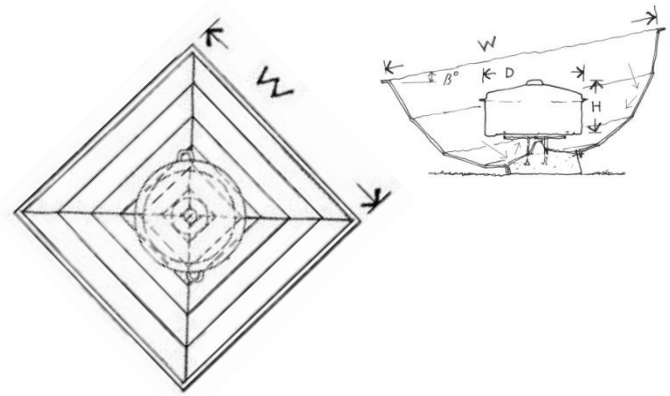
Solar Cooker Reflector LED-PV Lantern Set

Joel H. Goodman

Feb. 2, 2015

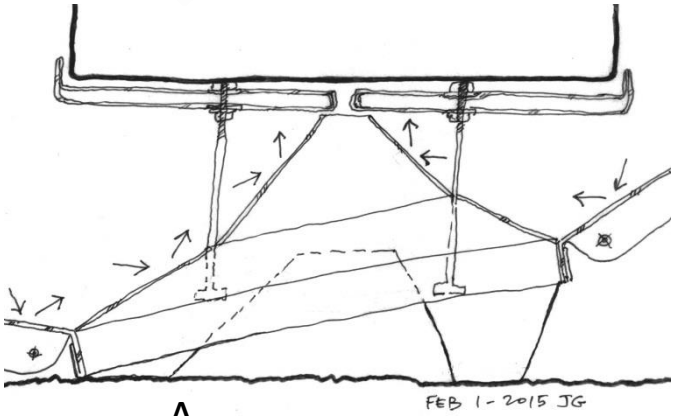


Stand-alone cooker-lantern set notes Feb. 2-2015

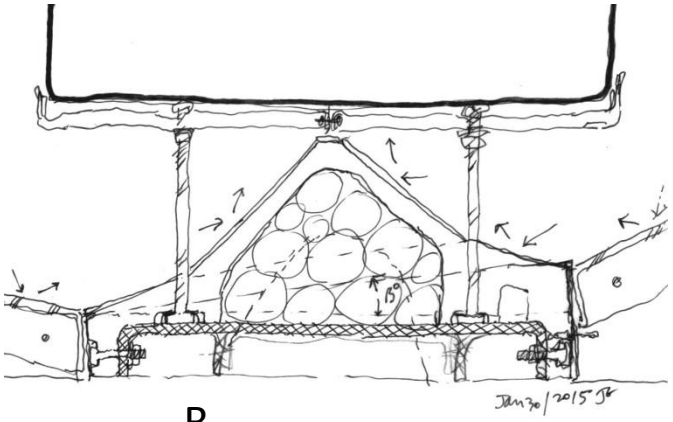
JH Goodman

Asymmetric weighted base reflector pyramids studied include:

