Santa Fe, NM

Builder: Stanley Associates, Sante Fe, NM

Designer: Francis E. Stanley

Solar Designer: Francis E. Stanley

Price: $85,000

Net Heated Area: 1583 ft²

Heat Load: 90 x 10⁶BTU/yr

Degree Days: 6007

Solar Fraction: 83%

Auxiliary Heat: 1.65 BTU/DD/ft²

Passive Heating System(s): Direct gain, indirect gain, sun-tempering

Recognition Factors: Collector(s): Double-glazed panels, sliding glass doors, 133 ft² **Absorber(s):** Concrete block Trombe wall, brick floor **Storage:** Concrete block Trombe wall, brick floor—**capacity:** 3247 BTU/°F **Distribution:** Radiation, natural convection **Controls:** Operable drapes, fixed overhang

Active Solar Heating: Air flat-plate collectors

Back-up: Gas furnace (50,000 BTU/H)

Domestic Hot Water: Air flat-plate collectors

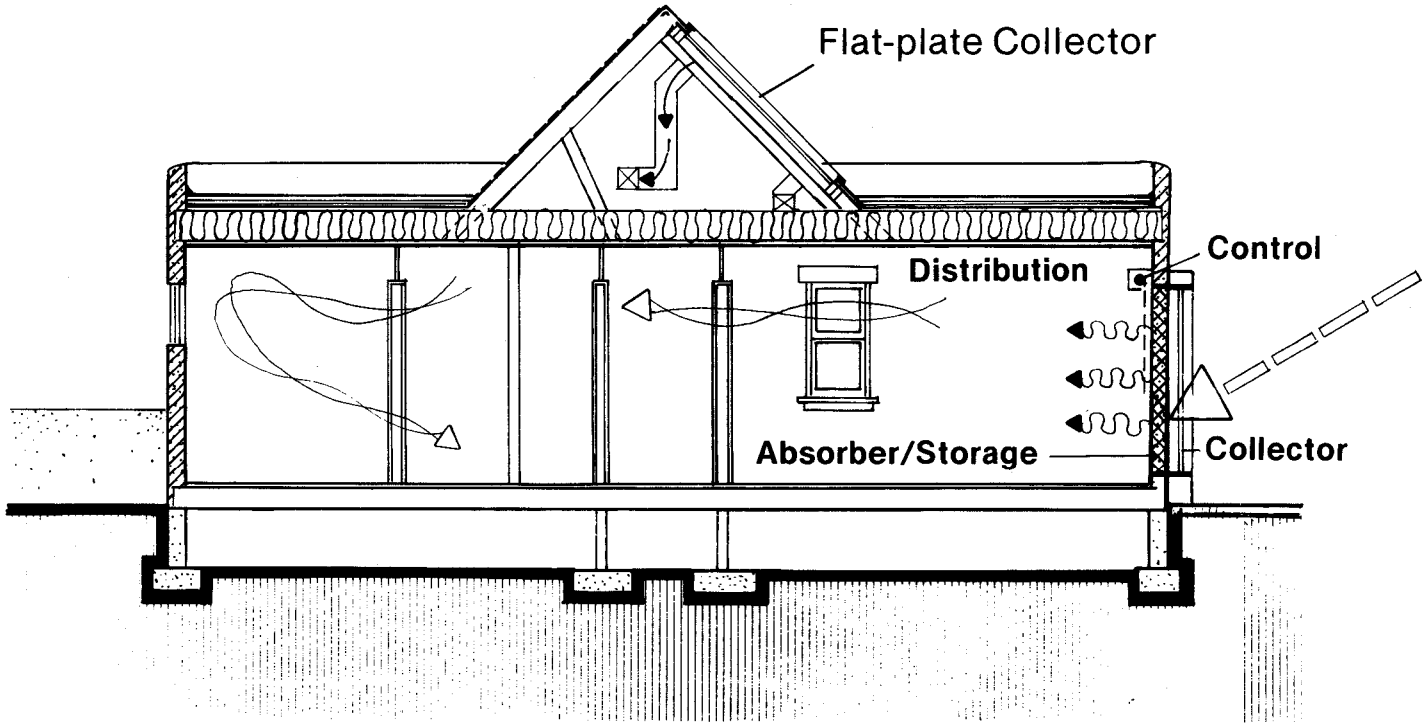
This adobe design in Santa Fe, New Mexico, combines passive and active solar heating systems in a marketable home package. Energy-conservation features for this cool, high-altitude climate include a buffer zone along part of the north wall, R24 insulation in walls and R-33 in ceilings, and double glazing for all windows. In addition, the siting takes advantage of a southfacing slope and of the wind protection offered by pinion pine trees to the north.

Two passive solar systems are integrated in the design. In the south-facing bedrooms, sunlight is **collected** through double-glass panels and is **absorbed** and **stored** in a solid concrete block Trombe wall immediately behind. For **distribution,** heat from the wall is radiated into the bedrooms during winter nights, and manually drawn drapes **control** heat loss. The other bedrooms **collect** solar radiation but have no mass to store it.

In the living room, solar heat is **collected** through south-facing sliding glass doors and a west window, and is then **absorbed** and **stored** in the brick floor to be radiantly **distributed** at night. Drapes **control** winter heat loss and summer gain through these windows. The glass doors are further protected by a fixed overhang. The carpeted dining room is also solar heated but without any heat storage. It also has a west-facing window with manually operated drapes for **control** of unwanted solar gain.

Summer cooling in this climate is easily accomplished by opening windows at night to induce natural cross-ventilation, and by drawing drapes or shades across direct gain windows during the day.

A Solaron™ active, air-type solar heating system with single-glazed, flat-plate collectors furnishes both space heat and domestic hot water. Space heat is **stored** in a below-grade rock bed and distributed through the perimeter radial duct system associated with the back-up, gas-fired, counter-flow furnace.


Flat-plate Collector
Control
Distribution
Absorber/Storage
Collector

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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