

# Build a Rapid Deployment Radio Go-Box

**Setting up to support public service events is fast and easy with this station-in-a-box.**

## Glen Popiel, KW5GP

When it comes to portable, public service, and disaster operations, rapid and easy deployment is the name of the game. Our club supports a number of portable operations each year, from local Boy Scout events, to ARRL Kids Day, and of course, Field Day. These events are a great way to have fun while honing emergency setup and operating skills. With each outing I learned to refine my setup, ending with the tidy go-box seen in the lead photo.

## In the Beginning

When I joined the Olive Branch Amateur Radio Club (Olive Branch, Mississippi) several years ago, I was a relative newbie to portable operations. Sure, I'd done my share of Field Days and helped with providing communications for local events, but usually I was operating someone else's station. Later, I dragged along a whole station's worth of my own gear. Setting up a simple HF station took an hour or more of connecting piles of cables, and then tearing everything back down at the end of the event. This gets old in a hurry. Figure 1 shows me on the right, operating my sprawled-out equipment. Next to me Wade Wingfield, KB5SSG, uses a portable go-box station.

## The Portable Rack Case

At one of our portable events, while I was setting up my sprawling HF station, fellow club member Ron Fox, K5RCF, put a big hard-shell plastic box on top of the table. He popped open the front and back covers, hooked up power and coax cables, and was ready to go in 5 minutes. I knew right then that I had to have one of those. Ron's box is a heavy-duty musician's portable rack case with a 6U rack-mount configuration inside. The "U" designation refers to



the height of a component used in a standard 19-inch-wide equipment rack. Each "U" is 1.75 inches high, so a 1U height is 1.75 inches, 2U is 3.5 inches, and so on. Ron's 6U box has 10.5 inches of usable rack mounting area inside the box. Detachable weatherproof covers protect the entire HF and VHF/UHF station mounted inside. On the removable rack-mount shelves, Ron installed an HF transceiver with a matching antenna tuner, a VHF/UHF radio, a 32 A power supply, two power/SWR meters, two speakers, and a power distribution panel that includes a voltage display and pull-out dimmable LED lighting. His box weighs

about 50 lbs and can easily be handled and set up by one person.

## Building the Box

Portable rack cases are available in sizes from 2U to 16U. Some versions even have built-in rollers and pull-out handles. I liked the size and manageability of Ron's setup, so I decided to use a 6U size case, and bought a Gator GR-6L Portable Rack Case for \$180 from [www.sweetwater.com](http://www.sweetwater.com). I installed an Alinco DM-330MV 32 A dc power supply and an ac power distribution panel. Next, I added a Powerwerx PWRgate PG40S backup power switching and charging system for automati-



**Figure 1** — The author operating portable the old-fashioned way on the right, while Wade Wingfield, KB5SSG, uses a go-box, seen on the left. [Dennis Wofford, K5OLV, photo]



**Figure 2** — Rear view of the bottom shelf installation. [Glen Popiel, KW5GP, photo]

cally handling the dc power supply and an external battery for times when ac power is not available. I also added a 1000 W dc to ac power inverter, and mounted a Powerwerx PS-6AA six-way Anderson Powerpole® splitter for 12 V power distribution, as seen in Figure 2.

I chose a Yaesu FT-450 HF transceiver for its convenient size and built-in antenna tuner, and a Yaesu FT-8800 VHF/UHF transceiver for its dual receivers and cross-band operation capability. I mounted the speaker for the FT-8800 on the rack shelf behind the radio, and added an MFJ-864 HF/144/440 SWR/wattmeter to cover both HF and VHF/UHF ranges in a single unit. To support HF digital modes, I added a Signalink® USB sound card interface. Two microphone hooks are mounted on the front-side rack rails.

In the rear of the case (Figure 3) I mounted a 1U rack panel for the coax and power connectors along with a DB-9 connector for the RS-232 Serial CAT connection to the FT-450. I used a hefty 175 A Anderson Powerpole connector for the power connection to an external battery. That would support the full power draw of the 1000 W inverter if needed. I also added an MFJ-914 Auto Tuner Extender to the rear of the middle shelf. All of the equipment is solidly screwed to the shelves, so it stays safely in place.

