

Lawrence Berkeley National Laboratory

Recent Work

Title

DOE-2 User News, Volume 14, Number 2

Permalink

<https://escholarship.org/uc/item/0f54k6j1>

Author

Lawrence Berkeley National Laboratory

Publication Date

1993-08-01

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.

THE DOE-2 USER NEWS

PUB-439

DOE-2: A COMPUTER PROGRAM FOR BUILDING ENERGY SIMULATION Volume 9, No. 3
Fall 1988

RECEIVED

DEC 20 1988

Published by L. L. LIBRARY

Simulation Research Group
Bldg. 90 — Room 3147
Applied Science Division
Lawrence Berkeley Laboratory
1 Cyclotron Road
Berkeley, California 94720

Editor: Kathy Ellington

Table of Contents

Hands On (items of interest).....	1
Heat Exchanger	2
All 2.1C Bugs and Fixes	4
Energy and Buildings.....	16
IBPSA Application	17
DOE-2 Directory	19

HANDS ON

All 2.1C Bugs and Fixes — See page 4 of this newsletter for a complete listing of 2.1C bugs and fixes; this is the last time they will be printed. [Thank Goodness!!]

Directory of Services

DOE-2 has generated some interesting program-related software and services. We have put together a directory of the software, services, and documentation offered (see inside back page of this newsletter). If you know of anything we've missed, please let us know.

Apply Yourself! — The IBPSA application form has been modified slightly; it is printed on page 17.

For Your Library

Proceedings are available from the *Second International Conference on System Simulation in Buildings*, held December 1-3, 1986 at the University of Liege, Liege, Belgium. For more information, please contact Dr. Jean LeBrun, University of Liege, Laboratory of Thermodynamics, Rue Ernest Solvay, 21, Bat. C3, B-4000 Liege, Belgium.

Also, proceedings from the *Building Energy Simulation Conference* held August 21-22, 1985, in Seattle, WA, are still available. The contact person is Edward Knipe, 28231 Ridgepoint Court, Rancho Palos Verdes, CA 90274.

Conferences

Oct 27-29, 1988 -- *Microcomputer Tools for Building and HVAC System Design*, University of Colorado at Boulder, CO. Sponsored by the Joint Center for Energy Management and the Colorado Office of Energy Conservation. Call (303) 492-3915 or (303) 492-6551 for further information.

Nov 29-Dec 3, 1988 -- *Housing for the 90s*, Washington, D.C. Sponsored by: Energy Business Association. Contact, Patricia Anderson, Conference Coordinator, Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, WA 98104. Tel: (206) 622-7171.

June 23-24, 1989 -- *BUILDING SIMULATION '89*, Vancouver, B.C., Canada. Sponsored by: IBPSA, the International Building Performance Simulation Association. Contact the Conference Coordinator: Dr. Marianne McCarthy, MCC Systems Canada, Inc., 30 Wellington Street East #202, Toronto, Ontario M5E 1S3, Canada. Tel: (416) 368-2959.

For Reference

Not to be taken from this room

PUB-439

■ ■ ■ THE HEAT EXCHANGER ■ ■ ■

by

Bruce Birdsall

Question: When it comes to "Schedules", I get confused. Could you give a simple explanation of how to use Schedules in DOE-2 ?!

Answer: "Load Profiles" in other computer programs are known as "Schedules" in DOE-2. There are three types of basic schedules used in BDL for the entire program:

- 1) DAY-SCHEDULE — Defines a day's hourly profile; a separate DAY-SCHEDULE is required for each type of day.
- 2) WEEK-SCHEDULE — Assigns each day of the week (MON, TUES, etc.) to a particular hourly profile (DAY-SCHEDULE).
- 3) SCHEDULE — Defines the types of week in the year; allows for the definition of calendar periods, such as summer vacations, etc.

In its simplest form, the input for DAY-SCHEDULE looks like:

U-NAME = DAY-SCHEDULE (hours covered) (values for each hour)	..
--	----

For example:

LTG-1 = DAY-SCHEDULE (1,24) (0,0,0,0,0,0,0,0,.3,.6,.8,1,1,1,1,1,1,0,0,0,0,0,0)	..
--	----

Optionally, this can be shortened by writing:

LTG-1 = DAY-SCHEDULE (1,8)(0) (9,11) (.3,.6,.8) (12,18) (1) (19,24) (0)	..
---	----

which is representative of the profile for a weekday. Always read the hour ending a period as the real start time for the next period; i.e., (1,8) (0) (9,11) (.3,.6,.8) ... indicates the lights were "off" until 8am and "on" from 8 to 11.

For weekends and holidays, let's assume that:

LTG-2 = DAY-SCHEDULE (1,24)(0)	..
--------------------------------	----

The purpose of the WEEK-SCHEDULE should now be apparent; we have two day types — one that represents weekdays, and another for weekends and holidays. The form of the WEEK-SCHEDULE is:

U-NAME = WEEK-SCHEDULE (†) (U-NAME of DAY-SCHEDULE referenced)	..
† days of week covered	

Using the previously defined DAY-SCHEDULEs LTG-1 and LTG-2, the example can be carried forward with:

NORMAL = WEEK-SCHEDULE (MON,TUE,WED,THU,FRI) LTG-1 (SAT,SUN,HOL) LTG-2 ..
--

Optionally, this can be shortened to:

NORMAL = WEEK-SCHEDULE (WD) LTG-1 (WEH) LTG-2 ..
--

where (WD) stands for weekdays and (WEH) for weekends and holidays. If Saturday is considered part of the normal week, you have to write (MON,SAT) LTG-1 and (SUN,HOL) LTG-2.

To illustrate the purpose of the SCHEDULE, assume we have a school that is closed in the summer and on weekends and holidays. Therefore, we need another week type:

VACATION = WEEK-SCHEDULE (ALL) LTG-2 ..

where (ALL) stands for all days of the week, including holidays, and LTG-2 was the DAY-SCHEDULE representing lights as being "off" for 24 hours.

In its simplest form, the input for SCHEDULE looks like:

U-NAME =SCHEDULE(THRU †)(U-NAME of WEEK-SCHEDULE referenced) ..
† calendar period covered

To finalize the example:

LIGHTS = SCHEDULE THRU JUN 10 NORMAL THRU SEP 5 VACATION THRU DEC 31 NORMAL ..
--

Another option, "nesting of schedules", can simplify the preparation of schedules. In the above example we could have bypassed the WEEK-SCHEDULEs by "nesting" the DAY-SCHEDULEs in the SCHEDULE itself. For example:

LIGHTS = SCHEDULE THRU JUN 10 (WD) LTG-1 (WEH) LTG-2 THRU SEP 5 (ALL) LTG-2 THRU DEC 31 (WD) LTG-1 (WEH) LTG-2 ..

Further, if there had been no vacation period, the DAY-SCHEDULE as well as the WEEK-SCHEDULE could have been bypassed by "nesting" as follows:

LIGHTS = SCHEDULE THRU DEC 31 (WD) (1,8)(0) (9,11)(.3,.6,.8) (12,18)(1) (19,24)(0) (WEH) (1,24)(0) ..
--

In the BDL for SYSTEMS, there are special requirements for DAY-RESET schedules, in PLANT there are DAY-ASSIGN schedules, and in ECONOMICS there are DAY-CHARGE schedules, but they all follow the same pattern described above.

DOE-2.1C BUGS and FIXES To date, 56 bugs have been found and fixed in the current version of DOE-2.

Please note that this is the last time we will print bugs or fixes for version 2.1C; please keep these for future reference.

Bug D-1 -- In the hourly reports, the values reported for SUM and AVERAGE summary variables, for temperatures only, will be incorrect if metric units are input and English units output, or vice versa. The conversion between English and metric units is not made correctly when the variable is a sum of temperatures. This bug no longer seems to exist! Interim solution: None

Bug D-2 -- When using window shade management with the MAX-SOLAR-SCH keyword in conjunction with SHADING-COEFF (S-C) instead of GLASS-TYPE-CODE, the calculation will be incorrect if the S-C's differ from window to window. Basically S_C was set to GSHACO, not <GSHACO>, resulting in S-C being set to the S-C of the last window in the previous space. For the first space in the building input, S-C would be set to the S-C of the last defined window in the last space in the building. This bug is not a problem if GLASS-TYPE-CODE is used on all windows, since then S-C defaults to 1. This bug was also in 2.1B. Interim solution: Use GLASS-TYPE-CODE on all windows if MAX-SOLAR-SCH is being used on any window. The fix is in file lds.bug. Date moved to release file: Before July 1, 1985

```

*/ FIX FOR BUG D-2 (ALSO IN 2.1B)
*/ THE SHADING COEFF (SC) USED IN CALCULATING THE TRANSMITTED
*/ SOLAR GAIN FOR SOLAR GAIN CONTROL OF SHADING DEVICES WAS
*/ NOT SET CORRECTLY (GSHACO WAS USED INSTEAD OF <GSHACO>).
*/ SC WAS SET TO THE SC OF THE LAST-DEFINED WINDOW OF THE
*/ PREVIOUS SPACE (OR, FOR A WINDOW IN THE FIRST SPACE, IT
*/ WAS SET TO THE SC OF THE LAST-DEFINED WINDOW OF THE LAST
*/ SPACE IN THE BLDG). THIS COULD GIVE INCORRECT RESULTS IF
*/ DIFFERENT SC-S WERE USED ON THE WINDOWS IN THE BLDG. IT
*/ DID NOT CAUSE A PROBLEM IF GLASS-TYPE-CODE WAS USED
*/ ON ALL WINDOWS (SINCE THEN SC DEFAULTS TO 1.0).
*/
*/D CALEXT.116
  QDIR = (1. - <WGOLGE>) * RDIR * TDIR * <GSHACO>
*/ ---

```

Bug D-3 -- In the daylighting calculation, windows in exterior walls with SHADING-SURFACE=YES were incorrectly taken to be completely shaded, so that no light from the sky or ground reached entered the windows. Direct light from the sun was not effected. This was a bug in 2.1B also. Interim solution: For daylit spaces (DAYLIGHTING=YES), do not use SHADING-SURFACE=YES on exterior walls with windows. The fix is in the file lds.bug. Date moved to release file: 4/10/85

```

*/ FIX FOR BUG D-3 (ALSO IN 2.1B)
*/ IN THE DAYLIGHTING CALCULATION, WINDOWS IN EXTERIOR WALLS
*/ WITH SHADING-SURFACE=YES WERE INCORRECTLY TAKEN TO BE
*/ COMPLETELY SHADED, SO THAT NO LIGHT FROM SKY OR GROUND
*/ ENTERED THE WINDOW. DIRECT LIGHT FROM THE SUN WAS NOT
*/ AFFECTED. (FCW 4-10-85)
*/
*/I DHITSH.75
C      PREVENT SELF-SHADE OF WINDOW
      IF (MG.EQ.<MXGEOM>) GO TO 240
*/ ---

