

air test

USER REPORTS ON SETS AND SUNDRIES

MICROWAVE MODULES MMT 432/144 TRANSVERTER

The current upsurge in activity on the 70cm band, together with the increasing availability of low power multi-mode 2m transceivers, provides an ideal opportunity to review the well proven linear transverter series MMT 432/144, from Microwave Modules.

When driven by a 2m multi-mode transceiver covering the frequency range 144 – 146 MHz, the transverter can be set to provide coverage of 432 – 434 MHz or 433.6 – 435.6MHz s.s.b., a.m., f.m or c.w., which encompasses the bulk of activity modes up to the low end of the amateur satellite service sub-band. Simple toggle switch selection of the transmit and receive frequency local oscillators allows access to the UK 70cm repeater network, without the need for "odd" 2m drive frequency offsets to obtain the required 1.6MHz shift.

On the transmit side the 2m r.f. drive is mixed with a 116MHz local oscillator and down converted to 28MHz. A second local oscillator, running at 101MHz is multiplied and mixed with the 28MHz signal to produce the required 432MHz output. A further local oscillator running at 101.4MHz may be selected to produce a 1.6MHz offset at the output for semi-duplex repeater use. The double conversion technique results in a substantially spurious-free output, with measured levels at 404MHz and related frequencies, all better than -65dB.

Frequency stability measurements of the review sample confirm the makers specification of drift to be within 2kHz/hour, and on both the reviewers MMT 432/144 and the review sample frequency errors of within ± 2 kHz are typical, and more than adequate.

The transverter is supplied complete with a discrete 15dB in-line power attenuator to allow up to a maximum of 10W applied 2m r.f. drive. For use with lower levels of drive the " π " network within the attenuator may be altered to produce the equivalent power level at the transverter 144MHz transceiver port. On test, with an applied 10W drive, an output power level of 14W was measured, with a slight reduction



at the extremities of frequency coverage.

On the receive side the MMT 432/144 features a low noise BFR34A first r.f. amplifier, BFY90 second r.f. amplifier stage and 3N204 dual gate MOSFET mixer. An overall conversion gain of 10dB, when connected via the in-line attenuator on the transceiver port, is the quoted typical figure. An additional, non-attenuated, 144MHz receiver output port is provided on the transverter, with a typical gain of 25dB, and is suitable for use in conjunction with an independent 2m receiver. An overall noise figure maximum of 3dB is quoted.

Under test in conjunction with the Standard C58 multi-mode portable

(basic sensitivity 0.2 μ V) the transverter produced a 12dB SINAD figure at 0.12 μ V p.d.

Following their standard format, the transverter is constructed within a matt-black painted die-cast aluminium box, measuring 188 x 120 x 60mm, with all input/output ports and frequency selection switches mounted along the front face.

Internal construction is to the usual high standard and features a single, double-sided p.c.b., containing all stages with the exception of the p.a. which is housed in its own fully screened enclosure. An r.f. VOX circuit is provided or, alternatively, use may be made of the separate p.t.t. pin on the DIN plug power line input. Antenna switching is accomplished by a pin diode changeover network.

During some 18 months' operation, the reviewer's own MMT 432/144 transverter has been used in conjunction with several f.m. and s.s.b. 2m rigs, such as the Trio TR-2300 and Icom 202-S and lately the Yaesu FT-290 multi-mode portable. In all cases results have been comparable with those obtained from "dedicated" 70cm transceivers of equivalent power output. Good results have been obtained when used mobile, via the extensive 70cm repeater network, and also for reception at the home QTH of Oscar series satellite downlinks and beacons. Best DX to date, when feeding into a 20 element quad loop Yagi antenna at 25m a.s.l., was West Yorkshire using s.s.b. during a recent contest, a distance of 450km over a very obstructed path.

In conclusion the MMT 432/144 transverter series is a cost effective means of operation on 70cm for those in possession of a 2m transceiver.

Our thanks go to **Microwave Modules, Brookfield Drive, Aintree, Liverpool, L9 7AN, Tel: 051-523 4011**, for the loan of the review model MMT 432/144R which is available at £184.00 direct from MM or their approved distributors.

