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

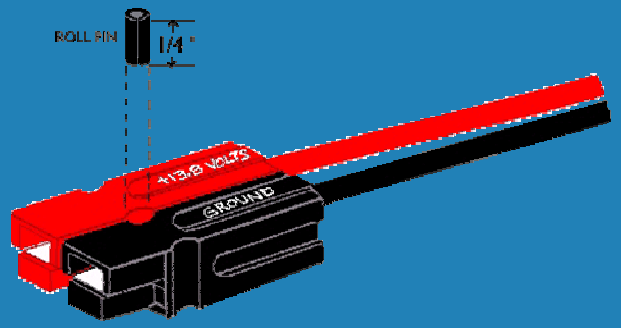
- Keep leads short.
- Match wire gauge to anticipated peak load and fuse accordingly.
  - 8 Gauge – 60 Amps
  - 10 Gauge – 40 Amps
  - 12 Gauge – 25 Amps
  - 14 Gauge – 20 Amps
  - 16 Gauge – 10 Amps
  - 18 Gauge – 8 Amps
- **Red** for Positive; **Black** for Negative
- **Red**/**Black** zip cord keep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