



Sticky Notes

GECO Newsletter
Vol.6, No. 4, May 2021



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Ready to Serve and Sustain Our Community

International Space Day

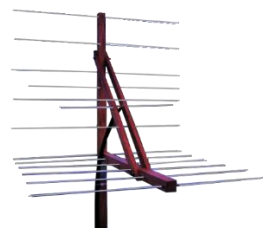
A March 13 spacewalk restored the antenna of the Amateur Radio on the International Space Station ([ARISS](#)) ham station in the Columbus module to service. This gave a boost to interest in contacting the ISS and to working satellites as well. And it's also a reminder that May 7 is International Space Day.

We found an interesting [dual band corner reflector design](#) (by Andrew ZS1AN). The antenna design is both dual band and dual purpose. It is easier to build than most yagis. Its main purpose is for working satellites (see diagram A on the right). Diagram B shows the antenna set up as a directional antenna for contacting ground stations.

We haven't done any satellite work, but we like the idea of being able to use it as a ground level directional antenna. For EmComm HAMs working from a fixed location, this dual-purpose antenna is very practical. You get two antenna functions for making one antenna.

We think HAMs with HTs should seriously consider this antenna project. The OEM rubber duck antenna on most HTs is limited in performance. Replacing the rubber duck with a high gain whip will be better. Both those antennas are omni directional. An HT benefits greatly from a directional antenna when trying to hit a repeater or a distant station.

When you are home, you can connect your HT to this dual purpose antenna. If you get clever, you can modify the antenna mount to let you quickly shift the antenna orientation. For EmComm work, HTs benefit greatly when used with a directional antenna. This antenna isn't particularly portable, but if at a set location, it lets you work satellites or hit distant repeaters with your HT. 🦎



(A) Antenna set up for satellite work.



(B) As a directional antenna for ground stations.

In This Issue			
International Space Day	1	Simple Storage for HT Cases	5
Updated Radio Frequency Exposure Rules	2	Deep VU3YDA Portable HF Man Pack	6
GECO HT Ready Pack Update	3-4		

Updated Radio Frequency Exposure Rules

ARRL Bulletin 11 [ARLB011](#)

From ARRL Headquarters

To all radio amateurs

Some of the key points in this announcement (directly quoted from ARRL):

- “[Report and Order](#)” governing RF exposure standards go into effect on May 3, 2021.
- The new rules do not change existing RF exposure (RFE) limits but do require that stations in all services, including amateur radio, be evaluated against existing limits, unless they are exempted.
- For stations already in place, that evaluation must be completed by May 3, 2023.
- After May 3 of this year, any new station, or any existing station modified in a way that’s likely to change its RFE profile — such as different antenna or placement or greater power — will need to conduct an evaluation by the date of activation or change.
- ***The Amateur Service is no longer categorically excluded from certain aspects of the rules, as amended, and licensees can no longer avoid performing an exposure assessment simply because they are transmitting below a given power level.*** [Editor Note: Emphasis is ours.]

According to Greg Lapin, N9GL (chair of the ARRL RF Safety Committee and a member of the FCC Technological Advisory Council--TAC) “...every ham will be required to perform *some* sort of calculation, either to determine if they qualify for an exemption or must perform a full-fledged exposure assessment. For hams who previously performed exposure assessments on their stations, there is nothing more to do.”

When I first got my Tech license in Fall 2006, and upgraded to General in Spring 2007, I looked at the RFE rules. On paper, HAMs were required to keep station logs to document they were “operating in accordance with good engineering and good amateur practice” (CFR Subpart B, §97.101). I asked my Elmer Mark N7YLA, “how many folks perform RFE safety evaluations?” I don’t remember his exact reply. But I got the impression most folks he knew avoided the issue (of RFE) by limiting their transmitter power to a maximum of 100W. As Greg Lapin N9GL stated, we must all “perform some” sort of RFE calculation.

