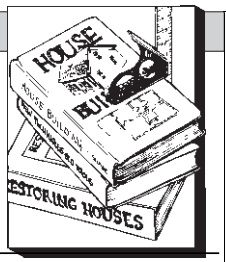
Radon Strategies



Practical Radon Control for Homes by Terry Brennan and Susan Galbraith; Cutter Information Corp.; Arlington, Mass.; 1988; 164 pages; $40.

Radon, as we are all becoming aware, is a colorless, odorless gas produced by the natural "decay" of radioactive uranium in the soil. The *alpha* particles emitted in this decay process are so weak, according to authors Brennan and Galbraith, that they can't even penetrate through a single layer of dead skin from outside the body. However, so-called "daughter" decay products *can* lodge in the lungs if inhaled, where tissue is so thin that oxygen and carbon dioxide pass through (as indeed they must). Long term exposure to certain radon levels could cause lung cancer.

How do you find out the concentration in a given house? And what do you do to mitigate the problem when levels go above the current EPA (Environmental Protection Agency) guideline of 4 Pico-curies per liter for concentrations in air? These are the questions *Practical Radon Control* attempts to answer.

First, the authors present four EPA-approved measuring techniques for diagnostic and post-mitigation testing, along with a description of typical air- and water-borne entry sources. (Radon, they say, will move due to differences in *concentration,* even when there is no air movement.) This section provides background information on the problem.

Next Brennan and Galbraith describe investigation techniques and how to select a mitigation strategy. There are, they say, two basic approaches: a) keep radon out of the building, or b) dilute it if it gets in. A total of seven techniques for carrying out these two strategies are given, along with the effectiveness of each. Computerized graphics illustrate the methods, conditions, techniques, and construction details discussed. How to do tests and understand the results are explained. Appendices provide a sample house inspection form; many pages of EPA-approved sources of test equipment and services by state, test type, and performance results information which could have been more usefully combined by the editors); an EPA synopsis of the pros and cons of different tests; and sources of specialized equipment such as heatless chemical smoke sticks or European manufactured fans. (We aren't told, however, why the particular fans are recommended.)

"Flow charts" (similar to home diagnostic medical or automotive trouble-shooting guides) take the user step-by-step through selecting the appropriate mitigation technique.

Finally, the authors offer advice and tips on installing various mitigation techniques. This is the book's weakest section, since there are no illustrations and the text is far from being a how-to field manual.

Despite its homespun appearance, lackluster illustrations, redundant EPA charts, and hefty price tag, *Practical Radon Control* will undoubtedly be a useful reference for people working in the trenches, with more limited value to engineers, code officials and others further removed from the nuts and bolts of radon control.

—Paul Hanke

Wiring Tips

Practical Electric Wiring. 14th edition by H. P. Richter and W. Creighton Schwan; McGraw-Hill; 1987; 683 pages; $32.95 hardcover.
Designing Electrical Systems; by James G. Stallcup; American Technical Publishers; Homewood. Ill.; 1983; $21.96; softcover.

For years the late H.P. Richter's *Practical Electrical Wiring* has been an old standby for beginners and experienced electricians alike. The 14th edition, based on the 1987 code, continues the tradition. If you want to understand both the hows and whys of residential and commercial electrical wiring, it would be hard to beat this densely written and thoroughly illustrated volume. From the basic principles and terminology of ac/dc electricity, to planning your installation, to the nitty-gritty of which wire connects to which screw, Richter and Schwan provide the answers. The book covers residential, farm, and commercial wiring, including new and old work, and is indexed with appendices taken from the National Electrical Code.

Designing Electrical Systems contrasts with the Richter/Schwan book by covering similar material in far fewer pages. It's also organized by Code section, rather than building from the simplest concepts and applications to more complex situations as Richter does. *Designing* is based on the '84 Code, which is probably a shortcoming in some respects.

Stallcup assumes the reader has some basic working knowledge of electricity (which Richter never does), and focuses almost exclusively on practical rather than theoretical concerns. *Warnings* are printed in boldface type, and a myriad of simple line drawings clearly represent the ideas in the text. Sample problems are worked outside the text—a convenient feature Richter doesn't offer. Each chapter ends with a pair of True/False and Design tests for self-study. The reference includes some esoteric information—such as exceptions for buried cable covered by 2-inch concrete slab or running wire under an airport runway, but suffers from the lack of an index.

