New Albany, IN

Builder: George W. Rosenbarger, New Albany, IN

Designer: Jim Rosenbarger, New Albany, IN

Solar Designer: Terry W. White, P.E., Terry White, Engineer, New Albany, IN

Price: $78,500

Net Heated Area: 1800 ft^2

Heat Load: 45.4×10^6 BTU/yr

Degree Days: 4636

Solar Fraction: 64%

Auxiliary Heat: 1.91 BTU/DD/ft^2

Passive Heating System(s): Isolated gain, sun-tempering, direct gain

Recognition Factors: Collector(s): Greenhouse glass, glass doors and windows, 511 ft^2 **Absorber(s):** Concrete mass wall and tile-covered concrete slab floor **Storage:** Concrete mass wall and slab floor—**capacity:** 16,312 BTU/°F **Distribution:** Radiation, natural and forced convection **Controls:** Canvas shades, fixed overhangs

Back-up: Woodburning stove and electric furnace

Passive Cooling Type: Exhaust fan in attic and natural ventilation

In this house, solar radiation is **collected** by a greenhouse. Sunlight also directly enters the living space through glass doors at the rear of the greenhouse. In a raised extension of the greenhouse just to the west, there is a double-glazed sliding door and two fixed windows above it **collecting** solar radiation. In the living room to the far west, there are three double-glazed windows that collect heat and light for that area and the dining room behind it.

Heat is **absorbed** and **stored** in the greenhouse by a solid 2-story concrete block wall, and a 4-inch concrete slab floor surfaced with quarry tile pavers. This same type of floor is used to **absorb** and **store** heat in the living room as well.

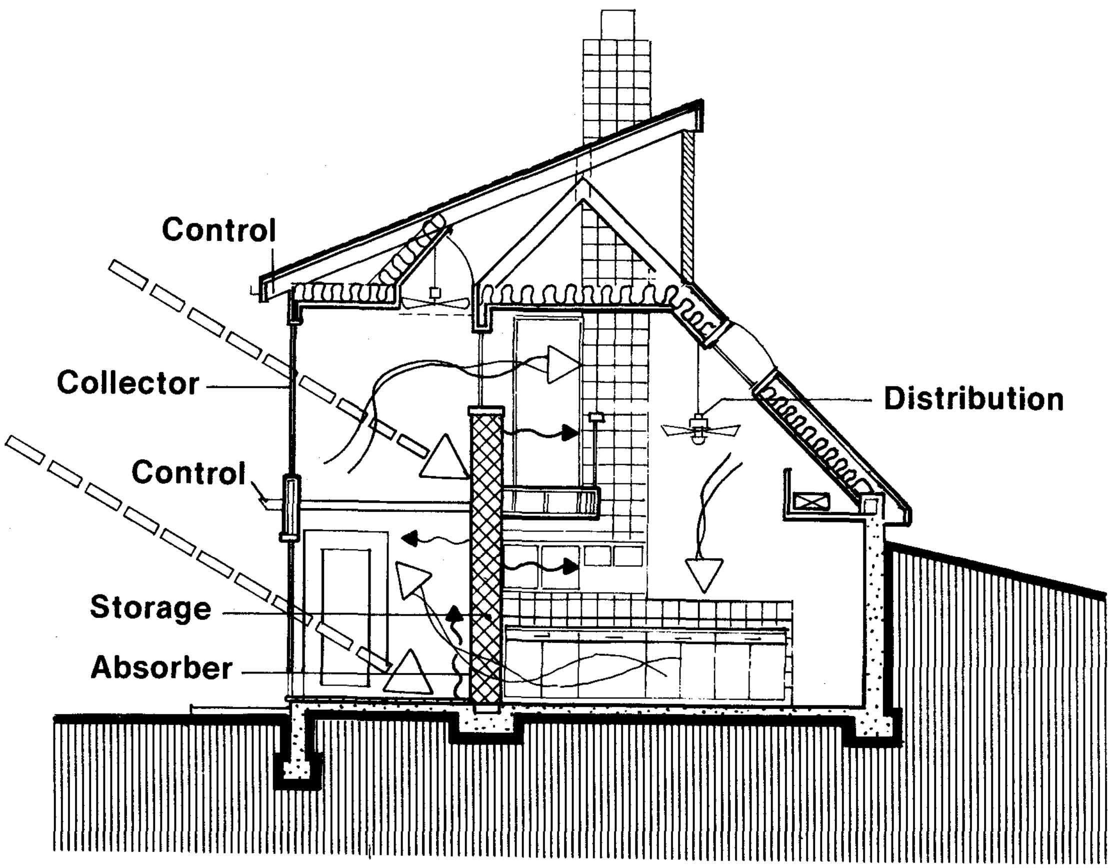
Distribution of heat is by radiation from storage masses together with both natural and forced convection. During winter days, heat that gathers at the top of the greenhouse can pass onto the second floor either through a window in the bedroom or over an open hallway with railings on either side. Behind the hallway, in the ceiling area of a 2-story kitchen, a 36-inch ceiling fan pushes heated air down to the lower level. Cooled air travels back into the greenhouse for reheating through connecting doors. For back-up heat at night and during extreme cold, there is a woodburning stove located in the living room beside a 12-inch masonry wall that stores heat. In addition, there is a furnace and duct system that makes continuous air flow available to all rooms.

To help cut heat loss, there is a 7-foot earth berm on the northwest corner of the house;

insulation values are R-19 for the walls and R-30 for the roof. Wind infiltration has been minimized by locating the garage and evergreen vegetation to the northwest where they can buffer winter breezes.

In the summer mode, canvas shades can be pulled to block out radiation entering through the greenhouse and to prevent it from being absorbed by the masonry wall. Fixed overhangs shade all other collectors.

Heat that does build up in the greenhouse can be exhausted through the attic and roof monitor by an attic fan in the raised section of the greenhouse. Natural ventilation of the living areas is achieved by opening east, west, and south windows. For peak cooling needs there is central air conditioning.



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.