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Saturday, November 13, 2021

QRP digital transceiver kits compared

The technology behind WSJT modes & JS8, and the evolution of various kits that take advantage of them, is something I find very interesting. It's amazing to see the innovation of design that has occurred, in such a very short time, in the four kits described here.

Phaser

It all started with the Phaser, and it was stunning. Designed not by Mr. Spock, but by Dave Benson K1SWL. I built one for 20m, converted it to 60m and had a lot of fun with it.

Phasers were (they are no longer available) monobanders, available initially for your band of choice, 17 to 160 meters. Later versions made 10 and 15 meters available. Each kit would operate on either of two discreet frequencies to allow FT8 and (usually) JS8.

Power output was ~4 watts and audio cables were required to/from the PC. VOX keying took the place of CAT and a single-step alignment procedure was required for frequency calibration. Modulation was SSB.

Price with a case made from circuit-board material was $80.

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Posted by John AE5X John AE5X at 3:03:00 PM 7 comments:

Tuesday, November 9, 2021

DC in to RF out with QDX on 40 meters

I made some measurements today to compare the RF out with a given DC input for my QDX operating on 40 meters. The results surprised me - I was expecting the QDX to drop out at around 8 volts or so.

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Posted by John AE5X John AE5X at 9:54:00 AM 2 comments:

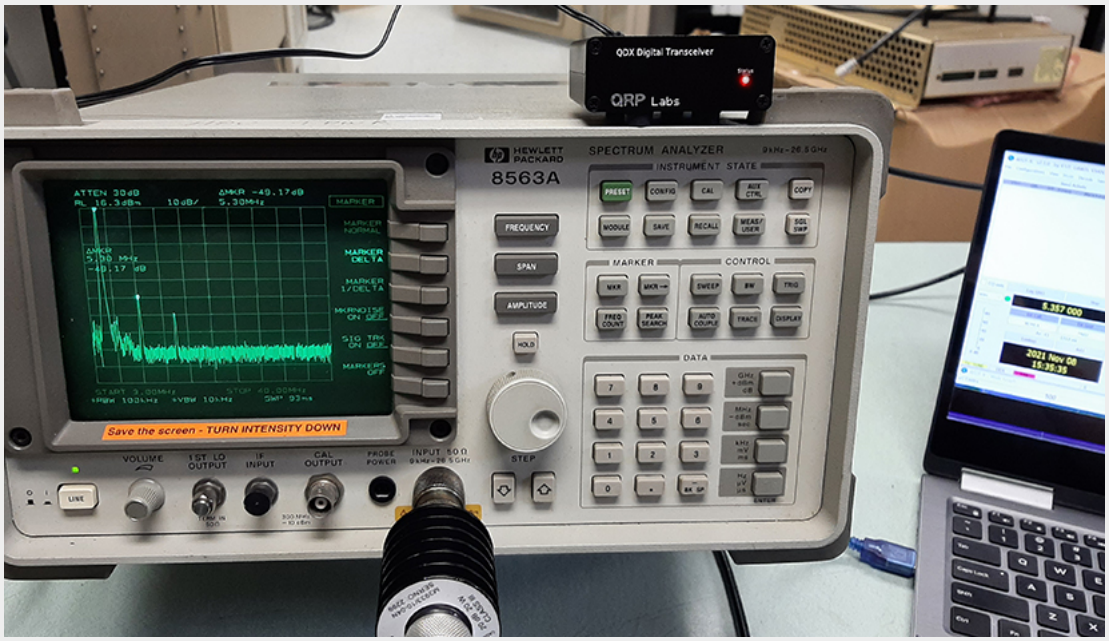
Monday, November 8, 2021

Spectrum analysis: QDX on 60m

Upon completion of my QDX transceiver I was happy to see it was capable of full output on 60m and had no apparent attenuation of signals on receive.

According to Hans GoUPL, the QDX uses the 40m LP filter when operating on 60 meters. Also, even harmonics are largely suppressed thanks to the characteristics inherent in the push-pull design of the QDX's PA.

