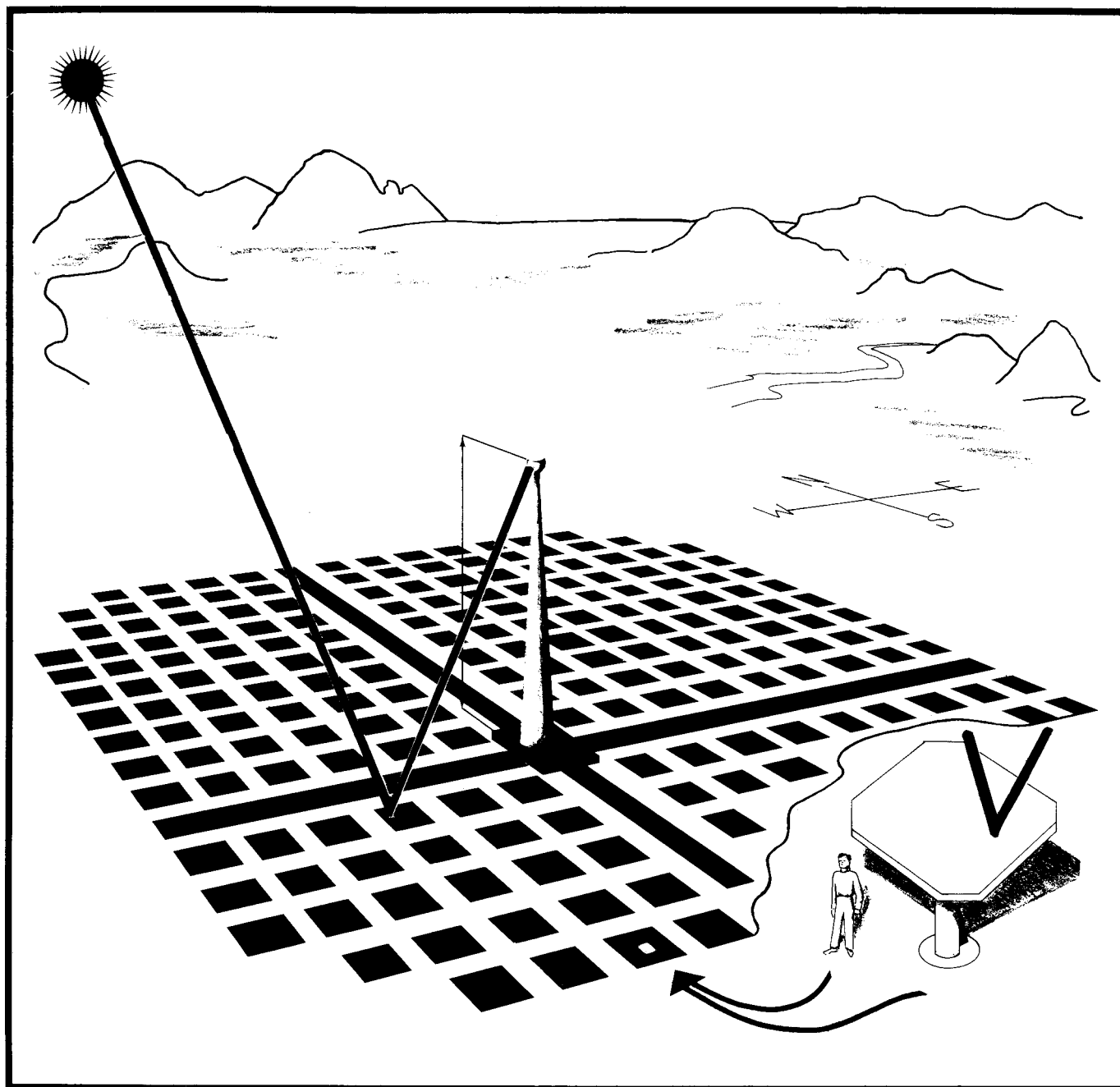


A User Manual for the University of Houston Solar Central Receiver— Cellwise Performance Model: NS

Volume 2 of 2

MASTER



A Code Documentation Project
prepared by the
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University of Houston
Houston, Texas 77004

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Solar Energy System Simulation
and Analysis for Central Receiver
Systems

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A USER MANUAL FOR THE UNIVERSITY OF HOUSTON
SOLAR CENTRAL RECEIVER CELLWISE PERFORMANCE MODEL: NS

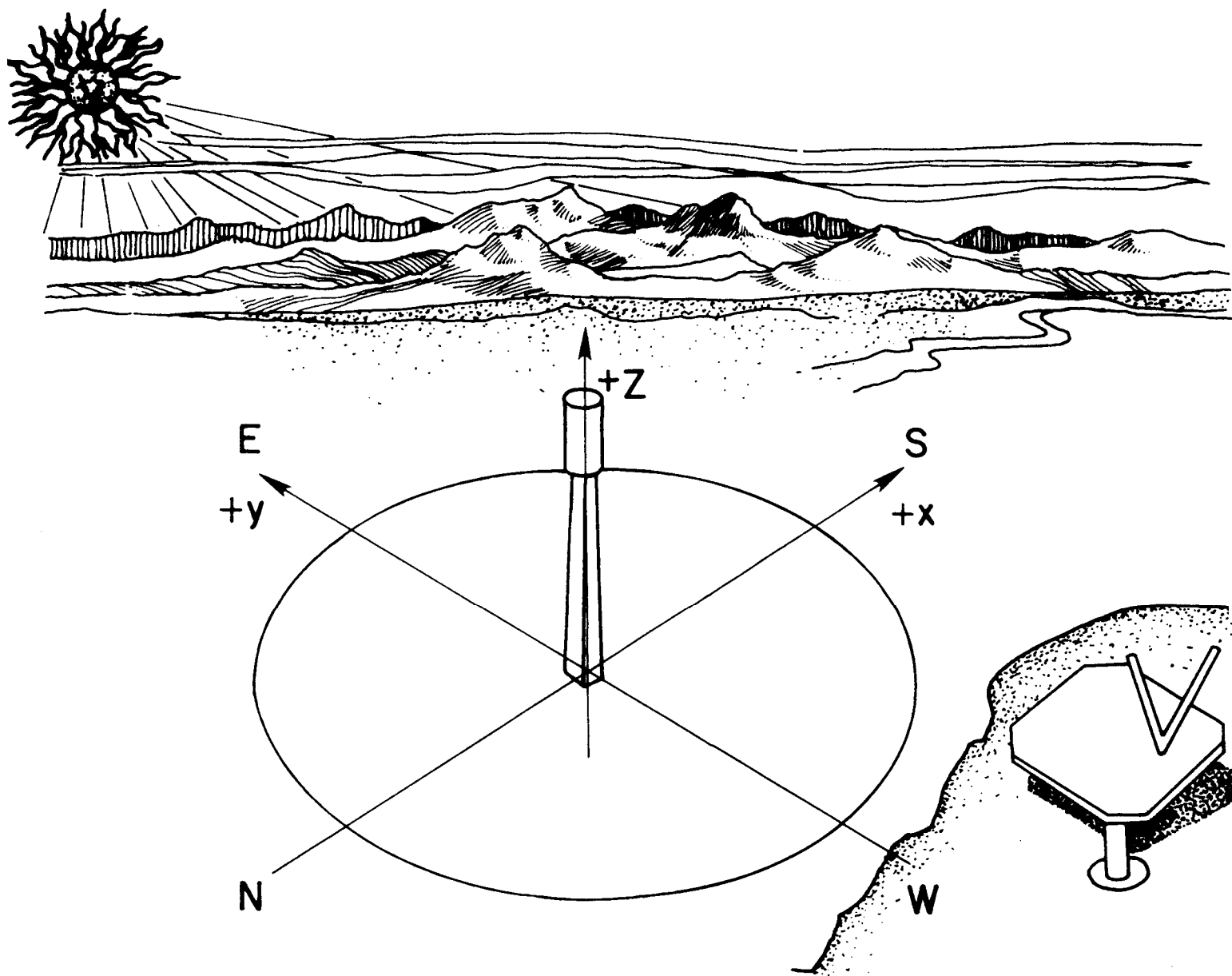
VOL. II OF 2 VOLS.

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Flyleaf: The System Concept

The central receiver system for solar thermal power conversion contains the following major components: the sun, the field of heliostats, the tower, the tower top receiver, the vertical plumbing, and the working fluid. The power plant and thermal storage system are included in the overall system but are not included in the optical model considered here.

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Purpose of Volume II

Volume II contains a complete listing of the inputs and outputs of four test runs designed to illustrate the most important features of the NS-cellwise performance code.

It is not intended as a "stand alone" document. Rather, it is intended to be read only in conjunction with Vol. 1. Sections 1-5 of Vol.I introduce and describe the NS performance code, while section 6 describes in detail the listings shown in the following pages.

Appendix A Complete Set of Inputs

The input data are maintained in the four modules (MAIN, HELIOS, FIELD, and RECOVER), listed below.

The first six lines of MAIN refer to a time sharing execution under Honeywell systems.

The outputs of the four test runs are listed in their entirety in appendices B-E. These four runs are obtained from the given inputs by switching the index parameters in the

CALL STDNS(JGRECP,1)

statement, which occurs on line 262 of MAIN. The 1 can be replaced by 2, 3, or 4 to obtain the 1st, 2nd, 3rd, or 4th runs as explained in the comments below line 262. Subroutine STDNS begins at line 302 of MAIN.

The MAIN program module drives both the NS-cellwise performance program and the RC-cellwise optimization program. Since these programs require differ field arrays, the PARAMETER situation is somewhat complicated. See comment beginning with line 43.

```

1##FRNH-200 HSELCG1122/NS/MAIN;HSELCG1122/NS/HELIO;
2##HSELCG1122/NS/RECVR;HSELCG1122/NS/FIELD;
3##HSELCG1122/NS/R-YEAR;HSELCG1122/NS/R-RSABS;HSELCG1122/NS/R-CLOUD;
4##HSELCG1122/NS/R-FINTS;HSELCG1122/NS/R-HCOEF;HSELCG1122/NS/R-ANNUAL=
5##(CORE=50,BCD,ULIB) UH/SLIBB/UH,R #HSELCG1123/NNN7X7"14",R;
6##HSELCG1122/OUTPUT1"06";HSELCG1122/CARDS"30"
7C
8C
9CRC&NS      JOINT INPUT PROGRAM FOR BOTH RC AND NS CODE SYSTEMS
10C
11C
12C      THE RC CODE IS THE CELLWISE OPTIMIZATION CODE SYSTEM
13C      RC HAS VARIABLE DIMENSIONS FOR WHOLE FIELD IN NS SYSTEM
14C      THE NS CODE IS THE CELLWISE PERFORMANCE SYSTEM
15C      NS HAS VARIABLE DIMENSIONS FOR EAST HALF OF SYM. FIELD
16C      SHADING AND BLOCKING SUBROUTINE ARE AVAILABLE FOR SPLIT
17C      RECTANGULAR SQUARE HEXAGONAL AND OCTAGONAL HELIOSTATS
18C      BOTH THE RC AND THE NS CODES PROVIDE FOR TIME AVERAGING
19C      RC INTEG. HOURS BY TRAPZD. APPROX. WITH UNEQUAL STEPS
20C      NS INTEG. HOURS BY QUAD. APPROX. WITH EQUAL STEPS
21C      DAYS ARE INTEG. BY QUADRATIC APPROX. WITH EQUAL STEPS
22C
23C      OUTPUT FILE CODES USED FOR RC SYSTEM
24C      06 = STANDARD PRINT FILE
25C      07 = SUN SAMPLE FILE
26C      08 = SHADING AND BLOCKING DATA FILE
27C      11 = OUTPUT OF ENHEL FOR NS CODE (SEE POSTPR)
28C      13 = OUTPUT FOR CELLAY PROGRAM
29C      14 = NODAL INTERCEPTION DATA FROM RECEIVER
30C      15 = SYSTEM CREATED FILE FOR FINT (SEE MAIN)
31C      17 = TRIM INDICES FOR LAYOUT PROGRAM (SEE TCONTR)
32C
33C      OUTPUT FILE CODES USED FOR NS SYSTEM
34C      06 = STANDARD PRINT FILE
35C      09 = AIM POINT FILE (SEE CYLN)
36C      10 = CAVITY GEOMETRY DATA
37C      11 = INPUT OF ENHEL MATRIX (SEE HREPS)
38C      14 = NODAL INTERCEPTION DATA FROM RECEIVER
39C      30 = CARD OUTPUT FOR ANNUAL SUMMARY OR CLOUD DATA
40C      39 = SYSTEM CREATED FILE FOR PANELV (SEE FINTP1)
41C      40 = SYSTEM CREATED FILE FOR PANSUM (SEE FINTP1)
42C
43C ***** SELECTION OF PROGRAMS ***** RC CODE VERSUS NS CODE *****
44C
45C      PARAMETER IPROG = -1      ;* 1 FOR RCELL AND PLOT FOR NEW COEFS
46C                                0 FOR RCELL ONLY
47C                                -1 FOR YEAR
48C
49C CONTROL OF VARIABLE DIMENSIONS FOR RECEIVER MODEL
50C      PARAMETER IGREC = 20      ;*NUMBER OF ROWS FOR FLREC
51C      PARAMETER JGREC = 18      ;*NUMBER OF COLUMNS FOR FLREC
52C      PARAMETER NSURF = 1       ;*NUMBER OF SURFACES FOR CAVITY
53C      PARAMETER KGREC = IGREC * JGREC ;*DIMS OF FLREC AND PANEL
54C      KGREC = NUMBER OF ZONES FOR A CAVITY RECIEVER
55C
56C CONTROL OF VARIABLE DIMENSIONS FOR NS PERFORMANCE CODE
57C      PARAMETER NCELL = 7       ;*NUMBER OF ROWS FOR NS FIELD
58C                                (IE. STEPS NORTH TO SOUTH)
59C      PARAMETER NCELJ = 7       ;*NUMBER OF COLUMNS FOR NS FIELD
60C                                (IE. STEPS WEST TO EAST - WHOLE FIELD)
61C      PARAMETER NCELJ4= 4*NCELJ ;*FOR ARRAY OF SAB EVENT'S
62C      PARAMETER JGRECP=JGREC+1 ;*FOR PANELH USE JGRECP = JGREC+1
63C
64C CONTROL OF VARIABLE DIMENSIONS FOR RC OPTIMIZATION CODE
65C      PARAMETER ID = 1          ;*USE ID = NCELL FROM PREVIOUS NS RUN
66C      PARAMETER JD = 1          ;*USE JD=(NCELJ+1)/2 ,PREVIOUS NS RUN
67C
68C ***** DO NOT REQUIRE STORAGE FOR BOTH RC AND NS ARRAYS *****
69C
70C CONTROL OF VARIABLE DIMENSIONS FOR ARRAYS IN NS AND RC CODES
71C      PARAMETER MAXIJ = 20      ;*MAX OF (IGREC,JGREC,ID,JD,NCELL,NCELJ)
72C                                FOR AVERAGES - IGNORE JGREC FOR CAVITY
73C      PARAMETER IC = 7          ;*NUMBER OF ROWS SAME FOR BOTH CODES
74C                                (IE. STEPS NORTH TO SOUTH)
75C      PARAMETER JC = 7          ;*NUMBER OF COLUMNS CHANGES
76C                                (RC-HALF FIELD, NS-WHOLE FIELD)
77C      PARAMETER KC = 7          ;*NUMBER OF COLUMNS FOR IGRND MATRIX
78C                                (WHOLE FIELD FOR BOTH RC AND NS NODES)
79C
80C ***** END OF PARAMETER INPUT LIST ***** FNL 3/20/80
81C
82C VARIABLE ARRAYS OCCURRING IN BOTH RC AND NS

