



# Equipment Review

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## KENPRO KT-220E TWO-METRE HAND-HELD TRANSCEIVER

The side panel has the PTT bar, a button to actuate the S-meter/LCD display illumination, a slide switch to lock the frequency control panel and a battery release button.

Frequency coverage is from 144 to 148 MHz in 5 kHz steps with an overlap at each end of the band. There are 10 memories which can be programmed with the required offset. Four scan modes are available, the first stops on a signal as determined by the centre zero detector, and then holds for 15 seconds before resuming scan.

The second mode stops on the first signal found and stays on that frequency. The third, like the first, stops but does not resume the scan until the transmission stops and the fourth is the memory scan which can be programmed to skip any of the selected memories not required at that time. A manual scan is also available with up/down buttons.

With the standard battery, power output is rated at 3.5 watts on high power selected, 0.5 watts on low power. Output can be increased to five watts using an external 13.2 volt supply which, as mentioned earlier, can be easily plugged into the top panel connector.

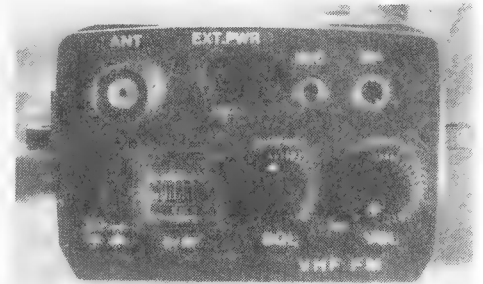
The KT-220E is supplied with a flexible stubby antenna, a belt clip, a wall plug-type battery charger, a selection of connector plugs, an ear-phone and instruction book.

### ON THE AIR

As with any key-board controlled transceiver, the operation of the KT-220E takes a bit of practice. Most of the buttons have double functions with the secondary function becoming available through the 'A' or function button. In the manual mode, most required frequencies can be selected by entering one or two figures and then pressing the set button. For example, enter 65, press set and you are on 146.500 MHz. You can, of course, enter the frequency by dialing in each number in turn if you have plenty of time.

With the frequency and offset selected, it's just a matter of pressing the function 'A' button, the memory button 'D' and required memory channel number, eg '9' and there you are. Be prepared to sit down for an hour or two to sort it all out. The instruction book is reasonably well written in this respect.

Received audio quality from the in-built speaker is good with a crisp sound, but like most hand-



Top View of the KT-220E.

helds is somewhat down in power output. With a good quality external speaker connected, both the quality and output level were good.

Transmit audio was reported as very clean and clear quality. Kenpro do offer an external speaker microphone as an option, but this was not available to test, however, again coincidentally, the Icom HM9 speaker/microphone worked very well with the Kenpro. I often get the impression that most Japanese manufacturers buy in many of their components from the same source. In other words, I do not think that Icom, Yaesu and Kenpro make their own brand of microphones. Stick a label on it and it turns into whatever brand is wanted.

A light is provided to illuminate the S-meter and LCD display. It works quite well for the meter but is useless for the display, just where it is needed most.

The keyboard buttons have a soft rubbery feel. I noted that at times one of them had a tendency to stick in and while this did not seem to effect operation, it might be interesting to see if this becomes a problem in the future. Also, the buttons are rather small. I found that they were better operated with the finger nail rather than the finger.

### UNDER TEST

Perhaps one of the more important tests with a battery powered hand-held transceiver is the current drain. I carried out two series of tests to check this, one with the normal 9.6 volt battery connected and the second using 13.8 volts from an external power supply. The results with the resultant RF power output were as follows:

9.6 volts power output	(high) 3.5 watts 600 mA.
	(low) 0.5 watts 350 mA.
13.8 volts power output	(high) 5.0 watts 800 mA.
	(low) 0.5 watts 360 mA.

The power output figures are right on specifications. The current drain is fairly high for the 250 mAh battery so you would need to keep overs fairly short. With 13.8 volts connected, a full five watts output is available, well within the ratings of a simple one amp power supply.

I next measured the battery drain on receive. With the receiver squelched and no audio output, the drain was 75 mA. At full audio output with no audible distortion, it was 180 mA. Again, it is a case of keep the volume as low as possible for extended battery life.

Power output and audio distortion was next checked. Feeding an eight ohm terminating audio watt meter, and a noise and distortion meter, the following results were noted. There was 10 percent distortion at 375 mW, 30 percent distortion at 450 mW.

This indicates that the total audio output is rather limited. At low volume, it sounds fine but if used in an average car at 80 to 90 km/h you might find it rather lacking. However, as mentioned



The two-metre FM hand-held transceiver must be a popular market. Here is yet another one to compliment the several already available through local outlets. Kenpro products have been available on the local scene for many years and they are well-known for antenna rotators and ancillary amateur equipment. I am not sure if Kenpro are related to the original Ken Company who produced the first two-metre hand-held, sold in this country many years ago, the famous KP-202.

The subject of this review, the KT-220E, is marketed in the USA under the Santec brand and is known as the ST-20T.

