Large Portable Imaging Solar Concentrator
Product Requirements Document
OPT 310 Solar Team

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Revisions Level	Date
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Authentication Block

Rev	Description	Date	Authorization

A		PK, DZ, DM
B	Added regulatory issues and additional required resources	PK, DZ, DM
C	Edited material budget, draft plan and timeline, responsibility list	PK, DZ, DM
D	Edited fitness for use, responsibility list,	PK, DZ, DM

The Large Portable Imaging Solar Concentrator (LPISC) is an externally driven product. As such its design inputs were derived from the ideas, project presentation, and conversations with Dr. Wayne Knox.

Vision:

A large lightweight, relatively inexpensive, efficient solar concentrator.

Environment:

As a laboratory instrument, it needs to operate in the following environment:

Temperature
0-95 °F
Weather
LPISC must be able to operate on a clear day when fully exposed to sun.
Relative Humidity
0-100%

The LPISC should be able to operate in both hot and cold environments. The LPISC should be able to function in windy weather (20 MPH wind), regardless of orientation.

Regulatory Issues:

Outdoors testing needs to be approved by the university fire marshall.
Indoors testing does not have to comply with any regulatory rules other than general safety guidelines.

Fitness for use:

The system will:

Be optimized to image the solar radiation onto a spot <2 inches in diameter at a distance of 10 feet from the base of the concentrator.
Be capable of being portable in sections that can be disassembled and reassembled by a single person.
Be restricted to costing less than 100 American Dollars.
Be capable of concentrating solar power and obtaining both a better overall intensity and higher efficiency than the model previously designed by Wayne H. Knox, given the same incident power.
Be powered by a portable power source of a 12 V motorcycle battery.
Be able to function on axis and off axis.

It is desirable that:

The system includes an automatic solar tracking device.
The system includes a system for the collection of solar power through the heating of water that can be turned into steam to power a tubine.
The system be simple enough that it can be easily assembled without prior knowledge of the materials and yeild a product that requires minimal inital allignment.

We are not responsible for:

Application of the collected power
Maintaining performance in adverse weather conditions
Maintaining performance far off axis

Schematic: