

# Ham Radio “Go-Boxes” “Why” and various methods of “How”

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Feb 2024

# Not an Expert

- While I have put together a few homebrew go-boxes, I certainly am NOT an expert
- There are many construction techniques I've never utilized (yet)

# WHY

- Many operators build their home stations on “shelves” so that they optimize placement of radio gear and minimize valuable desk space
- Radio might be elevated enough to slide a CW paddle or notepad or keyboard underneath at times
- Auto or Manual antenna tuner might be on top since it is rarely adjusted
- Power supply may be to the side or hidden
- SWR/Power meter somewhere; Lightning arrestor at the building entrance.
- 1:1 choke balun may be included.
- Polarity protection may also be involved
- Signalink or other sound-card interface may be needed
- VHF and HF ear have different needs.
- Antenna Switch may be involved

# Why

- What if you need to transport **all those different pieces of equipment?**
- You can arrange them in a tote – **but you'll still need to RE-connect every one of them.**
- Connectors may be exposed. If cables are connected, they may be severely damaged in transit
- Re-connection is FRAUGHT with risks – I've some some really funny re-connection mistakes!
- Cables get mixed up; USB connectors from different modules get confused.
- Where does the SWR meter go versus the 1:1 choke or the antenna tuner? Newer hams may get these all out of order.
- # of “trips to the vehicle” can be quite substantial!

# Organized go-box avoids most of this

- Antenna cabling is already done; no mixup! 1:1 baluns also!
- Power supply cabling is already done
- Protection systems are already in place
- USB cables can be left connected
- Connections can be protected by being recessed from the exterior of the go-box
- System can be used AT HOME or when ON THE ROAD – and everything is the SAME. In the SAME PLACE. Connected the SAME WAY.

# DISadvantages

- Over-zealousness can result in something that is horribly heavy.
- May be better to separate VHF/UHF and HF systems?
- Put the battery outside the unit?
- Choose lighter-weight support structures?
- COST of a go-box if commercially constructed can be QUITE significant
- EFFORT to custom build one at home can be considerable if not skilled in the technique

# HF GoBox Items

- Most Essential – HF
  - Transceiver +/- antenna tuner
  - AC power supply
  - Microphone holder
- Lesser Importance
  - Power/SWR measurement
  - 1:1 Balun
  - Signalink or equivalent (if needed)
  - Polarity Protection
  - Battery connection
  - Fusing Protection
  - Battery

# VHF/UHF items

- Most important
  - Transceiver
  - Microphone holder
  - AC power
  - Connection for DC power
- Lesser Importance
  - Signalink or equivalent
  - Power meter
  - Simple coil balun
  - Polarity protection
  - Battery



# Construction Alternatives

# PRIMARY OPTIONS

- Commercial: “GATOR” boxes built originally for the touring music industry to protect amplifiers, equalizers etc.
- Rated in “U” sizes and also in depths. 19” rack is “standard”
- Require purchased cantilevered shelves (\$\$)
- The box itself can be \$200
- Over-zealousness can result in H E A V Y and \$\$\$\$\$\$\$\$\$\$
- Include really nice FRONT and BACK to makes them better protected and “splash” waterproof

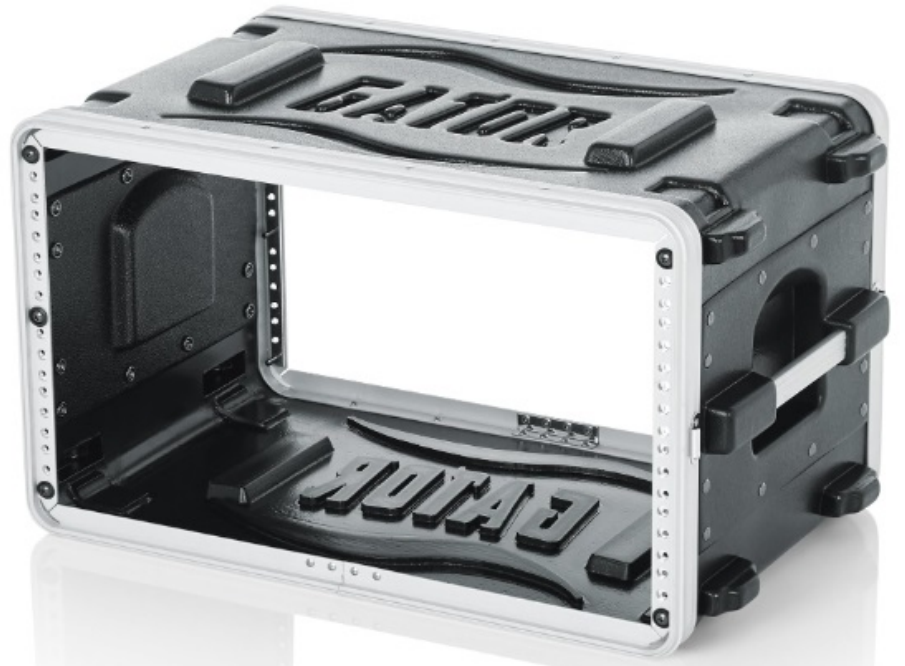
## How big is a “U” when measuring rack size?

