AN AR SPECIAL — REVIEW

KENWOOD TR7200G 2m Transceiver

Kenwood is the export name of equipment manufactured by the Trio Electronics Group of Tokyo, Japan. They are of course well established in the amateur communications field with several models of both HF and VHF gear available on the Australian market at the present time. The TR7200G is the first piece of two metre FM equipment marketed here, although their earlier TR7100 was sold in large quantities in both Japan and in the United States under the SBE label. The current 2 metre models are marketed in the USA under the Drake label.

Kenwood is handled in Australia by the Weston Electronics Company at North Rocks NSW. The unit used in our review was supplied to us by Ham Radio Suppliers of 323 Elizabeth Street, Melbourne. Details of price and delivery can be obtained from them or by reference to their advertisements in this magazine.

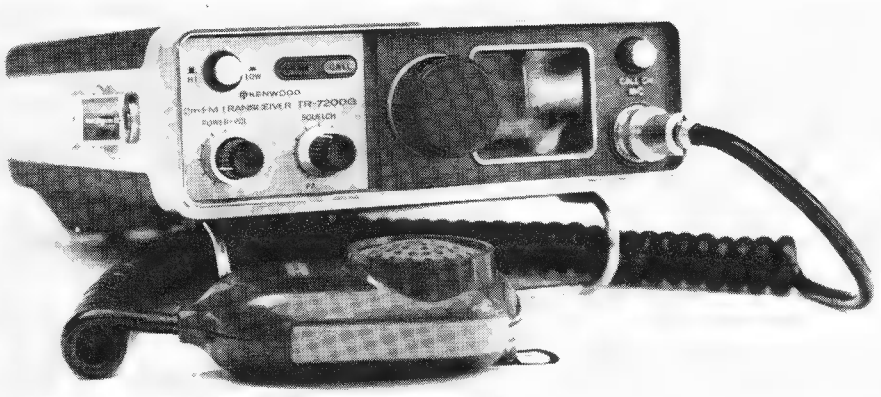
The TR7200G has much in common with other 2 metre FM rigs available at the moment, but as we will see, the Kenwood has many features that are both unique and interesting.

It is, of course, fully solid state and uses a total of 37 transistors, 2 FETs, 1 IC, and 24 diodes. Both dimensions and weight are slightly greater than other sets tested in the past, however it still rates as a very compact unit. It measures 180 mm wide x 60 mm high x 240 mm deep or in old terms 7-1/16" x 2-3/8" x 9-7/16". Weight is 2.5 kg which is approximately 5.5 lbs.

The appearance of the Kenwood is quite outstanding with the front panel finished in silver and light grey, with a satin chrome surround. Knobs are flat black and the cabinet is finished in a fine black crackle. The front panel is resplendent with a multitude of indicator lights which warn of any change from normal operation. Their functions will be later itemised.

As with all its contemporaries, the TR 7200G has provision for 22 channels plus an external VFO input. The optional external VFO is pictured in the advertisement brochure and is designated as VFO 30. Apart from this, no mention is made as to how it operates, nor have any apparently made their way to this country. The set is supplied with crystals for repeaters one and four. Crystals for other channels can be supplied on order from Ham Radio Suppliers, however, correspondence with Weston Electronics in Sydney indicates that they have only heard of repeater channels one to four and simplex channels 'A', 40 and 50. It would appear though that in the future they might investigate the possibility of importing additional channels.

The mobile mounting bracket has provision to take a small padlock to frustrate the efforts of any would-be thieves. The



transceiver slides in and out quite easily and can be adjusted to four different angles of tilt.

The Kenwood operates from a nominal 13.8 volts DC and is rated to deliver 10 watts output to a 50 ohm load in the high power position and 1 watt in low. Power selection is by a front panel push button with visual indication provided by a colour change in the illumination of the meter. The channel selector is clearly numbered 1 to 22 plus VFO. Position 1 can be selected by pressing the *"Call Ch."* button regardless of the actual channel selected. At the same time a small panel light indicates that the *"Call"* position has been selected.

Accessories supplied include a good quality dynamic push-to-talk microphone, mobile mounting bracket, DC power cable with in-line fuse, external speaker plug (3.5 mm), chrome stand leg for home station use and an assortment of nuts, bolts and washers for attaching the mobile mount.

TR 7200G CIRCUIT DESCRIPTION

Starting with the receiver, a normal double conversion system is used with 10.7 MHz and 455 kHz IF frequencies. The front end uses a 3SK41 in both the RF stage and first mixer. Ceramic filters are used at both IF frequencies with the 455 kHz filter having a bandpass of 20 kHz at the 6 dB points. The receiver is thus a little more tolerant with high deviation signals than are most of its competitors. All of the receiver stages with the exception of the audio end are supplied with 8.3 volts from a series regulator stage. Returning to the front end, the first conversion oscillator starts off with crystals in the 15 MHz region. These operate in a parallel resonant circuit with about 40 pF across each crystal. Perhaps due to this higher than normal capacity, receiver stability is excellent. Output from the last multiplier stage is monitored with a transistor driving a LED indicator. This is situated in the dial and meter escutcheon and gives an indication that the channel selected has a receive crystal installed. It would also of course fail to light in the unlikely event of a fault in the crystal or multiplier stages.

