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Cyclone 40

QRP Transceiver Kit by NMØS and 4SQRP

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When the 4SQRP Group announced the Cyclone 40 40-meter QRP transceiver kit last summer we featured it in our July 2013 issue. Here is my review of that kit.

Eager QRP'ers quickly snapped up the first run of 100 kits. The second run differed from the first with the provision of the Revision A printed circuit board. The first run of Cyclone 40 boards required several operator/builder performed modifications to the circuit. Starting with serial number 100 the supplied boards were revised and require only one simple to install jumper modification. When building your kit, be sure to use the latest assembly manual—it is a “living document” updated as needed. Mine was built according to Assembly Manual, Revision A.0.

The Build

My kit, serial number 108, arrived shortly after mail ordering it with its full complement of components—nothing missing. Kudos to the 4SQRP Group kitting and order fulfillment teams. As I inventoried the kit's parts I arranged the components into groups and singletons and labeled them with Post-it® notes. That well-invested 60 minutes saved me time overall by minimizing PCB populating errors.

Included with the kit is a compact (4.4' x 3.6' x 1.9') DIY enclosure comprised of precut, predrilled and silk-screened PCB stock. The builder spot solders the four sides; the top and bottom are screwed on, resulting in an attractive and trendy piano black and white custom case. I chose to darken the PCB's raw abutting edges with a black Sharpie® permanent marker.

Kit assembly over three laid-back evenings progressed without any hitches or head scratching over unclear assembly instructions. To improve access and keep the board clear of the working surface I added temporary stand-offs to the PCB's four corners.

Resistor R9, 470Ω, is color-coded in the manual's list of resistors as Yellow-Red-Brown, but should be Yellow-Violet-Brown.

The kit requires winding three toroids and a coil on form for the permeability-tuned oscillator (PTO). In addition to the threaded nylon coil on form, the PTO comprises a brass screw and two wire supports. The two supports are formed from wire salvaged from dipped silver mica capacitor C15's trimmed leads. As the manual cautions, “SAVE THE LEADS!” you will need them when constructing the PTO as detailed on page 13. There are

no smoke tests—testing and alignment are performed when the board is completed.

Alignment is mostly straightforward, a matter of peaking two transmit-mixer transformers and adjusting the balance and offset potentiometers. A bit more fiddly is the PTO adjustment—compress-

“SAVE THE
LEADS!”

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ing and spreading turns on the coil you've already wound and securing them with clear nail polish once the sweet spot is found. While performing this test I maintained magnet wire positioning between compressions and expansions with a strip of adhesive tape. My Cyclone 40 tunes from 7.000 to 7.125+ MHz.

The Cyclone 40 does not include RIT or a built in keyer. Provision is made on the board for wiring in the keyer of your choice. Frequency readout is by Morse annunciation accessed by a tactile switch on the enclosure's left side.

RF Power Output, selected frequencies, at 12 volts into a 50-ohm dummy load.

7.000	5.2 watts
7.025	5.1 watts
7.050	5.0 watts
7.058	5.0 watts
7.100	4.7 watts
7.121	4.6 watts

As built, from cold, my rig drifted approximately 1.5 kHz over a 15-20 minute warm-up period. Once stabilized the rig drifted about 100 Hz following periods of keying. To minimize drift I worked with the crew at 4SQRP and added 4SQRP-supplied heat sinks at U2 (78M05) and Q6 (2N7000) to supplement the furnished with kit heat sink at Q8 (MPF102). From cold, these additions reduced drift to 1 kHz over a 15-20 minute warm-up period.

Finally, the solution I and some other Cyclone 40 owners settled on was to operate with the rig's top cover removed. So set up, the rig drifts approximately 900 Hz from cold and heating-cooling cycles are moderated during operating sessions.

On the Air

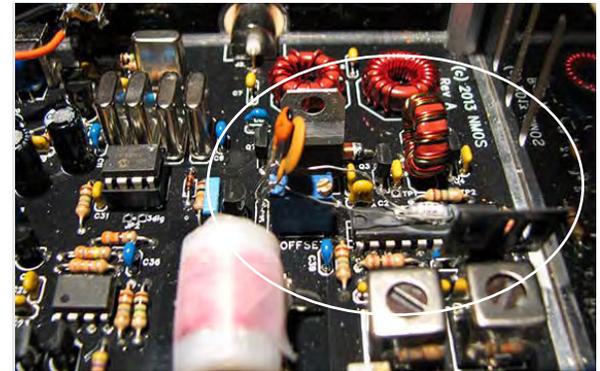
My first few QSOs were to Ottumwa, Iowa, RST 449 (251 miles); Ravenswood, WV, RST 578 (the 8 Tone due to the poorly filtered power supply first used) and drift (383 miles); Dickson, Tenn., RST 599 (TN QSO Party—so we're all 599—413 miles); Hastings, Minn., RST 579 (315 miles); Springfield, Ohio, RST 559 (251 miles); and Columbus, Ohio, RST 559 (288 miles). All QSOs were worked on my 10-80 fan dipole at 25 feet.

The rig's receiver is quite sensitive. Within a few minutes of nighttime listening at the lower end of

the band during mediocre conditions I copied EA8, F5, SJ2 and a PY to PP QSO—sensitive, yes, but also quite resistant to blasting when tuning across strong signals thanks to its effective AGC design.

Listening through an inexpensive pair of Sony earbuds the Cyclone 40's received audio is pleasant and non-fatiguing over extended operating periods. For me, the rig supplies sufficient audio output to minimize strained eardrums. For ragchewing and casual operating the rig's filtering does a fine job of separating nearby signals. If needed, an add-on filter like 4SQRP's Hi-Per-Mite (*K9YA Telegraph*, February 2013) or the New England QRP Club's NEScaf (*K9YA Telegraph*, July 2011) will do the job and boost audio output if desired. ■

Click [HERE](#) to subscribe to the Cyclone 40 Yahoo! Group.



Addendum

In mid-March the 4SQRP Group announced the Cyclone 40 PTO Modification and mailed the components to Cyclone 40 owners. According to 4SQRP, "This simple mod will reduce the drift considerably, and in some cases eliminate it for all practical purposes." The drift is attributed to minor heating of component U1, a 74HC240.

It is a very simple two-component mod, consisting of 150pF NP0 and 180pF polystyrene caps. For my particular rig, a 10pF cap was paralleled with the 150pF cap to return the base frequency to 7.000 MHz, and the heat sinks added in the previous mod removed.

The mod works, from cold my rig now drifts up 120 Hz and stabilizes. During operating sessions, receive and transmit, the rig does not noticeably budge, and the enclosure lid stays on.

Thanks to all at the 4SQRP Group for their range of economical, high quality kits and ongoing builders' support.

Mod information and photos at:

http://www.4sqr.com/kits/cyclone/cyclone_pto_mod.html



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