If you want bells and whistles to impress your ham buddies, look somewhere else. However, if you want hot performance from a solidly designed, 100 watt HF rig you can build yourself, read on...

CQ Reviews:

The Elecraft K2/100

Getting Back to Basics

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Anyone who has surveyed a current catalog of amateur radio equipment is well aware of the wide selection that's available today. No longer must one choose between an HF and a VHF/UHF transceiver, since many of today's units incorporate coverage of amateur bands from 1.8 to 450 MHz. Accessories such as keyers and antenna tuners frequently are built-in, and many radios can be controlled from a computer, allowing users to set up a customized virtual front panel that meets their liking.

Despite the broad selection of equipment that's available today, almost all of these new radios have one thing in common: They all essentially are commodity devices built to be produced in large numbers, not repaired. Surface-mount technology, once found only in more expensive commercial equipment, now is basically ubiquitous. In the past, an amateur who wanted to adopt an approach different from simply taking a radio out of the box and plugging it in could either home brew his equipment or build a kit. Unfortunately, today homebrewing is difficult, as sources for some of the more esoteric RF parts are drying up. Also, with the demise of Heathkit, Knight Kit, Eico, *et al.,* the majority of kits on the market are simple QRP radios. Many amateurs long to "get back to basics," but for some a QRP transceiver is not what they are looking for.

The Elecraft K2/100, a100 watt HF rig you can build yourself.

Enter Elecraft

Eric Swartz, WA6HHQ, and Wayne Burdick, N6KR, formerly of Wilderness Radio QRP fame, saw this need for a high-performance amateur radio transceiver kit with the basic features that today's ham wants while still being easy to construct at home. The Elecraft K2, introduced in 1999, was an almost overnight success. This 15 watt transceiver has a loyal, almost cult-like following. Numerous accessories have been added to the K2 over the past three years. However, the one aspect of the transceiver that many K2 owners longed for—higher output power—seemed elusive.

Early on, the Elecraft web page indicated that a "50 or 100 watt" PA would be available. However, as time passed, many questioned whether it would happen. Well, after waiting almost three years, it's here in the form of the Elecraft K2/100. If you are an amateur who has always wanted to build your own transceiver but didn't want to settle for QRP power levels, this is the radio for you. Let's lift the hood and take a close look at this high-performance, medium-power transceiver.

Under The Hood

The basic Elecraft K2/100 covers 80 through 10 meters, including the WARC

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Parameter	Value	Specification	Comments
MDS @ 3.75 MHz, Preamp Off	–135 dBm	–130 dBm	Measured in 300 Hz BW
MDS @ 7.2 MHz, Preamp Off	–135 dBm	–130 dBm	Measured in 300 Hz BW
MDS @ 14.2 MHz, Preamp Off	–132 dBm	–130 dBm	Measured in 300 Hz BW
MDS @ 21.2 MHz, Preamp Off	–134 dBm	–130 dBm	Measured in 300 Hz BW
MDS @ 28.5 MHz, Preamp Off	–130 dBm	–130 dBm	Measured in 300 Hz BW
MDS @ 3.75 MHz, Preamp On	–137 dBm	–135 dBm	Measured in 300 Hz BW
MDS @ 7.2 MHz, Preamp On	–140 dBm	–135 dBm	Measured in 300 Hz BW
MDS @ 14.2 MHz, Preamp On	–139 dBm	–135 dBm	Measured in 300 Hz BW
MDS @ 21.2 MHz, Preamp On	–140 dBm	–135 dBm	Measured in 300 Hz BW
MDS @ 28.5 MHz, Preamp On	–135 dBm	–135 dBm	Measured in 300 Hz BW
CW Passband Bandwidth (700 Hz Filter selected @ –3 dB points)	300 Hz	Not Specified	Measured with preamp off
CW Stopband Bandwidth (700 Hz Filter selected @ –60 dB points)	1210 Hz	Not Specified	Measured with preamp off
SSB Passband Bandwidth (SSB OPT1, FL1 selected @ –3 dB points)	1120 Hz	Not Specified	Measured with preamp off
SSB Stopband Bandwidth (SSB OPT1, FL1 selected @ –60 dB points)	3020 Hz	Not Specified	Measured with preamp off
3rd Order Intercept, Preamp Off	+18 dBm	+10 dBm	Measured @ 14.06 MHz
3rd Order Intercept, Preamp On	+0 dBm	0 to +7.5 dBm [1]	Measured @ 14.06 MHz
IF Rejection, Preamp On	90 dB	Not Specified	Measured at 7.2 MHz
Image Rejection, Preamp On	88 dB	Not Specified	Measured at 7.2 MHz
Output Power	100 watts	100 watts	Meets spec. on all bands
Carrier Suppression	>45 dB	>40 dB	Worst case (20 M LSB)
Opposite Sideband Suppression	>62 dB	Not Specified	
Spurious Suppression	–44dBc	–40 dBc or better	–44 dBc represents worst-case spur on 10M
Two-Tone Transmitter IMD (Measured relative to PEP)	–30 dB	Not Specified	Measured at 14.2 MHz
Harmonic Suppression	> –55 dBc	–45 dBc or better	
RX-TX Switching Time	22 ms	Not Specified	T/R Delay set to 0.00, Key-down to 90% TX
TX-RX Switching Time	50 ms	Not Specified	T/R Delay set to 0.00, Key-up to 90% RX

[1] *Third-order intercept (IP 3) specification varies by band.*

Table I– Elecraft K2/100 performance. Measured values vs. specifications.

bands, CW only, with RS-232 remote control. Accessory kits add 160 meters, SSB operation, receive audio filtering, real-time clock, and a noise blanker. The K2/100 provides all the basic features one would expect from a modern HF transceiver, such as 100 watt output on SSB and CW, direct frequency entry to 10 Hz resolution, band-stacking registers, dual-VFOs, full QSK, RIT/XIT, band scanning, direct frequency readout for transverters, selectable CW receive sideband, and an iambic type A or B keyer with multiple CW message memories. All this in a lightweight package that measures just 3.4" × 7.9" × 9.9". The Elecraft K2/100 is easily one of the smallest 100 watt HF transceivers to come along in some time. It's so small it should easily fit into almost any vehicle for mobile operation, although unlike some of the competition it doesn't have the option of separating the control panel from the transceiver itself for remote mounting.