ARRL members can get help from the ARRL. This situation is a good reason why I’ve been an ARRL member since I got my license. Here are resources on the ARRL website regarding RFE.

- “[RFE and You](#)” (free download)
- “[Learning to Live with RF Safety](#),” QST March 2009 pp. 70-71.
- [RF Exposure Station Evaluation and Exemption Worksheets](#) (Use this worksheet to see if your station qualifies for an exemption or if you need to do a full RFE assessment.)
- [RF Safety Calculator \(Online calculator\)](#). It’s “as is” so check for most current regulations.)
- RF Exposure and You, [link to download of the entire book, 8MB](#) ([Chapter 5 References](#) needed for filling out worksheets.)
- [RF Safety at Field Day QST](#) June 1999, pp. 48-51, A case study of Field Day with NSRC in a public park

To be clear, the amateur RFE specifications have not changed. New stations or modified stations must document compliance before operating. Existing stations must document their status (i.e., exempt or not) by 3 May 2023. 🐸



GECO Ready Pack Update

In 2019, GECO reported on its [EmComm HT Ready Pack](#) project. We wanted a multi-purpose HT backpack system for:

- 1) quick response recon scouting when activated for EmComm duty.
- 2) practicing HT operations with minimal preparation; and
- 3) use on one-day / short duration activities such as hikes or during camping trips.






This article reviews the radio power and antenna options of the GECO HT Ready Pack. [Note: All batteries are on float charge and are loaded to the pack immediately before use.]

New Power Option Added: Juan KM6DBN suggested including a USB battery pack, USB charging cable (which requires the HT charging cradle and a USB battery pack). This adds 0.4 kg to the existing pack weight of 4.3 kg.



The GECO HT EmComm Ready Pack is 56x36x20 cm, weighs 4.3kg with masts and radio gear.

The existing radios, batteries and charging systems in the HT Ready Pack are shown below.

BF F8HP & UV5R	Speaker / Mic	Extended Battery	AA Battery Pack	Battery Eliminator
 <p>Dual band OEM rubber duck antenna and 1800mAh Li-ion battery</p>	 <p>Consider boom mic / headset if operating in high noise environment</p>	 <p>Spare back-up radio battery rated as a 3800 mAh Li-ion battery (min. 1 per radio; but more is better). More power = longer operating time.</p>	 <p>The holder uses six AA 1.2 V rechargeable or 5 1.5 V alkaline batteries. Have one set of each type of battery on hand. Recharge as needed.</p>	 <p>with spare fuses</p> <p>Fused 12 VDC socket and battery clips & spare fuses</p>

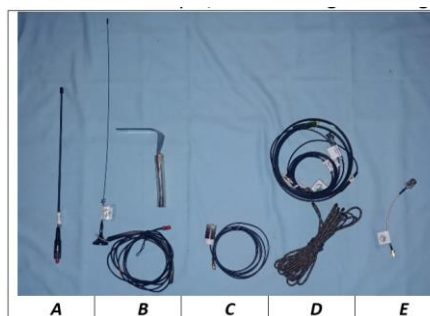
New Antenna Added: Joe N6WZK donated a compact vertical VHF/UHF antenna to GECO. The HYS antenna is 43 cm tall and 1.9 cm diameter with an SO-239 connector. It adds 0.095 kg to the HT Ready Pack weight.

[Note: Items C and E (see photo on the right) are needed to use this antenna.]

Each radio is put in the pack with its OEM rubber duck antenna. The other antennas and components in the pack are:

- A. High gain whip antenna;
- B. Mini-magmount antenna (with ground plane);
- C. SMA-M/SMA-F Extension cable for high gain whip (A);
- D. Roll-up emergency antenna and paracord;
- E. Pigtail (SMA-F to SO-239) if a mobile or base station antenna with PL-259 coax or connectors is available.

New Antenna Mount: The photo (above right-most) shows the HYS antenna fitted into a 3/4-inch PVC T-fitting. This required us to make an adapter so it could be used with the existing dual 1/2-inch PVC mast system in the HT Ready Pack.

