C14-23 (39p), C24-33 (10n).

2. Carry on with Q's 4-13 (BC308), and the PIN diodes, D2-11 (BA379 — keep the end marked with a silver line near the bottom edge of the pcb).

3. Wind each inductor (L2 — 11) as given in the table, leaving the turns spaced round the cores, with the base of the core resting on the pcb. Exact adjustment comes later.

4. Carry on with the rest of the components on the left hand side of the pcb up as far as T2, C74, RFC4, C72. Also insert IC3 (7808 — observe orientation), RFC6, C77,81,73,75. D22 has one lead soldered to the top foil.

T1 is wound with 11cm of wire for the 4 turn part, and 2cm for the rest, the join being the tap. T2 is bifilar wound as per the drawings. To make the bifilar pair, take two lengths of 0.25mm wire, fix one pair of ends in a vice or something similar, and the other ends in a twist drill chuck. Turn the drill to twist the wires together until one end breaks off! The wires are then wound through the core as though they were single. Untwist each end and establish with a multimeter which ends are which, and also that the two separate wires do not have a dc short.

Then connect the end of one wire with the beginning of the other — this end then goes to C76, and the other ends as shown, after reducing the leads to about 15mm in length, and stripping.

Initial alignment

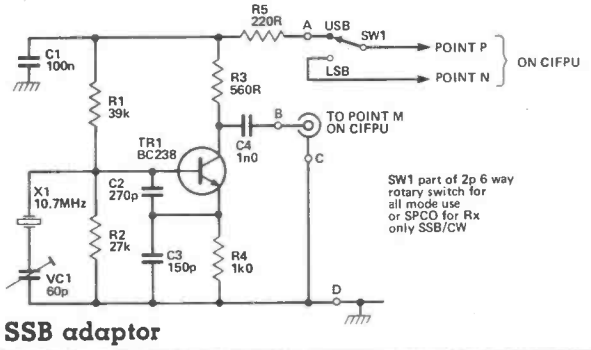
Exact alignment of the VCO s is done later — at this stage general operation is checked.

1. Make up a source of variable voltage to emulate the loop filter output to drive the varicap diode (D22). Use the RIT potentiometer with one end connected to earth, the other to +12v, and the wiper to the pin adjacent to C71.

2. Connect a frequency counter to the output of T2 (the twisted pair end) so that the VCO frequency can be read.

3. Apply +12v as before, and check that +8v is present on the drain of Q24.

4. Set the pot for +10v at the wiper, and activate the 160M VCO.



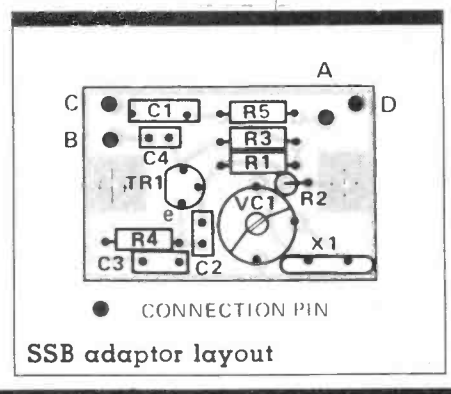
Receive only SSB adaptor

By varying the spacing of the windings on L2, it should be possible to set the VCO output frequency to the upper limit given in the table (13.2MHz for L2).

This adjustment is quite critical but only needs to be approximate at the moment. When you are sure that this adjustment can be made correctly, give the cores and windings a light coat of something like nail varnish (not epoxy resin at this stage!) to temporarily fix the windings in place. A more critical adjustment will be made later and each core fixed in place with epoxy adhesive.

Carry on adjusting each inductor in turn. If necessary, turns can be removed, or added, to the cores but this should be unlikely.

If things don't work check components first. Also check that the PIN diodes are switching on (is there a voltage drop across them?, and across the 220R resistors). Check T1 is the right way round, and that T2 is correctly wound. If you can get a frequency reading on the drain of Q25 but not at the transformer, then T2 is wrong.



SSB adaptor layout

Finishing the VCO sub-circuit

The rest of the VCO circuit can now be built, working up the pcb from T2 with the components. T3 is a simple centre tapped coil wound on a ferrite bead (7cm of wire needed for each half of the winding). Q26 (VN66AF) is static sensitive so DO NOT handle it by its leads — push the leads through a bit of kitchen foil, and remove it after soldering into place. One edge is chamfered and this should agree with the chamfered edge on the drawing, with the source soldered to the top foil. RFC6 uses 13cm of wire.

This transistor MUST have a heat sink attached to it — a drawing is given for a suitable sink. It is important that no insulating washer is used between the transistor and the sink, and that the sink is not attached to anything else — the extra capacity introduced will affect the frequency response of the amplifier.

When all components are in place, turn RV3 fully anticlockwise. Then with a multimeter set to 500mA range in series with the +12v supply, adjust RV3 so that the current taken increases by 100mA (ie the standing current of Q26 is set to 100mA) AT THE SAME TIME shorting the drain of Q24 to earth with a 1n or higher value capacitor (to ensure that the VCO is not oscillating). When you have done this, removing the short should drive the current up by a further 80-100mA or so.

If the current does not increase on removing the short, then drive is not reaching Q26.

Check that the current drain increases as each VCO is selected in turn, with slightly less increase at the HF ends.

Loop Mixer

Firstly, the remaining long screen should be soldered into place just next to the cyrstals, 20mm high as before.

1. Insert and solder the components associated with the loop mixer. The SBL-1 mixer has pin 2 (adjacent to pin 1) under the M of "MCL" stamped on the package.