

DOE/R4/10412--T1

DE FG44 81R410412

February 1983

FINAL PERFORMANCE REPORT

DOE/R4/10412--T1

DE84 000755

The Upper Sand Mountain Parish  
SOLAR CONSTRUCTION WORKSHOPS

AL - 100

**DISCLAIMER**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**NOTICE**

**PORTIONS OF THIS REPORT ARE ILLEGIBLE.**  
It has been reproduced from the best available copy to permit the broadest possible availability.

Dorsey H. Walker, Director  
The Upper Sand Mountain Parish  
The United Methodist Church  
P. O. Box 97,  
Section, Alabama 35771  
Phone 205-228-6611

**MASTER**

*[Handwritten signature]*

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

## **DISCLAIMER**

**This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.**

## **DISCLAIMER**

**Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.**

The following pages are an exact representation of what is in the original document folder.

TABLE OF CONTENTS:

1-2	BRIEF SUMMARY Workshop Brochures attached
3-5	PROJECT OBJECTIVES From the start to the finish.....
6-7	SOLAR WINDOW BOX COLLECTOR UNITS & HOT AIR PANELS
8-9	News items
10-11	Plans
12	SOLAR FOOD DRYERS
13	Workshop photos
14-15	News items and plans
16	SOLAR WATER HEATERS
17	News item
18-22	Plans
23-24	SOLAR TOURS: HOMES & GREENHOUSES
25-26	News items
27	USMP Ministry Center Greenhouse photos
28-31	News items
32	MOVABLE INSULATION PANELS & THE YOUTH & ENERGY PROJECT
33-34	CONCLUSIONS & RECOMMENDATIONS
35-38	Article: "Solar Energy & World Hunger"
39	Letter: Alabama Solar Energy Center
40	News item: Solar Greenhouse Owners Fellowship

*(many pages were removed because they  
had articles from newspapers)*

DE FG44 81R410412

USMP SOLAR CONSTRUCTION WORKSHOPS

BRIEF SUMMARY:

With three years of experience and over 350 solar projects complete, the Upper Sand Mountain Parish continues to employ its initial strategy for involving high school vocational students with the pre cutting and instructional assembly aid to area families. The parish project works with high school vocational classes in pre fabbing solar devices into kit form. Then, students are employed to serve as instructors for Saturday construction workshops at the local electric cooperative.

Trained teams of older and unemployed adults work with youth in building solar greenhouses for those able to pay labor. Over three years, the project has assisted and built 50 to 60 attached solar greenhouses with construction teams realizing in excess of \$26,000. in labor for newly developed skills.

The project continues to assist owners in monitoring and developing "horticulturally" as well as energy producing greenhouses. During the spring of 1982, the parish assisted greenhouse owners in marketing over 60,000 bedding plants worth over \$3000.. Monthly Greenhouse Owner Fellowship meetings have been a helpful setting for sharing of ideas and exchange of insights. A horticulturalist, Nina Greene, a local solar greenhouse owner and organic farmer, continues to make visits to assist new greenhouse owners.

A low interest solar loan fund, offering 5% loans for three years, has assisted over 30 families in "going solar". The principle for this revolving fund has almost reached the \$15,000. mark. The track record for loan repayments has been exceptional (one minor problem out of 30!).

A conservative estimate finds northeast Alabamians realizing over \$20,000. annually in energy from the SUN! Through workshops and tours we have acquainted hundreds of people across the southeast with low cost/low technology solar projects and a workable strategy for involving community groups and students in them. With church involvement, we have provided over \$25,000. in grants to over 200 area families. At every point the project has attempted to involve the total community (economic, age, sex, ethnic).

Workshop information and plans are available to those interested for "bread box" solar water heaters ; food dryers, window box collectors, insulation panels, and greenhouses.

We feel good about what the cooperative venture between local community groups and the U.S. Department of Energy has produced in our area over the past three years.

# THE UPPER SAND MOUNTAIN PARISH

P.O. Box 505  
Rainsville, AL 35986  
Phone 205/638-2126



## DO IT YOURSELF FAMILY SOLAR WORKSHOPS

### sponsored by:

The Sand Mountain Electric Cooperative, The Upper Sand Mountain Parish of The United Methodist Church, Section High School and other area Vocational Agriculture Depts., DeKalb, Jackson and Marshall County Community Action Agency, DeKalb County Energy Project, Jackson and DeKalb County Councils on Aging.

### LOW INTEREST LOANS AND GRANTS AVAILABLE

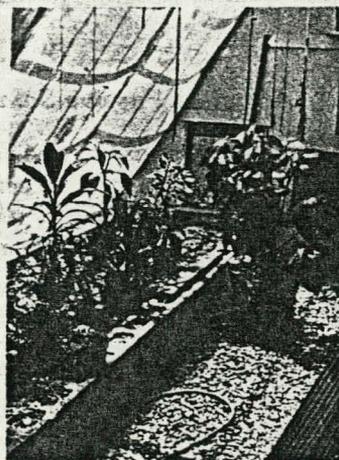
The Upper Sand Mountain Parish Solar Projects Loan Fund makes low interest loans to families unable to otherwise afford to construct solar devices.

A limited number of grants are available to area low income families.

FOR MORE INFORMATION, contact the Parish Office or Sand Mountain Electric Cooperative both in Rainsville, Alabama 35986.

### Solar Greenhouse Owners Fellowship

Meets the second Thursday of every month at 7 P.M. in Henagar United Methodist Church, Henagar, Alabama. The fellowship employs a part time horticulturalist and affords a good opportunity for sharing greenhouse management ideas and good gardening practices. Some 40 families are presently members. The public is welcome.



### Solar Tour of the Mountain

April 17, 1982 10 AM - 2 PM

Registration Deadline: April 10, 1982

Cost \$7.50 per person  
(sack lunch included)

See solar greenhouses  
trombe wall in commercial bldg.  
food dryers  
hot water heaters  
hot air panels

Greenhouse Plants for sale on tour.

### 250 SOLAR PROJECTS BUILT

For several years now the Upper Sand Mountain Parish has joined with the Sand Mountain Electric Cooperative, local high schools and other groups in developing "do-it-yourself" family solar workshops for the public.

In these workshops participants actually build a solar device and take it home for use.

Over the past two years more than 250 solar panels, window collectors, water heaters, food dryers and greenhouses have been built in workshops.

# THE UPPER SAND MOUNTAIN PARISH

P.O. Box 505  
Rainsville, AL 35986  
Phone 205/638-2126



## DO IT YOURSELF FAMILY SOLAR WORKSHOPS

### sponsored by:

The Sand Mountain Electric Cooperative, The Upper Sand Mountain Parish of The United Methodist Church, Section High School and other area Vocational Agriculture Depts., DeKalb, Jackson and Marshall County Community Action Agency, DeKalb County Energy Project, Jackson and DeKalb County Councils on Aging, DeKalb County Extension Service.

### Low Interest Loans and Grants Available

The Upper Sand Mountain Parish Solar Projects Loan Fund makes low interest loans to families unable to otherwise afford to construct solar devices.

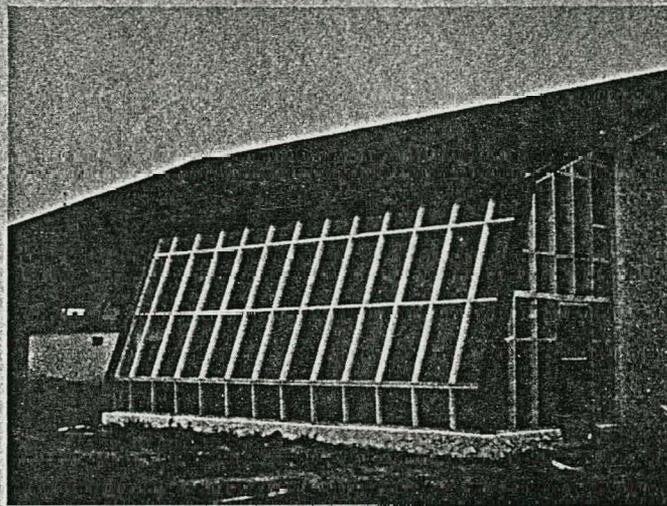
A limited number of grants are available to area low income families.

FOR MORE INFORMATION contact the Parish Office or Sand Mountain Electric Cooperative both in Rainsville, Alabama 35986.

### Solar Greenhouse Owners Fellowship

Meets the fourth Thursday of every month at 7 PM in Henagar United Methodist Church, Henagar, Alabama. The fellowship employs a part time horticulturalist and affords a good opportunity for sharing greenhouse management ideas and good gardening practices. Some 40 families are presently members. The public is welcome.

### WINTER TOUR OF SOLAR HOMES



January 22, 1983  
9 AM - 3 PM

Registration Deadline:  
January 15, 1983

Cost: \$7.50 per person  
(sack lunch included)

#### See.

- Attached Solar Greenhouses
- Vertical Wall Collectors
- Trombe Walls
- Solar Hot Water Systems
- Earth Shelters

### SOLAR HOME DESIGN WORKSHOP SESSION 7 PM, Friday, January 21, 1983

FREE —

**Sand Mountain Electric Coop**  
Rainsville, Alabama

### 300 Solar Projects Built

For several years now the Upper Sand Mountain Parish has joined with the Sand Mountain Electric Cooperative, local high schools and other groups in developing "do-it-yourself" family solar workshops for the public.

