



# EQUIPMENT REVIEW

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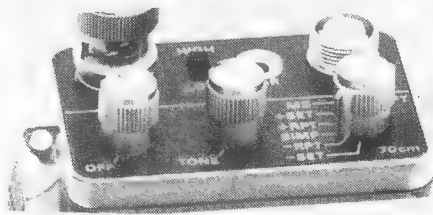
## YAESU FT-708R

This is a new 70 cm hand-held transceiver from Yaesu. It features microprocessor control of most functions. This unit is designed as an FM only unit for simplex or repeater use. Power output is 1 watt on high, or about 200 mW on low power. When used with the quarter wave whip antenna supplied, it was more than adequate to operate four repeaters from the Box Hill and Mount Evelyn areas of Melbourne. Other antennas can be used easily.

Frequency coverage is in 25 kHz increments from 430.000 to 439.975 MHz. It has the standard 5 MHz repeater offset available as standard, but if for any reason another shift such as 1.6 MHz is desired, then it can be programmed into it. Up to ten memory channels can be programmed into it, and it has a Lithium cell to keep the memory going for at least five years. All frequencies are entered from the keyboard on the front.

Other features include a variety of scanning modes, such as full band scanning with automatic hold on

either busy or clear channels, limited band scanning, memory scan, and it can also exclude a segment on its scan. It can also have a priority channel which it will periodically check.



Top view.

Digital display is provided by an LCD unit displaying the last four digits. This is a practice that irks me personally, as I like to know the full frequency. If I see for instance 7025, or 7.025 as it would be on this unit, I tend to think of 40 metres and 7.025 MHz. The same comment applies to all transceivers that give only a partial display of frequency — many manufacturers do the same thing.

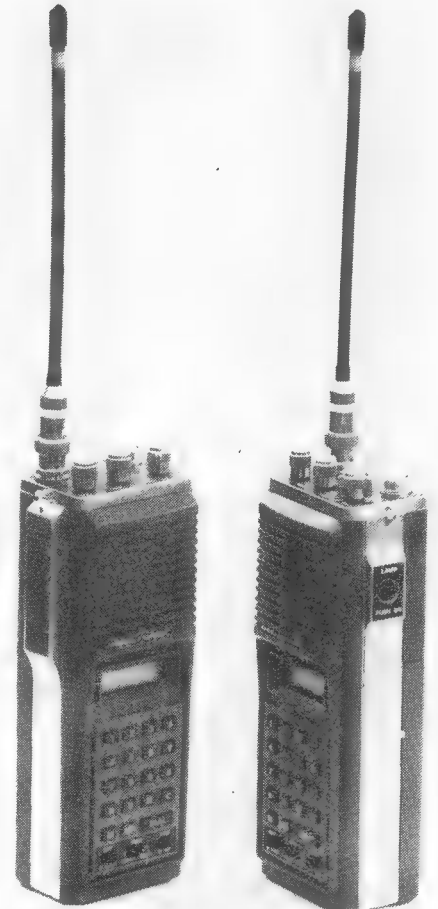
Controls provided are volume, squelch, Tx split switch, High/Low power switch, keyboard for frequencies etc, and a PTT switch. It also has a lamp switch to illuminate the LCD at night and a keyboard lock to prevent accidental change of channel.

Semiconductor line up includes 7 ICs, 5 FETs, 33 transistors and 33 diodes. They are all crammed into a package 168 by 61 by 49 mm, and a fair percentage of that space is taken up by the Nicad battery pack. Weight is approximately 720g.

Receiver is a double conversion superheterodyne type with a first IF fairly high at 46.255 MHz, and second IF at 455 kHz. Sensitivity is quoted as being 0.4  $\mu$ V for 12 dB SINAD. I measured 14 dB at .4  $\mu$ V, so it was better than the specifications.

Selectivity is claimed as  $\pm 15$  kHz at -60 dB. Audio output is 500 mW maximum, which is more than adequate for most needs.

Transmitter output is switch selectable at 1 watt or 200 mW. I did a check with a radiation hazard checker at distances from the antenna that an operator's head would be, and found it to be at a safe level when on high power. Deviation is set to 5 kHz. Spurious outputs are claimed to be better than -50 dB, and was measured at -60 dB as the worst one. Output is generally quite clean.