FAQ Category: **Racks**

A rack unit, U or RU is a unit of measurement that describes the height of equipment designed to mount in a 19" rack. Racks offer room for equipment that is 19" wide, and have variable heights, which are expressed in rack units. One rack unit (1U) is 1.75" (44.45 mm) of vertical space, or typically the equivalent of three rack hole spaces tall.

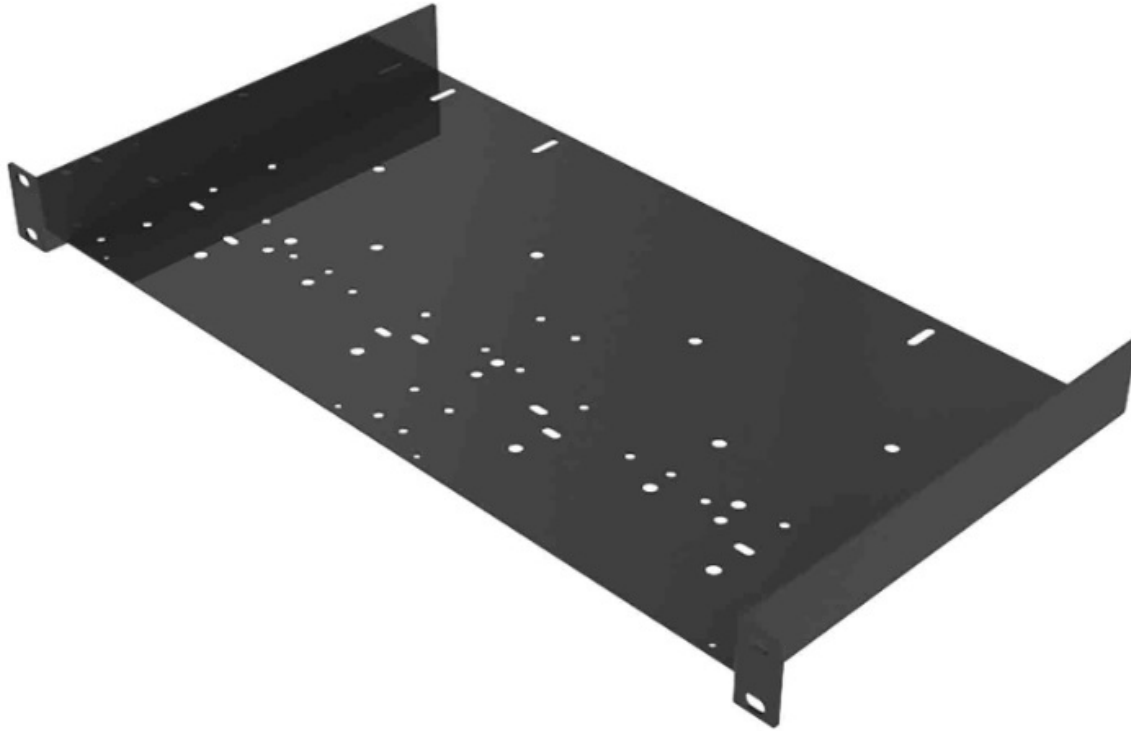
One of the first criteria to consider when purchasing a rack is how many RUs your equipment requires. Spacing is measured from center hole to center hole and does not vary, regardless of whether the rack angle has square or round mounting holes.

