DOE-2 User News

Vol. 14, No. 2
Summer 1993

The Simulation Research Group
Energy and Environment Division
Lawrence Berkeley Laboratory
One Cyclotron Road
Berkeley, California 94720

Editor: Kathy Ellington
Bldg. 90 — Room 3147

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16 ... New LBL report:
“Spectrally Selective Glazings...
in Cooling-Dominated Climates”

Late-breaking news about DrawBDL: DrawBDL is a graphic debugging and drawing tool for DOE-2 that was featured in the Spring newsletter. Joe Huang, author of DrawBDL, tells us he’s fixed the final bug in his program and he’s been shipping product. Introductory cost of the program including documentation is $99 + shipping. Fax your orders to Joe Huang at (510) 236-9238 [see p.13].

CALENDAR

Oct 24-27 — New Construction Programs for Demand-Side Management
to be held at the Loews Coronado Bay Resort in San Diego, California.
Phone (916) 363-8383; fax (916) 363-1788

Nov 1-3 — CLIMA 2000
to be held at the Queen Elizabeth II Conference Centre, London, England.
Contact: Anne Gibbins, CIBSE Headquarters, 222 Balham High Road, London SW12 9BS, UK. Fax: 44-1-675-5449.

Jan 22-24 — 1994 ASHRAE Winter Meeting
to be held in New Orleans, Louisiana
Sponsor/Contact: ASHRAE Meetings Section, 1791 Tullie Circle N.E., Atlanta, GA 30329; Phone (404) 636-8400, fax (404) 321-5478.
Daylighting Design Tool Survey

The information contained herein was compiled by Building Technologies Program at LBL. Any corrections or questions about the Survey should be directed to Michael Wilde, MS: 90-3111, Lawrence Berkeley Laboratory.

MAINFRAMES

* DOE-2.1D (current official version of DOE-2)
  Daylighting and glare calculation integrated with hourly energy simulation and window management.

  DOE-2.1E (release imminent)
  New window library: solar-optical and thermal properties of 200 currently-available glazings, including low-E, gas fill, heat mirror, superwindows.
  Custom glazings: option to add custom glazings to the DOE-2.1E window library by running the WINDOW-4 program with layer-by-layer input.
  Improved window U-value calculation: the very accurate WINDOW-4 calculation of window conduction and solar gain has been integrated into DOE-2.1E (includes window frame calculation). Switchable glazing simulation.

  Contact Kathy Ellington, Simulation Research Group, Bldg. 90 -- Room 3147, Lawrence Berkeley Laboratory, Berkeley, CA 94720. Phone (510) 486-5711, fax (510) 486-4089.
  Hardware: DEC and SUN-4
  Software: FORTRAN
  Cost and Availability: call or write for information

* RADIANCE 2.1
  A ray tracing program that accurately predicts light levels and produces photo realistic images of architectural spaces in all sky conditions.

  Contact Greg Ward, Lighting Systems Research Group, Lawrence Berkeley Laboratory, Bldg 90 -- Room 3111, Berkeley, CA 94720.
  Phone (510) 486-4757, fax (510) 486-4089.
  Hardware: SUN, DEC, CRAY, UNIX, Macintosh II (A/UX)
  Software: C
  Cost and Availability: Free to anyone who wishes to develop further.

* UWLIGHT
  Useful as an educational tool.

  Contact Brian Johnson, Dept. of Architecture, Gould Hall JO-20, University of Washington, Seattle, WA 98105. Phone (206) 543-4180.
  Hardware: CDC
  Software: FORTRAN 5
  Cost and Availability: call or write for information
MICROCOMPUTERS

* AAMASKY1 and SKYLIGHT HANDBOOK
Skylight design analysis with emphasis on optimizing for energy efficiency, incorporating both a worksheet and Lotus spreadsheet tool.
Contact the Architectural Aluminum Manufacturers Association (AAMA), 1540 East Dundee Road #310, Palatine, IL 60067. Phone (708) 202-1350.
Hardware: IBM PC or compatible
Cost and Availability: $50.00/software package. Lotus 1-2-3, $50.00/handbook, $100.00/handbook+software (half price for AAMA members)

* ADM-DOE2
Daylighting availability and control, accurate solar shading for individual and whole buildings. Sophisticated window management. Daylighting simulation is on an hour-by-hour basis. PC version of LBL's DOE-2.1D program.
Hardware: 80386 IBM PC, a 80387 math co-processor, 2MB extended memory
Software: DOS version 2.0 or better
Cost and Availability: $295.00 with one weather data file.

