

Schuder And His Design For Active Solar Systems

Active solar systems use fans, motors and control devices to take heat from solar collectors and deliver it to living spaces or storage areas. In order for an active solar system to operate automatically, you either have to have a genie or 24 hour call to open and close dampers, or you need a damper actuator.

When Charles B. Schuder designed a solar system to heat his A-frame house in Wilkes County six years ago, there were only a few damper actuators on the market to choose from, and they were expensive. He needed six of them for a total outlay of 900 dollars.

As a mechanical engineer, Schuder realized that the damper actuators were not

built to last the life time of his solar system. Moreover, the high cost of the damper actuators would discourage other home owners from considering active solar heating systems.

To remedy this situation, Schuder decided to design a damper actuator that could be made from salvaged parts by do-it-yourselfers. The Department of Energy's Appropriate Technology-Small Grants Program awarded him \$4,320 to design and build a demonstration model damper actuator. A little more than a year later, Schuder had designed three versions of a damper actuator that incorporates two solenoids and could be built for about \$25 by most do-it-

yourself types. Not only did his damper actuators actually work, they were designed and constructed within the budget of his grant. In fact, Schuder sent the Department of Energy a check for \$129.54 for funds he had not used in completing his project.

To understand the improvement Schuder's damper actuator represents, you have to understand some of the drawbacks of the commercial damper actuators. The original damper actuators in Schuder's solar system operated very smoothly.

The problem was that they would very smoothly open the dampers and then remain in an "on" mode as long as the damper

remained opened. On a good sunny day a damper might remain open all day. Hence, the electric motor would be on for eight hours running at a slow speed pushing the damper open. When the time came for the damper to close the electric motor in the damper actuator would shut off and a spring would return the damper to the closed position.


While Schuder's damper actuator's are not a quiet as the commercial units, they require only two electrical impulses to operate. Essentially, there are two solenoids on opposite sides of a metal arm which is connected to the axis of the damper. When the control system sends an electrical impulse to open the damper, the proper solenoid moves the arm instantly opening the damper. No power is used by the damper actuator from then on until its time to close the damper, at that time the control system sends another electrical

impulse which activates the other solenoid and promptly closes the damper.

Solenoids are used in almost all major appliances such as washing machines and dishwashers. If you want to build your own damper actuator, you should be able to find used solenoids in such appliances. Schuder wrote a final report for the

Department of Energy with instructions on how to build his damper actuators. Schuder didn't intend to seek a patent for his invention as he wanted it to be available for do-it-yourself types. You may obtain a copy of his final report by writing the Earth Studies Program, Appalachian State University, Boone, N.C. 28608.

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Tar Heel Book

Continued From Page 2-B

income producing capacity of the farm should be considered carefully, the booklet says.

The authors suggest that the prospective buyer have a qualified rural appraiser examine the farm. This is especially important if the would-be buyer is unfamiliar with the area.

The price of farmland has skyrocketed in North Carolina in recent years. By 1978 the average per-acre value statewide exceeded \$1,000, but there were wide variations in value from county to county.

"The value of farmland in many of the more heavily populated areas of the state is strongly influenced by nonfarm development potentials.

"In these instances the sale price generally exceeds the value of the property for farm use and its income in farm uses is low relative to the cost of the farm," the NCSU booklet says.

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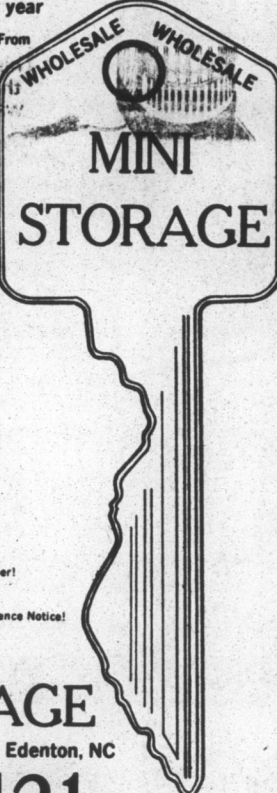
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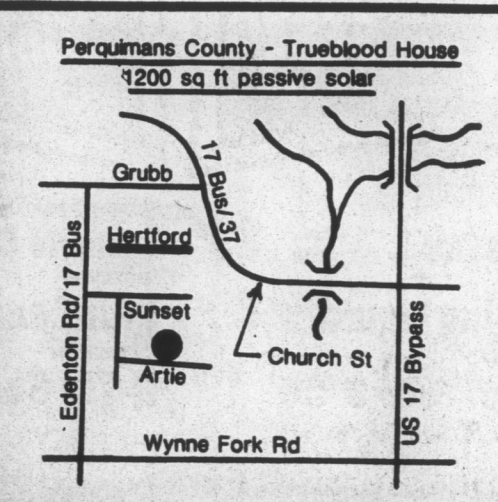


