Two Go Boxes to Go

by Liz (K5EMB) and Mike (W5MDB) Brown

Whether it's for ARRL Field Day, emergency preparedness, or any other event away from your home QTH, having a "Go Box" is desirable for many amateur radio operators. Some want an ultra-portable system that can be easily carried in one hand (or in a backpack) while others want an all-singing, all-dancing system that leaves no mode and no band behind. In our case, we simply saw an opportunity to re-purpose a couple of rigs that were gathering dust. So, we made a list of our objectives that itemized our "wants and needs." Mind you, this is not a comprehensive list:

Needs

- VHF/UHF/HF
- Easy to set up
- Ready-to-run—
  most essential devices in one box
- Can be carried by one person
- Fun to build

Wants

- Can be powered off the wall or by battery
- Easy to maintain
- Flat top
- Inexpensive
- Use as much of what we have rather than buy new

Next, we made an inventory of parts on hand:

Icom 706 HF-6m + 2m
Icom 208H dual-band 2m/440
Kantronics TNC KPC-3+
SignaLink™ USB
LDG Z-100 autotuner
A small speaker
A variety of switches, plugs and jacks
Jetstream JTPS31 power supply

The Design

Our first idea was to build a plywood box that contained all the above parts. We tried many configurations and concluded that the construction was more complex than we wanted, would weigh quite a lot, and not be very weather and dust resistant. We decided to purchase a molded rack case and move on.

We bought a Gator GR4S shallow rack case, 4U high, with 2 shelves. The box is not too heavy and is not too big. Next, we tried to fit all the gear in the case. We discovered there really wasn't enough room for everything and made the kit heavier than we wanted. So, we decided to create *two* boxes, one for HF and another for VHF/UHF. Two kits meant there was plenty of space for operation and to stow cables for power and computers.

The HF box would have the 706, the SignaLink™ for digital modes, the autotuner, and the Jetstream supply. The V/U box would have the 208H, and the TNC for packet. We bought an Astron SS-18 switching supply for this kit. We also bought two West Mountain RIGRunner 4005 distribution panels. Our power philosophy was that if a battery or other external source was required, that would come from a separate box rather than be installed. This saved considerable weight. We wanted to be able to conveniently switch from the on-board power supply to the external source from the front panel as well. This would avoid digging in cramped quarters, pulling on cables and potentially causing damage. We mounted a strip of LEDs under the top shelf that lights up the controls and the desk in front. Lastly, we wanted to easily switch from speaker to headset.

Construction

Layout was easy. The main thing was to make sure we had clearances for operation, cables, and bolting everything down. We did not have the mobile bracket for the 706 and didn't want to buy one, so we fabricated them out of stock angle brackets. We did the same for the Jetstream.

The 706 and the Jetstream have metric 4M-0.7 mounting holes. We had the bright idea to standardize on metric hardware for mounting everything! Unfortunately, this required many trips to Home Depot, Lowes and Ace hardware in search of all the nuts, bolts and washers. We may re-think that decision for future projects.

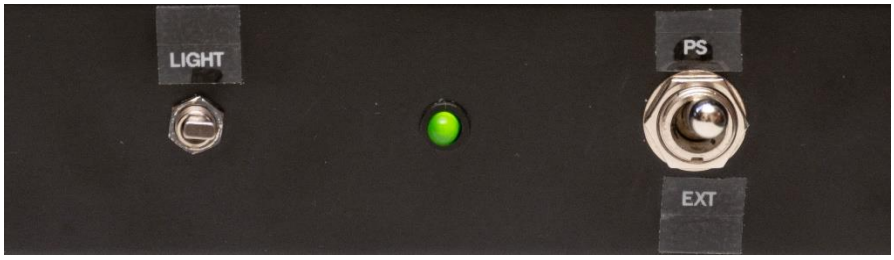
We used cable ties to secure the lightweight devices. The ties pass through holes with rubber grommets to avoid chafing. To make sure these devices would not slide around, we used some weatherproof double-stick foam tape on the feet. For the SignaLink™ and Z-100, we placed some high-density foam under them to help hold them in place.