A- Concrete with form (wood, steel, etc.) and
B- Plastic with refilled weight

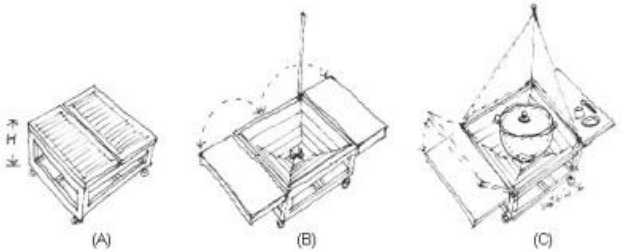


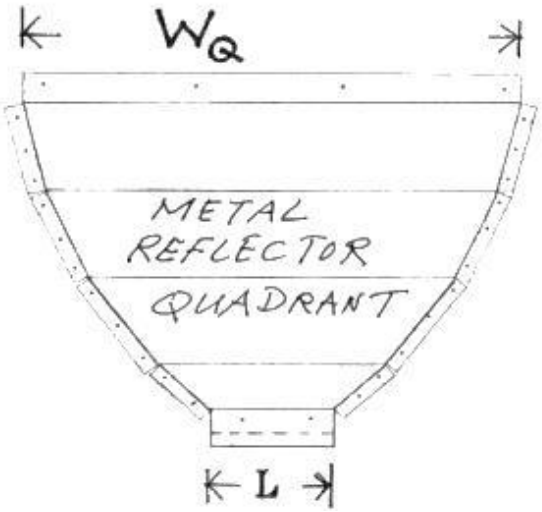
A

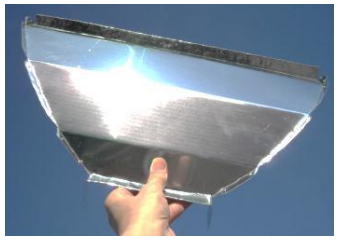


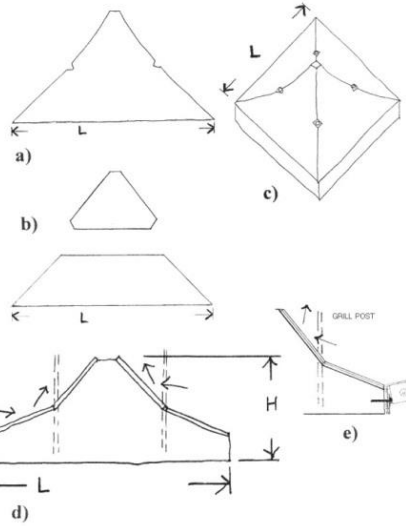
B

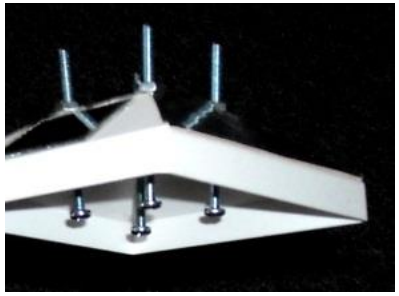
An asymmetric base has a more complicated form work, and for the cast concrete base an aim is to reduce weight. Base incline is limited to less than about 15 degrees from horizontal. The reflector form design is for both glued flat glass mirrors and glued bent anodized aluminum with materials for durability. Forms for on site casted concrete bases can now be developed for solar cooker trials, whereas refilled plastic bases may take a longer time to develop. The square unglazed reflector box may be hung on a wall or be part of a solar cooker cart as well.