In these workshops participants actually build a solar device and take it home for use.

Over the past two years more than 300 solar panels, window collectors, water heaters, food dryers and greenhouses have been built in workshops.

DE FG44 81R410412

PROJECT OBJECTIVES:

Concisely put, the project objectives focused around involving five area vocational high school classes in pre-fabbing solar devices and serving as workshop instructors to allow area families to build something "solar" for themselves. Several workshops were to permit construction of:

- 50 "bread box" type solar water heaters
- 25 solar food dryers
- 25 solar panels for home and farm use
- 20 solar window box units
- 20 removable insulation panels

along with a large solar greenhouse on the parish office building and the involvement of 100 youth during summer in solar construction and basic weatherization projects for low and fixed income families. Further, objectives allowed for continuation of the low interest solar loan program and for monthly horticultural visits and fellowship meetings. Plans, brochures and solar promotion was to be available to the public as requested.

The project did involve five high school vocational agriculture classes and one home economics department in its workshop events. Area families constructed the following in workshops with student instructors:

- 62 "bread box" type water heaters
- 39 solar food dryers
- 15 solar panels for home and farm use

27 solar window box units

37 removable insulation panels

6 attached solar greenhouses with two "built in" solar hot water heating systems and hot air panels.

Fifty-two people spent a week in Rainsville (all volunteer labor) helping construct and renovate the parish office center with a 39 ft. by 10 ft solar greenhouse. The greenhouse is presently (Feb 1983) filled with cabbage and lettuce seedlings for use with the parish's summer "Gardens of Plenty" ministry with low and fixed income families.

Forty-two persons attended the 1982 "Solar Tour of the Mountain" focused on solar retro-fitting (greenhouses, panels, hot water heaters, trombe walls etc.). Fifty-nine persons attended the 1983 "Winter Tour of Solar Homes" with thirty-seven participating in an evening workshop session, "Solar Home Design". The homes tour involved seven area homes with their owners giving input into the design session.

The summer/fall "Youth and Energy" Project involved 87 youth from across the eastern U.S. in a three hour workshop on solar design and application and basic weatherization. These youth were a part of five different workshops. After acquaintance with basic information, they built solar panels and water heaters for low and fixed income families. They learned to do energy audits and with assistance from the Sand Mountain Electric Cooperative provided basic weatherization to 15-30 area low/fixed income families. Basic weatherization included: caulking, weather stripping, insulating air spaces and water heaters, plastic storm windows, under-penning,

repair of leaky facets and "draft stopper" kits for senior citizens.

All of the project consultants served in superb fashion giving far more time and energy than compensated for. Miss Leanne Perme, our first horticulturalist moved away and Mrs. Nina Greene became available. Nina gave two or more days monthly and gave endless hours of help and encouragement to enable low income families to develop the horticultural aspects of their greenhouses.

Mr. Jerry Holcomb and Mr. Paul Konove have continued to be excellent people for working with youth and volunteers. They can so beautifully lead others into doing things and learning new skills.

DE FG44 81R410412

## SOLAR WINDOW BOX COLLECTOR UNITS & LARGE HOT AIR PANELS

In the beginning.....our first solar construction workshops involved 130 families in building solar window box collector units. The units were popular and well received. After several request, we decided to try to put all we had learned, since the first ones, together to offer a "new" solar window box collector workshop. We used 1 inch by 10 inch western cedar with corugated metal, painted flat black, insulated with  $\frac{1}{2}$  inch thermax board and clear rolled fiberglass sheeting. The unit proves to be as economical as the earlier ones, more energy efficient (better insulation, corrugated rather than flat rolled metal, more collector surface), more attractive (all western cedar), and easier to construct.

The large hot air panels for home and farm are constructed on the same principle as these window box collector units. They are 12 feet by 6 feet and contain a variable thermostat with a small blower to push air through them. Owners have reported 140 to 160 degree air coming from these units on good sunlite days. We only built 15 of these as that seemed to fulfill the demand! These are big and "heavy" panels built of 2X10 inch material.

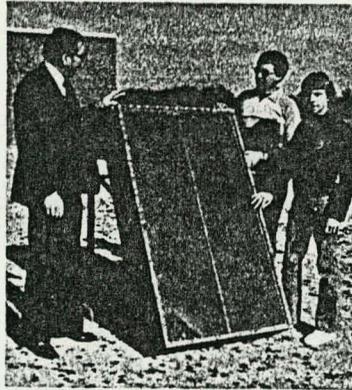
We have sought to keep cost down and promote good and responsible use of earth resources from the beginning of the project. Thus, recycling accounts for the "specifics" of several of our designs. There is little that is to be regarded as hard and fast rules regarding our projects. We

used basic principles and what we could find to accomplish our objectives. Plans hopefully offer others the basic ideas with freedom to go with what they have and find suitable to their needs.

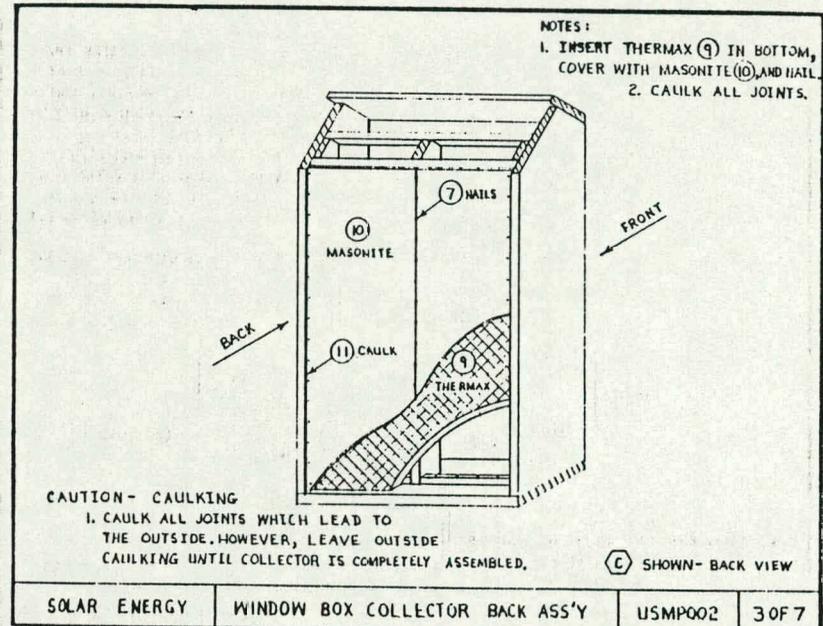
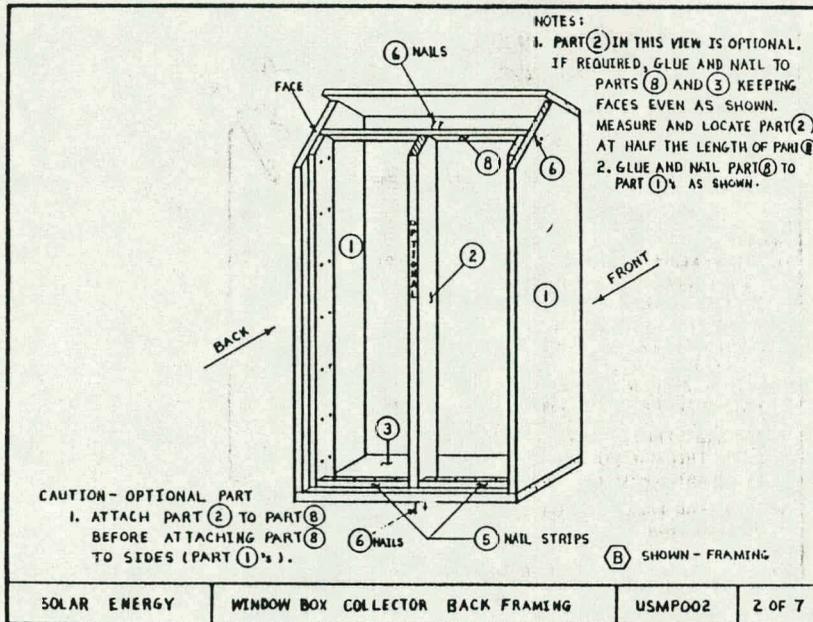
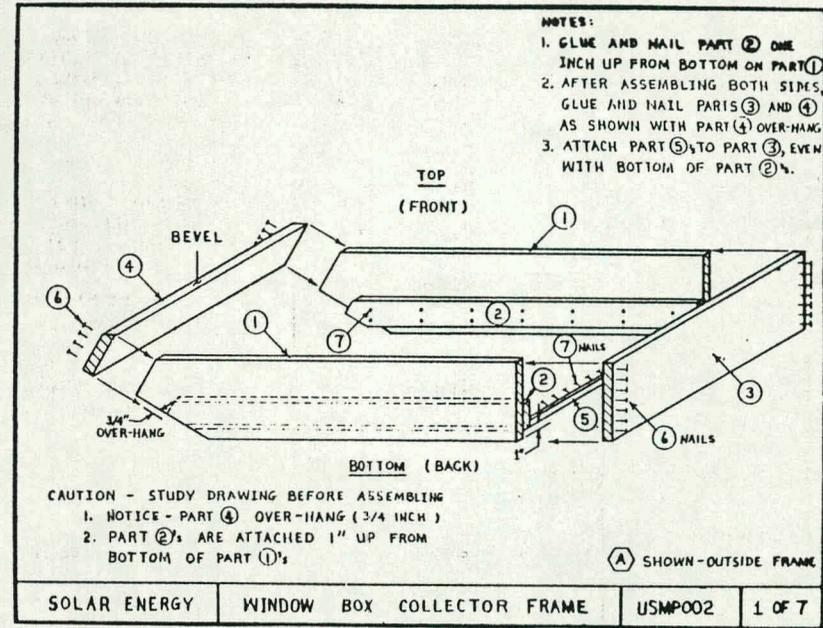
*newspaper  
articles removed -*