```

```

83  DIMENSION ASURF(NSURF),NSF(NSURF),NST(NSURF),FLRECP(MAXIJ)
84  DIMENSION AI(MAXIJ),AJ(MAXIJ),XNC(JC),YNC(IC)
85  DIMENSION FLREC(KGREC),PANEL(KGREC)
86  DIMENSION GREC(MAXIJ,6),AZC(JGREC)
87  DIMENSION IGRND(IC,KC),JGRND(IC,KC)
88  DIMENSION FINT(IC,JC),FGRND(IC,JC)
89  DIMENSION XA(IC),YA(JC),SR(IC,JC)
90  DIMENSION XC(IC,JC),YC(IC,JC),ZC(IC,JC),TX(IC,JC)
91  DIMENSION AIGRND(IC,JC),ENHCL(IC,KC)
92  DIMENSION ELEV(IC,JC),COSPH(IC,JC),XGRND(IC,JC),YGRND(IC,JC)
93C
94C VARIABLE ARRAYS REQUIRED FOR RC CODE ONLY
95  DIMENSION TGRND(ID,ID),IMECH(ID,JD),CONT(ID,JD),KGRND(ID,KC)
96  DIMENSION HGRND(ID,JD),THETA(ID,JD),TEST1(ID,JD)
97  DIMENSION EL(ID,JD),EF(ID,JD),FLOSS(ID,JD)
98  DIMENSION ENRGY(ID,JD),EGERG(ID,JD),RGRND(ID,JD)
99C
100C VARIABLE ARRAYS REQUIRED FOR NS CODE ONLY
101  INTEGER SB(NCELI,NCELJ4)
102  DIMENSION ERGM1(NCELI,NCELJ),ERGM2(NCELI,NCELJ),FAREA(NCELI,NCELJ)
103  DIMENSION FCOSI(NCELI,NCELJ),FMIRR(NCELI,NCELJ),TFLUX(NCELI,NCELJ)
104  DIMENSION PANELH(7,9,JGRECP),PANELV(JGRECP),CPOMR(NCELI,NCELJ)
105  DIMENSION SRT(NCELI,NCELJ),SLF(NCELI,NCELJ)
106  DIMENSION SUP(NCELI,NCELJ),SDN(NCELI,NCELJ)
107C
108C
109C CONSTANTS FOR TIME CONTROLS
110C
111  COMMON /TIME/ JDOVEQ,ESUNO,HYEARS,IMAX,JMAX,NSKIP,KVEC(13)
112C  KVEC GIVES SAMPLE DAYS - 13TH DAY UNUSED BUT AVAILBLE
113  DATA KVEC/ 93,124,155,186,216,246,276,306,336, 0, 31, 62,365/
114  JDOVEQ = 2441320  ;*JULIAN DAY OF VERNAL EQUINOX FOR MARCH 21,1980
115  ESUNO = 10.  ;*ELEVATION OF SUN AT STARTUP IN DEGREES
116  IMAX = 19  ;*NUMBER OF SAMPLE HOURS= 3,7,11,19 ..RC ONLY
117  JMAX = 7  ;*NUMBER OF SAMPLE DAYS = 7 REQUIRED FOR RCELL
118  NSKIP = 30  ;*INCREMENT OF DAYS THROUGH YEAR
119C
120C - TIME CONTROLS FOR ANNUAL PERFORMANCE PROGRAM
121  COMMON /TIMEX/IDAYS,IHORS,NDAY1,HOUR0,HOUR1,HOUR2,NHRS,DHOUR
122  IDAYS = 0  ;*2 FOR 7 SAMPLE DAYS USING KVEC
123C  1 FOR JMAX DAYS USING NDAY1 AND NSKIP
124C  0 FOR NDAY1 ONLY
125  IHORS = 0  ;*2 FOR PM HRS - NOON TO ESUNO
126C  1 FOR HOUR1 TO HOUR2 IN NHRS-1 STEPS
127C  0 HOUR0 ONLY
128C  -1 FOR AM, -2 FOR PM STARTUP AT ESUNO
129  NDAY1 = 0  ;*FIRST DAY FOR CALC
130  HOUR0 = 0.000  ;*SELECT HOUR FOR CALC
131  HOUR1 = -5.33  ;*FIRST HOUR FOR STARTUP CALC
132  HOUR2 = -4.68  ;*LAST HOUR FOR STARTUP CALC
133  NHRS = 7  ;*NUMBER OF SAMPLE HOURS= 5,7,9 IF IHORS=2
134  DHOUR = 0.1721  ;*HOURS BETWEEN CALCULATIONS FOR IHORS=-1,-2,0
135C
136C
137C
138  CALL FIELD(HT,NTOW)
139  CALL HELIOS(HT)
140  CALL RECVER(IGREC,JGREC,HT)
141C
142C
143C CONSTANTS FOR SUN
144  COMMON /SUNX/ ALPHAL,R2,R4,R6
145  DATA R2/.22416740E-0/,R4/.10433392E-0/,R6/.61979628E-1/
146  ALPHAL = .004660  ;* SOLAR LIMB ANGLE IN RADIANS
147  COMMON /SUNF/ ROOTSQ,CF(4)  ;*FOR FLASH ONLY
148  DATA ROOTSQ /5.213986/ ;*SUN SIZE FOR SIGMA=.003
149  DATA (CF(I),I=1,4) / .7286088,-.4695325,.1112683,-.0092093/
150C THE ABOVE ARE COEFFICIENTS FOR FLASH FROM A KGEN2 FIT ON LBL SUN
151C WITH SIGMA = .003 RADIANS.
152C
153C - INPUT COLLECTOR ARRAY SIZE FOR NS CODE
154C - OUTPUT COLLECTOR ARRAY SIZE FOR RC CODE
155  DATA ((IGRND(I,J),J=1,NCELJ),I=1,NCELI)
156  & /0,0,4,4,4,0,0,
157  & 0,4,4,4,4,4,0,
158  & 4,4,4,4,4,4,4,
159  & 4,4,4,3,4,4,4,
160  & 4,4,3,0,3,4,4,
161  & 3,4,4,3,4,4,3,
162  & 0,3,4,4,4,3,0/
163C
164C
165C
166C - PROGRAM CONTROL FOR ANNUAL PERFORMANCE

```

```

167 COMMON /CALCX/ICDEF,ISVIS,NREC,DELR,JTRIM,
168 & ISUMS,KANNU,ICLDF,JROW,JCOL
169 ICDEF = 1 ;*1 FOR HERMITE COEFS, 0 FOR FLASH
170 ISVIS = 0 ;* RELEVANT TO CAVITY RECEIVER MODEL
171C 0 NODES ON APERTURE SURFACE NOT VISIBLE
172C 1 NODES ARE VISIBLE
173 NREC = 21 ;*MAX DIMENS. OF FLUXOR FOR IMAGE PLANE OUTPUT
174 DELR = 1.0 ;*METERS BETWEEN NODES OF FLUXOR ONLY
175 JTRIM = 0 ;*1 READS ENHIL FROM FILE 11, 0 NOT
176 ISUMS = 0 ;*1 FOR SUM OVER HOURS FOR ANNUAL OUTPUT, 0 NOT
177 KANNU = 0 ;*1 PANEL POWER SUMMARY
178C (WRITES FILES 39,40 AND CALLS PANPOW)
179C 2 SAME AS 1 AND WRITES FILE 30 FOR PUNCH
180C 0 NO ACTION AS ABOVE
181 ICLDF = 0 ;*1 FOR CLOUD STUDY 0 NOT
182C CLOUD STUDY REQUIRES FILE 40
183C BUT DOES NOT CALL PANPOW
184 JROW = 0 ;*0 GIVES ALL ROWS OTHERWISE JROW ONLY
185 JCOL = 0 ;*0 GIVES ALL COLS OTHERWISE JCOL ONLY
186C
187C - PRINT AND I/O CONTROLS FOR ANNUAL PERFORMANCE PROGRAM
188 COMMON/PRINTX/IPSAB,IPMIR,IPANCT,JDISK,KDISK
189 IPSAB = -1 ;*2 FOR DIAGNOSTIC BOUNDARY VECTOR OUTPUT
190C 1 FOR SHADING AND BLOCKING ARRAY PRINT
191C 0 FOR NO SAB OUTPUT, -1 FOR NO SAB CALC
192 IPMIR = 1 ;*2 FOR IMAGE PRINT, 1 FOR HEADINGS, 0 NONE
193 IPANCT = 0 ;*2 FOR PRINT&CONTOUR, 1 FOR CONTOUR, 0 NONE
194C (APERTURE STUDY PRINT CONTROL VIA CYLN)
195 JDISK = 1 ;*1 TO WRITE WHOLE FIELD NODE FILE
196C 0 NOT TO WRITE NODE FILE 14
197C -1 TO WRITE A HALF FIELD NODE FILE
198 KDISK = 0 ;*1 TO READ(14,901) AND CALL- FINTP1
199C 0 FOR FINTS FROM USER ROUTINE FINTU
200C -1 FOR FINTS FROM INPUT DATA
201C
202C - INPUT COLLECTOR ARRAY LIMIT * * * * * FOR RC CODE
203C - INCLUDES SUBTOWER EXCLUSION * * * * *
204 DATA ((JGRND(I,J),J=1,KC),I=1,IC)
205 & /4,4,4,4,4,4,4,4,
206 & 4,4,4,4,4,4,4,4,
207 & 4,4,4,4,4,4,4,4,
208 & 4,4,4,3,4,4,4,4,
209 & 4,4,3,0,3,4,4,4,
210 & 4,4,4,3,4,4,4,4,
211 & 4,4,4,4,4,4,4,4/
212C
213C
214CONSTANTS RELATING TO PROGRAM CONTROL - FOR RC CODE ONLY
215 COMMON /CALC/ IROW,ICNTR,ITRIM,ISUN,LSUN
216 IROW = 0 ;*ROW NUMBER FOR TEST ,ZERO GIVES ALL ROWS
217 ICNTR = 1 ;*GOES TO ENTRY CNTR (5 OPTIONS-SEE CODE)
218C ICNTR = -1 FOR AVERAGES ONLY
219C ICNTR = 0 FOR PRINT ONLY
220C ICNTR = 1 FOR PRINT AVERAGES AND CONTOURS
221C ICNTR = 2 FOR PRINT AND CONTOURS
222C ICNTR = 3 FOR PRINT CONTOURS AND TRIM FILE 17
223 ITRIM = 0 ;*1 WRITES ENHIL TO FILE 11, 0 NOT
224 ISUN = 1 ;*0 FOR UNIFORM WTS, 1 FOR SINE WTS
225C GOES TO SUNSAM TO PROBE LOW SUN
226 LSUN = 1 ;*1 TO CALC&WRITE(07,901) YEARLY SUN SAMPLE,
227C 0 TO READ&PRINT SUN SAMPLE FROM FILE 7
228C -1 TO READ AND NOT PRINT SUN SAMPLE
229C
230C - PRINT AND I/O CONTROLS FOR OPTIMIZATION PROGRAM
231 COMMON /PRINT/IFINT,KTAPE,LTAPE,IPDAY,IPLONG,
232 & INERGY,IFLUX,TRMF,TRMI
233 IFINT = 1 ;* ONLY ACTIVE WITH KTAPE = 1
234C -1 READS FINT FILE(15) AND BYPASS FLUX PRINT
235C 0 READS NODE FILE(14) AND BYPASS FLUX PRINT
236C 1 READS NODES, PRINTS FLUX, AND WRITE FINTS
237C FOR LATER USE WITH IFINT = -1.
238 KTAPE = 1 ;* 1 TO READ WHOLE FIELD NODE FILE 14
239C 2 TO READ HALF FIELD NODE FILE 14
240C 0 FOR FINTS FROM USER ROUTINE IN FIELD
241C (CURRENTLY IN RCELL)
242C -1 FOR FINTS FROM INPUT DATA
243 LTAPE = 1 ;* 1 TO WRITE(08,901), -1 TO READ, 0 NOT
244 IPDAY = 0 ;* 0 FOR NO DAILY PRINT, 1 FOR THREE DAYS
245 IPLONG = 0 ;* 0 SHORTENS PRINT (NO OPT LOCATOR PRINT)
246C 1 FOR LONG PRINT (ONE PAGE PER CELL)
247C -1 FOR NO HEADINGS FOR CELLS.
248 INERGY = 0 ;* 1 TO WRITE(13,901)ENRGY, 0 NOT
249C OUTPUT FOR CELLS 5 2, CONST AZIMUTHAL
250C SPACINGS PARAMETERS IN ALL CELLS.