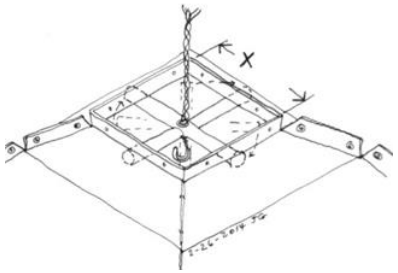


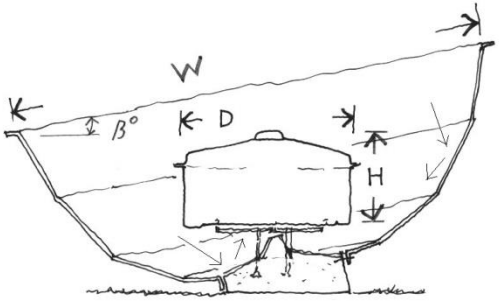


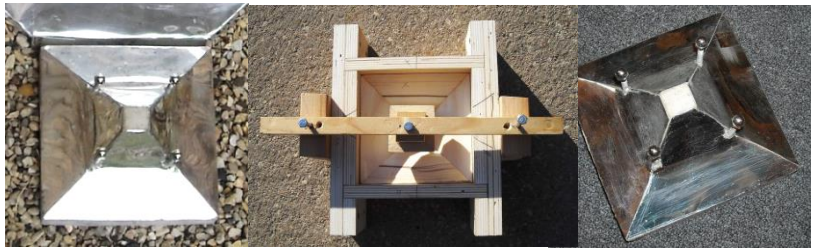


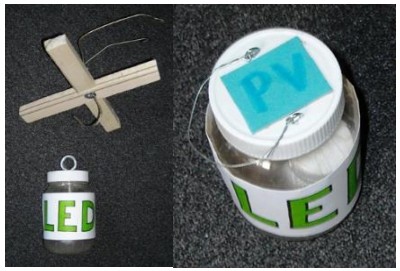






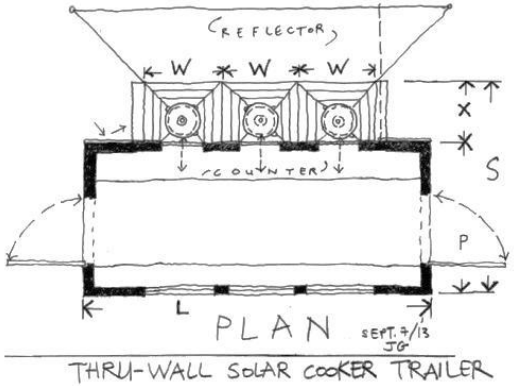


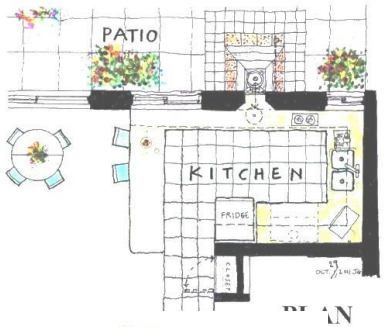


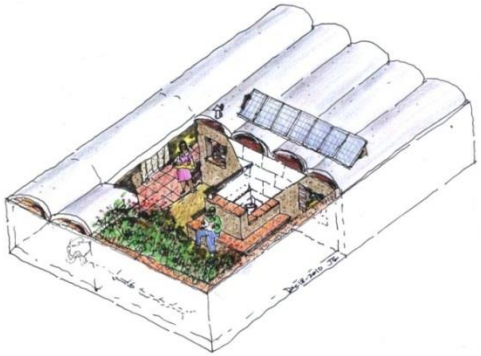


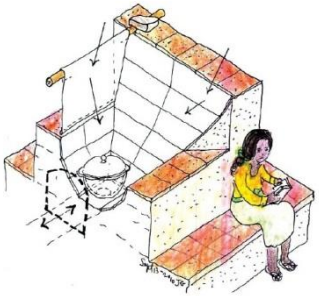
Stand-alone solar cooker and LED reflector set

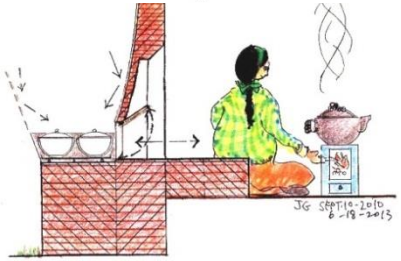
The reflector 'box' has a <u>standard quadrant-shape</u> . Reflector substrate pyramid-shape bases (6x6"x 3.5") have been cast with concrete with bolt posts, and may be wood or recycled plastic fence post caps type forms.



