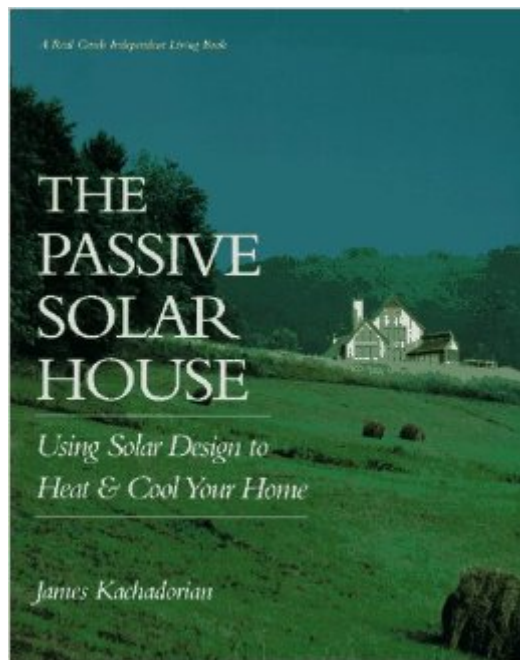


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# The Passive Solar House: Using Solar Design To Heat And Cool Your Home (Real Goods Independent Living Book)



## Synopsis

This book offers a technique for building homes that heat and cool themselves in a wide range of different climates, using ordinary building materials available anywhere and with methods familiar to all building contractors and many do-it-yourselfers. A formerly patented design for author James Kachadorian's Solar Slab heat exchanger is now available for the use of anyone motivated by the desire to build a house that needs a backup furnace or air conditioner rarely if ever. This is a building book for the next century. Applicable to a diversity of regions, climates, budgets, and styles of architecture, Kachadorian's techniques translate the essentials of timeless solar design (siting a home in harmony with nature, using windows as solar collectors, achieving year-round comfort by balancing good insulation with healthy supplies of fresh air) into practical wisdom for today's new generation of solar builders.

## Book Information

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## Customer Reviews

I picked up this book in a bookstore in Bar Harbor, Maine and 1 year later built a house around its concepts on the coast in Downeast Maine. The house is performing to expectations. We have had no problems over 3 years. Before proceeding, our building plans were independantly verified by a mechanical contractor. He found that the formulas presented in the book were accurate and dependable. The concrete crib added about \$3K to the overall cost of the house (it has a 25'x40' footprint) and the windows had to be specially ordered from Andersen. We also had some trouble

finding the 6 mil aluminized mylar. The only departure we made from the plans presented was we decreased the amount of air exchange by 50% over what was recommended. We used an outside air intake that funneled outside air into the crib and the bathroom vents (2) for exhaust. We have had no problems with this. I was fortunate to have found a contractor who was willing to take the time to understand the concept and then successfully build to the specifications. A number of foundation contractors turned us down. The contractor had to do the foundation himself. It went very smoothly. If you are serious about building this house, be sure to have very specific architectural plans for your builder....she/he will need them. Procuring the services of a "green" architect who buys into these stuff is most helpful.

"The Passive Solar House" explains in detail a system that the author patented (patents since expired) for a passive design using a concrete slab for thermal mass. There are detailed worksheets to let a prospective homebuilder figure out expected temperatures and available solar intake throughout the United States. Along with the formulas and worksheets, you can figure out how much insulation, concrete slab mass, air duct area, and heating plant capacity you'll need to incorporate the author's system into your house plans. While the author's patents were in effect his company sold dozens of passive solar houses in factory-built modules. Many of those houses are depicted in both exterior and interior photographs. While the thermal slab approach works equally well to buffer temperature swings for both heating and cooling, the book's emphasis is on solar heating. Conventional above-ground construction is assumed for the most part, but the treatment on the "sidehill" variant can be extended to included earth-bermed or buried houses. The illustrations are generally good. In a few cases they are more diagrammatic than detailed; however, with enough attention to the illustrations and the text, most details can be gleaned. (I'm still trying to figure out the spacing relationship between the concrete slab channels and the return air duct, though.) But this is definitely a book more about solar design than engineering or construction. "The Passive Solar House" could be improved by including more techniques for summer shading (such as awnings and overhangs) rather than just assuming deciduous tree plantings (which are expensive to keep watered in desert regions). Coverage of solar absorption properties of floors and windows would also be helpful. Summary: while not perfect, this is a very good book for explaining the author's thermal slab approach to passive solar design.

It is amazing how many houses are plopped down in this country with no consideration of the sun. After reading this book, it becomes apparent that even if we built the same houses, but simply

oriented them with respect to the sun (i.e., windowed rooms facing south, closets on the north wall, etc.) we could make drastic reductions in our consumption of natural resources. The book has general information on site selection, house layout, etc. but also details a manner of building involving forgoing a basement for a floor of concrete (for thermal mass), window placement and insulating shutters. During the day, the house will not overheat because the 'solar slab' soaks it up, while at night recirculation techniques are outlined that make this heat available and comfortable at night. The book also includes all the formulas used in the calculations of thermal mass, window sizing, etc. Even if you don't plan on building the house in this book, I got some great ideas involving placement of a hearth (a vertical thermal mass) in front of windows to put the sun to work minimizing the need for heating fuel. If you are planning a house, I'd highly recommend this book.

I was planning a major two-story, south-facing addition to our home on a slab and wanted passive solar already so I was intrigued by this book. It brings together the need for thermal mass to moderate temperature swings, backup heating needs, and provides much needed cooling assistance. I liked how he determined a practical level of insulation and didn't over engineer that aspect. He also covered air quality issues at length. One small error, I think, was in his design of thermal shutters saying the foil surfaces would reflect heat back into the room while behind wood veneers. I may be wrong, but reflective surfaces don't reflect heat unless there is an airspace adjacent and not up against a solid surface. I would like to see spreadsheets on disk to make it easier to run your own calculations for your home design and for your region. I would also like to see a chapter on making additions to your home like I'm planning. Adding more information about solar water heating would help complete the book too. I'm curious about the author's experience in this area.

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