```

```

251 IFLUX = 1      ;* NUMBER OF OPTIONAL TRIMS OUTPUT
252 TRMI = 1.00    ;* INITIAL TRIM FOR POSTPR OUTPUT
253 TRMF = 0.80    ;* FINAL TRIM VALUE FOR POSTPR OUTPUT
254C
255 JMODE = MODE(1) ;*JMODE=0 FOR BATCH AND 1 FOR TSS
256 CALL FMEDIA(14,0) ;*MODE AND FMEDIA ARE HONEYWELL SYSTEMS
257 IF(JMODE.EQ.1)CALL FMEDIA(06,3)
258 IF(JMODE.NE.1)CALL WREAD(20,1,100) ;* WRITES JCL FILE
                                         WREAD IS NON-STD FORTRAN
259C
260C
261 IF(IPROG.NE.-1)GO TO 1000
262 CALL STDNS(JGRECP,1) ;*PROVIDES FOUR SAMPLE RUNS
263C      1 GIVES RECIEVER RUN AND WRITES FILE 14
264C      2 GIVES ANNUAL PERFORMANCE RUN
265C      3 GIVES STARTUP STUDY
266C      4 GIVES CLOUD STUDY (SEE DATA IN CLOUD)
267C
268 CALL YEAR(HT, IGRND, AIGRND, SR, ENHEL, CPMR, ERM1, ERM2,
269 & FAREA, FCOSI, FGRND, FINT, FLREC, FLREC, TFLUX, FMIRR, GREC, MAXIJ,
270 & IGRND, JGREC, KGREC, JGRECP, NCELI, NCELI, NCELI, PANEL, PANELH,
271 & PANELV, SB, XA, XC, YA, YC, ZC, ELEV, COSPH, XGRND, YGRND, SRT, SLF,
272 & SUP, SDN, NSURF, AZC, ASURF, NSF, NST, AI, AJ, XNC, YNC)
273C
274 STOP
275C
276 1000 CONTINUE
277 CALL STDR(1) ;*SELECTS LONG OR SHORT RUN
278C      1 GIVES LONG RUN WHICH GENERATES INSOLATION AND SAB DATA
279C      2 GIVES SHORT RUN WHICH READS
280 CALL FMEDIA(07,0)
281 CALL FMEDIA(08,0)
282 CALL CREATE(15,1000,0,ISTAT)
283 CALL RCELL(HT, ID, JD, KC, FGRND, TGRND, XGRND, YGRND, XA, YA, SR,
284 & HGRND, TEST1, FINT, EL, EF, FLOSS, ENRGY, EGERG, RGRND,
285 & COSPH, ELEV, IMECH, CONT, XC, YC, ZC, TX, IGRND, JGRND, KGRND,
286 & AIGRND, XNC, YNC, IGRND, JGREC, AI, AJ, FLREC, PANEL, ENHEL)
287C
288C
289 IF(IPROG.NE.1)STOP
290 CALL PLOT2(ID, JD, NTOW, FGRND, TGRND, XGRND, YGRND,
291 & IGRND, EF, ELEV, COSPH, THETA,
292 & TEST1, IMECH, FLOSS)
293C      FLOSS IS OVERWRITTEN BY PLOT2
294C      EF IS OVERWRITTEN BY POSTPR
295C
296 CALL WREAD(17,1,300) ;* READS TRIM FILE TO OUTPUT
297 STOP
298 END
299C
300C
301C
302 SUBROUTINE STDNS(JGRECP, I)
303C
304C      1 GIVES RECIEVER RUN AND WRITES FILE 14
305C      2 GIVES ANNUAL PERFORMANCE RUN
306C      3 GIVES STARTUP STUDY
307C      4 GIVES CLOUD STUDY (SEE DATA IN CLOUD)
308C
309 COMMON /TIME/ JDEQ, ESUNO, HYEARS, IMAX, JMAX, NSKIP, KVEC(13)
310 COMMON /TIME/ IDAYS, IHORS, NDAY1, HOURS, HOUR1, HOUR2, NHRS, DHOUR
311 COMMON /PRINTX/ IPSAB, IPMIR, IPANCT, JDISK, KDISK
312 COMMON /CALCX/ ICDEF, ISVIS, NREC, DELR, JTRIM,
313 & ISUMS, KANNU, ICDF, JROW, JCOL
314 COMMON /TOWER/ ICYLN, HCYLNT, MCYLNT, HCYLN, WCYLN, OFFSET, REFLT, ABSOR,
315 & FRLOS, NPANLS, INODE1, INODE2, JNODE1, JNODE2
316 COMMON /CELL/ ORDER, DA, AC, XTOWI, YTOWJ, NBOR, KORY, LRAY, LGEO, DTRIM
317C
318 GOTO(100,200,300,400), I
319 100 RETURN
320C
321 200 IDAYS = 2
322 IHORS = 2
323 ISUMS = 1
324 KANNU = 2
325 IPSAB = 0
326 ICYLN = 0
327 JDISK = 0
328 KDISK = 1
329 IF(JGRECP.EQ.1)STOP'***** JGRECP = 1 - STOP'
330 RETURN
331C
332 300 NDAY1 = 186
333 IHORS = -1
334 IDAYS = 0

```

```

335     ESUNU = 5.
336     KANNU = 1
337     DHOUR = .200
338     NBR = 48
339     IPSAB = 1
340     ICYLN = -2
341     JDISK = 0
342     KDISK = 1
343     RETURN
344C
345 400 NDAY1 = 186
346     IHRS = 0
347     HOURS = 3.45
348     IPSAB = 1
349     ICYLN = -2
350     JDISK = 0
351     KDISK = 1
352     ICLDF = 1
353     KANNU = 1
354     RETURN
355     END
356C
357C
358     SUBROUTINE STDRC(I)
359C         1 GIVES LONG RUN TO GENERATE DATA BASES
360C         2 GIVES SHORT RUN TO READ DATA BASES
361C
362     COMMON /CALC/ IROW, ICNTR, ITRIM, ISUN, LSUN
363     COMMON /PRINT/ IFINT, KTAPE, LTAPE, IPDAY, IPLONG,
364 &          INERGY, IFLUX, TRMF, TRMI
365     IF(I .EQ. 1) RETURN
366     LSUN = -1
367     LTAPE = -1
368     IPLONG = 0
369     INERGY = 1
370     IFLUX = 3
371     TRMI = 1.20
372     RETURN
373     END

```

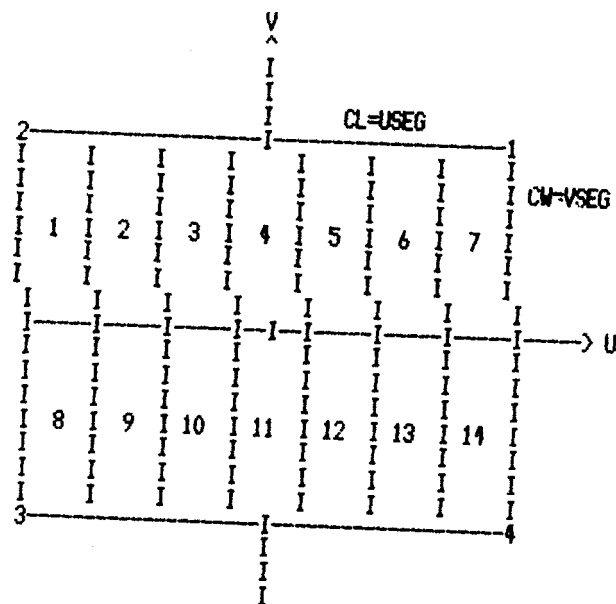
end of file - request executed 373 times

```

1#RUN HSELG1122/NS/HELIO =(BCD,NOGO,OPTZ)
2C
3C
4CONSTANTS FOR HELIOSTAT CHARACTERISTICS
5C
6    SUBROUTINE HELIOS(HT)
7C
8C
9C* * *BOUNDARY VERTICES FOR MDAC 56.41763 M2 HELIOSTAT (607.27 FT2)
10    COMMON /VERTX/ BU(18),BV(18),ICORN
11    DATA BU / 4.3275,-4.3275,-4.3275, 4.3275,14*0.0 /
12    DATA BV / 3.38455, 3.38455,-3.38455,-3.38455,14*0.0 /
13    ICORN = 4      ;* NUMBER OF VERTICES OF HELIOSTAT FOR HCOEF
14C
15C
16C* * *CENTER OF SEGMENTS FOR MDAC 56.41763 M2 HELIOSTAT (607.27 FT2)
17    COMMON /HELIX/ USEG,VSEG,ASEG,NSEG,SIGMA,
18    & SUFLAT(14),SVFLAT(14)
19    DATA SUFLAT /-3.7148,-2.4765,-1.2383,0.0,
20    & 1.2383, 2.4765, 3.7148,
21    & -3.7148,-2.4765,-1.2383,0.0,
22    & 1.2383, 2.4765, 3.7148/
23    DATA SVFLAT / 7*-1.705, 7*1.705 /
24    USEG = 1.2065      ;* WIDTH OF SEGMENTS IN METERS (MDAC)
25    VSEG = 3.3401      ;* LENGTH OF SEGMENTS IN METERS (MDAC)
26    ASEG = USEG*VSEG    ;* AREA OF SEGMENT IN METERS
27    NSEG = 14          ;* NUMBER OF SEGMENTS
28    SIGMA= .00283      ;* RMS DEGRADING CONSTANT IN RADIANS
29C                          (USED FOR IMAGE GENERATION ONLY)
30C
31C
32CONSTANTS FOR HELIOSTAT SHADING AND BLOCKING GEOMETRY
33    COMMON /HELI2/ UMIR,VMIR,SLOT
34    UMIR = 8.655      ;*WIDTH OF HELIOSTAT IN U-DIRECTION
35    VMIR = 6.769      ;*WIDTH OF HELIOSTAT IN V-DIRECTION
36    SLOT = 0.0        ;*WIDTH OF SLOT FOR SPLIT HELIOSTAT
37C
38C
39C
40CONSTANTS FOR HELIOSTAT CHARACTERISTICS
41    COMMON /HELIO/ NGON,IAXIS,RH,WH,DMIR,DMECH,HGLASS,FMIN,CHL,CHOM,
42    & FCANT,FUSEG,FVSEG,ISR,SRM
43    NGON = 4          ;*NUMBER OF SIDES OF HELIOSTAT FOR SAB
44    IAXIS = 1         ;*INDEX OF MOUNTING SYSTEM
45C                          ( 1 GIVES ALT-AZIMUTHAL )
46C                          ( 2 GIVES RADIAL PITCH-ROLL )
47C                          ( 3 GIVES AZIMUTHAL PITCH-ROLL )
48C                          ( 4 GIVES POLAR AXIS )
49C                          ( 5 GIVES RECEIVER ORIENTED AXIS )
50    DMIR = SQRT(UMIR*VMIR) ;* 7.6541293 MDAC607
51C    DMIR = RMS WIDTH OF HELIOSTAT IN METERS - USED FOR SCALING
52C
53    DMECH = 1.50768    ;*MECHANICAL LIMIT IN DMIR UNITS
54    HGLASS = NSEG*ASEG ;* 56.41763 M2 = 607.27 FT2 MDAC607
55C    TOTAL AREA OF REFLECTIVE SURFACE SQ METERS
56C
57    FMIN = 300.0      ;* MINIMUM FOCAL LENGTH FOR ISR = 8
58    CHL = 175.3       ;* HELIO COST IN $/M2
59    CHOM = 80.68      ;* HELIO PV OF 0 & M COST IN $/M2
60    FCANT = 6.0*HT    ;* CANT FOCAL DISTANCE - METERS
61    FUSEG = 1.0E12    ;* FOCAL LENGTH SEGMENT HORIZ DIR
62C    ALTERNATE FCANT=6.0*HT - FIELD DATA MUST BE CALLED BEFORE HELIO
63C
64    FVSEG = 1.0E12    ;* FOCAL LENGTH SEGMENT VERT DIR
65C
66    ISR = 0           ;* CANT OR FOCUS TO SLANT RANGE
67C
68C    =0 USE GIVEN VALUES FCANT, FUSEG, FVSEG FOR WHOLE FIELD
69C    =1 CANT ONLY TO SR
70C    =2 CANT TO SR AND FOCUS U DIR OF SEGMENTS TO SR
71C    =3 CANT TO SR AND FOCUS V DIR OF SEGMENTS TO SR
72C    =4 CANT TO SR AND FOCUS U AND V DIR OF SEG TO SR
73C    =5 FOCUS ONLY U DIR OF SEGMENTS TO SR
74C    =6 FOCUS ONLY V DIR OF SEGMENTS TO SR
75C    =7 FOCUS U AND V DIR OF SEGMENTS TO SLANT RANGE
76C    =8 SAME AS 3 BUT LIMIT MINIMUM FOCAL LENGTH TO FMIN
77C
78    SRM = 1.0         ;* MULTIPLIER FOR SLANT RANGE CANT FOR FOCUS
79C                          CANT TO SR*SRM
80C
81    RETURN
82C