Both books are easy enough to understand, but of the two, my first choice would be Richter/Schwan based on thoroughness. Stallcup's book is considerably more economical though.

—Paul Hanke

Free & Cheap

Infrared Guides: A 50-page *Directory of Infrared Thermographers* provides purchasers of infrared inspection services with the names, addresses, types of service, geographical areas serviced, and professional qualifications of practicing thermographers. Meanwhile, *Guidelines for Infrared Services* outlines practices that will produce the most useful and cost-effective results. The 22-page guide is free, as is the directory. For copies, contact the Infraspection Institute, 33 Juniper Ridge, Shelburne, VT 05482; 802/985-2500.

Energy Measurement: The manufacturers of ISTA BTU meters, which can be used to allocate heat and/or cooling costs, have released a 20-page catalog. The *ISTA BTU Meter Catalog* describes the company's line of meters and accessories, and provides step-by-step descriptions of meter selection, installation, and maintenance. Contact ISTA Energy Systems Corp., P.O. Box 618, Roselle, *NJ 07203; 201/241-8880.*

Energy Saving Appliances: The 1988 edition of *The Most Energy-Efficient Appliances* has been released by the American Council for an Energy-Efficient Economy. The 24-page guide identifies the top-rated residential appliances by brand name and model number, and covers ten major types of appliances including fumaces, water heaters, heat pumps, air conditioners, refrigerators, and freezers. The booklet also describes the national minimum efficiency standards for home appliances that were adopted in 1987. ACEEE also publishes *Saving Energy and Money with Home Appliances,* a 34-page illustrated guide describing the efficient use of home appliances, including water heaters, portable space heaters, cooking equipment, refrigerators, and lighting products. *Saving Energy...* was co-produced with the Massachusetts Audubon Society. Both publications are available for $2.00 each from ACEEE, Suite 535, 1001 Connecticut Ave. N.W., Washington, D.C. 20036; 202/429-8873.

Reducing Energy Costs: Two fact sheets are aimed at reducing heating and cooling costs. The six-page fact sheet *Improving the Efficiency of Oil and Gas Heating Systems* (FS219) describes annual servicing and cleaning of oil and gas furnaces; maintaining hot water, steam, and forced- air systems; and modifying both gas and oil furnaces. The five-page fact sheet *Efficient Air Conditioning* (FS206) provides guidelines for purchasing central and single room air conditioners, as well as ways to improve the efficiency of existing systems. It also discusses sizing, installing, operating, and maintaining air conditioning systems. To obtain copies of these free fact sheets write CARIERS, P.O. Box 8900, Silver Spring, MD 20907; 805/523-2929 (800/233-3071 in Alaska and Hawaii).

Insulation Retrofit: *Re-siding with Styrofoam Brand Insulation* (179-6308) is a 12-page guide from Dow Chemical detailing installation and trim when using Styrofoam over existing siding. For this and other free product literature, contact Dow Chemical, Styrofoam Brand Products, 2020 Willard H. Dow Center, Midland, MI 48674; or call 800/2582436, ext.25/Styrofoam.

Restoration Registers: A manufacturer of cast-iron and brass heating registers and grilles, shelf brackets, and other heating system accessories has released its 1987-1988 mail order catalog. For a free copy of the *Reggio Register Catalog* contact the Reggio Register Co., P.O. Box 511, Ayer, MA 01432; 617/772-3493.

Oil Heat Service: A training tape entitled *An Action Response to a No Heat Call,* has been produced by the National Assoc. of Oil Heat Service Managers and the Petroleum Marketing Education Foundation. The 30-minute, full-color tape follows an experienced technician and a trainee through a typical no-heat call, and provides a detailed step-by-step procedure. Accompanying the tape is a workbook chat can he used for technicians or others to test their knowledge. The tape/workbook combination is not cheap to purchase ($149.95), but can be rented for $49.95. For information, write the New England Fuel Institute (NEFI) at P.O. Box 888, Watertown, MA 02272; or call 617/924-1000.

