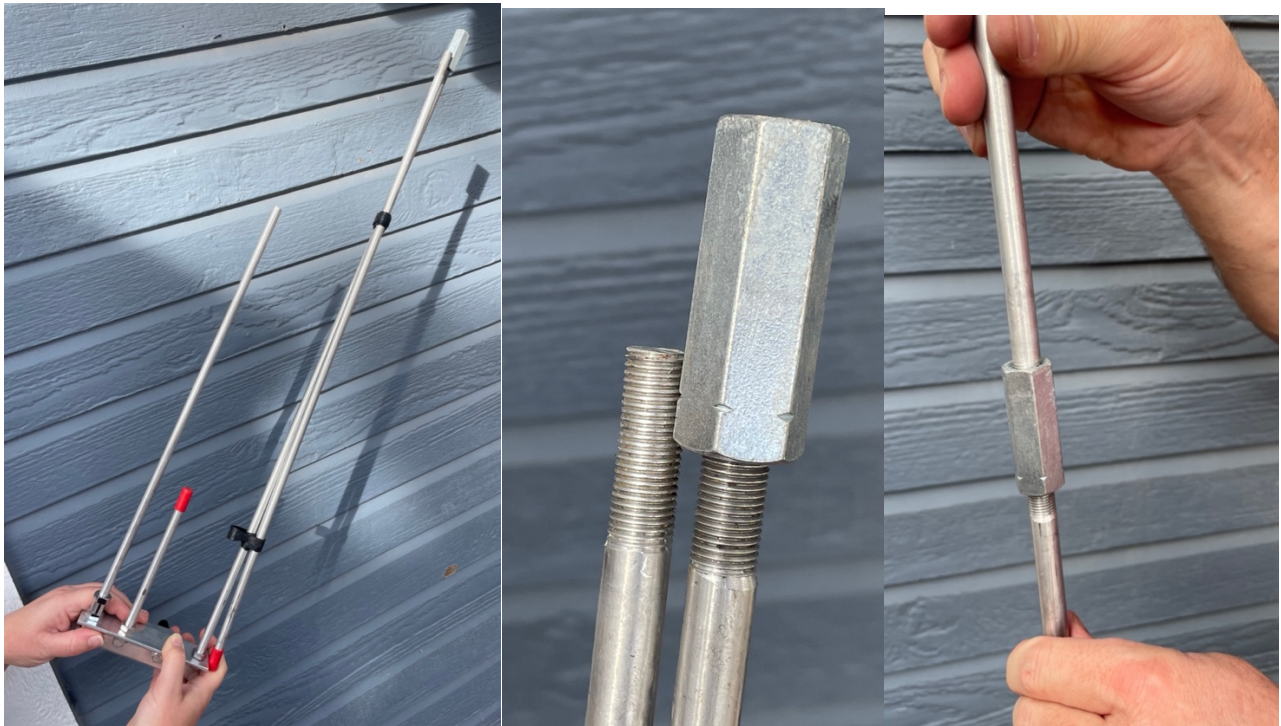
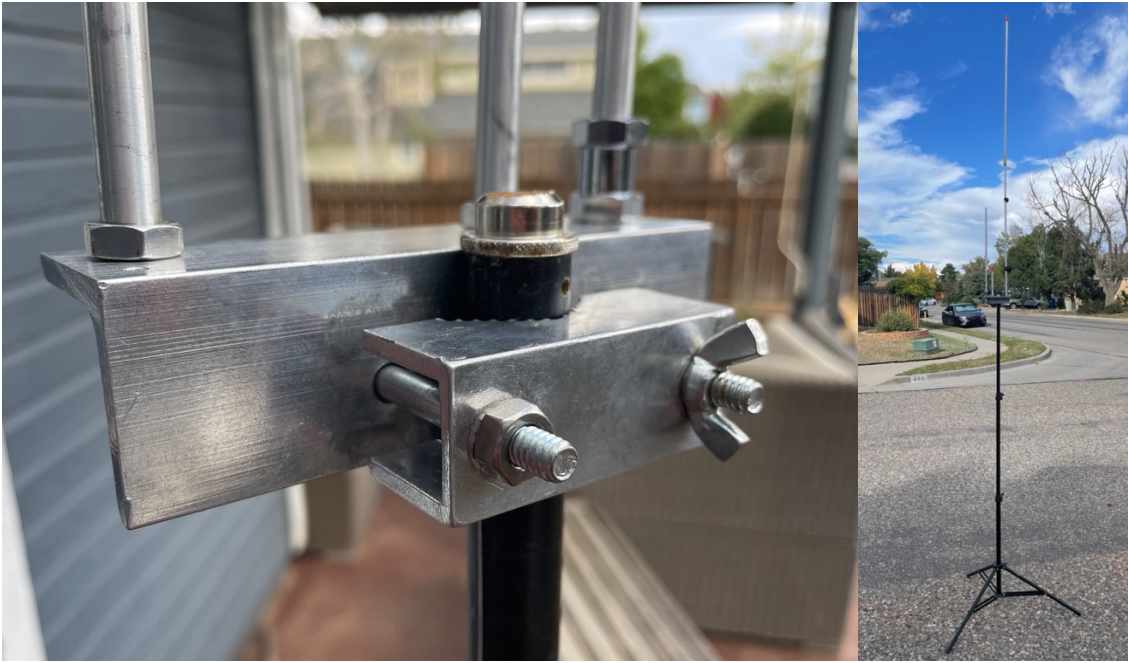


