

EQUIPMENT REVIEW:

THE YAESU FT-207R

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It is often said that good things come in small packages. The new Yaesu FT-207R is a hand held two metre FM transceiver and even for one used to using hand held equipment the 207R would have to be rated as very small. When it is considered just what this rig will do, the whole thing becomes quite remarkable. However, back to the beginning.

Two metre hand held transceivers go back quite a few years in the history of FM in Australia, but strangely cover only a very few models. Yaesu were rather late into the hand held field with the FT-202R announced a year or so ago. I am not certain if any of these were actually imported into Australia. These were six channel devices of apparently conventional electrical design with normal crystal control. Transmitter output was rated at one watt. The new FT-207R uses the same case but from there on, apart from the fact that they both operate in the two metre band there is very little in common. The FT-207R has more electronics built into its 68 x 181 x 54 mm case than almost any other mobile size package. Lets look at what it offers.

It has full microprocessor control with keyboard dial up frequency control. It covers the entire two metre band in ten kilohertz steps with a switch selected 5 kHz upshift. Four memory frequencies can be entered via the keyboard and scanning of either the four memories or the entire band is available with the scan stepping on either a busy or clear channel. Operating frequency is indicated with a LED readout and of course the usual 600 kHz offset for repeater operation can be selected with the function switch. In addition any other desired offset can be programmed into the system. Once a memory is programmed it is held even if the transceiver is switched off, for as long as the in-built nicad battery retains its charge. As the memory uses about 5 milliamps, this is limited to about 80 hours assuming no actual operation of the transceiver.

Transmitter output is rated at a generous 2.5 watts and on test actually produced just over three watts.

The FT-207R as supplied for test was complete with a nicad charger/AC adapter, external microphone/speaker, flexible antenna and adaptor to charge the battery when removed from the transceiver.

At least some of these are optional extras and it would be well to contact the distributors for all-up prices.

An interesting point is that the nicad battery is rated at 10.5 volts and the manual states that the transceiver should not be operated on a voltage in excess of exactly 12 volts. It would seem therefore that operation should not be attempted from a standard 12 volt car system which would rise to about 14 volts. Strangely, Yaesu do not have any sort of adaptor or regulator for such operation.

CIRCUIT DESCRIPTION

As could be imagined the little box contains a large number of semiconductor devices. There are in fact 31 transistors, 5 FETs, 10 ICs, 35 diodes plus 2 LEDs and a LED display. The receiver circuit is a standard double conversion with 10.7 MHz and 455 kHz IFs. However it comes as a surprise to find bipolar transistors in the RF and first mixer stages, but in practice sensitivity was first class.

The transmitter starts off at 10.7 MHz and is mixed directly with the 133.3 to 137.3 MHz output of the synthesized frequency control to produce the 144 to 148 MHz output. This same synthesized output is also injected into the receiver first mixer to convert the two metre signals to the first 10.7 MHz receive IF. Reference to the block diagram indicates the operation of the synthesizer and its control from the 4 bit microprocessor chip. An interesting point is that when the VCO is in an unlocked condition, voltage is removed from both the transmitter and receiver and the frequency display indicates 'E' for error condition. Transmitter output is switchable from the nominal 2.5 watts down to 200 mW simply by inserting a resistor in series with the voltage supply to the final and driver stages.

Diode switching is employed for transmit receive changeover which allows for normal push to talk operation with the external microphone. A microswitch is employed in the PTT switch on the transceiver which gives very positive and light control.

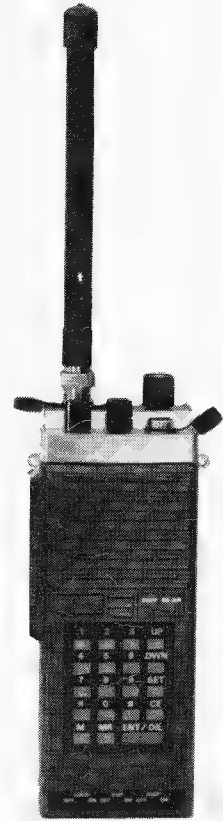


PHOTO 1: Front view of the FT207R

THE YAESU FT-207R ON AIR

This is one transceiver where it is absolutely necessary to read the instruction manual before trying to go on the air.

The transceiver was used in turn by four experienced amateurs and all found that the set had unexplained "faults". However the fault turned out to be the operators' and not of the set. In each case the manual had not been fully digested. But back to the start with a look at the controls and their functions. The top panel has the volume/on/off, squelch, mode switch for simplex or repeater operation, a 3.5 mm socket for external earphone or speaker, a BNC antenna connector and a multi pin miniature connector for the external microphone speaker unit. On the front of the set is the frequency selection keyboard, the LED frequency readout, the two LEDs to indicate transmit condition and incoming receive signal. Three miniature slide switches select the 5 kHz up condition, frequency display off and keyboard lock. The two latter require some additional explanation. The display off switches the display off once a frequency has been selected after a three second delay. If a new frequency is dialled up the display operates again for three seconds. While scanning the display operates and switches off three seconds after scanning stops. The keyboard lock switch retains the dialled frequency even if a new one is dialled up either accidentally or purposely.

The remaining control, the transmitter power selector switch is mounted on the bottom of the case. Rather badly placed, not from an operational point of view but the set will not sit firmly when placed on a flat surface. Four small rubber pads would fix this and at the same time protect the table top from scratching.

All operators testing the 207R found that small fingers would have been a decided advantage. Also good eyesight is handy to read the control designations. It's not a rig to use on a dark night unless you take a torch along. First few times the transceiver was operated without the external mike/speaker and transmit quality was clean but somewhat woofy in quality. It also appeared to have excess mike gain. Plugging in the external mike unit fixed all of these problems which indicates that the user would need to set the internal mike gain to suit either the internal or the external mike — one setting will not suit both. Another interesting point with the external mike/speaker unit is that when in use, the internal mike is muted but the internal speaker isn't.

Transmit capability with the flexible antenna was about as good (or bad) as other sets tested using these antennas. The radiation efficiency of stubby antennas seems dependent on just how much metal is under them to provide a ground plane, and most of these small transceivers just are not big enough. If you want to get out even into the local repeater a better antenna is needed.

Receiver sensitivity when checked against a selection of 2m FM units was as good and in fact the mute opened easily on very weak signals that would not open the mute on some of the others. The selectivity is designed for narrow band operation and the local channel eight repeater which tends to have rather wide deviation sounded somewhat distorted, however most local simplex signals were clean.

To get full use of all the keyboard facilities takes quite a bit of practice, hence my earlier remarks on unexplained "faults". It was discovered that changing the mode switch while the set was switched off produced some odd and unexpected results. This is covered in the instruction book, we just hadn't read it. The scanning position will either scan the whole band or the four memories. It is also possible to listen on one frequency and monitor a second frequency on a one second in five basis — very handy to listen to the local repeater while waiting for a friend to show up on simplex. The display shows the operating frequency at all times, so that if a transmit repeater offset is selected, the readout will show the transmit frequency. Many synthesized transceivers with digital readout do not have this feature and continue to display the receive frequency when actually transmitting 600 kHz away.

The FT-207R was supplied with the optional NC-2 quick charger/AC adapter.

