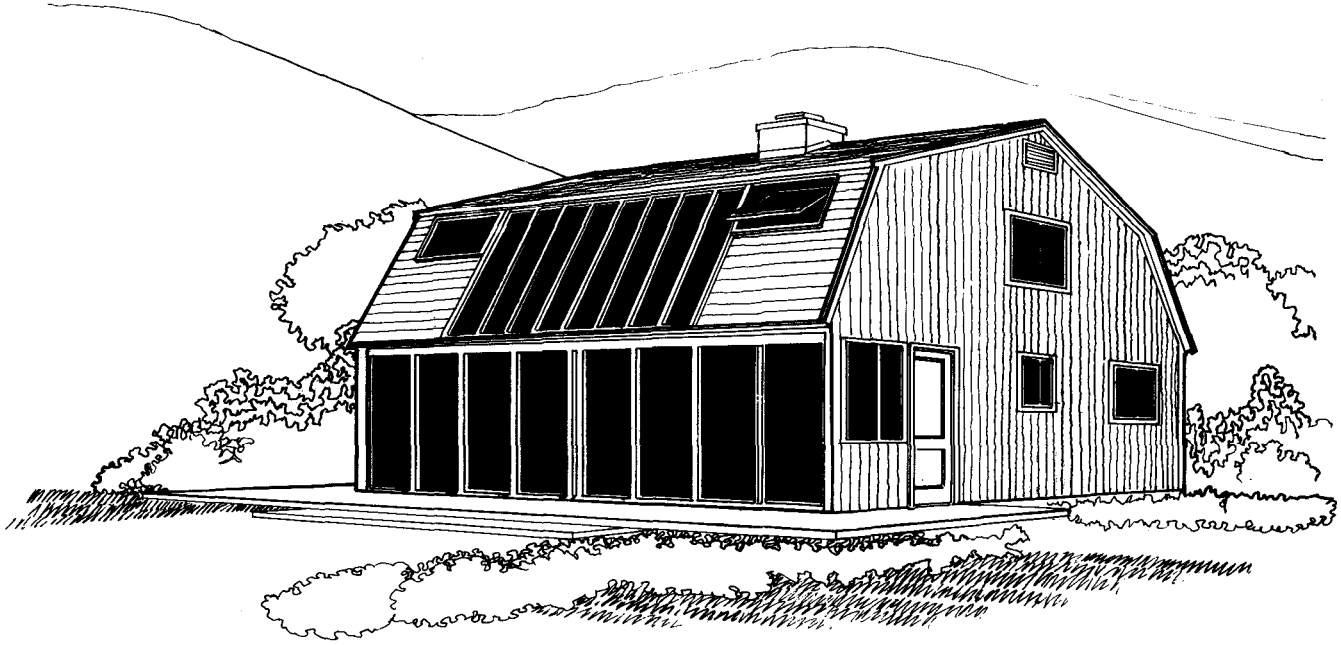
Shelton, CT



Builder: Building Co-ordinators, Shelton, CT

Designer: Sunspace, Inc., Shelton, CT

Solar Designer: Vic Reno, Walpole, N H

Price: $85,000

Net Heated Area: 1900 ft^2

Heat Load: 61.9 x 10^6 BTU /yr

Degree Days: 5617

Solar Fraction: 49%

Auxiliary Heat: 2.96 BTU / DD/ft^2

Passive Heating System(s): Direct gain Recognition

Factors: **Collector(s):** South-facing double glazing, greenhouse windows and sliding glass doors, 225 ft^2 **Absorber(s):**Concrete floor **Storage:** Concrete floor-**capacity:** 16,677 BTU / ₀F Distribution: Radiation, natural and forced convection **Controls:** Overhang, vents, insulated shutters

Active Solar Heating: Air flat-plate collectors (160 ft^2), 700 ft^3 rock storage

Back-up: Electric resistance heaters 38

This 2-story contemporary Cape Code style design in Fairfield, Connecticut, combines energy-conservation features with active and passive solar space heating systems. The gambrel roof deflects winter winds, and the siting of the house provides protection from infiltration as well as access to summer breezes. The garage and low-activity spaces located to the north further reduce winter heat loss. Fiberglass insulation has an R-value of 32 in the roof, and 21 in the walls and floors. The air-lock vestibule is located on the east, away from prevailing winds. The single north window is tripleglazed; all other windows are double glazed.

