

# Installation / Operations Manual

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## Overview

### PRODUCT HISTORY

The SOLAR ROOM<sup>®</sup> was developed and patented high in the Sangre de Cristo Mountains of New Mexico. Taos was a fortunate birthplace - its 7,000 ft. altitude makes a perfect solar test site. It has winters that drop to -20°, lots of sun and snow, 50 to 75 mph winds each spring. And in addition to a rigorous test climate, Taos is the home of creative and highly skilled people who hide in the woodwork. The support of Los Alamos Scientific Laboratory with its solar scientists is just 50 miles away.

### THE SOLAR GREENHOUSE SYSTEM

The SOLAR ROOM, when mounted on the south, southeast, or southwest sides of the home, is a solar collector in addition to being a greenhouse. It is a gold anodized extruded aluminum frame which bolts together erector set fashion. It is then bolted to a wood beam or cement foundation and the wall of the house. The frame is covered with a Twin Skin<sup>™</sup> glazing made of a double layer of special 6 mil ultraviolet resistant polyethylene developed for the commercial greenhouse industry. The layers are separated by air inflation supplied by a 36 watt blower. The Twin Skin is sealed around the perimeter of the "solar greenhouse" and locked into position by a patented locking gasket system. In the summer, the SOLAR ROOM can be easily converted to a screen porch with the removal of the Twin Skin cover and the installation of the optional screen/awning (an operation which generally takes one or two hours).

### DO-IT-YOURSELF INSTALLATION

Typical installation is 2 days for 2 people for a 20' to 24' unit. Your choice of foundation will affect the installation time! A 6" x 6" wooden beam in the ground installs rapidly and makes a fine foundation. Specific home and setting situation may require other kinds of foundations and attachments (see page 4). We have tried to anticipate installation questions in very great detail. However, if you have any questions, don't hesitate to call us at (505) 758-9344.

### SOLAR TESTING/SIZING

The SOLAR ROOM has been thermally tested under the Department of Energy auspices for three years and field tested in a dozen states for seven years. Tests prove that it can have significant effect on the amount of fuel used for home space heating. When the sun is shining during the winter the SOLAR ROOM will be 110° to 120° with no air circulation. It is designed to operate at a temperature of 80° to 85° while millions of BTU's are circulated around the house. Generally speaking, the larger the SOLAR ROOM the more BTU's provided. An optimum size can be calculated for any home and location by Norman Brooks in the Sales Engineering Department of Solar Resources, Inc. at (505) 758-9344.

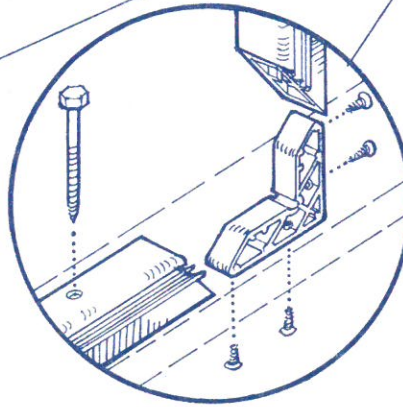
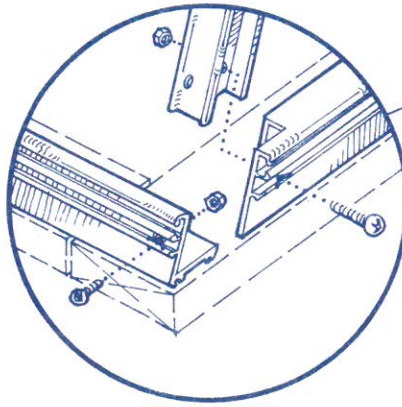
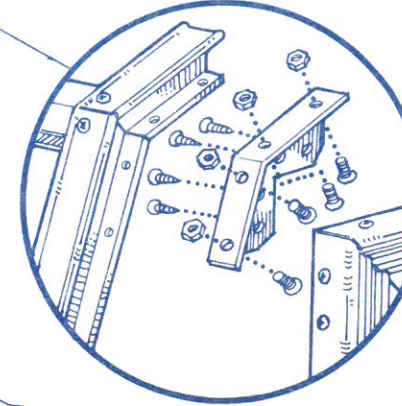
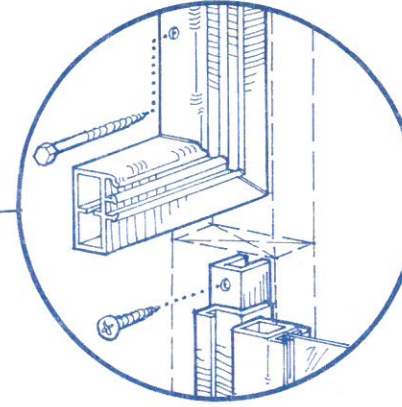
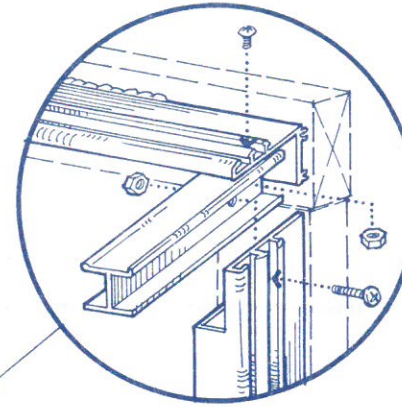
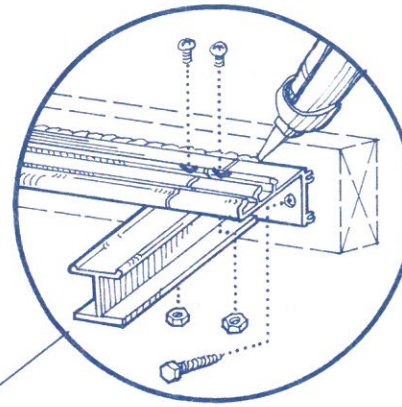
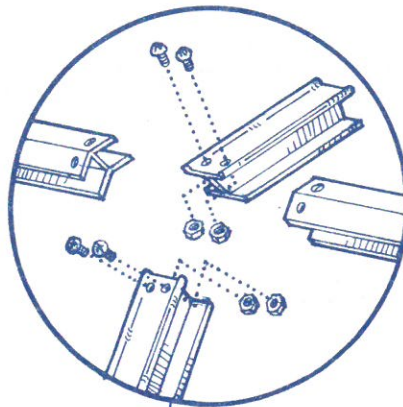
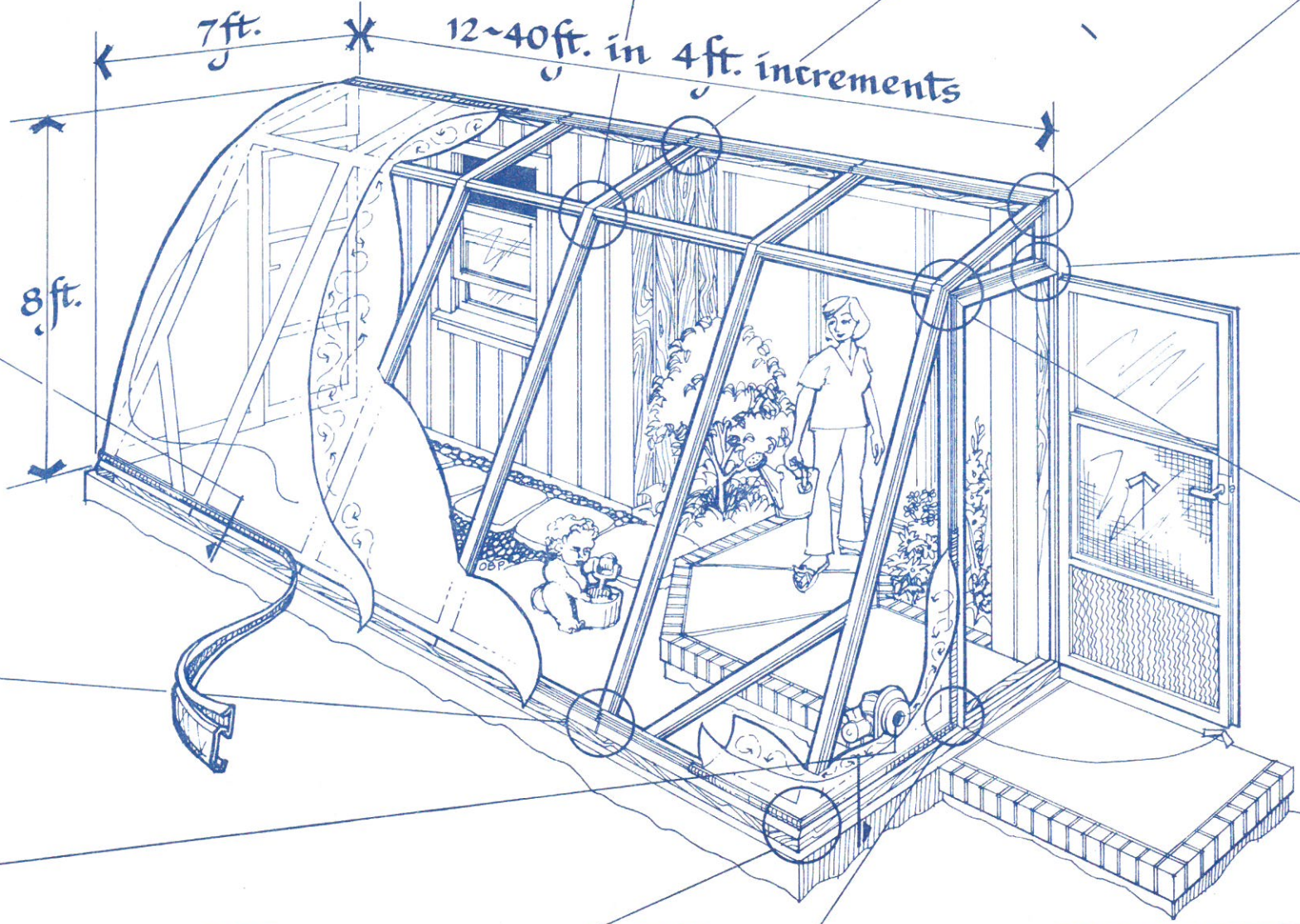
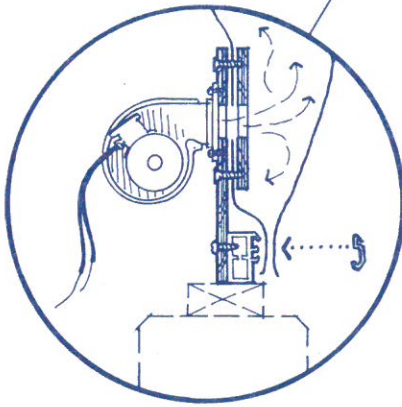
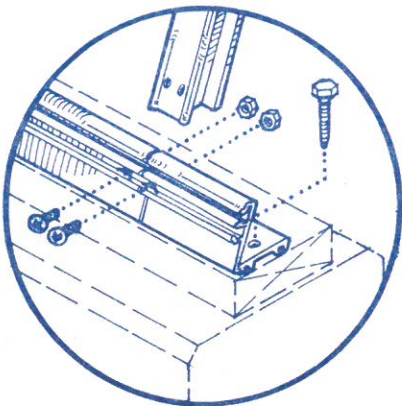
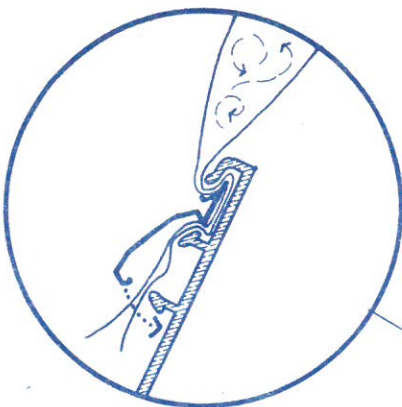
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## Table of Contents & Overview