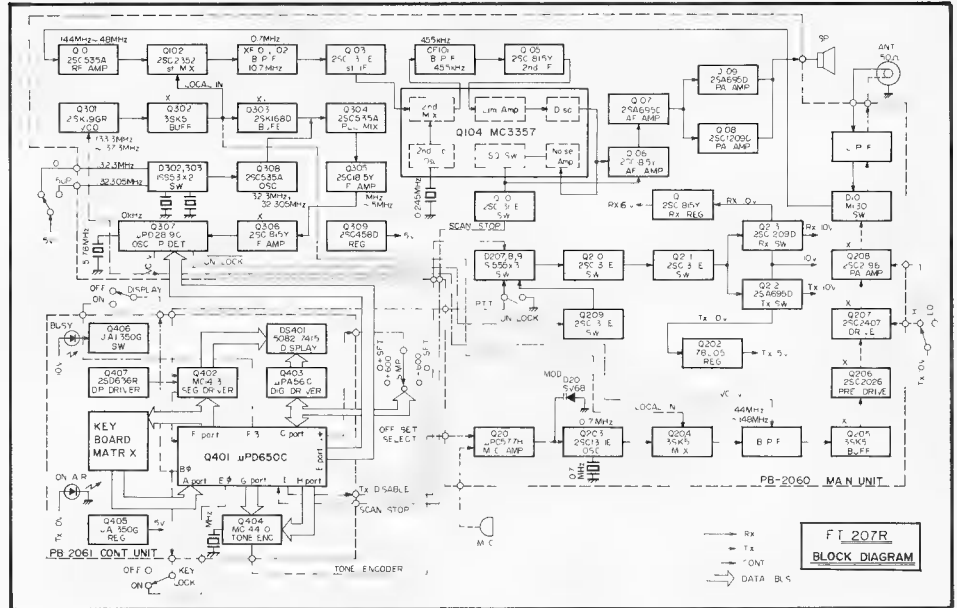


FIGURE 1 (above): Schematic diagram for the FT207R

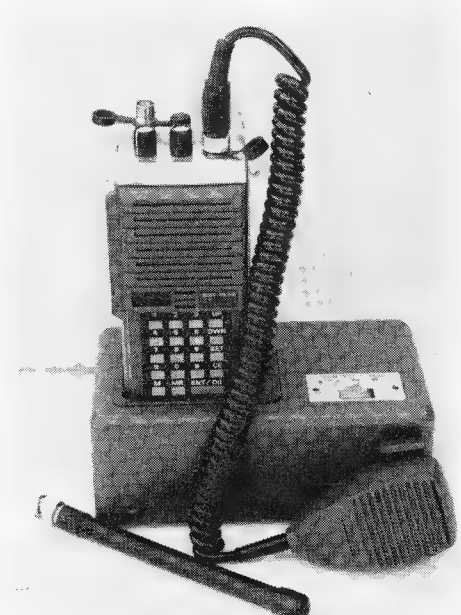


PHOTO 2: The unit complete with speaker/microphone, NC2 quick charger/AC supply and antenna.

The transceiver plugs into this either for quick battery charge in as little as three hours, or can be used to power the transceiver for base station use. In the charge mode, the initial charging rate is 450 milliamps which is automatically reduced to a pulsed 45 milliamps as the state of charge increases.

INSTRUCTION MANUAL

This came as quite a surprise as it is much smaller than the usual Yaesu manual (but then so is the transceiver). Its 40 pages cover operation, circuit description and basic maintenance and alignment. A full circuit diagram is included as well as a complete parts list. Several photos show

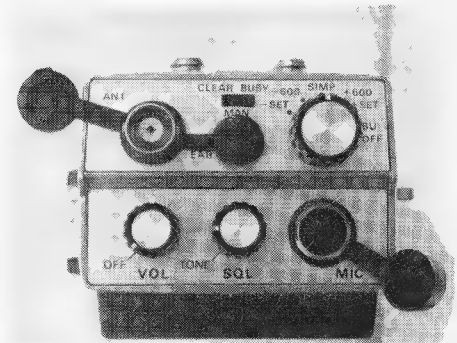


PHOTO 3: Control functions on the unit

the position of the main components and adjustment points. The book covers all needed points and is well written.

CONCLUSIONS

This little rig is superbly constructed and finished but where does it fit into the scheme of things? Well, if you travel either interstate or overseas and you need a rig with all facilities that will fit into a small overnight bag and still room for all the other things you need to take, then the FT-207R is for you. It would also make a wonderful toy for the amateur who "has everything". Beyond this, I am not sure. If you decide to buy one, drop a note to AR and let us know what your application for this rig is.

The FT-207R and NC-2 used in our review was supplied to us by Bail Electronics of Box Hill, Victoria, to whom all enquiries of price and delivery should be directed. ■

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