Review of Elecraft KX3 for Microwave IF

by Ed – KL7UW

Back in 1999, I was looking for a suitable radio to use as IF for my new 10-GHz transverter (Down East Microwave 10,368/144 MHz). The IC-260A 2m all-mode mobile had long been a favorite with microwavers, but Yaesu introduced the FT-817 HF-70cm all-mode which looked good with 5w transmitter and smaller size. I bought one and so did many mw'ers, such that it has become the current standard IF for microwave.

Fig. 1 – QST Advertisement

In 2010 I decided to part with my FT-847 and purchase better radio for cw-eme and return to using VHF/UHF transverters. I chose the Elecraft K3 for my main IF radio (in the shack). I considered that I might haul the K3 out on portable operation, but even though it is only 8-lbs. it's still a little large. So I held onto the FT-817 for portable mw use (until this year).

Software Defined Radios are now appearing in many forms for ham radio. The K3 I bought two years ago is a SDR with a dual-conversion front end. Flex-1500, Perseus, SDR radios from RF Space, even the Soft Rock radios are being used with microwave front-ends…and others that I have not listed here. Then in December, 2011 Elecraft announced early-ordering for their New Portable QRP SDR, the KX3. I ordered one and sold my FT-817.

The KX3 is one of the latest software defined radios. It uses direct frequency conversion with internal DSP software so no external computer is required.

Front panel closely resembles that of the K3 including most of its operating features.

Frequent firmware uploads from Elecraft are available to incorporate changes in technology.

Fig. 2

Some parameters of concern to Microwavers:

Sherwood Engineering Labs Tests:

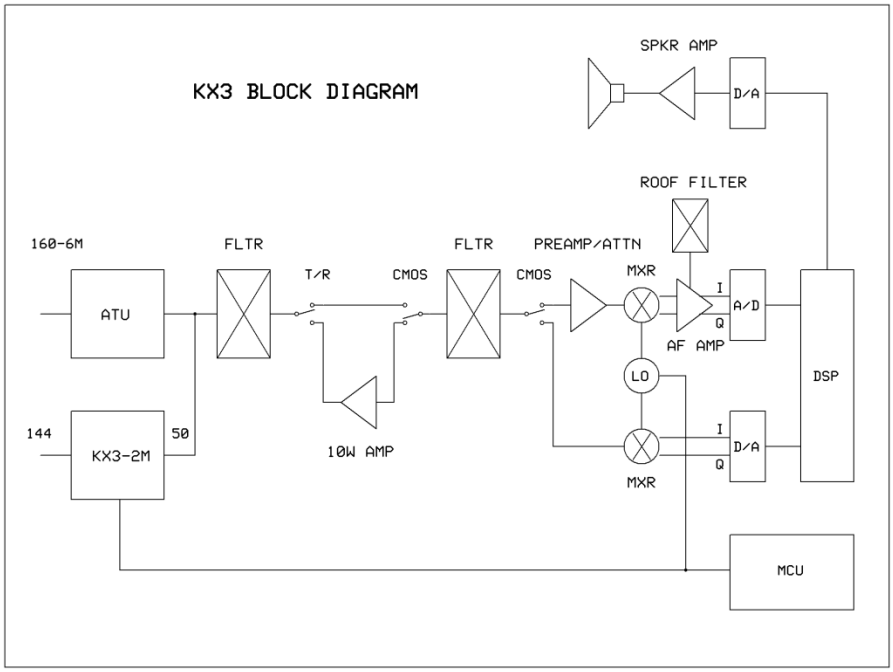
Noise Floor = -123 dBm, w/o preamp, -138 dBm w/ 20-dB Preamp
100-KHz Blocking = 138 dB
LO Phase Noise = 144 dBc/Hz at 10-kHz
Dynamic Range = 105 dB at 20-KHz,
= 104 dB at 2-KHz w/ roofing filter
= 96 dB at 2-KHz w/o roofing filter
= 65 dB at 1-KHz opposite sideband limited

RADIO	NOISE FLOOR	LO NOISE	BLOCKING	DYN RANGE
KX3	-123 / -138 dB	144 dBc/Hz	138 dB	104 dB
FTdx-5000D	-123/-135/-141	135	127	101
K3	-130/-138	138	140	101
Perseus	-123/-125	147	125	99
FLEX-5000D	-123/-135	123	123	96
Ten-Tec Eagle	-124/-132	131	135	90
FLEX-1500	-112/-136	131	108	88

