Sherwood Engineering HF Test Results

Model Apache ANAN-200D Serial # None Test Date: 12/15/2015

IF BW 2400 –6 / -60, Hz 2400/2548	Ultimate	90	dB
IF BW 500 –6 /-60, Hz 500/647	Ultimate	95	dB

Front End Selectivity (A – F) B

Note: Preamp in circuit all the time.
Attenuation never enabled except for S meter calibration check.

Dynamic Range with radio (attenuator = 0 dB)

Dynamic Range 20 kHz, dither & random ON:	77	dB
Dynamic Range 20 kHz, dither & random ON + 3rd signal	99*	dB
Dynamic Range 20 kHz, NO dither, NO random:	64	dB

*Note: 3rd signal similar in strength as test signals, frequency not critical

Dynamic Range independent of signal spacing

Blocking above noise floor, 1uV signal @ 100 kHz, AGC gain 91:	123	dB
Phase noise (normalized) at 2.5 kHz spacing:	126	dBc
Phase noise (normalized) at 5 kHz spacing:	129	dBc
Phase noise (normalized) at 10 kHz spacing:	131	dBc
Phase noise (normalized) at 20 kHz spacing:	134	dBc
Phase noise (normalized) at 30 kHz spacing:	136	dBc
Phase noise (normalized) at 40 kHz spacing:	137	dBc
Phase noise (normalized) at 50 kHz spacing:	137	dBc
Phase noise (normalized) at 80 kHz spacing:	138	dBc
Phase noise (normalized) at 100 kHz spacing:	138	dBc
Phase noise (normalized) at 200 kHz spacing:	141	dBc
Phase noise (normalized) at 300 kHz spacing:	142	dBc
Phase noise (normalized) at 400 kHz spacing:	142	dBc
Phase noise (normalized) at 500 kHz spacing:	142	dBc
Noise floor, SSB bandwidth 14 MHz :	-127	dBm
Noise floor, SSB bandwidth 14 MHz, dither & random ON:	-125	dBm
Sensitivity SSB at 14 MHz:	0.30	uV
Sensitivity SSB at 14 MHz, dither & random ON:	0.37	uV
Noise floor, 500 Hz, 14.2 MHz:	-133	dBm
Noise floor, 500 Hz, 14.2 MHz, dither & random ON:	-132	dBm

Note: Dither and random raise noise floor about 1.5 dB

Noise floor, SSB, 50.125 MHz, dither & random OFF:		-129	dBm
Sensitivity, SSB, 50.125 MHz, dither & random OFF:		0.24	uV
Noise floor, 500 Hz, 50.125 MHz, dither & random OFF:		-136	dBm
Signal for S9:	-73 dBm	50	uV

S meter constant within 1 dB with attenuation at 10, 20 & 30 dB

AGC threshold at -3 dB with AGC gain set to 101:	1	uV
AGC threshold at -3 dB with AGC gain set to 91:	3	uV

Blocking tested with AGC gain at 91.

Notes:

When making measurements with a third test signal, the setup was modified as follows: A second hybrid combiner was added after the HP 355C and 355D step attenuators. The 10 dB pad normally at the back of the radio was changed to a 3 dB pad into the second combiner and a 6 dB pad at the radio. The output of the pair of HP 8642A generators was increased 2.3 dB to partially compensate for the added hybrid loss, plus there was 1 dB less attenuation in the normal signal path. The third generator was an HP 3335A followed by a Mini-Circuits 22 dB gain buffer amp, followed by a 10 dB pad into the second hybrid combiner.

The third signal can provide the equivalent of dither, but the level of the third test signal has to be similar in strength to the two normal test signals. Generally it is advisable to have dither and random ON all the time, though there are times when dither made the third-order IMD worse if the third signal was present. Since one can never count on additional very strong signals being on the same ham band (within a given bandpass filter), the increased dynamic range from an additional signal (or signals combined) is rather ethereal and cannot be assumed.

The phase noise of the 200D is not as good as the Flex 6700 or the K3S or K3 with the new synthesizer, but similar to several legacy radios at 10 kHz.

ADC overload occurs at -10 dBm with no attenuation.

Blocking occurs very rapidly as the point of the 3 dB block is approached.

S meter accuracy and tracking is extremely good down to -100 dBm. Below that noise affects the reading by about 1 dB at -110 dBm and 2 dB at -120 dBm.