

# Battery Backup Power

## Uses:

- Power HF radio and computer during Field Day.
- Power refrigerator during SHORT power outages.
- Intermittently power small TV, laptop computer, cable modem, router, cell phones, and lights during LONG power outages.

# My Requirements

- Biggest battery that I can carry
- No assembly required to deploy
- Physically protected from short-circuits
- Fuse or circuit breaker on every output
- Safe for indoor use
- Rain and spill-resistant

# Battery

Sealed Lead Acid (SLA)

12 Volt

100 Amp-hour

59 pounds

\$ 200



SLA costs twice as much as deep cycle wet battery but is safe to use indoors

# Measured Battery Energy

Discharge to 11.9 Volts  
for maximum cycle life

**936 Watt-hours**

Discharge to 11.6 Volts  
in a pinch

**1130 Watt-hours**

# Trolling Motor Power Center

Waterproof case with handle

65 pounds w/ battery

10 Amp circuit breaker for  
2 cigarette lighter sockets

60 Amp circuit breaker  
re-wired to 3 Power Poles

Added 200 Amp fuse and  
0 AWG wires to bolts

Crude 4-bar battery meter

Fits *Group 27* marine battery, perfect fit for 100 A-h SLA



# Inverter

- Xantrex *True Sine Wave*
- Output: 120V AC  
900 Watts continuous  
1800 Watts surge
- Inverter \$250  
Cables and fuse \$75



- 600 Watt *Modified Sine Wave* inverter is as cheap as \$50, but not recommended for motor loads

# Inverter 12 Volt Cables

- 100+ Amp peak current when starting fridge.
- 12V cables must be as short and fat as possible.  
Recommended: 0 AWG wire, maximum of 6 feet.
- 200 Amp ANL fuse on the red wire.
- My cables:   2.5 feet   inside battery box  
                  2 feet     to inverter

# Results

- Powers HF radio and computer for 12+ hours during Field Day.
- Powers 17 cubic foot refrigerator for 10 hours. Compressor starts cleanly for the first 8 hours. The final compressor start required 5 attempts.
- Powers a 19-inch LCD TV for 20+ hours.



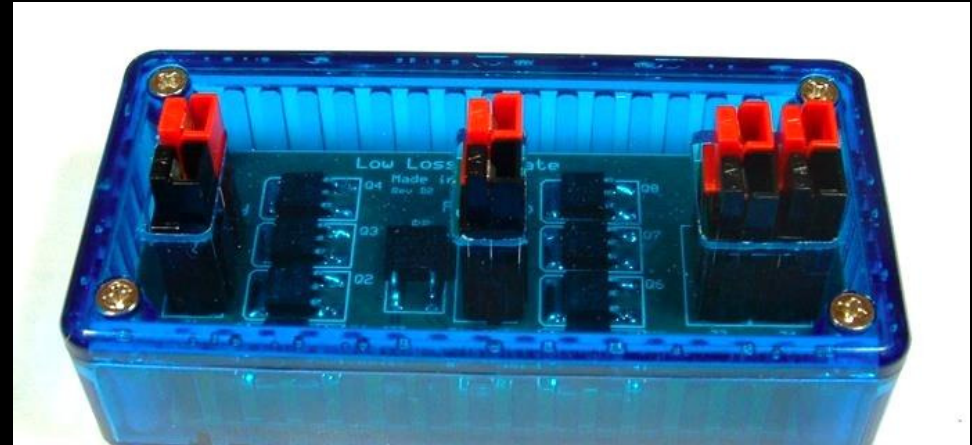
# 12V Battery Charger

- Noco 7.2 Amp “smart” lead-acid charger \$80
- 4 charge stages:
  - Recovery (if needed)
  - Bulk, with soft start
  - Absorption
  - Trickle
- Charges my 100 Amp-hour battery in 24 hours
- Continuously float charge battery during storage



# Automatic AC-Battery Switch

- PWRgate, by KI0BK \$49
- 25 Amp MOSFETs switch radio to 12V battery when 13.8V supply loses power.
- 20 mV voltage drop, much less than Schottky diodes.
- Anderson Power Pole connectors for 13.8V power supply, battery, and 2 radios.
- 3 Amp float charger powered by 13.8V power supply.



# USB Charging Ports

- It's useful to have a couple of USB charging ports on your backup battery system.
- 12V-powered USB chargers are widely sold for as little as \$5.



# Solar ?

- Most power outages occur during *winter* when western Oregon has little sunshine.
- Batteries and generators a better first investment
- 100 Watt solar suitcase is usable only a few months per year.

