

SOLAR WATER HEATER

PARTS AND MATERIALS

NUMBER REQUIRED	PART	SIZE		MATERIALS
		ENGLISH "	METRIC mm	
2	Long sides	3/4 x 2 1/2 x 10 1/2	20x60x267	Pine
2	Short sides	3/4 x 2 1/2 x 6	20x60x152	Pine
1	Back	1/8 x 7 1/2 x 10 1/2	3x190x267	Corrugated cardboard
6	Insulation	1/8 x 6 x 9	3x152x229	Corrugated cardboard
1	Plate	6 x 9	152x229	1 gallon can side
1	Piping	1/4" dia. x 8'	6x2400	Plastic tubing
1	Cover	1/8 x 7 1/2 x 10 1/2	3x190x267	Plastic or glass
1	Wire	22 Ga. x 3'	900	
1	Tank	8-16 oz.	-	Plastic with screw cap

PROCEDURE

1. Cut sides of collector frame to size.
2. Layout and drill the holes for the tubing in the short sides. Use a 9/32" bit.
3. Assemble sides with 1 3/4" finish nails and glue. Sand smooth.
4. Cut cardboard back and insulation to size.
5. Cut sheet metal collector plate to size. Be careful, sheet metal is sharp!
6. Layout collector plate for three or five loops. Punch holes so tubing can be tied to collector plate with wire.
7. Cut 15 pieces of 22 gauge wire 1 1/2" long and bend into a "U" shape.
8. Attach plastic piping to collector plate using the wires made in step 7. Allow 18" of pipe to extend beyond collector plate. Be sure your starting and stopping points match the hole locations in the frame.
9. Staple cardboard back on frame and insert cardboard insulation and collector plate assembly. Paint assembly flat black and let dry.
10. Drill four holes in plastic cover and attach with 1/2" No. 6 screws. *
11. Punch two holes in plastic tank. One should be located at the top of one side and at the bottom of the opposite side.
12. Insert tubing with lowest tube inserted into lowest tank hole and highest tube in highest tank hole.
13. Fill tank with water and place above collector. Place collector in sun so that collector plate is fully exposed to sunlight. Hot water is on its way.

*Note: If glass is used, cut slots in sides 1/4" below top edge before assembly. Cut top side to 2 1/8" wide so glass can be slid into frame.