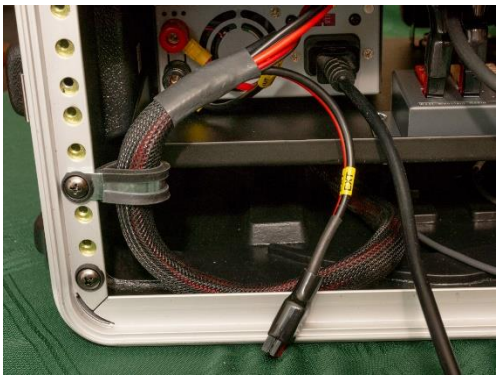
The front switch panel for the V/U kit was salvaged from some ancient electronics. We covered three rectangular holes with a strip of stock aluminum, and while this was a lot of work, we were able to recycle yet another junk box treasure.

We installed a zippered pouch in the rear cover using washers and pop rivets. This holds instructions, adapters, fuses and the microphone. We discovered we could wrap 50 feet of coax around the pouch and it would stay in place.

Wiring

The front power switch is a hefty DPDT toggle. In the "UP" position, power comes from the on-board supply; "DOWN" switches to a pigtail in the back. A green LED shows that the RIGRunner is energized. Next to the LED is the switch for the light strip.





Audio comes from the radio's external speaker jack to a DPDT switch. You can select either the speaker or the headphone jack. We discovered that the audio level relative to the speaker was very loud going into the headset. Two 500-ohm resistors from the junk box solved that problem right away. The jack is wired so that mono audio feeds both ears on our stereo headset. For the 208H, we brought out a 3.5mm jack for programming should that be necessary. Without it, we would have to remove the shelf to get access to the radio.