```

FIGURE SHOWING U AND V AXES IN THE PLANE OF THE HELIOSTAT
FOR MDAC607 HELIOSTAT



END

end of file - request executed 115 times

```

1*RUN HSELG1122/NS/RECVR =(BCD,NOGO,OPTZ)
2C
3C
4 SUBROUTINE RECVR(IGREC,JGREC,HT)
5C
6C
7CONSTANTS FOR DEFAULT FINIS
8 COMMON /FINT/ COFNT(8)
9 DATA COFNT /.0158,-.153,.370,5*0.000/
10C
11 COMMON /TOWER/ ICYLN,HCYLNT,WCYLNT,HCYLN,WCYLN,OFSET,REFLT,ABSOR,
12 & FRLOS,NPANELS,INODE1,INODE2,JNODE1,JNODE2
13 ICYLN = 1 ;#0 FOR NO RECEIVER OUTPUTS
14C >0 CALLS CYLN AND <0 CALLS FRECVR
15C 1 FOR CYLINDRICAL RECEIVER CALC
16C -1 FOR CYLINDRICAL RECEIVER OUTPUT FROM NODES
17C 2 FOR FLAT PANEL RECEIVER CALC
18C -2 FOR FLAT PANEL RECEIVER OUTPUT FROM NODES
19C 3 FOR CAVITY RECEIVER CALC - CAVITY
20C CAVITY GEOMETRY IS READ FROM FC 10
21C -3 FOR CAVITY RECEIVER OUTPUT FROM NODES
22C (NOT IMPLIMENTED AS OF 12/18/79)
23 INODE1 = 2 ;#LOOP PARAMETERS TO CONTROL RECEIVER NODES
24 INODE2 = 19 ;#IN THE VERTICAL DIRECTION - FOR RCFINT&RCFLUX
25 JNODE1 = 1 ;#LOOP PARAMETER FOR AZIMUTHAL OR HORIZONTAL
26 JNODE2 = 18 ;#DIRECTION (USUALLY JNODE2= NO. OF PANELS)
27 NPANELS = JNODE2-JNODE1+1 ;#NUMBER PANELS (OR COLUMNS) RECEIVER
28 HCYLNT = 15. ;#TOTAL HEIGHT OF CYLN OR FLAT FROM NODE FILE
29 HCYLN = HCYLNT*(INODE2-INODE1+1)/FLOAT(IGREC) ;#HEIGHT OF RECVR
30 WCYLNT = 10.4 ;#TOTAL DIAMETER OF CYLN OR TOT WIDTH OF FLAT
31 WCYLN = NPANELS*WCYLNT/FLOAT(JGREC) ;#WIDTH OF FLAT FOR ICYLN=2
32 WCYLN = 10.4 ;#FOR CYLINDER ,VRADII IS CALLED IF
33C ICYLN = 1 AND WCYLN < WCYLNT
34 OFSET = 0.0 ;#OFFSET FOR FLAT RECEIVER
35 OUTAGE = .998 ;#PERCENT HELIOSTATS NOT ACTIVE
36 SLIPAG = .97 ;#USEFUL AREA LOST BY LAYOUT
37C INCLUDING CORRECTION FOR ACTUAL IH S&B
38 REFLE = .94*.97 ;#REFLECTIVITY AND DUST
39 SNSHAD = 1.0 ;#SENSOR SHADOW, 1.0 OR .98
40 REFLT = REFLE*OUTAGE*SLIPAG*SNSHAD
41 ABSOR = .95 ;#RECEIVER ABSORBTIVITY - NOT INCLUDING
42C ANGULAR DEPENDANT EFFECT - SEE CYLN.
43 FRLOS = ABSOR*REFLT
44 RAREA = HCYLN*WCYLN ;#AREA OF RECEIVER IN M2
45 IF(IABS(ICYLN).EQ. 1)RAREA = 3.1415965 * RAREA
46C
47C
48C
49 COMMON /XLOSS/ KPANL,PREPAN,BLOSS,HLOSS,BOILER,HEATER,SOLARX
50C KPANL = XX CURRENTLY NOT IN USE
51 PREPAN = 0 ;#HALF NUMBER OF PRE-HEAT PANELS IN PANPOW
52 BLOSS = 27.0 ;#KW/M2 RAD.&CONV. LOSSES FOR BOILER PANELS
53 HLOSS = 27.0 ;#KW/M2 RAD.&CONV. LOSSES FOR HEATER PANELS
54 APAN = RAREA / NPANELS ;#AREA PER PANEL
55 BOILER = BLOSS*APAN * 1000. ;#W/PANEL LOSS FOR BOILER PANELS
56 HEATER = HLOSS*APAN * 1000. ;#W/PANEL LOSS FOR HEATER PANELS
57 SOLARX = 950.0 ;#WATTS/M2 FOR STANDARD SUN OUTPUTS
58C
59C
60C
61C - RECEIVER DATA FOR RECEIVER PERFORMANCE SUBROUTINE-
62 COMMON /RECVR/ YUP,YDN,XLF,XRT,IAIMS,LUPSD,ITAIM,ANGREC,
63 & APERHT,APERWD,KSHAPE,IAPER,RAREA
64 YUP = 1.0E6 ;# FRACTION OF IMAGE RADIUS USED FOR (HI) HI-LO
65 YDN = 1.0E6 ;# FRACTION OF IMAGE RADIUS USED FOR (LO) HI-LO
66 XLF = 1.0E6 ;# FRACTION OF IMAGE RADIUS TO SHIFT LEFT
67 XRT = 1.0E6 ;# FRACTION OF IMAGE RADIUS TO SHIFT RIGHT
68 IAIMS = 1 ;# NUMBER OF AIM POINTS
69 LUPSD = 1 ;# 1 TO SHIFT VERTICALLY, 0 HORIZONTALLY
70C ( LUPSD EFFECTIVE IF IAIMS = 2)
71 ITAIM = 1 ;# 1 COMPUTES AIMS ONLY
72C ;# 2 READ FILE 09 FOR AIMS (SHIFTS)
73C ;# 3 COMPUTE AIMS AND WRITE THEM TO FILE 09
74C ;# -1,-2,-3, SAME AS ABOVE EXCEPT IMAGE
75C ;# GENERATOR IS NOT CALLED (ANAIN).
76 ANGREC = 30.0 ;# RECEIVER TILT ANGLE TO THE NORTH
77C ( 0 GIVES NORTH FACING VERTICAL PANEL )
78 APERHT = 7.00 ;# HEIGHT OF APERTURE
79 APERWD = 8.00 ;# WIDTH OF APERTURE
80 KSHAPE = 0 ;# 0 FOR ELLIPSE, 1 FOR CTANGLE
81 IAPER = 0 ;# 0 FOR NO APERTURE, 1 FOR APERTURE CALCULATIONS
82C AFTER REGULAR FLAT PANEL CALCULATIONS

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83C      2 FOR APERTURE CALCULATIONS ONLY, REQUIRING
84C      PERMANENT FILE FOR READ(14,901) PANEL
85C
86      IF(IAPER.EQ.1)RAREA = APERHT * APERMD
87      IF(IAPER.EQ.1.AND.KSHAPE.EQ.0)RAREA = RAREA * (3.1415965/4.00)
88      RETURN
89C
90      ENTRY ECOTOW(HGLASS,IMODU,DA,ATLOSS,EGLLOSS,ATPOM,EGPOM,EGPOMS,
91      & HYEARS,TNN,ID,JD,IGRND,CTOWR,CRCV,CVPLUM,CFPUMP,CTTOW)
92      DIMENSION IGRND(ID,JD)
93C
94C      IMODU IS USED FOR THE NUMBER OF TOWER MODULES IF NOT ONE
95C      DA IS WIDTH OF CELLS IN METERS
96C      ATLOSS IS THE ANNUAL TOTAL RECEIVER LOSS IN MMH
97C      EGLLOSS IS THE RECEIVER LOSS IN MM AT EQUINOX NOON
98C      ATPOM IS THE USEFUL THERMAL ANNUAL ENERGY IN MMH/YR
99C      BUT IT PRINTS AS GJH/YR.
100C      EGPOM IS THE USEFUL THERMAL POWER IN MW AT DESIGN TIME
101C      FOR DAY 186 INSOLATION
102C      EGPOMS IS THE USEFUL THERMAL POWER IN MW AT DESIGN TIME
103C      INSOLATION
104C      HYEARS IS NUMBER OF HOURS/YR FOR SUN ABOVE STARTUP
105C      ANGLE TIMES PERCENT OPERATIONAL
106C
107      EGLLOSS = (BOILER*( NPANLS - 2*PREPAN)+2*PREPAN*HEATER)*1.E-6
108      IF(IAPER.EQ.1)EGLLOSS = BLOSS * RAREA /1000.
109      ATLOSS = EGLLOSS * HYEARS
110      EGPOMS = FRLOS*EGPOMS*HGLASS-EGLLOSS
111      IF(EGPOMS.LT.0.0)EGPOMS = 0.0
112      EGPOM = FRLOS * EGPOM * HGLASS - EGLLOSS
113      ATPOM = FRLOS * ATPOM * HGLASS - ATLOSS
114      WRITE(6,100) ATLOSS, EGLLOSS
115      100 FORMAT(1H0,'ANNUAL RECEIVER LOSS IS',F10.3,' MMH',
116      & ' AND THE EQUINOX NOON RECEIVER POWER LOSS IS',F10.3,' MW')
117C
118      CTOWR = ( 83. * (HT-10.5)**2.18446 ) * 1.1664 ;* TOWER COST
119      CRCV=(6.E6*(HCYLN/16.15)**.2*(WCYLN/16.15)**.6)*1.1664;*REC COST
120      SCALE = 1.0 + (HT+66.)/800. ;*SCALES VERTICAL CONSTRUCTION COSTS
121C      CVPLUM IS THE COST OF THE VERTICAL PLUMBING
122      CVPLUM = ((1.25E5+8413.2*(HT+4.)*SCALE)*SQRT(EGPOMS/429.))*1.1664
123C      CFPUMP IS THE COST OF THE RECEIVER FEED PUMP
124      CFPUMP = 40.697 * EGPOMS * (HT+66.) * 1.1664 ;* FEED PUMP
125      CTTOW = CTOWR + CRCV + CVPLUM + CFPUMP
126      RETURN
127C
128      ENTRY ECOAM(TOWOM,RECOM,VPOM,FPOM,TOTOM)
129C
130      TOWOM = 0.29*CTOWR
131      RECOM = 0.29*CRCV
132      VPOM = 0.29*CVPLUM
133      FPOM = (.58 + 3.706)*CFPUMP
134      TOTOM = TOWOM + RECOM + VPOM + FPOM
135      RETURN
136C      * * * * TEMPORARY FINITS * * FINTU * * 11/12/79
137C
138      ENTRY FINTU(ID,JD,XC,YC,ZC,SR,COSPH,FINT)
139      DIMENSION FINT(ID,JD)
140      DO 5 I=1,ID
141      DO 5 J=1,JD
142      5 FINT(I,J) = 1.0
143      RETURN
144      END

