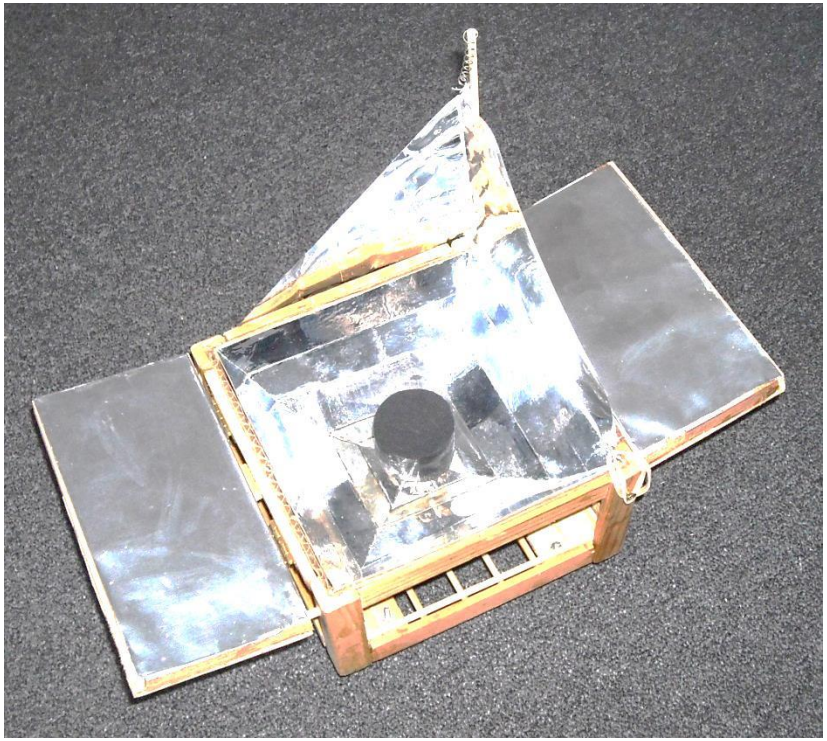
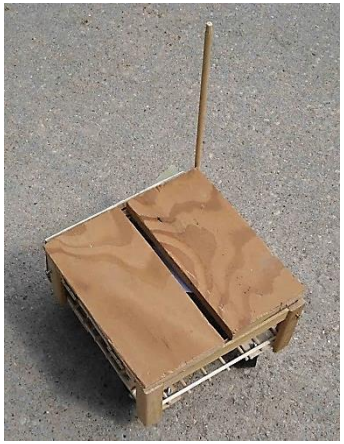
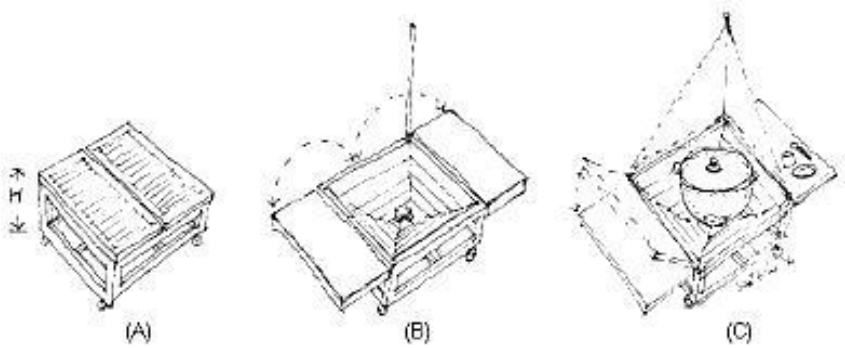
Solar Cooker Cart Studies

Joel H. Goodman

3-26- 2015







Solar Cooker Cart

A solar cooker cart has an unglazed horizontal square inlet aperture reflector box assembled with four identical metal panels attached to the cart frame. A reflector pyramid with four posts is at the center lower square of the reflector box. Lightweight triangular reflectors with wind load fail-safe connectors are spring-loaded on a pole to approximate inlet aperture inclination. One reflector optical shape may not be perfect for each different application (stand-alone cooker, cart and LED reflector) but good enough for mass production economy for identical quarter panels.