I decided to have a look at the QDX output on 60 meters and am happy with the results:



2nd harmonic -49dB

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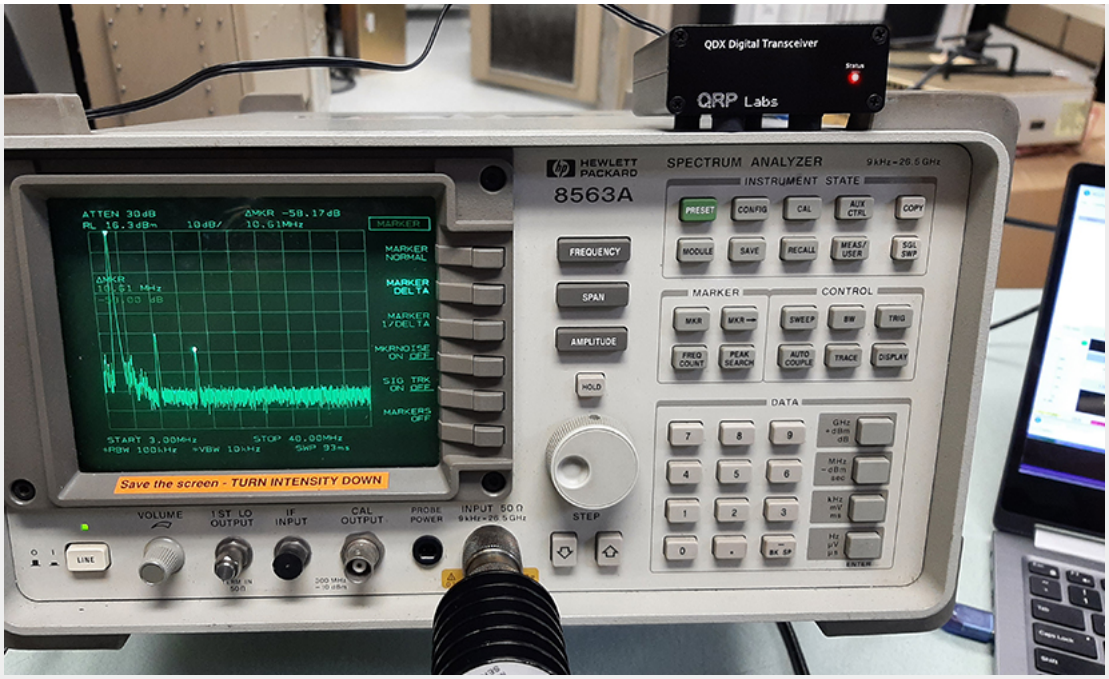

3rd harmonic -58dB

Other QDX-related postings are here.

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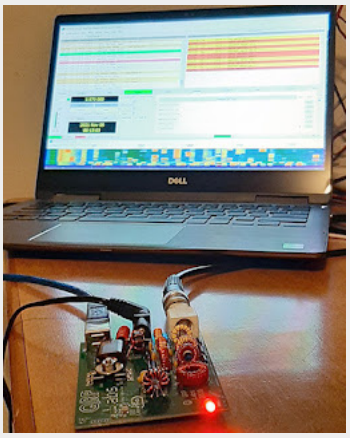
Posted by John AE5X John AE5X at 10:02:00 AM No comments:

Thursday, November 4, 2021

5-band QDX now on the air



My 22g wire arrived today and I re-wound T1 and fired the little rig up, connected a PC and the antennas - and off we went, exploring the ether.

QSO's were easily had on all 5 bands. Yep, 5. The radio performs very well on 60 meters in addition to the four for which it's advertised.

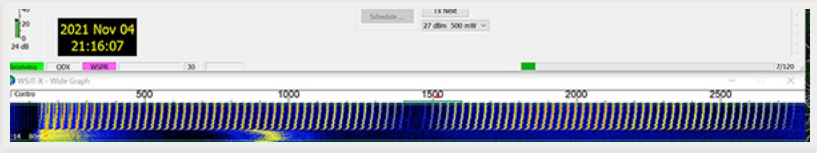
I adjusted my variable supply for exactly 12.0 volts and made the following measurements:

- 20m - 530mA - 3.5 watts out
- 30m - 550mA - 4.0 watts out
- 40m - 560mA - 4.25 watts out
- 60m = 690mA - 5.5 watts out
- 80m - 670mA - 5.3 watts out

Ryan W7RLF noted two issues with his QDX, and mine is doing the same:

1) Sometimes when switching bands (via WSJT), the rig initially is neither transmitting or receiving. It seems to go into a dormant state. This is easily fixed by clicking on the TUNE button in WSJT to transmit for a second, then clicking again to go back to receive. Now the QDX will begin receiving and all is well.

2) Sometimes when changing bands or modes (ie, FT8 to WSPR) the rig thinks it's receiving but the waterfall of WSJT contains only hash marks. This is remedied the same way as above.



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Neither of these things happen often - they are infrequent and easily fixed.

The receiver is amazing - I'm copying many European stations on 40, 60 and 80 meters, VK and Indonesia on 30 meters.

