

# DW REVIEW

## REFTEC MTR 934-2 934MHz CB Transceiver

For some time now—in fact ever since the 934MHz CB service was announced—we have been itching to get our hands on a pair of 934MHz rigs. Our experience with 430MHz amateur equipment and the results of tests with 1296MHz gear indicated that this band should have great potential.

We have patiently waited and waited, our appetites whetted by the loan of a couple of Reftec rigs which we used, with success, at the 1982 Electronic Hobbies Fair at Alexandra Pavilion. At last our patience has been rewarded and we have had two—well 1½ at times—Reftec 934MHz rigs together with the necessary antennas for what have proved to be very interesting but at times frustrating tests.

### Transceiver Description

Externally the Reftec MTR 934 is indistinguishable from many of the current 27MHz CB transceivers. Controls are sensibly kept to the basic minimum consistent with straightforward operation.

Choice of the currently available 20 u.h.f. CB channels is obtained by rotation of the 35mm diameter selector switch knob which features 40 positive indexing steps and 360° repeating sweep. Subsequent upgrading to 40 channel capability (when regulations permit) will require a switch replacement, but the 7-segment l.e.d. indicator and p.l.l. programming capability are already accommodated in the basic design. Signal level indication is provided by means of five red l.e.d.s arranged as a horizontal bar and on transmit these all illuminate together with a single red l.e.d. TX status indicator.

Other front panel features include a calibrated rotary volume control, 4-pin microphone connector (of the familiar oriental screw locked variety) and a non-latching squelch-enable button. This latter device is of push-to-make, push-to-break format, allowing use of the internally pre-set squelch or disablement of the facility where appropriate.

Rear apron features include a 2-pin d.c. supply receptacle, which although fitted with locator key will allow momentary reverse polarity connection—a protection diode is fitted internally! External speaker output, which was found to be essential for mobile activity, is via a 3.5mm jack and the



antenna connector is a 50Ω BNC socket.

Internally the transceiver comprises four main p.c.b.s which respectively accommodate the p.l.l. synthesiser/TX board; receiver/audio; display driver/channel selector and finally the p.a. strip. With the exception of the display driver board, all p.c.b.s are double-sided roller tinned and screwed to the folded steel chassis section. A close inspection of the reasonably compact assembly revealed several points at which additional decoupling/padding components had been added, often in "piggy-back" fashion where track pads were not available. Whilst this does suggest "amateur" type construction technique, the resulting performance was not impaired and presumably later models will incorporate what amount to on-going development modifications.

A fully detailed account of the circuit details is hampered by the absence of a circuit or block diagram, however certain deductions can be made.

On receive, incoming signals pass to a dual-gate m.o.s.f.e.t. r.f. amplifier and helical filtering before being applied to a further m.o.s.f.e.t. mixer. The local oscillator for the first i.f. conversion is derived by combination of a fixed frequency crystal oscillator and p.l.l. synthesiser. The fixed oscillator runs at 72.052083MHz (original UK channel spec.) and is subsequently multiplied by six to 432.312498MHz and applied to a mixer stage. The p.l.l. uses a 6.4MHz crystal reference with programmable v.c.o. outputs at 24MHz (CH1) thus the output of this mixer stage must be doubled to obtain the l.o. input to the m.o.s.f.e.t. receive mixer. After filtering and i.f. amplification the first i.f. frequency (21.400MHz) is once again mixed with a second fixed frequency conversion oscillator running at 20.945MHz to obtain a conventional 455kHz second i.f. which is then processed to audio via the familiar MC 3357 i.f. detector and LM 380 audio output combination.

The transmit side of life line-up, is basically similar using a fixed crystal oscillator running at 73.835416MHz to feed the same six-up multiplier, modulated p.l.l. output, mixer and doubler used by the receiver l.o. After filtering the transmit frequency signal feeds a discrete two-stage p.a. the final device of which is an SD1410, capable of 6W output.

### System Evaluation

Our experience at the 1982 EHF indicated great potential, with good solid copy between our base station, half buried in the hillside at Ally Pally, and a mobile station over a radius of around 6km.