* AWNSHADE 1.0
Calculates the unshaded fraction of a rectangular window shaded by an awning for any given solar position.
Contact Ross McCluney, Florida Solar Energy Center, 300 State Road 401, Cape Canaveral, FL 32920. Phone (407) 783-0300 x134, fax (407) 783-2571.
Hardware: IBM PC or compatible
Software: MS QuickBASIC 3.0, MS-DOS
Cost and Availability: $35.00

* BUILDING ENERGY ESTIMATION MODULE (BEEM™)
Useful in early design stages; evaluates energy impact of different types of windows.
Requests for copies should be directed to your local electric utility company. Ask for the person in charge of commercial lighting programs.
Hardware: IBM PC, IBM PCXT. Needs two disk drives for graphics.
Software: BASIC, 512KB RAM
Cost and Availability: No charge or nominal cost (max $50.00), EPRI/BEEM support line for registered users.

* CONTROLITE 1.0
Calculates energy savings and cost-benefit of using lighting controls in buildings; incorporates QUICKLITE.
Contact Francis Rubinstein, Lighting Systems Research, Lawrence Berkeley Laboratory, Bldg 90 - Room 3111, Berkeley, CA 94720; phone (510) 486-4095, fax (510) 486-4089.
Hardware: IBM PC XT/AT or true compatible
Software: 256KB RAM, MS-DOS 2.0 or later
Cost and Availability: $Free. No support.
DAYLIT
Calculates daylight considering fins, overhangs, skylights and light shelves. Calculates electric light for three zones with five control strategies. Plots hourly and annually data, based on IES method.
Contact Gregg D. Ander, Southern California Edison, Customer Energy Services, 300 North Lone Pine Avenue, San Dimas, CA 91773.
Phone (909) 394-8734, fax (909) 394-8922.
Hardware: IBM PC or compatible
Software: FORTRAN, 256KB RAM - MS-DOS 3.0, Manual on disk.
Cost and Availability: $ call for price.

DAYLITE 2.2
Daylighting design takes into account overhangs, fins, and skylights; calculates electric lighting demand.
Contact Bill Ashton, Solarsoft/Kinetic Software, 12672 Skyline Boulevard, Woodside, CA 94062; phone (510) 851-4484.
Hardware: IBM PC or compatible, Macintosh
Software: PASCAL
Cost and Availability: $489.00

DOE-24/Comply-24
DOE-24 is a special DOE-2 release which is both a state-approved compliance program for California's non-residential energy standards, and a stand-alone version of DOE-2.1D which includes a powerful, user-friendly preprocessor. A free demonstration program is available upon request.
Contact: Rosemary Howley at Gabel Dodd Associates, 1818 Harmon Street, Berkeley, CA 94703, for information on hardware, software, cost and availability. Phone: (510) 428-0803, fax (510) 428-0324

DOE-Plus™
DOE-Plus is used to interactively input a building description, run DOE-2, and plot graphs of simulation results. Features include interactive error checking, context-sensitive help for all DOE-2 keywords, a 3-D view of the building that can be rotated, and several useful utilities. DOE-Plus is a complete implementation of DOE-2.
Contact: Steve Byrne at ITEM Systems, P.O. Box 5218, Berkeley, CA 94705-0218, for information on hardware, software, cost and availability.
Phone: (510) 549-1444, fax (510) 549-1778

ENSAR
(custom built) used with physical model; analysis capability flexible to room configurations.
Contact Greg Franta, Ensar Group, P.O. Box 4164, Frederick, MD 21701.
Phone (301) 698-9455.
Hardware: Custom built
Software: Custom built
Cost and Availability: call or write for information
*FTI-DOEv2.1D*
Highly optimized version of DOE-2.1D available for the following operating systems: DOS, VMS, ULTRIX, SCO UNIX, RS/6000 (AIX), NeXT and SUN Sparc. Call for more information.
Contact: Scott Henderson at Finite Technologies, Inc., 821 N Street, #102, Anchorage, AK 99501, for information on hardware, software, cost and availability.
Phone: (907) 272-2714, fax (907) 274-5379

*LUMEN MICRO 6*
Analyzes complex interior lighting systems including daylight, direct/indirect lighting, mixed and even aimed luminaires. DXF file editor, user friendly input, animated walkthrough. Limited to rectangular spaces.
Contact David DiLaura, Lighting Technologies, 2540 Frontier Street #107, Boulder, CO 80301; phone (303) 449-5791, fax (303) 449-5864.
Hardware: IBM PC or compatible with high density floppy drive, 8MB hard disk space, 80387 math-coprocessor, VGA or SVGA graphics.
Software: FORTRAN, 2MB RAM, MS-DOS 3.3 or later.
Cost and Availability: $595; $129 for upgrade from LUMEN-MICRO 5 until December 1993.