```

Bug D-4 -- If a sunspace (a SPACE with SUNSPACE=YES) has no interior windows, the solar gain calculation is not functioning correctly. The exterior window pointer is not being set correctly, resulting in incorrect assignment of the solar transfer factors. The fix is in lds.bug. Interim solution: None. Date moved to release file: 4/19/85

```

*/ FIX FOR BUG D-4
*/ THE EXTERIOR WINDOW POINTER IN SUNSPACES WITH NO INTERIOR
*/ WINDOWS WAS NOT SET CORRECTLY. THIS LED TO INCORRECT
*/ ASSIGNMENT OF SOLAR TRANSFER FACTORS. (FCW 4-19-85)
*/
*/D SPMISC.287,288
*/I SPMISC.277
C      SAVE EXTERIOR WINDOW POINTER
      MWIEXT = MWI

```



Bug D-5 -- In a sunspace with more than one exterior window, the pointer to the beginning of the solar transfer factors was incorrectly calculated, resulting in the solar gain calculation being incorrect. The fix is in lds.bug. Interim solution: None Date moved to the release file: 4/19/85

```

*/ FIX FOR BUG D-5
*/ FOR A SUNSPACE WITH MORE THAN ONE EXTERIOR WINDOW, THE POINTER
*/ TO THE BEGINNING OF THE SOLAR TRANSFER BLOCKS WAS INCORRECTLY
*/ CALCULATED. (FCW 4-19-85)
*/
*/D SPMISC.297
      <MIWNSTF> = MST + (JIS-1)*MSTLEN*(NEXWIN)
*/

```

Bug D-6 -- If a space has DAYLIGHTING=YES but no LIGHTING-SCHEDULE assigned to it, then the values reported in the LS-G report for AVERAGE and PERCENT ILLUM and GLARE will be incorrect. This is a bug in 2.1B also. Interim solution: Assign a LIGHTING-SCHEDULE to each space with DAYLIGHTING=YES. If the space has no electric lights, specify LIGHTING-KW or LIGHTING-W/SQFT = 0 and use a LIGHTING-SCHEDULE with values of 1.0 for all hours of the run. The fix is in lds.bug. Date moved to release file: 4/22/85

```

*/ FIX FOR BUG D-6 (ALSO IN 2.1B)
*/ IF A SPACE HAS NO LIGHTING SCHEDULE, THE AVERAGE ILLUM AND
*/ GLARE AND PERCENT ILLUM AND GLARE ABOVE SETPOINT IN REPORT
*/ LS-G ARE INCORRECT. (FCW 4-22-85).
*/

```

```

*/ D DAYCLC.393
*/ I DAYCLC.394
    IF (<KZLT>.EQ.0) GO TO 21600
*/ I DAYCLC.421
    IF (<KZLT>.EQ.0) GO TO 21000
*/ I DAYCLC.431
    IF (<KZLT>.EQ.0) GO TO 21000
*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-7 -- For a sunspace with more than one interior wall, the following quantities were incorrectly filled for the second and subsequent interior walls, if these walls are delayed (have response factors): absorbed solar radiation, window conductance, and transmitted solar radiation. The fix is in file sys.bug. Interim solution: None Date moved to the release file: Feb., 1985

```

*/ FIX FOR BUG D-7
*/ FOR A SUNSPACE WITH MORE THAN ONE INTERIOR WALL, THE
*/ FOLLOWING QUANTITIES ARE INCORRECTLY FILLED FOR THE
*/ SECOND AND SUBSEQUENT INTERIOR WALLS IF THESE WALLS
*/ ARE DELAYED: ABSORBED SOLAR RADIATION, WINDOW CONDUCT-
*/ TANCE, AND TRANSMITTED SOLAR RADIATION. (FCW 2-85)
*/

```

```

*/ D HOURIN.159
    DO 544 ICW-1,NCW
*/ D HOURIN.171
    540 CONTINUE
    NRESF = <NRESFAC>
    MTW = MTW + 36 + 7*NRESF
    544 CONTINUE
*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-8 -- In the delayed interior wall conduction calculation for sunspaces, there was a sign error in the expression for B1 (+<RFCOMRATIO> instead of -) and the previous-hour rather than the current-hour outside surface temperature was used in calculating QIN, the inside surface heat flux. This is fixed in sys.bug. Interim solution: None Date moved to the release file: 2/8/85

```

*/ FIX FOR BUG D-8
*/ IN THE DELAYED INTERIOR WALL CONDUCTION CALCULATION
*/ FOR SUNSPACES, THERE WAS A SIGN ERROR IN THE EXPRESSION
*/ FOR B1 (+<RFCOMRATIO> INSTEAD OF -) AND THE
*/ PREVIOUS-HOUR RATHER THAN CURRENT-HOUR OUTSIDE SURFACE

```

```

*/ TEMPERATURE WAS USED IN CALCULATING QIN, THE INSIDE
*/ SURFACE HEAT FLUX. (FCW 2-8-85)
*/

```

```

*/ I SSFCOR.250
C      OUTSIDE SURFACE TEMP THIS HOUR
      TOTNEW = C4 + C5*TINNEW
*/ D SSFCOR.241,242
      B1 = <TLOADS>*(RFY1-RFY1) + TNEXT*FC - STOUTX + STINY
      1 - <RFCOMRATIO>*QOUTXS + QSUNO

```

```

*/ D SSFCOR.259,260
      QIN = (TOTNEW-<TLOADS>)*RFY1 - (TINNEW-<TLOADS>)*RFZ1
      1 + STOUTY - STINZ + <RFCOMRATIO>*QINXS
*/ D SSFCOR.266,267
*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-9 -- In the sunspace calculation, if a sunspace and its adjacent spaces were in different systems, the program would print

-NO ZP1-ZP2NXT MATCH IN SUBROUTINE SSFCOR-

and then abort. Fixed in sys.bug. Interim solution: None. Date moved to the release file: 4/2/85

```

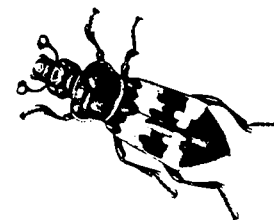
*/ FIX FOR BUG D-9
*/ IN THE SUNSPACE CALCULATION, IF A SUNSPACE AND ITS
*/ ADJACENT SPACES WERE ON DIFFERENT SYSTEMS, THE PRO-
*/ GRAM WOULD PRINT -NO ZP1-ZP2NXT MATCH IN SUBROUTINE
*/ SSFCOR- AND THEN ABORT. THIS FIX ALLOWS SUNSPACE
*/ AND ADJACENT ROOMS TO BE SERVED BY DIFFERENT SYSTEMS
*/ (FCW 4-2-85).
*/

```

```

*/ D SSFCOR.134,144
      NPLSAV = NPL
      NPSSAV = NPS
      IPSSAV = IPS
      NSPSAV = NSP
      DO 200 NP1 = 1,NPLANT
      NPL = IP + (NP1-1)*PSS
      NPS = <NPLSYS>
      IPS = <IPLSYS>
      DO 250 NS1 = 1,NPS
      NSP = IA(IPS+NS1-1)
      NSZ1 = <NZONES>
      ZP1 = <ISZONES>
      DO 301 NZ1 = 1,NSZ1
      IF (<ZP2>.EQ.ZP2NXT) GO TO 302
301  ZP1 = ZP1 + NZD
250  CONTINUE
200  CONTINUE
      CALL MSGSIM(-1,I,I,I,I,I)
      WRITE (IOUTPT,1301)
1301  FORMAT(41H NO ZP1-ZP2NXT MATCH IN SUBROUTINE SSFCOR)
      CALL ABT
302  CONTINUE
      ZP1NXT = ZP1
      ZP1 = IZP1T
      NPL = NPLSAV
      NPS = NPSSAV
      IPS = IPSSAV
      NSP = NSPSAV

```



-----1-----2-----3-----4-----5-----6-----7-----

Bug D-10 -- For systems using a heat pump (HEAT-SOURCE=HEAT-PUMP), the electric heating energy reported in SS-II varies significantly depending on what computer system is being used. The values reported can be as much as a factor of 3 too high in the Spring or Fall months. The problem is caused by a very small, unphysical heating load (< 1 Btuh) which turns on the heat pump, and causes it to consume electricity. On some machines these small numbers are rounded to zero, and the heat pump remains off. On other machines the numbers remain non-zero, and the heat pump turns on. Fixed in sys.bug.
Interim solution: None
Date moved to the release file: Before July 1, 1985.

```

*/ FIX FOR BUG D-10
*/ PREVENT VERY SMALL HEATING LOADS FROM ACTIVATING THE HEAT PUMP
*/
*/
*D HPUNIT.22

      IF(TLOAD .GE. -1.0) GO TO 30
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-11 -- In report LS-L, the quantities for

AVERAGE DAILY SOLAR RADIATION INTO SPACE
and
MAXIMUM HOURLY SOLAR RADIATION INTO SPACE



are not those for solar gains (unweighted) as intended; rather solar loads (weighted) were used. This problem was also present in 2.1B. No interim solution. The fix is in lds.bug.
Date moved to the release file: September 11, 1985

```

*/ FIX FOR BUG D-11
*/ THE SOLAR QUANTITIES ACCUMULATED FOR REPORT LS-L
*/ SHOULD BE SOLAR GAINS, NOT WEIGHTED SOLAR LOADS
*/
*D DAYCLC.375,379
      ZLSL(1,2,IZONE)=ZLSL(1,2,IZONE)+<QSOL1>
      ZLSL(2,2,IZONE)=ZLSL(2,2,IZONE)+<QSOL1>
C      MAXIMUM SOLAR
      IF(<QSOL1>.GT.ZLSL(1,3,IZONE)) ZLSL(1,3,IZONE)=<QSOL1>
      IF(<QSOL1>.GT.ZLSL(2,3,IZONE)) ZLSL(2,3,IZONE)=<QSOL1>
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-12 -- In metric runs, the conversion factor for the keyword RADIATIONS in the DAY-SCHEDULE command, used in conjunction with MAX-SOLAR-SCH for window blind control, is incorrect. It converts from W/ft² to W/m², using a factor 10.76392. It should convert from Btu/hr-ft² to W/m² using a factor of 3.15248. This is a bug in 2.1b also. The fix is in file bdl.bug. Interim solution: None
Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-12
*/ IN METRIC RUNS, THE CONVERSION FACTOR FOR THE KEYWORD

