

Equipment Review

The TEN-TEC Scout 555 HF Transceiver

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TEN-TEC I hear you say, who are they? Well, a few words about the Company before I tell you all about the Scout. First off, this will be the second TEN-TEC HF transceiver that I have reviewed in *Amateur Radio*. The first was the Omni C way back in August 1981.

TEN-TEC have produced a steady stream of equipment since then but, until recently, they have not had representation in Australia. Daycom (Stewart Electronics) now import TEN-TEC and will provide a full back-up service. Over the years, TEN-TEC are perhaps best known for their low power (QRP) equipment with such rigs as the Argonaut 509 and 515. These are highly prized by their owners and when the odd one appears on the second hand market, it is always snapped up very quickly.

As you might gather, TEN-TEC equipment is different from the usual run of Japanese-made gear. TEN-TEC is the only remaining American manufacturer of a full line of HF transceivers.

So what is the Scout 555? Basically, it's a simplified HF SSB and CW transceiver. I often hear amateurs complaining about the complexity of modern equipment. "Who wants all of those bells and whistles?" they say. "Can't we get back to a straightforward, no-frills transceiver?"

Well, here you are. Maybe we could even call this a 1994 version of the famous FT-7. So, if you want 200 memories with telephone numbers included, then the Scout 555 is not for you. But if your needs are for simple operation, excellent performance and very compact size, then read on. You won't be disappointed.

Scout 555 Features and Facilities

The two most important features of the Scout are the compact size and the unique band changing system. On the first score, the Scout measures 6.4 cm high, 18.4 cm wide and 24.8 cm deep. As a comparison, this is just a whisker larger than the

Kenwood TS50S. The weight of the Scout is 2.4 kg which is 0.5 kg less than the TS50S. The band changing system is new and different (unless you can remember the HRO and AR-7 receivers).

There is a plug in box for each band, 160 to 10 metres, including all the WARC bands. This includes the appropriate heterodyne crystal oscillator and a band pass filter for the transmitter output and receiver input. The basic price of the Scout, which is \$1199, includes one box of your choice. Boxes for other bands are available as options at \$62 each.

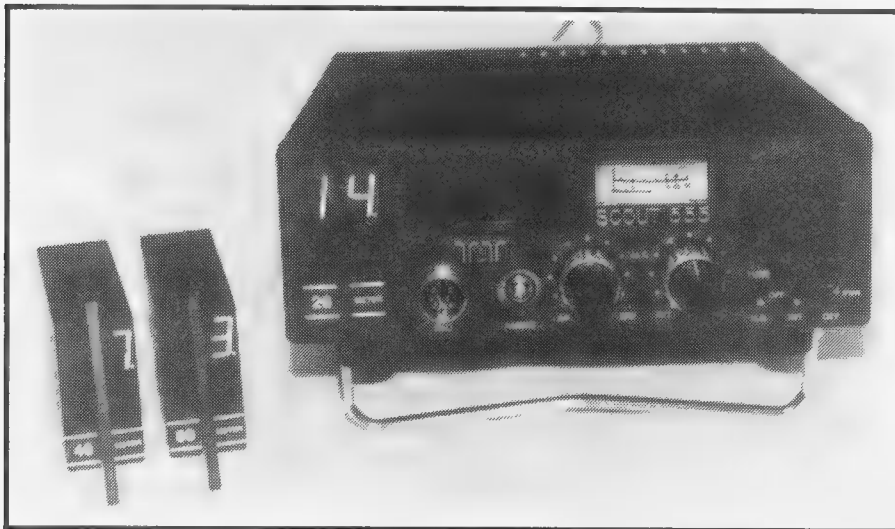
The basic Scout includes a number of very nice features that could well be options on your typical Japanese transceiver and some that are quite unique to TEN-TEC.

Included amongst these is a special variable band-width IF filter with front panel control. This is continuously variable from 500 Hz to 2.5 kHz. Called the "Jones" filter, it is covered by patents held by TEN-TEC. As we shall see, it works very well.