*MICRO-DOE2*
Micro version of DOE-2.1D mainframe program, with enhancements.
Contact Gene Tsai, Acrosoft International, 9745 E. Hampden Avenue #230, Denver, CO 80231. Phone (303) 368-9226. fax (303) 368-5929.
Hardware: Regular DOS Version: IBM 386 or compatible, Intel math-coprocessor Extended DOS Version: IBM 486 or compatibles, Intel or Weitek math-coprocessor
Software: Regular DOS Version: 640KB RAM, MS-DOS 2.1 or later.
Extended DOS Version: 3MB RAM, MS-DOS 3.0 or later.
Cost and Availability: call

*MICROLITE 1.0*
Analyzes the daylight illumination for rectangular rooms with vertical glazing in exterior walls. Obstructions are not accounted for.
Contact Harvey Bryan, 48 Agassiz Avenue, Belmont, MA 02178. Phone (617) 484-0854.
Hardware: IBM PC, APPLE II
Software: BASIC, IBM 128KB RAM, APPLE: 40KB RAM
Cost and Availability: $25.00

*PRC-DOE2*
A fast, robust and up-to-date PC version of DOE-2.1D. Runs in extended memory, is compatible with any VCPI compliant memory manager and includes its own disk caching. 377 weather data files available (TMY, TRY, WYEC, CTZ) for the U.S. and Canada
Contact: Paul Reeves, Partnership for Resource Conservation, 140 South 34th Street, Boulder, CO 80303, for information on hardware, software, cost and availability.
Phone or fax (303) 499-8611
QUICKLITE 1.0
A relatively quick, crude estimator of daylight levels in simple rectangular rooms. See
CONTROLITE.
Contact the Building Technologies Program, Lawrence Berkeley Laboratory, Bldg 90 --
Room 3111, Berkeley, CA 94720.
Phone (510) 486-5605, fax (510) 486-4089.
Hardware: TRS 80, TI-59
Software: BASIC, FORTRAN
Cost and Availability: $ Free. No support.

SUNPATH 1.2
Calculates solar coordinates, sunrise and sunset, sunpath for a sequence of days, solar-to-
standard time conversions and vice-versa. Includes graphic program PATHPLOT and edit-
able library of 233 U.S. cities.
Contact Ross McCluney, Florida Solar Energy Center, 300 State Road 401, Cape
Canaveral, FL 32920. Phone (407) 783-0300 x134, fax (407) 783-2571.
Hardware: IBM-PC or compatible. EGA or VGA monitor needed for PATHPLOT screen
display, but will output HPGL files for importing into presentation programs with a graphi-
cics monitor.
Software: SUNPATH requires MS QuickBASIC, PATHPLOT requires MS VisualBASIC,
350KB RAM, MS-DOS
Cost and Availability: $35.00

SUNSPEC 1.1
Calculates clear sky solar direct and diffuse spectral irradiances on horizontal or tilted
planes, integrated broad-band irradiances, luminances and luminous efficacies. Files can be
read by WINDOW 4.0. Includes graphic program SPECPLT.
Contact Ross McCluney, Florida Solar Energy Center, 300 State Road 401, Cape
Canaveral, FL 32920. Phone (407) 783-0300 x134, fax (407) 783-2571.
Hardware: IBM-PC or compatible. EGA or VGA monitor needed for PATHPLOT screen
display, but will output HPGL files for importing into presentation programs with a graphi-
cics monitor.
Software: SUNSPEC requires MS QuickBASIC, SPECPLT requires MS Visual BASIC,
300KB RAM, MS-DOS
Cost and Availability: $35.00

SUPERLITE 2.0
Updated version of SUPERLITE PC 1.01. Now analyzes daylight and electric lighting for
various room geometries (maximum 5 windows). Tabulated output, no graphics.
Contact Rob Hitchcock or Werner Osterhaus, Building Technologies Program, Lawrence
Berkeley Laboratory, Bldg 90 -- Room 3111, Berkeley, CA 94720.
Phone (510) 486-4154, fax (510) 486-4089.
Hardware: IBM PC or compatible with 8087 or better math co-processor chip
Software: FORTRAN, MS-FORTRAN 3.2 compiler, 640 KB RAM
Cost and Availability: free, no support
**WINDOW 4**

A public-domain program developed by Lawrence Berkeley Laboratory for analyzing heat transfer through window systems. U-value and shading coefficient are calculated.

Contact: Bostik Construction Products, P.O. Box 8, Huntingdon Valley, PA 19006.

Hardware: IBM PC or compatible.
Software: 256 KB RAM, MS-DOS 2.1 or higher. Math coprocessor decreases calculation time.
Cost and Availability: Free

**PROTRACTORS/TABLES**

**CLEAR SKY DAYLIGHT TABLES**

Determines sky component contribution to the illumination of an interior point for a given window geometry and glazing description. Most useful at an early design stage, when scale drawings are not available yet.