The K2/100 does not have an internal antenna tuner, as there simply isn't room for one. However, it does offer a unique feature. By removing the K2/100 top cover (which houses the 100 watt PA and RS-232 serial port) and replacing it with a K2 cover, the unit is converted to a 10 watt QRP transceiver. In the K2 top cover you can install an automatic tuner, a serial interface, and a 12 volt gel-cell battery. As a result, these two top covers allow you to change the radio from a "QRO" K2/100 to a "QRP" K2 just by removing and reinstalling six screws and plugging together a few connectors. No longer do you have to buy one radio for home/mobile use and another for backpacking. Now that's flexibility!

If you are looking for gimmicks, you won't find them in the K2/100. This radio was designed to perform, not to dazzle you with bells and whistles you don't really need. Lest you believe that the K2/100 is just another medium-power transceiver, keep in mind that the radio employs a high-performance receiver that is easily one of the best in its class. Its noise floor, blocking dynamic range, third-order, two-tone dynamic range are superb. This translates into true contest-grade performance. One criticism of the K2/100 is that it lacks a few features that some amateurs may consider "stock" on a transceiver of its class, such as passband tuning and a notch filter. However, the K2/100 easily makes up for this by its overall receiver performance, and a form of fixed passband tuning is possible thanks to the flexibility of the K2/100's crystal-filter adjustments.

K2/100 Construction

One of the primary attributes of the Elecraft K2/100 is the fact that you build the radio yourself. To be sure, there is a bit of a time commitment associated with the purchase and construction of the transceiver, but this is a large part of its appeal to some amateurs. The manual and all associated documentation are excellent, easily as good as or better than Heathkit.

The number of interconnecting wires has been kept to an absolute minimum in the K2/100, so the primary task during construction is "stuffing" the circuit boards. While there are a minimum of interconnecting wires, there is no shortage of toroidal inductors or transformers in this radio. While winding toroids is not particularly difficult, some consider this aspect of construction to be the least enjoyable. However, for a relatively small cost, you can purchase a

kit of pre-wound toroids from an Elecraft-approved independent vendor, which may prove to be a worthwhile expenditure.

The K2/100 is a relatively complex kit, and it may prove to be a rather daunting experience for someone with very little kit-building experience. If you would like a K2/100 and can't (or don't want to) build it yourself, Elecraft has a list of amateurs who will build your radio for a nominal fee (Some folks just can't build enough kits.). Another option is to acquaint yourself with Elecraft kit building by constructing the less-complex K1 CW-only transceiver.

On-Air Operation

The K2/100 is a surprisingly versatile package for on-the-air operation. It supports all the popular operating modes (with the exception of FM), and it really excels in its support of CW. The radio supports a total of nine CW memories, and there is a "Fast-Play" option that you can turn on for contests. Fast-Play allows you to tap a single key to play a CW message, instead of the normal requirement of pressing two keys. During CW operation, the QSK is unusually smooth, with no evidence of audio clicks or pops, even at high power while copying weak signals. SSB operators will find that the audio compressor does a credible job of bringing the average power up while maintaining readability. The radio also supports a scanning feature for CW and SSB operators that is probably one of the most practical operating aids I've ever come across. Unlike most scanning implementations that require a continuous carrier in order to lock, the scanner in the K2/100 *ignores* continuous signals and pauses for 25 seconds on keyed signals. This is an excellent tool for monitoring a band while handling other tasks.

Data and RTTY operators haven't been forgotten, as the radio supports a separate "data" mode which bypasses the audio compressor and allows custom setting of the IF filters. The K2/100 also supports a 4800-baud serial port, which can be used with any remote control/logging program that supports the Kenwood TS-570D command set. While the K2/100 isn't fully compatible with the Kenwood commands, there is sufficient support for most basic operation.

Elecraft also has its own software called "K2 Remote," which is available for free at its website. A unique aspect of K2 Remote is that you can use your PC as a CW keyboard. This, along with the scanning feature, would allow you to work on your PC, scan the CW portion of a band, and quickly call that rare DX station the K2/100 came across in the process. In the future, software will be available from Elecraft to support remote control over a 100/10baseT network. This connectivity could be used to support control of the radio over an 802.11 wireless networking link, allowing you to operate anywhere you have coverage from your home wireless network (WLAN).

K2/100 Performance

I ran the K2/100 through a number of parametric tests to validate basic receiver and transmitter performance. The results of this test suite are summarized in Table I.

All in all, the K2/100 is a radio that will give you a sense of ownership that goes well beyond the norm. The pride associated with taking a box consisting of hundreds of parts and turning into one of the best-performing medium-power HF transceivers on the market today can't be explained easily.

If you would like more information on the Elecraft K2/100, it can be obtained at the company's website: <http://www.elecraft.com>. ■