

Testing the New KSYN3A Synthesizer for the Elecraft K3

As many of you may know, the Elecraft K3 has a terrible CW jitter problem (bad CW timing) on TX if you transmit faster than 37 WPM, unless you enable CW QRQ mode. This problem exists even if you use semi-breakin mode instead of QSK. For more background on the issue, see:

<http://lists.f5mzn.org/pipermail/support/2013-November/083384.html>

Note that most operators choose *not* to enable CW QRQ mode, regardless of the benefit, because enabling CW QRQ mode *disables* RIT, Passband tuning, and Split operation.

I am fortunate to be a beta tester for the new Elecraft KSYN3A synthesizer boards for the K3, which was recently [announced](#). This new hardware virtually eliminates the CW jitter problem, and it also improves receiver performance (see the Sherwood Engineering Receiver Performance Table at <http://www.sherweng.com/table.html>). You can now send decent CW at high speed and still have RIT and PB tuning available. Diversity reception is also improved, since only one synthesizer is used to drive both receivers when selecting Diversity mode.

First, for the QSK operator, an upgrade to K3 firmware 5.14 or later is strongly recommended, as this alone eliminates all of the annoying loud pops and ticks heard between dots and dashes in prior releases (some of which were loud enough to potentially cause ear damage in pileup situations). The new v5.14 firmware completely eliminates this longstanding issue. No new hardware is required. QSK operation is at long last a very pleasant mode on an Elecraft K3. Be sure to select NEW QSK mode by using the menu CONFIG: CW WGHT, then tap [3] until "New QSK" is displayed.

Here are some recordings of the local sidetone (headphone audio) at high speed, made during the ARRL DX CW.

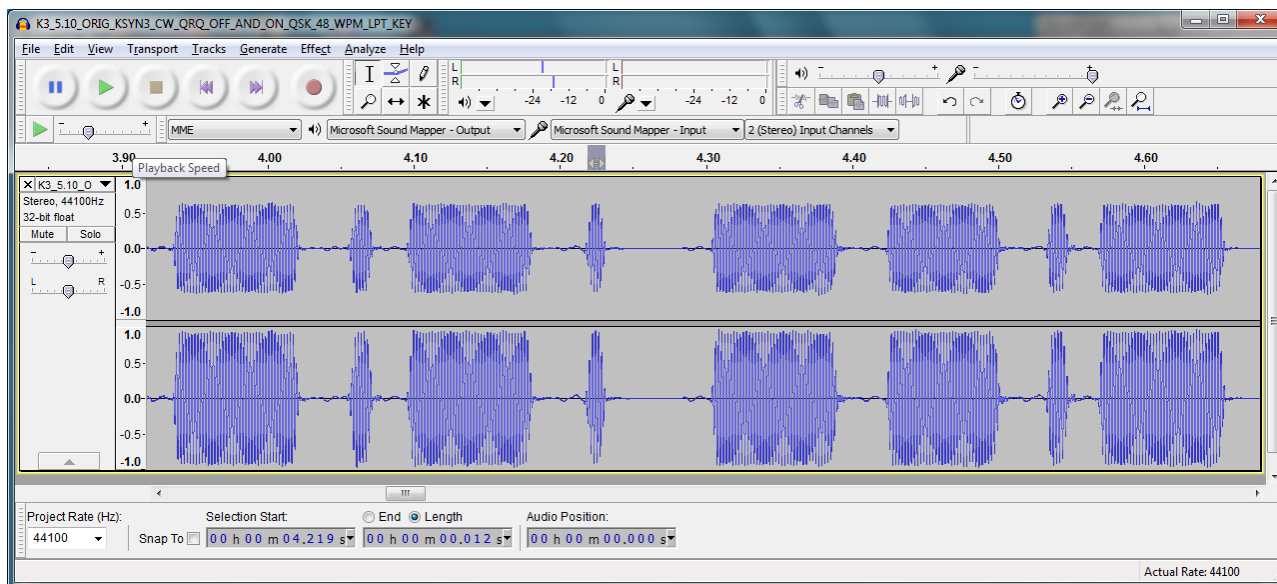
<http://bit.ly/KSYN3sidetone> (old boards, new firmware)