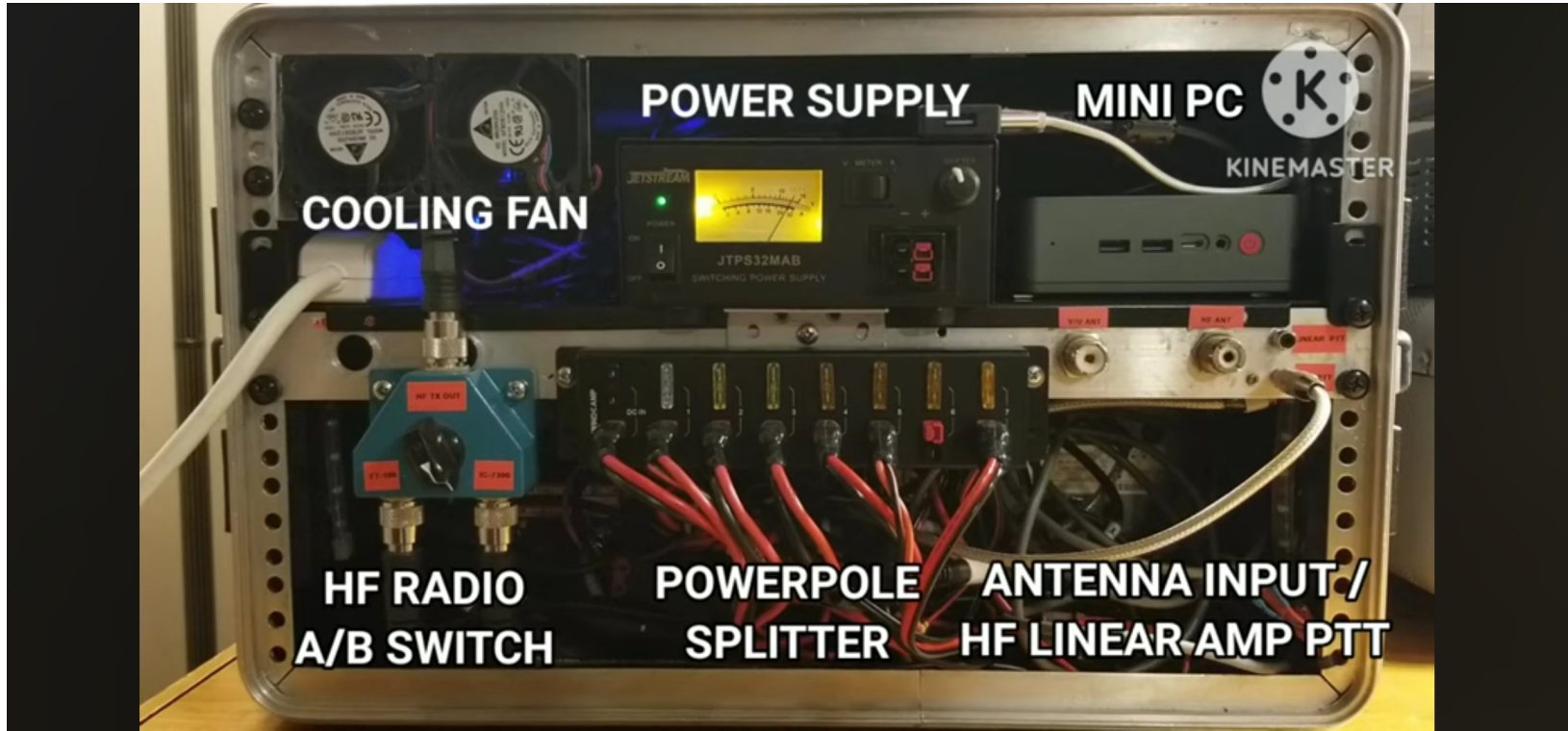
REF: <https://www.cyberpowersystems.com/faqs/how-big-is-a-u-when-measuring-rack-size>



02/18/2024

Multiple different kinds of shelves available.