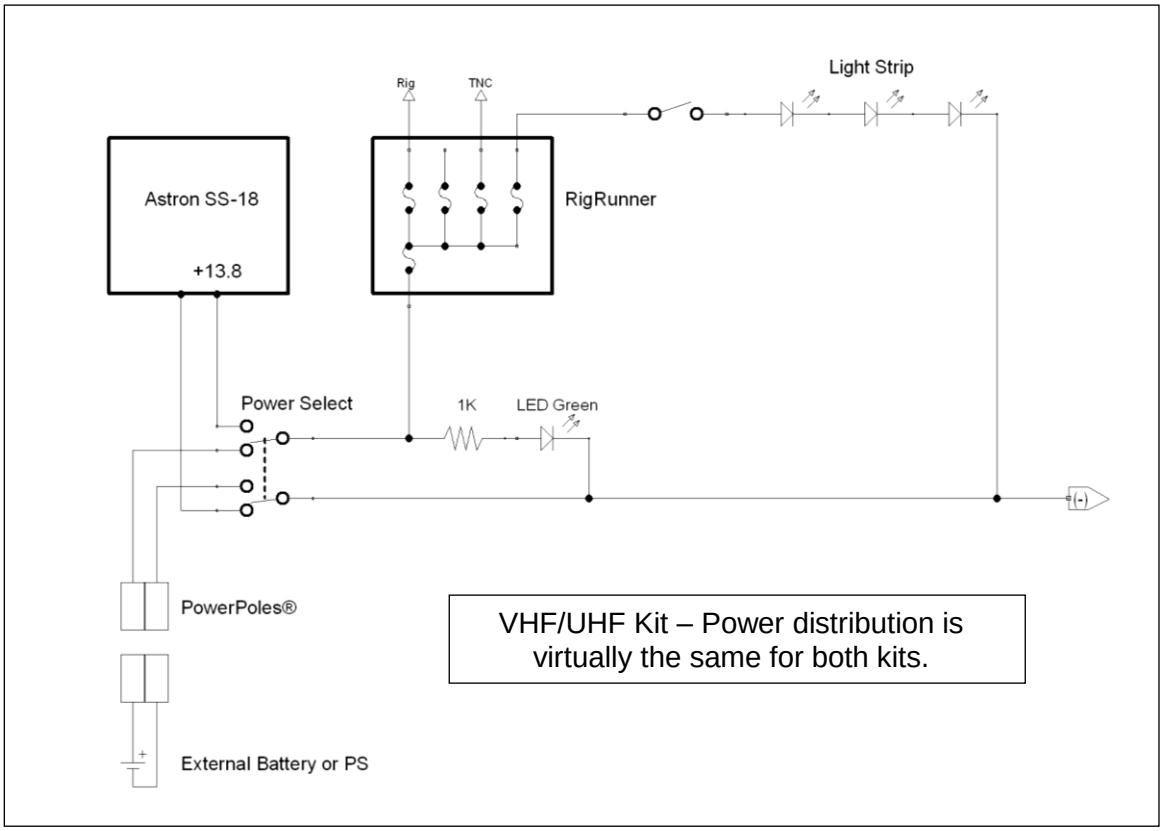
Conclusion

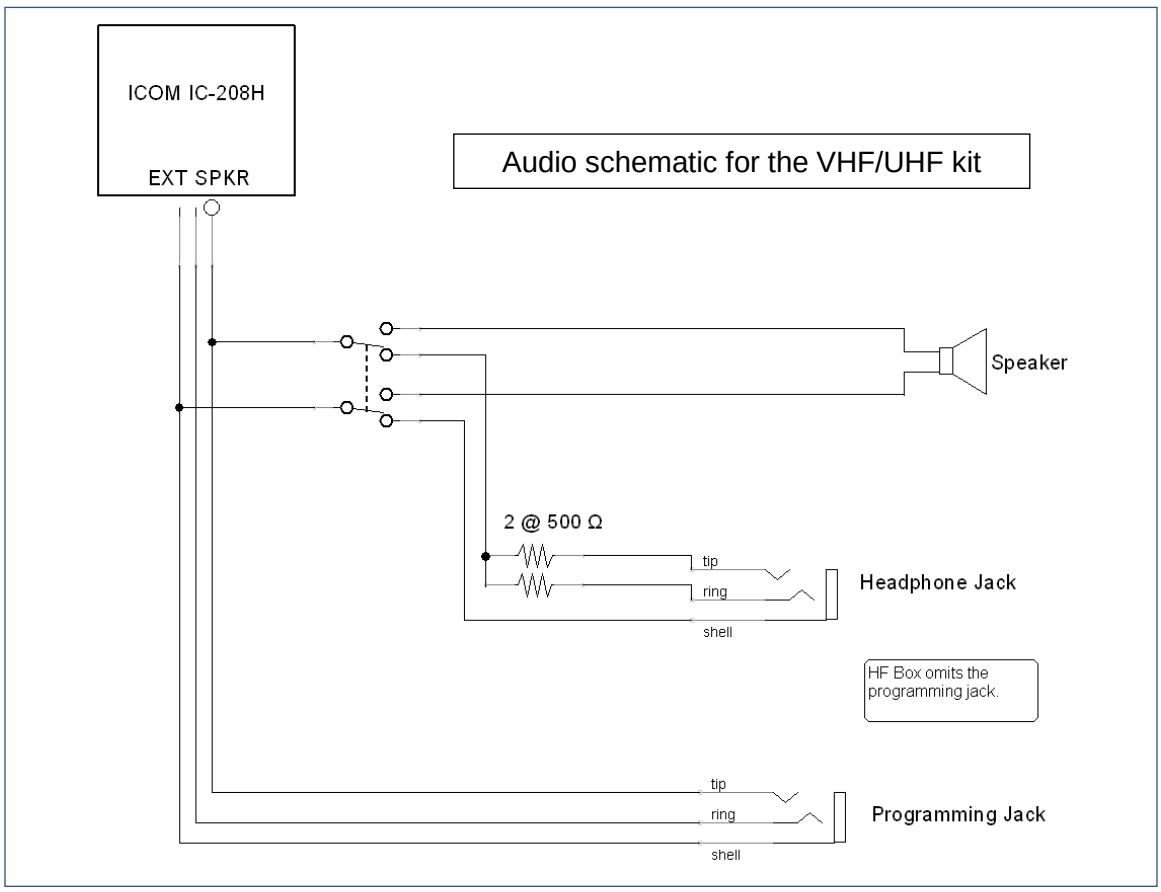
We think we fulfilled most of our objectives. Each kit is light enough to carry in one hand and set up on a table. The top is relatively flat and the two can be stacked if necessary. Except for an antenna, the kit is self-contained. We used a lot of what we had on hand.