```

end of file - request executed 144 times

```

1*#RUN HSELG1122/NS/FIELD =(BCD,NOGO,OPTZ)
2C
3C
4    SUBROUTINE FIELD(HT,NTOW)
5C
6CONSTANTS FOR SITE INFORMATION    (MONAHANS, TEXAS)
7C
8    COMMON /SITE/ XLAT,ILAT,MONTH,HS,EGRND,ZGRND
9    COMMON /GRPLS/ASDCS(7,10),ASDIN(12,10)
10C    ISOLATION DATA CAN BE INPUT BY ASDIN *****
11    REAL LAT(3)/31.583,0.,0./      ;*LATITUDE OF SITE IN DEGREES
12    REAL ELS(3)/800.,0.,0./        ;*ELEVATION OF SITE IN METERS
13    ILAT = 1                        ;* 1 GIVES SITE NO 1
14C                                ;* 2 GIVES SITE NO 2
15C                                ;* 3 GIVES SITE NO 3
16    MONTH= 1                       ;*-1 FOR INPUT INSOLATION DATA (ASDIN)
17C                                0 FOR NO MONTHLY WEATHER DATA,
18C                                ( FIXED CHW WATER INCLUDED )
19C                                1 FOR MONTHLY WEATHER DATA PPS,APW,ATF
20    XLAT = LAT(ILAT) ;*LATITUDE OF SITE
21    HS = ELS(ILAT) ;*ELEVATION OF SITE IN METERS
22    EGRND = 0.00 ;*SLOPE OF GROUND LEVEL IN DEGREES
23    ZGRND = 0.0 ;*AZIMUTH OF UPWARD SLOPE IN DEGREES
24C
25C
26CONSTANTS FOR ATMOSPHERIC DATA (ENTRIES FOR 3 LATITUDES)
27C
28    COMMON /ATMOS/ VR,CHW,RATHOS,PATHOS,PPS(3,13),APW(3,12),ATF(3,12)
29    REAL VRS(3)/50.,0.,0./          ;*VISUAL RANGE OF SITE IN KM
30    VR = VRS(ILAT) ;*VISUAL RANGE OF SITE IN KM
31    CHW = 1.44 ;*CENTIMETERS OF ATMOSPHERIC WATER VAPOR
32    REARTH = 6370. ;*RADIUS OF EARTH IN KILOMETERS
33    RATHOS = 8.130 ;*HEIGHT OF ATMOSPHERE IN KILOMETERS
34    PATHOS = (1.0 - .0065*HS / 288.)*5.2568 ;*PRESSURE IN ATMOS
35    RATHOS = REARTH/(RATHOS * PATHOS)
36    DATA (PPS(1,I),I=1,13) ;* PERCENT POSSIBLE INSOLATION
37    & / .710, .720, .751, .751, .760, .840, .800, .820, .800, .800, .740,
38C
39    & .73716632/ ;* LAST NO. IS PERCENT DAYS PER YR. NOT SUNLESS
40    DATA (PPS(2,I),I=1,13)
41    & / 13*0.0 /
42    DATA (PPS(3,I),I=1,13)
43    & / 13*0.0 /
44    DATA (APW(1,I),I=1,12) ;* ATMOS MERCIPITABLE WATER -CM-
45    & / 0.88,0.84, .95,1.25,1.60,2.11,2.76,2.86,2.53,1.67,1.16,0.93/
46    DATA (APW(2,I),I=1,12)
47    & / 12*0.0 /
48    DATA (APW(3,I),I=1,12)
49    & / 12*0.0 /
50C MODEL 11/12/79 ATF NOW LOG10 RATHER THAN LOG: NEW=OLD/LN 10
51    DATA (ATF(1,I),I=1,12) ;* ATMOS TURBIDITY FACTOR
52    & / .0, .0, .0, .0, .002, .007, .010, .011, .011, .010, .004, .000/
53    DATA (ATF(2,I),I=1,12)
54    & / 12*0.0 /
55    DATA (ATF(3,I),I=1,12)
56    & / 12*0.0 /
57C
58C
59    COMMON /CELL/ORDER,DA,AC,XTOWI,YTOWJ,NBOR,KORY,LRAY,LGEO,DTRIM
60    HT = 120. ;*OCAL HEIGHT OF TOWER
61    ORDER = 16 ;*ORDER OF CELL SIZE - SEE BELOW
62    DA = HT*SQR(ORDER/4.) ;*SPACING BETWEEN CELL CENTERS
63    AC = DA**2 ;*TOTAL AREA OF CELL IN METERS
64    XTOWI= 5.0 ;*ROW NUMBER OF TOWER IN NS SYSTEM
65    YTOWJ= 4.0 ;*COL NUMBER OF TOWER IN NS SYSTEM
66C    (CELL AUTOMATICALLY ADJUSTS TOWER COLUMN)
67    NBOR = 8 ;*NUMBER OF NEIGHBORS FOR HELIOSTAT
68C    ;*RCCELL AND ANNUAL BOTH ALLOW 24 NEIGHBORS
69C    ;* NBOR = 8 FOR FIRST RANK
70C    ;* NBOR = 24 FOR SECOND RANK
71    KORY = 1 ;* 1 FOR RADIAL , 2 FOR N-S ORIENTATION
72    LRAY = 2 ;* 1 FOR CORNFIELD , 2 FOR STAGGERED ARRAY
73    LGEO = 10 ;*VARIATION STEP SIZE CONTROL - 10 IS OPTIMUM
74    DTRIM= .060 ;*TRIM INTERPOLATION CONSTANT
75C    (EQUALS RMS DECREMENT OF RGRND - NONCRITICAL)
76    NTOW = INT(.5*XTOWI)
77C
78COEFFICIENTS FOR HELIOSTAT SPACINGS - FIT ON XGRND & YGRND FROM RCELL
79C
80    COMMON /COEF/ COEFX(6),COEFY(6),ICOF,ITWR
81C
82C FOR RCELL DATABASE

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83C
84C COEFX(1) = 8.4708 E+01      ;* RADIAL COEF NO 1
85C COEFX(2) = -4.1158 E+00    ;* NO 2
86C COEFX(3) = 1.3955 E-01     ;* NO 3
87C COEFX(4) = .0
88C COEFX(5) = .0
89C COEFX(6) = .0
90C
91C COEFY(1) = 2.2              ;* AZIMUTHAL COEF NO 1
92C COEFY(2) = .0              ;* NO 2
93C COEFY(3) = .0              ;* NO 3
94C COEFY(4) = .0
95C COEFY(5) = .0
96C COEFY(6) = .0
97C
98C FOR NS REPRESENTATION OF OPTIMIZED FIELD
99C
100 COEFX(1) = 1.16911146 E+02   ;* RADIAL COEF NO 1
101 COEFX(2) = -8.08400972 E+00 ;* NO 2
102 COEFX(3) = 2.42936177 E-01  ;* NO 3
103 COEFX(4) = .0
104 COEFX(5) = .0
105 COEFX(6) = .0
106C
107C
108 COEFY(1) = 1.88853290 E+00   ;* AZIMUTHAL COEF NO 1
109 COEFY(2) = 5.62198637 E-02   ;* NO 2
110 COEFY(3) = -2.11875424 E-03  ;* NO 3
111 COEFY(4) = .0
112 COEFY(5) = .0
113 COEFY(6) = .0
114C
115 ICOF = 1                      ;* 1 FOR 6 FIELD COEFFS , 2 FOR 12 COEFFS
116 ITWR = 1                      ;* 1 INCLUDES TOWER CELL IN NODE FILE 14
117C                               THIS IS STD WRITE/READ PROCEDURE
118C                               0 DO NOT INCLUDE TOWER CELL
119C                               ( FOR READING OLD NODE FILES)
120 COORL = 2.20                  ;* LIMITS COORX AND COORY TO COORL
121C
122CONSTANTS RELATING TO SYSTEM COST ( SEE TECH-MEMO )
123C
124 COMMON /COST/ FMI,ENFLA,CFIXD,CL,CLOM,CW(2),CMP(2),CMR(2),
125 & CHA(2),IMODU
126 FMI = 250.0                    ;* INPUT FIGURE OF MERIT
127 ENFLA = 1.00                   ;* INFLATION FACTOR ON COSTS
128 CFIXD = (2.62E6 + .27E6*(HT/120.)**2)*1.1664 ;* FIXED COST
129 CL = 1.738                     ;* COST OF LAND IN $/M2
130 CLOM = 0.                      ;* PV O&M COST OF LAND IN $/M2
131 CW(1) = 0.30                   ;* COST OF WIRING EQUIPMENT IN $/M2
132 CW(2) = 0.00                   ;* PV O&M WIRING EQUIPMENT IN $/M2
133 CMP(1) = 0.160                 ;* WIRING COST CONSTANT-PRIMARY FEEDERS ($/M)
134 CMP(2) = 0.00                 ;* PV O&M OF WIRING COST - PRIM FEEDERS ($/M)
135 CMR(1) = 1.373                 ;* WIRE COST CONSTANT-RADIAL HEADERS ($/M)
136 CMR(2) = 0.00                 ;* PV O&M WIRE COST RADIAL HEADERS ($/M)
137 CHA(1) = 10.20                 ;* WIRE COST CONSTANT-AZIMUTHAL ($/M)
138 CHA(2) = 53.81                 ;* PV O&M OF WIRE COST-AZIMUTHAL ($/M)
139 IMODU = 1                      ;* NUMBER OF TOWER MODULES
140 RETURN
141 END

```

end of file - request executed 141 times

Appendix B Interception Run for a Cylindrical Receiver at Equinox Noon

The main purpose of this run is to generate the receiver interception fractions, transmitted to the subsequent test runs via the standard Node file output (See volume I for explanations).

The first 24 lines reproduce the Honeywell JCL for the run shown below. The remaining portion of the first page gives the Node file header, which will be reprinted each time the Node file is re-read in subsequent runs.

```

100N.J.MONT
20: IDENT: 0382DOE-1910AM, X-RECV
30: NOTE: *****
40: TEST RUN FOR CELLWISE PERFORMANCE CODES
50: THIS EXECUTION FOR RECEIVER MODEL
60: NOTE: *****
70: OPTION: FORTRAN
80: FORTRAN: XREF, OPTZ
90: LIMITS: 50K
100: SELECTA(HSELG1122/NS/MAIN:M)
110: SELECTA(HSELG1122/NS/HELIO:M)
120: SELECTA(HSELG1122/NS/RECV:M)
130: SELECTA(HSELG1122/NS/FIELD:M)
140: SELECT:HSELG1122/NS/R-YEAR
150: SELECT:HSELG1122/NS/R-FINTS
160: SELECT:HSELG1122/NS/R-HCOEF
170: SELECT:HSELG1122/NS/R-RSABS
180: SELECT:HSELG1122/NS/R-ANNUAL
190: EXECUTE
200: LIMITS: 5.50K
210: PRMFL: 14, W, S, HSELG1123/NN7X7
220: PRMFL: 06, W, S, HSELG1122/OUTPUT1
230: PRMFL: 20, R, S, HSELG1122/NS/X-RECV
240: ENDJOB

```

1 FOLLOWING LABEL WAS WRITTEN BY A RECEIVER SUBROUTINE TO
DESCRIBE SYSTEM GEOMETRY WITH REGARD TO INTERCEPTION DATA.

1 HEIGHT OF THE TOWER IS 120.0 METERS.

16.0-TH ORDER CELLS ARE USED.

1 FIELD MATRIX IS DIMENSIONED 7 BY 7.

1 TOWER IS AT CELL(5.00, 4.00)

1 RECEIVER SHAPE IS CYLINDRICAL.

THE RECEIVER HEIGHT IS 15.00 METERS; WIDTH IS 10.40 METERS.

1 RECEIVER NODE MATRIX IS DIMENSIONED 20 BY 18.

1 HELIOSTATS ARE NOT FOCUSED AND ARE CANTED.

1 AIMING STRATEGY IS 1 PT AIM.

1 HELIOSTAT IS SQUARE WITH 56.42 M2 OF REFLECTIVE SURFACE.

1 HELIOSTAT WIDTH IS 7.6541293 METERS.

1 BEAM ERROR (DEGRADING) IS 2.83 MILLI-RADIANS

1 NODE INTERCEPTION FRACTIONS STORED ON DISK ARE ALWAYS

1 OMETRICAL, I.E., THERE ARE NO LOSSES DUE TO DUST,

REFLECTIVITY, VISUAL RANGE, ETC.

CALCULATION DAY 0 TIME 0. FROM SOLAR NOON

DATE AND TIME(HRS)

07/02/80

17.36

THIS IS A WHOLE NODE FILE

CANTING FOCAL LENGTH 720.0 METERS

SEGMENT U FOC LENGTH IS , V IS METERS

SLANT RANGE OPTION IS 0 WITH MULTIPLIER 1.000

THIS IS A CYLINDRICAL RECEIVER

TOTAL NODE AREA = 490.088 SQUARE METERS DISTRIBUTED OVER 360 POINTS

LIMITED RECEIVER AREA = 441.080 SQ M

IN 18 PANELS OF 18 ROWS

COORDINATES OF NODES FOR CYLINDRICAL RECEIVER

UNIT NORMALS VARY WITH AZIMUTH

X COMPONENTS, Y COMPONENTS, AND Z COMPONENTS ARE LISTED

0.9848	0.8660	0.6428	0.3420	0.0000	-0.3420	-0.6428	-0.8660	-0.9848	-0.9848	-0.8660	-0.6428
-0.3420	0.0000	0.3420	0.6428	0.8660	0.9848						
0.1736	0.5000	0.7660	0.9397	1.0000	0.9397	0.7660	0.5000	0.1736	-0.1736	-0.5000	-0.7660
-0.9397	-1.0000	-0.9397	-0.7660	-0.5000	-0.1736						
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.						

X AND Y COMPONENTS OF POSITION VECTORS VARY WITH AZIMUTH

5.1210	4.5033	3.3425	1.7785	15	0.0000	-1.7785	-3.3425	-4.5033	-5.1210	-5.1210	-4.5033	-3.3425
--------	--------	--------	--------	----	--------	---------	---------	---------	---------	---------	---------	---------

-1.7785 0.0000 1.7785 3.3425 4.5033 5.1210

0.9030 2.6000 3.9834 4.8864 5.2000 4.8864 3.9834 2.6000 0.9030 -0.9030 -2.6000 -3.9834
-4.8864 -5.2000 -4.8864 -3.9834 -2.6000 -0.9030

Z COMPONENT OF POSITION VECTOR VARIES WITH THE VERTICAL DISTANCE FROM THE CENTER OF THE CYLINDER

7.1250 6.3750 5.6250 4.8750 4.1250 3.3750 2.6250 1.8750 1.1250 0.3750 -0.3750 -1.1250
-1.8750 -2.6250 -3.3750 -4.1250 -4.8750 -5.6250 -6.3750 -7.1250

XNC= 0.446 0.985 1.550 1.238 1.550 0.985 0.446

YNC= 0.256 0.578 1.122 1.587 1.282 1.526 0.848 7.200

NGON = 4 ; MAX. NUMBER OF HELIOS./CELL= 1021.0 ; RHILI = 0.9630 ; TOTAL GLASS =0.4147E 06 ; TOTAL LAND =0.2189E 07

TRIM CONTROL MATRIX 7351. HELIOS AMELI= 58.5857 ASEG= 4.0298 HGLASS= 56.4176 CELLS= 38.00

0044400
0444440
4444444
4443444
4430344
3443443
0344430

***** NUMBER OF HELIOSTATS PER CELL***** ; HT= 120.0 METERS FOCAL HEIGHT

0. 0. 86.0 89.6 86.0 0. 0.