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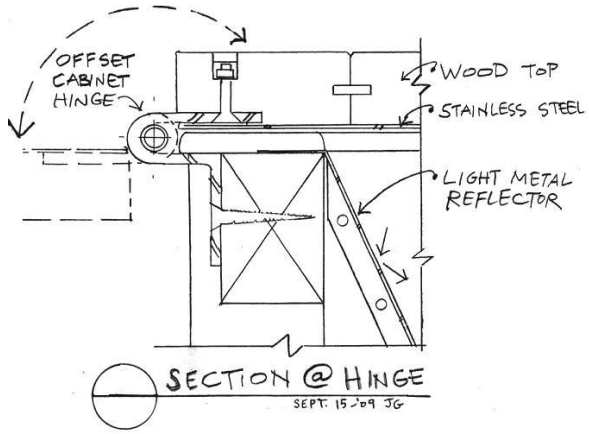

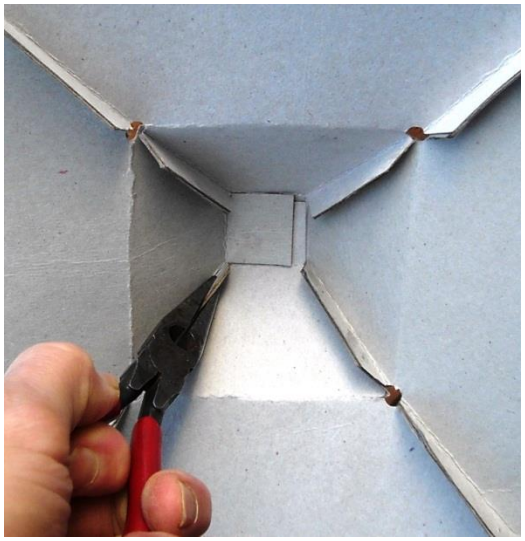

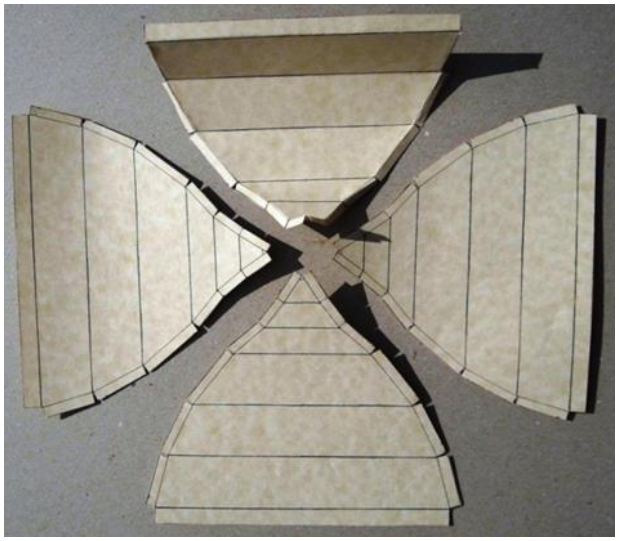

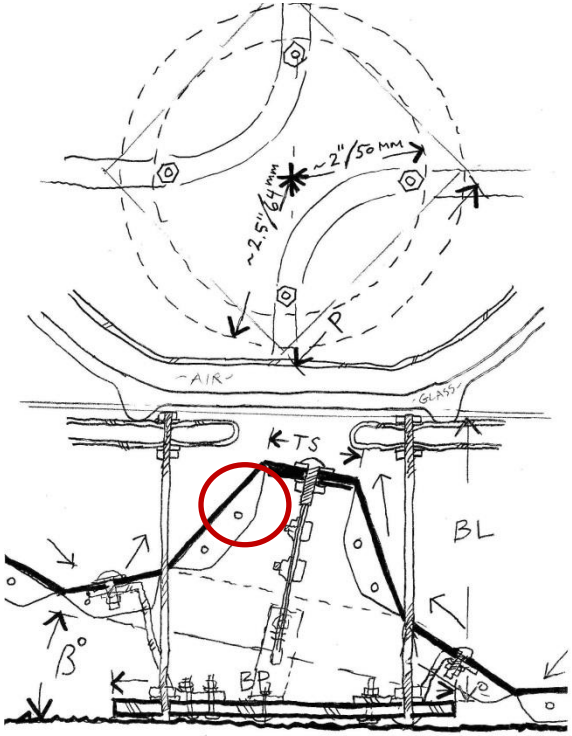

Section study at base plate

Solar cooker reflector project notes 3-26-2015
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The feasibility of assemble connecting four full panel reflectors can be verified by fabricating a full size mock-up. A concern is tool access to the top of the top tabs. Is there a rivet/clamp that can be compressed with a small pliers?

Try to report the embedded energy (electrical, thermal) and pollutions in the selected materials and processes.