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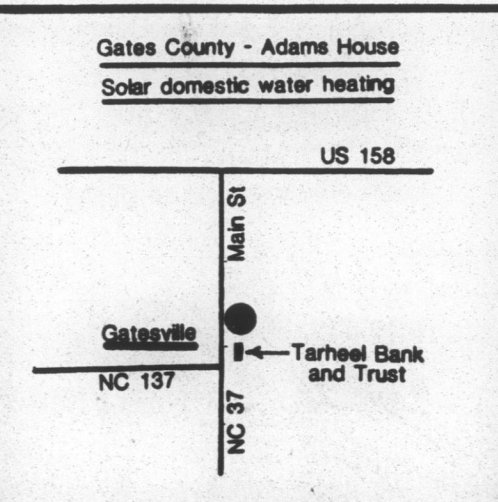
Edenton Saving & Loan

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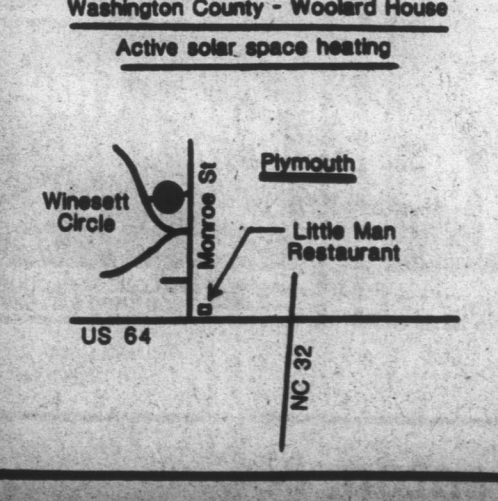
Perquimans County - Trueblood House
1200 sq ft passive solar



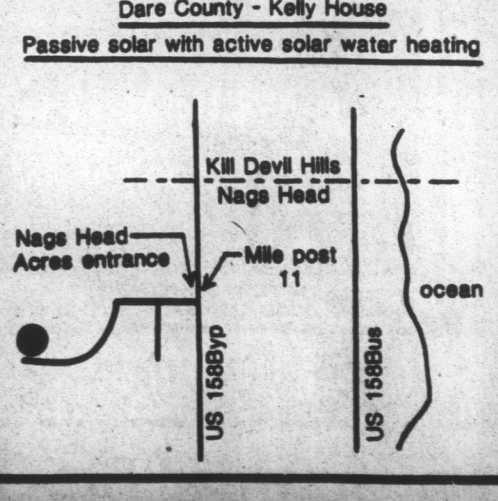
Gates County - Adams House
Solar domestic water heating



Washington County - Woolard House
Active solar space heating



Dare County - Kelly House
Passive solar with active solar water heating



NEAR TOWN—Attractive brick veneer home on 1/2 acre wooded lot, 3 BR, LR, den, dining area, 1 1/2 baths. 10 per cent APR owner financing \$39,500

2 ACRE LOT—With this 4 BR home. Convenient to town, 2 full baths, LR, family room with woodstove, central air and oil furnace, 3 yrs. old, outbuildings. 10 per cent APR owner financing \$42,000

BRICK HOME — Three BD, 2 baths, large livingroom with fireplace, dining room, kitchen. Well insulated. Central heat and air. Two car garage and workshop. 12 per cent owner financing \$49,500.

SNUG HARBOR — Two bedroom frame house \$18,500.

BRICK RANCH — 4 bedrooms, living room, den with fireplace, well equipped kitchen, dining room, utility room, 2 1/2 baths, rec. room, in-ground swimming pool 12 per cent owner financing \$39,000

CAPE COLONY — 3 bedroom home, eat in kitchen, living room with fireplace, workshop on the water. 10 per cent owner financing \$39,000

SMALL HOUSE IN COUNTRY — 1 year old \$14,400

HOME IN THE COUNTRY — Large living room, den, 2 full baths, two bedrooms, two car garage, large lot, furnished, one year old mobile home.

