

Load Calculation Worksheet					
Step 1 Calculate your AC loads. If there are no AC loads, skip to Step 2.					
Description of AC Loads Run by an inverter	Watts	X	Hrs/Day	=	Ah/Day
Microwave	1250	X	0	=	0.0
Rad Battery charger	120	X	6	=	57.1
		X		=	0.0
Computer	27	X	0	=	0.0
Blow Dryer	900	X		=	0.0
Electric Skillet	1200	X		=	0.0
Toaster	756	X	0	=	0.0
Fan	12	X		=	0.0
Coffee maker		X		=	0.0
Refrigerator	475	X		=	0.0
Fireplace	1330	X		=	0.0
Water heater	1350	X		=	0.0
A/C 15000 BTU	1550	X		=	0.0
		X		=	0.0
		X		=	0.0
	AC Ah/Day including inverter losses				67.2 Ah
Inverter efficiency ---->>	85%				
Inverter DC input voltage; This is the DC system voltage.--->	12.6V				
Step 2 Calculate your DC loads.					
List all DC loads in the spaces below.	Watts	X	Hrs/Day	=	Ah/Day
Furnace	157	X	0	=	0.0
Water pump	86	X	0	=	0.0
Lights (dining table)	6.1	X	0	=	0.0
LR lights (5)	35.5	X	0	=	0.0
Island lights	2.8	X	0	=	0.0
Reading area lights	7.1	X		=	0.0
Bath lights	7.2	X	0	=	0.0
Awning lights	12	X		=	0.0
Bedroom lights	21.3	X	0	=	0.0
Entry step light	0.5	X		=	0.0
Under bed slide lights	3.6	X		=	0.0
Interior step light	0.5	X	0	=	0.0
Hutch lights	6.1	X		=	0.0
Awning lights		X		=	0.0
Work table lights	6.1	X	0	=	0.0
Bath Vent fan	20	X	0	=	0.0
Kitchen fan	20	X	0	=	0.0
Refrigerator (what is your duty cycle?)	15	X	0	=	0.0
Water Heater	12	X	0	=	0.0
Inverter idle current	10	X	0	=	0.0
HP photo printer	30	X		=	0.0
HF radio-avg duty cycle	60	X		=	0.0
AM/FM radio	5	X	0	=	0.0
		X		=	0.0
		X		=	0.0
		X		=	0.0
Phantom loads (control circuits, LP detector , refig)	9	X	0	=	0.0
Total amp hours per day used by DC loads.	DC Ah/Day				0.0 Ah
Total amp hours per day used by all loads.	Total Ah/Day				67.2 Ah

Battery Bank Sizing

1. Total amp hours per day needed to recharge the battery bank. (See solar array sizing page)

67.2

2. Maximum number of days with no recharge.

1

3. This is the Ah used + the extra amps needed to compensate for conversion losses.

67

5. If you are using a lead-acid battery, select the multiplier below which corresponds to the battery's average ambient temperature:

1

If you do not intend to discharge below 50% this is your minimum battery size ==>

134 Ah @ 50% DOD

This is your suggested battery size in amp-hours if using 80% of the capacity ==>

84 Ah @ 80% DOD

	Battery Capacity Multiplier Table	Temperature adjusted charging voltage
80°F/26.7°C	1	14.80
70°F/21.2°C	1.04	14.97
60°F/15.6°C	1.11	15.13
50°F/10.0°C	1.19	15.30
40°F/4.4°C	1.3	15.46
30°F/-1.1°C	1.4	15.63
20°F/-6.7°C	1.59	15.80

Solar Panel Array Sizing

1. Total amp hours per day from the Load Calc Worksheet	67.2	Ah
2. Multiply line 1 by 1.25 to compensate for charge controller & battery recharge efficiency	84.0	Ah
3. Average sun hours per day in your area of interest.	6	hr/day
4. This is the average Ah rate required for daily recharge.	14.01	A
5. Watt hours needed to recharge the battery bank.	1059	Wh
Watts/hr. needed to replace 1 days useage w/ no additional recovery from a cloudy day.	202	Watts of tilted panels

For recovery from a cloudy period double the panel wattage.

Double the panel size if used flat in the winter

Size the wire between the solar panels and the charge controller to provide a voltage drop of less than 2%. Use the copper wire table to help with this calculation and don't forget that the wire needed is twice the distance from the solar panels to the charge controller.

If long wire runs are necessary it may be advisable to install the panels in series to raise the voltage. Then use a MPPT type charge controller.

Minimum panel size is generally considered to be 60 watts per 100 Amp Hours of battery.