Contact: Harvey Bryan, 48 Agassiz Avenue, Belmont, MA 02178. Phone (617) 484-0854.
Cost and Availability: $25.00

**CLEAR SKY WALDRAM DIAGRAMS**

Assist in determination of sky component contribution to the illumination of an interior point, accounting for angle of incidence losses for vertical glazing and obstructions. Graphic method is useful in early design stages.

Contact: Harvey Bryan, 48 Agassiz Avenue, Belmont, MA 02178. Phone (617) 484-0854.
Cost and Availability: $25.00

**LBL PROTRACTORS**

Allows for determination of the sky component contribution to the illumination of an interior point for an interior point of finite height under overcast sky conditions.

Contact: Harvey Bryan, 48 Agassiz Avenue, Belmont, MA 02178. Phone (617) 484-0854.
Cost and Availability: $25.00

**UW GRAPHIC DAYLIGHTING DESIGN METHOD (GDDM)**


Contact: Marietta Millet at the College of Architecture and Urban Planning, Gould Hall JO-20, University of Washington, Seattle, WA 98105. Phone (206) 543-4180.
Cost and Availability: $ 30.00
NOMOGRAPHS

* DAYLIGHTING NOMOGRAPHS
Assist designers in determining potential daylighting benefits and costs; checking strategy for energy conservation and load management.

Contact the Building Technologies Program, Lawrence Berkeley Laboratory, Bldg 90 - Room 3111, Berkeley, CA 94720.
Phone (510) 486-5605, fax (510) 486-4089.
Cost and Availability: Free, no support.

* ENERGY NOMOGRAPHS
Useful in early design analysis on commercial buildings; capable of total building energy analysis, including savings from daylight and heating/cooling loads.

Contact Al Sain at Burt Hill Kosar Rittelmann, 400 Morgan Center, Butler, PA 16001; phone (412) 285-4761.
Cost and Availability: $50.00 for notebook and enlarged, reusable nomograph set from: TVA, Conservation and Energy Management, Commercial and Industrial Branch, 3S D Signal Place, Chattanooga, TN 37401.

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DOE-2 Program Documentation

<table>
<thead>
<tr>
<th>Document</th>
<th>Order Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOE-2 Basics Manual (2.1D)</td>
<td>DE-920-07955</td>
<td>46.00*</td>
</tr>
<tr>
<td>BDL Summary (2.1D)</td>
<td>DE-890-17726</td>
<td>29.00*</td>
</tr>
<tr>
<td>Sample Run Book (2.1D)</td>
<td>DE-890-17727</td>
<td>69.00*</td>
</tr>
<tr>
<td>Reference Manual (2.1A)</td>
<td>LBL-8706, Rev.2</td>
<td>119.00*</td>
</tr>
<tr>
<td>Supplement (2.1D)</td>
<td>DE-890-17728</td>
<td>65.00*</td>
</tr>
<tr>
<td>Engineers Manual (2.1A)</td>
<td>DE-830-04575</td>
<td>55.00*</td>
</tr>
</tbody>
</table>

* Prices shown are approximate; call NTIS for update.
  Note that for shipment to foreign countries, double the U.S. prices are doubled.

Order from:
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone (703) 487-4650
FAX (703) 321-8547

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PRC-Tools is a collection of programs written for the personal computer by The Partnership for Resource Conservation. These programs work with any PC version of DOE-2 and have two main functions: assisting in running multiple DOE-2 runs and analyzing hourly output. PRC-Tools is intended to be used by persons familiar with the standard features of DOE-2.1D and who have a working knowledge of DOS computing. Each of the "Tools" programs cost $195.; the entire set costs $695. If these programs don't do quite what you need, there's a good chance we can create a custom version that can.

**PRC-Run**

PRC-Run is a simple text substitution program with some special features that make running DOE-2 parametrics fast and easy. The program reads a "command" file that tells it which DOE-2 input file to use, which variables to modify, and what weather files to use. A single command file can specify any number of parametric runs, and any number of variables can be changed for each parametric run. The program creates multiple DOE-2 input files as well as a batch file which, along with PRC-DOE2, can run all of the input files/weather locations specified with a single command. In order to use PRC-Run, the BDL input file you create must define key variables with the BDL macro commands, **SETI** or **DEFI**. Typically, these macros are used to specify a variable which is referenced elsewhere in the program, such as the building area, number of stories, chiller capacity, etc. You can use PRC-Run to create and execute hundreds of simulation based upon a single BDL file and one command file. File management and updates become fast and easy.

**PRC-Grab**

This program opens a specified DOE-2 output file, searches for the report or reports of interest and grabs the data you need. The data is appended to a file so that answers from numerous parametric runs appear as columns of data with the first column identifying the DOE-2 run. The process is easily integrated into your DOE-2 batch files, so that answers are ready to be sorted, compared, and graphed in the spreadsheet of your choice, automatically. Combined with PRC-Run, parametric analysis becomes a snap!

