

Yaesu FT-650

24, 28 & 50MHz All Mode Transceiver



Recently Rob Mannion G3XFD and Tex Swann G1TEX had the chance to try the Yaesu FT-650 Transceiver. They liked what they found!

I often wonder why the various manufacturers go to the bother to produce sophisticated modern transceivers for a very limited number of bands. Mind you, after trying the Yaesu FT-650 for a week or so, I soon found that the benefit is biased towards the operator!

Tex Swann, our technical sub-editor, has a QTH better equipped with 50MHz antennas, so he had the first go. Now I've got to admit that Tex, when it comes to 'singing the praises' of modern commercial transceivers - is not known to 'overdo it'. Well, that was certainly the case until he tried this rig out on 50MHz!

Sensitive Receiver

The main comment coming from Tex after he'd had the transceiver for a few days, centred on the receiver. "It's incredibly sensitive" he said - and after I'd tried it out I could only agree.

Working on 50MHz, Tex found that the receiver's very sensitivity caused problems - due to the very high level of 'computer hash' which surrounds almost every 'built up' area.

The appalling 'hash' problem wasn't quite so bad at my QTH, and I was able to sit and listen - quite fascinated - by the American 'Public Service Band' signals appearing between 35 and 50MHz.

Good Guides

The various signals from the USA and elsewhere on 'low-band' v.h.f., although not of interest to the radio amateur for their own sake - provide good indications of the band conditions on 28 and 50MHz. (Yes, I did find them both 'up' at the same time, to a limited extent).

Tex had listened a lot on 28MHz, and I'd had the opportunity to work some of the real DX that had appeared on 28MHz. The superior sensitivity of the FT-650 made my existing equipment sound very poor. Compared to the FT-650, my other equipment acted as if it was completely 'deaf'!

On The Air

I didn't work anyone on 24MHz, but I heard a great deal of activity. My antenna, which is particularly useful for 28MHz work, brought me excellent reports from as far afield as South America, the American Mid-West and my very first Japanese station on s.s.b.

The FT-650's triple-conversion receiver (dual-conversion on f.m.) coped with some terrible 'pile ups' on 28MHz and even sorted out some of the problems on the UK and international CB radio frequencies. The selectivity and dynamic range of this handsome little transceiver is certainly amongst the best I've heard in a while.

General Coverage Receiver

The ability of the receiver to tune continuously from 24.5 to 56MHz was a definite bonus. I was able to listen to many transmissions from the United States and farther afield - to provide me with a guide to propagation.

Tuning control, knobs and all controls are very well laid out. In particular (and I'm very 'fussy' in this respect) the main tuning control is a delight to use and it's completely free of the very common, but annoying, 'click-stop' effects.

As I'm a keen c.w. operator, I was keen to see how well it coped and again I can freely admit I was impressed. Yaesu offer a 600Hz crystal filter kit - but I managed without it on 28MHz!

Transmitting

The transceiver has a duty cycle of 100% at 100W at 25°C. It seemed to cope very well with everything even when it had been left on in the shack all day.

There is not a great deal of activity on 50MHz here in the south and I only worked a few stations. The reports on speech quality were very satisfactory indeed.

REVIEW

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I'm pleased to say that there is growing interest in a.m. transmission. 'Ancient Modulation' is making a 'come back' - it's already got a foothold on 70MHz - and a good quality a.m. signal is a pleasure to listen to on v.h.f.

I heard several a.m. transmissions and the FT-650 provided good quality reception. Although I'm pleased that the transceiver has a.m. facilities, unfortunately, the a.m. stations were somewhere in the south midlands and they couldn't hear me!

Summing Up

To sum up our impressions of this rig, I must say that I found it delightful. I even found the multi-function controls easy to use. It was a delight to have in the shack, mainly because it covers some very interesting frequencies which provide some excellent DX 'forecasting'.

There's no doubt in the mind of G3XFD that Yaesu have an excellent transceiver here, and that the receiver is especially good in an area where receivers - even modern designs - can 'fall down'. If I get the chance - this is another of very few modern transceivers that I'd like in my shack. But this time, we'll let Tex Swann G1TEX (as a true v.h.f. man) have the final words on this machine,

Swan Song

As Rob has already told you, I have a series of antennas at my QTH, one of them being a delta loop for 50MHz. I've used this antenna with my FT-690R and consider it to be adequate, given the south facing side-of-the-hill position of my house. I had already noticed a few 'burbles', 'squeaks' and other associated 'twitters' with my '690, but I was unprepared for the continual barrage of signals which were marching down the coaxial cable into the FT-650.

Literally every few kHz I could hear some activity from the microprocessor-based cash-tills in the row of shops 200m to the north. The sensitivity of

the rig could be reduced with a simple switch, but even this left the rig more sensitive than my own.

A few tentative 'CQs' showed that the output of the rig was 'clean'. When I transmitted at approximately the 20W output level, little disturbance was noted on a nearby domestic v.h.f. f.m. radio.

