Building A Simple Wooden Emergency Radio Go-Box

Gordon Gibby KX4Z

Introduction – Why a go box?

The concept of a "go-box" applies more to situations where you may be conducting radio communications for an extended period, and possibly without normal power or antennas. An emergency deployment for example. Digital communications often involve some extra "boxes" such as a Signalink or other TNC-equivalent, and a portable computer. While there are elaborate transportation boxes designed to be water- and shock-proof, most of us just need some structure that provides solid mounting for all our gear, so we can pick up one box---not juggle multiple items connected by expensive and fragile connectors.

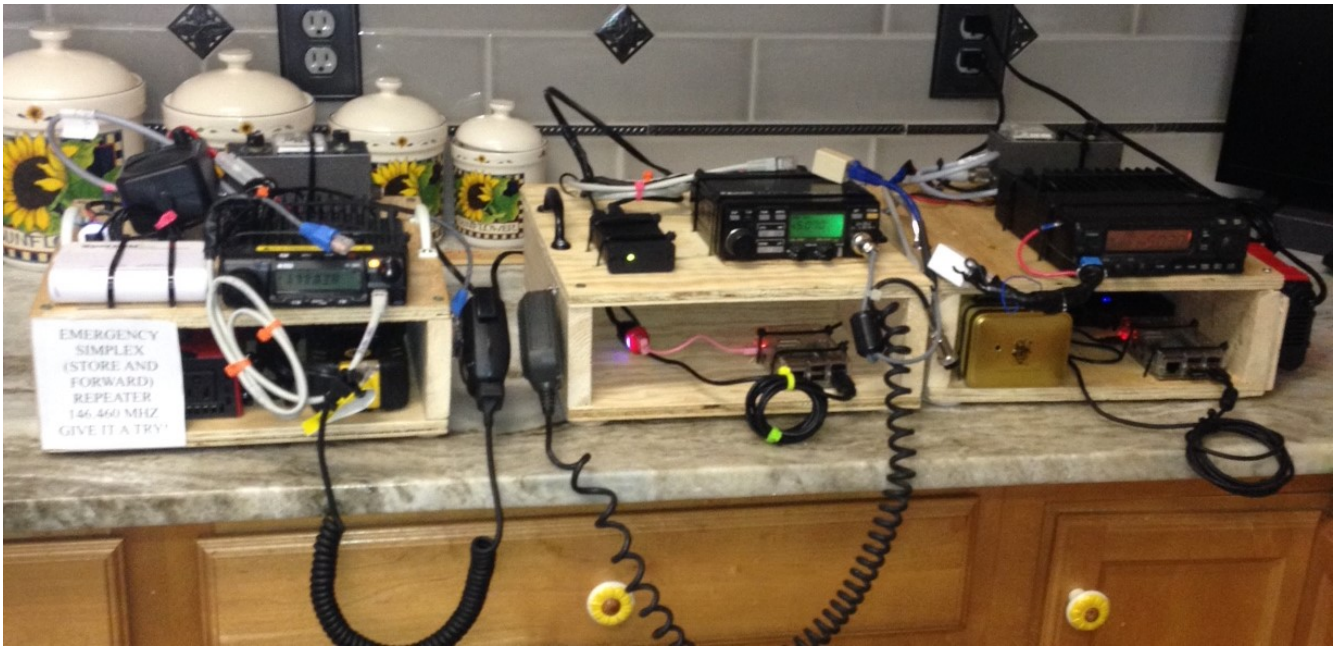

Figure 1 – *three different go-boxes made for different purposes. Left-most is a self-contained self-powered simplex repeater in a box. The middle is provides an additional frequency to the linbpq node repeater in the right-most go-box.*

The items we need mounted generally include:

- vhf/uhf (or even HF) transceiver
- microphone
- modest (gel-cell) storage battery
- some charging system for the storage battery
- TNC or sound-card interface system (e.g., Signalink)
- Some form of output indication +/- SWR indication

There are lots of ways to accomplish these goals. An open-top wooden shelf system allows easy access to the controls of the radio and to radio and other connections. This article will show one way to

accomplish this.

STEP ONE: Measure and Cut Some Wood

Figure 2 – *Making accurate and safe cuts of plywood and lumber to create a go-box.*

I use a 2' x 2' plywood square from a home improvement store, roughly 1/2” thick, for the top and bottom. Depending on the height of the enclosure desired, I use a 1”x4” lumber plank (soft pine) or 1”x6” lumber plank (soft pine) for the sides. Avoid expensive wood like oak!

The 2'x2' plywood gets cut in half in both directions, and makes 4 pieces of 1'x1' plywood, enough for two go-boxes. Cut the side planks into 12” lengths. As with all woodworking, measure TWICE so you only have to cut ONCE, and be very careful with power tools --- keep your fingers WELL AWAY and don't release your watchfullness until the blades have COMPLETELY stopped. Use hearing protection of some sort.

Sand the rough edges enough to avoid splinters. 80 or 100 grit sandpaper works well, even just held against your palm.

STEP TWO: Screw It Together

Figure 3. *Screwing the boxes together. It is a lot easier if you have more than one drill, so you don't have to keep switching tools.*

I screw the "bottom" onto the two sides, and then I usually put only 1 screw in the top so it can rotate and allow me access to build, and then finish the screws when everything is installed.

You can use decking screws of about 1-5/8" length, or #8 or #10 screws of about 1-1/2" inch. You can avoid splitting the side lumber planks by drilling pilot holes of about 3/32" size an inch and half deep.

