against the core. Then fold the two wires you just inserted back over the top of the core so that they are on the same side as the tap. Cut these two wires to a 10mm overhang, and strip 5mm off the ends.

You now have a six turn primary, and a centre tapped one



**CW filter and CIFPU mounted in diecast box**

turn secondary (as only one turn is actually inside the core). T1 can now be soldered into place, core against the PCB, and with all leads short and symmetrical. It doesn't matter which lead of the secondary is earthed to the top foil.

T2 is very similar (except that the primary has fewer turns than the secondary), so wind 6 turns on another balun core as before. Again take 2 lengths of wire 40mm long, and strip, twist and solder as before. Put the lead through each hole in the core as before, but this time bringing them back through the core, rather than over the top, so as to have a centre tapped winding. Finish stripping off and solder into place as with T1.

Now make the three links indicated with short pieces of insulated wire on the underside of the PCB (connecting the two points marked 'b' together, then c-c etc.)

Finally, holding it by its case, slip a bead over the centre lead of

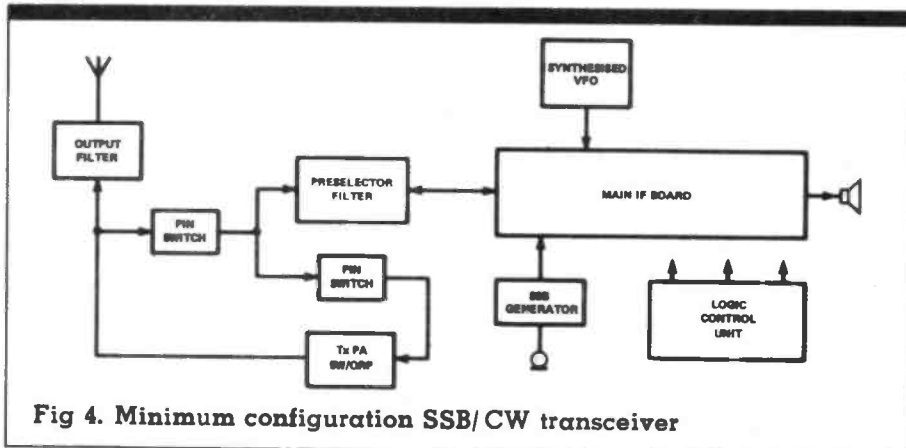
Q2, insert as far as it will go into the board, and then solder the source lead to the top foil, and then the leads on the underside.

Before continuing, go round the PCB and check for solder bridges etc, and double check all the components are in place, and soldered to the top foil where they should be. If you are using the kit, there shouldn't be any components left over.

### Testing

As you will see from the photograph, the IF unit is housed in a diecast box, to avoid unwanted signal pick up, both into and out of the unit. The enclosure also helps the noise blanker by backing the PCB with an earthed plane, so the unit must eventually be built into the box. For testing, it may be left out of the box, but bolted to the underside of either it or a piece of aluminium etc, so that it is easily accessible. We have not given full wiring diagrams for the unit as these will be given when the synthesised VFO, preselector, PA and switching unit have been described and can be connected. However, the wiring is quite straightforward, using the lettered points and circuit diagram as a guide. Use screened cable for the audio connections.

You will require a temporary VFO of some sort until the proper one has been built. This can be a simple signal generator, or a temporary oscillator, or even a VFO from another rig if you have a suitable one. A high oscillator level is needed — about 200mW (23dBm), which is fed via a 13dB pad to give 10mW (20dBm) to the LO port of the mixer. You can get away with less for alignment purposes, but the recovered signals, and the dynamic



**Fig 4. Minimum configuration SSB/CW transceiver**