

# ISES Solar Charging Station

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# Introduction

- ISES Solar Charging Station
  - Sponsor is Dr. Thomas Acker
- Objective: Design a Solar charging station that can charge small electronic devices

# Previous Design

- 1000W inverter
- 3 sets of two panels in series
- 20 Amp DC disconnect/ combiner box
- 20 Amp AC disconnect
- Green Energy Options Chorus PV monitoring system
- Costs = \$946.65

# Design Changes

- Increased inverter size to 2000W
  - Sunny Boy 2000HF-US Inverter
- Changed display to be compatible with Sunny Boy Inverter
  - SMA Sunny Beam Monitor
  - Interacts with inverter via Bluetooth



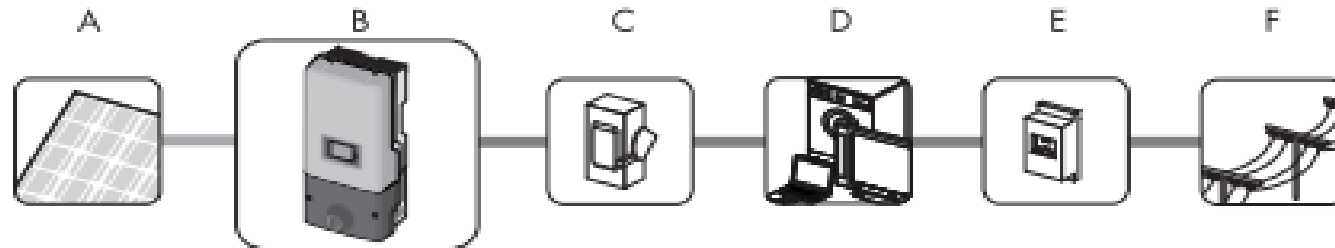
Tyler Faulkner

Figures provided by SMA

# System Setup

- 7 panels in series

Principle of a PV plant with this Sunny Boy



Position	Name
A	PV array
B	Sunny Boy with integrated SMA DC-Disconnect
C	Line circuit breaker
D	Load
E	Energy meter
F	Power distribution grid

Figure provided by SMA

# Updated Cost

## Cost Analysis

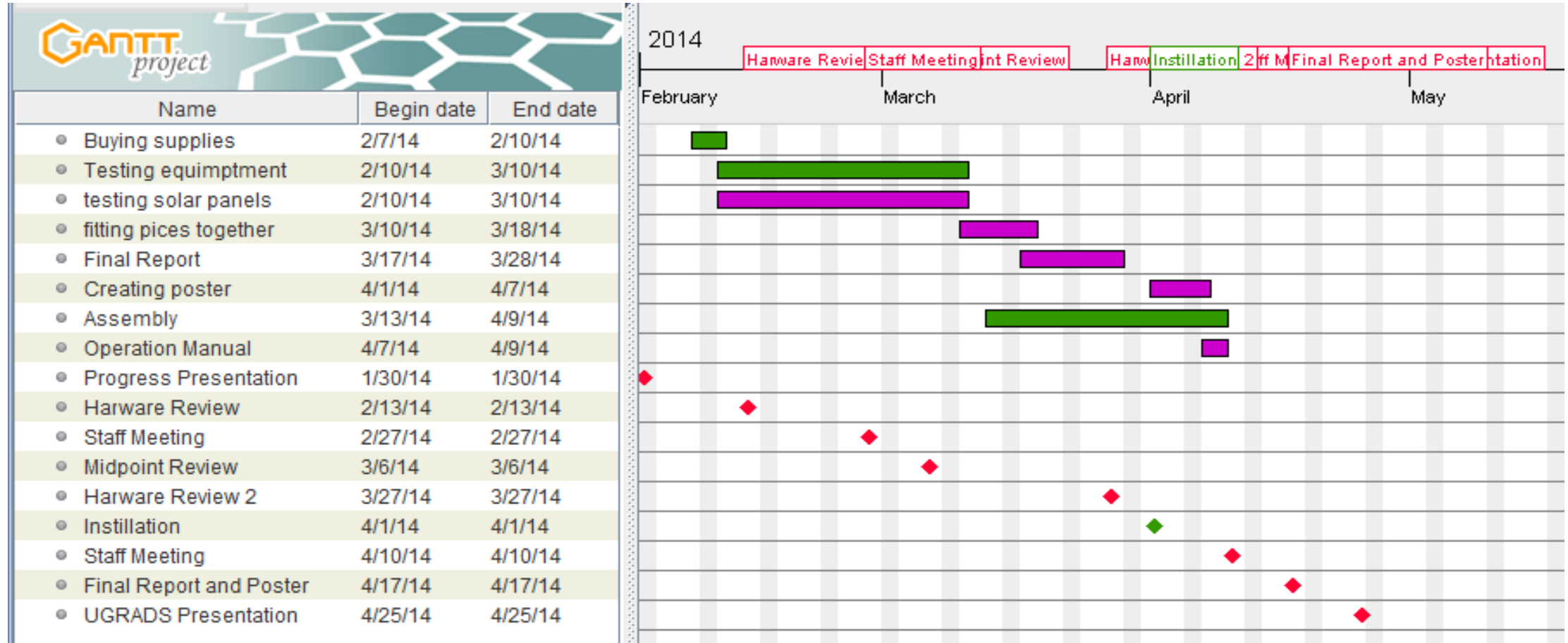
Item	Cost (\$)
Sunny Boy 2000HF-US Inverter	1385
SMA Sunny Beam Monitor	236.93
Square D Disconnect Switch 30A 240V AC	60
Midnite Solar MNPV3-Circuit Combiner/ DC Disconnect	75
#12 AWG Two Conductor Stranded Wire 50ft	45
Outlets	19.49
<b>Total</b>	<b>1821.42</b>

# Team Member Tasks

## Assigned Tasks

Name	Tasks
Ze Chen	Testing Solar panels
Tyler Faulkner	Order parts, test system
Alexa Kearns	Green Fund, Order parts
Yaqoub Malony	Testing inverter
Thomas Penner	Testing Solar Panels

# Project Plan



Alexa Kearns



# Next Steps

- Contact Dan Hanselman at Northern Arizona Wind & Sun for final design evaluation
- Order components
- Complete and submit the Green Fund proposal

# References

- [1] [http://www.solarpanelstore.com/solar-power.sma-inverters.sma\\_sunnyboy.sma\\_hfus\\_2000.info.1.html?gclid=C1bL45jklwCFVBgfgodqHwA-w](http://www.solarpanelstore.com/solar-power.sma-inverters.sma_sunnyboy.sma_hfus_2000.info.1.html?gclid=C1bL45jklwCFVBgfgodqHwA-w)
- [2] <http://www.solar-electric.com/sqddisw24acn1.html>
- [3] <http://www.solar-electric.com/mnpv3.html>
- [4] <http://www.solar-electric.com/12-2-tc.html>
- [5] [http://www.amazon.com/50759-6-Grounded-Outlet-In-Wall-Adapter/dp/B0009HKEXM/ref=sr\\_1\\_1?ie=UTF8&qid=1391047948&sr=8-1&keywords=4+plug+outlet](http://www.amazon.com/50759-6-Grounded-Outlet-In-Wall-Adapter/dp/B0009HKEXM/ref=sr_1_1?ie=UTF8&qid=1391047948&sr=8-1&keywords=4+plug+outlet)