# THE UPPER SAND MOUNTAIN PARISH

of  
The United Methodist Church  
P.O. Box 505  
Rainsville, AL 35986  
Phone (205) 638-2126



## SOLAR WINDOW BOX PLANS



Plans by: John A. Walker

SOLAR WINDOW BOX COLLECTOR  
 Upper Sand Mountain Parish  
 P.O. Box 505, Rainsville, Alabama 35986

PARTS LIST

Pcs Per Unit	Size	Description of Parts	Design Part Number
--------------------	------	-------------------------	--------------------------

White Pine or Western Cedar (1X12)

2	1"X12"X57"	SIDES	1
1	1"X12"X33"	BOTTOM	3
1	1"X7"X33"	TOP	4
3	1"X12"X25½"	THROAT DIVIDERS	19
2	1"X12"X12"	THROAT SIDES	21

White Pine (1X4)

2 cr 3	(optional) 1"X4"X52"	INTAKE DEPARTMENT DIVIDER STRIPS	2
1	1"X4"X31½"	TOP (Horizontal) COMPARTMENT DIVIDER STRIPS	8
4	1"X1½"X15"	NAILER STRIPS	5
2 or 3 (optional)	1"X4"X56"	OUTLET COMPARTMENT DIVIDER STRIPS	14
2	1"X4"X11½"	THROAT ATTACHMENT STRIPS	22
3	1"X1½"X25½"	THROAT ATTACHMENT DIVIDER STRIPS	23

Miscellaneous

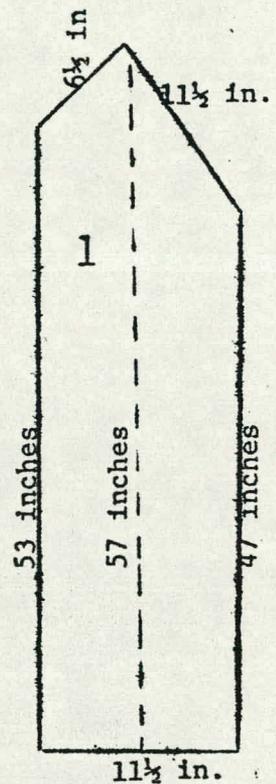
- 1 8 oz. bottle of wood glue (Elmers)
- ½ lb. 1 inch aluminum gasketed nails (18)
- ½ lb. #8 penny coated nails (20)
- ½ lb. #10 penny coated nails (6)
- ½ lb. #4 penny coated nails (7) & (16)
- 2 tubes silicone caulk (or "Geo-Cel") (11)
- 1 3 ft.X5ft. flat metal sheeting (Painted flat black) (15)\*
- 1 3 ft.X5 ft. clear fiberglass glazing (17)

Thermas Insulation Board (¾" thickness)

1	¾"X33"X48"	BACK INSULATION	9
1	¾"X33"X48"	COMPARTMENT DIVIDER INSULATION	12
1	¾"X30"X48"	CUT & LINE THROAT WITH INSULATION	24

Masonite or plywood (½" thickness)

1	½"X33"X48"	BACK	10
1	½"X33"X48"	COMPARTMENT DIVIDER	13



\*Metal can be used recycled barn roofing. Corrugated metal is actually preferred to flat metal. Run corrugations horizontally to create greater air turbulence and contact with metal surface.

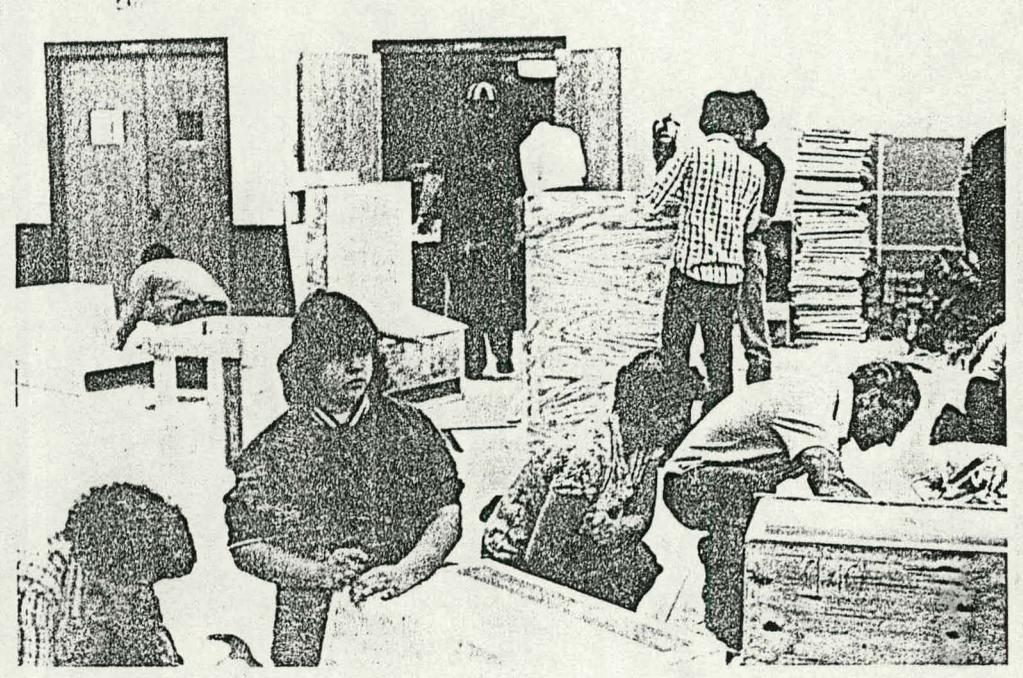
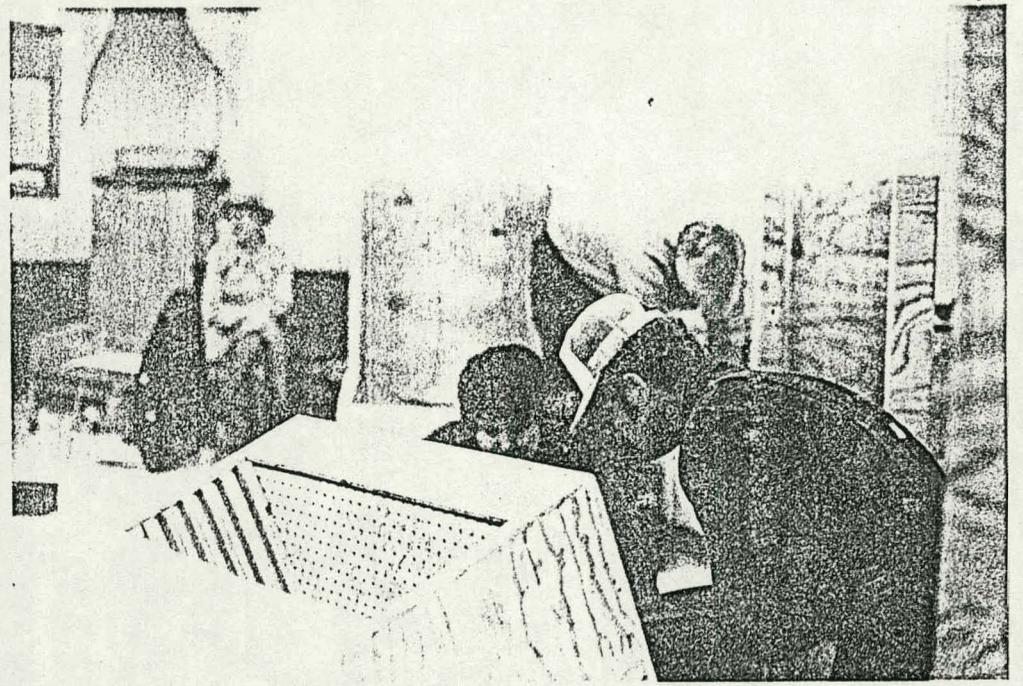
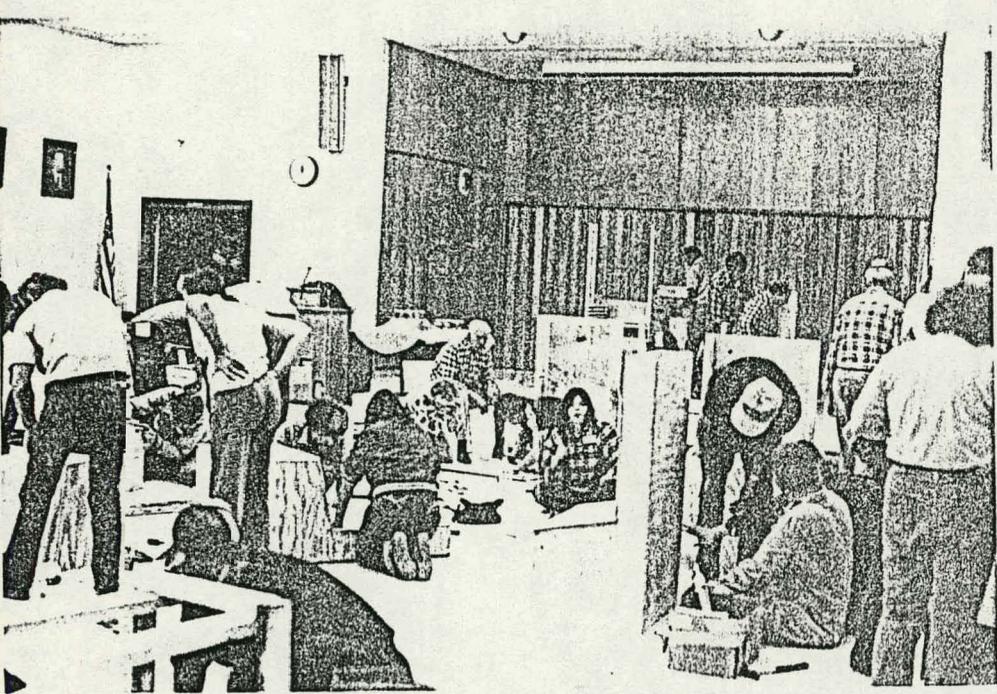
Note: While plans call for full size lumber, i.e. 1"X12", it is assumed builders will use dressed materials that will actually run ¾"X11½".

