Sherwood Engineering HF Test Results

Model T-T Argonaut VI Serial # 3053381210 Test Date: 06/21/2013

IF BW 2400 –6 / -60, Hz	/	Ultimate	90	dB
IF BW 500 –6 /-60, Hz	/	Ultimate	95	dB

Front End Selectivity (A – F)	B
First & second IF rejection 90018 kHz (on 20 meters)	73 dB

Dynamic Range with radio, no preamp

Dynamic Range 20 kHz	95	dB	IP3	+18	dBm
Dynamic Range 5 kHz	95#	dB	IP3	+17	dBm
Dynamic Range 2 kHz	92*	dB	IP3		dBm

Combination of phase noise and 3rd order product
* Consisted of phase noise only

Dynamic Range with radio, Preamp 1

Dynamic Range 20 kHz	dB	IP3	dBm
Dynamic Range 5 kHz	dB	IP3	dBm
Dynamic Range 2 kHz	dB	IP3	dBm

Combination of phase noise and 3rd order product
* Consisted of phase noise only

Phase noise (normalized) at 2.5 kHz spacing:	-121	dBc
Phase noise (normalized) at 5 kHz spacing:	-124	dBc
Phase noise (normalized) at 10 kHz spacing:	-127	dBc
Phase noise (normalized) at 20 kHz spacing:	-130	dBc
Phase noise (normalized) at 40 kHz spacing:	-132	dBc
Phase noise (normalized) at 50 kHz spacing:	-134	dBc
Phase noise (normalized) at 80 kHz spacing:	-135	dBc
Phase noise (normalized) at 100 kHz spacing:	-135	dBc
Phase noise (normalized) at 200 kHz spacing:	-137	dBc
Phase noise (normalized) at 300 kHz spacing:	-137	dBc
Phase noise (normalized) at 400 kHz spacing:	-137	dBc
Phase noise (normalized) at 500 kHz spacing:	-137	dBc

Blocking above noise floor, 1uV signal @ 100 kHz, AGC On,	127^	dB

^ See notes below on blocking.

Noise floor, SSB bandwidth 14 MHz, no preamp	-122	dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On	-129	dBm

Sensitivity SSB at 14 MHz, no preamp	0.52	uV
Sensitivity SSB at 14 MHz, Preamp 1 On	0.25	uV
Noise floor, 500 Hz, 14.2 MHz, no preamp	-125	dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp 1 On	-135	dBm
Signal for S9, no preamp	50	uV
Signal for S9, Preamp 1	50	uV
Gain of preamp(s)		
Preamp 1	13	dB
AGC threshold at 3 dB, no preamp	3.2	uV
AGC threshold at 3 dB, Preamp 1 On	0.75	uV

Notes:

S meter linearity is outstanding. Preamp does not affect the S meter calibration. Each S unit down to S2 is a consistent 6 dB per S unit. Above S9 markings at 10, 20 and 30 over are accurate within the hysteresis of the LCD increments. 1 uV reads S3, so since the S meter is so accurate, band noise will often read upscale on the higher HF bands. Most S meters barely show 20 to 25 dB of signal change from S1 to S9 instead of 48 dB. Some hams may be confused when a more typical rig's S meter will show band noise at S0, where the Argonaut VI will give the correct value.

Due to the hysteresis of the S meter LCD segments, I did not try to measure filter bandwidths for SSB and CW. The DSP bandwidths adjust between 100 Hz and 6 kHz if an AM filter is installed. I used an AM filter from an Eagle in the Argonaut VI.

^ Blocking was measured with a 500 Hz bandwidth at the point phase noise increased the audio output 3 dB. I did not use an FFT (fast fourier transform) spectrum analyzer to measure when actual blocking occurs, since no one uses a 1 Hz bandwidth on the air. I use a 1 uV signal to test blocking, since this level is usually below the AGC threshold of modern transceivers with the preamp OFF.

Likewise the 2 kHz dynamic-range measurement was also made with the 500 Hz filter, and listed at the point phase noise went up 3 dB for the 2-kHz test. Compare this value to the ARRL RMDR listing when the League publishes their measurements. Using an FFT analyzer to measure the third-order dynamic-range intermodulation product buried in phase noise does not correlate to how the radio will perform on the air in most cases.

My only complaint with the radio is there is no easy way to use an external speaker, short of amplified computer speakers. The headphones output on the rear have 100 ohm resistors in series, which is a good choice with most headphones. However this makes it impossible to drive a speaker at any reasonable volume. I used an external audio

amplifier to drive my standard Icom SP-20 speaker for receiver testing. The internal speaker is quite small and limited in frequency range.

A test for how the AGC handles impulse noise with the noise blanker OFF, indicates the AGC is not captured by a single pulse. (A recent e-mail indicates the Orion II may also have new firmware to improve this issue.) All Ten-Tec rigs will be evaluated as new firmware becomes available.

Transmitter measurements will be made at a later date, plus on-air evaluations will be added as time permits.

Rev C