```

```

*/ RADIATION IN THE DAY-SCHEDULE COMMAND, USED IN CONJUNCTION
*/ WITH THE MAX-SOLAR-SCH FOR WINDOW CONTROL, IS INCORRECT.
*/ IT CONVERTS FROM W/SQFT TO W/M**2 USING A FACTOR OF
*/ 10.76392. IT SHOULD CONVERT FROM BTU/HR/SQFT TO W/M**2,
*/ USING A FACTOR OF 3.15248.
*/
*D SCEDDI.41
      6 4HRADI,4HATIO,4HNS ,4H ,4HRADT,4H ,17,1,24,-1,100,1/
*D SCEDDI.121
      TEMP(25)=1./VKONV(17)
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-13 -- In metric runs using LOAD-ASSIGNMENT and LOAD-MANAGEMENT in PLANT, the plant equipment referenced in the LOAD-ASSIGNMENT would not be assigned correctly. Also, if the LOAD-ASSIGNMENT was for a utility, the NUMBER keyword, representing mBtu's, would not be converted to mWh. Both problems were caused by the incorrect placement and argument list of a call to KDIV, the subroutine that does the metric conversion. The problem is in subroutine LMLAO in BDL. This was a problem in 2.1B also. The fix is in bdl.bug. Interim solution: None
Date moved to release file: February 5, 1986

```

*/ FIX FOR BUG D-13
*/ IN METRIC RUNS USING LOAD-ASSIGNMENT AND LOAD-MANAGEMENT IN PLANT,
*/ THE PLANT EQUIPMENT REFERENCED IN THE LOAD-ASSIGNMENT WOULD NOT
*/ BE ASSIGNED CORRECTLY. ALSO, IF THE L-A WAS FOR A UTILITY, THE
*/ NUMBER KEYWORD, REPRESENTING MBTU'S, WOULD NOT BE CONVERTED TO
*/ MWH. BOTH PROBLEMS WERE CAUSED BY THE INCORRECT PLACEMENT AND
*/ ARGUMENT LIST OF A CALL TO KDIV, THE SUBROUTINE THAT DOES THE
*/ METRIC CONVERSION.
*/ THE PROBLEM WAS IN THE SUBROUTINE LMLAO IN PLANT.
*/
*I LMLAO.107
      IF(METIN.EQ.1)CALL KDIV(IA(IPTR+4),50,1,METIN)
*D LMLAO.124
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-14 -- In the SYSTEM-CONTROL command in SYSTEMS, MAX-HUMIDITY and MIN-HUMIDITY are assigned the wrong units. Units should be percent, not (lbs water)/(lbs dry air), or (kg water)/(kg dry air). This error shows up when the user turns on DIAGNOSTIC COMMENTS. The input should be, and has always been percent, and the calculations are correct. It is just the label that is wrong. The BDL Summary has the correct units. This was a bug in 2.1B also. The fix is in dkey.bug. Interim solution: Ignore the label, input in percent.
Date moved to release file: February 5, 1986

```

*/ FIX FOR BUG D-14
*/ IN THE SYSTEM-CONTROL COMMAND IN SYSTEMS, THE KEYWORDS
*/ MAX-HUMIDITY AND MIN-HUMIDITY ARE ASSIGNED THE
*/ WRONG UNITS. THE UNITS SHOULD BE PERCENT, NOT
*/ LBS-WATER/LBS DRY AIR.
*/
*D SDLKEY.385
      MAX-HUMIDITY      MAX-H      38      1      1      30.      80.      -77777.
*D SDLKEY.389
      MIN-HUMIDITY      MIN-H      38      1      1      0.      70.      -77777.

```

Bug D-15 -- In metric runs, some plant report output headings should be labeled kWh/m2-yr, not kWatt/m2-yr. No calculations are affected by this bug. This is a bug in 2.1B also. The fix is in dkey.bug. Interim solution: None
Date moved to release file: February 5, 1986

```

*/ FIX FOR BUG D-15
*/ IN METRIC RUNS, SOME PLANT REPORT OUTPUT HEADINGS
*/ SHOULD BE LABELED KWH/M**2-YR, NOT KWATT/M**2-YR .
*/

```

```

*/ D UNITCD.74
73 KWH/M2-YR KBTU/SQFT-YR 3.15248
*/

```



-----1-----2-----3-----4-----5-----6-----7-----

Bug D-16 -- When using metric input, the conversion of the response factors was done on the input data, not on the data assembled for writing to the standard file. Thus if the input data was used more than once (via the LIKE command), conversion on the same set of data would occur more than once, and the LIKE'd response factors would be incorrect. This problem was fixed in 2.1C for the response factors which include the inside film coefficient, but not for those which do not (used for calculating weighting factors). This was a bug in 2.1B also. The fix is in bdl.bug.

Interim solution: Do not use LIKE in the LAYERS command.

Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-16
*/ WHEN USING METRIC INPUT, THE CONVERSION OF THE RESPONSE
*/ FACTORS WAS DONE ON THE INPUT DATA, NOT ON THE DATA ASSEMBLED
*/ FOR WRITING TO THE STANDARD FILE. THUS IF THE INPUT WAS USED
*/ MORE THAN ONCE (VIA THE LIKE COMMAND), CONVERSION ON THE SAME
*/ SET OF DATA WOULD OCCUR MORE THAN ONCE, AND THE LIKE'D RESPONSE
*/ FACTORS WOULD BE INCORRECT. THIS PROBLEM WAS FIXED IN 2.1C FOR
*/ THE RESPONSE FACTORS WHICH INCLUDE THE INSIDE FILM RESISTANCE,
*/ BUT NOT FOR THE SECOND SET, WITHOUT I-F-R.
*/

```

```

*/ D CONSTO.140,142
CALL MOVEN (AA(IRF+1),AA(IPT+9),NSTOR)
IF (METIN.EQ.1) CALL KDIV(AA(IPT+9),6,1,METIN)
IF (METIN.EQ.1) CALL KDIV(AA(IPT+12),6,NSTOR-3,METIN)
*/

```

Bug D-17 -- For system types DDS, MZS, and PMZS, the hourly report variable 35 (system level in SYSTEMS) WR, the return air ratio, can be incorrectly reported when it should be at its minimum value. The calculation is not affected. This was a bug in 2.1B also. The fix can be found in file sys.bug.

Interim solution: None Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-17
*/ FOR SYSTEM TYPES DDS, MZS, AND PMZS, THE HOURLY REPORT
*/ VARIABLE 35 (SYSTEM LEVEL) WR, THE RETURN AIR RATIO,
*/ CAN BE INCORRECTLY REPORTED WHEN IT SHOULD BE AT ITS
*/ MINIMUM VALUE. THE CALCULATION IS NOT AFFECTED.
*/

```

```

*/ I DDSF.235
WR = WRMIN
*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-18 -- If the building AZIMUTH is entered as a negative value between -90 and -360 degrees, the daylighting program will incorrectly calculate interior illuminance and glare if the sun is between south and the direction of the negative building x-axis. In this case the solar bearing of 20 degrees north of west is used instead of the actual bearing. For example, if building AZIMUTH is -135 degrees, then the building y axis points southwest, the x-axis points northwest, and the negative x-axis points southeast, so solar bearings between south and southeast will have incorrect interior daylight values. This was a bug in 2.1B also. The fix is in lds.bug.

Interim solution: Use only positive values of building AZIMUTH.

Date moved to the release file: December 3, 1985.

```

*/ FIX FOR BUG D-18
*/ FOR BUILDING AZIMUTH VALUES BETWEEN -90 AND -360, IN
*/ INTERPOLATING TO GET DAYLIGHT FACTORS THE PROGRAM
*/ INCORRECTLY USES A SUN AZIMUTH OF 20 DEG NORTH OF WEST
*/ IF THE ACTUAL SUN AZIMUTH LIES BETWEEN SOUTH AND THE
*/ DIRECTION OF THE NEGATIVE BUILDING X-AXIS. FOR EXAMPLE,
*/ IF BUILDING AZIMUTH = -135, SUN ANGLES BETWEEN SOUTH
*/ AND SOUTHEAST WILL HAVE INCORRECT INTERPOLATED DAYLIGHT
*/ FACTORS. THIS PROBLEM CAN BE AVOIDED BY ALWAYS SPECI-
*/ FYING POSITIVE VALUES FOR BUILDING AZIMUTH. (FCW 12-3-85)
*/

```

```

*/ D DAYCLC.139
IF(THSUND.GT.180.) THSUND=THSUND-360.*(1.+AINT(THSUND/540.))
*/

```

```

*/ IDENT LDSBG2
*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-19 -- This is not really a bug, but a documentation error. However, since it was submitted on a bug report, it will remain a bug forever! There are two errors in the description of the daylighting verification report, LV-L. First, the quantity VW-AZ (view azimuth) is given relative to north, not relative to the building y-axis as stated on page 2-65 of the 2.1C Supplement. Note that the corresponding keyword, VIEW-AZIMUTH, is input relative to the space y-axis. Second, the quantity AZIM is the azimuthal angle of the window outward normal relative to north, not relative to the building y-axis as stated on page 2-66 of the 2.1C Supplement. Note that for horizontal windows (skylights), the value of AZIM in this report has no meaning and should be ignored. This "bug" has no mod to fix it.



Bug D-20 -- In the daylighting calculation, the values of luminous efficacy and direct normal solar illuminance are too high for values of atmospheric turbidity (ATM-TURBIDITY in the BUILDING-LOCATION command) above 0.2. This results in overestimates of interior daylight illuminance. In addition to fixing this problem, an improved calculation of these quantities (from Aydinli) is added, replacing the previous Dogniaux formulation. The fix is in lds.bug. Interim solution: none. Date moved to the release file: December 13, 1985

```

*/ FIX FOR BUG D-20
*/ IN THE DAYLIGHTING CALCULATION, THE VALUES OF LUMINOUS
*/ EFFICACY AND DIRECT NORMAL ILLUMINANCE ARE TOO HIGH FOR
*/ TURBIDITY (BETA) ABOVE 0.2. IN ADDITION TO FIXING THIS
*/ PROBLEM, AN IMPROVED CALCULATION OF THESE QUANTITIES
*/ (FROM AYDINLI) IS ADDED, REPLACING THE PREVIOUS DOGNAUX
*/ FORMULATION. (FCW 12-13-85)
*/
*I DZENLM.25
  TFAC = AMIN1(TFAC,7.5)
*D DLUMEF.17,30
  (FIT TO TABULATED VALUES OF DIR NORM LUMINOUS
  EFFICACY VS SOLAR ALTITUDE, TURBIDITY FACTOR, MOISTURE --
  AYDINLI, THE AVAILABILITY OF SOLAR RADIATION AND
  DAYLIGHT, TABLE 4, OCTOBER 1981.)
  RESTRICT BETA TO RANGE OF AYDINLI VALUES (0 TO 0.2)
  BC=AMIN1(0.2,BETA)
  CDIRLW(IHR)=(99.+4.7*W-52.4*BC)*(1.-EXP((24.*BC-8.)*PHSUN))
*D DNSOL.18,22
  ABARS=1.4899-2.1099*CPHSUN+0.6322*COS(2.*PHSUN)+
  0.0252*COS(3.*PHSUN)-1.0022*SPHSUN+
  1.0077*SIN(2.*PHSUN)-0.2606*SIN(3.*PHSUN)
  BC=AMIN1(0.2,BETA)
  LUMINOUS EFFICACY
  EFFLUM=(99.+4.7*W-52.4*BC)*(1.-EXP((24.*BC-8.)*PHSUN))
  93.73 BELOW IS EXTRATERRESTRIAL LUM EFFICACY (LM/W)
  DNSOL=EFFLUM*(SOLIC(M)/93.73)*EXP(-AM*TFAC*ABARS)