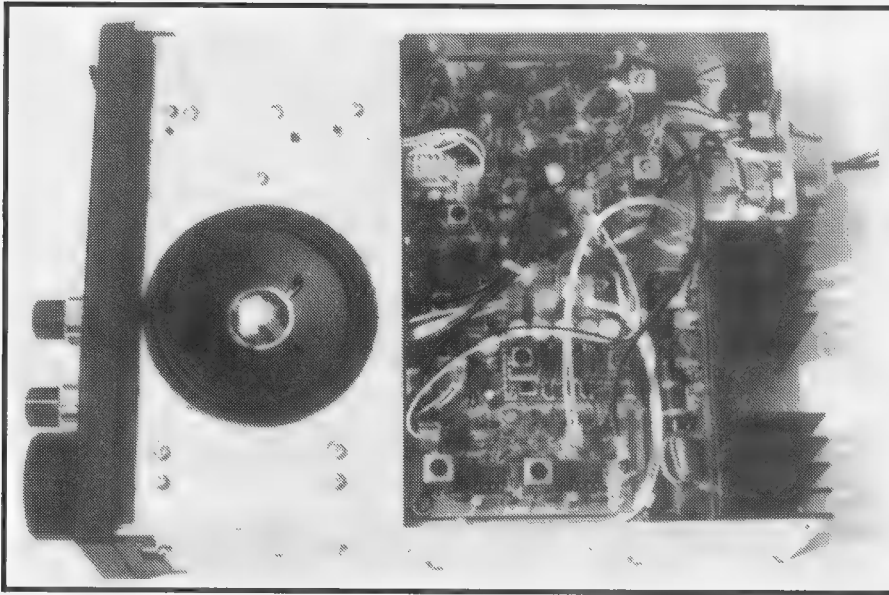
Also included in the Scout is an iambic keyer with an adjustable speed range of 5 to 50 words per minute. Transmitter power output is 50 watts both CW and PEP on SSB which TEN-TEC claim is an excellent compromise between power consumption and relative signal strength. It also means that the transmitter does not require a cooling fan.

Frequency readout is via a four digit LED display with the MHz figure printed onto the front of the plug-in module. The digits are about 1.5 cm high. Controls are very simple and straight forward. From left to right, we have a four pin microphone connector which is wired to the TEN-TEC standard system which is, in turn, different from all other manufacturers. By the way, a microphone is not supplied with the Scout but is offered as an option.

The "audio" jack next in line is a 6.5 mm stereo connector. It provides a multi purpose audio output for headphones, external speaker or even a connection to a tape recorder. Later I will describe how it works. The first concentric control is for receive audio level and the IF band-width control described earlier. Between the



The TEN-TEC Scout 555 with the 80 and 40 metre band boxes.



Top view of the Scout with the cover removed.

two rotary controls is a small LED to indicate ALC action. The second concentric control is for transmit microphone level and RIT. There are three small toggle switches in line under the tuning control and these are for, in turn, noise blanker, tune, and power.

In the tune mode a 15 watt carrier is transmitted for antenna tune, etc. The noise blanker "on" works so long as the optional noise blanker module has been purchased and installed. The second switch also has two functions. Firstly it switches the RIT on, with its second function being to switch in the speed selection function for the built-in keyer. The actual speed selection is carried out with the key itself.

The last switch is the power on/off. The meter is well illuminated and carries scales for "S" meter, power output and SWR. The selection between power and SWR is via another toggle switch on the rear panel. The tuning control at the right is about 3.5 cm in diameter and, as TEN-TEC point out in the manual, it requires a slight effort to rotate as it drives a variable inductor in the VFO unit.

The rear panel carries connectors for DC power input, an SO239 for antenna connection, two 3.5 mm jacks for key connection, one for a paddle to couple to the built-in electronic keyer, the other of an independent key or keyer. A

concentric DC output connector provides 13.8 volts at a maximum current drain of 2 amps and, to complete the rear panel, there is a ground terminal with a good, solid wing nut to hold it down.

A 7.5 cm speaker is mounted under the top cover and two preset controls are accessible through holes in the bottom of the cabinet. They allow adjustment of sidetone volume and RF power output. Maximum output can be reduced from the 50 watt level down to about five watts. There is no external switching for a linear amplifier, however the manual

describes how this can be enabled if needed.

