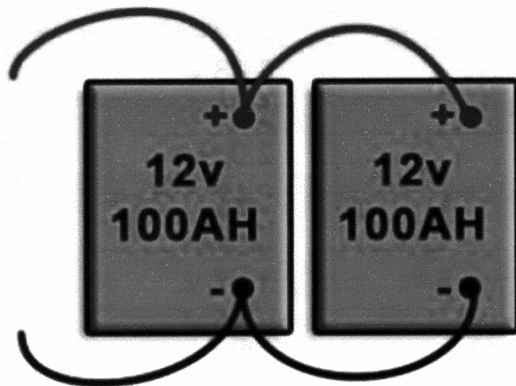
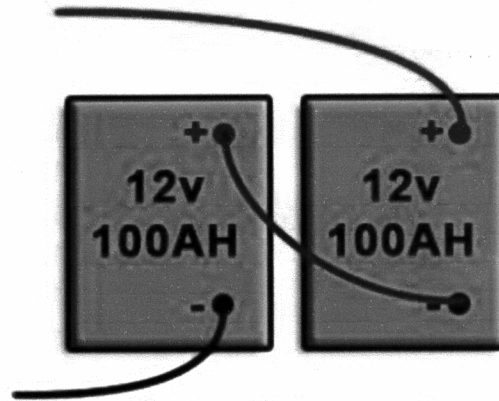