```

Bug D-21 -- This is not actually a bug fix, but an improvement to the daylighting calculation. Previously, sun reaching the reference point directly (without reflecting from an interior or exterior surface or diffusing from a window shade) was omitted from consideration on the assumption that a shading device would be deployed to prevent a sun patch from falling on the work surface. This assumption is, however, too restrictive in some situations; for example, in rooms with reflective glazing and no drapes or blinds, or in atria with transparent glass where direct sun is intentionally allowed to penetrate to floor level. The program has, therefore, been modified so that the illuminance of the sun patch is calculated. In addition the program now calculates the glare due to the solar disk when it is visible from the reference point. The fix is in file lds.bug. No interim solution. Date moved to the release file: December 19, 1985

```

*/
*I DCOF.757
C
C      ILLUMINANCE FROM (UNREFLECTED) DIRECT SUN
C
  IF(IX.NE.NWX.OR.IY.NE.NWY) GO TO 8010
  UNIT VECTOR FROM REF. PT. TO SUN
  RAYCOS(1)=CPHSUN*COS(THSUN)
  RAYCOS(2)=CPHSUN*SIN(THSUN)
  RAYCOS(3)=SPHSUN
  IS SUN ON FRONT SIDE OF WINDOW
  COSI=DDOT(WNORM,RAYCOS)
  IF(COSI.LE.0.) GO TO 8010
  DOES RAYCOS PASS THRU WINDOW
  CALL DPIERC(W1,W2,W3,RREF,RAYCOS,IP)
  IF(IP.EQ.0) GO TO 8010
  DOES RAYCOS INTERCEPT SHADING SURFACE
  CALL DHITSH(RREF,RAYCOS)
  IF(IHIT.NE.0) GO TO 8010
  SUN REACHES REF. PT. INCREMENT ILLUMINANCE
  TVISS=AMAX1(0.,<CAM1>+COSI*(<CAM2>+COSI*(<CAM3>+COSI*(<CAM4>)))
  /TSOLNM
  DNSOLI=DNSOL(IMREF)

```

```

EDIRSU(1,1,IHR)=EDIRSU(1,1,IHR)+DNSOLI*RAYCOS(3)*TVISS
C
C      GLARE FROM SOLAR DISK
C
C      POSITION FACTOR FOR SUN (NOTE THAT AZVIEW IS WRT BLDG
C      Y-AXIS, THSUN WRT BLDG X-AXIS)
  XR=TAN(ABS(0.5*PI-AZVIEW-THSUN)+.001)
  YR=TAN(PHSUN+.001)
  POSFAC=DPFAC(XR,YR)
  IF(POSFAC.EQ.0.0.OR.<OMEGAW>.LT.0.000001) GO TO 8010
  INCREMENT WINDOW LUMINANCE. LUMINANCE OF SOLAR DISK
  (FT-L) IS 46000*DNSOL FOR DNSOL IN FC. SOLID ANGLE
  SUBTENDED BY SUN IS .000068 SR.
  AVWLSU(1,1,IHR)=AVWLSU(1,1,IHR)+46000.*DNSOLI*TVISS*
  & SQRT(.000068*POSFAC)*(FLOAT(NWX*NWY)/PI)/<OMEGAW>***.8
  8010 CONTINUE
*I DCOF.910
C      LIMIT SFACSU TO PREVENT PACKING OVERFLOW
  SFACSU=AMIN1(99.,SFACSU)
*/
*/ TO SAVE TIME, AVOID CALLING DHITSH IF NO SHADES
*/
*D DREFLT.94
  MH=0
  IHIT=0
  IF((<NWISHADE>+<NXSHAD>+<NGSHAD>+<NSSHD>).NE.0) CALL DHITSH(WC,U)
*D DCOF.676
  MH=0
  IHIT=0
  IF((<NWISHADE>+<NXSHAD>+<NGSHAD>+<NSSHD>).NE.0) CALL DHITSH(RREF,RAY)
*/
*IDENT LDSBG4
*/

```

Bug D-22 -- Bug 22 is missing; please phone home.

Bug D-23 -- The units for WW (moisture change), hourly report variable 38 in SYSTEMS at the SYSTEMS level, are incorrect. The units should be lbs (kg), not "fraction". The fix is in file drlc.bug. Interim solution: None Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-23
*/ THE UNITS FOR WW, HOURLY REPORT VARIABLE 38 IN SYSTEMS AT
*/ THE SYSTEMS LEVEL, ARE INCORRECT. THE UNITS SHOULD BE LB
*/ (KG), NOT FRACTION.
*/
*D HRPICRD.336
  2 10 38 11,1X,F10.1      MOISTURECHANGE      21
*/

```

Bug D-24 -- The units for the keyword NIGHT-VENT-DT in the SYSTEM or SYSTEM-FANS command were incorrect. They should be R (K) not F (C). This will result in an incorrect conversion for this keyword when metric input is used. The fix is on file dkey.bug. Interim solution: None Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-24
*/ THE UNITS FOR THE KEYWORD NIGHT-VENT-DT IN SYSTEMS ARE IN-
*/ CORRECT; THEY SHOULD BE R (K), NOT F (C). THIS WILL
*/ RESULT IN AN INCORRECT CONVERSION FOR INPUT VIA THIS
*/ KEYWORD FOR METRIC RUNS.
*/
*D SDLKEY.559
NIGHT-VENT-DT      N-V-D      60      5      1      0.0      30.0      5.0
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-25 -- The abbreviations for the keywords NATURAL-VENT-SCH (SYSTEM-AIR subcommand) and NIGHT-VENT-SCH (SYSTEM-FANS subcommand) are the same; namely, N-V-SCH. The program will always interpret N-V-SCH as referring to NATURAL-VENT-SCH, since this is first in the keyword file. The abbreviation of NIGHT-VENT-SCH will be changed to NT-V-SCH. The fix is on file dkey.bug.
Interim solution: Do not use the abbreviation for NIGHT-VENT-SCH.
Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-25
*/
*D SDLKEY.555
NIGHT-VENT-SCH      NT-V-SCH      0      3      1      76.0      0.0      -77777.
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-26 -- TAVE, the average zone temperature, hourly report variable number 31 at the zone level, is not set in SYSTEM = SUM.
As a result it is reported as 0 degrees F for all hours, or -17.8 degrees C.
This is a bug in 2.1B also. The fix is in sys.bug.
Interim solution: None
Date moved to the release file: February 5, 1986

```

*/ FIX FOR BUG D-26
*/
*I SUM.39
TAVE = ( <TNOW>+<TPAST> ) * 0.5
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-27 -- In report PS-D the column labeled PEAK OVERLOAD is incorrectly given the units MBTU instead of MBTUH. The fix is in file drlc.bug.
Interim solution: None
Date moved to the release tape: February 5, 1986

```

*/ FIX FOR BUG D-27.
*/ THE COLUMN LABELED PEAK OVERLOAD IN REPORT PS-D
*/ WAS INCORRECTLY LABELED MBTU INSTEAD OF MBTUH.
*/
*D REPCRD.557
5000 5000 5000 3400
*D REPCRD.560
1000010000100001000010000 50 50 50 34

```

Bug D-28 -- The daylighting calculation for the Southern hemisphere (LATITUDE < 0) is incorrect since the wrong values are used for solar azimuth. This is not a problem in the Northern hemisphere.
The fix is in file lds.bug. Interim solution: None
Date moved to the release tape: February 13, 1986

```

*/ FIX FOR BUG D-28
*/ THE DAYLIGHTING CALCULATION IS INCORRECT IN THE
*/ SOUTHERN HEMISPHERE (LATITUDE < 0) SINCE THE WRONG
*/ VALUES OF SOLAR AZIMUTH ARE USED. THIS IS NOT A
*/ PROBLEM IN THE NORTHERN HEMISPHERE. (FCW 2-13-86)
*/
*D CAEXT.89
*I DCOF.64
C SET MINIMUM SOLAR AZIMUTH IN SOUTHERN HEMISPHERE
C IF (STALAT.LT.0.0) THSMIN=70.
*/
-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-29 -- When there is more than one RUN-PERIOD per month (exclusive of RUN-PERIODS associated with DESIGN-DAY's) the annual quantities reported in the BEPS report from PLANT, and some quantities in PS-D are incorrect. Basically PLANT assumes, when adding up the yearly totals from the monthly totals, that the end of a run period is the end of a month. If there is more than one run period in a month, double or multiple counting occurs. The error can be large. Incorrect results have occurred in the ELECTRICITY column of the BEPS report, and for MBTU SUPPLIED and PCT OF TOTAL LOAD in the ELECTRICAL INPUTS section (input = ELECTRICITY) in PS-D, as well as LOAD SATISFIED in the ELECTRICAL INPUTS section of PS-D. The number for TOTAL LOAD ON PLANT in the ELECTRICAL INPUTS section of PS-D is correct. Interim solution: Except for RUN-PERIOD's associated with a DESIGN-DAY command, use only one RUN-PERIOD per month, if you are going to use PLANT reports. Hourly reports from PLANT are OK.
The fix is on file plt.bug.
Date moved to the release file: April 4, 1986

```

*/ FIX FOR BUG D-29
*/
*/
*D PLANT.558, PLANT.565
IF (IEODMR.EQ.3) GO TO 800
C END OF MONTH; SUM MONTHLY STATISTICS.
CALL STATSM
C RECORD OPERATION THIS MONTH
MONRUN(IMO) = 1
GO TO 30
800 CONTINUE
C END OF RUN PERIOD (AND POSSIBLY OF MONTH ALSO).
C IF THE NEXT RUN PERIOD STARTS IN THE SAME MONTH, KEEP GOING
IF ((JRUNPD.LT.NRUNPD).AND.
1 (IRUNPD(4,JRUNPD).EQ. IRUNPD(1,JRUNPD+1)))
2 GO TO 20
C OTHERWISE SUM THE MONTHLY STATISTICS
CALL STATSM
MONRUN(IMO) = 1
GO TO 20
*/

```

```

*/ ----- FIX SYNTAX ERROR IN EQUIVALENCE STATEMENT
*/ D NAME/.5,6
      EQUIVALENCE ( NAMQ(1,1) , NAMES(1) ) , ( NAMEQ(1,1) , NAMES(301) )
      , ( NAMUT(1,1) , NAMES(421) )
*/

```

```

-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-30 -- The packaged systems PSZ, PMZS, and PVAVS will show seriously incorrect seasonal COP's. If the TOTAL under the COOLING ENERGY column in report SS-A is divided by the TOTAL from column ELECTRIC COOLING ENERGY in SS-H, seasonal COP's of around 8 will result, instead of 3. This is because the electricity consumed by cooling is too small, due to the program using only the first two coefficients of the relevant COOL-EIR-FPLR curve (the curve is cubic; the program thinks it is linear).