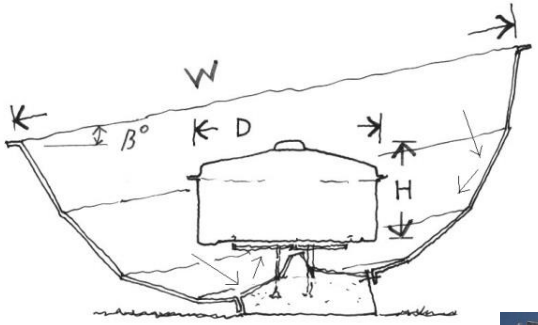




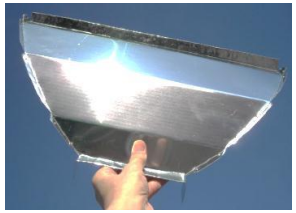


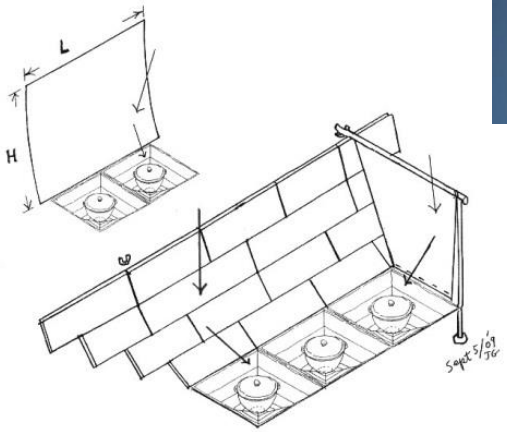


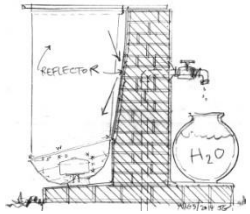
Thru-wall slide out-in kitchen studies

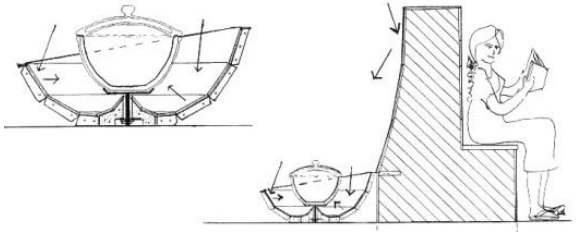


PROJECT





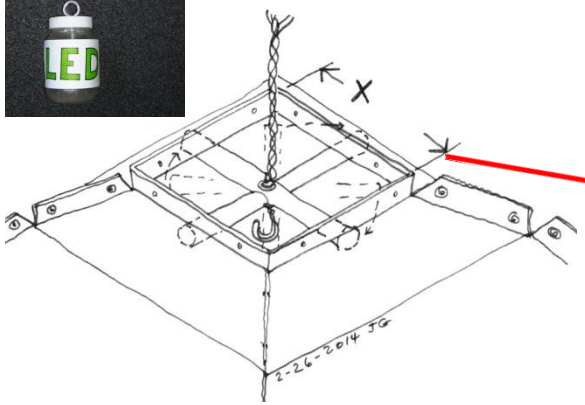


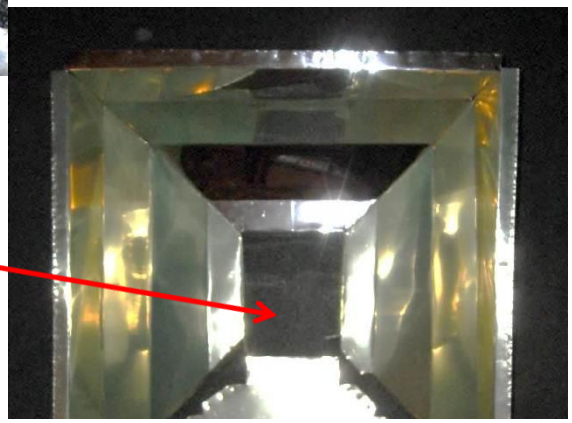


<u>Stand-alone solar cookers</u>

Nonimaging reflector concentrator solar kitchen-cooker studies

Joel H. Goodman 1-2015





Stand-alone solar cooker and LED PV reflector set

The LED lantern has a wire hook and plus-shaped wood hanger for the inverted reflector concentrator box. An open square, X = around 6 to 7”/15-18 cm, and is an optical-thermal fabrication design variable. A thin metal stamping workshop could cut out the patterned elements and punch holes from flat sheets. The flat lightweight aluminum sheets could be transported to local workshops for assembly (bending, pop rivets, etc.) and distributed, a creation of local jobs idea.

Nonimaging reflector concentrator cooker LED PV lantern set

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Selected Publications:

Goodman, Joel H., *Building Integrated CSP Selected Studies*, SOLAR 2010 ASES Conf., May 2010, Phoenix, Arizona
Goodman, Joel H., Architectonic Reuse of Wind Turbine Blades, SOLAR 2010 ASES Conf., May 2010, Phoenix
Goodman, Joel H., Building Interior Evacuated Tubes and Reflectors, Solar 2009 ASES Conf., Buffalo, NY May 2009
Goodman, Joel H., Building Size Fixed Reflector CPC Troughs and Bowls for Food Processing Facilities, Proceedings of the International Solar Food Processing Conference, ISES, Jan. 2009, Indore, India
Goodman, Joel H., *"Architectural Active Solar Energy Reflector Collector Studies*", Solar 2008 American Solar Energy Society Conference, San Diego, California.
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Goodman, Joel H., *"Architectonic Studies with Selected Reflector Concentrating Solar Collectors",* 2007, Journal of Green Building, Vol. 2 Number 2, Spring, College Publishing, pp 78-108
Goodman, Joel H., "*Architectonic studies with building size nonimaging reflectors"*, invited, Proceedings of the World Renewable Energy Congress IX, Florence, Italy, Aug.,2006
Goodman, Joel H., *Active Solar Energy Engineering University Undergraduate Student Projects,* Proceedings of the ISES Solar World Congress 2005, Orlando, Florida, 8-2005