

Sherwood Engineering HF Test Results

Model	Ten-Tec Eagle	Serial # 3051271120	Test Date: 10/25/2010
IF BW 6000 –6 / -60, kHz			Ultimate dB
IF BW 2400 –6 / -60, kHz	2320 / 2950		Ultimate 90 dB
IF BW 1800 –6 / -60, kHz			Ultimate dB
IF BW 500 –6 / -60, Hz	430 / 990		Ultimate 92 dB
Front End Selectivity (A – F)			?
First IF Rejection @ 9.0015 MHz IF			70 dB
DR3 measured on the low side and high side for reference. Publish lowest value only.			
Dynamic Range 100 kHz			dB IP3 dBm
Dynamic Range 20 kHz 95 low, 93 high			dB IP3 +16 dBm
Dynamic Range 5 kHz			dB IP3 dBm
Dynamic Range 2 kHz 90 dB noise limited			dB IP3 dBm
Dynamic Range 1 kHz			dB IP3 dBm
DR3 using 3 Hz method 2 kHz 95 L, 93 H			dB IP3 +16 dBm
Blocking above noise floor at 100 kHz, AGC On, 1 uV, 500 Hz BW			129 dB
Blocking above noise floor at 100 kHz, AGC On, 1 uV, 3 Hz BW			135 dB
Blocking above noise floor at 20 kHz , AGC On, 1 uV, 3 Hz BW			128 dB
Blocking above noise floor at 2 kHz, AGC On, 1 uV, 3 Hz BW			116 dB
Note: With 500 Hz filter, noise went up 1 dB			
Note: With 3 Hz spectrum analyzer, signal went down 1 dB			
Phase noise at 2.5 kHz -118 dBc			
Phase noise at 5 kHz -124 dBc			
Phase noise at 10 kHz -131 dBc			
Phase noise at 20 kHz -138 dBc			
Phase noise at 40 kHz -142 dBc			
Phase noise at 80 kHz -144 dBc			
Phase noise at 100 kHz -144 dBc			
Phase noise at 200 kHz -144 dBc			
Phase noise at 400 kHz -144 dBc			
Noise floor, SSB bandwidth 14 MHz, Preamp Off			-119 dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On			-126 dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 2 On			dBm
Sensitivity (10 dB S+N/N) at 14 MHz, Preamp Off			0.7 uV
Sensitivity (10 dB S+N/N) at 14 MHz, Preamp 1 On			0.3 uV
Sensitivity at 14 MHz, Preamp 2 On			uV

Noise floor, 500 Hz, 14.2 MHz, Preamp Off	-124	dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp On	-132	dBm
Noise floor, 300 Hz, 14.2 MHz, Preamp Off	-124	dBm
Noise floor, 300 Hz, 14.2 MHz, Preamp On	-134	dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp Off	-122	dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 1 On	-130	dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 2 On		dBm
Noise floor, SSB, 50.125 MHz, Preamp Off	-117	dBm
Noise floor, SSB, 50.125 MHz, Preamp On	-123	dBm
Signal for S9, Att ON / Preamp Off / On	50 / 50 / 50	uV
Preamp(s), dB gain,	12	dB
S meter has a strange delay or hysteresis		
AGC threshold at 3 dB audio drop, Att On	7.5	uV
AGC threshold at 3 dB audio drop, Preamp Off	2.5	uV
AGC threshold at 3 dB audio drop, Preamp On	0.57	uV
Note: Reference level for AGC threshold -33 dBm		

Rise time 3.25 msec
Fall time 3.4 msec
Overshoot 2%

Comments:

I used it on SSB, driving an Alpha 89, to get some feel for it before I ran it through the lab. Some of the decisions on ergonomics seem a little puzzling to me. Later I ran one third of a 160 meter CW contest with the Eagle, and it performed quite well. The main issue with the Eagle is it has few features, compared to the more expensive Ten-Tec rigs, or similarly priced competitive rigs. For instance, no RX antenna input, and no second transmit antenna connector.

The audio is clean on SSB, unlike the K3, so I am pleased with that.

Many of the buttons on the right side have four letters, Lock, Atten, Fast & Tune. Why is Band abbreviated BAN and Mode abbreviated MOD? Why not BAND and MODE?

I use an external Icom speaker (SP-20) for all my radios. When sitting in front of the rig I barely crack open the volume control maybe 5 degrees for a comfortable listening level. This makes it touchy to adjust. If I am walking around the room and need it louder, then I can turn it through about 180 degrees for a modest increase. Finally it gets real aggressive the last 10 or 20 degrees of rotation as to loudness. It is not close to a normal audio taper, but seems more like a linear taper except the last 20 degrees.

The power output pot has to be turned a full 3 X 360 degrees to go from 5 to 100 watts. Nice vernier, but really kind of over-kill. Reminds me of the original audio volume control of the RX-350 where I had to turn it about 10 turns to go from zero volume to max volume. That was later changed.

Annunciator settings that display on the LCD don't stay there, for no obvious reason. I set the speech processing to 3, but once I set it the value goes away, even though there is nothing taking up that space on the LCD. Why doesn't that setting stay visible?

The function key stays on (blinking) until one turns it off. It might be better if it canceled itself after some predetermined time.

Like the Omni-VII, the preamp / attenuator button seems backwards. Since all the T-T radios have great dynamic range, the need for the attenuator is very modest. Thus I would rather the button for the preamp, likely only needed on 15 meters and above, was the primary and not needing the FNC button.

Similar feelings on Lock / AGC. Having to use FNC for Power and RIT is also inconvenient, though reversing those buttons is impractical. Maybe the radio needs more buttons.

The Multi knob on this unit is extremely stiff and hard to turn.

I would reverse the BW and the PBT knobs, but that is likely hard to tell which most people would prefer.

The dead band in the PBT (described in the manual) seem excessive. Then once it gets out of the dead band, it is really touchy. To get the band noise pitch where I want it, I really have to set it within a couple degrees.

I was going back and forth one Sunday evening on 40 meters between the IC-781 and the Eagle. If the timber of the audio was set to be the same with the PBT, the band noise seemed higher pitched on the Eagle. Also the QRN was more raspy sounding on the Eagle than the Icom. This was only a problem with the weaker stations in my schedule, which included K8DEL near Cincinnati, W6XX near San Francisco, W0ALC near Grand Junction, CO, and KL7QOW/7 in Medford, OR. I don't have a complete handle on the QRN issue yet. W0ALC was weak since the path is under 200 miles, too short for 40 meters at that time of night. It seemed that the QRN was much more obvious and broad-band sounding on the Eagle. This will require more observation.

The Yahoo reflector has been complaining about relay keying noise on CW. I didn't even notice any relay noise on PTT SSB. My Alpha is PIN diode switched, so it makes zero noise, except for the blower

I have not experimented with the NB or NR to any extent. Generally I don't like the sound of noise reduction, and I don't have any impulse noise at my QTH. I did try the Auto-Notch once when a het came on top of W0ALC, and it took out almost all the audio, along with the het. Had to turn the audio gain way up, and still could barely get usable audio since most of the passband seemed to be notched out.

The S meter markings are basically invisible to me unless I get up close and use the bottoms of my trifocals. I had cataract surgery many years ago, thus the need for trifocals. The time constant of the S meter seems very fast, not following the AGC speed. It acts much like the Orion II S meter, which seems more like a VU meter than an S meter.

Initial tests of the radio were on 20 meters and 40 meters thus far, except to check to see what happened to the radio with the 160 meter antenna connected. During the day BC overload made 160 full of BC IMD on 10 kHz increments. This also occurs on the Orion II and the Omni-VII. I have an ICE BC high-pass filter that completely eliminates the BC IMD problem. (I understand the owner of the ICE products may be SK.)

The following radios don't need the ICE highpass filter at my shack: IC-781, IC-756 Pro III and Drake R-4C

Those that do need the ICE filter: Flex 5000, Flex 3000, Elecraft K3.

In December 2010 and January 2010 I used the Eagle in the CQ 160 meter CW contest, splitting my operating time between the Kenwood TS-590S and the Eagle. Both did quit well in the high-density signal environment. In both cases I needed the narrowest CW bandwidth to work CE1/K7CA. Since the DX was not working split, I had trouble hearing when he came back to me. In the case of the Kenwood I used the 50 Hz bandwidth, and in the case of the Eagle I used the minimum 100 bandwidth. Both did the job.

From a feature and ergonomic standpoint, the Kenwood comes out on top. From a performance standpoint on CW on the WARC bands and 10 & 6 meters, the dynamic range of the Eagle is significantly superior.

RevC