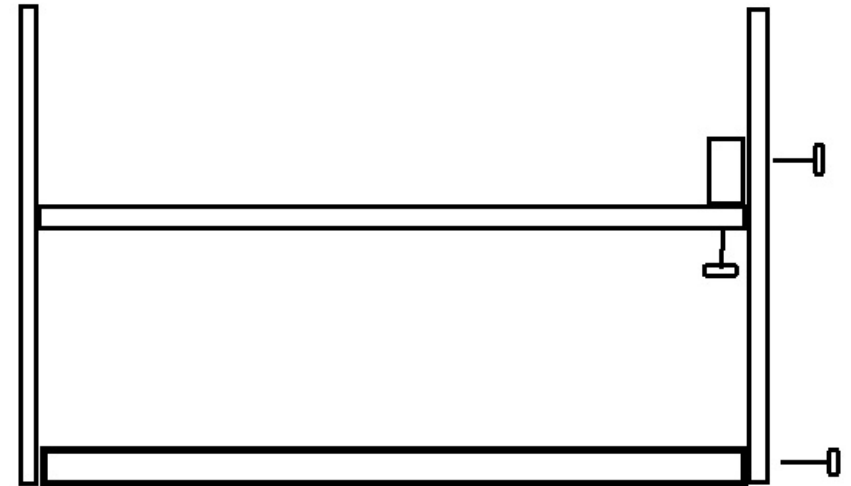


# Costs

- Expect your costs to be in the \$200-\$300 range for a gator box.

# Homebrew #1

- Plywood/lumber – perhaps to most easily constructed and cheapest.
- 3/8” plywood works well for sides and top and sometimes bottom if lightweight gear.
- Secured with carefully placed #6 sheet metal screws or into gussets from 1x2 or 2x2
- Using 1/2” plywood or 1” lumber planks as bottom or middle shelf adds considerable rigidity



#6 x 3/4” sheet metal screws work well through 3/8” plywood into either 1/2” plywood (e.g. bottom shelf shown) or into 1x2 gusset (on 2<sup>nd</sup> shelf shown).

Sturdy shelf can be placed as #2 if desired.







- EASY to route cables (drill hole!) or secure cables (zipties thru holes)
- EASY to mount gear: can even do it with **zip ties**.
  - Zip ties can be linked “in series” to go around almost anything.
- **1” aluminum angle with gorilla double sided tape** can secure items where screws or zip ties don’t work well.
  - The double sided can connect to sides of more fragile/expensive gear like PACTOR modems and then be screwed into wood.
  - Easy to mount things if you mount stuff starting on the bottom before adding upper shelves – makes drilling easier
- Plastic-boxed components can be **simply screwed to the plywood** using sheet metal screws.
- Sometimes rubber feet secured by screws allow **longer screws to be used to secure to the wood**.
- Sometimes **mounting bracket** makes all this easy (e.g. most mobile VHF/UHF radios)



Enough gorilla tape or angle iron for SEVERAL units are only about \$8 ea.

- Plywood is probably one of the **cheapest** ways to mount.
- “Front” or “back” can be built if desired using cabinetry hinges and/or clasps. (I don’t bother)
- NOT likely to be waterproof!



# Minimal Construction Costs

- 2foot x 2foot 15/32 plywood for sturdy shelf: \$10.66
- 2foot x 2foot 1/4" plywood (suitable for sides, top) \$7.83
- 2foot x 4foot 1/4" plywood (suitable to cut up for several sides, etc) \$14.94
- 8feet of 1x2 for corners is only about \$8
- Screws are CHEAP
- So expect your construction costs for simple box (bottom, top, middle shelf, two sides, no front/back) to run around \$30.

# Earl's Battery System Box



# Homebrew #2 – commercial boxes

- Multiple sources of molded small suitcase boxes allows placement of smaller radios, batteries, connections for VHF/UHF
- Gun-transport boxes from Harbor Freight are very popular. Pick-and-pluck foam can be made to suit your radio
- More rigid foam can be cut with knife
- These systems can be made waterproof
- I think they work better for mobile VHF rigs





# Commercial Box Costs

- Pelican - \$\$\$\$\$
- Harbor Freight - \$60



# Homebrew #3 – ammo cans

- Metal or Plastic ammo-cans provide very sturdy support at modest cost
- Items can be mounted on an **internal wooden structure** that “fits”
- Can also double-stick tape or screw through the side if needed.
- Lid opens widely and unit can be operated with box vertical or laid on side as desired.



# Ammo Cases - Costs

- Plastic cases from Harbor Freight \$10 (50 cal)
- I have one HUGE metal ammo can (big enough for a 7300!) for FREE to anyone who wants it



# Homebrew #4 – milk crate

- Not the prettiest, but it works!
- The simple college-student milk crate is very cheap and amenable easily to zip ties.
- Shelves can be easily added with wood, plastic or metal
- Often includes nice handles to tote
- Rides nicely on Costco folding roll-arounds.
- May not be pretty, but the CABLES ARE ALREADY CONNECTED AND PROTECTED