COUNTRY CLUB AREA — Brick home on large lot, 4 bedrooms, 2 full baths, large L.R. and den with fireplace, kitchen, utility room, garage, fenced backyard. 9 1/2 per cent assumption \$68,000

RENT WITH OPTION TO BUY — Two bedroom home. In town, living room with fireplace, bath, eat-in kitchen, screened porch, fenced backyard \$35,000.

WATERFRONT — Custom built cedar home. 3 BR, 2 1/2 baths, recreation room, great room with cathedral ceiling, 2 car garage, bulkheading with sandy beach on the Albemarle Sound \$80,000.

HISTORIC DISTRICT — Spacious 2 1/2 story home with large, beautifully landscaped yard, 6 bedrooms, 2 full baths, 2 half baths, 2 car garage, workshop, guest house, recreation room, water view.

HISTORIC DISTRICT — Charming 1 1/2 story brick home, large rooms, 2 fireplaces, screen porch, excellent condition. **SOLD**

APARTMENT HOUSE — Good location in town, 5 apartments, 3 lots \$40,000.

HISTORIC DISTRICT — Delightful 1 1/2 story brick home on West Gale Street, superb condition, excellent craftsmanship. **SOLD**

ALBEMARLE SOUND — Beautiful wooded lots over one acre in size on the water. Prices starting at an unbelievable \$24,000.

MEXICO ROAD — 1 bedroom brick ranch in immaculate condition. Extremely energy efficient, many extras \$54,000.

CAPE COLONY — Brick home with water view, carport, workshop, etc. **SOLD** adjacent to the boat basin

WATERFRONT — Albemarle Sound, charming 2 BD house, deck, bulkhead, **SOLD** owner financing

10 PERCENT ASSUMABLE LOAN — Payments of 304. per month buys this like new 3 bedroom home in the country with 3/4 acre lot. Call for further details. Low down payment.

INVESTMENT OPPORTUNITY — Apartment house with eight apartments. Excellent income in prime location. 9 1/4 per cent assumption.

HALF ACRE LOT — Just \$60 per month buys your own half acre lot with septic tank, water and electricity, perfect for mobile home. Low down payment.

PRICE REDUCED — Log Cabin, beautiful inside and out. Large fireplace, 2 bedrooms and loft. Maintenance free, energy efficient \$38,000.

ACREAGE — Three lovely acres in a choice location, privacy. 12 per cent owner financing. \$10,000.

SNUG HARBOR — Partially furnished mobile home on a well landscaped lot. Large workshop, room addition, and deck. 10 per cent owner financing.

INCOME PRODUCING INVESTMENT — Excellent rental property, brick duplex 3 BR apartments. Good location. Great price. **SOLD**

WATERFRONT — Elegant home in a spectacular setting on the Albemarle Sound, featuring, foyer, great room, 3 or 4 bedrooms, Florida room, 2 full baths and 2 half baths. Plus 3 bdrm guest house. 1.1 acres with sandy beach. 12 per cent owner financing.

COMMERCIAL BUILDING — On 2.6 acres with 365' of highway frontage - 12 per cent owner financing \$65,000.

COMMERCIAL BUILDING — Highway frontage on 2.8 acres make an offer.

HISTORIC DISTRICT — Charming 4 BD home with 2 full baths, eat-in kitchen, formal dining room, LR, den, and utility room. Beautiful yard. Price reduced to \$48,000.

CAPE COLONY — Charming 2 bedroom home, 1 1/2 baths, eat-in kitchen, LR, Florida rm, carport, large utility rm. Beautiful, landscaped setting. Many extra features. **SOLD**

CAPE COLONY — Unique, custom built home on dbl. lot, 3 bdrm. 2 1/2 baths, LR, cathedral ceiling - balconies - deck, **SOLD** 2 bay carport, workshop, beach and much more

VALHALLA — Owner Must Sell Now! — Eight year old spacious country home with over 1750 sq. ft. including 3 bdrms., LR, DR., kit., 1 1/2 baths, utility room and studio. Situated on two acres north of Edenton Price Reduced \$34,000.

Waterfront Lots — Snug Harbor and Arrowhead. Other Lots and Acreage For Sale.