Transmitter circuitry commences at 12 MHz, again with about 40 pF across the crystals. The only IC in the TR7200G is used as the microphone amplifier and speech clipper stage. In a system similar to that used on the receiver, the output of the last transmitter doubler stage is monitored with a DC amplifier and transistor switch to operate the *"On Air"* light on the front panel. This will then only come on when the transmitter is actually delivering drive to the final stages. An elaborate protection system is provided for the final stage. This is actuated by a high SWR sensing circuit. The low power setting is variable over a wide range as it operates the same voltage regulating system used to provide the high SWR protection.

Another feature that appears to be quite unique to the Kenwood is a built-in public address system. A special socket on the rear of the set can be connected to an external speaker, then with the receiver squelch turned fully counter-clockwise, the microphone amplifier output is switched to the input of the receiver audio stage. At the same time the internal speaker of the Kenwood is disconnected. As well as the external PA speaker socket a normal receiver external speaker socket is situated on the back panel.

THE KENWOOD TR7200G ON THE AIR

The transceiver is mooth to operate. The channel selector knob is relatively large and rotates with a satisfying clunk. When the rig is turned on with the push-on, push-off volume control, the channel selector and meter are illuminated and providing a receive channel is selected, the red LED indicator will also come on. The escutcheon is covered with a darkly tinted glass so that it is difficult to see which

channel is selected when the set is off. When in the high power position, the meter illumination is white, in low it turns green. With the green call channel light and the orange on air light the Kenwood can be a very colourful sight. Receive audio quality at first appeared to lack low frequency response; however, after use in high noise situations, this turned out to be a decided advantage. When first put on-air, reports indicated considerable roughness.

Investigation revealed that the microphone gain control was full on. Reducing this to the half way point cleaned up the audio.

Squelch control operation was smooth and progressive. However, when set close to the mute point, it was noticed that when external electrical noise such as from other cars at the traffic lights, the mute would open. This proved to be the only annoying feature of the set. I have checked with other TR7200G owners who report the same problem.

THE TR7200G ON TEST

Our usual series of tests were carried out.

Transmitter power output was checked with 13.8 volts applied. A Hewlett Packard 432A thermo-coupled power meter was used. On high power 12 watts exactly was delivered and on low power 1 watt. Current drain was 2.9 amps and 1.35 amps respectively. Current drain on receive rather depended on how many of the various indicator lights were on. We recorded the following; Muted: 375ma. Muted low power selected: 500ma. Muted, low power and call channel: 550ma. Receive with normal volume 450ma, and with full volume 600ma. Transmitter deviation was set at 10 kHz. Figures obtained on receive sensitivity were excellent. The mute opened at .1uV

Quieting at	.5 uV	—27 dB
	1 uV	—33 dB
Signal to Noise Ratio	.5 uV	—33 dB
	1 uV	—40 dB

The meter readings on receive were calibrated against the signal generator.

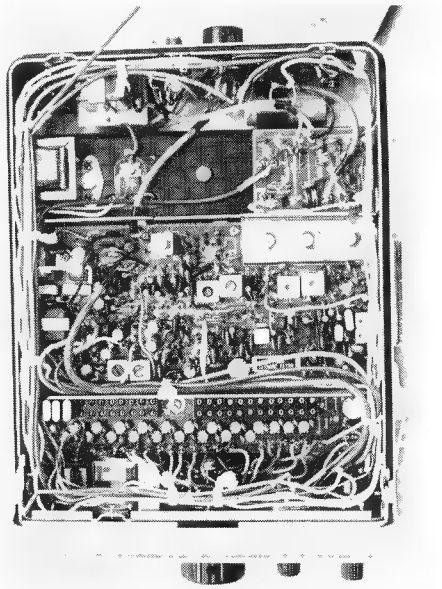
Meter	Input
2	.5 uV
3	1 uV
5	1.6 uV
7	2.0 uV
8	2.5 uV
9	3.1 uV
10	5.0 uV

Receiver audio output was measured on steady tone and at the onset of audible distortion was 1.5 watts. This meets the specification. A Marconi signal generator was used in the above tests. No further comment is needed as these figures are the best obtained in this series of reviews.

INSTRUCTION BOOK

The book is well written in so far as operation of the set is concerned. From a service point of view it leaves a lot to be desired. Only a circuit diagram is included. There are no printed board layouts or alignment instructions.

In regard to service, Weston Electronics advise that "Our Company is able to provide full service support and the supply of spare parts to our authorised dealers".



CONCLUSION

An excellent performer in all respects except the mute sensitivity to external noise. Crystal availability could be a problem but Ham Radio Suppliers can obtain crystals at around two weeks delivery for $10 per set. ■