Alachua ARES Emergency VHF Go-Box Construction

by Gordon Gibby KX4Z

Three VHF transceiver go-boxes constructed by Alachua County ARES volunteers in time for Hurricane Irma

Alachua County Emergency Management purchased multiple VHF radio systems and AGM 12-volt batteries for emergency communications, with purchase lists compiled by Gainesville Amateur Radio Society member Larry Rovak WB2SVB and President Pete Winters W4GHP

Plans for turning the components into waterproof and compact stations went into high gear with the projected arrival of Hurricane Irma cutting through all of the State of Florida. ARES volunteers (Susan Halbert KG4VWI, Art Grant KM4YGH, Vann Chesney AC4QS and Rosemary Jones KI4QBZ) met at the home of Gordon Gibby KX4Z to finish putting three portable stations together.

The equipment provided by Alachua County EM included Yaesu FT-7900 dual band 50-watt FM transceivers, Jetstream JPS-28 25-Amp continuous 120VAC power supply (see http://www.cheapham.com/products/Jetstream-JTPS28.html) , KI0BK Low Loss PowerGate auto-battery backup switching systems (http://ki0bk.no-ip.com/~pwrgate/LLPG/Site/LLPG.html) , VHF SWR meters, MFJ powered speakers, and PolyPhaser lightning arresters. The VHF transceiver includes its own speaker, so the powered speakers are optional.

Jeff Capehart W4UFL, ARES Emergency Coordinator suggested using the RIDGID waterproof tool boxes, which provide multiple sections. (Ref: http://www.homedepot.com/p/RIDGID-22-in-Pro-Organizer-Black-222571/205440492 $29) However applying fasteners to the inside plastic surface is problematic to avoid harming the waterproof exterior. The RIDGID box comes with two vertical dividers – so a convenient solution was to cut 1/2” plywood so that it fits the larger central compartment, and secure it with #6 x 1/2” sheet metal screws through the plastic dividers and into the edges of the plywood base. Small pre-drilled holes into the edges of the plywood were used to guarantee the wood wouldn't split when the screws were inserted. To fit the molded plastic case, the edges of the plywood had to be cut back significantly.

AC power supply and radio assembled on plywood base attached to plastic RIDGID box dividers so system can be inserted and removed.

With the constrained space, the best fit seemed to be to mount the Jetstream AC power supply to the plywood base with #8 x ½ or 5/8 sheet metal screws, through ventilation slits at two corners, and through one hole drilled through a partial thru-hole in the back right portion of the power supply. Brackets had to be constructed to support the VHF transceiver. Pre-drilled metal plates from Home Depot allowed for easy construction of the brackets. Bends were figured out, and then accomplished using a vise, a table edge, manual pressure and a bit of tapping with a hammer. (See: http://www.homedepot.com/p/Simpson-Strong-Tie-3-1-8-in-x-7-in-Tie-Plate-TP37/100375215 and http://www.homedepot.com/p/Simpson-Strong-Tie-20-Gauge-1-1-4-in-x-9-in-Strap-Tie-LSTA9/202255804)

Hand-Bent Brackets – using vise, table edge and small hammer

Marking the screw hole locations for the left bracket.

Once the brackets were bent, the right bracket was attached to the plywood base so that there was about 3/8 – 1/2" clearance for the mic cord on the transceiver to attach. The left hand bracket was then attached (only one screw is possible) to the transceiver and marks made to indicate where the bracket should be screwed to the base. Drilled holes aren't generally necessary when screwing into the top surface of the plywood with #6 screws.
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After the brackets are installed, the Jetstream power supply was inserted, and screwed into place on the plywood base --- then its cover was slide over the power supply and secured with the supplied side screws.

At that point the VHF transceiver could be re-installed.

Our volunteer crew had friendly "competitions" to figure out the best techniques for finishing off the installation, which involved various solutions to fit power cord, amplified speaker, and VHF SWR meter – mulitple excellent solutions were found.

The PowerGate will automatically provide power to the transceiver from either the battery or the AC power supply as needed, and uses PowerPole connectors, so all the proper wiring was completed with Power Pole terminations, using color-coded #14 stranded wire. Fuse receptacles were provided at the battery end of the battery wiring, and either at the transceiver input or the Jetstream power output --- the Jetstream high-amperage output is only at the FRONT of the unit.

Additional options included making up the mini-DIN 6pin plugs to fit the packet connection in the back.

PROGRAMMING—Ham Style

Although programming cables are commercially available for the Yaesu FT-7900, we couldn't get them in time before the hurricane and took advantage of a fascinating tip published by VK4GHZ to use an ICOM CI-V computer cable to connect to the PTT and GND terminals of the rear-panel mini-DIN --- and CHIRP was able to program all three units to match the local Baofeng UV-5R channel scheme with which many of our members are very familiar. (Ref: http://vk4ghz.com/ft-7800r-programming-lead-ci-v-adapter-lead-2/)

Comparison of finished radio mounting and in-process plywood base with brackets.