Frequency Stability = 1ppm (+/-50 Hz at 50-MHz)
= 0.1ppm (est.) with EXREF option
RF output of 2m module = 3-10w (pre-release estimate)
Common antenna connections for Rx and Tx; HF antenna is BNC, 2m antenna connector is sma

All-mode 160-6m Portable Radio:

Covers 310-KHz to 32, 44-54 MHz
Operation on 8v to 15v with
  Rx min 150 ma; Tx max 2A
150 memories
Weighs 1.5 lbs.
Size: 3.4H x 7.4W x 1.7D
Rx sensitivity of -138 dBm
Internal 2-in speaker; 0.5w audio
8-band audio equalizer
Optional 500/1500 Hz roofing filter
DSP filter 50-4000 Hz
Dual Watch & Scanning
Tx output with ext. 13.8v:
  10w 160m-15m (0.1w min)
  8w 12m-6m
  5w on FM/AM/DATA modes
  3w on internal batteries (8 AA)



Mic compression 8-band Equalizer
CW keyer up 8 – 50 wpm (Iambic)
Two Digital Record memories
PBT, auto-notch, NB and NR.
Center tuning indicator for CW.
Multi-function meter
9-transverter bands
Full/semi break-in (QSK)
Six CW messages
Optional ATU (20w) SWR<20:1
Built-in TTY/PSK/CW decode
APF for weak CW
10-Hz/1-Hz tuning

Rx IQ baseband audio output to computer for using other sw. USB/RS-232 cable for computer control and firmware upgrades. 32-bit DSP

Prices:

KX3 (assembled)	--- $ 999.95	http://www.elecraft.com/KX3/kx3.htm
KX3 (kit)	--- $ 899.95	http://www.kl7uw.com/KX3.htm
MH3 hand mic	--- $ 59.95	
KXFL3 roof filter	--- $ 129.95	
KXAT3 ATU	--- $ 169.95	
KXPD3 iambic key	--- $ 129.95	
KXBC3 Internal NiMH charger	--- $ 59.95	
KXMM3 Mobile Bracket	--- $?	
KXPA3 100W PA	--- $?	
KXAT100 100W ATU	--- $?	
KX3-2M 144/50 XVTR	--- $?	
KX3-EXREF	--- $?	

The kit (mechanical assembly, only) takes about four hours (photos):

Fig. 3 Shipping Package One

Fig. 4 Shipping Package Two

Fig. 5 Options

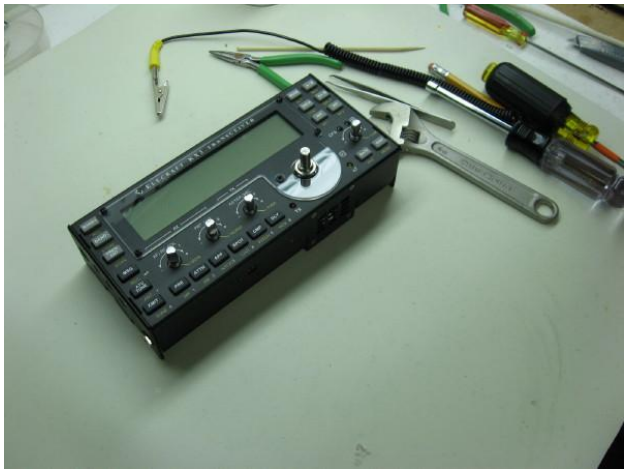


Fig. 6 Front Panel

Fig. 7 Digital Board

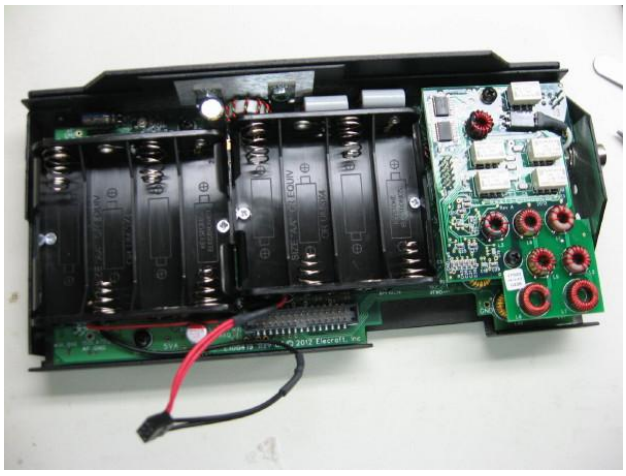


Fig. 8 RF Board/Battery/ATU

Fig. 9 KX3 with Case Open

Fig. 10 KX3 vs. K3 at KL7UW