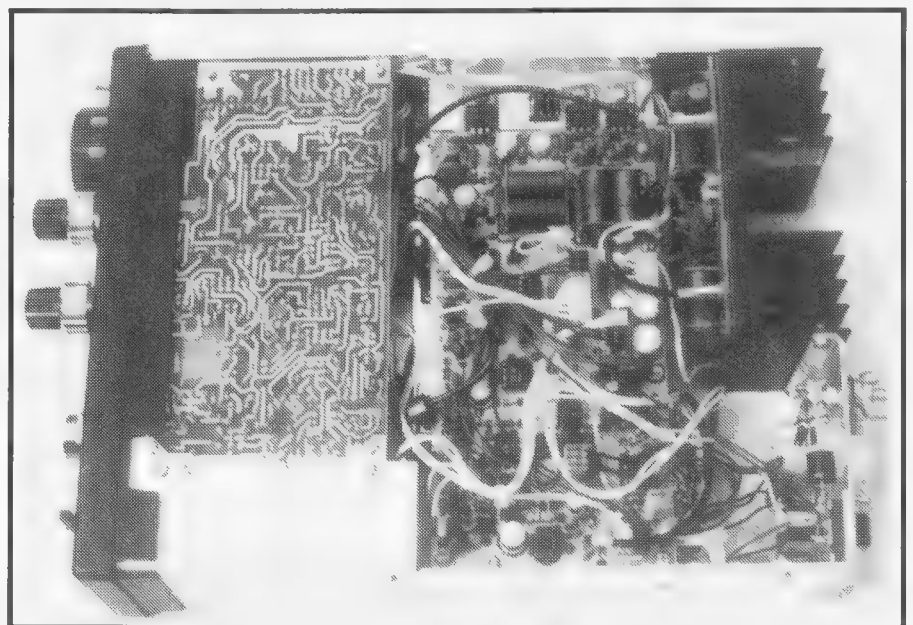
An interesting note in the handbook states "the power output of 50 watts drive is marginal for most linear amplifiers on the market". With a typical American linear you would only get eight or nine hundred watts output. Clearly not worth while!

The Scout 555 on the Air

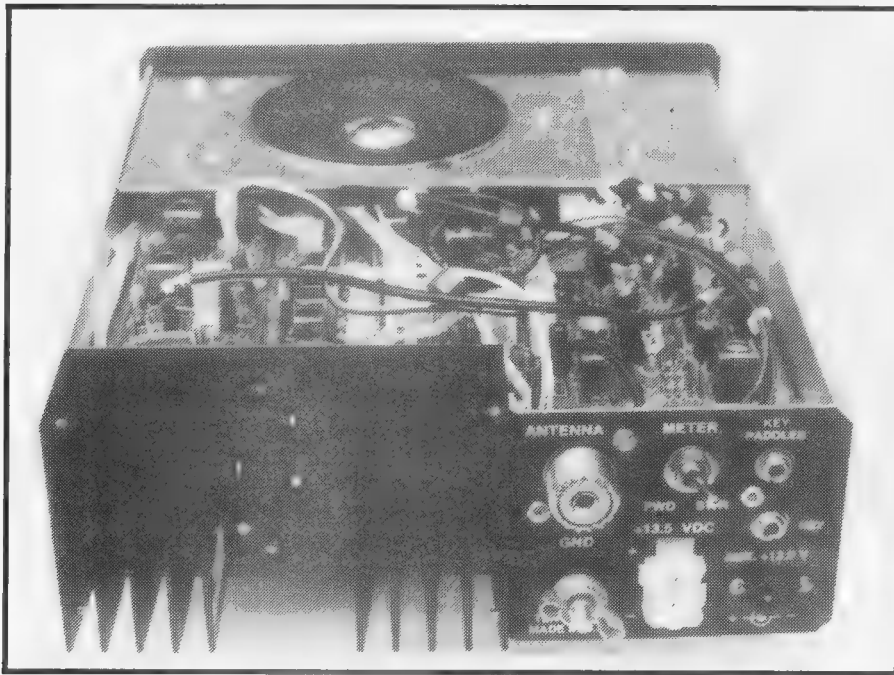
The first thing needed to put the Scout on the air is a microphone. In due course Daycom will have matching TEN-TEC microphones available but these were not available at the time of the review. I wired up a spare Shure 401 hand microphone to suit. I figured that the American Scout might prefer a genuine American microphone.

Next thing needed is a suitable power supply and something with 10 amps output is suitable. It appears that TEN-TEC do not produce a matching AC power unit. Getting the Scout on the air is very simple. Connect a suitable microphone, antenna and power supply and away you go. But the first thing to try is the receiver.

The operator's manual warns that the tuning control is stiff and indeed it is. It's definitely a thumb and forefinger job. The other problem is that some of the other controls are very close and get in the way. I found that I kept knocking the RIT control



Bottom view of the Scout with the cover removed.



