amplification (in receive) is done at AF and this section of the equipment has to have a very high gain. Our design incorporates more than 100dB of amplification. Just 10 microvolts of recovered audio produces more than a volt across the loudspeaker.

Circuit description

The heart of the transceiver is the double balanced mixer, DBM1 on the circuit schematic, **Fig. 1.** It comprises three ports: RF, LO and IF. The RF and LO ports are electrically interchangeable. The IF port is used for injecting AF in the transmit direction or recovering AF in the receive mode. We make no apologies for commencing circuit description at the DBM because all the other circuitry is built around it. Tr1 and Tr2, the VFO circuit, drive the LO port with around 10mW in all modes. In receive, signals are coupled to the RF port through the preselector/filter, L4, L5 where they are mixed down to AF by the DBM. Audio, appearing at the IF port, passes through the low pass filter R9, C11 through to the AF pre-amp Tr7, Tr8. This couplet is designed to produce about 70dB of gain, the remainder coming from IC1, the LM380 audio amplifier chip.

The AF pre-amp couplet uses a double ganged volume control, RV2. This is to increase the dynamic range of the receiver. If just a single volume pot where included between Tr8 and IC1, there would be a real chance that the pre-amp circuit may overload on strong signals. If just a single control were included ahead of the AF amplifier as a whole, then strong signals would be as noisy as weak ones!

Transmit mode

In transmit (phone) microphone signals are amplified by Tr5 and applied to the DBM via C27. The diode, D4, serves to isolate the collector resistor, R21, in the receive mode. The input impedance is in th region of 5K ohms. Without any adjustable components, the microphone amplifier/modulator circuitry provides enough RF drive to the PA strip (Tr3, Tr4) with normal close talking. Very insensitive microphones may need further amplification though.

In CW transmit, keying is

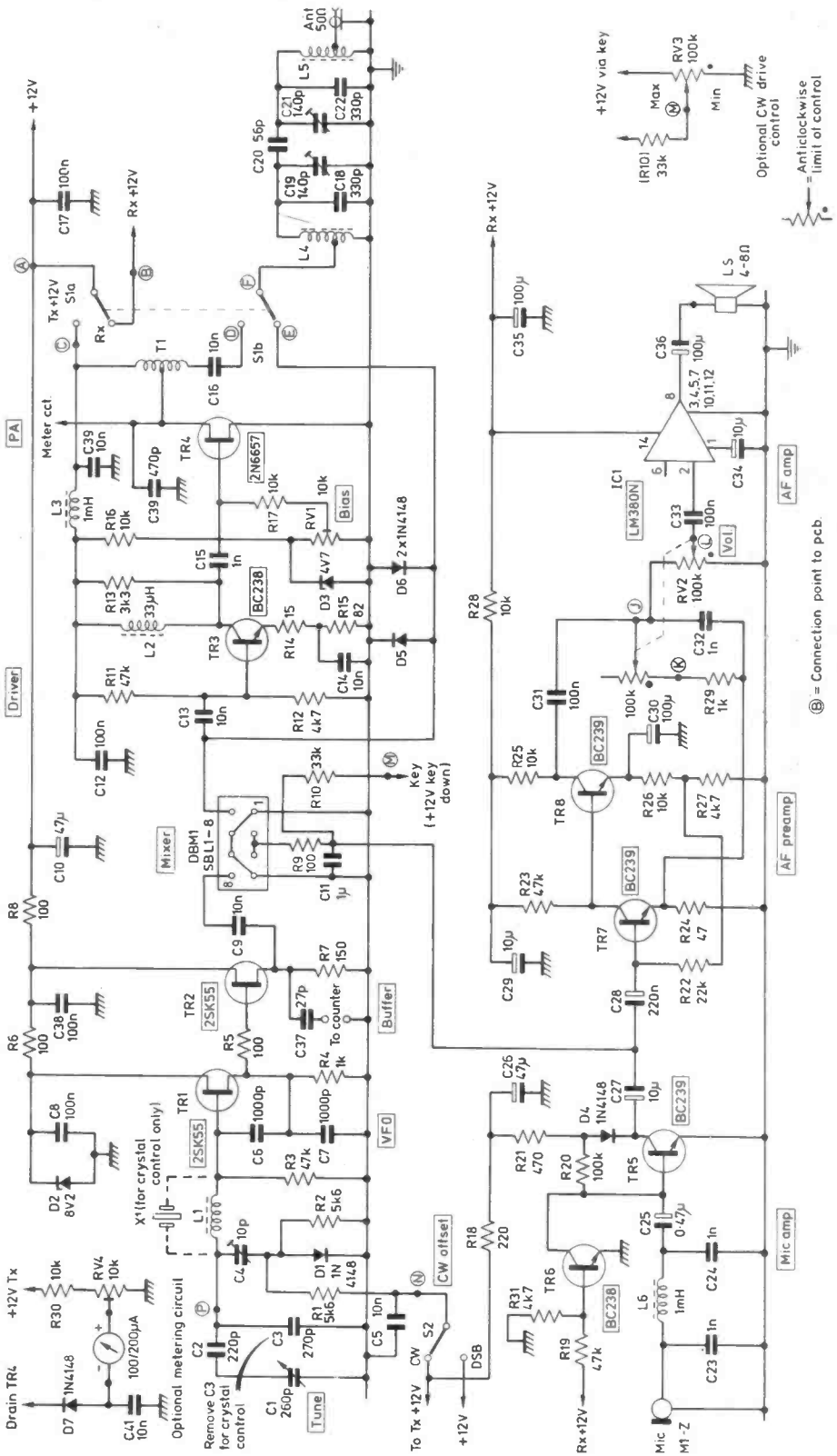

Fig. 1.