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Solar Resources Inc. Taos N.M.

**Solar Room**®  
**Heat Machine/Screen Porch**  
 PATENTED

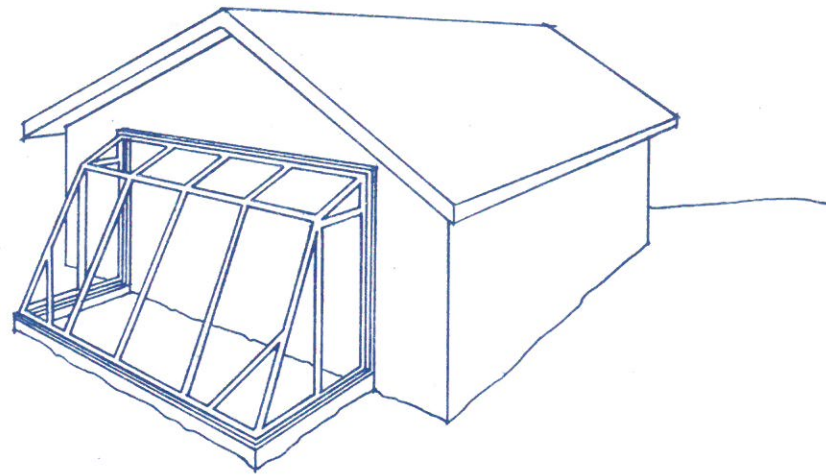


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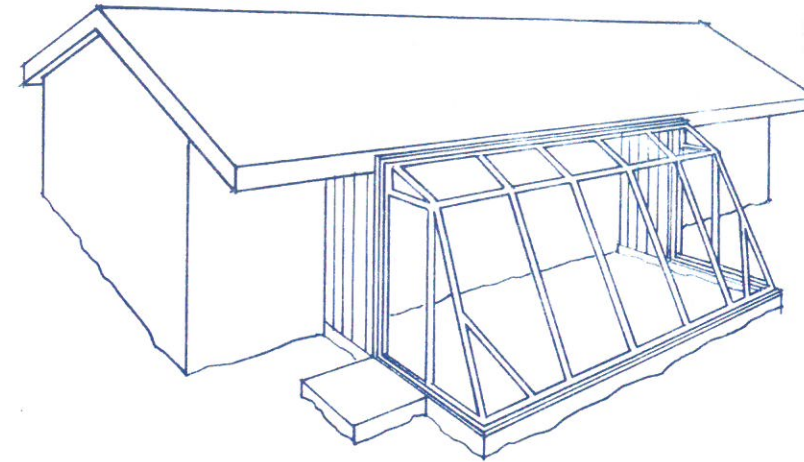
**Solar Resources, Inc.**

Taos, New Mexico 87571

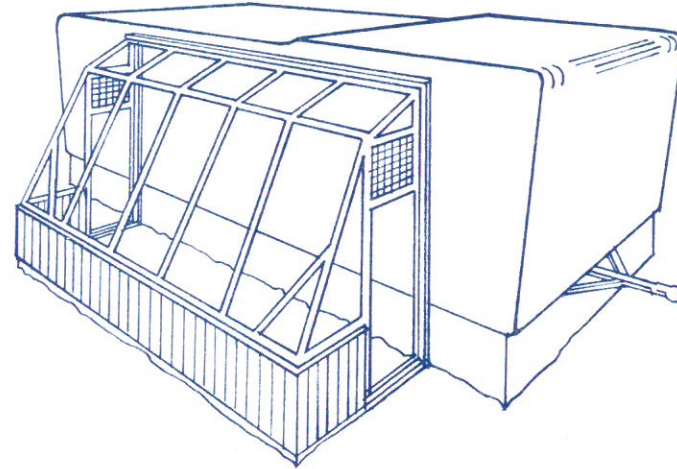
(505) 758-9344



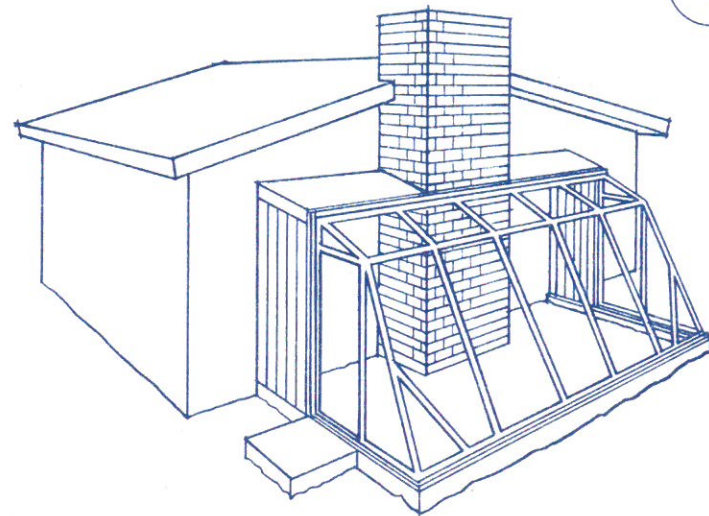
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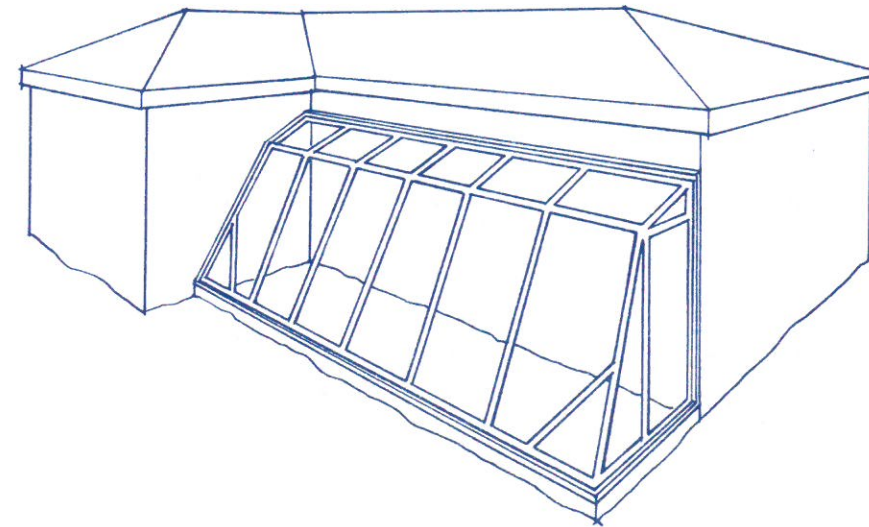
2 EAVE PROJECTION  
FILL-IN WALL PANELS UNDER EAVES BY OWNER