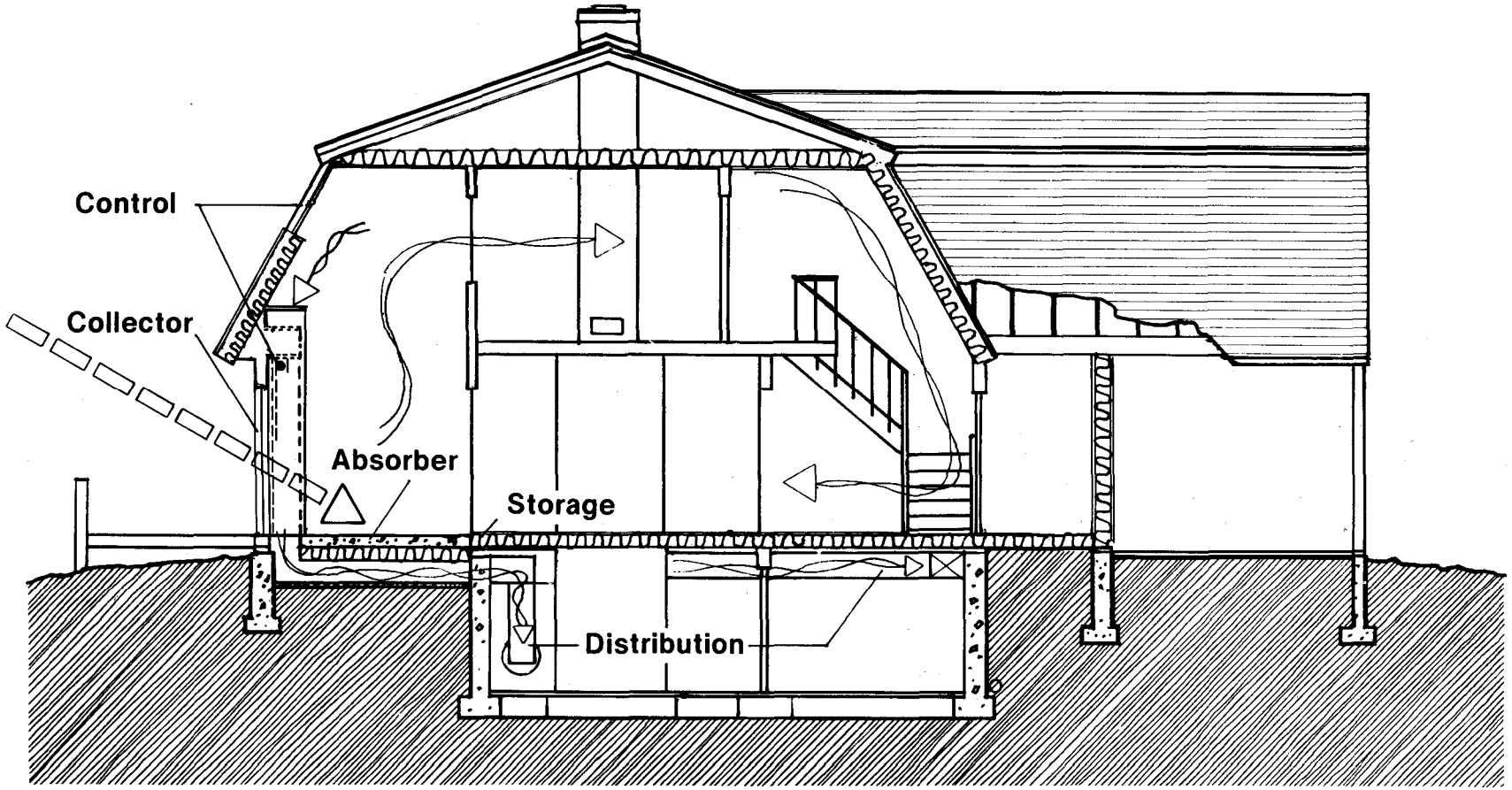
The major passive heating system is a 2story, south-facing greenhouse which includes a "fair weather" breakfast area. In the greenhouse, solar heat is collected through fixed windows and sliding glass doors. The masonry floor absorbs and stores the heat, which is later re-radiated into the greenhouse. Passive solar heat from the greenhouse is distributed through whole-house circulation if the bedroom doors and the door and windows between the greenhouse and interior rooms are opened.

When these doors and windows are closed, greenhouse-heated air is supplied to the flat-plate collectors mounted on the greenhouse roof, where the temperature of warmed air from the ridge of the greenhouse is boosted. When the house thermostat calls for heat, air that has been heated in the active collectors is distributed directly to the house through the air handling and ducting systems connected with the back-

up electric resistance furnace. When the interior temperatures are adequate, the air handling system transfers air from the active collectors directly to a remote rock storage bin in the basement for later distribution and use.

During winter nights, the greenhouse is isolated from the rest of the house and insulating shades are drawn across all greenhouse windows to **control** heat loss.

Summer cooling results from shading windows, inducing natural cross-ventilation, and reversing the active distribution system to store cool air at night and transfer it to the house during the day.



This plan is from the book
“Passive Solar Homes – 91 new award-winning, energy-conserving single-family homes”,
The U.S. Department of Housing and Urban Development, **1982**

The solar homes designs in this book were the winners of HUD’s fifth (and final) cycle of demonstration solar homes. The 91 winning home plans in the book were selected from 550 applications from builders.

This was a time of great interest and activity in the passive solar home designs – many of the winning homes show a level of innovation not found in most of today’s passive solar designs.

www.BuildItSolar.com