### Safe and Secure

Teardown is as easy as the setup. I just

**Pop open the front and back covers, hook up power and coax cables, and you're ready to go in 5 minutes.**

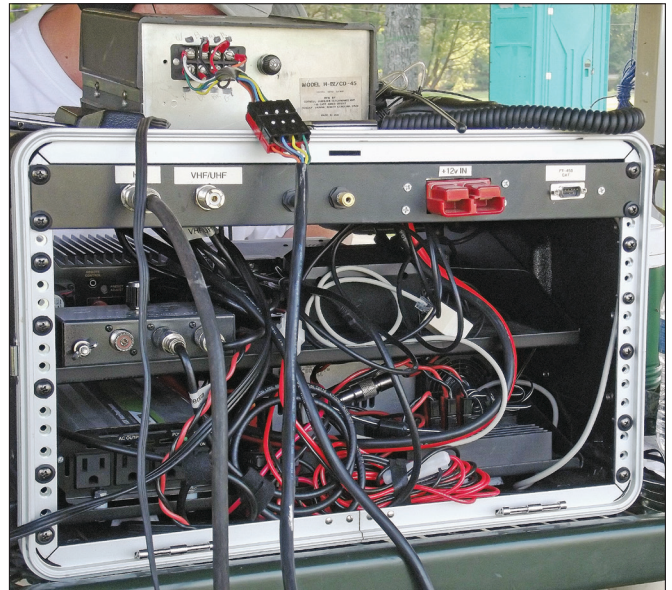
disconnect the antenna and power cables, attach the front and rear covers to the case, and I'm done. The portable station is safe and secure in a rugged weatherproof box, ready for next time. While operating, all of the gear is safely enclosed inside the case, and in the event of bad weather, it's already partially protected from the elements. If things get really bad, all I have to do is put

the covers on and everything stays nice and dry until the storm passes.

### In Summary

The rack mount and shelf design makes equipment additions and modifications quick and easy. My box weighs 60 lbs, right at the upper end of single-person portability. In hindsight, I should have gone with the wheeled version of the case. I am considering replacing the FT-450 and FT-8800 with a Yaesu FT-991, which supports HF, VHF, and UHF operation from a single radio. This might also make room to mount an antenna rotator controller inside, further simplifying setup for Field Day. Now when it's time to go portable, I just put the case in the car, get to the site, and I'm on the air in a matter of minutes with a complete and fully operational station.

Glen Popiel, KW5GP, authored the ARRL book *Arduino for Ham Radio*. He is an ARRL member, Volunteer Examiner, member of QRP-ARCI, and the Olive Branch Amateur Radio Club. By day, he is a Network Engineer



**Figure 3** — Go-box rear view. [Dennis Wofford, K5OLV, photo]

and Technology Consultant for Ciber, Inc., and the Mississippi Department of Education, specializing in open source solutions. First licensed in 1972 as WN4FTX, and later WA4FTX, Glen holds an Amateur Extra class license and has worked in the computer and electronics field for over 40 years. Glen is also a member of the QRP SkunkWerks, a design team of fellow hams and Arduino enthusiasts who have succeeded in getting the JT65 digital mode to run natively on the TEN-TEC Rebel CW-only QRP transceiver. He currently lives in Southaven, Mississippi, where he continues to develop fun and exciting new Arduino projects. You can reach Glen at [kw5gp@arrl.net](mailto:kw5gp@arrl.net).

For updates to this article, see the QST Feedback page at [www.arrl.org/feedback](http://www.arrl.org/feedback).

**VOTE**  
Did you enjoy this article?  
Cast your vote at  
[www.arrl.org/cover-plaque-poll](http://www.arrl.org/cover-plaque-poll)

**Ham Radio is for Everyone – Including You!**



Learn more!  
[www.arrl.org/what-is-ham-radio](http://www.arrl.org/what-is-ham-radio)