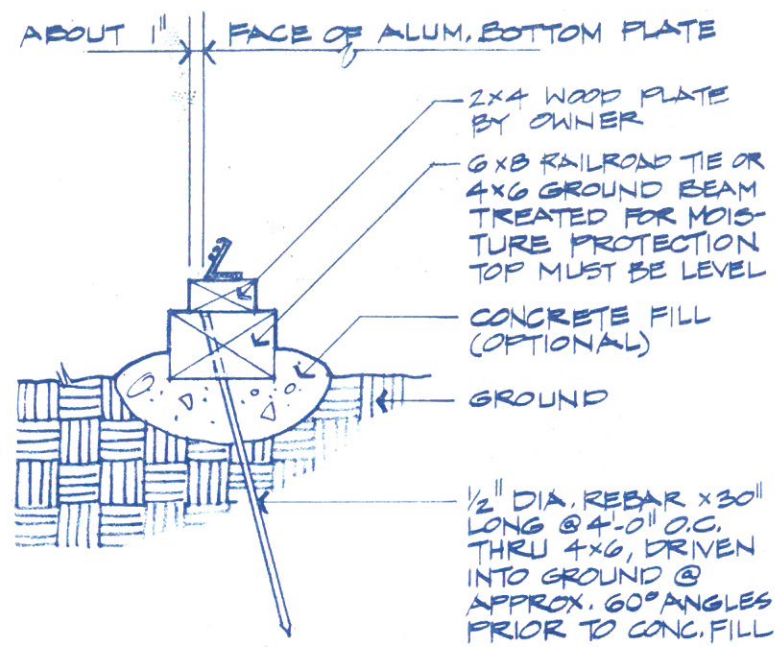
4 LOWERED DOORWAY  
HIGH STEM WALL BY OWNER -  
FIBERGLASS INFILL PANELS UPON REQUEST



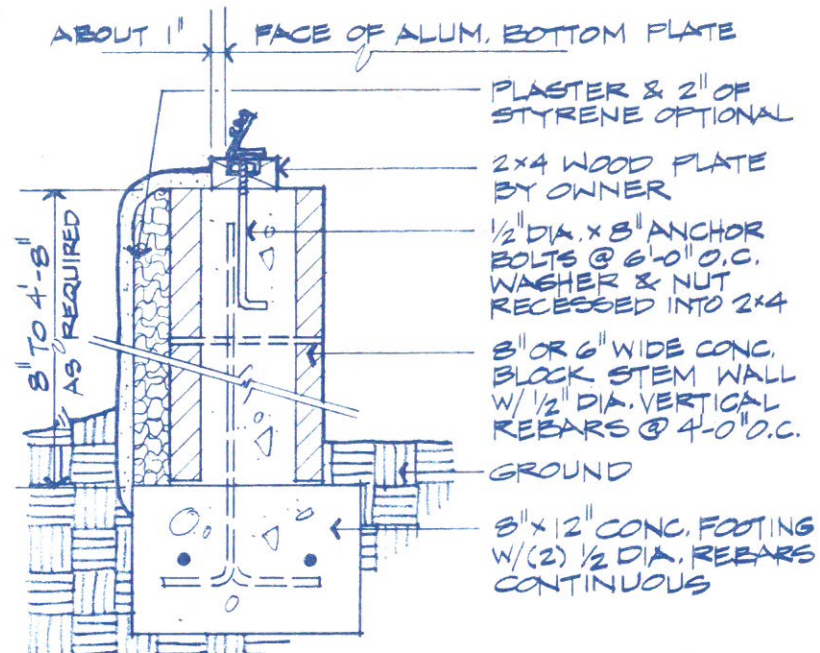
3 BUILDING PROJECTION  
FILL-IN ROOF & WALL PANELS BY OWNER



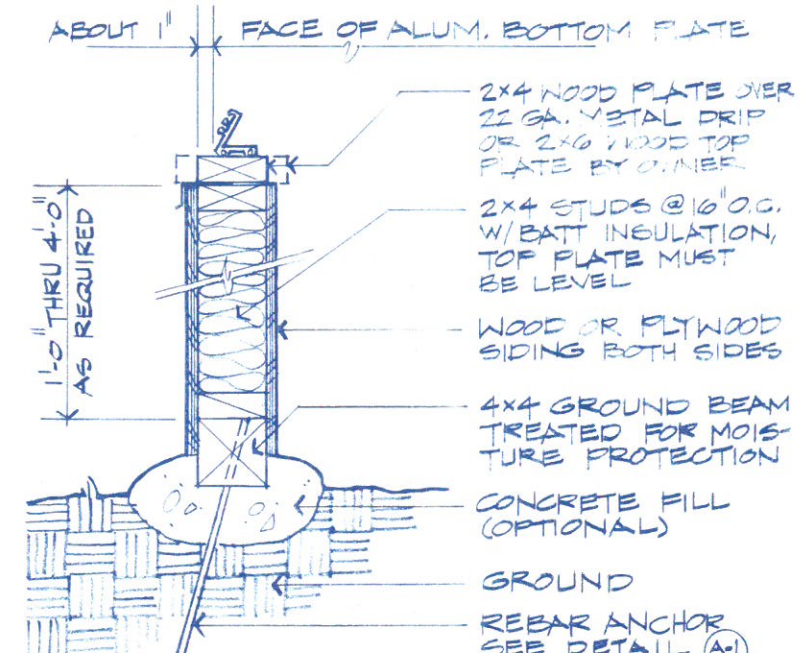
5 INSIDE WALL CORNER  
DOOR FRAMING IS OMITTED ON SIDE WHERE  
SOLAR ROOM® ABUTS TWO WALLS



**A-1 GROUND BEAM SECTION**  
OPTION #1



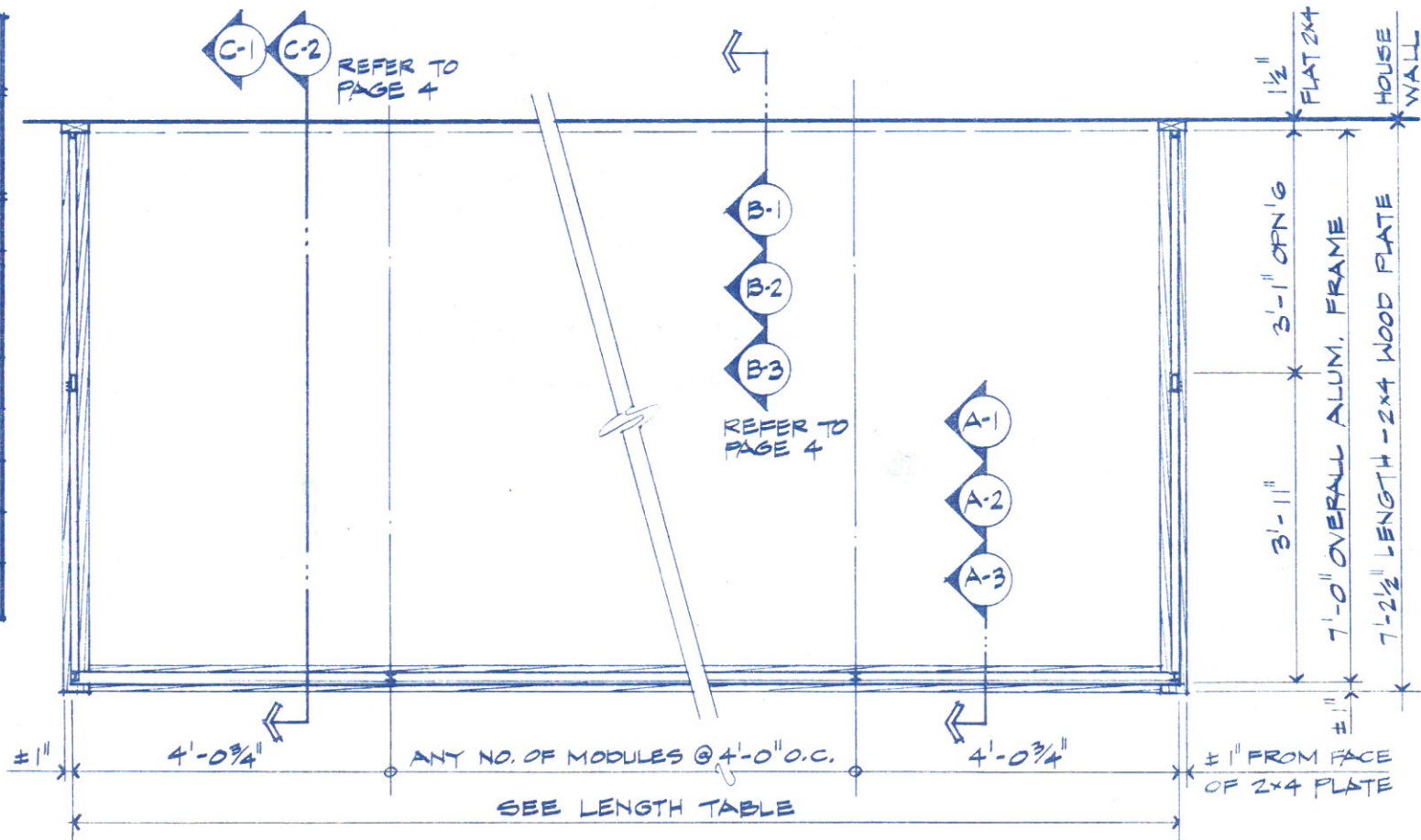
**A-2 STEM WALL SECTION**  
OPTION #2



**A-3 2x4 STUD WALL BASE SECTION**  
OPTION #3

LENGTH TABLE			
KIT LENGTH	REAR TOP 2x4 WOOD PLATE		
	NOMINAL	ALUM. FRAME	FRONT BOTTOM 2x4 WOOD PLATE
12 FT.	12'-1 1/2"	12'-3 1/2"	11'-8 1/2"
16 FT.	16'-1 1/2"	16'-3 1/2"	15'-8 1/2"
20 FT.	20'-1 1/2"	20'-3 1/2"	19'-8 1/2"
24 FT.	24'-1 1/2"	24'-3 1/2"	23'-8 1/2"
28 FT.	28'-1 1/2"	28'-3 1/2"	27'-8 1/2"
32 FT.	32'-1 1/2"	32'-3 1/2"	31'-8 1/2"
36 FT.	36'-1 1/2"	36'-3 1/2"	35'-8 1/2"
40 FT.	40'-1 1/2"	40'-3 1/2"	39'-8 1/2"