**PRC-Hour**

The PRC-Hour program extracts hourly data from PRINT formatted DOE-2 hourly output and writes the data to a text file in column format. The month, day and hour are added to each line as separate numbers for compatibility with spreadsheet and database programs; each hourly variable can be scaled separately so that the written data file is in consistent units. Separate hourly reports from the Loads, Systems, and Plant subprograms of DOE-2 can be combined into one file with multiple columns of data. While PRC-Hour is useful for spreadsheet analysis of hourly data, its true utility is realized when combined with the PRC-Peak program.

**PRC-Peak**

PRC-Peak was written out of the need to analyze peak-period energy demand by end-use and to create various load shapes for particular end-uses and multiple periods. PRC-Peak reads the hourly data created by PRC-Hour and summarizes the data for up to 24 periods by defined end-use categories. The peak electric demand during each period is broken down into its end-uses. Energy and demand costs can be included in the summary of each end-use. The program can create average, maximum, and peak-day load shapes for each of the periods and for each end-use.

For more information about PRC-Tools contact Paul Reeves at the Partnership for Resource Conservation, 140 South 34th Street, Boulder, CO 80303; phone or fax (303) 499-8611.
Elite Software Announces ... 

EZDOE for IBM-PCs!

EZDOE is an exceptionally easy-to-use IBM-PC version of DOE-2.1D. An entirely new program, EZDOE calculates the hourly energy use of a building and its life cycle cost of operation based on the building's location, construction, operation and HVAC System.

EZDOE Features

- Complete Life Cycle Economic Analysis
- Accurate Models Of All Types Of HVAC Systems
- Handles Complex And Bldg. Designs & Schedules
- Performs 8,760 Hour By Hour Computations
- Use TMY Weather Data Files
- Full Screen Input & Editing With Mouse Support
- Includes Detailed 1,000 Page Manual And Much More!

Elite Software is the nation's leader in HVAC Software and offers over 30 programs to MEP Engineers.

For Complete Information On EZDOE And Fully Operational Demonstration Versions

Call Elite Software

(800) 648-9523
# DOE-2 DIRECTORY

## Program Related Software and Services

### Mainframe Versions of DOE-2

<table>
<thead>
<tr>
<th>Program</th>
<th>Source Code Information</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| DOE-2.1D (Source Code) | For DEC-VAX mainframe or SUN-4 mini-computer; contact the Simulation Research Group for directions on obtaining the program. | Simulation Research Group  
Bldg. 90, Room 3147  
Lawrence Berkeley Laboratory  
Berkeley, CA 94720  
Contact: Kathy Ellington  
Phone: (510) 486-5711  
FAX: 486-4089/5172 |
| DOE-2.1D (Source Code) | For DEC-VAX, Order #159-D6220-00  
DOE-2.1C (Source Code) | For IBM-3083, Order #158-13083-00  
For DEC-VAX11, Order #158-DVX11-00  
For a complete listing of the software available from ESTSC order their "Software Listing" catalog ESTSC-2. | Energy Science and Technology  
Software Center  
P.O. Box 1020  
Oak Ridge, TN 37831-1020  
Contact:  
Phone: (615) 576-2606  
FAX: (615) 576-2885 |
| * FTI-DOEev2.1D (Source Code) | This is a highly optimized and basically platform-independent version of the DOE-2.1D source code. Will compile for most computing systems. The original LBL 2.1D source code is also available in a variety of distribution formats. Site licenses and educational discounts are available. Also available is the full set of program documentation as distributed by NTIS and weather files (TMY and TRY) in a variety of distribution formats. [See User News Vol.12, No.4, p.16 for more information] | Finite Technologies, Inc  
821 N Street, #102  
Anchorage, AK 99501  
Contact: Scott Henderson  
Phone: (907) 272-2714  
FAX: (907) 274-5379 |

### Microcomputer Versions of DOE-2

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| * ADM-DOE2 | ADM-DOE2 (DOE-2.1D) is for professional energy analysts who require a state-of-the-art simulation tool for building energy use. It performs a detailed, zone-by-zone hourly simulation and includes a wide array of modeling features that make it possible to simulate "real buildings". These capabilities offer much greater accuracy and detail than is possible with handbook methods or simplified analysis. [See User News Vol 7, No.2, p.6 for more information] | ADM Associates, Inc.  
3239 Ramos Circle  
Sacramento, CA 95827  
Contact: Marla Sullivan, Sales  
Kris Krishnamurti, Support  
Phone: (916) 363-8383  
FAX: (916) 363-1788 |
| * CECDOEDC (Version 1.0.A) | A microcomputer version of DOE-2.1D integrated with a pre- and post-processing system designed strictly for compliance use within the State of California. It generates some of the standard compliance forms as output. Order P40091009 for the CECDOEDC Program with Manuals. Order P40091010 for the DOE-2.1 California Compliance Manual. [See User News Vol 12, No.4, p.13 for more information] | Publication Office  
California Energy Commission  
P.O. Box 944295  
Sacramento, CA 94244-2950 |