The only negative aspect was that we spent more than we expected. The extra rack case with shelves, RIGRunner and power supply were the major budget busters. However, that was offset by the convenience of rack mounting. We doubt we could have home-built a box as light, flexible and durable as the Gator cases.

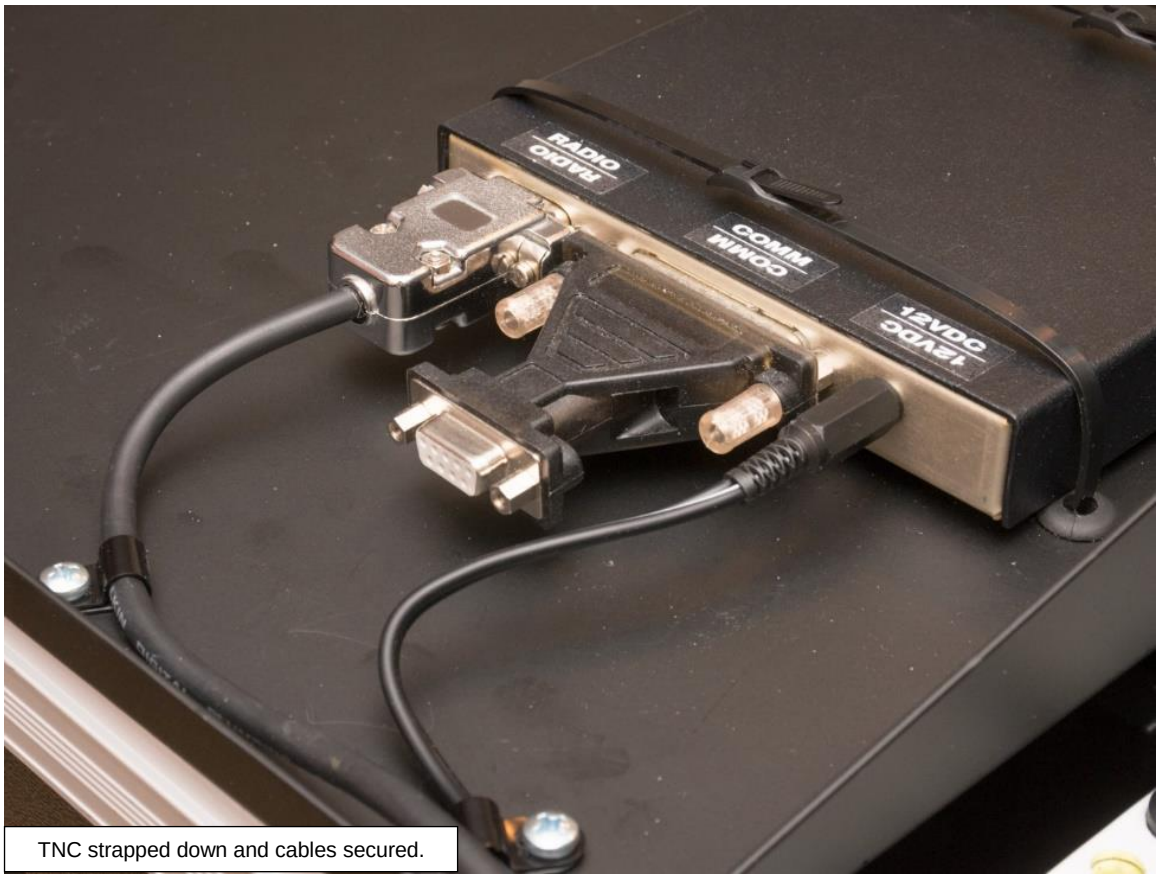
We're looking forward to using these in the field. As with all things amateur radio, we expect to tweak the design as time goes on. Look for more pictures and schematics at the end of this article.