NOTE: SIDE BOTTOM 2x4 WOOD PLATE = 7'-2 1/2"  
SIDE VERTICAL 2x4 WOOD PLATE = 7'-9 1/2"

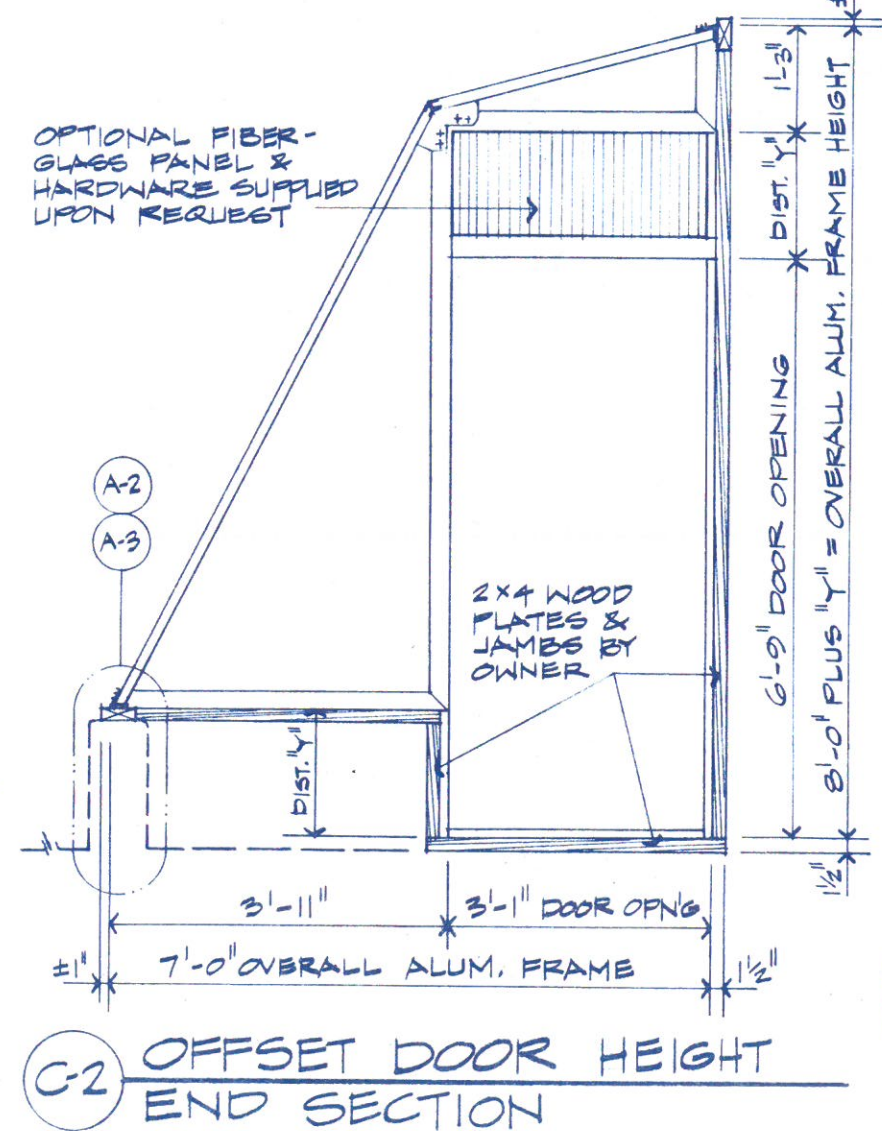
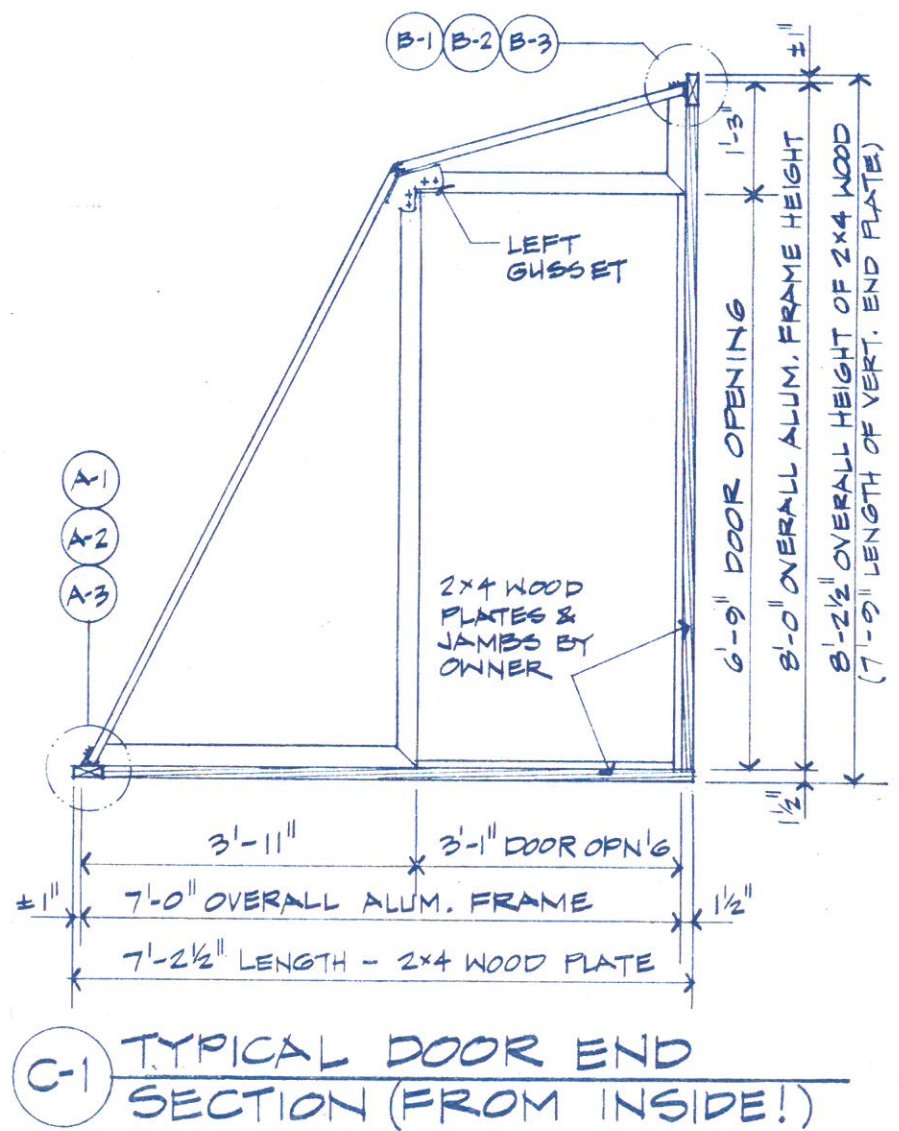
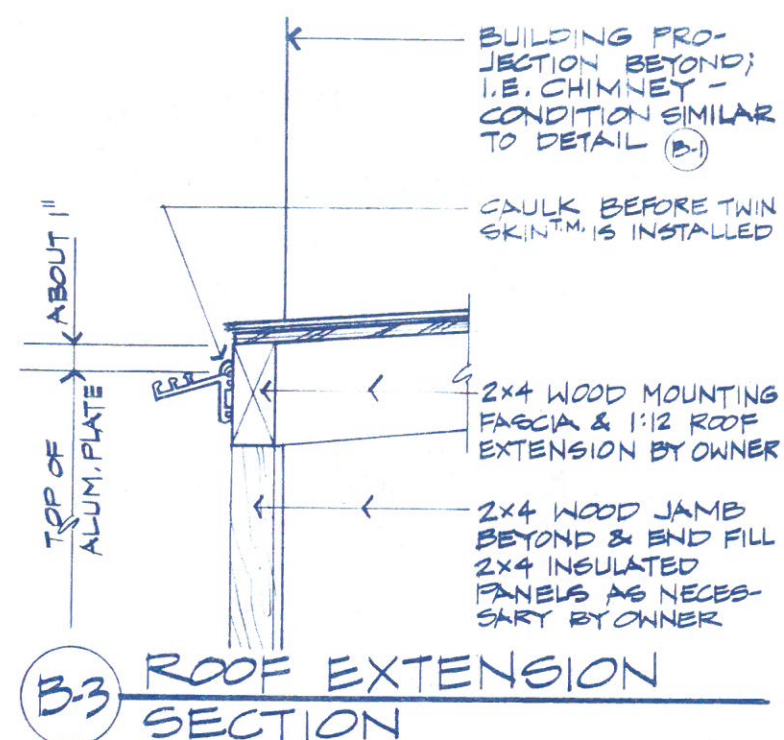
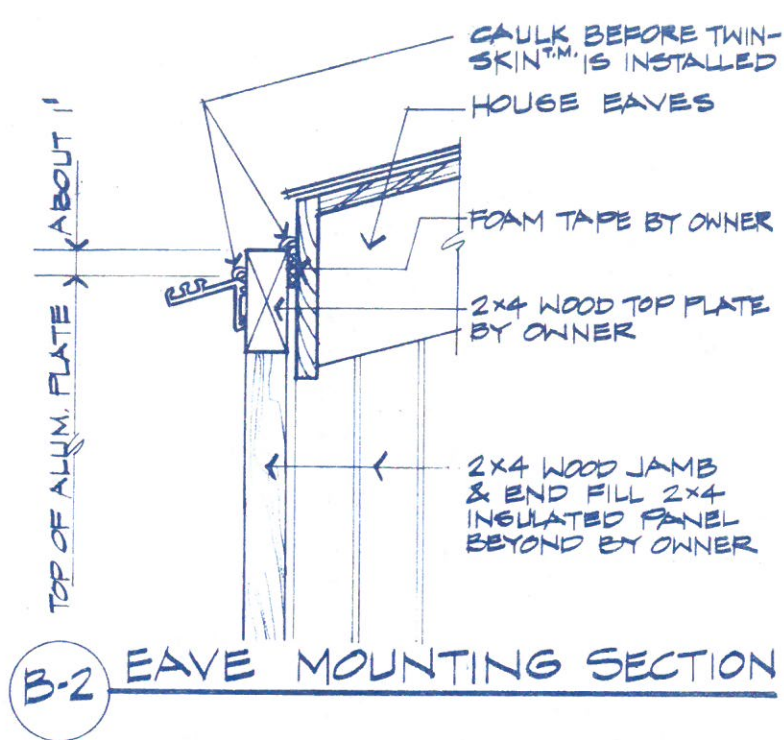
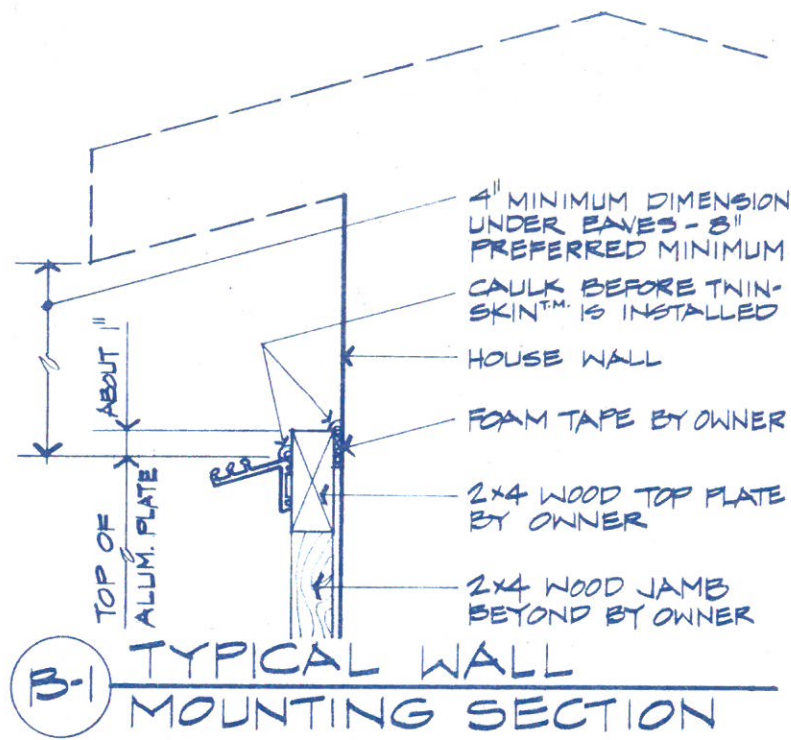