***** THIS BUG IS SERIOUS! *****

It should be fixed or avoided on all runs involving PSZ, PMZS, and PVAVS. This bug is in the 2.1C version only. The fix is on file bdl.bug. Interim solution: The correct curve must input be via the CURVE-FIT command. Namely:

REPLACEMENT=CURVE-FIT TYPE=CUBIC

COEF=(.20123007,-.0312175,1.9504979,-1.1205104) ..

and

COOL-EIR-FPLR=REPLACEMENT

in the SYSTEM command.

Date moved to the release file: April 4, 1986.

```

*/ FIX FOR BUG D-30
*/ FOR SYSTEM = PSZ, PMZS, OR PVAVS, THE ELECTRICITY CONSUMED
*/ FOR COOLING IS SERIOUSLY INCORRECT, DUE TO THE DEFAULT
*/ COOL-EIR-FPLR CURVE HAVING THE WRONG TYPE. THE CURVE
*/ IS CUBIC, BUT THE TYPE IS LINEAR, SO ONLY THE FIRST TWO
*/ COEFFICIENTS OF THE CURVE ARE USED.
*/
*/ DATSD.274
$ C15/4/, C16/1/, C17/1/, C18/5/, C19/0/, C20/1/, C21/4/,
*/

```

```

-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-31 -- Page 3-26 of the DOE-2.1c Supplement mentions that the curves SDL-C117, SDL-C118, and SDL-C119 are alternatives to SDL-C18 for the COOL-EIR-FPLR for system types PSZ, PMZS, and PVAVS in the SYSTEMS program. These curves are cubic in the PLR, but their type is set to zero, which means that the curve is always set to 1.0 in SYSTEMS. Thus there will be no variation of the EIR as a function of the PLR if these curves are used. Interim solution: Use the CURVE-FIT command to input these curves, or do not use them. The fix is in bdl.bug.

```

*/ FIX FOR BUG D-31
*/ CURVES SDL-C117, SDL-C118, AND SDL-C119 ARE ALTERNATIVES TO
*/ SDL-C18, THE DEFAULT COOL-EIR-FPLR CURVE FOR SYSTEM TYPES PSZ,
*/ PMZS, OR PVAVS IN SYSTEMS (SEE PAGE 3-26 OF THE DOE-2.1C
*/ SUPPLEMENT). THESE CURVES ARE CUBIC, BUT HAVE TYPE=0, WHICH
*/ MEANS THEY WILL ALWAYS HAVE THE VALUE 1.0 . HERE WE CHANGE THE
*/ TYPE TO 5, WHICH WILL ALLOW THE CURVES TO BE USED CORRECTLY.
*/ (FB 4/4/86).
*/
*/
*/ DATSD.288
$ C113/3/,C114/4/,C115/4/,C116/0/,C117/5/,C118/5/,C119/5/,
*/

```

```

-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-32 -- In SYSTEMS input, when the user forgets to include a zone in one of the systems, the obscure message "NO ZP1-ZP2 MATCH IN HOURIN" would appear, and execution would be terminated. Although this message amused many users and led to many stimulating discussions between users and the program developers, we have replaced it with

"ZONE ---- IS NOT SERVED BY ANY SYSTEM",

where ---- is the actual offending zone name. The fix is in sys.bug. Interim solution: Dial 415-486-5711 and ask Ender Erdem what the message means. Do not ask for Fred Buhl. Ever.

Date moved to the release file: April 18, 1986

```

*/ FIX FOR BUG D-32
*/
*/
*/ D HOURIN.141,HOURIN.142
      NMZP2 = ZP2 + 3
      WRITE (IOUTPT,5301) (IA(N99),N99-ZP2,NMZP2)
      5301 FORMAT(//6H ZONE ,4A4,29H IS NOT SERVED BY ANY SYSTEM. //)
*/

```

```

-----1-----2-----3-----4-----5-----6-----7--

```

Bug D-33 -- Metric input: when GLASS-CONDUCTANCE in the GLASS-TYPE command in the LOADS input is allowed to default, the second and subsequent uses of the GLASS-TYPE command will have incorrect defaults assigned to GLASS-CONDUCTANCE. The fix is on bdl.bug. Interim solution: Input a value for GLASS-CONDUCTANCE or use LIKE for the second and subsequent GLASS-TYPE's. Date moved to the release file: April 18, 1986

```

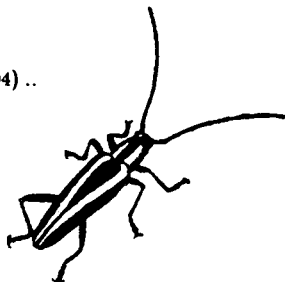
*/ FIX FOR BUG D-33.
*/ FOR METRIC INPUT, WHEN GLASS CONDUCTANCE IN THE GLASS-TYPE
*/ COMMAND (LOADS INPUT) IS ALLOWED TO DEFAULT, THE SECOND AND
*/ SUBSEQUENT GLASS-TYPE COMMANDS WILL BE ASSIGNED INCORRECT
*/ GLASS-CONDUCTANCE DEFAULTS. THIS IS DUE TO THE CONVERSION
*/ BEING DONE ON THE STORED ENGLISH DEFAULT VALUE. SUBSEQUENT
*/ USES OF GLASS-TYPE CONVERT THE ALREADY CONVERTED VALUE.
*/ THE FIX DOES THE CONVERSION ON A LOCAL VARIABLE, WHICH HAS
*/ BEEN ASSIGNED THE ENGLISH DEFAULT VALUE. THE BUG DISCOVERY
*/ AND CORRECTION ARE FROM T.G. TRUONG AT THE NEW ZEALAND
*/ MINISTRY OF WORKS AND DEVELOPMENT. (APRIL 18, 1986)
*/
*/ D GLTYPI.88
*/ I GLTYPI.89
      IF (METIN .EQ. 1) CON=CON*VKONV(6)

```

```

-----1-----2-----3-----4-----5-----6-----7--

```



Bug D-34 -- Reports EV-A and EV-B could not be produced together when the user used the COMPONENT-COST command in the ECONOMICS input.

Interim solution: none. The fix is on eco.bug.

Date moved to the release file: April 18, 1986

*/ FIX FOR BUG D-34

*D EVRPT.67

GO TO 301

*/

*/ ALSO REMOVE AN UNWANTED PAGE EJECT AT THE END OF EV-B.

*/

*D EVRPT.124,EVRPT.125

*/

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-35 -- When metric output is requested, the ECONOMICS reports remain in English units. This is because the code to do the conversion was never added to ECONOMICS. English units appear only in a few places (most of the output is dollars or hours), and only in EV-B and ES-D.

The fix is on eco.bug. Interim solution: none.

Date moved to the release file: April 18, 1986

*/ FIX FOR BUG D-35

*/ WHEN METRIC OUTPUT IS USED, THE ECONOMICS REPORTS REMAIN IN

*/ ENGLISH (THEY WERE NEVER CONVERTED). THIS MOD CONVERTS THOSE

*/ FEW ITEMS THAT NEED IT. THIS MOD IS FROM T.G. TRUONG AT THE

*/ MINISTRY OF WORKS AND DEVELOPMENT, NEW ZEALAND. (APRIL 12, 1986)

*/

*AF INPUT,HEADER

*COMDECK /UNITT/

COMMON /UNITT/ VKONV(80), DUMLOG(4), JUNITT(4,80,2)

*IDENT ECOBG2

*D CTRL.3

1 IPROG, IFATAL, NAMPRG(3,7), MTRICR

*I EVRPT.2

*CALL,/UNITT/

*D EVRPT.84

J = 2

IF (MTRICR.EQ. 1) J = 1

WRITE (IOUTPT,320) JUNITT(1,3,J)

*D EVRPT.91

6 7HCHARGE2,/,14X,1H(,A3,1H),8X,3H(\$),6X,4HRATE,6X,3H(\$),

*D EVRPT.118

EUNIT = UDATA(1,IUT)

IF (MTRICR.EQ. 1) CALL KDIV(EUNIT,3,1,0)

WRITE (IOUTPT,350) (NAMFL(I,IUT),I=1,2),

1 EUNIT, (UDATA(I,IUT),I=2,4),

*I EORPT.289

IF (MTRICR.EQ. 1) CALL KDIV(UNIT,3,NUTLTY,0)

*/ --- FILE HRPMOD ---

*IDENT HRPBG1

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-36 -- The weather processor is unable to handle weather for the southern hemisphere. When the packer encounters a negative latitude in the input, it will print an error message and then abort. The error message is:

(ERROR -- LATITUDE IS OUTSIDE ALLOWED RANGE etc.)

Fix is on wth.bug. Interim solution: none.

Date moved to the release file: April 18, 1986

*/ FIX FOR BUG D-36

*/ THE WEATHER PROCESSOR CANNOT HANDLE SOUTHERN

*/ HEMISPHERE WEATHER; THAT IS, NEGATIVE LATITUDE

*/ AND ALL ITS IMPLICATIONS.

*/

*/ ALLOW LATITUDES FROM -90 TO 0.

*/

*D PACKER.152

CALL VALIDF(XLAT,-90.,90.,NAMS(1,5),0,STOPIT)

*I STATS.11

*CALL /MONTHC/

*/

*/ FIX THE TIME ZONE FORMAT IN THE STATISTICAL SUMMARY

*/

*D STATS.45

1 20X,12HTIME ZONE = ,I3)

*/

*/ FIX THE DESIGN TEMPERATURE CALCULATIONS

*/ TO WORK FOR BOTH HEMISPHERES

*/

*D STATS.258,STATS.261

IF (WLAT.LT. 0.) GO TO 3020

GO TO (3000,3000,1040,1040,1040,1040,3050,

1 3050,3050,3050,1040,1040,3000),I

3020 GO TO (3050,3050,3050,1040,1040,3000,

1 3000,3000,1040,1040,1040,3050),I

3050 DO 1020 J=1,250

*D SUMDT.2

SUBROUTINE SUMDT(NB,NHRSUM,IT01,IT025,IT05)

*D SUMDT.10

*D WINDT.2

SUBROUTINE WINDT(NB,NHRWIN,IT99,IT975)

*D WINDT.7,WINDT.8

*D STATS.309,STATS.311

IF (WLAT.LT. 0.) GO TO 4000

NHRSUM = 2928

NHRWIN = 62 + MDAYS(2)

NHRWIN = NHRWIN*24

GO TO 4010

4000 NHRSUM = 93 + MDAYS(2)

NHRSUM = NHRSUM*24

NHRWIN = 2208

4010 CONTINUE

CALL SUMDT(NSUMHS,NHRSUM,IT01,IT025,IT05)

CALL SUMDT(NSMWHHS,NHRSUM,ITW01,ITW025,ITW05)

CALL WINDT(NWINHS,NHRWIN,IT99,IT975)

*D STATS.375

*/

*/ MODIFY THE CLOUD COVER FACTOR TO ALLOW FOR THE

*/ SEASON SHIFT IN THE SOUTHERN HEMISPHERE.

