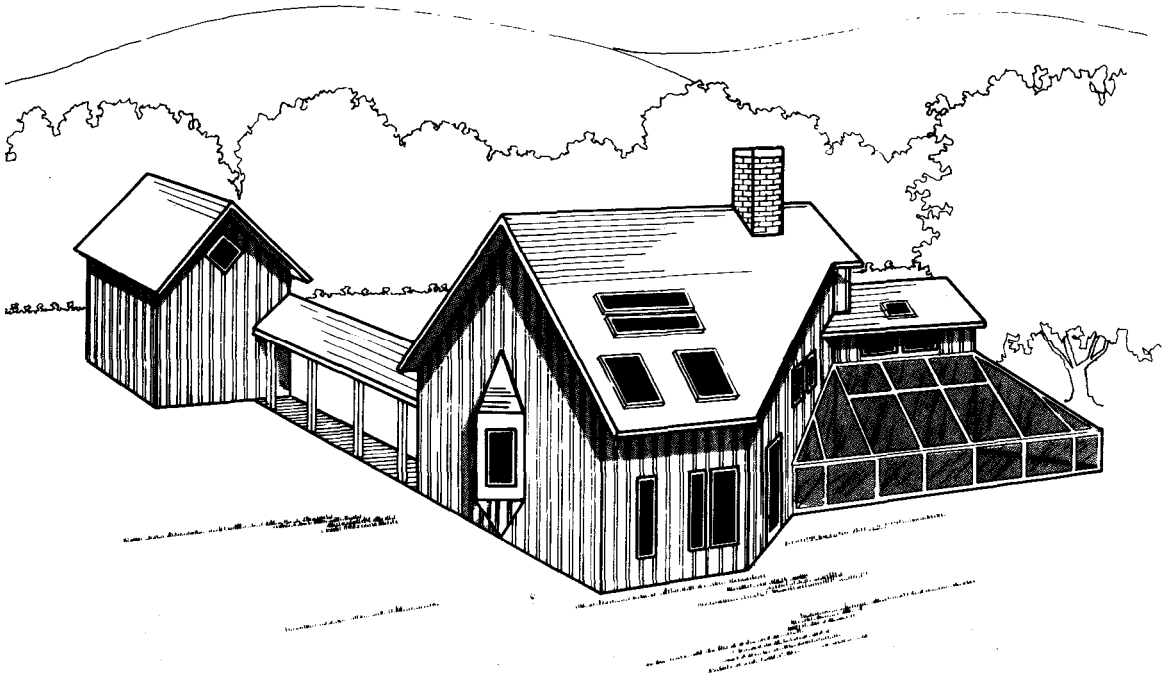
Hampden, ME



Builder: Campbell Construction Co., Bangor, ME

Designer: William R. Sepe, Camden, ME

Solar Designer: Richard Hill, University of Maine, Orono, ME

Price: $109,250

Net Heated Area: 1585 ft^2

Heat Load:66.1 x10^6BTU/yr

Degree Days: 7784

Solar Fraction: 61 %

Auxiliary Heat: 2.06 BTU/DD/ft^2

Passive Heating System(s): Direct gain, isolated gain

Recognition Factors: **Collector(s):** South-facing windows and skylight, 498 ft^2 **Absorber(s)**: Concrete mass floors, stone chimney mass Storage: Concrete mass floors, stone chimney **mass-capacity:**11,314 BTU / ₀F **Distribution:** Radiation, forced convection **Controls:** Thermostat, damper, insulating curtain, shades

Back-up: Gas wall furnaces (12,600 BTU / H), electric baseboard heaters (12,750 BTU / H)

This 2-story, 3-bedroom home in a rural Maine subdivision is intended for middle and upper-income families. The styling acknowledges traditional building forms, with a neutral-colored board and batten exterior and a conventional roof tilt.

In the winter heating mode, a ground-level greenhouse with operable skylight and windows provides a passive solar collection area for convective and radiant heating of the first-story living and dining rooms. Each room also receives limited amounts of direct sunlight, as do the upper-level bedrooms, which are sun-tempered spaces.

Heat is absorbed and stored for nighttime use in the mass floors of the greenhouse and first-story living areas, as well as in the stone chimney mass in the center of the house.

Fan-assisted distribution of solar-heated air begins when the greenhouse temperature reaches 8soF. A thermostat activates a fan in a foot-level vent between the greenhouse and the crawl space beneath the living area, and a motorized damper automatically opens. Heated air is pulled through the plenum and into the dining room through floor vents against the rear dining room wall. Cool air circulates back into the greenhouse when double-hung windows in the greenhouse/living area wall are partially opened.

