How it Works

Tracking

The tracking software developed for the TOSS was written entirely in C and developed for the PIC18F4620 using Microchip MPLAB IDE. The microchip obtains voltage levels from the Solar Sensor Array and runs them through an algorithm to calculate the position of the brightest spot in the sky.

This information is then used to drive the motors to position the panel to face that spot. The motors are DiSEqC 2.0 compatible, allowing for two-way communication with the PIC18F4620 regarding position and other information

Charging

The two heavy-duty lead-acid batteries are charged using the Maximum Power Point Tracking charge controller. The charge controller uses a dedicated lead-acid battery charging chip to ensure fast and safe charging.

The charge controller is fed with a MPPT unit which ensures the charge controller is receiving the greatest amount of power possible from the solar panel by tracking the maximum power point.

"Worry-free tracking solar power system"

THE TOSS

Features

- 130W Solar Panel
- Dual 12V 100 A-h Batteries
- Dual SG-2100 Motors
- MPPT Charge Controller
- 120V AC Inverter
- Solar Sensor Array
- Two-Axis Tracking

TOSS

Tracking Optimized Solar System

Team Apollo Creed

Robert Valleau
Hanlin Li

How it Works (cont.)

Power Distribution

The power stored in the TOSS's batteries is used to power everything on board, as well as to provide an energy source for a 120V DC-to-AC inverter, which provides a standard household voltage and current to run any appliances, from a phone charger to a TV.

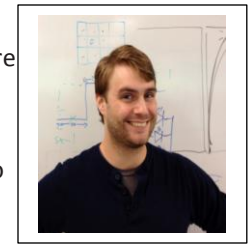
The TOSS was designed to provide a robust, efficient source of electricity from a renewable source, independently and without any complicated set-up. It would be ideal for camping, outdoors events, or for powering permanent installations.

Team Apollo Creed

Hanlin Li

Hanlin is responsible for the design of the hardware and printed circuit boards. Hanlin moved to Canada In 2002, and to Victoria in 2004. In 2006 he began at Camosun to upgrade his English, and in 2007 he began the Engineering Graphics Technician program. In 2009 he started the Electronics and Computer Engineering Technology – Renewable Energy progam, and will be graduating June 2012. He will contribute to the project his skills in the use of CAD programs, mechanical design skills, and circuit board design.

Robert Valleau



Robert is the team's software Designer, he has lived on Vancouver Island his entire Life, moving from Crofton to Victoria in 2007 to attend UVIC for Computer Engineering. He left UVIC to begin the Electronics and Computer Engineering Technology –Renewable Energy program in 2009, and will graduate with Hanlin in 2012. Robert will contribute his programming, soldering, and software design skills to the project.

In closing

The TOSS represents an advance in the design of very small scale solar power generating stations, with robust and cleverly designed software to ensure the maximum power will always be delivered.

If you need to power sensitive scientific instruments gathering data out in the field, or if you just need to power your game console and television you brought along on your nature retreat, the TOSS will provide an easy-to-use, renewable source of power.

The members of Team Apollo Creed are very excited to have the opportunity to be working on this new type of power station.