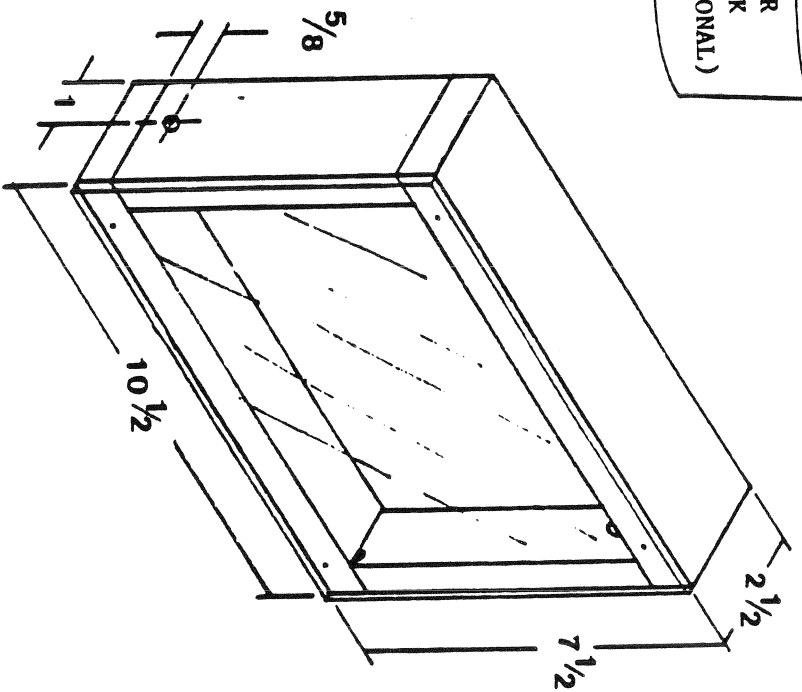
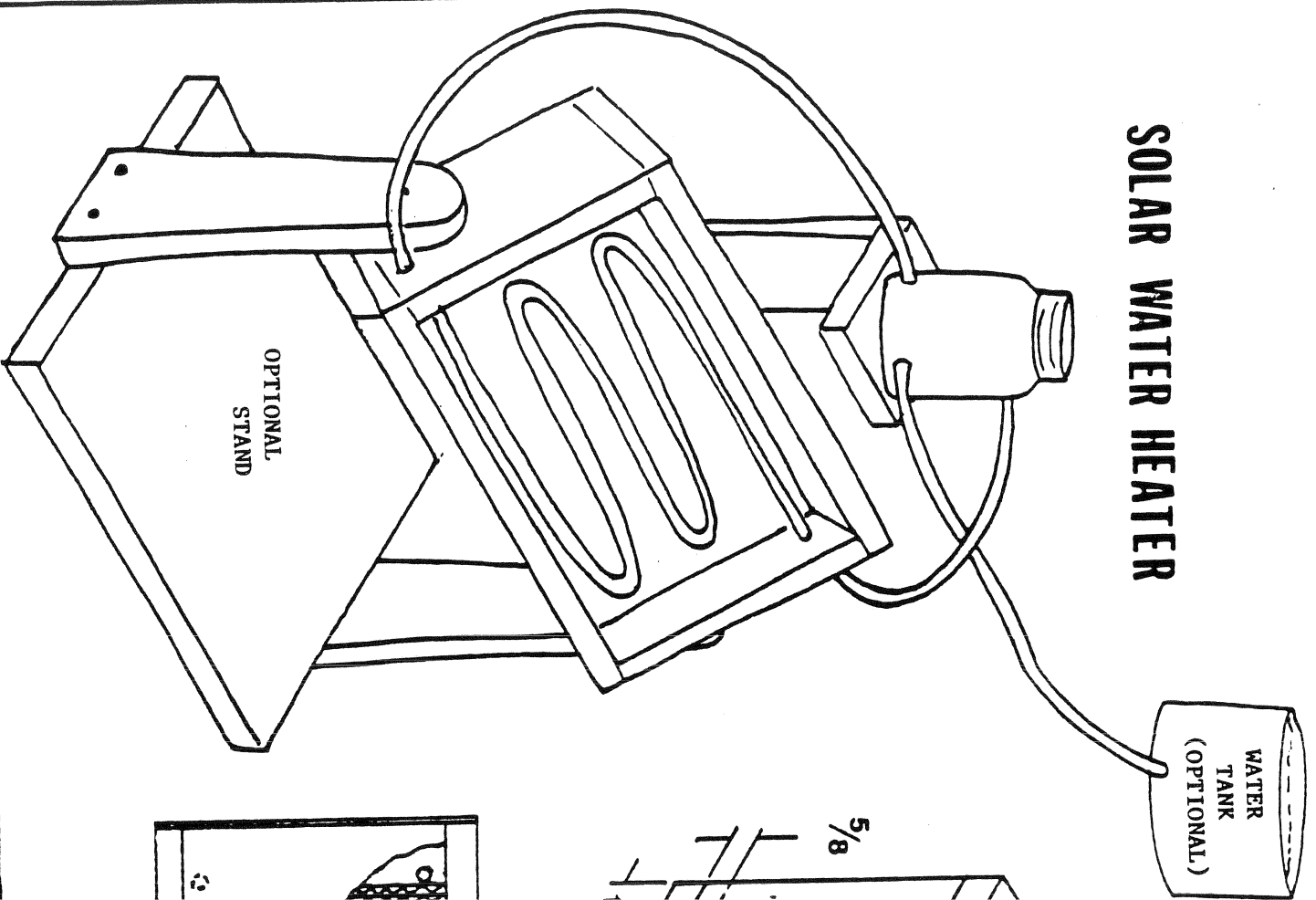
IMPROVING YOUR SOLAR WATER HEATER

You have built a passive solar system which operates on the principle of thermo-syphoning (hot water rises while cold water sinks). Although the water in the collector will reach a temperature of 130° very quickly in full sun, the diameter of the piping, the lack of water pressure, and heat loss make the system inefficient.

To improve your system, experiment by insulating all piping and the holding tank. A gravity water pressure system can also be made by adding a water reservoir and connecting it with piping to the holding tank as shown in the drawing. The reservoir should be at least five feet higher than the holding tank.

What else can you do to improve your system?

SOLAR WATER HEATER



COLLECTOR PLATE (TYPICAL)