Well, let us look at the KT-220 in detail to see what it has to offer. It is a handy size, being just a little longer than the well-known Icom IC-2. The width and depth are about the same. The actual measurements are 18 x 4.5 x 6.5 cm (HDW). The weight is 550 grams compared with 525 grams for the IC-2.

It is interesting to note that the battery pack of the Kenpro is inter-changeable with the Icom, although the standard battery supplied with the KT-220E is a 9.6 volt unit as against the smaller 8.4 volt IC-2 power pack.

The Kenpro has all the features of the opposition plus a few more. Frequency selection is via a 16 button key-pad. A LCD readout displays transmit and receive frequency, memory or non-memory operation, scan stop mode, repeater offset and a clock. The top control panel has audio volume/power on/off, squelch, external microphone speaker outlet, high/low power selector, external 13.2 volt power input socket and the indispensable adjunct for the enthusiastic two-metre operator, an S-meter.



Keypad.

earlier, an external speaker can make a big difference.

Receiver sensitivity was checked. At .25 uV the SINAD was 12 dB and at .1 uV it measured 6 dB. The .25 uV figure is right on specifications. The S-meter is naturally rather small. It is calibrated with nine divisions presumably for nine S-points and labelled 1, 3, 5, 7 and 10, which I guess means S9 + 10 dB. Whatever, the following results were noted.

S1	S3	S5	S7	S8	S9
.5uV	.7uV	8uV	10uV	40uV	Not reached

The meter would not go beyond S8, regardless of the signal input. However, it is better than nothing.

On transmit, the meter becomes a volt meter. At the junction of the red and green section on the scale, it is exactly 9.6 volts with 13.8 volts indicated at the start of the red 10 on the S-meter scale. The receiver front end performance appeared to be quite good for a hand-held. While receiving a weak signal of around .5 uV, I injected a strong signal 50 kHz away. It required an input of 10 mV to degrade the signal-to-noise ratio by 2 dB on the wanted signal.

All in all, these figures are very reasonable for a two-metre hand-held transceiver. The only point of criticism is the low receive audio output, but even that is not too bad.

### INSTRUCTION BOOK

The book runs to 26 pages. It is well written and contains a lot of useful information. The circuit diagram is spread over four pages while printed

circuit layouts cover another four. A page of trouble shooting hints mainly cover operating problems.

The actual operating instructions are good. Flow charts show how the various functions are programmed.

Thanks to Emtronics of Sydney and Melbourne for the loan of the review transceiver. Further inquiries should be directed to them or refer to their current advertisement in *Amateur Radio* magazine.

### EVALUATION AND ON-AIR TEST AT A GLANCE

#### APPEARANCE

- Packaging \*\*\* Strong carton with foam inserts.
- Size \*\*\* Not the smallest full featured HT, but very good.
- Weight \*\*\* Again not the lightest, but very good.
- External Finish \*\*\* Very clean and presentable finish.
- Construction Quality \*\*\* Good internal wiring and construction.

#### PANEL CONTROLS

- Location of Controls \*\*\* Key-pad and top panel controls well located.
- Size of Knobs \*\* For a hand-held, quite large. Keyboard buttons rather small.

#### Status Indicators

- \*\*\* All built into the LCD readout. Transmit, receive, offset, memory, scan, battery alarm.

#### S-METER AND DISPLAY ILLUMINATION

- \* S-meter clearly lit but very little gets to LCD display.

#### RECEIVER OPERATION

- Memories \*\*\* Ten memories with repeater offset included.
- S-Meter \*\* Better than nothing. (See test section).
- Sensitivity \*\*\* As good as most other hand-helds.
- Signal Handling \*\*\* Better than most hand-held transceivers.
- Internal Speaker \*\* Clear distinct quality but output limited.

#### TRANSMIT OPERATION

- Power Output \*\*\* Very good output for most applications.
- Battery Drain \*\* Keep your overs short.
- Audio Quality \*\*\* Crisp clean audio.
- Metering \*\* Indicates battery voltage only. No output indication.

#### MANUAL

- Owners Hand Book \*\* Clear adequate instructions. Circuit and board layouts.

#### OVERALL RATING

- \*\*\* If you need a hand-held, this one is worth looking at.
- Rating Code: \* Poor; \*\* Satisfactory; \*\*\* Very Good; \*\*\*\* Excellent.

# MORSE CODE TONE CONVERTER

P J Grigg VK3APG  
Lot 441 Glenburn Street, Newcomb, Vic. 3219

This device varies the tone of Morse code from tape or record to suit ones own individual taste.

Also when the play-back speed is varied, the tone remains the same.

A key facility has been included for sending practice Morse.

Rb is selected with no signal input so that Q1 Vc is about 90 mV. This allows for a wide range of input signal level to be handled.

Connect the input of this device to the speaker output of a tape recorder or record player whose volume-control can be set at any point above the threshold of operation.

The unit was constructed on *Vero-board* and placed in a small wooden box with a sloping metal front panel.