Moisture Problems: An eight-page report entitled *Moisture Problems in the Home* (B3371) has been prepared by the University of Wisconsin. The pamphlet provides a basic description of how moisture works in the home, including how it is affected by weatherization, and offers several strategies to solve moisture problems. For a copy, send 30 cents to Agricultural Bulletin, Rm. 245, 30 No. Murray St., Madison, WI 53715; 608/262-3346.

Wood Heat Safety: A 50-page booklet providing guidelines for the proper installation, operation, and maintenance of wood heating systems has been published by the Reinsurance Association of Minnesota. *Fire Safety in Wood Heating Systems* discusses freestanding wood, dual-fuel, and add-on wood heating units, in addition to fireplaces and outside woodburning appliances. It also details clearances, connectors and pass throughs, types of liners and relining methods. Copies cost $3.00 ppd (includes $1 shipping) from RAM, P.O. Box 308, Esko, MN 55733; or call 218/879-3321.

Air Systems Manual: A technical publication to help in the design of effective and energy-efficient air systems has been released by the Air Movement and Control Association, Inc. (AMCA). In addition to an introduction to air system components and the properties of air, *Air Systems* (Publication 200) covers airflow, system design, and tolerances. Appendices include charts on friction and air density. The book costs $6 ($4 to AMCA members). Contact AMCA, 35 West University Drive, Arlington Heights, IL 60004; 312/394-0150.

Passive Solar Report: The combined efforts of the U.S. and U.K. Departments of Energy have resulted in *Passive Solar Design,* a report of the Passive Solar Design R&D efforts of both nations, and a summary of the conclusions reached at a workshop held in 1984 by researchers and practitioners working on passive solar design in the two countries. The 12-page, full-color booklet contains charts and data on both residential and non-residential buildings. It's free from the National Institute of Building Sciences, 1015 15th St., N.W., Suite 700, Washington, D.C. 20005; 202/347-5710.

Energy Advice

Energy Efficient Housing Design by Jonathan Lane; Van Nostrand Reinhold; New York, N.Y.; 1986; 134 pages; $31.95, paperback.

Despite its appealing basic premise that the best features of passive solar, earth-sheltered, and superinsulated houses be combined for optimum performance, *Energy Efficient Housing Design* is one of the poorest books I've had occasion to review. Some shortcomings:

- Detail drawings that lack consistent symbols, labels, and roof venting.
- A recommendation that the poly vapor barrier be placed on *top* of the ceiling joists (rather than below).
- The authors claim that surface-bonded block walls don't resist earth pressure as well as "conventional masonry" walls, when surface-bonding actually has about six times the tensile strength of block-in-mortar and is roughly equal in this respect to unreinforced poured concrete.
- Lane's recommendation that earth-sheltered north walls be insulated (in the moderate Philadelphia area) with 5½ inches of foam board *plus* 3½ inches of fiberglass. This seems hardly justified, when heat loss into the earth is much slower than into the ambient air. The author also recommends that this insulation be placed on the inside of the wall, where it eliminates the thermal mass effect of the masonry and cannot be used to protect the outside waterproofing membrane.

Perhaps the most off-the-wall (so to speak) idea Lane proposes, however, is his suggestion that Tyvek be used as a *waterproofing* membrane on the outside of earth-sheltered walls.

A check of Dupont literature revealed that the company nowhere recommends (or even suggests) that Tyvek be considered for such applications (which Lane acknowledges in the book). Moreover, BOCA has approved Tyvek only as an *air infiltration* barrier (which is how the company markets it) for replacement of conventional building paper. A phone call to Dupont confirmed this. "Don't do it," said the rep, "polyethylene (and several other films) would be better than Tyvek for waterproofing walls."

However, it is precisely advice like this, and the author's lack of a convincing argument for his hybrid system, which adds up to a book of little practical or theoretical value. According to Lane's calculations, the added cost of his house is 27 percent (or an increase in annual mortgage payments of up to $1,920), which the author admits is "consistently larger than the energy savings...projected." Lane justifies the expenditure, by arguing that the difference will be made up by Federal tax credits. By the way—don't confuse this author, Jonathan Lane, with *Charles* Lane—whose books on earth-sheltered housing from the University of Minnesota are among the best there are.

—Paul Hanke