

Builder: Prowswood, Inc., Salt Lake City, UT

Designer: Kurt Brandle, Architect, Robert Boehm, Practical Engineer, Salt Lake City, UT

Solar Designer: Kurt Brandle, Robert Boehm

Price: \$65,000

Net Heated Area: 1161 ft²

Heat Load: 41.3 x 10⁶ BTU/yr

Degree Days: 6052

Solar Fraction: 39%

Auxiliary Heat: 4.02 BTU/DD/ft²

Passive Heating System(s): Direct gain

Recognition Factors: **Collector(s):** Triple-glazed south-facing windows, 114 ft² **Absorber(s):** Black chromium venetian blinds **Storage:** Masonry walls —**capacity:** 1541 BTU/°F **Distribution:** Natural and forced convection **Controls:** Blinds, dampers, overhangs, floor registers

Back-up: Two kW inline duct heaters

Domestic Hot Water: Active DHW system

Solar collection in this single-floor structure occurs at the four large windows of the south wall: two in the living room and one in each bedroom. These windows are triple glazed and include integrated venetian blinds.

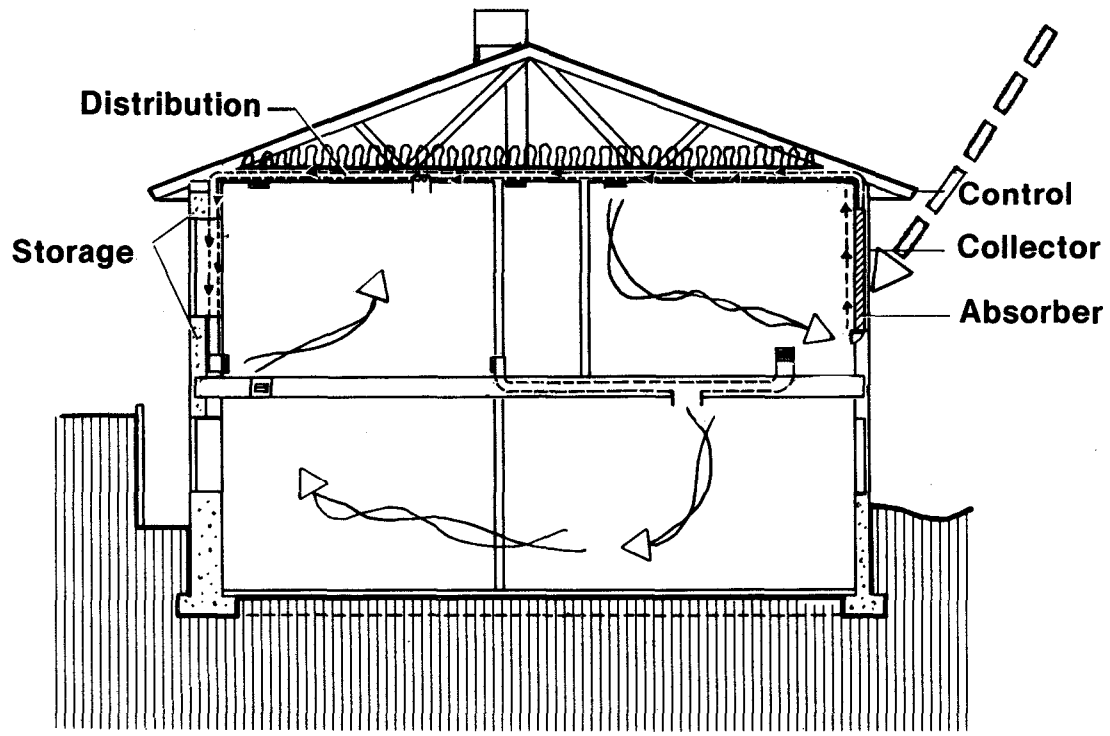
The heating system works as follows: light strikes the black venetian blinds and is absorbed, causing them to heat the air cavity around the blinds. Hot air within the cavity rises through vents into a header located above the venetian blind unit; cooler air is drawn into the cavity from the south rooms through vents at the bottom of each unit. On cold sunny days a ceiling duct system using inline blowers draws heat from the window headers and distributes it to each room of the house. When too much heat is supplied to any room, a motorized damper automatically adjusts the amount of air flow to that room. When overheating occurs, warm air is ducted to north-side masonry storage walls in the kitchen and master bedroom. The air

is forced through ducts within these 8-inch masonry walls and discharged at floor registers. It is expected that, on sunny days, the storage masses will absorb enough excess heat to radiate at night so that the kitchen and master bedroom will be kept warm. For colder weather there are two kW inline duct heaters to further warm the air.

These heaters are also within the system of floor ducts and registers used to supplement room heat and provide heat to the bathroom.

For summer cooling, a roof-mounted evaporative cooler is incorporated into the duct system. Ventilation occurs if the front pane of the solar windows is opened and allowed to cool the blinds before they can heat the air. Also, overhangs on all south glass help to keep the blinds cool.

Roof insulation is R-38, with R-19 in the walls.



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



—