Rear view of the Scout with the cover off.

(often unnoticed). Pity the RIT knob doesn't have a detent. The display is large and clear and the green LEDs look great. However, when you take the Scout outside, even in subdued light, the display disappears. This is a typical result with LEDs. Why not an LCD display?

In spite of all of this, the receiver sounds very good. There is enough sensitivity to make it sound really lively and the variable selectivity gives excellent QRM rejection. There is no sideband selection on the Scout. The conversion setup gives you lower sideband on low frequency bands and upper sideband on the higher frequencies.

While tuning around, I happened to have my two metre handheld operating listening to a vacant simplex channel. Every so often I heard strange signals emanating from the hand held. It turned out that the Scout was the culprit. The signal sounded like the old Woodpecker. It was worst with the 14 MHz box installed and with the Scout tuned to 14.175 the interfering signal appeared on 147 MHz. As the Scout was tuned up or down, the interference moved up and down the two metre band. Strange!

The optional noise blanker was most effective on ignition noise. I believe it would be essential for mobile operation. Its use appeared to

have no effect on the receiver performance. There was no noticeable cross modulation even on 80 metres at night with lots of strong signals about.

Now a few words about the front panel "audio" jack. It gets you straight into the receiver audio output at four ohms impedance. Plug your stereo headphones straight in and hear the output in both ears. Great, except you might find the level too high. Most transceivers have an attenuator in their headphone output. Plug in a single circuit plug half way and you will get output with the internal speaker still operating. Handy to connect to a tape recorder. I think I would prefer a 3.5 mm external speaker jack on the rear panel and a normal headphone socket on the front, but TEN-TEC's idea does have merit.

Transmit is easy. You either talk into the microphone or press the key. There is no switch to select either mode. The Scout knows which one you want. Very neat. In the CW mode, flip the middle switch under the tuning control to "speed". The figure 25 will appear on the digital display. This is the default speed of the built-in keyer. Change the speed by holding either the dot paddle or the dash paddle. There is no back up for this so when you switch off, and then back on, you will need to go through

the process again.

On CW, the Scout operates full break-in only. Sidetone is fixed at 750 Hz and the level is adjustable through a hole in the bottom of the cabinet. It is not adjustable with the normal receiver audio gain control.

For SSB operation, push the PTT and bring up the Mic gain until the small green LED marked "ALC" flashes on peaks. Quality reports using the Shure microphone were quite satisfactory. There is no speech processor, but the transmitted audio had plenty of punch.

I am concerned about the durability of the plastic levers on the front of the band boxes. They actually lever the boxes out of the Scout by pulling at the bottom. I didn't manage to break one so my fears might be unfounded. I hope so.

Finally, the Scout does have a very nice bail to lift the front of the rig up to present an excellent view of the front panel.

Scout on Test

Our usual series of tests started with the transmitter. Three band modules were supplied with the review transceiver. They were for 3.5, 7 and 14 MHz. Power output on the three bands was essentially the same at 50 watts. This was both for CW and PEP on SSB. The current drain with no output, SSB mode, was 1.5 amps. With full output of 50 watts it was 9.4 amps and in the "tune" position with 15 watts output it was 6 amps.

TEN-TEC do not specify transmitter intermodulation distortion, but we carried out our usual tests and came up with a figure of -25 dB compared to full 50 watts SSB output.

Receiver Tests

The "S" meter calibration was checked first. The meter is calibrated at S1, 3, 5, 7, 9 and half way between 9 and the end of scale is "+". There are no dB calibrations above S9. I recorded the following results. There is no preamp switching or attenuator on the Scout so there is only one way to go.

S1	3	5	7	9	+
0.7 μ V	1.4 μ V	2.0 μ V	4.0 μ V	30 μ V	2000 μ V

The specification states that S9 is calibrated at 50 μ V.

The difference between 30 μ V and 50 μ V at S9 is actually less than the

width of the pointer on the meter and a slight amount of parallax error in reading the meter could result in an even greater change. These figures were taken at 14.2 MHz. Measurements at 7 and 3.5 MHz were within a dB or so of the above figures.

Receiver sensitivity was checked at 14.2 MHz. It was $0.35 \mu\text{V}$ for 10 dB SINAD which exactly meets the specified figure.

Receiver audio output was measured into a four ohm load. The specified 1 watt with 2% distortion was met exactly, but with a maximum output of 2.7 watts and 2 watts at 10% distortion.

