

# NASA TECH BRIEF

## Marshall Space Flight Center



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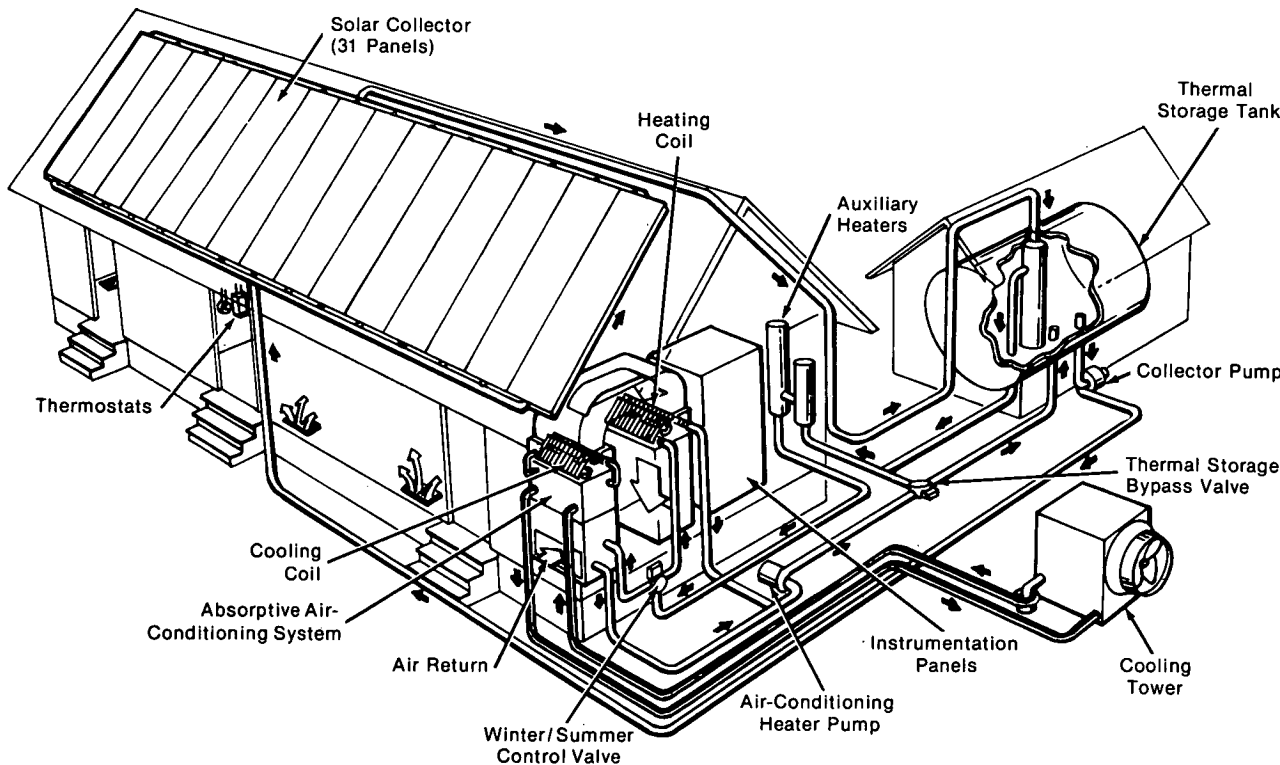
### Solar Residential Heating and Cooling System

From a recent investigation it has been concluded that a solar-powered residential heating and cooling system is technically feasible. A complete system analysis was performed to provide design information and to establish the contribution which solar energy could make to the heating and cooling requirements of a selected building configuration. Based on this analysis, a test system which provides heating and cooling to a simulated residence has been fabricated and is in operation at the Marshall Space Flight Center. The system has been placed into operation to verify the technical feasibility of utilizing solar energy

to provide heating and cooling and to identify areas where additional development is required to provide reliability and to produce an economically attractive system.

The basic elements of the system (see figure) include:

- a. A flat-plate solar collector to collect solar energy,
- b. A thermal-energy storage system (thermal storage tank) to store collected energy for use during the night or during periods of inclement weather,
- c. An absorptive cycle air-conditioner for cooling the building,



Solar-Powered Residential Heating and Cooling System

(continued overleaf)

- d. A liquid /gas heat exchanger (heating coil) to heat the residence,
- e. Auxiliary heaters to provide the energy required by the absorptive air-conditioner or the heating system, if the energy stored in the energy storage system (thermal storage tank) is depleted, and
- f. A control system (instrumentation panels) which allows automatic operation of the system and utilizes conventional residential thermostats for adjustment.

**Patent status:**

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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