DE FG44 81R410412

## SOLAR FOOD DRYERS

These are no doubt one of the most interesting devices we have been involved with. Solar food drying never fails to evoke interest in a wide range of people... city, rural, all ages, men and women! Everybody seems to be intrigued by the possibility of drying something.

The dryers we have worked with have ranged from simply placing two window screens together (food to be dried between them to keep insects out) with a one inch divider strip (makes it look like a screened suit case), to a more complicated dark box compartment with chimney attached to our solar panel. The workshop dryer is a 3 foot by  $4\frac{1}{2}$  foot solar panel that allows heated air to move up into a small compartment with six drying screens and out through a chimney on top of the compartment (see next page). This is without question the most difficult "kit" to make yet the most in demand. In all, we have assisted families in building over 80 of these.



*p. 14- newspaper article removed*

From greenhouses to window boxes, the interest grew to a pre-heat solar hot water system. The first unit was added to the mayor's greenhouse. The cost of this unit was \$200. The mayor says his monthly electric bill is running \$20 a month less than last year's bill. Because of the interest in hot water systems, the high school Vocational Agriculture teachers and students are working to prefab 52 gallon "bread box" type solar hot water heaters for a public workshop. The estimated cost for all new materials is \$250. The area Community Action Agency has purchased 10 workshop slots to provide materials without cost to low-income families.

The story of Sand Mountain-Section Alabama is somewhat unique, but it does not have to be. The coming together of the people and institutions of a community not only to plan but to actually build a new self reliance is possible.

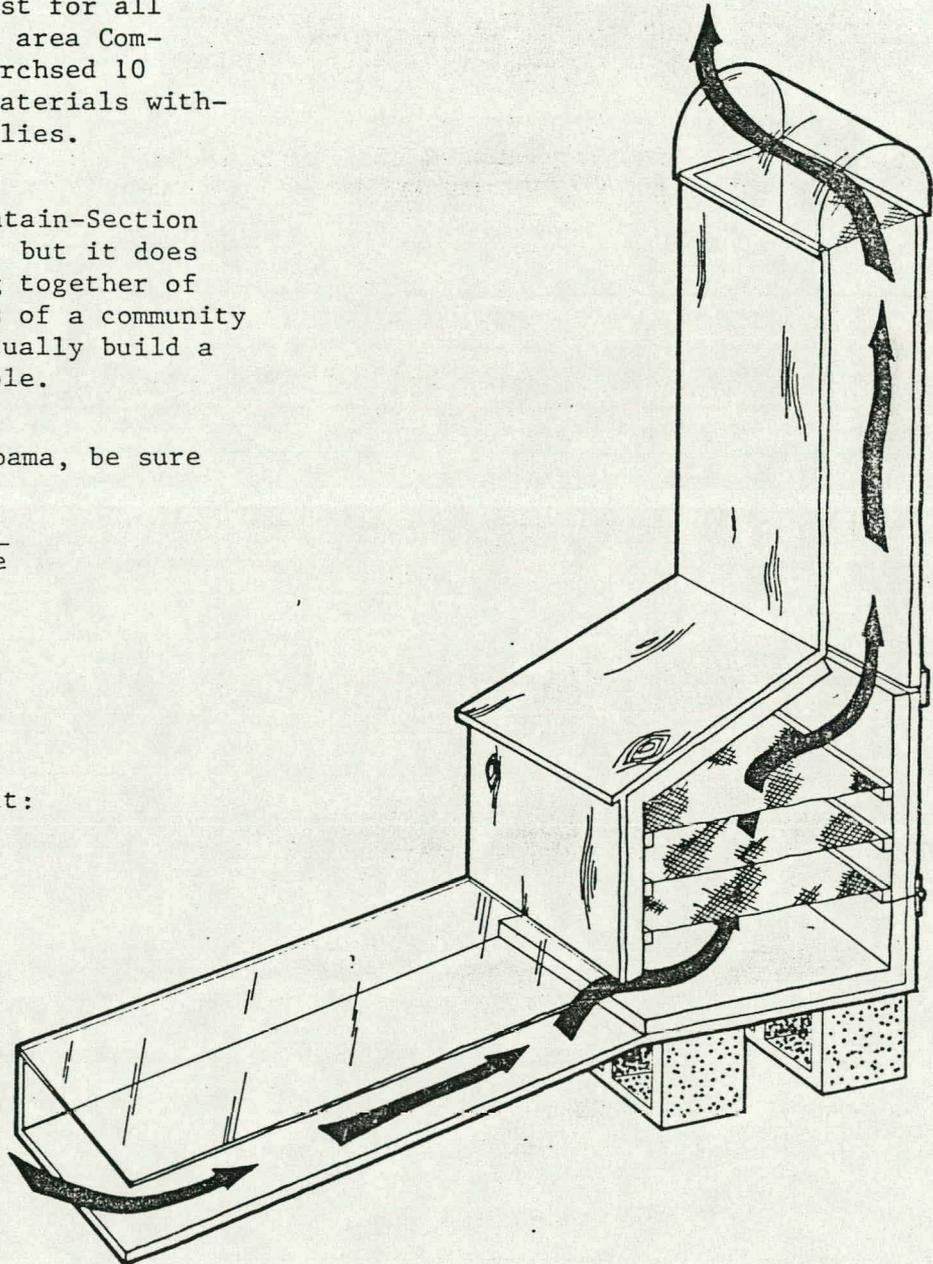
When in northeast Alabama, be sure to plan a tour of Section.

A.B. Howell-Short Associate  
Director of Alternatives.

For more information contact:

Bill Dow  
SGEP  
Rt. 3, Box 73-A-4  
Pittsboro, NC 27312  
(919)542-5528

Free window box collector plans are available from The Upper Sand Mountain Panal, P.O. Box 505, Rainsville, AL 39586. Please enclose a stamped, self-addressed envelope.



*Outside air enters this chimney dryer at the bottom, is heated as it moves up the chute, then rises over the food and dries it.*

Solar Food Dryer

DE FG44 81R410412

SOLAR WATER HEATERS

Our solar water heaters have been of the "bread box" pre-heat variety. They contain new 52 gallon tanks, painted flat black in a well insulated compartment of western cedar and covered with Sunlite Premium II glazing. Families have built over 70 of these in workshops with several built as "off springs" at home with whatever people could find. Several families have incorporated one or two of these tanks into their solar greenhouse design.

We feel families can average 80-90 degree water year around with these units. They have cost near \$250. with a life expectance of 20 years. Several families have reported as much as a 33% saving on hot water heating cost with these units. TVA has been in the process of monitoring 6 or 8 of these units but still have no concrete data!

The only problem families have had with these units (reported) is freezing water lines leading to them. This problem has been readily solved with better insulation. The TVA recommendation to "drain down" is winter is in our opinion misguided in that savings during winter can be sizable and should not be overlooked.

We are planning to do several construction workshops with these across Alabama during the next year. We are planning a special focus on older families with one or two persons. Their lower use of hot water may make this unit ideal!

Plans are available and attached (see following pages.)