*/

*I CCFKS.13

IF (WLAT.LT. 0.) ISEAS = MOD((ISEAS+1),4) + 1

*/

*/ SHIFT THE EXTINCTION AND DIFFUSE COEFFICIENT CURVES BY 6 MONTHS

*/ IN THE SOUTHERN HEMISPHERE

*/

*I SUNPRM.19

C

C

C

C

SHIFT THE EXINCTION AND DIFFUSE COEFFICIENT CURVES
BY 6 MONTHS FOR THE SOUTHERN HEMISPHERE

IF (XLAT.GE. 0.) GO TO 100

S1 = -S1

C1 = -C1

S3 = -S3

C3 = -C3

100 CONTINUE

*/

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-37 -- This fixes a bug in the WYEC section of the weather processor. For at least one WYEC file (Amarillo), the processor needs to look at the next hour solar data, as well as present and previous hour data. The fix is on file wth.bug. Interim solution: None. Date moved to the release file: April 18, 1986

```

*/ FIX FOR BUG D-37
*/ THE WEATHER PROCESSOR COULD NOT HANDLE ALL WYEC INPUT
*/ FILES. AT LEAST ONE FILE REQUIRES USING NEXT HOUR
*/ SOLAR DATA, NOT JUST PRESENT AND PREVIOUS HOUR DATA.
*/
*I TRYDCD.26
  DIMENSION ISOLWY(24)
*D TRYDCD.65
  IF (ID0Y .NE. ID0YSH(I)) GO TO 1005
  ISHFT = ISSHFT(I)
  IF (ISHFT .GT. 0) ISHFT = ISHFT - 1
*D TRYDCD.67
*D TRYDCD.105,TRYDCD.106
*D TRYDCD.143,TRYDCD.180
C   STORE THE WYEC SOLAR DATA FOR THE DAY
  ISOLWY(IH) = ITEMP(16)
*D TRYDCD.182
*D TRYDCD.191
*I TRYDCD.192
C   SOLAR FOR WYEC
C   CALCULATE RKT
  DO 1041 IH=1,24
  ISOL(IH) = 0
  IDN(IH) = 0
  RKTS(IH) = 0.
  SOLHOR(IH) = 0.
  DIRN(IH) = 0.
  IF (IH .EQ. 1) CALL SUNPRM(ID0Y,DEABC)
  GET HOUR ANGLE. ASSUME SOLAR DATA IS BINNED
  IN SOLAR TIME.
  UL = FLOAT(IH) - 12.
  BL = UL - 1.
C   SUNRISE AND SUNSET HOUR ANGLES
  SSHA = ACOS((-TAN(STALAT)*TAN(DEABC(1)))/PIOV12)
  SRHA = -SSHA
C   RESET BIN BOUNDARIES TO ALLOW FOR SUNRISE AND SET
  IF ((UL .LE. SRHA) .OR. (BL .GE. SSHA)) GO TO 1041
  IF (SRHA .GT. BL) BL = SRHA
  IF (SSHA .LT. UL) UL = SSHA
  IF ((UL-BL) .LT. 0.02) GO TO 1041
  IF (ISOLWY(IH+ISHFT) .EQ. 0) GO TO 1041
  IF (ISOLWY(IH+ISHFT) .EQ. NOTTHR(16)) RKTS(IH) = IUNDEF
  IF (ISOLWY(IH+ISHFT) .EQ. NOTTHR(16)) GO TO 1041
  A = SIN(DEABC(1))*SIN(STALAT)
  B = COS(DEABC(1))*COS(STALAT)
C   GET SOLAR CONSTANT. THIS FORMULA IS FROM DUFFIE AND
C   BECKMAN, PAGE 7.
  SOLCON = 436.8*(1. + 0.033*COS(DTOR*360.*FLOAT(ID0Y)/365.))
C   INTEGRATE SOLAR Z DIREC. COSINE OVER BIN
  COSZIN = A*(UL-BL) + B*(SIN(PIOV12*UL)-SIN(PIOV12*BL))/PIOV12
  SOLH = SOLCON*COSZIN
  SOLHM = FLOAT(ISOLWY(IH+ISHFT))*0.3686691
  SUNSUM = SUNSUM + SOLHM
  RKTS(IH) = AMIN1(SOLHM/SOLH,0.9)
C   IF (IMNTH .NE. 5) GO TO 1041
  PRINT 9004,IH,IDAY,MNAMES(IMNTH),ITEMP(16),ISHFT,ID0Y
9004 FORMAT(1H,9HIH = ,I11,10X,9HIDAY = ,I11,10X,9HMNAMES = ,
1 7X,A4,10X,9HITMP16 = ,I11/1H,9HISHFT = ,I11,10X,
2 9HID0Y = ,I11)
1041 CONTINUE
C   REBIN WYEC SOLAR DATA
*/

```



Bug D-38 -- The metric synonym for the keyword MIN-CFM-SCH in the ZONE command in SYSTEMS is missing. The fix installs the correct synonym MIN-FLOW-SCH. Interim solution: use MIN-CFM-SCH. The correction is on file dkey.bug. Date moved to the release file: April 25, 1986



```

*/ FIX FOR BUG D-38
*/ THE KEYWORD MIN-CFM-SCH IN THE ZONE COMMAND HAS NO METRIC
*/ SYNONYM. WE INSERT THE PROPER SYNONYM: MIN-FLOW-SCH.
*/ THE BUG AND CORRECTION ARE FROM THE MINISTRY OF WORKS AND
*/ DEVELOPMENT, NEW ZEALAND.
*/
*D SDLKEY.925
MIN-FLOW-SCH      M-F-SCH      0      3      1      76.0      0.0      -77777.
MIN-CFM-SCH      M-C-SCH      0      3     -1      76.0      0.0      -77777.
*/

```

Bug D-39 -- Item 47 in the units table is incorrect. It gives an incorrect conversion from lbs/kw to kg/kw. This conversion is not at present used, but the number should be corrected anyway. The old (incorrect) conversion was .65359; the correct number is .45359. The fix is on file dkey.bug. Interim solution: not relevant. Date moved to the release file: April 25, 1986

```

*/ FIX FOR BUG D-39
*/ ITEM 47 IN THE UNITS TABLE IS INCORRECT. IT GIVES THE
*/ CONVERSION FROM LBS/KW TO KG/KW AS .65359, INSTEAD OF .45359.
*/ THIS UNITS TABLE ITEM IS NOT PRESENTLY BEING USED. THIS BUG
*/ AND FIX ARE FROM THE NEW ZEALAND MINISTRY OF WORKS AND
*/ DEVELOPMENT.
*/
*D UNITCD.48
47      KG/KW      LBS/KW      .45359
*IDENT DRLCBG1
*/

```

Bug D-40 -- A line of code is in the wrong place in the HELP subroutine in KEYWDT, the keyword file producing program. HELP prints the command and keyword summary. The incorrect placement of the line of code may cause a scrambled printed output for those keywords that have a units table pointer of zero. The actual keyword table itself is unaffected by this bug. Interim solution: None. The fix is on file key.bug. Date moved to the release file: April 25, 1986

```

*/ FIX FOR BUG D-40
*/ THE LINE OF CODE IN THE HELP SUBROUTINE THAT CHECKS FOR A
*/ ZERO UNITS TABLE POINTER IS IN THE WRONG PLACE. CONSEQUENTLY
*/ THIS POINTER IS NOT RESET, AND THE ZEROth ENTRY IS SOMETIMES
*/ PRINTED, WHICH INFREQUENTLY SCRAMBLES THE PRINTED OUTPUT.
*/
*D HELP.45,HELP.46
  IUN = KONTXT(7,JKEY)
  IF (IUN .LT. 1) IUN = 1
*IDENT LDSBG1
*/

```

Bug D-41 -- Verification reports LV-C and LV-F display a multiplier for interior walls, while this is no longer a legal keyword for the INTERIOR-WALL command. We eliminate the multiplier field in both reports, and add the surface type to LV-F. The fix is on files lds.bug and drlc.bug. Interim solution: none
Date moved to the release file: April 25, 1986



```

*/ FIX FOR BUG D-41
*/ VERIFICATION REPORTS LV-C AND LV-F SHOW AN INTERIOR WALL
*/ MULTIPLIER, BUT THIS IS NO LONGER A LEGAL KEYWORD FOR
*/ INTERIOR WALLS. WE ELIMINATE THE MULTIPLIER FROM BOTH
*/ REPORTS AND ADD SURFACE-TYPE TO THE LV-F OUTPUT.
*/ PART OF THE FIX IS ON LDS.BUG.
*/
*D REPCRD.96,REPCRD.98
(//1X,17HINTERIOR SURFACES//65X,7HU-VALUE/29X,4HAREA/5X,7HSURFACE,14X,
1H(A4,A1,1H),7X,12HCONSTRUCTION,5X,1H(,3A4,A1,1H),7X,14HADJACENT SPACE,
5X,12HSURFACE-TYPE/)
*D REPCRD.100,REPCRD.103
1 1 0 20
(5X,4A4,F12.2,7X,4A4,F16.3,7X,4A4,3X,2A4,4A4)
10000100001000010000 910000100001000010000 61000010000100001000010000
10000100001000010000
*D REPCRD.205,REPCRD.207
(//100X,15HADJACENT SPACES/1X,7HSURFACE,16X,4HAREA,6X,12HCONSTRUCTION,5X,
12HSURFACE-TYPE,20X,7HU-VALUE/1X,4HNAME,16X,1H(,A4,A1,1H),6X,4HNAME,37X,1H(,
3A4,A1,1H),6X,7HSPACE-1,10X,7HSPACE-2/)
*D REPCRD.209,REPCRD.212
1 1 0 24
(1X,4A4,F11.2,6X,4A4,1X,2A4,4A4,F15.3,6X,4A4,1X,4A4)
10000100001000010000 9100001000010000100001000010000100001000010000 6
100001000010000100001000010000100001000010000