Portable Repeater Setup Instructions

- a. System should consist of three separate components:
 - a. Antenna (with disconnectable rod velcro'd to side)
 - b. Black tripod stand
 - c. Clear plastic case with:
 - i. Radio
 - ii. Batteries
 - iii. Two voltage meters (inline & blue)
- b. Repeater setup instructions for cross-band repeating from SAR VHF 1 to SAR UHF 1.
- c. Important points first:
- d. Please do not power up the radio without the antenna connected; it can be damaged
- e. The radio needs ventilation to cool itself when it is transmitting; keep the lid ajar at the least and check on it please so it doesn't burn up!
- f. Connect antenna first. **DO NOT POWER UP WITHOUT ANTENNA CONNECTED.**
 - a. Open up the tripod stand.
 - b. Snug antenna elements (threads at the mounting plate tend to loosen)
 - c. Screw the antenna elements together, all the way until they "bottom out" against each other
 - i. (The extra piece should be velcro'd to the lower for storage. Don't use if the extra element length is missing!)



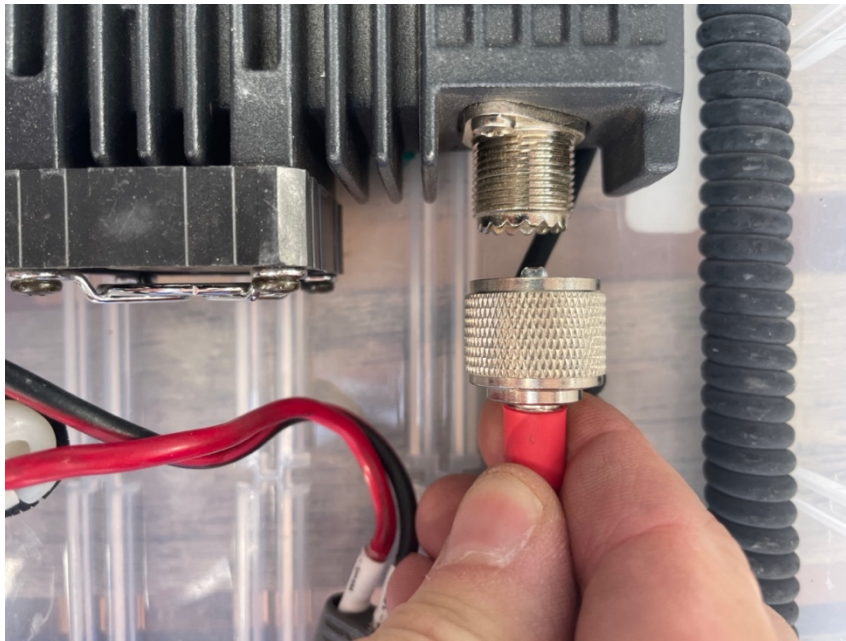
- g. Clamp the antenna to the tripod. Clamp it to the very tippy top of the stand, so no stand sticks up above the antenna mounting plate.



- h. Connect coax cable to antenna



- i. Connect coax cable to radio



- j. Plug battery into black inline meter.



- k. Check battery voltage shown on inline meter. A fully charged battery just off the charger will be 16.8 V. At 14.8 V, battery is still mostly charged. The battery will spend the most time around 14.8 V. Battery is almost dead at 13.5 V. (battery type is Li-Ion). Do not use battery below **13.2 V**. When battery discharges down to 13.2 V, disconnect and replace with fresh battery. (battery damage accrues below 13.2 V)
- l. Plug black inline meter into radio (this can be left plugged into radio).



m. To power up, press and hold in the bottom right knob for one second. It will make a fancy sound to inform you.



- n. Check that desired channel is set to SARV1 on left side and SARU1 on right (or whichever VHF and UHF channels are desired-SARVHF1 and SARUHF1 are good defaults for SAR purposes).
- o. Set left side to SARV1 (channel 1). To change channel, rotate top left knob.



p. To swap which side is the "active" frequency, momentarily press IN on the top knob for the desired "active" VFO (either the top left or top right knob).



q. Set right side to SARU1 (channel 5). To change channel, rotate top right knob.



- r. Adjust volume if necessary. Use outermost (top) rotation ring on the bottom left and bottom right knobs for each side. (note: radio may be set up to not output any audio; there is a “silent” x-band repeat mode).