0. 103.4 124.4 134.2 124.4 103.4 0.

103.4 146.0 204.5 238.0 204.5 146.0 103.4

124.4 204.5 340.3 282.1 340.3 204.5 124.4

134.2 238.0 282.1 0. 282.1 238.0 134.2

93.3 204.5 340.3 282.1 340.3 204.5 93.3

0. 109.5 204.5 238.0 204.5 109.5 0.

FRACTION OF GROUND COVERED UNIVERSITY OF HOUSTON

MAX(A) = 3.6844E-01 MIN(A) = 6.5316E-02 AVR(A) = 1.8948E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.065 0.076 0.084 0.088 0.084 0.076 0.065 1.000

0.081 0.101 0.122 0.131 0.122 0.101 0.081 1.000

0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000

0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000

0.131 0.233 0.368 0.581 0.368 0.233 0.131 1.000

0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000

0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000

1.000 1.000 1.000 1.000 1.000 1.000 1.000 0.189

```
(-----)
( 00000000000000000000 )
( 0000 1111111111 0000 )
( 00 1111111111 00 )
( 0 1111 1111 )
( 11 22222 11 )
( 111 22222333332222 111 )
( 1 22 3333444443333 22 1 )
( 1 22 33 444 5555 444 33 22 1 )
( 1 2 3344455566666665544433 2 1 )
( 1 2 3 4 5667777887777665 4 3 2 1 )
( 1 2 3 4 56788999999888765 4 3 2 1 )
( 1 23 4 567899 ** 998765 4 32 1 )
( 12 3 4 56789 ** 98765 4 3 21 )
( 12 34 5678 9**16 * *9 8765 43 21 )
( 12 34 5678 9*** * *9 8765 43 21 )
```

```

( 12 3 4 56789 ** 98765 4 3 21)
( 1 23 4 567899 ** 998765 4 32 1)
( 1 2 3 4 567888999999888765 4 3 2 1)
( 1 2 3 4 5667777887777665 4 3 2 1)
( 1 2 334445566666665544433 2 1)
( 1 22 33344444554444333 22 1)
(-----)

```

CONTOUR MODE T STEP SIZE 3.0312E-02

X = FIRST SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 1.3776E 01 MIN(A) = 2.6506E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

```

1.378 1.179 1.050 1.006 1.050 1.179 1.378 0.
1.094 0.864 0.711 0.657 0.711 0.864 1.094 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.657 0.366 0.277 0.220 0.277 0.366 0.657 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

Y = SECOND SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 2.2605E 00 MIN(A) = 1.8868E 00 AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

```

2.140 2.161 2.176 2.182 2.176 2.161 2.140 0.
2.171 2.200 2.223 2.231 2.223 2.200 2.171 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.231 2.260 1.887 1.508 1.887 2.260 2.231 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

INTERCEPTION FACTORS FROM COFNT(8) INPUT DATA * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 1.0000E 00 MIN(A) = 2.3540E-01 AVR(A) = 8.1030E-01

AIJ = (10 ** 0) X PRINTED VALUES

```

0.235 0.323 0.390 0.415 0.390 0.323 0.235 0.398
0.366 0.501 0.604 0.643 0.604 0.501 0.366 0.577
0.501 0.684 0.822 0.872 0.822 0.684 0.501 0.739
0.604 0.822 0.970 1.000 0.970 0.822 0.604 0.882
0.643 0.872 1.000 0.792 1.000 0.872 0.643 0.880
0.604 0.822 0.970 1.000 0.970 0.822 0.604 0.893
0.501 0.684 0.822 0.872 0.822 0.684 0.501 0.801

0.592 0.766 0.877 0.872 0.877 0.766 0.592 0.810

```

```

(-----)
( 111 00000011111111111000000 111)
(1 000 11111 2222222222 11111 000 )
( 00 11 2222 33333333 2222 11 00)
(0 11 22 3333344444443333 22 11 )
( 11 22 33 4444 55555 4444 33 22 11)
(1 22 3344455555666665555544433 22 )
( 2 33 4 55 6666777776666 55 4 33 2)
(2 3 44556667777 8888 77776665544 3 )
( 3 4 5 6 77 8888 8888 77 6 5 4 3)
(3 4 5 6 7 88 9999999999 88 7 6 5 4 )
(34 5 6 7 8 99 99 8 7 6 5 4)
( 4 56 7 8 9 9 8 7 65 4)
( 45 6 7 8 9 9 8 7 6 54)
(4 5 67 8 9 ** * ** 9 8 76 5 )
(4 5 67 8 9 ** * ** 9 8 76 5 )
( 45 6 7 8 9 9 8 7 6 54)
( 4 56 7 8 9 9 8 7 65 4)
(34 5 6 7 8 99 99 8 7 6 5 4)
(3 4 5 6 7 88 9999999999 88 7 6 5 4 )
( 3 4 5 6 77 8888 8888 77 6 5 4 3)
(2 3 4 5 66 77 8888 77 66 5 4 3 )
(-----)

```

CONTOUR MODE T STEP SIZE 7.6460E-02

FRACTION OF LOSS DUE TO HORIZONTAL VISIBILITY * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7658E-01 MIN(A) = 9.2970E-01 AVR(A) = 9.6310E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.930	0.936	0.940	0.942	0.940	0.936	0.930	0.941
0.939	0.946	0.952	0.954	0.952	0.946	0.939	0.950
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.958
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.967
0.954	0.965	0.977	0.984	0.977	0.965	0.954	0.968
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.968
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.961

0.951	0.960	0.967	0.967	0.967	0.960	0.951	0.963
-------	-------	-------	-------	-------	-------	-------	-------

INTERCEPTION FRACTIONS INCLUDING VISIBLE RANGE LOSSES * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7658E-01 MIN(A) = 2.1885E-01 AVR(A) = 7.8207E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.219	0.302	0.366	0.391	0.366	0.302	0.219	0.375
0.343	0.474	0.575	0.613	0.575	0.474	0.343	0.548
0.474	0.654	0.791	0.841	0.791	0.654	0.474	0.709
0.575	0.791	0.943	0.977	0.943	0.791	0.575	0.854
0.613	0.841	0.977	0.780	0.977	0.841	0.613	0.853
0.575	0.791	0.943	0.977	0.943	0.791	0.575	0.865
0.474	0.654	0.791	0.841	0.791	0.654	0.474	0.770

0.563	0.735	0.849	0.846	0.849	0.735	0.563	0.782
-------	-------	-------	-------	-------	-------	-------	-------

* * * * * TOWER ELEVATION ANGLE IN DEGREES * * * * *

MAX(A) = 2.6565E 01 MIN(A) = 5.7106E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

0.571	0.638	0.691	0.713	0.691	0.638	0.571	0
0.672	0.790	0.898	0.946	0.898	0.790	0.672	18

0.790 1.002 1.260 1.404 1.260 1.002 0.790 0.
 0.898 1.260 1.947 2.657 1.947 1.260 0.898 0.
 0.946 1.404 2.657 9.000 2.657 1.404 0.946 0.
 0.898 1.260 1.947 2.657 1.947 1.260 0.898 0.
 0.790 1.002 1.260 1.404 1.260 1.002 0.790 0.
 0. 0. 0. 0. 0. 0. 0. 0.

***** SLANT DISTANCE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 1.2060E 03 MIN(A) = 2.6833E 02 AVR(A) = 0.

AIJ = (10 ** 3) X PRINTED VALUES

1.206 1.080 0.997 0.967 0.997 1.080 1.206 0.
 1.025 0.874 0.768 0.730 0.768 0.874 1.025 0.
 0.874 0.689 0.550 0.495 0.550 0.689 0.874 0.
 0.768 0.550 0.360 0.268 0.360 0.550 0.768 0.
 0.730 0.495 0.268 0.120 0.268 0.495 0.730 0.
 0.768 0.550 0.360 0.268 0.360 0.550 0.768 0.
 0.874 0.689 0.550 0.495 0.550 0.689 0.874 0.
 0. 0. 0. 0. 0. 0. 0. 0.

***** X COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 4.8000E 02 MIN(A) = -9.6000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-9.600-9.600-9.600-9.600-9.600-9.600-9.600 0.
 -7.200-7.200-7.200-7.200-7.200-7.200-7.200 0.
 -4.800-4.800-4.800-4.800-4.800-4.800-4.800 0.
 -2.400-2.400-2.400-2.400-2.400-2.400-2.400 0.
 0. 0. 0. 0. 0. 0. 0. 0.
 2.400 2.400 2.400 2.400 2.400 2.400 2.400 0.
 4.800 4.800 4.800 4.800 4.800 4.800 4.800 0.
 0. 0. 0. 0. 0. 0. 0. 0.

***** Y COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 7.2000E 02 MIN(A) = -7.2000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 -7.200-4.800-2.400 0. 2.400 4.800 7.200 0.
 0. 0. 0. 0. 0. 0. 0. 0.

***** Z COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 0. MIN(A) = 0. AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.

ON THE 0TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 0.99638 ASU
SOLAR ELEVATION= 58.8290 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
SUNRISE TIME = 5.2331 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
SUNRISE AZIMUTH= 84.2704 DEGREES EAST OF SOUTH
UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

DAY = 0 HOUR = 1 CELL 1, 1 IMAGE PLANE FLUX MATRIX COSI = 0.86520 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4330 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 1, 2 IMAGE PLANE FLUX MATRIX COSI = 0.88180 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4164 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 1, 3 IMAGE PLANE FLUX MATRIX COSI = 0.89484 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4018 IMAGE RADIUS = 0.

EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677

DAY = 0 HOUR = 1 CELL 1, 4 IMAGE PLANE FLUX MATRIX COSI = 0.89992 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3958 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 1, 5 IMAGE PLANE FLUX MATRIX COSI = 0.89484 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4018 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 1, 6 IMAGE PLANE FLUX MATRIX COSI = 0.88180 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4164 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 1, 7 IMAGE PLANE FLUX MATRIX COSI = 0.86520 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4330 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 1 IMAGE PLANE FLUX MATRIX COSI = 0.85546 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4072 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 2 IMAGE PLANE FLUX MATRIX COSI = 0.87867 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 3 IMAGE PLANE FLUX MATRIX COSI = 0.89962 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067272
EXP UNDERFLO AT LOCATION 067677

DAY = 0 HOUR = 1 CELL 2, 4 IMAGE PLANE FLUX MATRIX COSI = 0.90863 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3163 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 5 IMAGE PLANE FLUX MATRIX COSI = 0.89962 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 6 IMAGE PLANE FLUX MATRIX COSI = 0.87867 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 2, 7 IMAGE PLANE FLUX MATRIX COSI = 0.85546 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.4072 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 1 IMAGE PLANE FLUX MATRIX COSI = 0.83723 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 2 IMAGE PLANE FLUX MATRIX COSI = 0.86872 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.2939 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 3 IMAGE PLANE FLUX MATRIX COSI = 0.90513 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067677
EXP UNDERFLO AT LOCATION 067677

DAY = 0 HOUR = 1 CELL 3, 4 IMAGE PLANE FLUX MATRIX COSI = 0.92457 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.0969 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 5 IMAGE PLANE FLUX MATRIX COSI = 0.90513 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 6 IMAGE PLANE FLUX MATRIX COSI = 0.86872 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.2939 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 3, 7 IMAGE PLANE FLUX MATRIX COSI = 0.83723 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 1 IMAGE PLANE FLUX MATRIX COSI = 0.80477 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 2 IMAGE PLANE FLUX MATRIX COSI = 0.84042 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 3 IMAGE PLANE FLUX MATRIX COSI = 0.90285 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.7279 IMAGE RADIUS = 0.

EXP UNDERFLO AT LOCATION 067047
EXP UNDERFLO AT LOCATION 067321
EXP UNDERFLO AT LOCATION 067321
EXP UNDERFLO AT LOCATION 067047
EXP UNDERFLO AT LOCATION 067321

DAY = 0 HOUR = 1 CELL 4, 4 IMAGE PLANE FLUX MATRIX COSI = 0.96062 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.0748 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 5 IMAGE PLANE FLUX MATRIX COSI = 0.90285 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.7279 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 6 IMAGE PLANE FLUX MATRIX COSI = 0.84042 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 4, 7 IMAGE PLANE FLUX MATRIX COSI = 0.80477 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 1 IMAGE PLANE FLUX MATRIX COSI = 0.75520 REFLECTIVE AREA =56.418 DELR = 1.00
**** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3163 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 2 IMAGE PLANE FLUX MATRIX COSI = 0.77702 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.0969 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 3 IMAGE PLANE FLUX MATRIX COSI = 0.83146 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.0748 IMAGE RADIUS = 0.

EXP UNDERFLO AT LOCATION 067047
 **THIS IS THE LAST TIME THE ABOVE MESSAGE WILL APPEAR*

DAY = 0 HOUR = 1 CELL 5, 4 IMAGE PLANE FLUX MATRIX COSI = 0.96323 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 0.0000 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 5 IMAGE PLANE FLUX MATRIX COSI = 0.83146 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.0748 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 6 IMAGE PLANE FLUX MATRIX COSI = 0.77702 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.0969 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 5, 7 IMAGE PLANE FLUX MATRIX COSI = 0.75520 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3163 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 1 IMAGE PLANE FLUX MATRIX COSI = 0.69712 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 2 IMAGE PLANE FLUX MATRIX COSI = 0.69311 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 3 IMAGE PLANE FLUX MATRIX COSI = 0.68562 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.7279 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 4 IMAGE PLANE FLUX MATRIX COSI = 0.67812 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.0748 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 5 IMAGE PLANE FLUX MATRIX COSI = 0.68562 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 12.7279 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 6 IMAGE PLANE FLUX MATRIX COSI = 0.69311 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 6, 7 IMAGE PLANE FLUX MATRIX COSI = 0.69712 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3343 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 1 IMAGE PLANE FLUX MATRIX COSI = 0.64542 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 2 IMAGE PLANE FLUX MATRIX COSI = 0.62791 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.2939 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 3 IMAGE PLANE FLUX MATRIX COSI = 0.60618 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 4 IMAGE PLANE FLUX MATRIX COSI = 0.59388 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.0969 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 5 IMAGE PLANE FLUX MATRIX COSI = 0.60618 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.1747 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 6 IMAGE PLANE FLUX MATRIX COSI = 0.62791 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.2939 IMAGE RADIUS = 0.