My unanswered 'CQ' calls and the interference from 'background' radiation, has left me unable to comment on the transmit side. Unable to use the other two bands of the set, I listened to others making use of them. I noted that the delta loop was more than adequate to hear 'state-side' on 28MHz at signal levels as if the USA was next-door!

Controlled Ease

As I had little time to play with the rig 'on air', I'll expand on some of the controls that Rob found quite easy to use. The synthesisers in the rig have several stepping rates, changeable by either a small button or by pressing the function key in.

This action, and rotating the main tuning dial is a way of tuning the transceiver quickly, in large steps, through the range covered by the equipment.

With the smaller step-rate, the tuning, though in steps, was both precise and stable. It sounded 'smooth' when tuning into s.s.b. speech transmissions. The FT-650 also has a secondary receiver incremental tune (r.i.t.) which allows over 20kHz of independent 'off-tuning' capability.

Second Method

A second method of tuning in larger discrete 2.5kHz steps, was available from a smaller knob low on the right hand side of the rig. When using f.m. or a.m. this feature proves very useful.

The extra control knob, when in 'memory' mode, cycles through each memory in turn. To store a frequency into a memory, the operator has to tune the v.f.o. to the frequency required and then press the 'mem' button once.

Specifications

General

Receiving frequency range: 24.5 to 56MHz

Transmitting frequency range: 24.5 to 25MHz
28 to 29.7MHz
50 to 54MHz

Frequency Stability (0 to +50°C) less ± 2 ppm on s.s.b./c.w., less than 10ppm on a.m./f.m.

Emission Modes: J3E (s.s.b.), A1A (c.w.), A3E (a.m.), F3E (f.m.).

Frequency Steps: 10 and 500kHz for all modes.
10Hz for s.s.b., c.w. and a.m.
2.5, 5, 10, 15, 20, 25kHz selectable (all modes).

Antenna Impedance: 50 Ω

Supply Voltage: 13.8V d.c.
110-125 or 220-234V a.c. (selectable) 50-60Hz with optional FP-22 a.c. p.s.u.

Power Consumption: 2A d.c. receive and 18A d.c. transmit (100W) approximately.

REVIEW

Specifications (continued)

Transmitter Details

Power Output:	10-100W adjustable (Max. 50W a.m. carrier)
Duty Cycle:	100% @ 100W, 25°C
Modulation Types:	Balanced, filtered carrier on s.s.b. Low-level (early stage) on a.m. Variable reactance on f.m. Maximum f.m. deviation \pm 5kHz at normal i.f. bandwidth, \pm 2.5kHz at narrow i.f. bandwidth.
Spurious radiation:	(harmonic/non-harmonic) at least 50/40dB below peak output below 30MHz. 70/60dB below peak output above 50MHz.
Carrier Suppression (s.s.b. operation):	at least 40dB below peak output.
Unwanted sideband suppression:	at least 40dB below peak output.

Receiver Details

Circuit Specifications:	triple-conversion superhet in c.w. and a.m. modes. (dual-conversion on f.m.)
Intermediate frequencies:	13.69, 455kHz and 8.215MHz (excluding f.m. mode).
Sensitivity (r.f. amplifier on):	0.125 μ V for 10dB S/N c.w./s.s.b. 0.5 μ V for 10dB S/N on a.m. 0.16 μ V for 12dB SINAD on f.m.

Selectivity

Narrow:	2.4/4.5kHz (-6/-60dB) s.s.b., c.w., a.m.
Narrow (with c.w. optional filter):	600/1200Hz (-6/-60dB)
Narrow (f.m.):	8/30kHz (-6/-40dB)
Normal (a.m.):	6/18kHz (-6/-50dB)
Normal (f.m.):	15/30kHz (-6/-40dB)
Intermediate Frequency Rejection:	70dB or better (within amateur bands)
Image Rejection:	60dB or better (within amateur bands)
Intermediate frequency notch depth:	4dB or better.

The memory number then flashes in the display. The next step is to rotate the smaller knob to select the memory which is to hold the information, before pressing the 'mem' button in until a fairly long 'beep' is heard. Both frequency and mode have been stored.

On this transceiver, only memories containing data were displayed. Overall I found this method simple and quite easy to understand.

There's another control button which can be used to transfer the information in the 'other direction' (memory to v.f.o.) if required. This allows 'frequencies of interest' to be held in memory, to be recalled and used as a tuning start point.

Portable Operation

This rig isn't just a base station for the shack, where an optional switch-mode p.s.u. can be used. The transceiver's also supplied with a long, very heavy 12V lead to allow the set to be used in the 'field'.

I'd like the opportunity to take it to a local hilltop overlooking the sea to work the DX. Please SMC can I borrow it again when the weather is warmer and vertical antennas are allowed on 50MHz?

PW

The Yaesu FT-650 is available from South Midlands Communications at Chandler's Ford, Eastleigh, Southampton SO5 3BY, at £995 inclusive of VAT (optional power supply £149 inclusive of VAT) and we thank them for the loan of the review model.