- s. Set squelch if necessary (if hearing static, increase squelch until static stops). Squelch is the lower rotation ring on the bottom left and bottom right knobs, for each side. See image below to see fingers on these lower rotation rings. THIS IS VERY IMPORTANT. If squelch is set too low, radio can get “stuck” in full-time transmit and block everyone else from communicating. NOTE: IF RADIO IS NOT SET TO OUTPUT AUDIO, YOU WILL NOT HEAR IT AUDIBLY WHEN SQUELCH IS TOO LOW! And you might be locking up the frequency without knowing it! Radio will display a small “busy” indicator when it is receiving—look for this and if it’s showing up beware!



- t. Adjust power to “low”. To adjust power, repeatedly press the “low” button along the bottom row, for whichever side you’re adjusting, until it shows “low” then just wait a second. The toggle sequence for the button press is LOW→MID 2→MID 1→HIGH. If Low does not suffice, Medium 2 is also ok. Try to avoid the higher-powered Medium 1. “High” is too high for the battery that we’re using, so avoid that.
- u. **Set power for BOTH sides separately.** Power can only be adjusted **before** x-band repeat is started.



- v. To activate x-band repeat:
- Short-press the middle, unlabelled “set” button on the bottom row to enter the menu. It’s important to just “tap” the button as holding the button down for any length of time takes you to an incorrect menu.
 - If you press too long and enter an unwanted menu, simply wait a few seconds and the display will reset.**



- c. Change the menu to choice 45 “X-RPT” (if it isn’t already).
 - i. The menu choices will appear on whichever the active side currently is. If it’s the left, then you will rotate the top left knob to change the menu choice. It doesn’t matter which side is currently active, but it does determine which knob (top left or top right) you’ll have to use to switch to X-RPT.
- d. Once you are seeing “X-RPT”, press IN on the top knob for the active side. It will say “XSTART”.



- e. Press IN on the same knob **AGAIN**. It will give one high longish beep and then start x-band repeating. There is no obvious indication on the screen that this is actively occurring. Only indication: the little circular “MAIN” icon will DISAPPEAR from the screen.



- f. To stop x-band repeat, tap the unlabelled “set” center button on the bottom row once. You’ll hear a low short double beep, then “MAIN” will reappear on one of the sides.
- w. The radio *may* be configured to NOT provide any sound on the speaker while in x-band repeat, and also for the mic to NOT work for broadcasting (these are configurable options). Basically, it can be configured to act in a silent mode, and you’ll have to use your separate handheld radio for communicating. AVOID USING the repeater mic for communicating while simultaneously in x-band repeating mode unless you know what you’re doing (even if you do know what you’re doing, you can’t transmit on both frequencies simultaneously so one half of the audience won’t hear your transmission). Again, the mic may be deactivated anyway so it might not work even if you try.

- x. Given that you're standing right next to the repeater, you can use either frequency on your handheld, but set one handheld to be on ONE frequency. When you have a dual VFO handheld (can talk or monitor two channels simultaneously), do not set the handheld to be on both frequencies at the same time, as that will just be confusing and may cause problems.
- y. Ideally, you will have two handhelds, one on each frequency, and your task while sitting around at the repeater will simply be to listen and confirm that every transmission is passing through to be repeated on the other frequency, in both directions. If at any point it stops, there's a problem that needs to be solved. (battery dead?)
- z. Ongoing monitoring tasks:
 - a. BATTERY VOLTAGE Periodically check the voltage of the battery. When it drops to 13.2 V, replace it. Any voltage below 13.2 V can start to damage the battery.
 - b. SQUELCH/SPURIOUS TRANSMISSION. When the radio is transmitting, it will be pretty obvious: the inline meter will show amps-worth of power consumption, and the fan on the radio will start running. When the radio is engaged in this transmission, there should be voice coms on the handheld radio you're using for monitoring. If transmission is occurring without any voice coms on the spare handheld, the squelch may be set too low and might be triggering a transmission when it ought not to—if this is the case definitely turn up the squelch (see an earlier step). Note: the squelch and volume knobs are super easy to bump/turn accidentally.
- aa. If necessary the other spare batteries voltage can be checked—without unplugging the main power monitor that's in use on the radio—using the spare blue voltmeter
 - a. Connect white plastic "balancing" connector on battery to right side of voltmeter
 - i. Connector all the way at the top end of the pins
 - ii. Black wire(s) at the top, red wire(s) down
 - b. If you accidentally press a button or get the meter into a funky state just unplug it and re-plug it.
 - c. Leave it on Lipo, no need to switch battery type to Li-ion (voltage is the same).



bb.

- cc. TEARING IT DOWN
 - a. Power off radio before unplugging antenna.
 - b. Power off radio same way it's powered on: hold IN the bottom right knob.
 - c. Unplug the battery before disconnecting the antenna, to make it harder to do the wrong thing.
 - d. Collapse the extendable antenna and tripod.