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### **Elecraft's Philosophy of Community Input on Product Design**

**By Wayne Burdick, N6KR**

It has often been stated, by both Elecraft and our customers, that we leverage user input as we flesh out new products. In this article I'll clarify our development model, hopefully elevating it above hearsay. It's intentional and methodical. We like to think it's one of the things that makes Elecraft unique among well-known amateur radio brands.

The design of commercial gear is subject to many constraints. It has to meet user expectations, earn type acceptance, do well in performance benchmarks, and yet be fairly priced. To varying degrees, it must also satisfy a universal requirement for communications gear: it should be usable during emergencies to support local or regional traffic. (For some of us, knowing we might be called upon as the last resort in difficult times motivates us to keep our equipment and skills fresh.)

Most use of our gear is by enthusiasts, so an additional set of requirements comes into play. For example, a radio has to be enjoyable to operate. If it's a kit, it must be rewarding and educational to

build.

We take things two steps further.

First, we believe that our customers - the real experts when it comes to using ham gear - are a rich source of creative and technical input. Second, we recognize that since this is a hobby, the road is just as important as the destination. In other words, we want to share the *\*process\** of product design with our customers, not just plant a stake in the ground and say "this is what we've done; take it or leave it."

To this end, at the onset of a new product cycle we imagine the hardware and firmware as an elastic canvas upon which we and our customers can sketch and refine ideas. This means products must be endowed with a great degree of modularity; we have to leave spaces that can be filled in the future, firing the imagination of users. Here's a musical analogy: If you've ever listened to jazz trumpeter Miles Davis play, you'll notice some gaps between his phrases. These allow listeners to engage with his music, completing their part of the conversation. The result? You work a bit harder at it, but come away more satisfied. (Don't get me started on the Key of Morse.)

What this means in practice is that we take continuous customer input, weight it, adjust firmware implementation priority, and revise or extend hardware over time. Let me give you two examples of how this has played out.

## **K2**

The K2 was the test case for our "canvas" development model. To ensure flexibility, we designed intermodule communications around a 1-wire bus - the auxBus - which we routed to every option connector in the radio. These connectors were strategically distributed to nodes where they could pick up supply voltages, control, and RF or audio paths. The idea was that each module would have its own small MCU, hanging on the auxBus, where it could exchange information with the main MCU.

We then started shipping the K2 to early adopters, soliciting their input on what they'd like to see next. I can't claim that this process was entirely democratic, and in truth it was messy at times. But the upshot was that we quickly followed with new K2 options and firmware features in an order that gave users a vote. When 60 meters came on the scene, we added a module for that as well.

Here's where the auxBus comes in: On power-up, each option module checks in with the main MCU, reporting its status. But the MCU needn't know every detail of how modules function. For example, when you go into the menu entry for the K2's ATU (KAT2), the text for the various settings is supplied by the KAT2's own MCU, over the auxBus. If you update the ATU module to one that has different settings, the main MCU doesn't have to be updated - just the KAT2 itself. The main MCU thus functions as a "server" for semantic information supplied by each of the option modules.

The K2 is also an exemplar of hardware flexibility, embodied in something we called the 2D fastener.

This is a short length of 1/4" aluminum bar with three tapped 4-40 holes that permits attachment of PC boards, sheet metal, and hardware. Over the years we and our customers have taken advantage of 2D fasteners to upgrade or enhance products. Our seafaring customers helped us migrate to all stainless-steel hardware at some point, facilitated by 2D fasteners as generic attachment points.

Shortly after we thought we'd fully populated the K2 with options, we were contacted by Lyle Johnson, KK7P. Lyle had reverse-engineered the auxBus node associated with our KAF2 analog audio filter module, where he inserted his own: the KDSP2, a DSP-based audio filter complete with noise reduction. This is an extreme case of tapping community creativity. In addition to adding the KDSP2 to our product line, we added Lyle to our engineering staff.

One final note about the K2 and extensibility. Once we had accumulated a number of useful upgrades, we created an "A" to "B" conversion kit. This was the genesis of our promise to provide an upgrade path for every owner of our transceivers so they can remain current.

### **K3**

The K3, with its larger MCU and plenty of interior space, has benefited from many suggestions by its user base over the 10 years since initial release. We phased in a high-performance sub receiver, 2 meter transverter, enhanced ATU, DVR, SWL band-pass filter array, reference lock module, USB port for control/audio, and most significantly, an entirely new synthesizer design. As the phrase "competition-grade" evolved, the K3 continued to set the standard.