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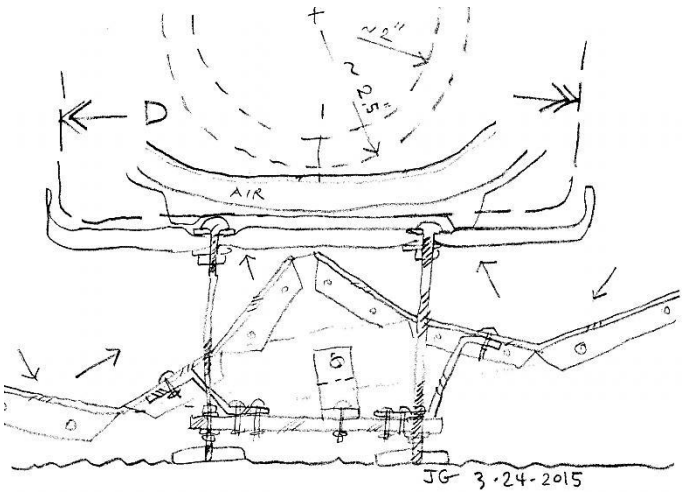
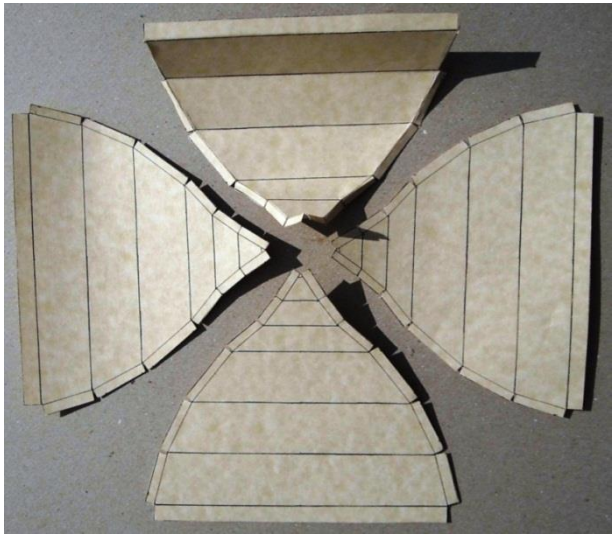


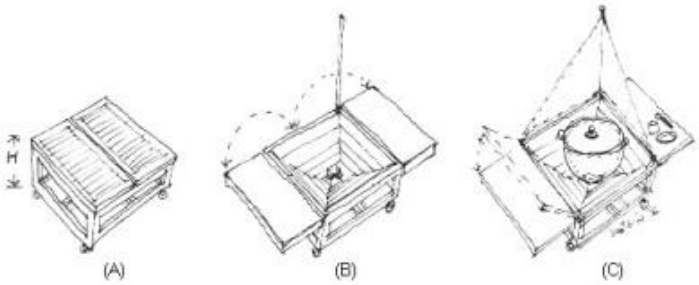
Section at base of inclined reflector study

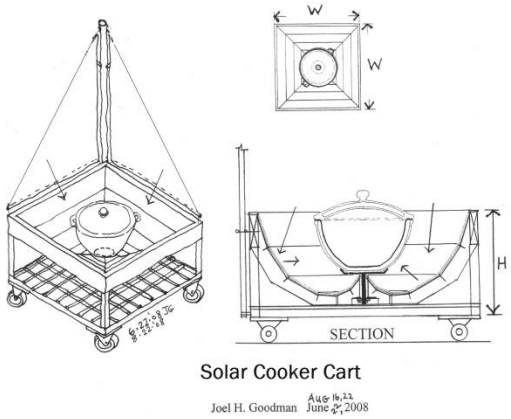


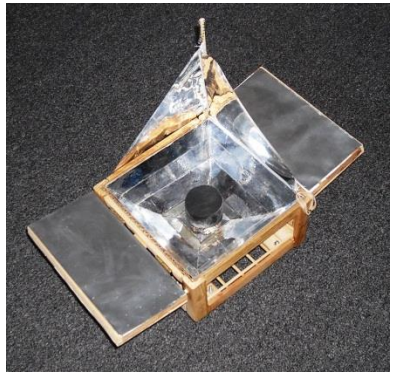
During the 3-23-2015 Dodgeville library meeting with UW-P students Hayley, Chaz, Andy, and Nathan three types of cookers were discussed: mainly a lightweight stand alone easy to carry inclined cooker; and a cooker cart with same reflector horizontal; and briefly a metal “cookit” type cooker. A range of cost estimates for production quantities of identical metal full panels may be a few to large numbers. The main nonimaging reflector design target may be about the size of the SCI 3 lb roaster, and the inclined and horizontal reflector should be large enough to block wind loads to the HotPot TM cooker. The UW-Madison solar lab and Prof. Klein may have suggestions and design aid software.

