

## Sherwood Engineering HF Test Results

<b>Model</b> <b>Elecraft K3</b>	Serial #	00149	Test Date:	2/9/2008
IF BW 6000 –6 / -60, kHz			Ultimate	dB
IF BW 2400 –6 / -60, kHz			Ultimate	dB
IF BW 1800 –6 / -60, kHz			Ultimate	dB
IF BW 500 –6 / -60, Hz			Ultimate	dB
Front End Selectivity (A – F)			B	
First IF Rejection @ MHz IF			100	dB
Dynamic Range 100 kHz	104	dB	IP3	dBm
Dynamic Range 20 kHz	104	dB	IP3	dBm
Dynamic Range 5 kHz	102	dB	IP3	dBm
Dynamic Range 2 kHz	101*	dB	IP3	dBm
Dynamic Range 2 kHz	95 #	dB	IP3	dBm
Dynamic Range 1 kHz	noise	dB	IP3	dBm
* with 200 Hz 5-pole filter, phase noise only.				
# with 500 Hz 5-pole filter, weak IMD with phase noise				
Blocking of 1 uV signal reference noise floor at 100 kHz, AGC On			140	dB^
Blocking of 1 uV signal reference noise floor at 2 kHz, AGC On			123	dB^
^ Measurement was phase noise limited				
Phase noise at 20 kHz spacing:			144	dBc
Phase noise at 10 kHz spacing:			138	dBc
Phase noise at 5 kHz spacing:			132	dBc
Phase noise at 2.5 kHz spacing:			126	dBc
Noise floor, SSB bandwidth 14 MHz, Preamp Off			-126	dBm
Noise floor, SSB bandwidth 14 MHz, Preamp 1 On			-131	dBm
Sensitivity at 14 MHz, Preamp Off			0.33	uV
Sensitivity at 14 MHz, Preamp 1 On			0.19	uV
Noise floor, 500 Hz, 14.2 MHz, Preamp Off (500 roof / 500 DSP)			-130	dBm
Noise floor, 200 Hz, 14.2 MHz, preamp Off (200 roof / 200 DSP)			-133	dBm
Noise floor, 500 Hz, 14.2 MHz, Preamp 1 On (500 roof / 500 DSP)			-138	dBm
Noise floor, SSB, 2 MHz (500/500)			-125	dBm
Noise floor, CW, 2 MHz (500/500)			-129	dBm
Sensitivity, 2 MHz			0.3	uV
Signal for S9, Preamp Off / On			75 / 20	uV
Preamp(s), dB gain,			10	dB

AGC threshold at 3 dB, Preamp Off, config set to 15	2.1	uV
AGC threshold at 3 dB, Preamp 1 On, config set to 15	0.6	uV
AGC threshold at 10 dB, Preamp Off, config set to 13	2.3	uV

Note: Sensitivity is standard 10 dB S+N/N with a 2.7 kHz roofing filter and a 2.4 kHz DSP bandwidth. SSB noise floor is a 3 dB S+N/N with the same filtering.

During blocking measurements, the phase noise + audio from 1 uV reference signal went up 1 dB on the RMS meter. S meter reading also went up from reciprocal mixing. No audio drop was measurable with using a 3 Hz bandwidth on HP 3585A spectrum analyzer looking at the same audio being fed the HP 3400A RMS voltmeter.

Dynamic range measurements at 2 kHz or closer were limited by the phase noise of the K3 synthesizer.

#### User Comments:

Over several years I have borrowed three different K3 transceivers. Initially I was disturbed by the poor receive audio quality when driving a speaker (internal or external). After several discussions with Elecraft, they addressed this issue in late 2008. The improvements were significant but not nearly a 100% solution. While many others also complain about the K3 audio, most people do not seem to notice the issue.

The line output or the headphone output is much better, and I use an external amplifier to drive my standard Icom SP-20 speaker. This solves the receiver audio problem for me.

For a small radio, the ergonomics of the K3 are pretty good. Most buttons have two functions, a quick push or a long push. The LCD display does not always show important information, such as the selected bandwidth of the DSP filter. This is because that part of the display is used for frequency of the second receiver, if installed.

The number of accessories that can upgrade the base radio have been amazing, including a second full-performance receiver, an output for a panadapter, VHF converts, RX receive antenna input, etc. Elecraft has to also be commended for quickly updating firmware to fix problems or add features, such as the CW APF (audio peak filter). No other OEM has ever been so responsive to their customers as Elecraft.

The transmitter IMD performance could be improved, but is not much worse than most 13.8 volt class B rigs. It is unfortunate that rigs today are so much worse than the Collins S-Line from the 1960 and 1970s, in respect to the distortion sideband on SSB.

I saw the P3 panadapter at Dayton 2010, and was impressed. While reviewing the Yaesu FTdx-5000D, a K3 / P3 owner broke into my QSO and said my signal was the cleanest he had ever seen on the air with his P3. I must explain some details on the 5000D. If run

with no speech processing, no ALC at all, and in class A, it is an astonishingly clean transmitter. Unfortunately if one turns on the processor and hits the ALC to half scale on the meter (only 3 dB of ALC), the signal degrades to worse than most class B radios.

Personally I wish Elecraft also offered a K4 that is the size of large radio such as the IC-765 or IC-781. (It need not be as large and heavy as an FTdx-5000D.) If it would have more dedicated knobs, a much larger display, and the P3 built-in, that would be quite a radio. Others have asked for such a radio out of Elecraft, but who knows if this will ever happen.

Rev C