Accessories have been added to the K-Line based on customer needs as well - the P3 panadapter, KPA500 amp, KAT500 ATU, SP3 speaker, and K-Pod remote controller. All of these new modules and accessories were accompanied by free firmware upgrades.

Like the K2, the K3 underwent one major face-lift, in the form of the K3S. In keeping with our model, we offered just about everything but the "K3S" front panel bezel to those who wanted the latest in Elecraft tech.

Our first two decades have been a time of challenge, opportunity, and satisfaction for our team. Reflecting on this period, we need to thank our customers not just for their creativity and enthusiasm, but also for their patience. We've traveled the road together, bumps, potholes and all, and I hope you've all enjoyed the ride as much as we have.

It goes without saying that our future products will continue to reflect our philosophy of community involvement and "hands-on" design.

Here at Elecraft headquarters, we're already raising a toast to the next decade.

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# Elecraft Elmers

One thing that defines Elecraft is an extended community comprised of builders, operators, tinkerers, and friends. It's been gratifying to watch the breadth and depth of this interaction over the years (mostly civilized and helpful :)

In particular, we'd like to recognize those who have stepped up to become "Elecraft Elmers," helping get others' kits working, figuring out cabling or software setup problems, and coaching new operators about how to make the most of their radios' features on the air.

We've received several amazing Elecraft Elmer stories that we're excited to share.

If you have someone in mind, please tell us who they are and how they helped. Specific examples with short narratives would be great. We'll include as many of your stories as possible in upcoming newsletters.

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## Charles Knowles (Bob), VA3IL

*My Elecraft Elmer is VA3IL, Bob not only ran the theory course for the York Region Amateur Radio Club but also ran the GOTO station for field day. He personally inspired many a new ham to the hobby and assisted them with equipment advise and assistance. With his guidance he advised my wife, VA3MLU, one of his students, on the options to get for her K3 Christmas present to me many years back. That introduction to Elecraft continued with a recommendation to the K2 which I know he helped many a club member complete and other Elecraft projects. Kit building and hands on radio were in his blood. I personally have 4 Elecraft radios inspired by his love of radio and the desire to spread the thrill of the hobby.*

*Not many people have reached the level of greatness Bob has in my life, possibly 3 in total and Bob did it all through his selfless acts of promoting wireless communication and usually that brought us back to getting the best, Elecraft.*

*Amateur radio needs more Bobs!*

73, Svend  
VE3SWN

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If you have someone in mind, please tell us who they are and how they helped. Specific examples with short narratives would be great. We'll include as many of your stories as possible in upcoming newsletters. Email your stories to [margaret@elecraft.com](mailto:margaret@elecraft.com).

# News & Updates

## 2019 Trade Show Schedule

Below is a list of trade shows that we'll be attending in 2019. We'll let you know if we add any more shows to our list. If you're attending any of these events, come on by and say hello!

- May 17-19 - Dayton Hamvention, Xenia, OH.
- May 31-June 2 - SeaPac, Seaside, OR.
- June 21-23 - Ham Radio, Friedrichshaven, Germany
- June 7-8 - Hamcon, Plano, TX.
- August 9-10 - Pacific NW DX Convention, Everett, WA.
- Aug 17-18 - Huntsville, Huntsville, AL.
- September 6-8 - New England Division, Boxborough, MA.
- September 13-14 - W9DXCC, St. Charles, IL.
- September 20-21 - W4DXCC, Pigeon Forge, TN.
- October 18-20 - Pacificon, San Ramon, CA.

## KPA1500 Update 1500+ W Solid State Amplifier /160-6 meters



The KPA1500 integrates with popular Yaesu, Icom, Flex and Kenwood transceivers. You can see the brand and model numbers of transceivers that play well with the KPA1500 [here](#) under **Cables for Radio Brands/Models**.

[Overview](#)

[Specs](#)

[Accessories](#)

[Cables for Radio Brands/Models](#)

[FAQ](#)

[Manuals](#)

[Price List/Order](#)

We are shipping new orders from stock, typically 1-5 days after order.

**KPA1500 introductory pricing and free ground shipping within the continental U.S. is still in effect for a short while longer, so order soon!**

Learn more about [KPA1500 here](#)