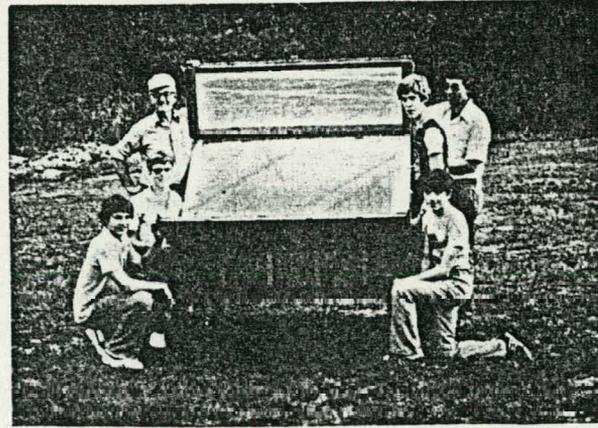
*P. 17 removed;  
newspaper article*

# THE UPPER SAND MOUNTAIN PARISH

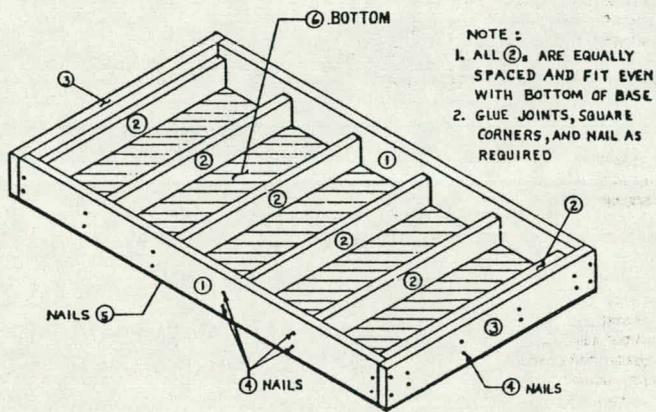
of  
The United Methodist Church  
P.O. Box 505  
Rainsville, AL 35986  
Phone (205) 638-2126



(Plans drawn by John A. Walker)



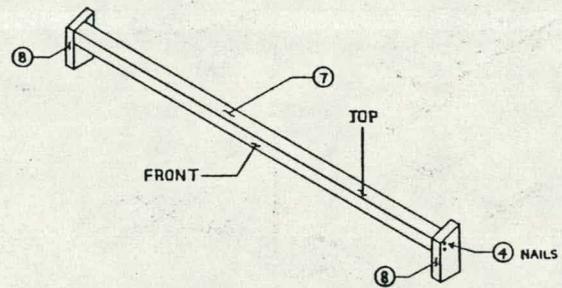
## SOLAR HOT WATER HEATER PLANS



NOTE:  
1. ALL (2)s ARE EQUALLY SPACED AND FIT EVEN WITH BOTTOM OF BASE  
2. GLUE JOINTS, SQUARE CORNERS, AND NAIL AS REQUIRED

(A) - SHOWN - BASE ASSEMBLY

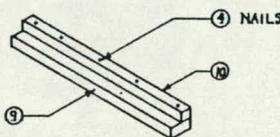
SOLAR ENERGY	HOT WATER HEATER BASE	USMPOOL	2 OF 11
--------------	-----------------------	---------	---------



NOTE:  
1. GLUE JOINTS AND NAIL AS REQUIRED  
2. FRONT AND TOP EDGES MUST BE EVEN

(B) - SHOWN - FRONT FRAME ASSEMBLY

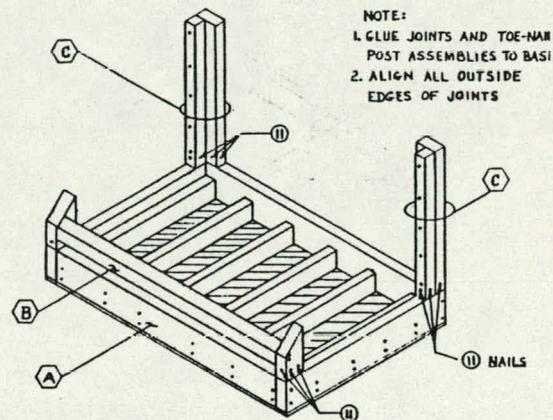
SOLAR ENERGY	HOT WATER HEATER FRONT FRAME	USMPOOL	3 OF 11
--------------	------------------------------	---------	---------



NOTE:  
1. GLUE JOINT AND NAIL AS REQUIRED  
2. BACK EDGE MUST BE EVEN WHEN NAILED

(C) - SHOWN - BACK CORNER POST ASSEMBLY

SOLAR ENERGY	HOT WATER HEATER BACK CORNER POST	USMPOOL	4 OF 11
--------------	-----------------------------------	---------	---------



NOTE:  
1. GLUE JOINTS AND TOE-NAIL POST ASSEMBLIES TO BASE  
2. ALIGN ALL OUTSIDE EDGES OF JOINTS

(D) - SHOWN - BASE AND POST ASSEMBLY

SOLAR ENERGY	BASE, FRONT FRAME & CORNER POST ASS'Y	USMPOOL	5 OF 11
--------------	---------------------------------------	---------	---------

PARTS LIST

Pcs Per Unit	Size	Description of Parts	Design Part Number
--------------------	------	----------------------------	--------------------------

WESTERN CEDAR SIDING (4' X 9' Sheets): Reverse Board & Batting

(2)	18½" X 56" X 5/8"	DOOR FRONTS	(50)
(2)	30¼" X 36" X 5/8"	CABINET ENDS	(17)
(1)	48" X 10" X 5/8"	FRONT	(20)
(1)	3½" X 10" X 5/8"	FRONT STRIP	(21)
(1)	36" X 48" X 5/8"	BACK	(18)
(1)	36" X 8½" X 5/8"	BACK STRIP	(19)

MASONITE SIDING (4' X 9' Sheets):

(1)	30" X 54" X 5/8"	BOTTOM	( 6)
-----	------------------	--------	------

THERMAX INSULATION BOARD: Foil Covering 3/4" Sheets (4' X 9')

(1)	50 X 29" X 3/4"	BOTTOM (Inside)	(40)
(1)	51½ X 27" X 3/4"	BACK (Inside)	(42)
(1)	50" X 7" X 3/4"	FRONT (45 deg. bevel)	(43)
(1)	49½" X 4" X 3/4"	TOP (45 deg. bevel)	(44)
(2)	29" X 27" X 3/4"	ENDS (Inside)	(41)
(2)	14-3/4" X 52" X 3/4"	DOOR INSULATION	(39)

STYOFAM INSULATION (Sheets) Either 3/4" or 1½" thickness

3/4 INCH THICKNESS WILL REQUIRE TWICE AS MANY PIECES AS WILL 1½ INCH.  
 THICKNESS BEING USED: \_\_\_\_\_ INCH.

(2)	42-3/4" X 28" X 3/4"	BACK	(23)
(2)	28" X 3-3/8" X 3/4"	BACK STRIP	(24)

SOLAR HOT WATER HEATER PAGE 2

Pcs per Unit	Size	Description of Part	Design Part Number
<u>STYOFOAM INSULATION (Sheets)</u>			
(2)	1½" X 51-3/4" X 3/4"	FRONT STRIP	(25)
(2)	19½" X 27½" X 3/4"	ENDS	(22)
<u>DENNY BOARD (Sheets) Foil Covering ¼ inch</u>			
(2)	3" X 30" X ¼"	END COVER STRIPS	(37)
(1)	3" X 55-3/4" X ¼"	TOP EDGE COVER	(36)
(1)	4" X 55-3/4" X ¼"	BOTTOM EDGE COVER	(38)
<u>PINE 2X6</u>			
(2)	2" X 6" X 30"	BOTTOM END FRAME	(3)
(2)	2" X 6" X 51½"	FRONT & BACK BOTTOM FRAME	(1)
(1)	2" X 6" X 54½" (45 deg. bevel)	INSIDE TOP FRAME	(13)
<u>PINE 2X4</u>			
(6)	2" X 4" X 27"	BOTTOM SUPPORT FRAME	(2)
(1)	2" X 4" X 51½" (45 deg. bevel)	FRONT TOP FRAME	(7)
(2)	2" X 4" X 7" (45 deg. bevel)	FRONT CORNER POST	(8)
(2)	2" X 4" X 28"	BACK CORNER POST	(9)
<u>PINE 2X2</u>			
(2)	2" X 2" X 49-3/8 <u>BLACK</u> 45 deg.	TANK SUPPORTS	(45)
(2)	2" X 2" X 33¼" (45 deg. bevels both ends)	END TOP RUNNERS	(14)
(2)	2" X 2" X 28"	BACK SIDE CORNER POST	(10)
(1)	2" X 2" X 28"	BACK SIDING JOINT POST	(12)
(1)	2" X ½" X 54½"	STRIP TO ATTACH TO (13)	(15)
<u>WESTERN CEDAR 2X4</u>			
(4)	2" X 4" X 12"	STAND LEGS	(51)
(2)	2" X 4" X 55½"	STAND SIDES	(53)
(2)	2" X 4" X 12"	STAND SIDES	(52)