Batteries In Parallel
 Voltage remains the same
 AmpHour capacity doubles

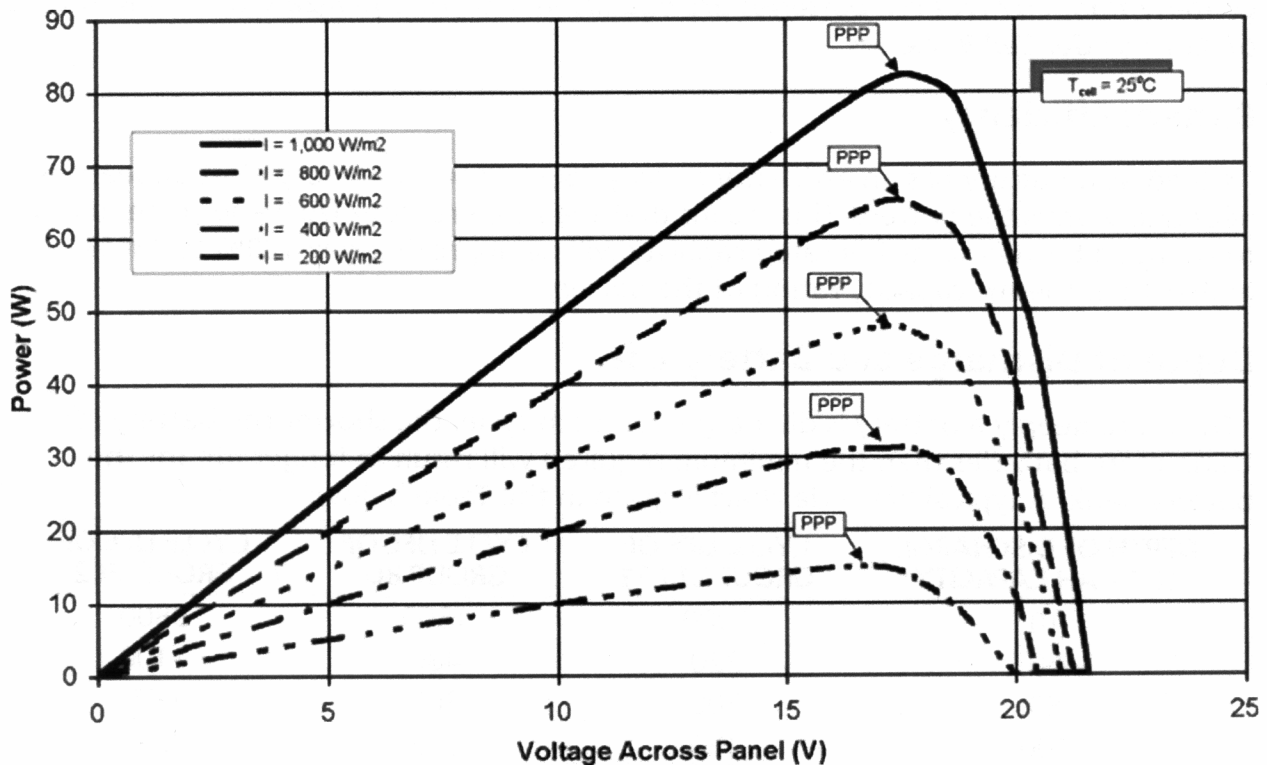


System Voltage = 12v
 AmpHour Capacity = 200AH

Batteries In Series
 Voltage doubles
 AmpHour capacity stays the same



System Voltage = 24v
 AmpHour Capacity = 100AH



GENERAL INFORMATION: BATTERIES

PERCENTAGE OF FULL CHARGE	STANDING VOLTAGE OF 12 V NOMINAL BATTERY	CELL VOLTAGE (12 V BATTERY HAS 6 CELLS IN SERIES)
100%	12.63 V	2.105 V
90%	12.6 V	2.10 V
80%	12.5 V	2.08 V
70%	12.3 V	2.05 V
60%	12.2 V	2.03 V
50%	12.1 V	2.02 V
40%	12.0 V	2.00 V
30%	11.8 V	1.97 V
20%	11.7 V	1.95 V
10%	11.6 V	1.93 V
0%	= / < 11.6 V	= / < 1.93 V

Table 3.3. State of Charge versus Standing Voltage – 12 V Battery

Check the individual cell voltages. If the inter cell voltage difference is more than a 0.2 V, the battery will have to be equalized. **Please note that only the non-sealed / vented / flooded / wet cell batteries are equalized. Do not equalize sealed / VRLA type of AGM or Gel Cell Batteries.**

Battery Efficiency

A lead-acid battery has an efficiency of only 75% - 85%. The energy lost appears as heat and warms the battery. This means that the Ampere Hour (AH) energy required to charge a battery to its full rated capacity will be approximately 120% to 130% higher than the AH capacity rating of the battery.

Depth of Discharge and Battery Life

The more deeply a battery is discharged on each cycle, the shorter the battery life. Using more batteries than the minimum required will result in longer life for the battery bank. A typical life cycle chart is given in the Table below:

DEPTH OF DISCHARGE % OF AH CAPACITY	CYCLE LIFE OF GROUP 27 / 31	CYCLE LIFE OF GROUP 8D	CYCLE LIFE OF GROUP GC2
10	1000	1500	3800
50	320	480	1100
80	200	300	675
100	150	225	550

Table 3.4. Typical Cycle Life Chart

It is recommended that the depth of discharge should be limited to 50%.

Airstream Repair and Maintenance Resources

The Care and Feeding of your RV – Howard Lefkowitz WBCCI Tech Committee, material links found on the WBCCI activities/caravan web pages; <http://wbccicaravan.wbcci.net>.

I. Spare Parts, Special Tools and Knowledge:

<http://wbccicaravan.wbcci.net/files/2014/06/The-Care-and-Feeding-of-Your-RV.pdf>

II. Batteries, Chargers, Inverters and Solar Panels:

<http://wbccicaravan.wbcci.net/files/2011/07/the-care-and-feeding-of-your-rv-ii.pdf>

III. Troubleshooting and Repair of Your Propane Equipment:

<http://wbccicaravan.wbcci.net/files/2011/07/the-care-and-feeding-of-your-rv-iii.pdf>

IV. Troubleshooting and Repair of Your Air Conditioning System:

<http://wbccicaravan.wbcci.net/files/2013/06/The-Care-and-Feeding-of-Your-RV-IV.pdf>

V. Safe Towing:

<http://wbccicaravan.wbcci.net/files/2015/07/Towing-Seminar.pdf>

Sierra Nevada Unit Resources:

Off-grid camping will set you free!

Dry-camping:

<http://sierranevadaairstreams.org/owners-guide/living/dry-camping.html>

Solar Power Installation on a 25' Airstream:

<http://sierranevadaairstreams.org/owners-guide/maintaining/energy-power/solar-kd6uvt/index.html>

Step by Step Photo Gallery for Solar Power on a 25' Airstream:

<http://sierranevadaairstreams.org/owners-guide/maintaining/energy-power/solar-kd6uvt/gallery.html>