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Posted by John AE5X John AE5X at 8:02:00 PM 4 comments:

Wednesday, November 3, 2021

Video: QDX now operational

My QDX is now repaired and seems to have quite a hot receiver. As I write at 2:30pm local, I'm receiving stations from NA, SA, EU and Africa on 20m FT8.

My problem was a shorted primary-secondary winding in T1. Fortunately, I used a current-limited power supply when I initially attempted to power-up the newly completed kit. Power supply voltage dropped to zero (with 11V dialed in) and there was no indication on the kit's LED.

There was unmistakably a short somewhere.

While building the kit, I was surprised at the ease with which the insulation could be scraped from the 22g wire used for T1. I think I could have removed it with my fingernail so it was the first component I suspected when I had this problem. I believe that, in the process of winding the transformer, the insertion of one wire scraped the insulation from the winding already placed.

I removed T1 from the board, re-wound it with wire I had available and tested resistance readings again, that were faulty before. Success - no shorts between ground and VCC.

So I applied power and got a fast blinking, then a steady, LED. Success.

Connecting to the PC gave the hoped-for "Device Found" and then "QDX Ready" notification by Windows. WSJT configuration went exactly as described in the manual and signals started filling up the screen.

A brief test transmitting on 20m with 11VDC applied gives 3.5 watts out.

I don't want to transmit for a full FT8 cycle with the small wire now making up T1 but am 100% confident that everything now works correctly. I will re-wind T1 with the proper gauge wire once it arrives.

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Posted by John AE5X John AE5X at 3:16:00 PM 10 comments:

Monday, November 1, 2021

The QDX kit hath arriven

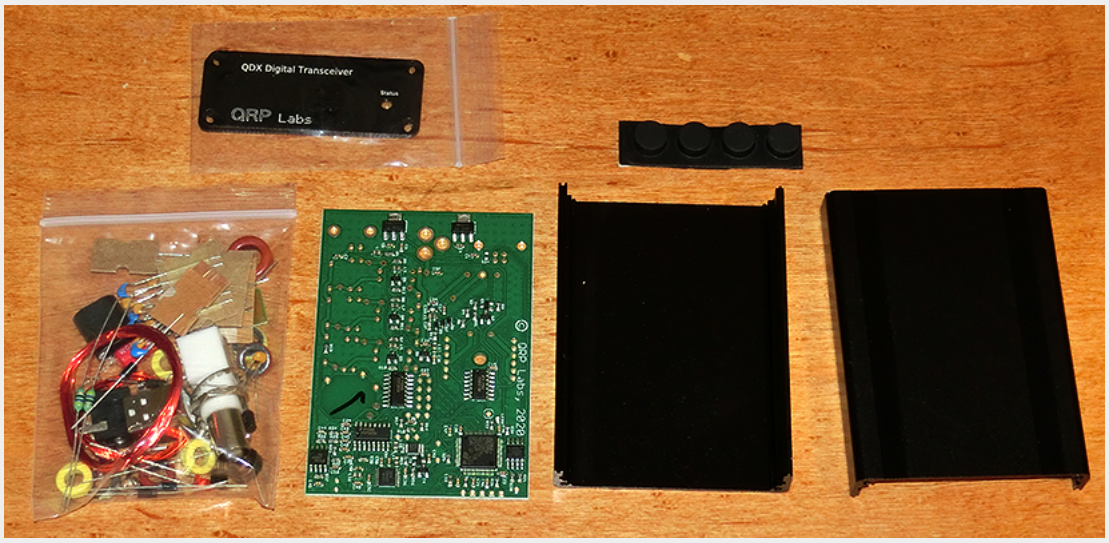
My much-awaited QDX digital transceiver kit from QRP Labs was gently deposited into my mailbox this morning and the Hakko soldering iron is already salivating.

Construction begins this evening.

As can be seen, many parts - the SMD's - are pre-installed, leaving less than 50 components to be soldered. The time-consuming parts will be the inductors, including the dreaded L12.

Builders have a choice in how to wind T1: either for a 9V or a 12V DC voltage. I'll be building mine for a 12V power supply.

Those who wanted a QDX but didn't complete the order in time will be happy to know that Hans G0UPL has recently obtained parts to allow the eventual sale of another 375 QDX kits. Read all about it here.