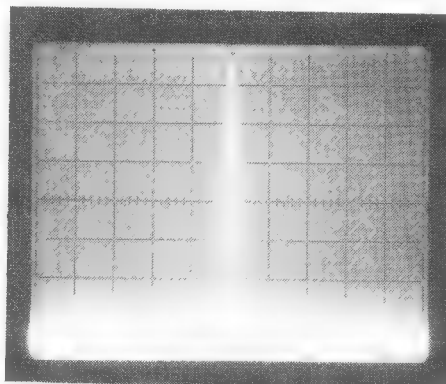


Side views showing the PTT and lamp switches.

This unit uses Phase Lock Loop technology. It generates a VCO signal at 127.915 — 131.240 MHz, and mixes it with a crystal oscillator at 126.240 MHz. The difference of 1.675 — 5.00 MHz is then fed to a programmable divider with division ratios of 201-600, which produces basic 8.333 kHz steps for the synthesizer. There is also a 5.333 MHz oscillator which is divided down to 8.333 kHz, and the two 8.333 kHz signals are fed to a phase comparator, and any difference produces an error voltage which is then fed back to the VCO at 127.915 — 131.240 MHz. When the VCO is multiplied by three it comes back to 25 kHz steps.

The VCO output is split two ways. For the receiver it is simply multiplied by three and fed to the first mixer, producing an IF of 46.255 MHz. Signal for the transmitter is first mixed with a 15.4183 MHz frequency modulated crystal oscillator, and then filtered and multiplied by three to the final frequency.

Power requirements are met with a nominal 10.8 volt battery pack. Maximum voltage is 13 volts, so it would be unwise to operate this unit directly from a car battery as most cars can produce voltages above 14 volts. Current consumption is about 20 mA when muted, 150 mA at full audio out and 500 mA on high power transmit.



How the FT-708R looks on a spectrum analyser.





Plug-Pack Charger.

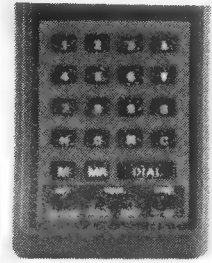
The review unit was supplied with a plug pack charger, but it was not the Yaesu one. It was one of the Dick Smith units that have polarity reversal and a multi-way plug on it. If it were mine, I would cut off that plug and fit a standard charger plug. Fortunately the transceiver does have polarity protection on the charge input, but not on the external power socket.

The unit can be operated while charging, but as the charge plug enters from underneath, it becomes inconvenient to put it down base first. Side entry would have been better for such use, but as Yaesu also have accessories in the form of table top chargers and power supplies, I guess it doesn't matter.

The handbook supplied was of good standard, providing details of how it works, maintenance data, parts list and circuit diagram. Accessories provided are a rubber whip antenna, Ni-Cd battery pack, carrying case, shoulder strap, and earphone. The review unit also came with the optional external speaker/microphone (YM-24A) which allows the operator to hold the transceiver high under weak signal conditions, and also allows easy base station operation.