DAY = 0 HOUR = 1 CELL 7, 7 IMAGE PLANE FLUX MATRIX COSI = 0.64542 REFLECTIVE AREA =56.418 DELR = 1.00
 **** SHIFT UP = 0. **** SHIFT DOWN = 0. FORESH.REC. = 13.3720 IMAGE RADIUS = 0.

INCIDENT FLUX DENSITY FOR 1PT AIM IN MW/M2.

ON DAY 0 AT 0. HOURS FOR A RECEIVER DIAMETER= 10.40

TOTAL INCIDENT RECEIVER POWER = 2.693E 08 IN WATTS AVERAGE FLUX DENSITY = 6.106E 05 CONCENTRATION= 609.1

0.003	0.005	0.009	0.015	0.023	0.031	0.040	0.048	0.053	0.053	0.048	0.040	0.031	0.023	0.015	0.009	0.005	0.003
0.007	0.011	0.020	0.031	0.044	0.059	0.073	0.085	0.092	0.092	0.085	0.073	0.059	0.044	0.031	0.020	0.011	0.007
0.016	0.025	0.041	0.062	0.085	0.108	0.131	0.149	0.160	0.160	0.149	0.131	0.108	0.085	0.062	0.041	0.025	0.016
0.038	0.055	0.083	0.122	0.161	0.197	0.234	0.262	0.277	0.277	0.262	0.234	0.197	0.161	0.122	0.083	0.055	0.038
0.085	0.114	0.165	0.233	0.299	0.351	0.407	0.448	0.470	0.470	0.448	0.407	0.351	0.299	0.233	0.165	0.114	0.085
0.180	0.230	0.311	0.420	0.520	0.592	0.664	0.722	0.755	0.755	0.722	0.664	0.592	0.520	0.420	0.311	0.230	0.180
0.350	0.427	0.537	0.685	0.819	0.910	0.991	1.069	1.111	1.111	1.069	0.991	0.910	0.819	0.685	0.537	0.427	0.350
0.596	0.699	0.820	0.985	1.137	1.248	1.328	1.426	1.470	1.470	1.426	1.328	1.248	1.137	0.985	0.820	0.699	0.596
0.859	0.978	1.084	1.240	1.389	1.516	1.592	1.709	1.744	1.744	1.709	1.592	1.516	1.389	1.240	1.084	0.978	0.859
1.039	1.156	1.234	1.368	1.509	1.638	1.715	1.841	1.868	1.868	1.841	1.715	1.638	1.509	1.368	1.234	1.156	1.039
1.054	1.152	1.208	1.330	1.476	1.585	1.665	1.787	1.821	1.821	1.787	1.665	1.585	1.476	1.330	1.208	1.152	1.054
0.897	0.971	1.018	1.140	1.304	1.375	1.460	1.565	1.619	1.619	1.565	1.460	1.375	1.304	1.140	1.018	0.971	0.897
0.640	0.697	0.741	0.862	1.029	1.068	1.155	1.234	1.305	1.305	1.234	1.155	1.068	1.029	0.862	0.741	0.697	0.640
0.387	0.432	0.472	0.576	0.719	0.745	0.824	0.881	0.951	0.951	0.881	0.824	0.745	0.719	0.576	0.472	0.432	0.387
0.204	0.237	0.270	0.345	0.447	0.473	0.537	0.577	0.630	0.630	0.577	0.537	0.473	0.447	0.345	0.270	0.237	0.204
0.098	0.119	0.145	0.191	0.252	0.280	0.326	0.355	0.388	0.388	0.355	0.326	0.280	0.252	0.191	0.145	0.119	0.098
0.044	0.056	0.074	0.101	0.135	0.159	0.189	0.211	0.229	0.229	0.211	0.189	0.159	0.135	0.101	0.074	0.056	0.044
0.019	0.026	0.037	0.052	0.070	0.088	0.108	0.124	0.135	0.135	0.124	0.108	0.088	0.070	0.052	0.037	0.026	0.019
0.007	0.011	0.018	0.026	0.037	0.048	0.061	0.072	0.079	0.079	0.072	0.061	0.048	0.037	0.026	0.018	0.011	0.007
0.003	0.005	0.008	0.013	0.019	0.026	0.034	0.041	0.046	0.046	0.041	0.034	0.026	0.019	0.013	0.008	0.005	0.003

PANEL POWER =

8.87 10.07 11.27 13.30 15.56 16.93 18.32 19.76 20.56 20.56 19.76 18.32 16.93 15.56 13.30 11.27 10.07 8.87

INCIDENT FLUX DENSITY FOR 1PT AIM IN MW/M2.

ON DAY 0 AT 0. HOURS FOR A RECEIVER DIAMETER= 10.40

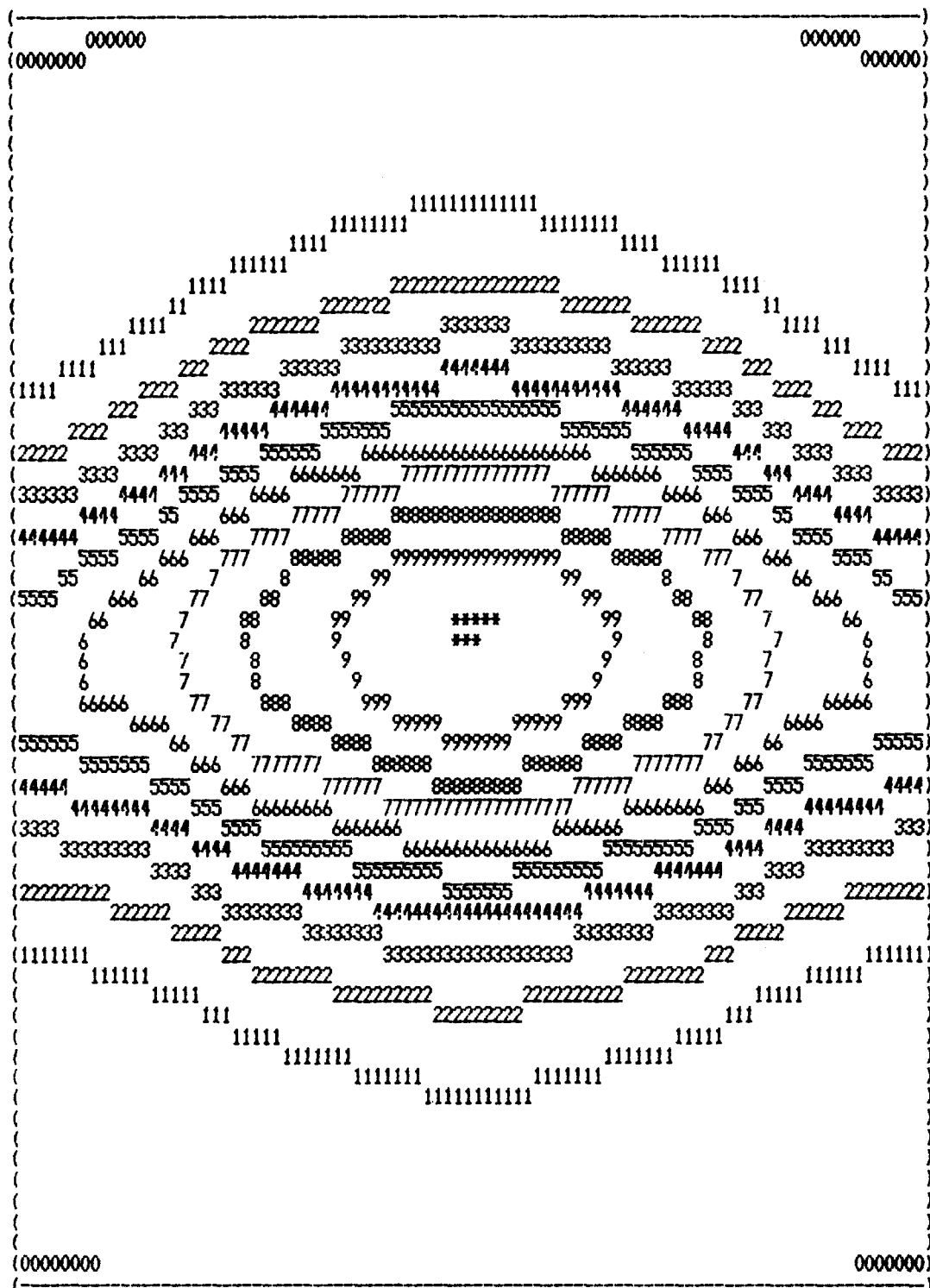
TOTAL INCIDENT RECEIVER POWER = 2.693E 08 IN WATTS AVERAGE FLUX DENSITY = 6.106E 05 CONCENTRATION= 609.1

MAX(A) = 1.8681E 06 MIN(A) = 2.6558E 03 AVR(A) = 5.5187E 05

AIJ = (10 ** 6) X PRINTED VALUES

0.003	0.005	0.009	0.015	0.023	0.031	0.040	0.048	0.053	0.053	0.048	0.040	0.031	0.023	0.015	0.009	0.005	0.003	0.025
0.007	0.011	0.020	0.031	0.044	0.059	0.073	0.085	0.092	0.092	0.085	0.073	0.059	0.044	0.031	0.020	0.011	0.007	0.047
0.016	0.025	0.041	0.062	0.085	0.108	0.131	0.149	0.160	0.160	0.149	0.131	0.108	0.085	0.062	0.041	0.025	0.016	0.086
0.038	0.055	0.083	0.122	0.161	0.197	0.234	0.262	0.277	0.277	0.262	0.234	0.197	0.161	0.122	0.083	0.055	0.038	0.159
0.085	0.114	0.165	0.233	0.299	0.351	0.407	0.448	0.470	0.470	0.448	0.407	0.351	0.299	0.233	0.165	0.114	0.085	0.286
0.180	0.230	0.311	0.420	0.520	0.592	0.664	0.722	0.755	0.755	0.722	0.664	0.592	0.520	0.420	0.311	0.230	0.180	0.488
0.350	0.427	0.537	0.685	0.819	0.910	0.991	1.069	1.111	1.111	1.069	0.991	0.910	0.819	0.685	0.537	0.427	0.350	0.766
0.596	0.699	0.820	0.985	1.137	1.248	1.328	1.426	1.470	1.470	1.426	1.328	1.248	1.137	0.985	0.820	0.699	0.596	1.079
0.859	0.978	1.084	1.240	1.389	1.516	1.592	1.709	1.744	1.744	1.709	1.592	1.516	1.389	1.240	1.084	0.978	0.859	1.346
1.039	1.156	1.234	1.368	1.509	1.638	1.715	1.841	1.868	1.868	1.841	1.715	1.638	1.509	1.368	1.234	1.156	1.039	1.485
1.054	1.152	1.208	1.330	1.476	1.585	1.665	1.787	1.821	1.821	1.787	1.665	1.585	1.476	1.330	1.208	1.152	1.054	1.453
0.897	0.971	1.018	1.140	1.304	1.375	1.460	1.565	1.619	1.619	1.565	1.460	1.375	1.304	1.140	1.018	0.971	0.897	1.261
0.640	0.697	0.741	0.862	1.029	1.068	1.155	1.234	1.305	1.305	1.234	1.155	1.068	1.029	0.862	0.741	0.697	0.640	0.970
0.387	0.432	0.472	0.576	0.719	0.745	0.824	0.881	0.951	0.951	0.881	0.824	0.745	0.719	0.576	0.472	0.432	0.387	0.665
0.204	0.237	0.270	0.345	0.447	0.473	0.537	0.577	0.630	0.630	0.577	0.537	0.473	0.447	0.345	0.270	0.237	0.204	0.413
0.098	0.119	0.145	0.191	0.252	0.280	0.326	0.355	0.388	0.388	0.355	0.326	0.280	0.252	0.191	0.145	0.119	0.098	0.239
0.044	0.056	0.074	0.101	0.135	0.159	0.189	0.211	0.229	0.229	0.211	0.189	0.159	0.135	0.101	0.074	0.056	0.044	0.133
0.019	0.026	0.037	0.052	0.070	0.088	0.108	0.124	0.135	0.135	0.124	0.108	0.088	0.070	0.052	0.037	0.026	0.019	0.073
0.007	0.011	0.018	0.026	0.037	0.048	0.061	0.072	0.079	0.079	0.072	0.061	0.048	0.037	0.026	0.018	0.011	0.007	0.040
0.003	0.005	0.008	0.013	0.019	0.026	0.034	0.041	0.046	0.046	0.041	0.034	0.026	0.019	0.013	0.008	0.005	0.003	0.022

0.326 0.370 0.415 0.490 0.574 0.625 0.677 0.730 0.760 0.760 0.730 0.677 0.625 0.574 0.490 0.415 0.370 0.326 0.552