SOLAR HOT WATER HEATER PAGE 3

Pcs Per Unit	Size	Description of Part	Design Part Number
--------------------	------	---------------------------	--------------------------

WESTERN CEDAR 2X6

(1)	2" X 6" X 57"	TOP	(16)
-----	---------------	-----	------

WESTERN CEDAR 3/4" (TRIM)

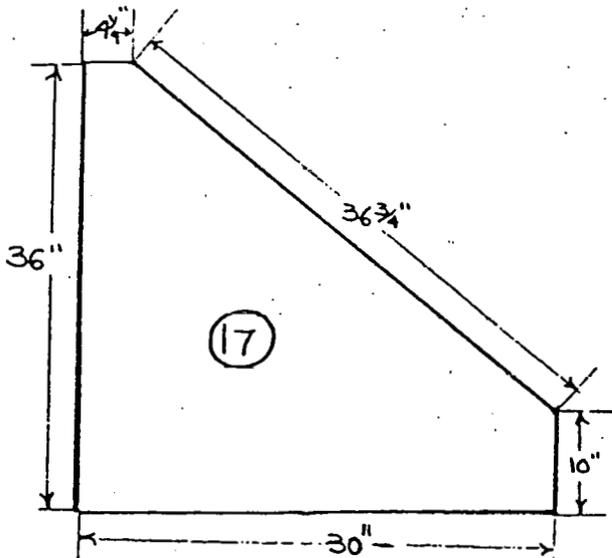
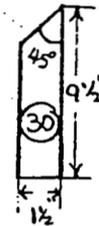
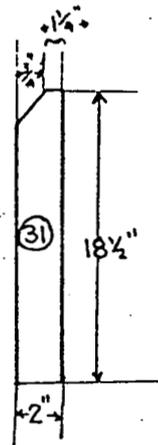
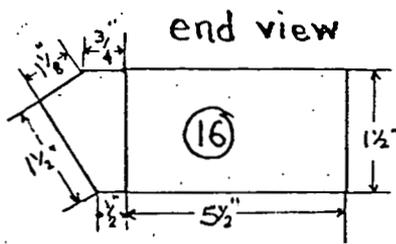
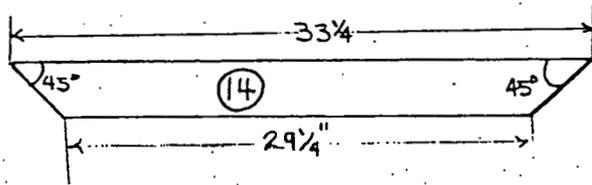
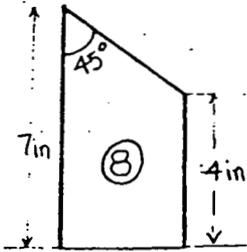
(1)	2" X 57-3/8" X 3/4"	DOOR LAP STRIP	(35)
(2)	2" X 18 1/2" X 3/4"	UPPER DOOR END TRIM	(32)
(4)	2" X 56" X 3/4"	HORIZONTAL DOOR FRAMING STRIPS	(49)
(4)	2" X 14-3/4" X 3/4"	VERTICAL DOOR FRAME STRIPS	(48)
(2)	2" X 18 1/2" X 3/4"	LOWER DOOR END TRIM	(31)
(2)	9 1/2" X 1 1/2" X 3/4"	FRONT CORNER SIDE TRIM STRIP	(29)
(2)	9 1/2" X 1 1/2" X 3/4" (45 deg. bevel)	FRONT CORNER FRONT TRIM STRIP	(30)
(4)	36" X 1 1/2" X 3/4"	BACK CORNER TRIM STRIPS	(28)

MISCELLANEOUS

(1)	52 gallon tanks		
(1)	9'X15'X3 1/2" (R 11) Fiberglass Insulation		(26)
(1)	3'X5'X.04 Sunlite Prem. II Glazing		
(4)	5" strap hinges		(57)
(2)	tubes geo-cel silicone caulk		
(1)	5" handles (Door pull)		(54)
(2)	small "S" hooks		(34)
(1)	12 ft. piece of small chain		(47)
(8)	No. 10 "O" hooks with wood screw shank		(33)
(2)	90 degree 3/4" street "Ls"		
(2)	14" (3/4" galvanized pipe)		
(3)	3/4" galvanized plugs		
1/2lb.	4 penny electroplated nails		(5)
1/2lb.	8 penny coated nails		(4)
1/2lb.	10 penny coated nails		(11)
1/2lb.	10 penny electroplated nails		(27)
1/8lb.	3/4 inch aluminum nails		(46)
24-No. 10	- 1 inch wood screws		(56)
4 -No. 10	- 3/4 inch wood screws		(55)
	1 pint flat black paint		
	1 - 8 oz. wood glue		

# Miscellaneous Patterns

USMP Solar Hot Water Heater  
 P.O. Box 505 - Rainsville, Ala. 35986



DE FG44 81R410412

### SOLAR TOURS: HOMES & GREENHOUSES

Across the years of our project, numerous people have sought information on solar homes, earth sheltered living, double envelop homes etc.. A number of area families have set out to build for themselves. These courageous adventurers have drawn plans, collected ideas and put skills into action.

We decided to bring seven of these families together to do a workshop for those who might like to learn from them. The workshop was assisted by slides of homes made by Mr. Tim Chamblee of TVA. Each family drew a floor plan and developed a data sheet for packets. A two hour evening session had 37 participants (terrible winter storm weather) with 59 people touring the homes on the following day (rain and snow). The stories told, the lessons learned and the homes visited made a most impressive and encouraging weekend.

Most of the homes have solar greenhouses and solariums, or they plan for one. Most of the homes are owner-built. Most plan for solar water heating systems. All homes are economically constructed and reflect the feeling by most that they are no more expensive to build than conventional housing.

No more attractive building is to be found in Rainsville, Alabama than the Upper Sand Mountain Parish Ministry Center. It is a good model for area residents, as well as an energy producing/plant growing environment to support parish ministries. Plans are for a three tank

(156 gallon) roof top solar hot water system this summer.

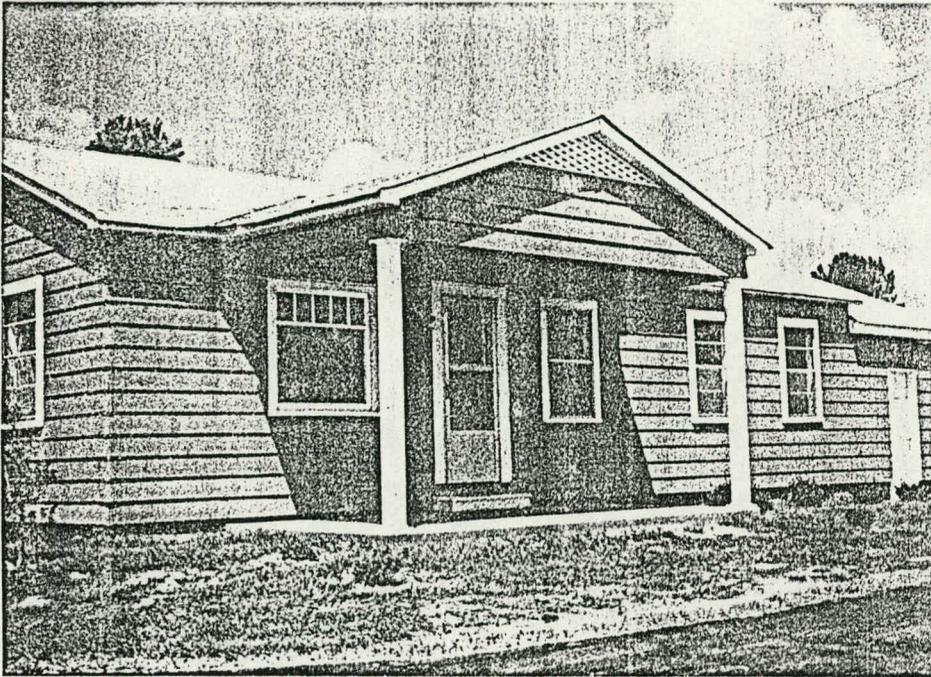
This system will be used to supply a parish community cannery being developed to serve the area (special focus on low and fixed income families).

