Sherwood Engineering HF Test Results

Model Elecraft KX2	Serial # 01244	Test Date: 3/22/17 & 4/28/17
Model Elecraft KX2	Serial # 01548	Test Date: 7/19/2017

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

Front End Selectivity (A – F)
First IF rejection +/- kHz dB

Dynamic Range with radio, no preamp, sample #1 (S/N 01244)

Dynamic Range 20 kHz	low side 97, high side 92	dB
Dynamic Range 10 kHz		dB
Dynamic Range 5 kHz	low side 88, high side 83	dB
Dynamic Range 2 kHz	low side 86, high side 85*	dB

* See notes on anomalous readings at 2 kHz

Dynamic Range with radio, no preamp, sample #2 (S/N 01548)

Dynamic Range 20 kHz	low side 98, high side 93	dB
Dynamic Range 10 kHz		dB
Dynamic Range 5 kHz	low side 89, high side 88	dB
Dynamic Range 3 kHz	low side 88, high side 86	dB
Dynamic Range 2 kHz	low side 87, high side 85*	dB

* See notes on anomalous readings at 2 kHz

Dynamic Range with radio, 2nd radio
Dynamic Range 20 kHz dB
Dynamic Range 2 kHz dB

Dynamic Range with radio, alternate conversion scheme
Dynamic Range 20 kHz dB
Dynamic Range 2 kHz dB

Blocking above noise floor, 1uV signal @ 100 kHz, AGC On, dB
See notes below on blocking.

Phase noise (normalized) at 2.5 kHz spacing:		dBc
Phase noise (normalized) at 5 kHz spacing:	-131	dBc
Phase noise (normalized) at 10 kHz spacing:	-132	dBc
Phase noise (normalized) at 20 kHz spacing:	-129	dBc
Phase noise (normalized) at 30 kHz spacing:	-129	dBc
Phase noise (normalized) at 40 kHz spacing:	-130	dBc
Phase noise (normalized) at 50 kHz spacing:	-129	dBc
Phase noise (normalized) at 80 kHz spacing:		dBc

Phase noise (normalized) at 100 kHz spacing:			dBc
Phase noise (normalized) at 200 kHz spacing:			dBc
Phase noise (normalized) at 300 kHz spacing:			dBc
Phase noise (normalized) at 400 kHz spacing:			dBc
Phase noise (normalized) at 500 kHz spacing:			dBc
Noise floor, SSB bandwidth 14 MHz, no preamp		-115	dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On		-129	dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 2 On			dBm
Sensitivity SSB at 14 MHz, no preamp		1.2	uV
Sensitivity SSB at 14 MHz, Preamp 1 On		0.25	uV
Sensitivity SSB at 14 MHz, Preamp 2 On			uV
S/N 01244			
Noise floor, 500 Hz, 14.2 MHz, no preamp		-121	dBm
Noise floor, 500 Hz, 14.2 MHz, preamp 1 On		-135	dBm
S/N 01548			
Noise floor, 500 Hz, 14.2 MHz, no preamp		-123	dBm
Noise floor, 500 Hz, 14.2 MHz, preamp 1 On		-136	dBm
Noise floor, SSB, 50.125 MHz, no preamp			dBm
Noise floor, SSB, 50.125 MHz, Preamp 1			dBm
Noise floor, SSB, 50.125 MHz, Preamp 2			dBm
Sensitivity, SSB, 50.125 MHz, no preamp			uV
Sensitivity, SSB, 50.125 MHz, Preamp 1			uV
Sensitivity, SSB, 50.125 MHz, Preamp 2			uV
Noise floor, 500 Hz, 50.125 MHz, no preamp			dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 1 On			dBm
Noise floor, 500 Hz, 50.125 MHz, Preamp 2 On			dBm
Signal for S9, no preamp	-57 dBm	286	uV
Signal for S9, Preamp 1	-76 dBm	33	uV
Signal for S9, Preamp 2			uV
Gain of preamp(s)			
Preamp 1		19	dB
Preamp 2			dB
AGC threshold at 3 dB, no preamp		31	uV
AGC threshold at 3 dB, Preamp 1 On		3.4	uV
AGC threshold at 3 dB, Preamp 2 On			uV

Notes:

S/N 01244 was returned to Elecraft for "tweaking" after the initial dynamic-range measurements at 5 kHz were modestly lower than published by the ARRL. While I no longer publish any non-random sample data on my website, I did re-measure this KX2 after returning from Elecraft.

There was no change in noise floor or 20 kHz dynamic range. The 5 kHz dynamic range improved 4 dB on the high side and degraded 1 dB on the low side. My website (and the ARRL) only publishes the lower of the two dynamic-range numbers for any high side and low side measurements. (worst case)

It was also noted that at 5 kHz the distortion products followed a virtual 1:1 ration rather than a more classic 3:1 ratio. This is unusual, as at least a 2:1 is typically observed for measurements near the receiver's noise floor.

The reason for testing another random sample was to see if the dynamic range anomaly on the high side at 2 kHz was consistent. The same issue was observed on sample #2.

The anomaly noted when measuring the 2-kHz dynamic range is as follows: On the low side the measurement was made without any leakage from the test tone 2 kHz away. On the high side, however, the leakage from the test tone 2 kHz away overwhelmed the third-order measurement at bandwidths of 500, 400, 300, 200 & 100 Hz. On the other hand, if the bandwidth was set to 550, 450, 350, 250, 150 & 50 Hz, the leakage was minimized.

From a practical standpoint, the 2-kHz dynamic range issue is rather meaningless when a KX2 is used out in the field with a modest antenna. Additionally, there are other spurious responses that are at least 10 dB stronger than the third-order distortion. Due to this anomaly, however, my web site will publish the 3-kHz dynamic range instead of the 2-kHz dynamic range.

All in all, for a radio that can be put in a coat pocket, the KX2 performs admirably. My friends who do SOTA should be quite pleased using the lighter weight "little brother" of the KX3.

Rev D1