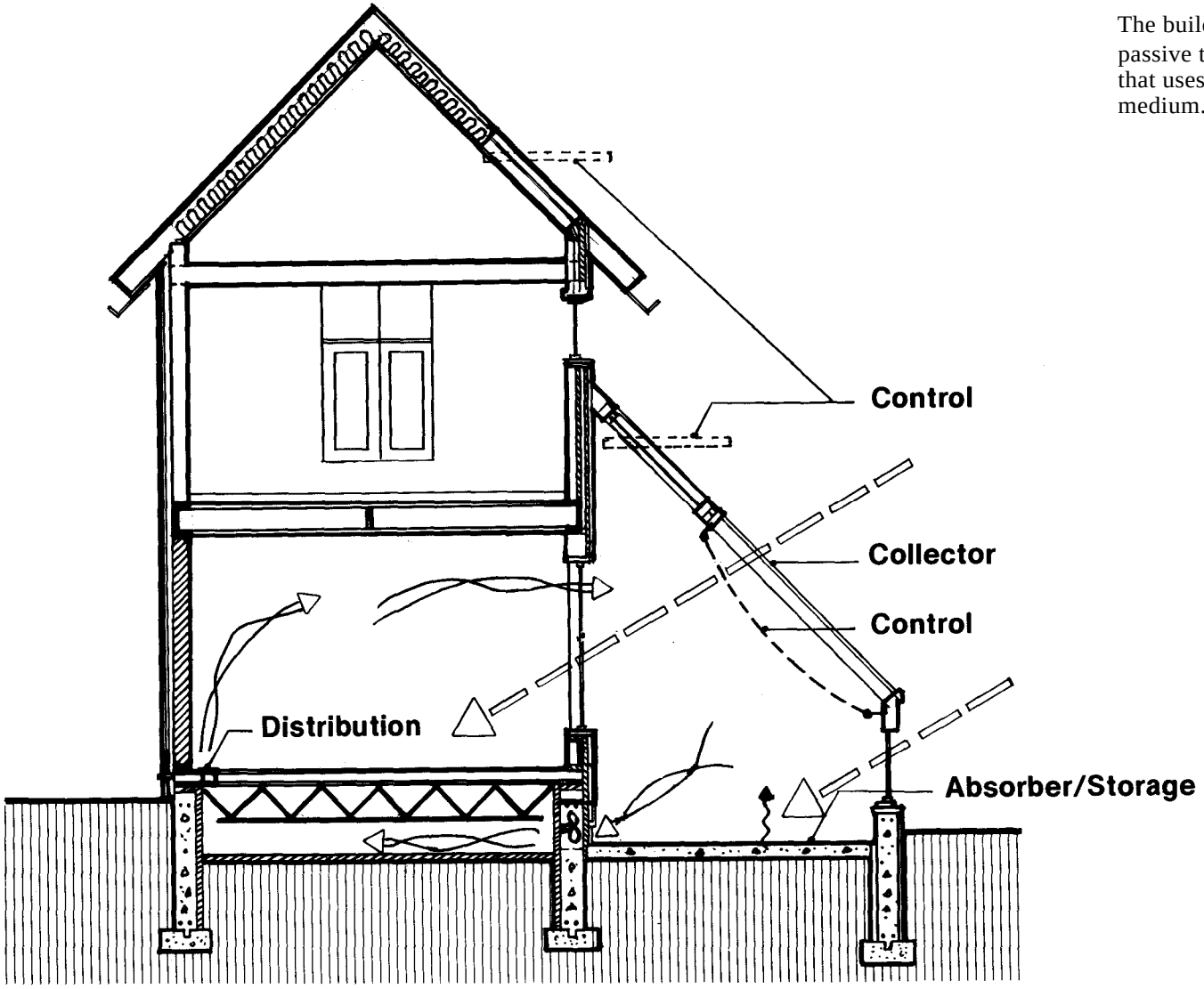
Nighttime heat losses are controlled by closing quilted insulating curtains on all

windows and by closing windows and doors between the greenhouse and adjacent rooms.

For summer cooling, windows and skylights are opened to permit natural cross-ventilation. Shades are closed during the day, reducing heat gain, and opened at night to allow heat to radiate from the house to the cooler night air.

Energy-conservation features include triple glazing and air-lock entry. Low-use rooms form a buffer zone along the north side of the house.

The builder offers an optional "Suntap ™ passive thermosiphon domestic water heater that uses Freon 114™ as the heat transfer medium.



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.

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