System Loads Worksheet

Use this work sheet to determine the total amp-hours per day used by all the loads in your system.

Step 1. Calculate your AC loads. If no AC loads, skip to Step 2.

1. List all AC loads, wattage and hours of use per week in the space below. Add up all the watt-hours per week to determine AC watt-hours per week.

Description of Load Watts x Hrs/Wk = WH/WK

Total AC watt-hours per week: ________

Note: Wattage of appliances can usually be determined from tags on the back of the appliance or from the owner's manual. If an appliance is rated in amps, multiply amps by operating voltage (120 or 240) to find watts.

2. Actual AC watt-hours per week. Multiply line 1 by 1.15 to correct for inverter loss. _________

3. Inverter DC input voltage; usually 12 or 24 volts. This is DC system voltage. _________

4. Divide line 2 by line 3. This is total amp-hours per week used by AC loads. _________

Step 2. Calculate your DC loads

5. List all DC loads in the spaces below:

Description of Load Watts x Hrs/Wk = WH/WK

Total watt-hours per week: ________

6. DC system voltage. Usually 12 or 24 volts. __________

7. Total amp-hours per week used by DC loads. Divide line 5 by line 6. __________

8. Total amp-hours per week used by AC loads from line 4. __________

9. Add lines 7 and 8. This is total amp-hours per week used by all loads. __________

10. Divide line 9 by 7 days. __________

This is the total average amp-hours per day.

Battery Sizing Worskheet

Use this worksheet to determine what size battery is required for your system.

1. Total solar array amp hours per day required from Systems Load Worksheet, line 10, page 7. ______

2. Maximum number of continuous days of cloudy weather expected in your area during one year. (5 to 10 days in most areas) ______

3. Multiply line 1 by line 2. ______

4. Divide line 3 by 0.8 to maintain a 20% reserve after deep discharge period. If no special condition, skip to line 10. ______

5. Select multiplier below which corresponds to the batteries' wintertime average ambient temperature.

Battery Temperature Multiplier

Battery Temperature	Multiplier
80°F/26.7°C	1.00
70°F/21.2°C	1.04
60°F/15.6°C	1.11
50°F/10.0°C	1.19
40°F/4.4°C	1.30
30°F/-1.1°C	1.40
20°F/-6.7°C	1.59

6. Multiply line 4 by line 5. This is your optimum battery size. ______

7. Amp-hours of battery chosen (i.e. L16 is 360. amp hours) ______

8. Divide line 6 by line 7. This is the total number of batteries in parallel required. ______

9. Round off to the next highest whole number. ______

10. Divide the system voltage by the battery voltage. ______

11. Multiply line 9 by line 10. ______

This is the total number of batteries required.

Array Sizing Worsksheet

Use this worksheet to figure the total number of solar modules required for your system.

1. Total average amp-hours per day from the System Loads Worksheet, line 10. _____________

2. Multiply line 1 by 1.2 to compensate for loss from battery charge/discharge. _____________

3. Average sun hours per day in your area. _____________

4. Divide line 2 by line 3. This is total solar array amps required. _____________

5. Optimum or peak amps of solar module used. See module specifications. _____________

6. Total number of solar modules in parallel required. Divide line 4 by 5. _____________

7. Round off to the next highest whole number. _____________

8. Number of modules in each series string to provide DC Battery voltage: _____________

DC Battery Voltage	Number of Modules in Each String
12	1
24	2
36	3
48	4

9. Multiply line 7 by line 8. _____________

This is the total number of solar modules required.