73 from K5EMB and W5MDB


Light Strip
Rig
TNC
Astron SS-18
+13.8
RigRunner
Power Select
1K
LED Green
(-)
PowerPoles®
External Battery or PS
VHF/UHF Kit – Power distribution is virtually the same for both kits.

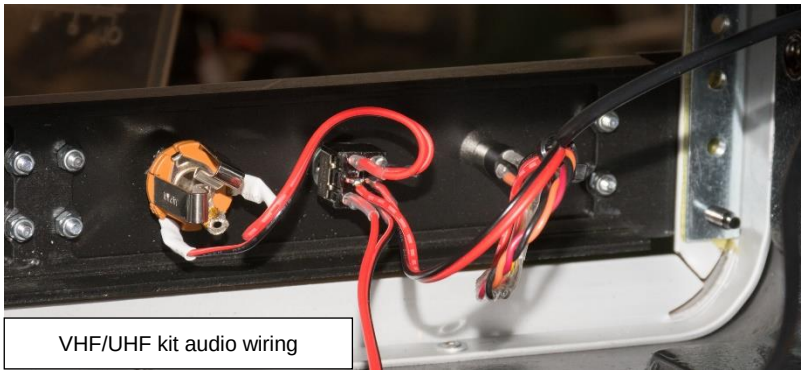

ICOM IC-208H
EXT SPKR
Audio schematic for the VHF/UHF kit
Speaker
2 @ 500 Ω
tip
ring
shell
Headphone Jack
HF Box omits the programming jack.
tip
ring
shell
Programming Jack

More Pictures

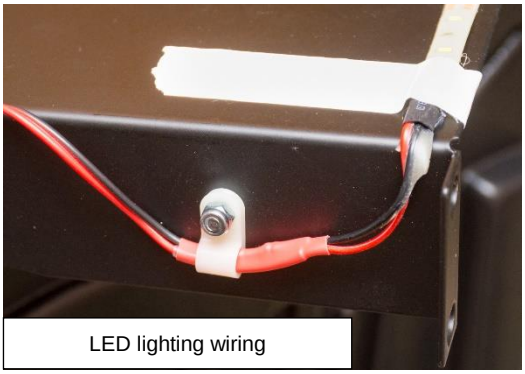


TNC strapped down and cables secured.

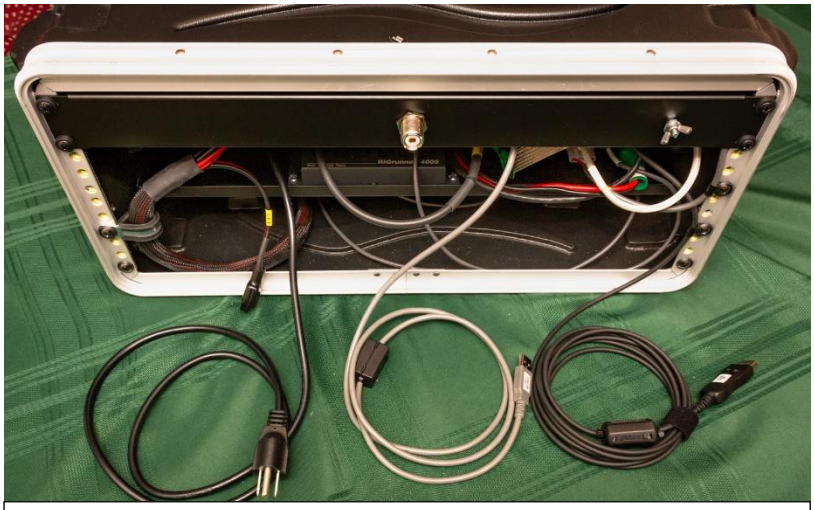
TNC straps secured through grommets.