```

```

*/ VERIFICATION REPORTS LV-C AND LV-F REPORT A MULTI-
*/ PLIER FOR INTERIOR WALLS, EVEN THOUGH THIS IS NO
*/ LONGER A LEGAL KEYWORD FOR THE COMMAND. WE
*/ ELIMINATE THE MULTIPLIER AND ADD SURFACE-TYPE TO
*/ THE LV-F OUTPUT. THE REST OF THIS BUG FIX IS ON
*/ FILE DRLC.BUG.
*/
*D RLVC.190
*D RLVC.191,RLVC.192
WRITE (IREPFL) I24,IUNIQ,IONE,I13,I20,
1 (<IWNM>,II-1,4),(<IWAR>,(<IPRPNM>,II-1,4),
*I RLVF.14
DIMENSION IWLTYT(2,2), IWTYP(4,4)
*I RLVF.15
DATA IWLTYT / 4HQUIC, 4HK , 4HDELA, 4HYED /
DATA IWTYP / 4HSTAN, 4HDARD, 4H , 4H ,
1 4HAIR , 4H , 4H , 4H ,
2 4HADIA, 4HBATI, 4HC , 4H ,
3 4HINTE, 4HRNAL, 4H , 4H /
*D RLVF.34,RLVF.38
IWTYP = <IW-TYPE>
ITYP = 2
IF (<NRESF>.EQ.0) IITYP = 1
WRITE (IREPFL) I28,ISIX,IONE,ITHREE,I24,
1 (<IWNM>,II-1,4),(<IWAR>,(<IPRPNM>,II-1,4),
2 (IWLTYT(II,ITYP),II-1,2),(IWTYP(II,IWTYP),II-1,4),
3 (<UFACTR>,(<I2NM>,II-1,4),(NAME(II),II-1,4)
*/
*/

```



Bug D-42 -- If system type TPIU or FPIU is chosen in SYSTEMS and the user specifies the primary air flow rate with SUPPLY-CFM, the BASEBOARD-RATING for each zone is added twice to <ERMIND>, the heat addition rate which is reported in SV-A. The fix is on file sys.bug. Interim solution: none.
Date moved to the release file: April 25, 1986

```

*/ FIX FOR BUG D-42
*/ WHEN AN INDUCTION UNIT (TPIU OR FPIU) WAS CHOSEN IN
*/ SYSTEMS, AND SUPPLY-CFM WAS INPUT, THE BASEBOARD-RATING
*/ WAS ADDED TWICE TO <ERMIND>, PRODUCING AN INCORRECT
*/ NUMBER FOR THE ZONE HEAT ADDITION RATE REPORTED IN SV-A.
*/ THIS BUG WAS REPORTED AND FIXED BY ISIDORE MARCUS AT EMPA
*/ IN SWITZERLAND. YET ANOTHER FAMOUS USER!
*/
*I DESIGN.1315
IF (IUNIT.EQ.3) GO TO 53
*/

```

-----1-----2-----3-----4-----5-----6-----



Bug D-43 -- For a sunspace, if WIN-SHADE-TYPE for a window is MOVABLE-EXTERIOR or MOVABLE-INTERIOR and the SHADING-SCHEDULE value is 1.0, the shade will be considered closed and the interior solar radiation will be calculated as completely diffuse. This fix changes the shade status to open under these circumstances, allowing beam radiation to penetrate through the window into the sunspace, and thus increasing the solar gain through interior windows illuminated by direct sun. The fix is on file lds.bug. Interim solution: none.
Date moved to release file: 5-5-86

```

*/ FIX FOR BUG D-43
*/ SET SHADING-FLAG=1 (SHADE ASSIGNED BUT OPEN) IF
*/ WIN-SHADE-TYPE IS MOVABLE-INTERIOR OR MOVABLE-EXTERIOR,
*/ AND SHADING-SCHEDULE VALUE IS 1.0. ONLY THE SUNSPACE
*/ CALCULATION IS AFFECTED BY THIS CHANGE. FOR A SUNSPACE
*/ A CLOSED SHADE IS CONSIDERED TO COMPLETELY DIFFUSE SOLAR
*/ RADIATION WHEREAS AN OPEN SHADE ALLOWS PENETRATION OF
*/ BEAM RADIATION. (FCW 5-5-86)
*/
*D CAEXT.84
6002 MS=<@KGCURT>+ISCHR
C IF SHADING-SCHEDULE VALUE IS 1.0, SHADING-FLAG IS 1
IF(AA(MS).EQ.1.0) GO TO 80
IF(<CONDUCT-TMIN-SCH>.NE.0.OR.<MAX-SOLAR-SCH>.NE.0)
*/

```

-----1-----2-----3-----4-----5-----6-----

Date moved to release file: February 5, 1988

```

*/ FIX FOR BUG D-49
*/ WHENEVER A SYSTEMS INPUT CONTAINS BOTH PIU AND NON PIU
*/ SYSTEMS, EXTRANEOUS RECORDS FOR REPORT SV-B WERE WRITTEN
*/ TO THE REPORT FILE FOR THE NON-PIU SYSTEMS, RESULTING IN
*/ AN ABORT BY THE REPORT GENERATOR PROGRAM AFTER ALL THE
*/ SV-A REPORTS WERE PRINTED.
*/

```

```

*I SVB.18
  NSP = IS + (NS-1)*NSS
  IF (<SYSTEM-TYPE> .NE. 23) GO TO 100

```

```

*D SVB.20
*D SVB.23
*/

```

-----1-----2-----3-----4-----5-----6-----7-----



Bug D-50 -- A user (who shall remain nameless) used the set-default command in the LOADS input to turn all his spaces into plenums (zone-type=plenum). This causes the building net area to be zero, since plenums aren't added into the building floor area. This results in strange building level LOADS reports (mostly zero), odd SYSTEMS results, and a divide by zero abort in PLANT when creating the BEPS report. An error message has been added to LOADS to avoid this problem.

Interim solution: Don't do it. Fix is on file: lds.bug, sim.bug.

Date moved to the release file: February 5, 1988.

```

*/ FIX FOR BUG D-50
*/ WHEN THE USER MANAGES TO MAKE ALL HIS SPACES IN LOADS
*/ ZONE-TYPE-PLENUM, THE BUILDING NET AREA IS ZERO. THIS
*/ RESULTS IN STRANGE OUTPUT AT THE BUILDING LEVEL FROM
*/ LOADS (MOSTLY ZEROES), DOESN'T DO MUCH FOR SYSTEMS, AND
*/ EVENTUALLY RESULTS IN A DIVIDE BY ZERO IN PLANT, WHILE
*/ WRITING OUT THE BEPS REPORT RECORDS. THERE IS ALSO A
*/ MOD TO SIM, TO INSERT THE ERROR MESSAGE.
*/

```

```

*I LOADS.286
  IF (IERRF .EQ. 3) CALL ABT

```

```

*I READSF.674
  IF (BNAREA .LE. 0.) THEN
    CALL MSGSIM(4,N,N,N,N)
    IERRF = 3
  END IF

```

```

*IDENT PLTBG1
*/

```

```

*/ THIS IS PART OF THE FIX FOR BUG D-50
*/ SEE LDS.MOD FOR AN EXPLANATION
*/

```

```

*D MSGSIM.45
  104 WRITE (IOUTPT,1004) ERRPX
  1004 FORMAT(3A4,27H BUILDING NET AREA IS ZERO!,
    1 56H CHECK ZONE-TYPE, SPACE MULTIPLIER, AND FLOOR-MULTIPLIER.)
*IDENT SYSBG1
*/

```

-----1-----2-----3-----4-----5-----6-----7-----



Bug D-51 -- PLANT aborts with a divide by zero error when a gas domestic hot water heater has been defined in the PLANT input, but there is no domestic hot water load (due to the user forgetting to input the BUILDING-RESOURCE command in the LOADS input.

Interim solution: don't forget the BUILDING-RESOURCE input.

Fix is in file: plt.bug

Date moved to the release file: February 5, 1988

```

*/ FIX FOR BUG D-51
*/ WHEN THE DOMESTIC HOT WATER HEATER IS AUTO SIZED TO
*/ ZERO, DUE TO NO DOMESTIC HOT WATER USE, THERE IS A
*/ DIVIDE BY ZERO WHEN CALCULATING THE PART LOAD RATIO.
*/

```

```

*I GASDHW.34
  IF (OPCAP(6) .LE. 0.) RETURN

```



Bug D-52 -- In PIU systems when NIGHT-CYCLE-CTRL=ZONE-FANS-ONLY, the system fans were actually cycling on; that is, it was acting like NIGHT-CYCLE-CTRL= CYCLE-ON-ANY.

Interim solution: none. Fix is in file: sys.bug

Date moved to the release file: February 5, 1988.

```

*/ FIX FOR BUG D-52
*/ FOR PIU SYSTEMS, WHEN NIGHT-CYCLE-CTRL=ZONE-FAN-ONLY
*/ THE SYSTEM FANS WOULD CYCLE ON
*/ (I.E., NIGHT-CYCLE-CTRL=CYCLE-ON-ANY).
*/

```

```

*I DAYCLS.187
  IF (<NIGHT-CYCLE-CTRL> .EQ. 3) GO TO 52
*D PIU.37,39
*I PIU.57
  C      SET ZONE FAN FLAG

      ZFONLY = 0.
      IF (<NIGHT-CYCLE-CTRL> .EQ. 3) ZFONLY = 1.

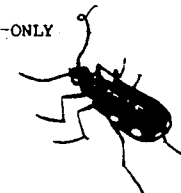
```

```

*/

```

-----1-----2-----3-----4-----5-----6-----7-----



Bug D-53 -- In PIU systems, for TERMINAL-TYPE=SERIES, the electricity consumption of the zone fans was not accounted for. Interim solution:

none. Fix is in file: sys.bug Date moved to the release file: February 5, 1988.

```

*/ FIX FOR BUG D-53
*/ FOR PIU SYSTEMS, TERMINAL-TYPE=SERIES, THE KW FOR THE
*/ ZONE FANS WAS NOT ADDED IN TO THE ELECTRICAL CONSUMPTION,
*/ DUE TO <ZFONF> (ZONE FAN ON FRACTION) WAS NEVER SET.
*/

```

```

*I PIU.395
  IF ((<TERMINAL-TYPE> .EQ. 3) .AND. (FON .GT. 0)) <ZFONF> = 1.

```

```

*/

```

-----1-----2-----3-----4-----5-----6-----7-----

Bug D-54 -- On the VAX, when a DAY-SCHEDULE input, but there are no schedules, the program will die in BDL when attempting to write the schedule record of the standard file.

Interim solution: none. Fix is on file: bdl.bug

Date moved to the release file: December 8, 1987.

```

*/ FIX FOR BUG D-54.
*/ BUG IN SCEDO VAX VERSION. IF ANY DAY-SCHEDULE BUT NO
*/ SCHEDULE INPUT, SCEDO CALLS WRITTEN WITH LENY=0 WHICH
*/ GETS ADJUSTABLE ARRAY DIMENSION ERROR
*I SCEDO.150
  IF ( LENY .LT. 1 )    LENY = 1
*/

```



Bug D-55 -- All the special error messages for the zone command in SYSTEMS would come out incorrectly or not at all. These messages have to do with the piu system (lack of an INDUCED-AIR-ZONE) and with refrigeration equipment.