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* Cautet: We list third-party DOE-2-related products and services for the convenience of DOE-2 users, with the understanding that the Simulation Research Group does not have the resources to check the DOE-2 program adaptations and utilities for accuracy or reliability.
Microcomputer Versions of DOE-2 (continued)

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DOE-24 is a special DOE-2 release which is both a California-approved compliance program for the state's 1992 non-residential energy standards, and a stand-alone version of DOE-2.1D which includes a powerful yet easy-to-use input preprocessor. A free demonstration program is available upon request.
[See User News Vol.12, No.2, p.2 for more information]

Gabel Dodd Associates
1818 Harmon Street
Berkeley, CA 94703
Contact: Rosemary Howley
Phone: (510) 428-0803
FAX: (510) 428-0324

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[See User News Vol.11, No.4, p.4 and Vol.13, No.2, p.54 for more information]

ITEM Systems
P.O. Box 5218
Berkeley, CA 94705-0218
Contact: Steve Byrne
Phone: (510) 549-1444
FAX: (510) 549-1778

* FTI-DOEv2.1D
Highly optimized version of DOE-2.1D available for the following operating systems: DOS, VMS, ULTRIX, SCO UNIX, RS/6000 (AIX), NeXT and SUN Sparc. Call for more information.
[See User News Vol.12, No.4, p.18 for more information]

Finite Technologies, Inc
821 N Street, #102
Anchorage, AK 99501
Contact: Scott Henderson
Phone: (907) 272-2714
FAX: (907) 274-5379

* MICRO-DOE2
MICRO-DOE2 (DOE-2.1D) has been in use since 1987; it is an enhanced PC version of the DOE-2 program (over 500 users worldwide). Two versions of MICRO-DOE2 are available: a regular DOS version for all IBM-PC compatibles and an extended DOS version for 386 or 486 computers only.
[See User News Vol.7, No.4, p.2 and Vol.11, No.1, p.2 for more information]

Acosoft International, Inc.
Suite 230
9745 East Hampden Avenue
Denver, CO 80231
Contact: Gene Tsai, P.E.
Phone: (303) 368-9225
FAX: (303) 368-5929

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A fast, robust and up-to-date PC version of DOE-2.1D. Runs in extended memory, is compatible with any VCP compliant memory manager and includes its own disk caching. 377 weather data files available (TMY, TRY, WYEC, CTZ) for the U.S. and Canada.
[See User News Vol.13, No.4, p.11 for information]

Partnership for Resource Conservation
140 South 34th Street
Boulder, CO 80303
Contact: Paul Reeves
Phone or FAX: (303) 499-8611
## Pre- and Post-Processors for DOE-2

<table>
<thead>
<tr>
<th><strong>Pre-DOE (A BDL math pre-processor)</strong></th>
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<tr>
<td>Nick Luick</td>
<td>19030 State Street</td>
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<tr>
<td>Phone: (714) 278-3131</td>
<td>Corona, CA 91719</td>
</tr>
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<th><strong>DrawBDL</strong></th>
<th>Joe Huang &amp; Associates</th>
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<tr>
<td>Graphic debugging and drawing tool for DOE-2 building geometry</td>
<td>6720 Potrero Avenue El Cerrito CA 94530</td>
</tr>
<tr>
<td>[See User News Vol 14, No.1, p.5 for information]</td>
<td>Contact: Joe Huang Phone: (510) 559-9067</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th><strong>Graphs from DOE-2</strong></th>
<th>Ernie Jessup</th>
</tr>
</thead>
<tbody>
<tr>
<td>[See User News Vol 10, No 3, p.5 for information]</td>
<td>4977 Canoga Avenue Woodland Hills, CA 91364</td>
</tr>
<tr>
<td>Phone: (818) 884-3997</td>
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<thead>
<tr>
<th><strong>PRC-TOOLS</strong></th>
<th>Partnership for Resource Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A set of programs that aids in extracting, analyzing and formatting hourly DOE-2 output. Determines energy use, demand, and cost for any number of end-uses and periods. Automatically creates 36-day load shapes. Custom programs also available.</td>
<td>140 South 34th Street Boulder, CO 80303</td>
</tr>
<tr>
<td>Contact: Paul Reeves</td>
<td>Phone or FAX: (303) 499-8611</td>
</tr>
</tbody>
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<thead>
<tr>
<th><strong>Prep™</strong></th>
<th>ITEM Systems</th>
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<tbody>
<tr>
<td>Prep is a batch preprocessor that enables conditional text substitution, expression evaluation, and spawning of other programs. Prep is ideal for large parametric studies that require dozens or even thousands of DOE-2 runs.</td>
<td>P.O. Box 5218 Berkeley, CA 94705-0218</td>
</tr>
<tr>
<td>Contact: Steve Byrne</td>
<td>Phone: (510) 549-1444</td>
</tr>
<tr>
<td>Phone or FAX: (510) 549-1778</td>
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<tr>
<th><strong>Graphs for DOE-2</strong></th>
<th>Energy Systems Laboratory</th>
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</thead>
<tbody>
<tr>
<td>2-D, 3-D, hourly, daily, and psychrometric plots [See User News Vol 13, No.1, p.5 for information]</td>
<td>Texas A&amp;M University College Station, TX 77843-3123</td>
</tr>
<tr>
<td>Contact: Jeff Haberl</td>
<td>Phone: (409) 845-6065</td>
</tr>
<tr>
<td>Phone or FAX: (409) 862-2762</td>
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### Footnote:

A cubic foot of water contains 7.5 gallons, and weighs 62.5 lbs.
**RESOURCES**

**DOE-2 User News**  
Sent without charge to DOE-2 users, the newsletter prints documentation updates and changes, bug fixes, inside tips on using the program more effectively, and articles of special interest to program users.

Regular features include a directory of program-related software and services and an order form for documentation. In the summer issue an alphabetical listing is printed of all commands and keywords in DOE-2, and where they are found in the documentation. The winter issue features an index of articles printed in all the back issues.

**Help Desk – Bruce Birdsall**  
Call our help desk if you have a question about advanced modeling techniques. If you need to fax an example of your problem, please use the Simulation Research Group’s fax number (510-486-4089) and we will forward it.  
This service is supported by the Simulation Research Group.

**DOE-2 Training**  
DOE-2 courses for beginning and advanced users.

**Instructional DOE-2 Video and Manual**  

**Weather Tapes**  
- TMY (Typical Meteorological Year)  
- TRY (Test Reference Year)  
- CTZ (California Thermal Climate Zones)  
- WYEC (Weather Year for Energy Calculation)

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**8/93 975 - (c) 1993 Regents, University of California, Lawrence Berkeley Laboratory. This work is supported by the Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technologies, Building Systems and Materials Division of the U.S. Department of Energy under Contract DE-AC03-76SF00098.**
<table>
<thead>
<tr>
<th>Consulting Engineers</th>
<th>Consultant</th>
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<tbody>
<tr>
<td>Charles Fountain</td>
<td>Greg Cunningham</td>
</tr>
<tr>
<td>Burns &amp; McDonnell Engineers</td>
<td>Cunningham + Associates</td>
</tr>
<tr>
<td>8055 E. Tufts Avenue, Suite 330</td>
<td>512 Second Street</td>
</tr>
<tr>
<td>Denver, CO 80237</td>
<td>San Francisco, CA (415) 495-2220</td>
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<tr>
<th>Microcomputer DOE-2 for European Users</th>
<th>Consultant</th>
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<tbody>
<tr>
<td>Werner Gygli</td>
<td>Jeff Hirsch</td>
</tr>
<tr>
<td>Informatik Energetechnik</td>
<td>2138 Morongo Drive</td>
</tr>
<tr>
<td>Weinerweg 19</td>
<td>Camarillo, CA 93010 (805) 482-5515</td>
</tr>
<tr>
<td>CH-8604 Volketswil Switzerland</td>
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<thead>
<tr>
<th>Consultants</th>
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<tbody>
<tr>
<td>Charles Eley, Mark Hydeman, Terry Laird</td>
<td>Mike Roberts</td>
</tr>
<tr>
<td>Eley Associates</td>
<td>Roberts Engineering Co.</td>
</tr>
<tr>
<td>142 Minna Street</td>
<td>11946 Pennsylvania</td>
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<tr>
<td>San Francisco, CA 94105 (415) 957-1977</td>
<td>Kansas City, MO 64145 (816) 942-8121</td>
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<tr>
<th>Mainframe DOE-2 for European Users</th>
<th>Consultant</th>
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<tbody>
<tr>
<td>Joerg Tscherry</td>
<td>Philip Wemhoff</td>
</tr>
<tr>
<td>EMPA, Section 175</td>
<td>1512 South McDuff Avenue</td>
</tr>
<tr>
<td>86000 Dubendorf Switzerland</td>
<td>Jacksonville, FL 32205 (904) 632-7393</td>
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<tr>
<td>Steven D. Gates, P.E.</td>
<td>Donald E. Croy</td>
</tr>
<tr>
<td>Building HVAC Design/Performance Modeling</td>
<td>CAER Engineers, Inc.</td>
</tr>
<tr>
<td>9718-A Fair Oaks Boulevard</td>
<td>814 Eleventh Street</td>
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<tr>
<td>Fair Oaks, CA 95628 (916) 638-7540</td>
<td>Golden, CO 80401 (303) 279-8136</td>
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<tr>
<th>Mechanical Engineers</th>
<th>Consultant</th>
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<tbody>