QDX Digital Transceiver
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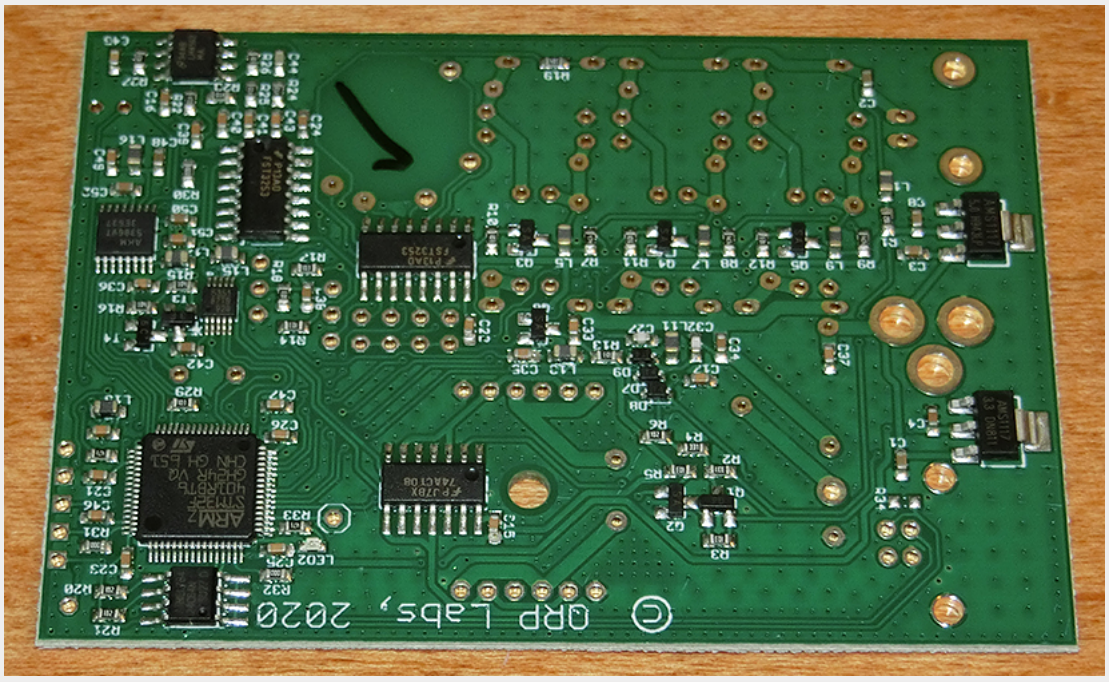
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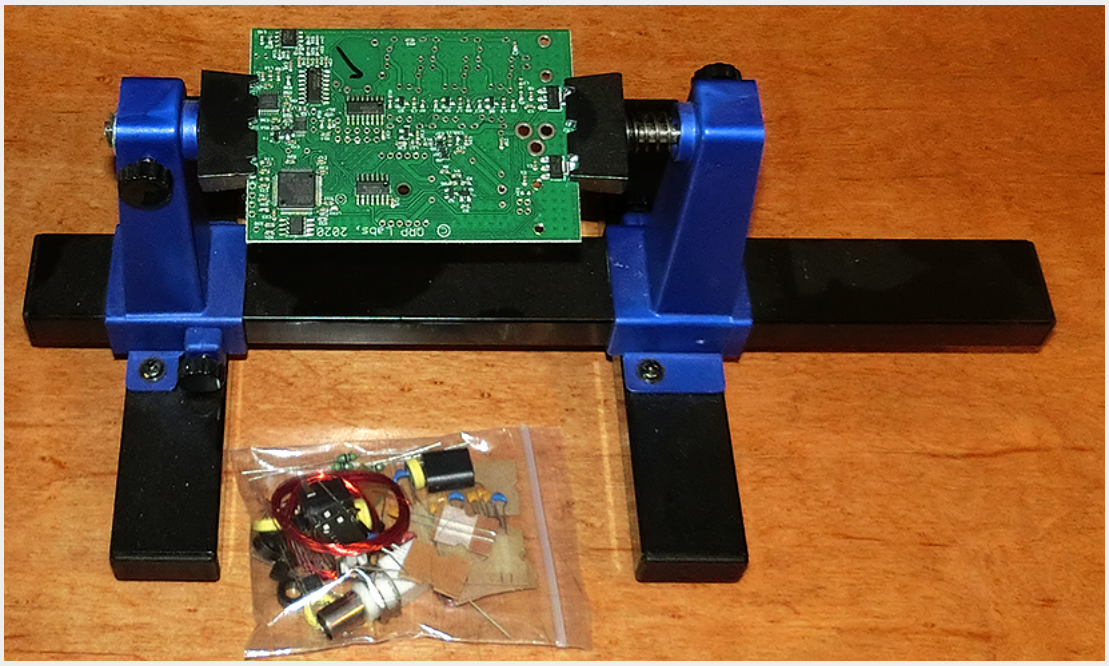

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Posted by John AE5X John AE5X at 2:20:00 PM 2 comments:

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