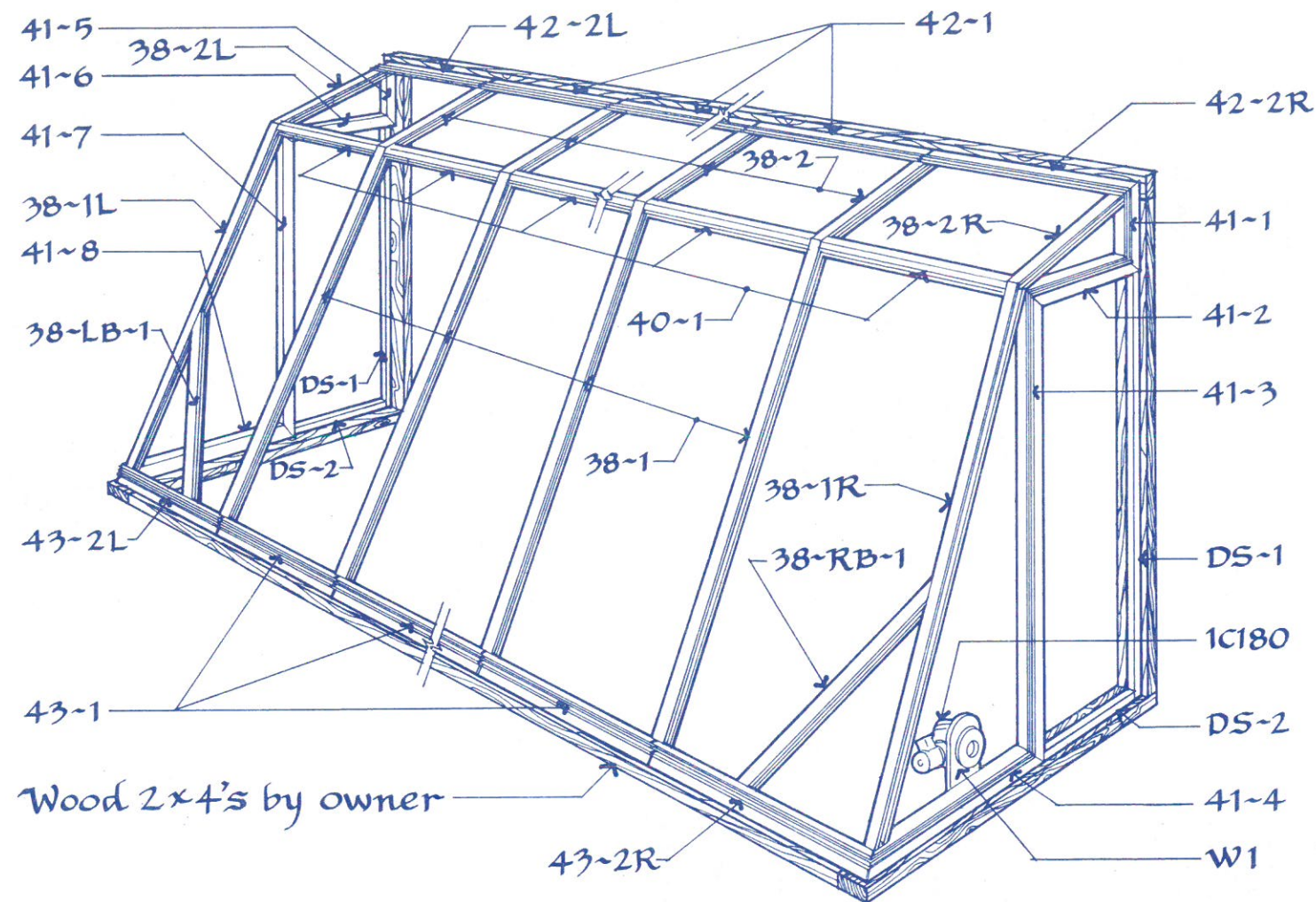
**TYPICAL SOLAR ROOM® FLOOR PLAN**

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**Site Preparation & Foundation Details** **3**

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## AX1-96 Frame - Part Number Locator

### Boxes Shipped

3 BOXED MODULES (MODS)

MOD	SIZE	INSIDE
'A'	96" x 7.5" x 6.5"	Frame Parts
'B'	96" x 3.5" x 2.5"	Frame Parts
'C'	40" x 7.0" x 17"	Twin Skin

Boxes Needed	SOLAR ROOM length-ft.							
	12	16	20	24	28	32	36	40
MOD 'A'	1	1	1	1	1	1	1	1
MOD 'B'	1	2	3	4	5	6	7	8
MOD 'C'	1	1	1	1	1	1	1	1

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## Parts & Tools

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## Parts List

PART #	NAME
41-1	RIGHT DOOR END RISER
41-2	RIGHT DOOR END HEADER
41-3	RIGHT DOOR END POST
41-4	RIGHT DOOR END PLATE
41-5	LEFT DOOR END RISER
41-6	LEFT DOOR END HEADER
41-7	LEFT DOOR END POST
41-8	LEFT DOOR END PLATE
42-1	TOP PLATE MID-PIECE
42-2R	TOP PLATE RIGHT END-PIECE
42-2L	TOP PLATE LEFT END-PIECE
43-1	BOTTOM PLATE MID-PIECE
43-2R	BOTTOM PLATE RIGHT END-PIECE
43-2L	BOTTOM PLATE LEFT END-PIECE
40-1	SPACER
38-1	LOWER STRUT MID
38-1R	LOWER STRUT RIGHT
38-1L	LOWER STRUT LEFT
38-2	UPPER STRUT MID
38-2R	UPPER STRUT RIGHT
38-2L	UPPER STRUT LEFT
38-RB-1	RIGHT BRACE
38-LB-1	LEFT BRACE
DS-1	VERTICAL DOOR STOP
DS-2	HORIZONTAL DOOR STOP
1C180	BLOWER
W1	BLOWER MOUNT

### MISCELLANEOUS PARTS (NOT SHOWN)

LEFT GUSSET  
 RIGHT GUSSET  
 CORNER KEYS (6)  
 FASTENERS  
 INSERTS  
 TWIN SKIN GLAZING  
 TWIN SKIN PATCHING TAPE

\* NOTE: 2" x 4" FRAME PROVIDED BY OWNER

## Tools List

Hammer or Mallet  
 Phillips Screwdriver  
 3/8" Wrench (for frame bolts)  
 7/16" Wrench or socket (for lag screws)  
 Wrench (for fasteners to house wall & foundation)  
 3/16" Bit (for pilot holes in wood)  
 Chalk Line  
 Measuring Tape  
 2' Level  
 Line Level  
 Saw  
 Electric Drill (for pilot holes in wood)  
 Hack Saw  
 Step Ladder

## 1 - PREPARATION:

PRIOR TO FRAME ASSEMBLY AND INSTALLATION YOU MUST COMPLETE THE FOLLOWING STEPS:

- A. PREPARE SITE AND INSTALL FOUNDATION AS REQUIRED BY YOUR SPECIFIC SITUATION. DIMENSIONS SHOWN ON PAGE 3.
- B. INSTALL 2" x 4" FRAME. SEE PAGES 3 & 4. MAKE SURE ALL CORNERS ARE AS CLOSE TO A RIGHT ANGLE AS POSSIBLE.  
( REMOVE ALL FRAME PARTS FROM MODULE A AND MODULE B BOXES - CHECK THE PARTS PACKING LIST. DO NOT MIX MODULE A WITH MODULE B AT THIS TIME.)

