

APRS In Your Pocket

For a lightweight portable station, all you need is a handheld transceiver, a tiny packet TNC, and an *Android* smartphone.

Jerry Clement, VE6AB

For those unaware, APRS® is the Automatic Packet Reporting System, a VHF packet radio network, primarily on 144.39 MHz in the US and Canada, that is used for tracking moving objects (and people), texting, and a great deal more.

I enjoy operating APRS, and I thought that I had it covered when it came to the different types of APRS devices that are available. However, I recently assembled a pocket sized full-featured APRS setup for portable operating that uses a smartphone as part of the station.

My configuration is based around a Baofeng UV-3R dual-band handheld transceiver along with a Mobilinkd packet radio TNC known as the TNC2 (see www.mobilinkd.com/) and my *Android* smartphone. Although I'm using a UV-3R transceiver, you can assemble this station with many other FM handhelds. The only trick is finding the cable to connect the TNC to the radio. There are cables for sale on the Mobilinkd website, but nothing stops you from making your own.

For the *Android* smartphone, you will need to download the *APRSdroid* software app available at aprsdroid.org. I am using my Blackberry Z30 smartphone loaded with *APRSdroid* software. *APRSdroid* software will not run on Apple iPhones, though.

The Mobilinkd TNC2 is tiny, so it can be easily secured to the back of a handheld transceiver.



The author enjoying some winter hiking with his portable APRS station.

software to supply the APRS packet formatting and other information, as well as GPS data. Since the GPS data is provided by your smartphone, of course, you don't need a separate GPS receiver. That's one less device to carry!

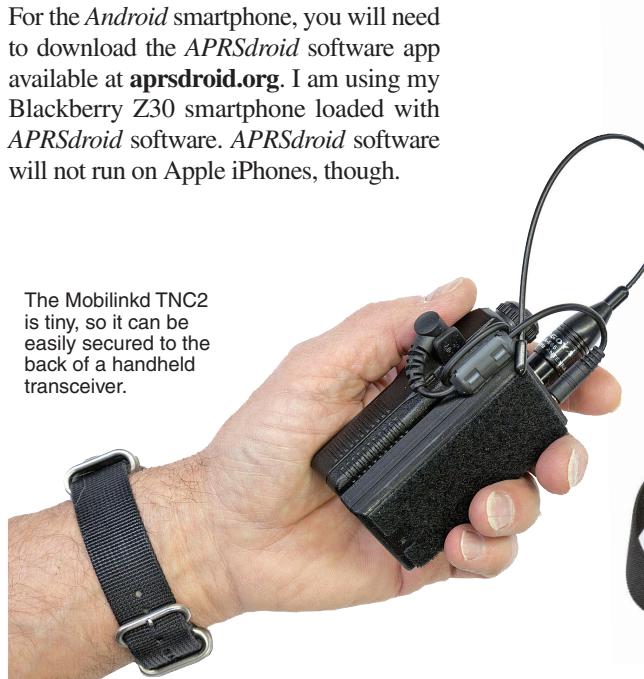
The very cool thing about the TNC2 is the fact that it talks to your smartphone via a wireless Bluetooth connection. This means that once you power up the handheld and the TNC2, your portable APRS system will communicate with your smartphone wherever your smartphone happens to be — in your hand, in your pocket, or anywhere else within about 30 feet.

Initial Setup

The Mobilinkd TNC2 comes with complete instructions on how to pair your smartphone with the device, and how to connect the TNC2 to your radio. I won't bother repeating the excellent instructions in the TNC2 manual. Suffice it to say that it is a simple procedure.