I often drill a 3/4" or 1" hole in the "back" area of the top shelf, because there are always power cables or something that needs to traverse from bottom shelf to top shelf and I like them to be protected inside the footprint of the go-box.

STEP THREE: Build Your Power Wiring

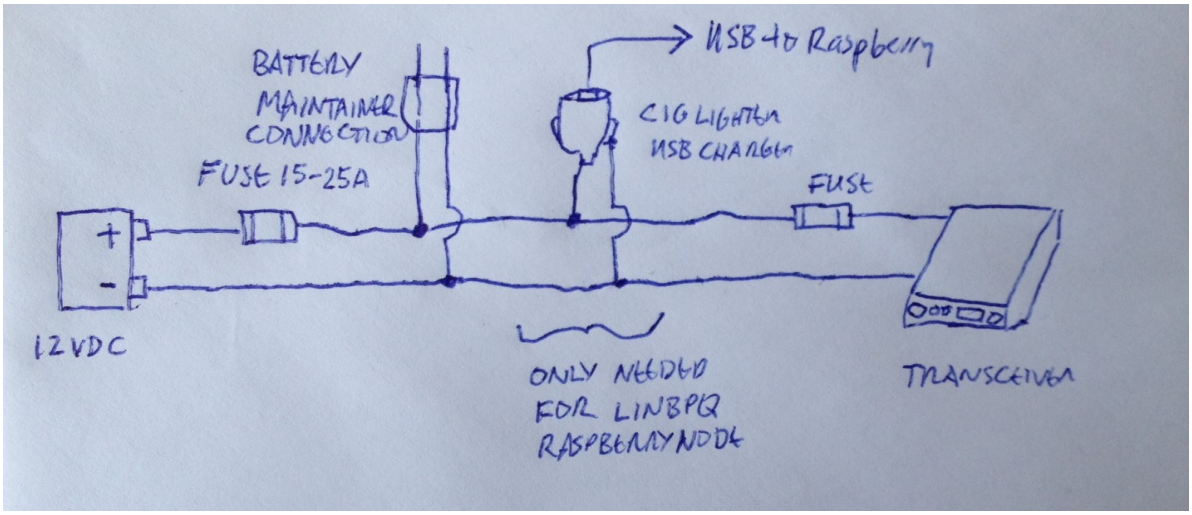

Figure 4. *Power wiring. Use 16-gauge or 14-gauge wire for the main power carrying elements. Don't skimp on fuses! Carefully protect against short-circuits.*

Most transceivers require 12-13.8 VDC. For extended operation, a 7-, 8- or 9-Ahr gel-cell 12VDC sealed lead acid battery is nice, and they can be obtained for $10-$16 from apexbattery.com You can also find them in the hunting section of Walmart because the power feeder-timers. These can be mounted safely on their side to fit if needed. I prefer to keep the power wiring tabs accessible, at the back of the go-box, but recessed in about 1/2" so nothing hits them.

Stanley makes a 1-1/2 ampere "battery maintainer" that properly charges these batteries, keeps them from sulfating if charged frequently or left connected, and is adequate to provide enough power for normal duty cycles of operation of 50-watt output transceivers. These cost just under $30, and can be mounted either inside or on the side of the go-box. The kit includes some connectors that can go to the battery; I use this as part of my power wiring.

The 12VDC wiring must handle 15Am or more, so #16 stranded wire is a reasonable choice. Be certain to put a FUSE as the first thing in the (+) connector to the battery. From there the wiring must go to the battery maintainer, and then onwards to your loads: your transceiver may have its own fuse, and if you're using something else that needs power (like a Raspberry Pi, or a sound-card or TNC that needs power beyond the USB connection) you may need to connect other loads. To power a Raspberry Pi, I've learned how to make soldered connections to the internal wiring of a certain brand of cigarette lighter-type USB chargers that put out as much as 1.5 Amps at 5VDC USB.

The enclosed schematic shows how to wire the power wiring. You may need a special connector for your transceiver, possibly an Anderson PowerPole connector.

Optionally, you may wish to provide a power cable to go to your car, perhaps to the cigarette or accessory power connector. In this case, remove the gel-cell from the system before plugging into your car, or a very large charging current may flow from your car to the low-impedance of a partially discharged gel-cell, resulting in either a blown fuse, or damage to the gel cell, which wasn't meant to be

charged at faster than 2 Amps.

Be sure to have insulating shields around all (+) wiring terminals and connectors to avoid damage if there is an accidental touch to a grounded wire or object.

STEP FOUR: Mount Your Equipment

There are several ways to mount your equipment. If you have a bracket for the transceiver you can screw it to the wood with #8 1/2" sheet metal screws. Likewise the Stanley Battery maintainer which comes with "ears" for screw mounting.

An easy way to mount lots of items that can't be easily screwed is to drill 1/4" holes at their perimeters and use tye-wraps encircling them and a portion of the wood shelf, to mount them very securely. This has worked well for me for Raspberry Pi's, 2-meter transceivers, SWR meters, Signalinks and other gear. I generally use 2 such wraps on each piece of equipment, and you may need to purchase very long tye-wraps or else use 2 to encircle a piece of equipment.

Some nice touches are to provide some form of output signal indication --- even a cheap CB SWR meter will work with only modest losses at 2 meters. Adding a couple of pull handles near the edges of the top shelf makes it a very easy bundle to carry. I often tye-wrap the microphone connector and the digital connector together so they don't get lost; either one or the other is always going to be connected. Adding a mic hanger on the side makes it much easier to transport the microphone safely.

Of course, you could stain and seal the wood if you were really into woodworking!

Add some felt pads on the bottom to avoid scratching surfaces. You should be good to go!