After the meeting a base study was considered without using glue and four vertical bolt-posts (~~not~~ in a square) positioned to keep the HotPot TM from sliding. A concern is dissimilar bolt and reflector metals touching. A suggestion is to order a cardboard “cookit” from SCI and some extra metal reflector and consider a metal “cookit” type cooker if time permits.

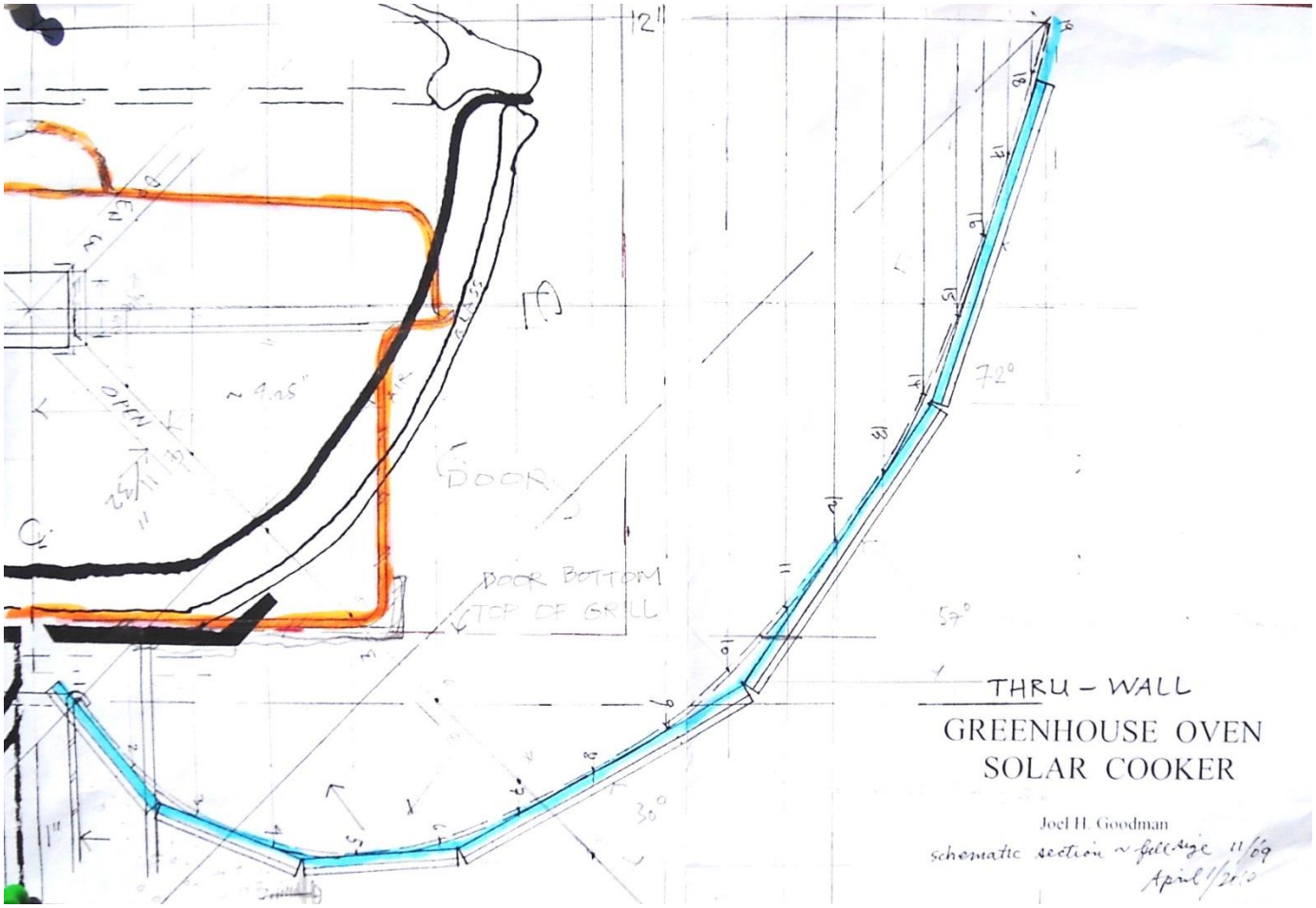
Anodized aluminum reflector mock-up full-size model with 3lb SCI roaster







Solar cooker cart



Half-SECTION of horizontal inlet reflector study with SCI 3lb roaster and the larger HotPot TM.

The reflector shape was composed of flat segments for bent metal reflectors and flat glass mirror segments. The reflector four panels box would have to be larger to block wind to the HotPot TM cooker, and the design may be different for an inclined reflector box.

Project: Solar Reflector Cooker LED-PV Lantern Set –2-2015 JH Goodman