## 2 - LAYOUT:

LAYOUT AND MARK LOCATION OF OUTSIDE DIMENSIONS OF ALUMINUM FRAME ON 2 x 4'S USING CHALK LINE (FIG. 1). SEE LENGTH TABLE ON PAGE 3. AND HEIGHT DIMENSIONS ON PAGE 4.

## 3 - INSTALL DOOR STOP:

INSTALL VERTICAL DOOR STOP FIRST THEN HORIZONTAL ON EACH END, SO THAT THE OUTSIDE FACES LIE ON THE CHALK LINE. FASTEN TO 2 x 4'S WITH 1 3/4" SHEET METAL SCREWS.

## 4 - ASSEMBLE LEFT DOOR END:

USING PARTS FROM MODULE A BOX, ASSEMBLE LEFT DOOR END ON FLAT SURFACE AS FOLLOWS:

**NOTE:** RIGHT AND LEFT ARE ORIENTED AS YOU FACE THE SOLAR ROOM FROM THE OUTSIDE.

- A. JOIN DOOR END PLATE, POST, HEADER AND RISER WITH 3 CORNER KEYS AND 12 SCREWS.
- B. ATTACH LEFT GUSSET TO LOWER LEFT STRUT AND UPPER LEFT STRUT USING 3/8" MACHINE SCREWS AND NUTS.
- C. ATTACH STRUTS TO DOOR END PIECES USING 1 1/4" MACHINE SCREWS AND NUTS AND FASTEN BRACKETS TO DOOR END WITH 1/2" SHEET METAL SCREWS.

**NOTE:** CHECK TO SEE THAT YOU HAVE ENOUGH SPACE FOR THE TOP AND BOTTOM PLATES TO FIT BETWEEN THE STRUT ENDS AND THE 2 x 4.

## 5 - INSTALL LEFT DOOR END ASSEMBLY:

INSTALL LEFT DOOR END ASSEMBLY USING 4 - 4" LAG SCREWS WITH RUBBER WASHERS (FIG. 2). MAKE SURE THE OUTSIDE FACE LIES ON THE CHALK LINE AND THAT THE DOOR END HEADER RESTS ON TOP OF THE VERTICAL DOOR STOP AND THE DOOR END POST BUTTS AGAINST THE HORIZONTAL DOOR STOP. LEAVE THE LAG SCREWS SLIGHTLY LOOSE TO ALLOW INSTALLATION OF THE PLATES.

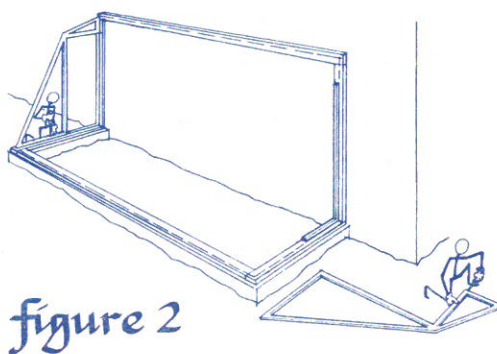
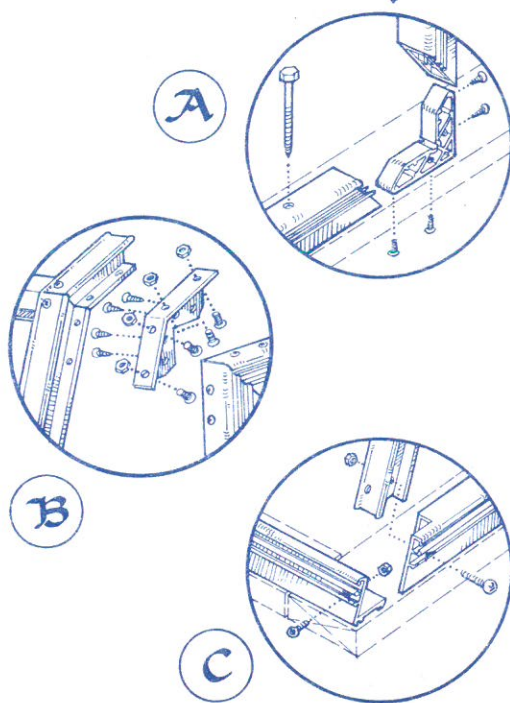
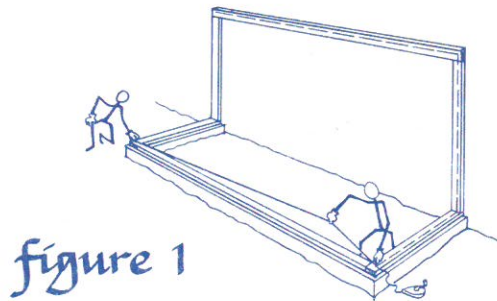
## 6 - ASSEMBLE RIGHT DOOR END:

USE SAME PROCEDURE AS WITH LEFT DOOR END IN STEP 4.

## 7 - INSTALL RIGHT DOOR END:

INSTALL THE RIGHT DOOR END ASSEMBLY USING THE SAME PROCEDURE AS WITH THE LEFT DOOR END ASSEMBLY IN STEP 5.

AT THIS POINT THE FRAME PARTS REMAINING FROM MODULE A ARE TOP RIGHT AND LEFT PLATE, BOTTOM RIGHT AND LEFT PLATE, 2 SPACERS, 1 UPPER AND 1 LOWER MID STRUT AND THE RIGHT AND LEFT BRACES. COMBINE THESE PARTS WITH ALL OF THE MODULE B PARTS TO COMPLETE THE FOLLOWING PROCEDURES:



## 8 - INSTALL TOP PLATES:

INSTALL TOP PLATES STARTING AT THE LEFT DOOR END WITH THE TOP LEFT PLATE (FIG. 3). THE TOP EDGE OF THE PLATE SHOULD LIE ON THE CHALK LINE AND THE LEFT END FLUSH WITH THE OUTSIDE FACE OF THE LEFT UPPER STRUT. FASTEN THE PLATE TO THE 2 x 4 WITH 1 3/4" LAG SCREWS AND RUBBER WASHERS AND FASTEN THE LEFT UPPER STRUT TO THE PLATE WITH A 3/8" MACHINE SCREW AND NUT. NEXT INSTALL THE TOP MID PLATES BUTTING THE ENDS OF THE PLATES TIGHTLY TOGETHER, CAULK BETWEEN ENDS (SEE #12 - CAULKING), THEN FINALLY, THE TOP RIGHT PLATE. THE RIGHT END OF THIS PIECE SHOULD LIE ON THE RIGHT HAND EDGE OF THE RIGHT UPPER STRUT. FASTEN TO THIS STRUT.

## 9 - INSTALL BOTTOM PLATES

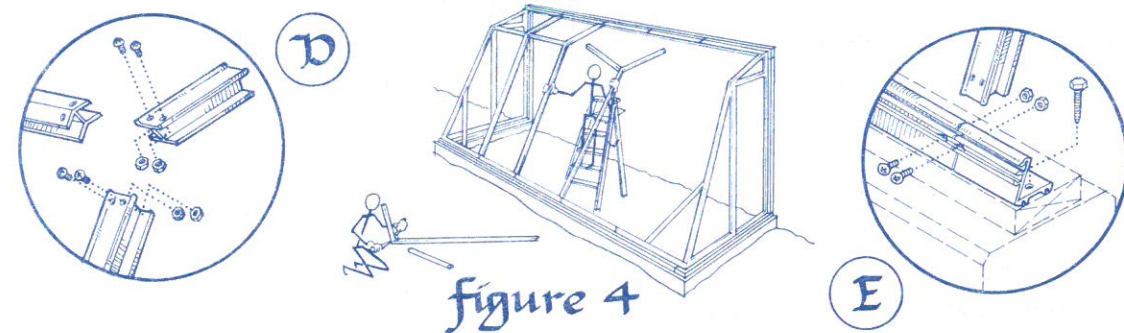
INSTALL BOTTOM PLATES IN SIMILAR MANNER (DON'T FORGET TO FASTEN END PLATES TO LOWER STRUTS). AFTER PLATES ARE INSTALLED, GO BACK AND TIGHTEN LAG SCREWS, FASTENING DOOR-ENDS TO 2 x 4'S.

## 10 - INSTALL BRACES:

INSTALL RIGHT AND LEFT BRACES USING 3/8" MACHINE SCREWS AND NUTS. THE MOST POINTED END OF THE BRACE IS THE TOP AND SLIPS OVER THE FLANGE OF THE STRUT.

## 11 - MID STRUT AND SPACER ASSEMBLY AND INSTALLATION:

ASSEMBLE A LOWER STRUT, AN UPPER STRUT AND A SPACER ON THE GROUND USING 2 - 3/8" MACHINE SCREWS AND NUTS, BUT LEAVING THEM SLIGHTLY LOOSE (FIG. 4) (D). THE END OF THE STRUTS WITH THE HOLES NEAREST THE END ATTACH TO THE SPACER. ASSEMBLE THIS UNIT SO THAT THE SPACER EXTENDS TO THE LEFT (LOOKING FROM OUTSIDE). INSTALL WITH THE STRUT END BISECTING THE PLATE JOINTS (E). FASTEN WITH 2 - 3/8" MACHINE SCREWS AND NUTS AT EACH PLATE - STRUT JUNCTION AND 2 - 3/8" SCREWS AND NUTS AT THE SPACER-STRUT JUNCTION, AGAIN LEAVING THEM SLIGHTLY LOOSE.