<tr>
<td>Chuck Sherman</td>
<td>Michael W. Harrison, P.E.</td>
</tr>
<tr>
<td>64 East Broadway, Suite 230</td>
<td>305 West Mercury</td>
</tr>
<tr>
<td>Tempe, AZ 85282 (602) 967-5278</td>
<td>Butte, MT 59701 (406) 723-4061</td>
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<tr>
<th>Consulting Engineers</th>
<th>Hourly Calibrated DOE-2 Analysis</th>
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<tr>
<td>Jeff Ponsness, P.E.</td>
<td>Jeff S. Haberl</td>
</tr>
<tr>
<td>Criterion Engineers</td>
<td>Energy Systems Laboratory</td>
</tr>
<tr>
<td>5331 SW Macadam Ave., Suite 205</td>
<td>Texas A&amp;M University</td>
</tr>
<tr>
<td>Portland, OR 97201 (503) 224-8606</td>
<td>College Station, TX 77843-3123 (409) 845-6065</td>
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<tr>
<th>Consultant</th>
<th>Consulting Engineers</th>
</tr>
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<tbody>
<tr>
<td>Martyn C. Dodd</td>
<td>Prem N. Mehrotra</td>
</tr>
<tr>
<td>Gabel Dodd Associates</td>
<td>General Energy Corporation</td>
</tr>
<tr>
<td>761 Sir Francis Drake Blvd.</td>
<td>230 Madison Street</td>
</tr>
<tr>
<td>San Anselmo, CA 94960 (415) 456-7588</td>
<td>Oak Park, IL (708) 386-6000</td>
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<tr>
<th>Energy Management Specialists</th>
<th>Consultant/Building Systems Analysis</th>
</tr>
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<tbody>
<tr>
<td>Hank Jackson, P.E.</td>
<td>Robert H. Henninger, P.E.</td>
</tr>
<tr>
<td>R.C., &amp; I Engineering Services</td>
<td>ElectroCom GARD Ltd.</td>
</tr>
<tr>
<td>P.O. Box 2059</td>
<td>7449 N. Natchez Avenue</td>
</tr>
<tr>
<td>Asheville, NC 28802 (704) 254-6080</td>
<td>Niles, IL 60714 (708) 647-3252</td>
</tr>
</tbody>
</table>
A new report describes a method of saving energy in cooling-dominated climates through the use of retrofitted spectrally selective glazings. The abstract is printed below. This paper has been submitted for presentation at the ASHRAE 1994 Winter Meeting to be held in New Orleans next January. The paper will be made into an LBL report after the ASHRAE meeting. If you would like to reserve a copy of the LBL report, please fax Pat Ross in the Building Technologies Program at LBL (510) 486-4089 and ask her to reserve a copy of LBL-34455 for you.

Spectrally Selective Glazings for Residential Retrofits in Cooling-Dominated Climates
by
E.S. Lee, D. Hopkins, M. Rubin, D. Arasteh and S. Selkowitz
Building Technologies Program
Energy and Environment Division
Lawrence Berkeley Laboratory
Berkeley, CA 94720

Abstract
Spectrally selective glazings can substantially reduce energy consumption and peak demand in residences by significantly reducing solar gains with minimal loss of illumination and view. In cooling-dominated climates, solar gains contribute 24-31% to electricity consumption and 40-43% to peak demand in homes with single pane clear glazing; standard practice for residential construction built before the implementation of building energy efficiency standards. Therefore, the existing residential housing stock offers a prime opportunity for significant demand side management (DSM), but the energy and cost savings must be weighed against retrofit first costs in order for the technology to achieve full market penetration. Using DOE-2.1D for numerical simulation of building energy performance, we quantify the energy and peak demand reductions, cost savings, and HVAC capacity reductions using spectrally selective glazings for five cooling-dominated climates. The cost-effectiveness of various material and installation retrofit options is discussed. Glazing material improvements for retrofit applications that are needed to achieve prescribed cost savings are also given.

LAWRENCE BERKELEY LABORATORY
SIMULATION RESEARCH GROUP 90-3147
UNIVERSITY OF CALIFORNIA
BERKELEY, CA 94720
U.S.A.

ADDRESS CORRECTION REQUESTED

Read DOE-2 Documentation:
Fun for the Whole Family!