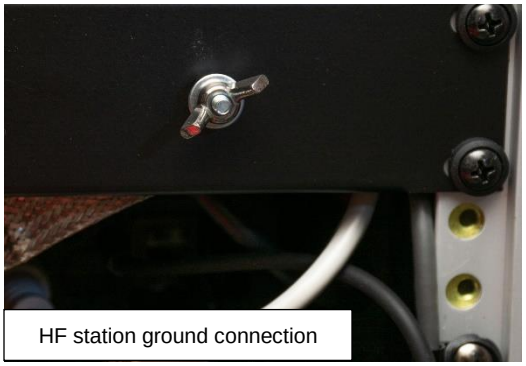
VHF/UHF kit audio wiring



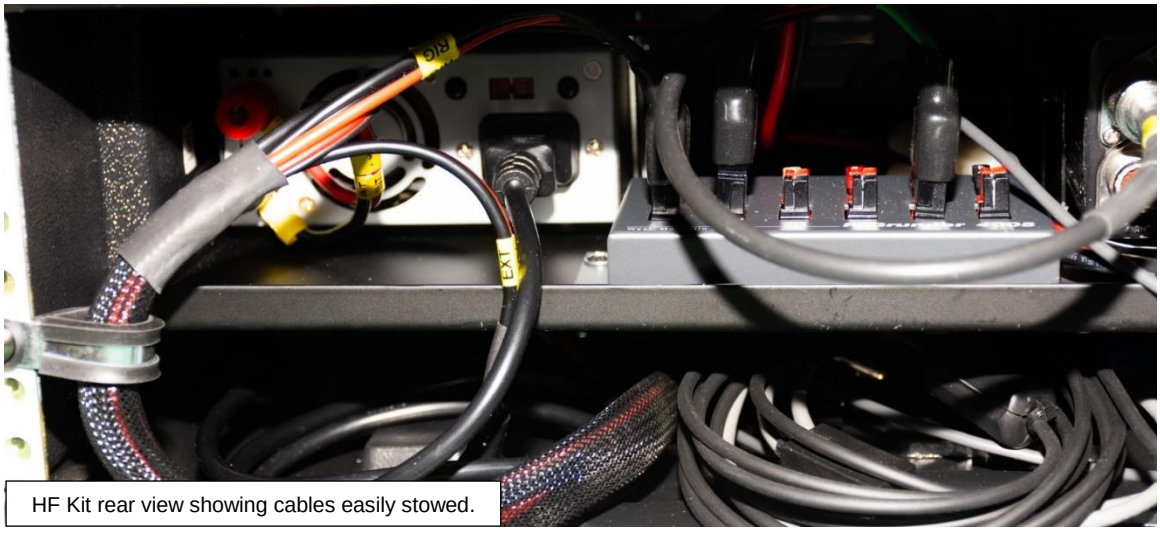
LED lighting wiring



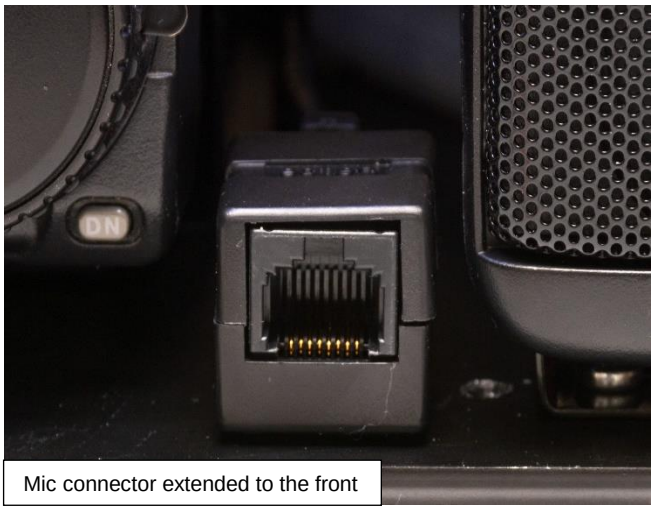
HF Kit rear view showing antenna connector brought out to the rear panel because it's not accessible otherwise.
Cables L to R: AC power; SignaLink USB; Icom CI-V USB



HF station ground connection



HF Kit rear view showing cables easily stowed.



Mic connector extended to the front

Mic hanger detail

Completed HF Go Box