

Smart Houses

A sophisticated approach to home energy efficiency highlights technology transfers in energy production and conservation

The environmental control system of the Apollo lunar landing spacecraft was a masterpiece of energy efficiency. It had to be, to protect the crew from outside temperatures that ranged from 400 degrees above to 400 below zero Fahrenheit. Inside the Command Module, the three-man crew worked in a shirtsleeve environment with temperatures approximating those of a business office. This extraordinary degree of temperature control was achieved with a total energy expenditure equivalent to that of 10 150-watt electric light bulbs.

It occurred to a group of engineers who had worked on Apollo that this superefficient technology could effectively be applied to reducing energy consumption in residential and commercial buildings. From that idea, there emerged in the 1970s a new company spawned by Apollo technology—Watt Count Engineering Systems, Inc., Nashville, Tennessee—and an innovative and highly successful energy conservation technique known as the Watt Count System. Today there is a spinoff from that spinoff, another energy efficiency service that employs variations of the same Apollo-derived technology. Called the Smart House™ program, it is a joint venture of Guaranteed Watt Savers, Inc. (GWS), Charlotte, North Carolina and Smart House Consultants, Inc., Oklahoma City, Oklahoma.

Headed by Tracy Bass, GWS originated in the early 1980s as three Watt Count dealerships in North Carolina. Personally trained by Watt Count president Mike Busby, a Doctor of Engineering from Massachusetts Institute of Technology, Tracy Bass drew upon his own extensive experience as a building, heating/air conditioning and insulation contractor to modify

the original technique. In 1985, he reorganized his dealerships as Guaranteed Watt Savers and the following year Smart House Consultants joined GWS as Oklahoma representative.

Like its predecessor Watt Count, the GWS design technique combines space technology, advanced building technology and an engineering systems design approach to offer dramatic reductions in home heating and cooling costs—typically, says GWS, about 50 percent or as much as \$8,000 for a representative home over a 30-year mortgage span.

GWS takes plans for a new home, subjects them to intensive computerized analysis that takes into account some 10,000 calculations relative to expected heat loss and heat gain, then provides specifications—designed specifically for each structure—as to heating, cooling, ventilation and insulation. As construction on the home progresses, GWS inspects the work of the electrical, plumbing and insulations contractors and installs its own Smart House Radiant Barrier. On completion of the home, GWS technicians use a machine that creates a vacuum in the house and enables computer calculation of the air exchanged, a measure of energy efficiency. Satisfied that the home has been built to its specifications, GWS delivers—a month after owner occupancy—a five-year guarantee that energy consumption will not exceed the kilowatt-hour level determined by the computer in the energy analysis.

A key factor in the company's ability to make such guarantees is the Radiant Barrier, the main feature borrowed from the Apollo program. This is an adaptation of a highly effective aluminized heat shield used in the Apollo Command and Lunar Modules—and on other space systems—as a radiation barrier, holding in or keeping out heat, cold air and water vapor. GWS uses a barrier of aluminized polymer film that serves three purposes: as a vapor barrier; a barrier



Heating and cooling costs for this large new home at Lake Wylie, South Carolina average well under \$40 a month. It is a home that has been "treated" by the Guaranteed Watt Savers Program, which employs space technology and other advanced building techniques to effect dramatic reductions in energy consumption.

to air infiltration, reducing the necessary operating time for the heating/air conditioning unit; and as a barrier to radiant heat, the major factor in home energy efficiency. The Radiant Barrier, says Smart House Consultants, will reflect away up to 95 percent of the Sun's energy.

The GWS/Smart House program extends to existing as well as new homes. Using sophisticated computerized test equipment, the company measures and reduces air infiltration and a Radiant Barrier is placed in the attic along the roof line. Smart House Consultants acknowledge that it is not possible to be as thorough on an existing home as on new construction, but no matter how old the home, it can be made more energy efficient.

GWS has applied its energy efficiency program in more than 2,000 new homes and acceptance is growing. There are now eight GWS centers in Maryland, North Carolina, South Carolina, Georgia, Oklahoma and Arizona, and by year-end 1987 the company expects to have 30 centers operating in the U.S. ▲

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Guaranteed Watt Savers (GWS) energy efficiency measures are applicable to existing as well as new homes. The century-old Cabarrus Academy, Concord, North Carolina, a combined home and private school, had a heating bill of \$700 a month; GWS cut it to less than \$300 a month while improving occupant comfort.



Guaranteed Watt Savers president Tracy Bass (right) explains to GWS Houston (Texas) dealer Al Clark the function of the company's Radiant Barrier, an adaptation of an aluminized heat shield used on spacecraft.