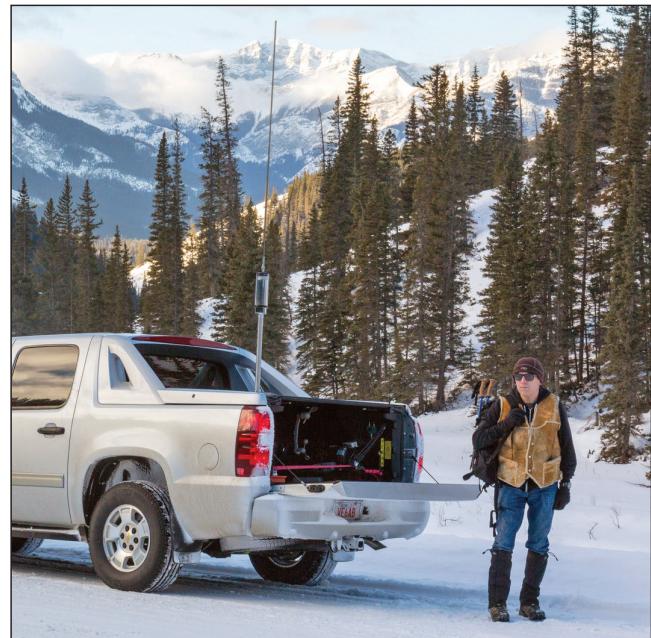
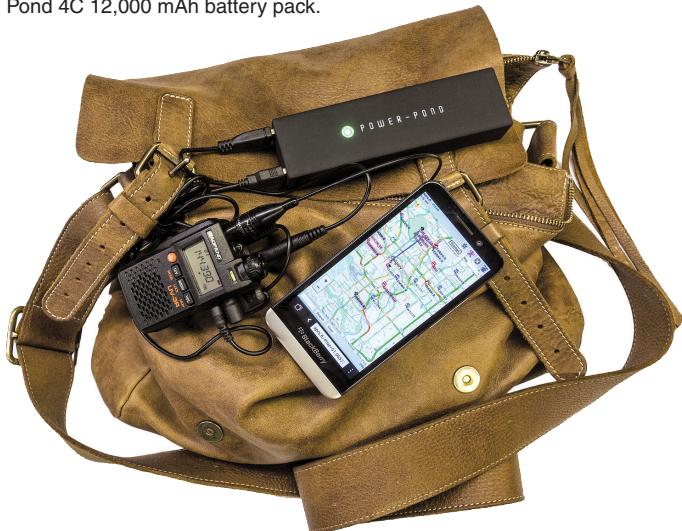
When I initially connected the UV-3R to

Also, be aware that the Mobilinkd is not a full-featured packet radio TNC of the type you may be accustomed to seeing. The TNC2 is really a KISS modem; it simply decodes and encodes packet signals. It requires your smartphone and the *APRSdroid*



Serious portable! This pack contains two transceivers, the TNC2 and the author's *Android* smartphone with APRS software.

For longer use, the author prefers a Power-Pond 4C 12,000 mAh battery pack.



The author uses his vehicle's APRS weather station as a digipeater to make sure his beacons reach the network while he is on the trails.



The author's handheld with the Mobilinkd TNC2 provide a wireless link to the nearby Blackberry smartphone running APRSdroid software.

the Mobilinkd TNC, I quickly realized that I had a problem. I could hear the buzzes of APRS packet transmissions, but few signals were being decoded. After some time spent trying to come up with a solution, I discovered that the problem was with the squelch of the UV-3R. It was very slow to open, which caused the packet signals to be effectively "chopped."

The problem was easily rectified by going to the UV-3R menu and setting the squelch open, or setting it for "0." With the squelch open, and the UV-3R connected to an external antenna on the roof of my home, I was decoding nearly 100% of the beaconing stations heard. Also, setting the volume on the UV-3R for $\frac{1}{2}$ scale on the display works well when connected to the Mobilinkd TNC2.

When it came to portable operating, I know the handheld's "rubber duck" antenna would be less than ideal. After trying the many different handheld whips that I have in my antenna arsenal, I settled on the Comet SMA-24. It seemed to provide the best performance overall. The antenna measures about 17 inches in length and it is very durable.

Going APRS Portable

I was a little concerned about running the UV-3R with its squelch wide open because I thought this might quickly deplete the battery, but I was pleased to discover that this did not prove to be true. I have operated this APRS station for 8 hours at a time, with beacons sent every 10 minutes, without depleting the battery.

Like many APRS devices used in a "tracking" mode, the software doesn't have the means to detect whether the frequency is clear before transmitting. Some applica-

tions detect when the squelch opens and closes, but with the squelch open continuously, that isn't possible. That's why I set my station to only transmit beacons every 10 minutes. I'm less likely to inadvertently cause interference that way. Of course, it also means that some of my beacons will be lost to "collisions" with other signals, which is why I use the best antenna possible.

When I'm portable I often have the advantage of having my APRS weather station in the truck. The station can operate as a digipeater, so it can relay beacon packets while I am hiking. That extends my effective range considerably.

If I wish to operate voice, it's as simple as temporarily disconnecting the TNC2 cable from the handheld, resetting the squelch, and going on the air.

Photos by the author.

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