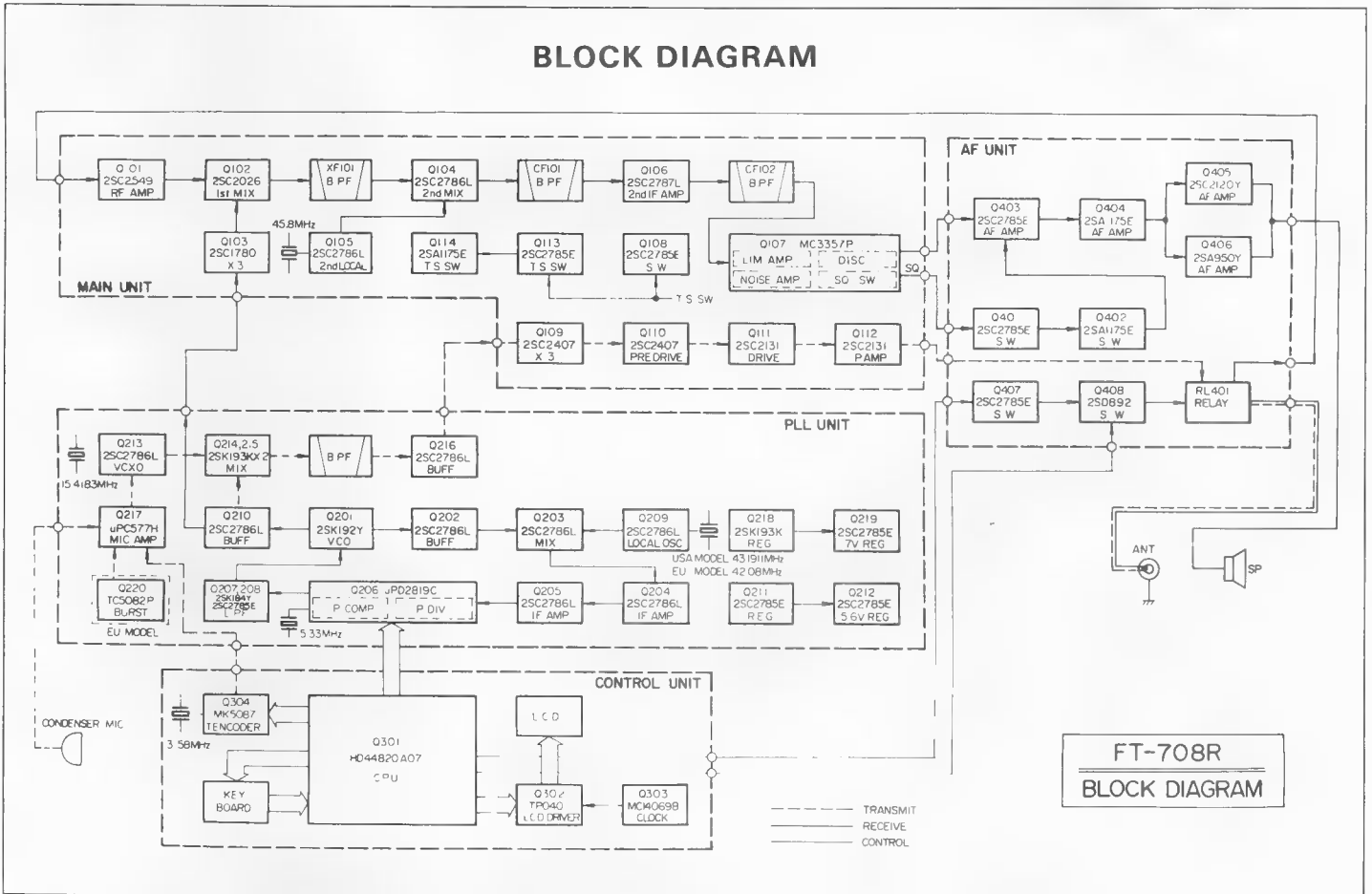
Overall impression of this unit is that it is well built, works well, and has a definite use now that 70 cm repeaters are getting to be numerous. It is worth looking at if you are in the market for a UHF handheld.

This test unit was kindly supplied by Dick Smith Electronics, to whom further enquiries should be directed.



Keyboard Panel.

## BLOCK DIAGRAM



### NEW ERGONOMIC KEYBOARD SAYS GOODBYE TO "QWERTY"

Complaints by telex operators at the Australian Post Office have led to a British-produced computer keyboard which completely changes this one part of the equipment based on a layout more than 100 years old.

The operators said that using the keyboards all day caused pains in the neck and shoulders, and the resulting investigation by Sydney experts has been used to design the PCD-Maltron ergonomic keyboard.

The keys are divided into two well separated groups, with each key at a different height to allow for the varying lengths of the fingers. This means that the hands can be held straight, instead of close together with the wrists turned outwards, the usual position which leads to tension, and so to pain.

And the inevitable QWERTY arrangement of the keys, inherited from the typewriter, has also been changed. This layout was designed to stop the most used letters jamming together, but as this cannot happen with computers, the letters have been set out so that the most used are all adjacent. The left "home row" now reads ANISF and the right DTHOR, with E, the most used letter in English, being pressed by the normally underworked left thumb.

Ninety percent of the 100 most used words in

English are on the home rows — with the addition of E — and the result, say the makers, is an increase in operating speed of between 20 and 40 percent.

The space between the two main sets of keys means that more use can be made of the thumbs. In addition to pressing the E key, the left thumb controls the "left" and "up" arrows, while the right governs the "right" and "down" movements and the return key, which normally has to be reached by stretching the little finger.

Operators are said to have no trouble adapting to the new keyboard, which can be attached to many computers. But for those who cannot learn where the letters are the QWERTY layout can be provided.

from Information Technology from Britain.

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