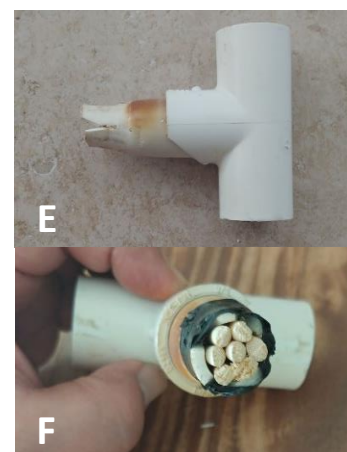
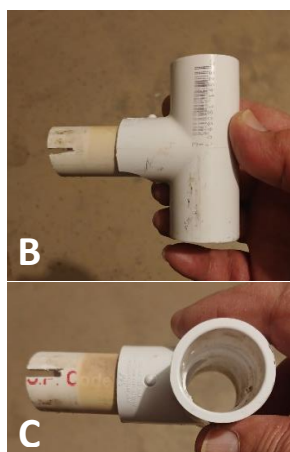
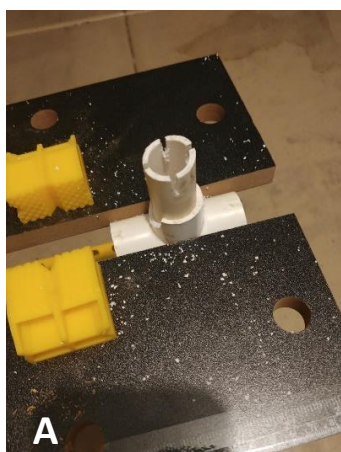


The HT Ready Pack Dual Mast System:

The new antenna mount had to be compatible with the Ready Pack mast system. The mast system was planned for pedestrian mobile and portable (temporary fixed station) operations.

The HYS antenna mount uses a $\frac{3}{4}$ -inch PVC T-fitting to hold the antenna. The mast system uses $\frac{1}{2}$ -inch PVC pipe. This is the connection point for the mast. The HYS mount had to go from $\frac{3}{4}$ -inch PVC to $\frac{1}{2}$ -inch PVC. We made do with what we had on hand. The photo on the right shows that not all $\frac{3}{4}$ -inch PVC T-fittings are created equal. We selected the longer bodied T-fitting to get more support for the HYS antenna base.

The horizontal connecting piece from the T-fitting to the Pack Mast needed to be $\frac{3}{4}$ -inch on one end, and $\frac{1}{2}$ -inch on the other. We notched the end to go to $\frac{1}{2}$ -inch elbow (A-C below), heated it with a hot air gun (photo D), and gently squeezed it to fit the $\frac{1}{2}$ -inch 90° elbow of the Pack Mast. The heated,



crimped end of the PVC stub (E) collapsed from the process. We inserted short pieces from a bamboo chopstick to expand the PVC for a tight fit into the $\frac{1}{2}$ -inch PVC elbow (F). A few wraps of black electrical tape



covered any rough edges. To get a snug fit of the HYS metal antenna base, we inserted a small piece of firm foam sheeting salvaged from packing material from an electronics parts box. The foam compresses about $\frac{1}{8}$ th of its thickness. This is enough for us to wedge the HYS antenna base into the $\frac{3}{4}$ -inch PVC T-fitting (G). Photo H shows the HYS $\frac{3}{4}$ -inch PVC mount connected to the $\frac{1}{2}$ -inch PVC 90° elbow of the HT Ready Pack mast system. The final HYS PVC mount is painted to match the mast system. The HYS PVC mount weighs 0.08 kg.

These new systems increased the total weight of the HT Ready Pack from to 4.3 kg. to 4.875 kg. 🍌

Simple Storage for HT Cases

We have nylon cases for each of our HTs. We needed a way to store them while having easy access to them for rapid deployment. We decided to repurpose an empty graham cracker box. it was the proper width to fit the nylon cases (A). We cut the box to an appropriate height to easily grab and remove a case for use (B). Covering the box with wood grained adhesive shelf paper improved its appearance (C).