A signal of $17 \mu\text{V}$ was needed to produce maximum audio output.

The AGC action was very good for SSB with a decay time from S9 of about three seconds. There is no switchable time constant, so the same three seconds is there for CW also. This could be a bit on the slow side for quick break-in operation.

Audio output versus signal input, taking $1 \mu\text{V}$ as 0 dB: was $3 \mu\text{V} +7\text{dB}$, $10 \mu\text{V} +9\text{dB}$ and $30 \mu\text{V} +13 \text{dB}$. From there up there was a 1 dB increase in audio up to $3000 \mu\text{V}$. This is a fair result. Receiver band-width was measured at maximum and minimum setting of the band-width control.

300 Hz	600 Hz	1.0 kHz	1.5 kHz	2.0 kHz	2.5 kHz	2.9 kHz
Maximum B/W						
-6dB	0 dB	0 dB	-1 dB	-2 dB	-3dB	-6 dB
Minimum B/W						
-6 dB	0 dB	-6 dB	-20 dB			

The tuning rate of the Scout varied somewhat from one end of the band to the other. At the low frequency end it was about 20 kHz per tuning knob revolution. At the 300 kHz point it was 18 kHz, at the 400 kHz point 14 kHz and at the 500 kHz point 6 kHz per knob revolution. The RIT offset was about +/- 1.6 kHz. The main tuning readout shifted to indicate this.

Receiver current drain was measured at 450 mA with no audio output and peaking at 800 mA with maximum audio output. It was noted that the transmitter power output as indicated on the Scout's meter was spot on. The meter also indicates full PEP output.

However, I could not make much sense of the SWR readings. There are two calibration points above the 1:1.1 or zero meter position. The



Ron's hand holding the Scout 20 metre band box shows the small size of the unit.

handbook states the first indicates a 2:1 SWR and anything further up scale indicates an SWR greater than this. In most cases the 1:1 point coincided with my standard meter but the 2:1 point on the Scout meter was often a higher or lower reading than my normal meter. I guess the main thing is that the 1:1 point is right and it appeared to be so.

The instruction manual states that users might experience some trouble from images and IF breakthrough. These problems appear on certain bands under certain conditions. It seems there could be a problem on 18 MHz from broadcast stations on the 16 metre band getting through the receiver front end filtering. I did not have an 18 MHz box with our review Scout so could not check this. Another potential problem mentioned in the manual is the possibility of images from the 31 metre broadcast band (9.6 to 10 MHz) getting into the 14 MHz band. During our tests no sign of this was noted.

Frequency stability was checked and found to be very good. TEN-TEC use a microprocessor to look after several transceiver functions. One of these is to correct the VFO frequency when any drift occurs. This quite ingenious system holds the frequency to within about +/- 20 Hz. When a correction is taking place, an LED dot is illuminated to the right of the last

digit of the frequency readout. There is, however, no VFO correction when CW operation with the internal keyer is taking place as the micro-processor is then looking after the keyer and not the VFO. But, during normal short transmissions, drift should be minimal.

Scout 555 Operators Manual

Ah, I wish they were all like this one. The Scout manual is actually an instruction and workshop book combined into one volume. It's divided into three sections, installation, operation, and circuit descriptions and illustrations. The quality of the illustrations is poor and there is no illustration of the rear panel included. Even with a few faults, I award it 9½ out of 10. Japanese manufacturers please take note.

Scout 555 Conclusions

I guess the first question to ask is whether the Scout is good value for money. The answer to this is yes and no.

Let's take the "yes" answer first. At the basic price of \$1199 for one band operation it is excellent value. Add a couple of extra bands and it's still good value, but add all band options and I would have to say maybe not. The above estimates take into account that you have a suitable microphone to connect up and that you do include the optional noise blanker in your budget. I find it strange that TEN-TEC make this an option at all. Anyhow this would take the price up to close to \$1400.

There are also a couple of things that TEN-TEC need to look at when they update the Scout. The most important of these is to substitute an LCD for the LED display. I cannot see that this would add much, if anything, to the price but it would improve the versatility of the rig out of sight. Other minor changes, such as improved tuning action, should also be considered. Last, but by no means least, a detent should be added to the RIT control.

I must say that I have enjoyed using the Scout over the last three weeks. My thanks to the gang at Daycom for the loan of the Scout 555. **ar**