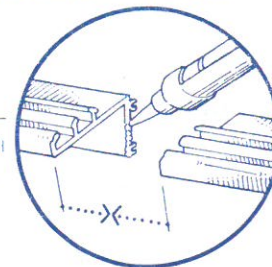
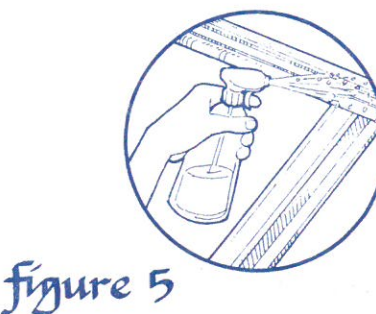
REPEAT WITH ADDITIONAL STRUTS AND SPACERS UNTIL ONE SPACER REMAINS. SLIP THIS REMAINING SPACER INTO PLACE AND FASTEN WITH 4 - 3/8" MACHINE SCREWS AND NUTS. NOW GO BACK AND TIGHTEN ALL THE 3/8" MACHINE SCREWS AT THE PLATE-STRUT AND SPACER-STRUT JUNCTIONS.

## 12 - CAULKING:

TO PREVENT WATER LEAKS, "GLUE" ENDS OF TOP PLATE SECTIONS TOGETHER USING CLEAR SILICONE CAULKING. CAULK AROUND THE PERIMETER OF THE ALUMINUM FRAME WHERE IT JOINS THE 2" x 4".

## 13 - SPRAY BOTTLE CHEATER

MAKE YOURSELF A SPRAY BOTTLE OF WATER PLUS 3 DROPS OF DISH SOAP (FIG. 5). THIS WILL SPEED UP THE INSTALLATION OF THE TWIN SKIN. LIGHTLY LUBRICATE THE TWIN SKIN, INSERTS, AND THE ALUMINUM EXTRUSION UNDER IT.



TWIN-SKIN™ INSTALLATION

1 - REMOVE TWIN SKIN FROM MOD 'C' BOX AND UNFOLD IT ON THE GROUND IN FRONT OF THE SOLAR ROOM (FIG. 1). UNROLL IT WITH THE FOLDED EDGE TOWARD THE SOLAR ROOM UNTIL IT IS LYING FLAT ON THE GROUND. DO NOT SEPARATE THE 2 LAYERS. (YES, THERE ARE 2 LAYERS!) REROLL TWIN SKIN TOWARDS SOLAR ROOM (FIG. 1D).

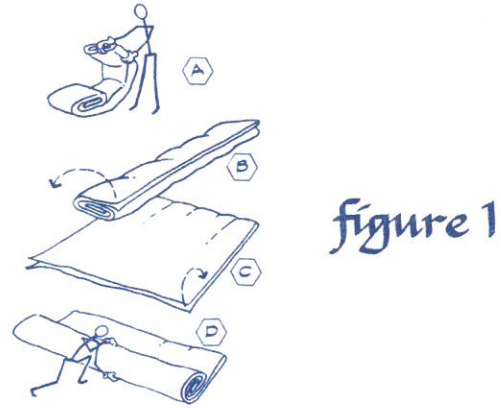


figure 1

2 - WITH A HELPER AND 2 LADDERS, LIFT THE TWIN SKIN UP AND OVER THE STRUTS AND LAY IT ALONG THE TOP OF THE FRAME WITH FOLDED EDGE TOWARD THE PLATE. BE CAREFUL NOT TO SNAG THE TWIN SKIN. MAKE SURE THE ROLL OVERHANGS THE DOOR ENDS EQUALLY ON EACH END (ABOUT 4'). WITH A PERSON AT EACH END ON LADDERS, STRETCH THE TOP EDGE OF THE TWIN SKIN TIGHT AND TEMPORARILY CLIP IT TO THE EXTRUSION USING A SHORT (2") PIECE OF WHITE PLASTIC INSERT AT EACH END AND 1 IN THE MIDDLE. THE TOP EDGE OF THE TWIN SKIN SHOULD EXTEND ABOUT 1" BEYOND THE WHITE INSERT WHEN INSTALLED (FIG. 2). TAKING 4' LENGTHS OF INSERT, FASTEN DOWN THE ENTIRE TOP EDGE OF THE TWIN SKIN STARTING AT THE LEFT (FIG. 3 & 4). IF THE INSERTS ARE DIFFICULT TO INSTALL IN THE ALUMINUM EXTRUSION, LUBRICATE THE ALUMINUM AND PLASTIC WITH SPRAY BOTTLE (SEE P. 6, #13) DO NOT USE A HAMMER! IT WILL CUT THE TWIN SKIN!

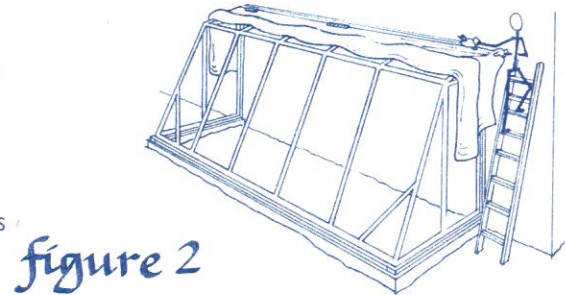


figure 2

3 - TO INSTALL THE INSERT, FIRST PUSH THE TOE DOWN INTO THE ALUMINUM EXTRUSION, FORCING THE TWIN SKIN IN PLACE (FIG. 4). LISTEN FOR A 'CLICK' AS THE INSERT LOCKS ONCE. THEN PUSH THE HEEL IN PLACE AND LISTEN FOR THE SECOND 'CLICK'. CONTINUE ALONG A FEW INCHES AT A TIME UNTIL THE ENTIRE 4' LENGTH IS CLIPPED IN PLACE. GO BACK AND CHECK THE BACK EDGE AND CLICK IT INTO PLACE IF NECESSARY.

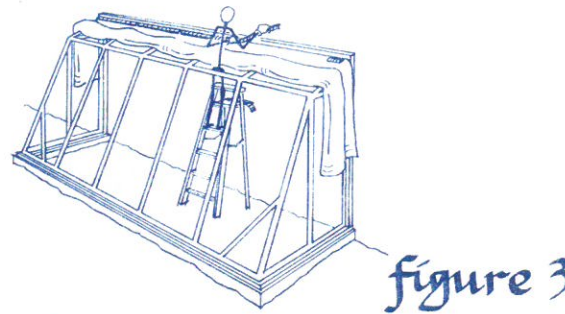


figure 3

4 - AFTER SECURING THE TWIN SKIN TO THE TOP PLATE, CAREFULLY UNROLL IT DOWN OVER THE FRAME. DON'T SNAG IT ON THE CORNERS. CLIP IT INTO THE BOTTOM PLATE USING 3 SHORT PIECES OF INSERT (FIG. 5). GENTLY PULL OUT THE WRINKLES. WHEN IT IS INFLATED BY THE BLOWER, THE TWIN SKIN WILL STRETCH SMOOTH AND LOSE ITS UNEVENNESS. STARTING AT THE MIDDLE, INSTALL THE 4' LENGTHS OF INSERT AS BEFORE.

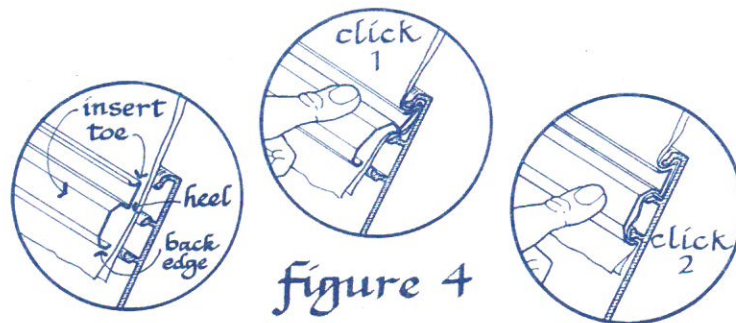


figure 4

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Twin-Skin™, Blower & Door Installation 7

Solar Resources Inc. Taos N.M.

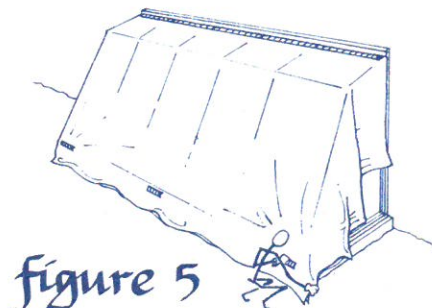


figure 5

5 - NEXT CLIP THE TWIN SKIN TO EACH DOOR END AT THE LOWEST CORNER USING A PIECE OF SHORT INSERT (FIG. 6). PULL THE TWIN SKIN ENOUGH TO MAKE IT LIE FLAT BUT NOT TIGHT. INSTALL 3 OR 4 MORE SHORT WHITE INSERTS TO POSITION THE TWIN SKIN.

