



12 VDC Distribution

It's as clear as **Black and **Red****

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What Voltage is it anyway?

- **15.5 Max for most Radios (13.5 +15%)**
- **14.4 (2.4) Full Charge**
- **13.8 (2.3) Alternator out; Gel Cell Float**
- **13.5 Radio Design; Auto engine running**
- **13.2 (2.2)**
- **12.6 (2.1)**
- **12.2 Ignition off**
- **12.0 (2.0)**
- **11.5 Minimum for most radios (13.5 -15%)**
- **10.5 (1.75) Battery discharged**

Amateur Radio Power Requirements

- **HF Equipment**
 - **2 Amps Receive**
 - **20 Amps Transmit**
 - **6.5 Amps per Hour typical***

- **VHF Mobile Rigs**
 - **1 Amp Receive**
 - **10 Amps Transmit**
 - **3.3 Amps per Hour typical***

Based on 25% Transmit & 75% Receive duty cycle



DC Power Sources

- **Linear Power Supplies**
 - **Big & Heavy**
 - **Indestructible**
- **Switching Power Supplies**
 - **Lightweight**
 - **More complex**
 - **Can generate noise**



12 Volt Batteries

- Work when AC mains fail.**
- Require maintenance.**
- Involve chemistry.**
- Require charging Source.**
- Need venting.**



Lead Acid Batteries

- **Automotive Type**
 - **They're everywhere!**
 - **Designed for short bursts & recharge.**
 - **Repeated Deep cycle use will kill them.**



Lead Acid Batteries

- **Deep Cycle (Marine/RV)**
 - **Designed for deep discharge use.**
 - **Check water & charge state monthly.**



Lead Acid Batteries

- **GelCels**
 - **Smaller capacity.**
 - **Most are spill proof.**
 - **Check charge state monthly.**
 - **Can be stand-by floated with isolation.**

Testing Gel cells.

- **> 12.8 Open voltage**
- **Less than .5 Volt drop after test**
- **< 10 amp hour**
 - **Load of “C” for one minute**
- **> 10 amp Hour**
 - **1 minute full key down into dummy load.**

Wire for 12VDC

- **Keep leads short.**
- **Match wire gauge to anticipated peak load and fuse accordingly.**
 - 8 Gauge – 60 Amps
 - 10 Gauge – 40 Amps
 - 12 Gauge – 25 Amps
 - 14 Gauge – 20 Amps
 - 16 Gauge – 10 Amps
 - 18 Gauge – 8 Amps
- **Red for Positive; Black for Negative**
- **Red/Black zip cord keep things neat!**

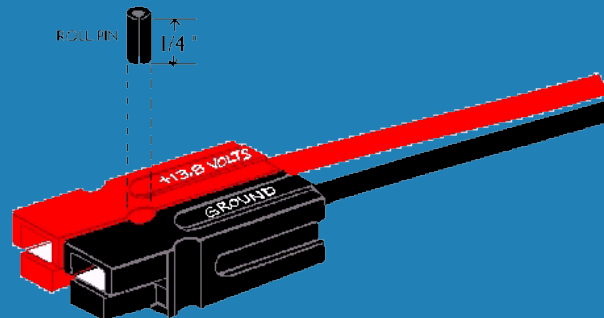


Battery Fusing

- **Batteries can deliver 100's of amps.**
- **This can melt wires and boil the acid!**
- **All batteries need to be fused at the positive terminal!**
- **Always cover the positive terminal!**
- **Also fusing and covering negative terminal is a good backup.**
- **Use automotive blade type (ATO & Mini) fuses.**
- **Store spare fuses with battery.**

12VDC Connectors

- **Need to handle amperage.**
- **Need to be polarized.**
- **Need to be standardized.**
- **Need to be inexpensive.**
- **Need to be easily attached.**



Anderson 30 Amp Powerpole

- **ARES/RACES standard across USA.**
- **Actually rated to 45 Amps.**
- **Can handle 100 Amps.**
- **Exceed your radio's specifications.**
- **Cost is \$1.00 or less per radio or power source.**
- **Crimped or soldered in a minute.**
- **Gardner-Bender GS-88 crimping tool is \$8.50 at Home Depot.**

Advantages of the using this 12VDC standard

- **Handles modern power requirements.**
- **Safer than binding posts.**
- **Eases moving equipment.**
- **Enables switch to alternate power.**
- **Allows sharing of equipment and batteries.**
- **Invaluable in Emergency work.**
- **Useful for Field Day and Special Events.**
- **RIGrunner fused distribution panel.**

More Information

- **ARES/RACES Standard:**

<http://www.races.net/sca/powrpole.html>

- **Vendors include:**

www.powerwerx.com

<http://www.westmountainradio.com/faqrr.htm>

<http://www.dcpwr.com>

<http://www.cablexperts.com> (under DC Power)



12 VDC Demonstrations

- **Wire**
- **Batteries**
- **Fuses**
- **Distribution panels**
- **Chargers**
- **Meters**
- **Radios**