*Pp 25, 26, 28, 29-31, 40 removed  
newspaper articles*

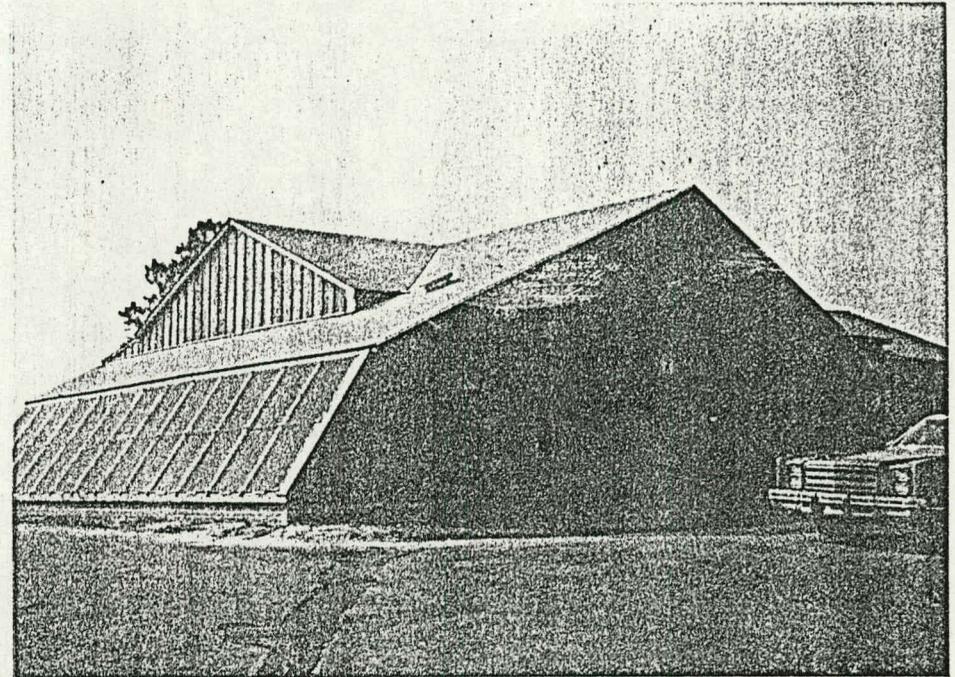
THE UPPER SAND MOUNTAIN PARISH

MINISTRY CENTER

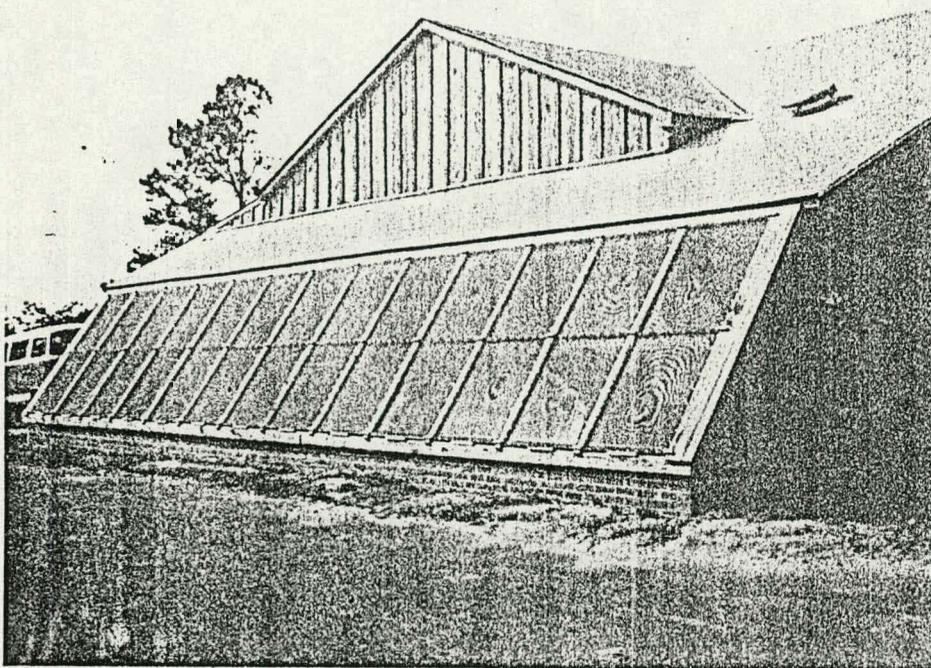
Rainsville, Alabama



BEFORE: A conventional house



AFTER: The Parish Ministry Center Building was renovated with energy saving air locks and a 39 foot attached solar greenhouse on the south side to assist with heating as well as to provide space for growing bedding plants for use in the parish's Garden of Plenty program with low and fixed income families. The solar greenhouse was constructed in a week long workshop with volunteer labor. Materials for the greenhouse were provided by the US Dept of Energy, The Un.Meth. Board of Discipleship and Vestavia Hills UMC..



39 Foot Solar Greenhouse with sunscreen for summer cooling

DE FG44 81R410412

## MOVABLE INSULATION PANELS & THE YOUTH & ENERGY PROJECT

Aside, from involving youth in study of basic weatherization and solar principles, these projects and workshops offered "on-hands" experience.

The movable insulation panel project involved students from Section High School Home Economics and Vocational Agriculture classes. Students worked together to construct panels for use in classrooms and were then employed to lead a public workshop. The panels were rigid "thermax" ( $\frac{1}{2}$  inch) insulated board covered with drapery material on the interior side and taped down edges with aluminum duct tape on the side to be facing the outside weather. The workshop was easy and rather inexpensive. It involved two hours for construction time.

The "Youth and Energy" project invited groups of youth from churches across the eastern United States to come for a week and learn solar and weatherization skills through first hand experience. Emphasis was placed on "mission" involvement or helping low and fixed income families. The local electric cooperative, Councils on Aging, Departments of Pensions and Security and churches were asked to make referrals of persons needing services.

Some 87 youth were involved in assisting 15-30 families.

CONCLUSIONS & RECOMMENDATIONS:

It has been a good three years! The project has been well accepted by so many people. Many of the early "skeptics" have been "converted". Solar is well on the minds of area people. The Upper Sand Mountain Parish involvement and workshops are known across the church and especially with people in the southeastern United States.

The low interest solar loan fund has proved adequate to date with almost \$15,000. principle to remain as a revolving loan fund. A multitude of people, at least 350 project owners, have first hand experiences and testimonies of what the SUN can do and is doing for them.

Probably no less that 500 students have some "hands-on" solar involvement through high school vocational agriculture and home economics classes. Students, with their instructors have looked first-hand at new ways to obtain energy, protect earth resources, build for a living, grow plants and food indoors.

Low and fixed income families have come to feel that someone does care about them and seeks to enable them to become more "in charge" of their lives - to become more self-reliant. Families are producing food during winter, having hot water they could not previously afford and selling bedding plants for supplemental income. Allow me: Last year as I came to one low-income family to pick up plants for sale the lady commented: "We've tried hard to grow the best plants we could because we want you to be proud of us". That family

sold \$155. in bedding plants that day, but most of all I let them know that someone is proud of them and the good work they did. They're doing it again this year! The sun works miracles in a variety of ways.

My conservative estimate is that area families are realizing \$20,000. in energy from the sun annually. I will roughly guess that around \$150,000. to \$175,000. has been the total expenditure of this three year project (grants included). By my calculations that's a  $7\frac{1}{2}$  to  $8\frac{1}{2}$  year repayment period aside from all of the fun, food produced, bedding plants sold, grants given, labor derived, people trained and acquaintances made.

#### RECOMMENDATIONS:

- \* Our solar plans are nothing exceptional, but they are good, workable and simple. We are always willing to share them.
- \* Encourage combined community efforts for "do-it-yourself" family oriented workshops for solar.
- \* Provide incentives for high school and state vocational colleges to involve students as builders and instructors.
- \* Develop solar loan funds (low interest.....solar bank).
- \* Promote self-help strategies for enabling the poor to become more self reliant.
- \* Continue to publicize solar as a healthy, earth respecting, economical, democratic energy alternative.
- \* Support training programs that will bring youth together with older adults for learning skills etc..

# Solar Energy

World Hunger Education Action Together  
Board of Discipleship  
The United Methodist Church

## and World Hunger

--- Dorsey Walker, Project/Parish Director  
North Alabama

Three years ago friends suggested that solar energy, especially solar greenhouses, could be a significant response to world hunger. We, at Upper Sand Mountain Parish, United Methodist Church, Rainsville, Alabama set out to explore this new alternative, and to date we have involved over 300 families in building and benefitting from solar systems (hot water heaters, hot air panels, food dryers and greenhouses).

Solar energy has helped us to move concretely toward becoming more responsible in our lifestyles and more responsive to the nutritional needs of others. Our "do-it-yourself" family oriented workshops offer participants opportunities for responding to hunger through each action/area available to WHEAT Covenants.

### LIFESTYLE ASSESSMENT

One of the most challenging and difficult means for responding to a hungry world is that of lifestyle assessment. One of the problems is finding new models or alternative ways of doing things.

Solar "do-it-yourself" workshops have enabled participants to actually build their own solar systems. We have sought to create "community-models" with solar greenhouses on homes, schools, camp lodges, clinic buildings, offices and stores. These solar systems allow families to be more self-sufficient in terms of energy production.

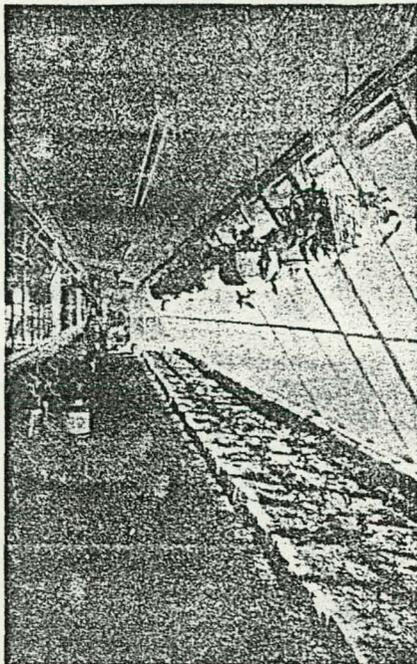
With a 10 X 16 foot attached solar greenhouse, a family can save 30-50% on their total winter heating cost and keep cooler in summer. The same greenhouse enables families to eat fresh, nutritious vegetables year around. Families become more "in control" of their winter food supply with several hundred dollars in savings and improved food quality.