Interim solution: none. Fix is on file: bdl.bug

Date moved to the release file: February 8, 1988

```

*/ FIX FOR BUG D-55
*/ THE KEYWORD POINTERS (FOR ERROR MESSAGES) IN FOR THE ZONE
*/ COMMAND IN SYSTEMS WERE OFF BY ONE POSITION, CAUSING IN-
*/ CORRECT ERROR MESSAGES TO BE PRINTED. THESE MESSAGES HAVE
*/ TO DO WITH PIU SYSTEMS AND WITH REFRIGERATION EQUIPMENT.
*/
*D DATSDL.126,127
  DATA IKIAZ /63/, IKTT /61/, IKRZB/65/, IKRDT /67/, IKRET /68/,
  1 IKRZDT /71/, IKRAK/ 73/, IKRDE /76/, IKRDM /75/
*IDENT DKYBG1
*/

```

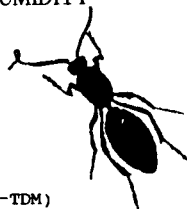
Bug D-56 -- When dehumidification is required (by specifying a MAX-HUMIDITY) there would be a rarely occurring divide by zero error in SYSTEMS. The known example occurred in a packaged single zone system, but the error could probably occur in any system. Interim solution: Change the specified MAX-HUMIDITY value slightly. Fix is on file: sys.bug

Date moved to the release file: February 9, 1988.

```

*/ FIX FOR BUG D-56
*/ DEHUMIDIFICATION (USING MAX-HUMIDITY) CAN INFREQUENTLY
*/ CAUSE A 0/0 ABORT IN SDSF IN SYSTEMS.
*/
*D SDSF.263
  DTHUM = ((WCOIL-WCOL)/AMAX1(WCOIL-WCOLM,1.E-6))*(TC-TDM)
*D SDSF.271
  DTSUP = (TR-DTP) - (TC+<DUCT-DELTA-T>)
*D SDSF.274
  CFMC = CFM*AMAX1(0.,AMIN1(PCM,DTSUP/AMAX1(DTSUP+DTHUM,1.E-6)))
*IDENT WTHBG1
*/

```



The Vol. 10, No. 3 issue of *Energy and Buildings* was devoted to Building Energy Simulation; we have reprinted the table of contents below. This issue would be an important addition to any building energy library. Contact the publisher for availability of single copies: Elsevier Sequoia S.A., P.O. Box 564, 1001 Lausanne 1, Switzerland.

ENERGY AND BUILDINGS

Special Issue devoted to Building Energy Simulation

Guest Editors: J. A. Clarke (Glasgow, U.K.) and A. D. Irving (Didcot, U.K.)

Building energy simulation: an introduction	157
J. A. Clarke (Glasgow, U.K.) and A. D. Irving (Didcot, U.K.)	
Advances in building energy simulation in North America	161
F. Winkelmann (Berkeley, CA, U.S.A.)	
Advances in building energy simulation in the U.K. — The Science and Engineering Research Council's programme	175
T. J. Wiltshire and A. J. Wright (Newcastle upon Tyne, U.K.)	
Modelling of air infiltration in single- and multi-cell buildings	185
D. W. Etheridge (London, U.K.)	
Control system simulation in North America	193
G. E. Kelly (Gaithersburg, MD, U.S.A.)	
Control system simulation — computer control	203
A. L. Dexter (Oxford, U.K.)	
Validation of dynamic thermal models	213
A. D. Irving (Didcot, U.K.)	
Validation of building energy analysis simulation programs at the Solar Energy Research Institute	221
R. D. Judkoff (Golden, CO, U.S.A.)	
Building energy simulation — a user's perspective	241
D. Newton, R. James and D. Bartholomew (London, U.K.)	
Some trends in computing: the implications for simulation	249
D. MacRandal (Didcot, U.K.)	
The energy kernel system	259
J. A. Clarke (Glasgow, U.K.)	
CONFERENCE CALENDAR	267
AUTHOR INDEX	268
SUBJECT INDEX	269

ibpsa[®] - APPLICATION FOR MEMBERSHIP

I wish to apply for membership in the International Building Performance Simulation Association (ibpsa).

CIRCLE ITEMS IN
EACH CATEGORY:

Areas of Interest

- 1.01 Analytical Techniques
- 1.02 Component Simulation
- 1.03 Computer Science
- 1.04 Control Systems
- 1.05 Development Applications
- 1.06 Marketing Applications
- 1.07 Measurement Techniques
- 1.08 Numerical Techniques
- 1.09 Optimization
- 1.10 Policy Applications
- 1.11 System Simulation
- 1.12 Other _____

Profession

- 2.01 Architectural Engineer
- 2.02 Business Administration
- 2.03 Chemical Engineer
- 2.04 Civil/Structural Engineer
- 2.05 Electrical Engineer
- 2.06 Mathematician
- 2.07 Mechanical Engineer
- 2.08 Operations Researcher
- 2.09 Physicist
- 2.10 Other _____

Company / Institution

- 3.01 Architect
- 3.02 Consulting Engineer
- 3.03 Contractor
- 3.04 Equipment Manufacturer
- 3.05 Federal Government
- 3.06 Local Government
- 3.07 Research Institute
- 3.08 State Government
- 3.09 University
- 3.10 Other _____

Professional Duties

- 4.01 Academic Research
- 4.02 Applications Research
- 4.03 Building Engineer
- 4.04 Corporate Energy Director
- 4.05 Education
- 4.06 Energy Engineer
- 4.07 Plant Engineer
- 4.08 Product Development
- 4.09 R & D Manager
- 4.10 Other _____

MEMBERSHIP CLASSIFICATION DESIRED (check one)

- ☐ **Sustaining Member**..... \$500.00/yr
An individual, company, or institution in related practice.
- ☐ **Member**..... \$75.00/yr
A graduate from a college or university, or a registered Professional Engineer or Architect.
- ☐ **Student Member**..... \$25.00/yr
An individual under 25 years of age who is a full-time student.

Amount enclosed: \$ _____

Name _____
Last First Initial

Title _____

Company Name _____

Company Address _____

_____ City State Zip Phone

Home Address _____

_____ City State Zip

Circle place where *ibpsa* mail should be sent: Company Home

Experience in Building Performance Simulation: _____ yrs.

EDUCATION:

College _____ Degree _____ Field _____ Year _____

College _____ Degree _____ Field _____ Year _____

I attest that my statements in this application are correct, and if elected a member, that I will be governed by the Association's constitution and bylaws, and that I shall promote the purposes of the Association to the extent of my abilities.

_____ Applicant's Signature Date

Please mail to:

ibpsa
International Building Performance
Simulation Association
%ADM Associates, Inc.
3299 Ramos Circle
Sacramento, CA 95827
U S A

FOR OFFICE USE ONLY

amount paid:

date paid:

check #:

process date:

by:

ibpsa
Care of: ADM Associates
3299 Ramos Circle
Sacramento, California 95827
USA

-staple-

■ ■ ■ ■ DOE-2 DIRECTORY ■ ■ ■ ■

of

Program Related Software, Services, and Publications

■ ■ NOTE ■ ■

Any user of the DOE-2 program who offers related software, training in the use of DOE-2, consulting, or program support should contact Kathy Ellington for inclusion in this directory.

■ ■ SOFTWARE ■ ■

DOE-2.1C for Micros (MICRO-DOE2)

Gene Tsai
Acrosoft International
3120 S. Wadsworth Blvd.
Denver, CO 80227
Phone: (303) 969-0170

■ ■ UTILITY PROGRAMS ■ ■

Pre- and Post-Processor Software

James Trowbridge
Trowbridge Software Engineering
4884-D Sunset Terrace
Fair Oaks, CA 95628
Phone: (916) 962-3001

Graphs from DOE-2

Ernie Jessup
E. Jessup & Associates
4977 Canoga Avenue
Woodland Hills, CA 91364
Phone: (818) 884-3997

■ ■ SERVICE BUREAUS ■ ■

DOE-2 Computer Service

Dashka Slater
Berkeley Solar Group
P.O. Box 3289
Berkeley, CA 94703
Phone: (415) 843-7600

■ ■ CONSULTANTS ■ ■

Computer-Aided Mechanical Engineering

Mike Roberts
Roberts Engineering Co.
11946 Pennsylvania
Kansas City, MO 64145
Phone: (816) 942-8121

Large Facility Modelling

George F. Marton, P.E.
1129 Keith Avenue
Berkeley, CA 94708
Phone: (415) 841-8083

Master Classes, Tutorials, Consulting

Bruce Birdsall
"In Support of Energy Software"
166 Caldecott Lane, Suite 113
Oakland, CA 94618
Phone: (415) 841-2050

Classes and Consulting

Richard Kuo
Knowledge Laboratory
362 Ripley Court
Naperville, IL 60565
Phone: (312) 416-1696

Consulting and Training

Jeff Hirsch
2138 Morongo
Camarillo, CA 93010
Phone: (805) 482-5515

■ ■ ■ ■ DOCUMENTATION ■ ■ ■ ■

— Complete 2.1C Documentation	PB-852-11449	\$288.00/each *
— 2.1C Update Package	PB-852-11431	\$ 87.00/each *
— Engineers Manual	DE-830-04575	\$ 39.50/each *

To Order by Separate Titles:

— BDL Summary (2.1C)	DE-850-12580	\$ 14.95/each *
— Users Guide (2.1A)	LBL-8689, Rev.2.	\$ 44.95/each *
— Sample Run Book (2.1C)	DE-850-12582	\$ 50.95/each *
— Reference Manual (2.1A)	LBL-8706, Rev.2	\$ 92.95/each *
— DOE-2 Supplement (2.1C Update)	DE-850-12581	\$ 25.95/each *

To Order Documentation, Write or Call:

National Technical Information Service, U.S. Dept. of Commerce,
5285 Port Royal Road, Springfield, VA 22121
For Credit Card Purchases, Phone: (703) 487-4650

To Be Put On The USER NEWS Distribution List, Write:

Ms. Jan Carter, National Energy Software Center,
9700 South Cass Avenue, Argonne, IL 60439

Questions Or Comments About DOE-2 Or The USER NEWS, Write:

Kathy Ellington, Simulation Research Group, 90-3147,
Lawrence Berkeley Laboratory, Berkeley, CA 94720

* For delivery to addresses outside the United States, please double the price of the documentation.

The DOE-2 USER NEWS
c/o National Energy Software Center
Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439
U.S.A.

<mailing label>

300-10/88 This work was supported by the Assistant Secretary for Conservation and Renewable Energy, Office of Building and Community Systems, Building Systems Division of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098. Lawrence Berkeley Laboratory is an equal opportunity employer. ***** DISCLAIMER — This document was prepared as an account of work sponsored by the United States Government. Neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. References herein to any specific commercial products, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or the Regents of the University of California, and shall not be used for advertising or product endorsement purposes.