<http://bit.ly/KSYN3Asidetone> (new boards, new firmware)

I've also posted some recordings I made with a separate receiver. This first one demonstrates the high speed CW jitter problem when using the original KSYN3 board. CW is 48 WPM via external keying, QSK mode (but it sounds just as bad with semi-breakin). In the middle of the recording I switch to CW QRQ mode, which cleans everything up, but at a high cost (no more RIT or PB tuning):

<http://bit.ly/KSYN3>

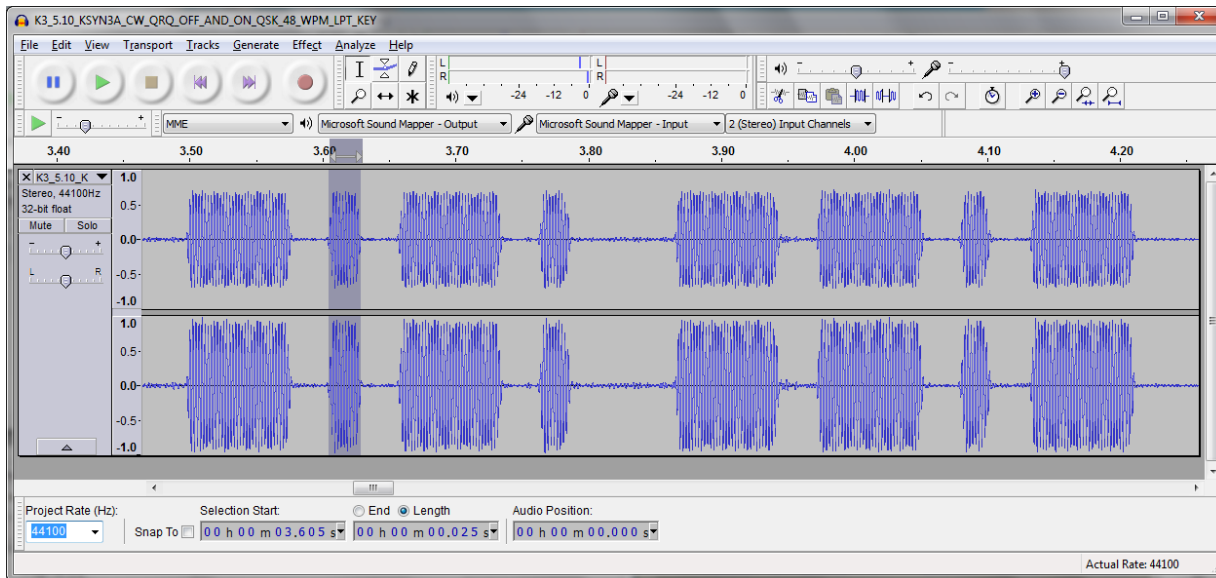
At 48 WPM, each dot (and the space between them) is supposed to be $1200/48 = 25$ ms long, but some are only 12 ms long (per Audacity), and the timing variation is easy to see when you zoom in on "CQ":



The second recording was made of a K3 transmitter with two new KSYN3A boards (again, listening on a separate receiver).

http://bit.ly/KSYN3_A

Even with CW QRQ OFF, things are looking pretty good:



I can barely hear the difference now, with CW QRQ ON or OFF (CW QRQ ON still sounds a *little* better, but not by much).

I say this is a nice piece of work by Elecraft Chief engineer N6KR. The new KSYN3A boards are \$189 each and pretty simple to install. If you have the subreceiver, you need two boards, one for the main, one for the sub. If you plan on operating any CW above 37 WPM, which is common on expeditions, you really should get them.

73,
Bob, N6TV