Solar food dryers encourage an alternative means for preserving and storing food for winter use. While other types of food preservation systems (i.e. canning and freezing) are costly with their dependence on conventional non-renewal energy sources, solar drying is virtually cost free.

Our solar greenhouses, dryers, and hot water systems have all been passive or controlled by natural and human regulators rather than electrical or mechanical devices.



Families from across southeastern USA travel to Rainsville to participate in a solar construction workshop.



Inside "lay-out"  
for a heat and food  
producing solar green-  
house.

We have no pumps, thermostats or blowers.. People become an important part of making the system work for their benefit. Close attention to what's happening in the natural world around them (sun shining, etc.) and adjustment of doors and vents allow for maximum gain. People thus become engaged in genuine "self-help" projects.

Emphasis is placed on good stewardship and ecologically responsible activities through solar developments that are both non-polluting and earth renewing, and which help foster commitment to responsible living.

#### COMMUNITY INVOLVEMENT

Solar projects, for us, began with our Parish inviting a number of community groups and churches to come together to consider the appropriateness of such a project to the needs of people in our area. We had representatives from the groups we felt should be naturally allies for such an effort:

- ...two county councils on aging
- ...county board of education
- ...vocational agriculture teachers
- ...the local electric cooperative
- ...county agriculture extension services
- ...community action agencies
- ...other church congregations.

The Councils on Aging offered to help recruit and provide volunteer workers....

The high school vocational agriculture classes saw an opportunity to provide community recognition for youth who are frequently overlooked (those with manual skills but often low academic and athletic achievers).....The Upper Sand Mountain Parish and The Sand Mountain Electric Cooperative committed enough money to buy materials for three solar greenhouses..... the local community action agency provided scholarships for low income families to participate in "do-it-yourself" workshops.

Community Workshops were organized and invited interested persons to come and work a day or more to learn how to build a solar greenhouse. Recycling efforts began stock piling good usable materials. Families agreed to work together in barn-raising fashion. A community low interest solar loan program began and material grants became available for low income families agreeing to work together.

High school vocational agriculture classes pre-cut solar water heaters, food dryers and panels for workshops. Families would come to build on Saturdays with students hired to serve as instructors.

One community began a health care clinic and when time came for a building chose to go solar. We assisted them in creating a very attractive community model.

Solar projects have a wide appeal and can attract participation from every segment of a community. We were intentional from the outset to see that opportunities were present to allow every community family to participate as they desired. We obviously wanted "models" of every conceivable application .... nice new home -- commercial buildings -- older frame dwelling -- and as improvements for sub-standard housing.

Teams from churches and the community built for those unable to build for themselves with youth and older adults, trained by the project, available to build (deriving supplemental income) for those able to pay labor cost.

#### ADVOCACY

There are many areas for "advocacy" in relation to energy and solar alternatives in particular. One important dimension has to do with creating incentives (local, government, etc.) to encourage community "models". How do we get people, and especially institutions to look at a new responsible option, to take solar seriously? It costs little, if any more, to build solar if it is incorporated into the initial construction plan. Retro-fitting existing buildings is cost effective for most applications, especially if "do-it-yourself" strategies and recycling are employed.

Areas for advocacy can deal with "sun rights" to assure accessibility to the sun .... anti-nuclear development in favor of a less risky energy alternative .... federal and state tax credits for those wanting to install solar or other alternative (renewable/non-fossil based) energy production systems .... increased research and interest on the part of agricultural colleges in organic, non-toxic pest control and fertilization .... the formation of community controlled low interest loans funds and grant programs for low income families and environmental protection.

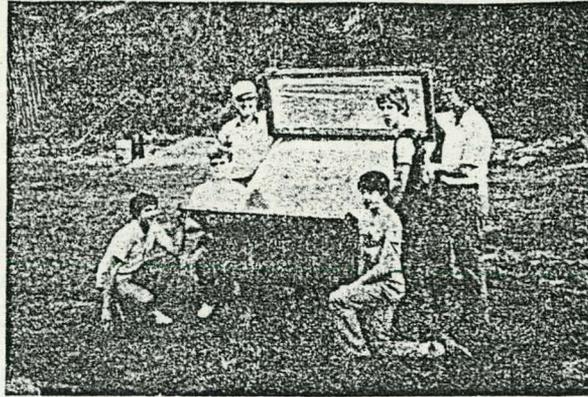
Persons wishing to become Advocates for Solar  
and other Alternative Energy  
contact:

The Solar Lobby,  
100 Connecticut Avenue, N.W.  
Washington, D.C. 20036

#### LOCAL CHURCH AID

Local churches can be instrumental in contributing toward the creation of a community low interest solar loan fund and the availability of grants to low income families. Solar energy and food producing projects are supported through gifts to the United Methodist Church's Hunger Special Program fund (UMCOR).

The Upper Sand Mountain Parish Solar Projects have received financial support from the Board of Discipleship (Hunger and Value Formation); and the National Division of the Board of Global Ministries, providing assistance for low income rural families.



High school youth and teachers share the thrill of having created a "model" for solar hot water heaters to be built in community workshops

#### EDUCATION

Good publications and films are available on energy related issues and solar applications.

Two excellent publications available from Discipleship Resources, Box 189, Nashville, TN. 37202 are:

- \*\* Can Our Church Save Energy?  
Karen A. Greenwaldt & Neil M. Alexander  
(7846C), \$2.00 ea.
  
- \*\* Energy Ethics: A Christian Response  
Dieter T. Hessel (7937C), \$4.25 ea.

Secular presses provide technical publications for solar systems. Many state departments of energy have free materials available. Local utility companies and the Tennessee Valley Authority, Solar Division, Chattanooga, Tennessee can give assistance.

Two good publications for the construction of a solar greenhouse are:

- \*\* The Food and Energy Producing Solar Greenhouse  
Bill Yanda and Rick Fisher
- \*\* Sunspaces for the Southeastern United States(\*)  
Pat Jeanson and Charles Feltus  
(\*) (Available free from Kentucky Department of Energy)

Plans for solar water heaters, hot air panels, window box collectors and food dryers, along with materials pertaining to the project's development are available from:

--The Upper Sand Mountain Parish  
P.O. Box 505, Rainsville, AL 35986  
Self-Addressed-Stamped Envelopes are appreciated.

The Solar Greenhouse Employment Project, of which Upper Sand Mountain Parish is a part, prints a Newsletter quarterly. It is available from ALTERNATIVES, P.O. Box 1707, Forest Park, GA 30051. SEND YOUR NAME AND ADDRESS - NO COST.

# ALABAMA SOLAR ENERGY CENTER

## Advisory Board

### Chairman

The Honorable G.D.H. McMillan, Jr.  
Lieutenant Governor  
State of Alabama  
Montgomery

### Board Members

John R. Chambless  
Chambless, Killingsworth and Associates  
Architects  
Montgomery

Richard B. Davis  
Assistant District Manager  
Office of Power  
Tennessee Valley Authority  
Muscle Shoals

Barbara A. Herring  
Consumerist  
Mobile

Edwin G. Hudspeth  
Staff Director  
Alabama Energy Management Board  
Montgomery

William C. Martin  
Manager, Technical Services  
Alabama Power Co  
Birmingham

Harry Pennington  
Vice-Chairman, Alabama Space  
Science Exhibit Commission  
Huntsville

Robert L. Potts  
Attorney  
Potts, Young and Blasingame  
Florence

Jonn Foshee  
Alabama Homebuilders Association  
Montgomery

Edward A. Sokol  
Director, Government Relations  
Russell Corporation  
Alexander City

Rev. Dorsey Walker  
Upper Sand Mountain Parish  
The United Methodist Church  
P. O. Box 505  
Rainsville, AL 35986

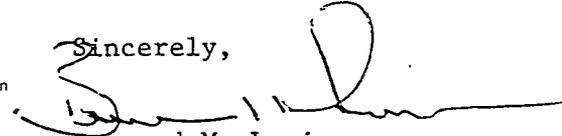
May 17, 1982

Dear Rev. Walker,

I want to thank you on behalf of the Alabama Solar Energy Center and other sponsoring organizations for your participation in the recent Small-Scale Renewable Energy Workshop held in Alabama's major cities. The interest of the participants in the comments you made and the exhibits presented was evident. Efforts such as yours will do much to lead Alabama away from energy dependency toward a clean and healthful environment.

If the Center can do anything for you at any time, please do not hesitate to call on us. Let me add personal thanks for making the work easier and more pleasurable and to express the hope that we soon get another opportunity to work together.

Sincerely,

  
Bernard M. Levine  
Director, Public Service Programs

cc: Dr. G. R. Guinn  
Dr. B. J. Schroer  
Ms. Donna Robinson  
Mr. Vish Varma, Harmon Engineering