

# Emergency Communications Backpack Radio

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## Introduction

What do you do if the repeaters are down or you can't reach the repeaters or anyone with a 5 watt handheld radio in the middle of nowhere? You need a lightweight 5-50 watt portable radio with a substantial antenna and ground system.

The high powered backpack radio consists of a Yaesu FT-8900R, 5-50 watt, 10 m / 6 m / 2 m / 70 cm, battery powered radio with a diamond CR-8900 10 m / 6 m / 2 m / 70 cm antenna at height of about 9 feet and a 17 foot ground plane. The folder over antenna can be operated vertically or horizontally depending upon whether or not there are obstructions in the way. Under normal conditions, this radio and antenna combination does not require a tuner. It also does not require a duplexer.

There are a number of 10 meter FM repeaters that can be reached when VHF/UHF are not in the line of sight. Ten meters can be used over long distances. This system can also be used as a stand alone radio with the legs folded down as well as a cross band repeater along with several handheld radios. If there is an AC outlet nearby, keep the charger connected so that the battery will charge as it is used. Headphones will minimize environmental noise. The separation kit is used to bring the controls to the front of the backpack. If it is raining, the controls must be covered with plastic.

Why not use an HF/VHF/UHF radio? It can be done. However, an HF/VHF/UHF radio will add extra weight, a larger antenna, and a tuner, which will require tuning to a station whereas this configuration will not require tuning if properly configured.

Construct a wooden box to fit snugly inside the backpack. The battery, radio, and antenna pole are mounted to the box. A 12 foot length of tinned copper flat braid is mounted on and around the sides and bottom of the wooden box by looping it back and forth. Do not coil the braid. The tinned copper braid is connected to the radio ground with a 15 inch piece of tinned copper braid. The ground plane consists of the 5 foot pole and 12 feet of tinned copper flat braid, making a total ground plane of 17 feet. Anderson power pole connectors are used to connect the radio, battery, and charger together. Construct a bracket and legs as shown below. The total weight is 21 pounds.

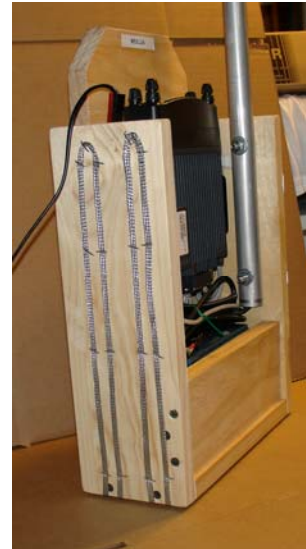
<u>Mode</u>	<u>Measured Power Draw</u>	<u>Estimated Battery Life</u>
Receive	0.27 amps	25.9 hours
5 Watts Output	2.15 amps	3.26 hours
10 Watts Output	2.86 amps	2.45 hours
20 Watts Output	4.01 amps	1.75 hours
50 Watts Output	7.42 amps	0.94 hours (56 minutes)



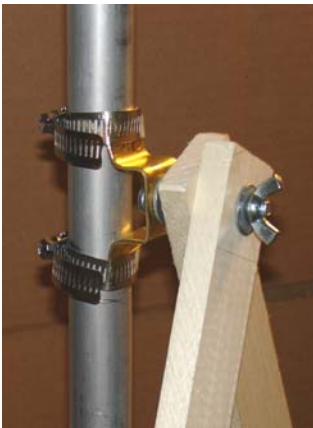
Wooden Case & Battery



Pole & UHF Connector



Looped Tinned Copper Braid



Clamp, Bracket, and Legs



## Parts List

Yaesu FT-8900R 10 m / 6 m / 2 m / 70 cm, 5-50 watt radio  
Yaesu YSK-8900 separation kit  
Diamond K550 rail mount  
Comet 3D4M UHF mount with 13.5 feet of low loss cable and PL-259 connector  
Diamond CR8900A, 10 m / 6 m / 2 m / 70 cm, 50" fold over antenna  
60 inch length of 1 inch O.D., 0.035" wall, aluminum tubing  
Power Sonic PS-1270F1, 12 volt, 7.0 AH, sealed lead acid battery  
Ault, Inc, BA500120500003BK, automatic 12 volt charger  
6 sets of Anderson power pole connectors  
2 female disconnects 0.25"  
12 feet of 1/4 inch tinned copper flat braid  
15 inches of 1/4 inch tinned copper flat braid  
3/4 inch pine wood as needed  
2 1/4-20 2.5 inch screws  
6 1/4-20 washers  
2 1/4-20 lock washers  
2 1/4-20 nuts.  
1/4 inch staples  
1-5/8 inch wood screws  
Backpack  
Pair of over-the-ear headphones