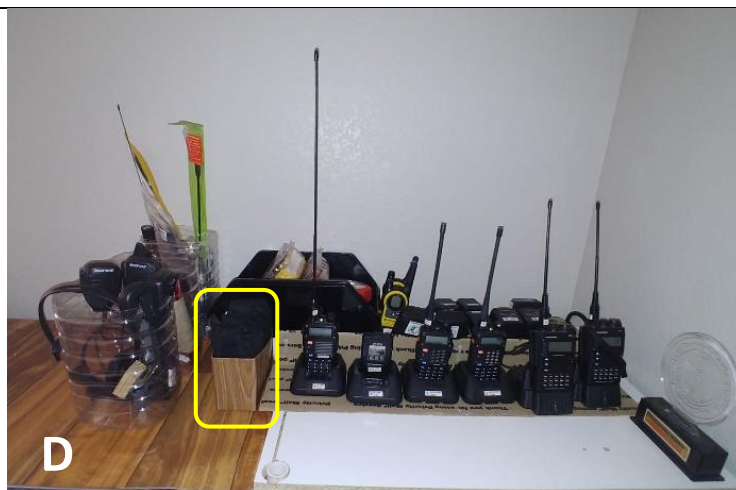
The HT storage box (yellow rectangle in D) is kept near the HT



battery charging station. All GECO HTs are kept at this charging station for routine charging each month. Batteries are recharged when units return from field use.

Photo E is an overhead view of the HT battery charging station. The chargers are controlled by one master switch (red arrow, Photo E). The different sections are indexed below:

1. Microphones/headsets.
2. Power cords
3. Antennas
4. Nylon HT cases



5. VOM/Flashlights
6. GMRS radios
7. Master power strip
8. HT charging cradles

As you can see, this set up allows for ready access to critical HT components for rapid deployment: the radio, battery, speaker/microphone or headset/mic, 12 VDC battery eliminator, and high gain whip antenna.



If the HT Ready Pack is being deployed, only two HTs radios (and possibly extra fully charged batteries) need to be removed from the HT charging rack. All other components are in the [Ready Pack](#). 🌱

Deep VU3YDA Portable HF Man Pack



During the recent elections in West Bengal, the West Bengal Radio Club (WBRC) members provided radio communications support for polling places. We saw photos of Deep VU3YDA on a boat using his portable 22 kg. HF man pack (left photo). We asked him to share some information about his rig, and he agreed.

The middle photo shows other WBRC radio flying squad members onboard. The right photo shows VU3IQW, Nirmalendu with Deep.



Deep sent the following information:
Mainland to island in boat around 2 hours journey. I am using an HF man pack including battery pack (homemade) with a whip antenna. Between the mainland and island is a mobile shadow zone. I was in contact with VU2WB and Vu3JXF around 170km away.

We set a schedule. If Communication is not established at hourly intervals, we change Bands. In this case, 6 am to 8 am 20M, 8am to 12 PM 40M, after 12 try few hours in 10M on AM mode. After that 4 PM to 7 PM again 20M and 40M after 9PM we used 80M band. All frequencies and bands are pre-planned.

When we setup the control room on the island, we also setup a VHF tower and successfully established communication to Kolkata and District Magistrate office (left photo above). The control antenna is about 90 ft AGL.

The WBRC is very active in using HAM radio to serve their community. In addition to participating in local and regional EmComm drills, they've provided HAM radio communications for finding and reuniting missing persons, and for major events such as Ganga Segar Mela. This event is a major pilgrimage involving 3 million people. WBRC HAMs travel 128 km south from Kolkata by ground transport, take a ferry, and then by ground to their assigned stations (e.g., temporary stations, ferry, ambulances, etc.). 🌿