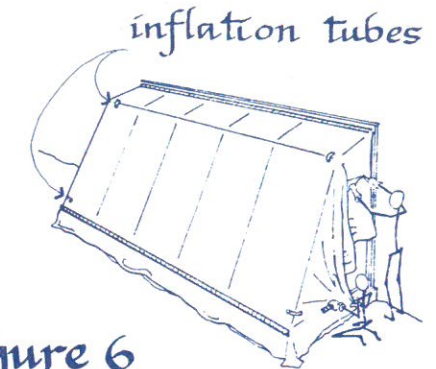


figure 6

6 - PRE-TRIM THE TWIN SKIN AT THE DOOR ENDS BY SLIPPING A KNIFE BETWEEN THE DOOR AND THE DOOR FRAME (DO THIS WITH CARE. A MISCUT IS NOT DESIRABLE (FIG. 6)).

7 - INSTALL 4 INFLATION TUBES (4 CLEAR 3" TUBES)(FIG. 6). INSTALL THEM BETWEEN TWO LAYERS OF TWIN SKIN SO THAT THEY LAY ON AND WRAP AROUND THE LOWER LEFT AND RIGHT STRUTS AND THE LEFT AND RIGHT SPACERS. THE INFLATION TUBES LET AIR PRESSURE PASS AROUND THE CORNERS.

8 - INSTALL LONG WHITE INSERTS AT DOOR ENDS. CUT TO LENGTH AND CUT CORNERS AT 45° ANGLE WITH HACK SAW. DO NOT INSTALL THE BOTTOM INSERT ON THE END WITH THE BLOWER YET.

9 - IF, AFTER THE BLOWER HAS BEEN INSTALLED (FIG. 9) AND THE TWIN SKIN HAS INFLATED, THE TWIN SKIN LOOKS BUNCHED UP AT ANY POINT, REMOVE THE NECESSARY INSERTS AND ADJUST THE TWIN SKIN. THEN, TRIM THE TWIN SKIN RIGHT NEXT TO THE INSERT (FIG. 7 & 8) FOR A CLEAN EDGE. DO NOT BE CONCERNED ABOUT NEEDING THE TRIMMED EDGE TO REMOVE AND INSTALL THE TWIN SKIN. THERE IS ENOUGH MATERIAL UNDER THE INSERT FOR THAT PURPOSE.

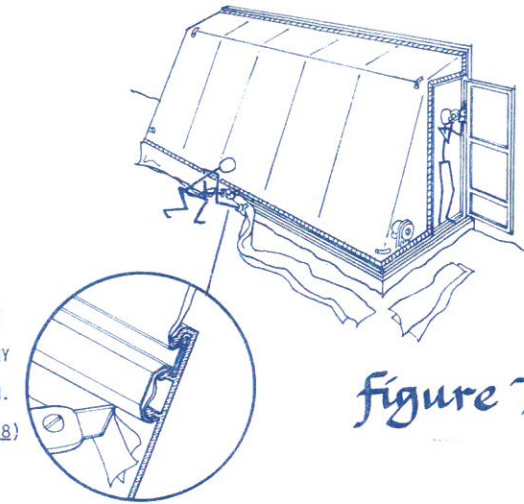


figure 7

figure 8

BLOWER INSTALLATION

1 - ATTACH THE BLOWER MOUNTING PLATE (2 WOODEN PARTS) TO THE DOOR END PLATE WITH 2 - 1" SHEET METAL SCREWS. THEN PLACE THE CIRCULAR WOODEN PART OF THE BLOWER MOUNT BETWEEN THE TWO LAYERS OF TWIN SKIN. PULL IN INNER LAYER DOWNWARD UNTIL IT IS NEAT AND FAIRLY TAUT AND FASTEN THE TWO HALVES OF THE BLOWER MOUNT TOGETHER WITH 4 - 3/4" FLAT-HEAD WOOD SCREWS THUS CLAMPING THE TWIN SKIN IN THE MOUNT.

2 - USING A KNIFE, CUT THE PLASTIC FROM THE SMALL HOLE IN THE CENTER OF THE BRACKET. INSTALL THE BLOWER ON THE WOODEN BRACKET USING 2 - 3/4" SHEET METAL SCREWS.

3 - WHEN PLUGGING IN THE BLOWER, BE SURE TO USE A GROUNDED CORD. THE SOLAR ROOM WILL TAKE 10 TO 20 MINUTES TO INFLATE AND A FULL DAY FOR THE AIR TO PASS AROUND TIGHT CORNERS.

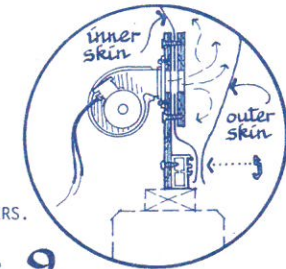


figure 9

DOOR INSTALLATION

YOU WILL NEED ONE LEFT HAND AND ONE RIGHT HAND DOOR. THESE ARE STANDARD 3'0" X 6'8" ALUMINUM STORM AND SCREEN DOORS. THE GLASS IN THE DOORS SLIDES UP TO REVEAL THE SCREEN AND IS IMPORTANT FOR VENTING EXCESS HEAT. THE DOORS MUST BE INSTALLED TO SWING OUTWARD. THEY SHOULD HINGE ON THE WALL SIDE OF THE OPENING. YOU WILL HAVE TO DRILL PILOT HOLES TO INSTALL THE DOORS AS PER THEIR INSTRUCTIONS.



#### SUNNY DAY TEMPERATURES

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When the sun strikes the SOLAR ROOM<sup>®</sup>, the temperature in it will rise to between 100<sup>o</sup> to 120<sup>o</sup>. The temperature difference depends on the construction of the south wall of the home. If the wall is of massive materials, such as cinderblock, brick, adobe, or cement, it will absorb and store a significant amount of heat to reradiate into the SOLAR ROOM and into the living space as the outside temperature drops. In those cases the maximum SOLAR ROOM temperature will be approximately 100<sup>o</sup> F. If the wall of the home is of frame construction, the SOLAR ROOM temperature can easily reach 120<sup>o</sup> F. In both cases, the heat must be circulated into the living space of the home or it is not usable.

#### CLOUDY DAY TEMPERATURES

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The SOLAR ROOM is also a solar heater on cloudy days but of course it will not provide as much heat. Even diffused radiation will raise the temperature to 65<sup>o</sup> to 75<sup>o</sup> depending on the density of the cloud cover and the outside temperature. Even though the temperature in the SOLAR ROOM may not be high enough to circulate through the house, it does effectively eliminate the heat loss from the house through that portion of the south wall covered by the SOLAR ROOM.

#### NIGHT TEMPERATURES

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At night the SOLAR ROOM also limits the amount of heat loss by insulating the south wall. It also prevents cold air infiltration. When it is mounted on a frame wall, the nighttime temperature in the SOLAR ROOM will be 15<sup>o</sup> to 30<sup>o</sup> above the outside temperature. In a mass wall situation, it will be 30<sup>o</sup> to 50<sup>o</sup> above the outside temperature.

#### SOLAR HEAT CIRCULATION

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The two most common methods of heat circulation are: 1. A window fan of 2 to 3 thousand cubic feet a minute, which is installed in one window and circulates the heat through the greenhouse and into another window or door. The fan can easily be thermostatically controlled so that when the SOLAR ROOM temperature reaches 80<sup>o</sup> to 85<sup>o</sup> the fan turns on and when the temperature drops below that the fan turns off. 2. The heat can be circulated by natural convection through doors and windows. If you find that your home is cool and your SOLAR ROOM is hot, you are not effectively circulating the available heat.

#### VENTILATION

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Venting will be required of the SOLAR ROOM when the indoor house temperature is comfortable and the SOLAR ROOM temperature is 80<sup>o</sup> or above.

Venting is accomplished by opening the sliding windows in the combination aluminum/screen and storm doors at each end. It may also be necessary to open a window or two in the home to permit cross-ventilation. If there are no prevailing breezes and the SOLAR ROOM temperature is getting above the comfortable level, it may be necessary to the Twin-Skin<sup>™</sup>.

#### GREENHOUSE USE

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The SOLAR ROOM is also a greenhouse. The translucent twin-skin covering produces a diffuse light most beneficial to growing plants and eliminates the hot spots found in glass greenhouses. Since only the south side of the greenhouse is glazed (in typical free-standing greenhouses both the south and the north sides are glazed) heat loss is greatly reduced. It is important to remember that the SOLAR ROOM can drop below freezing if the outside temperature gets cold enough. One way to eliminate the freezing of plants is to install water containers near them that will absorb heat during the day and moderate the greenhouse temperature at night. Another approach utilizes the installation of electric radiant heat panels, usually one or two - two by four foot panels hung several feet above the plants. The objective is to warm the plant leaves while not heating the air in the SOLAR ROOM. This is an effective use of electric heat. Some of our customers grow plants year round by removing the twin-skin covering in the spring time and recovering the plants in the fall. A significant number of SOLAR ROOM owners do heat the greenhouse with either radiant or other heat, some circulate home air into the greenhouse during those few times of the year when the potential of freezing occurs. Some folks forget to plan for those two or three months of the year. Don't be one of them!

#### OPTIMIZING SOLAR ROOM PERFORMANCE

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The two quickest methods of dramatically improving SOLAR ROOM heat output is by:

1. Painting the house wall in the SOLAR ROOM a darker color - brick red, adobe or dark green.
2. Eliminate any outside air infiltration by caulking or weather-stripping with sponge rubber.

#### HEAT STORAGE

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Our DOE testing shows that every home can store heat passively in the structure of the home. Some materials store more heat than others. Frame stucco homes are of light-weight materials and store less than cinderblock or masonry homes. But frame stucco homes do store a significant amount of heat and in some climates (parts of California and the South) will store all the heat that is required. In colder climates it will store all of the heat that is needed early in the fall and late in the spring. The amount of heat stored in the materials of the home is most clearly understood when one realizes that the fossil fuel heating system is not coming on during the day and when it comes on it is late in the evening.