CONTOUR MODE T STEP SIZE 1.8654E 05

PANEL POWER =

8.87 10.07 11.27 13.30 15.56 16.93 18.32 19.76 20.56 20.56 19.76 18.32 16.93 15.56 13.30 11.27 10.07 8.87

INTERCEPTED POWER/COLLECTOR CELL IN WATTS

MAX(A) = 1.4854E 07 MIN(A) = 0. AVR(A) = 6.7416E 06

ΔI₀ = (10 ** 7) X PRINTED VALUES

0. 0. 0.286 0.306 0.286 0. 0. 3.427

0. 0.373 0.490 0.543 0.490 0.373 0. 3.925

0.354 0.576 0.874 1.048 0.874 0.576 0.354 4.148
 0.438 0.811 1.485 1.321 1.485 0.811 0.438 4.070
 0.451 0.881 1.141 0. 1.141 0.881 0.451 3.414
 0.283 0.666 1.124 0.928 1.124 0.666 0.283 3.079
 0. 0.309 0.578 0.662 0.578 0.309 0. 2.688
 3.264 3.591 3.673 3.429 3.673 3.591 3.264 0.674

FRACTION OF BEAM INTERCEPTED BY RECEIVER/CELL ***** UNIVERSITY OF HOUSTON

MAX(A) = 9.9961E-01 MIN(A) = 6.2054E-01 AVR(A) = 9.5835E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.621 0.709 0.768 0.786 0.768 0.709 0.621 0.774
 0.746 0.851 0.911 0.929 0.911 0.851 0.746 0.894
 0.848 0.946 0.982 0.987 0.982 0.946 0.848 0.950
 0.910 0.981 0.996 1.000 0.996 0.981 0.910 0.980
 0.927 0.988 0.998 0. 0.998 0.988 0.927 0.980
 0.905 0.977 0.993 0.995 0.993 0.977 0.905 0.978
 0.838 0.934 0.969 0.972 0.969 0.934 0.838 0.961
 0.900 0.958 0.971 0.968 0.971 0.958 0.900 0.958

```
(-----)
(32211100111222222222221110011122)
(211001112223333344433332221110011)
(1001122333444555555555444333221100)
(011223344555666666666655544332211)
(12234455666777777777776665544322)
(23 45566777 88888 88888 77766554 3)
(3445 6 7 888 999999 888 7 6 544)
(455667788 99999 99999 88776655)
(5 6 7 8 9 9 8 7 6 )
(66 7 8 99 99 8 7 6)
( 7 8 9 9 8 77)
( 7 8 9 9 8 7)
(7 8 9 9 8 )
( 8 9 9 8 )
( 8 9 9 8 )
(7 8 9 9 8 )
( 7 8 9 9 8 7)
(6 7 88 9 9 88 7 )
( 6 7 8 99 99 8 7 6)
(556677 8 99 99 8 77665)
(4 5 67 88 99 99 88 76 5 )
(-----)
```

CONTOUR MODE T STEP SIZE 3.7907E-02

AT 0. HOURS THE SUN GIVES
 1002.436 WATTS/M2. THE TOWERTOP COLLECTOR HAS
 329976.578 M2 OF EFFECTIVE AREA AND PROVIDES
 330.781 MEGAWATTS OF DIRECTED POWER.
 227.580 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.	0.517593	0.	0.855627	58.8290	0.

EOF

Appendix C. Annual Performance Study for a Surround Field.

The main purpose of this run is to generate the annual summary outputs which occur at the end of the output listing below. The annual summary contains seven afternoon hours for each of seven days for the second half of the year.

After the JCL listing, the first output provides field trim data. Notice that the receiver geometry data does not appear, since the call to the receiver program does not occur.

Although the JCL system varies greatly from computer to computer, a few remarks are worthwhile. The data modules (MAIN, HELIO, RECVR, and FIELD) are being compiled to provide a print copy of the inputs. The program code is kept in relocatable files (R-YEAR, RRSABS, R-ANNUAL, and R-FINTS), and hence are not compiled again for each run. Normally the PRMFL:06 is not required, and the output will go directly to the printer. Similarly, PRMFL:20 will not be required unless an output print of the JCL is desired as is provided here. The JCL output print is provided by the WREAD subroutine, which can read source files. This feature may not work outside the Honeywell environment. The PRMFL:14 is required for the Node file MMM7X7 and has "read only" status for this run. The PRMFL:30 is required for this run because a card copy of selected outputs is written to support additional receiver related design studies.

```

1$N,J,MONT
2$IDENT:0382DOE-1$10AM,XYANN
3$NOTE:*****
4$:: TEST RUN FOR CELLWISE PERFORMANCE CODES
5$:: THIS EXECUTION FOR ANNUAL BEHAVIOR
6$:: 35 DEGREES NORTH LATITUDE
7$:: MONMANS REPOWERING PLANT
8$NOTE:*****
9$OPTION:FORTRAN
10$FORTRAN:XREF,OPTZ
11$LIMITS:50K
12$SELECT(HSELCG1122/NS/MAIN:M)
13$SELECT(HSELCG1122/NS/HELIO:M)
14$SELECT(HSELCG1122/NS/RECVR:M)
15$SELECT(HSELCG1122/NS/FIELD:M)
16$SELECT:HSELCG1122/NS/R-YEAR
17$SELECT:HSELCG1122/NS/R-RSBS
18$SELECT:HSELCG1122/NS/R-ANNUAL
19$SELECT:HSELCG1122/NS/R-FINTS
20$EXECUTE
21$LIMITS:5,50K
22$PRMFL:06,W,S,HSELCG1123/OUTPUT2
23$PRMFL:14,R,S,HSELCG1123/MMM7X7
24$PRMFL:20,R,S,HSELCG1122/NS/X-ANNUAL
25$PRMFL:30,W,S,HSELCG1122/CARDS
26$ENDJOB

```

XNC= 0.446 0.985 1.550 1.238 1.550 0.985 0.446

YNC= 0.256 0.578 1.122 1.587 1.282 1.526 0.848 7.200

NGON = 4 ; MAX. NUMBER OF HELIOS./CELL= 1021.0 ; RHeli = 0.9630 ; TOTAL GLASS =0.4147E 06 ; TOTAL LAND =0.2189E 07

TRIM CONTROL MATRIX 7351. HELIOS AHeli= 58.5857 ASEG= 1.0298 HGLASS= 56.4176 CELLS= 38.00

0044400
0444440
4444444
4443444
4430344
3443443
0344430

***** NUMBER OF HELIOSTATS PER CELL***** ; HT= 120.0 METERS FOCAL HEIGHT

0. 0. 86.0 89.6 86.0 0. 0.
0. 103.4 124.4 134.2 124.4 103.4 0.
103.4 146.0 204.5 238.0 204.5 146.0 103.4
124.4 204.5 340.3 282.1 340.3 204.5 124.4
134.2 238.0 282.1 0. 282.1 238.0 134.2
93.3 204.5 340.3 282.1 340.3 204.5 93.3
0. 109.5 204.5 238.0 204.5 109.5 0.

FRACTION OF GROUND COVERED UNIVERSITY OF HOUSTON

MAX(A) = 3.6844E-01 MIN(A) = 6.5316E-02 AVR(A) = 1.8948E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.065 0.076 0.084 0.088 0.084 0.076 0.065 1.000
0.081 0.101 0.122 0.131 0.122 0.101 0.081 1.000
0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000
0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000
0.131 0.233 0.368 0.581 0.368 0.233 0.131 1.000
0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000
0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000

1.000 1.000 1.000 1.000 1.000 1.000 1.000 27
1.189

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(          1          2 3 4 5667777887777665 4 3 2          1 )
(          1          2 3 4 56788899999888765 4 3 2          1 )
(          1          23 4 567899          ** 998765 4 32          1 )
(          1          2 3 4 56789          ** 98765 4 3 21          1 )
(          1          2 34 5678 9***** * *9 8765 43 21          1 )
(          1          2 34 5678 9***** * *9 8765 43 21          1 )
(          1          2 3 4 56789          ** 98765 4 3 21          1 )
(          1          23 4 567899          ** 998765 4 32          1 )
(          1          2 3 4 56788899999888765 4 3 2          1 )
(          1          2 3 4 5667777887777665 4 3 2          1 )
(          1          2 334445566666665544433 2          1 )
(          1          22 3334444554444333 22          1 )
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CONTOUR MODE T STEP SIZE 3.0312E-02

X = FIRST SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 1.3776E 01 MIN(A) = 2.6506E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

```

1.378 1.179 1.050 1.006 1.050 1.179 1.378 0.
1.094 0.864 0.711 0.657 0.711 0.864 1.094 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.657 0.366 0.277 0.220 0.277 0.366 0.657 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

Y = SECOND SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 2.2605E 00 MIN(A) = 1.8868E 00 AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

```

2.140 2.161 2.176 2.182 2.176 2.161 2.140 0.
2.171 2.200 2.223 2.231 2.223 2.200 2.171 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.231 2.260 1.887 1.508 1.887 2.260 2.231 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

THE FOLLOWING LABEL WAS WRITTEN BY A RECEIVER SUBROUTINE TO
 DESCRIBE SYSTEM GEOMETRY WITH REGARD TO INTERCEPTION DATA.
 THE HEIGHT OF THE TOWER IS 120.0 METERS.
 16.0-TH ORDER CELLS ARE USED.
 THE FIELD MATRIX IS DIMENSIONED 7 BY 7.
 THE TOWER IS AT CELL(5.00, 4.00)

THE RECEIVER SHAPE IS CYLINDRICAL .
 THE RECEIVER HEIGHT IS 15.00 METERS; WIDTH IS 10.40 METERS.
 THE RECEIVER NODE MATRIX IS DIMENSIONED 20 BY 18.
 THE HELIOSTATS ARE NOT FOCUSED AND ARE CANTED.
 THE AIMING STRATEGY IS 1 PT AIM.
 THE HELIOSTAT IS SQUARE WITH 56.42 M2 OF REFLECTIVE SURFACE.
 THE HELIOSTAT WIDTH IS 7.6541293 METERS.
 THE BEAM ERROR (DEGRADING) IS 2.83 MILLI-RADIANS
 THE NODE INTERCEPTION FRACTIONS STORED ON DISK ARE ALWAYS
 GEOMETRICAL, I.E., THERE ARE NO LOSSES DUE TO DUST,
 REFLECTIVITY, VISUAL RANGE, ETC.
 CALCULATION DAY 0 TIME 0. FROM SOLAR NOON
 DATE AND TIME(HRS)

06/18/80 11.72

THIS IS A WHOLE NODE FILE
 CANTING FOCAL LENGTH 720.0 METERS
 SEGMENT U FOC LENGTH IS , V IS METERS
 SLANT RANGE OPTION IS 0 WITH MULTIPLIER 1.000

INTERCEPTION FACTORS FROM RECEIVER PROGRAM * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.9961E-01 MIN(A) = 6.2054E-01 AVR(A) = 9.5835E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.621	0.709	0.768	0.786	0.768	0.709	0.621	0.774
0.746	0.851	0.911	0.929	0.911	0.851	0.746	0.894
0.848	0.946	0.982	0.987	0.982	0.946	0.848	0.950
0.910	0.981	0.996	1.000	0.996	0.981	0.910	0.980
0.927	0.988	0.998	0.	0.998	0.988	0.927	0.980
0.905	0.977	0.993	0.995	0.993	0.977	0.905	0.978
0.838	0.934	0.969	0.972	0.969	0.934	0.838	0.961
0.900	0.958	0.971	0.968	0.971	0.958	0.900	0.958

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(-----)
(3221110011122222222222110011122)
(21100111222333344443333222110011)
(100112233344455555555444333221100)
(011223344555666666666655544332211)
(12234455666777777777776665544322)
(23 45566777 88888 88888 77766554 3)
(3445 6 7 888 999999 888 7 6 544)
(455667788 99999 99999 88776655)
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( 77 8 9 9 8 77)
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CONTOUR MODE T STEP SIZE 3.7907E-02

FRACTION OF LOSS DUE TO HORIZONTAL VISIBILITY * * * * * UNIVERISITY OF HOUSTON AND DOE

MAX(A) = 9.7658E-01 MIN(A) = 9.2970E-01 AVR(A) = 9.6310E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.930	0.936	0.940	0.942	0.940	0.936	0.930	0.941
0.939	0.946	0.952	0.954	0.952	0.946	0.939	0.950
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.958
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.967
0.954	0.965	0.977	0.984	0.977	0.965	0.954	0.968
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.968
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.961

0.951	0.960	0.967	0.967	0.967	0.960	0.951	0.963
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INTERCEPTION FRACTIONS INCLUDING VISIBLE RANGE LOSSES * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7621E-01 MIN(A) = 5.7692E-01 AVR(A) = 9.2346E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.577	0.664	0.722	0.740	0.722	0.664	0.577	0.728
0.700	0.806	0.867	0.885	0.867	0.806	0.700	0.849
0.803	0.904	0.945	0.953	0.945	0.904	0.803	0.910
0.866	0.944	0.968	0.976	0.968	0.944	0.866	0.948
0.884	0.954	0.975	0.	0.975	0.954	0.884	0.948
0.861	0.940	0.965	0.972	0.965	0.940	0.861	0.947
0.793	0.892	0.932	0.938	0.932	0.892	0.793	0.924

0.856	0.920	0.940	0.937	0.940	0.920	0.856	0.923
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* * * * * TOWER ELEVATION ANGLE IN DEGREES * * * * *

MAX(A) = 2.6565E 01 MIN(A) = 5.7106E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

0.571	0.638	0.691	0.713	0.691	0.638	0.571	0.
0.672	0.790	0.898	0.946	0.898	0.790	0.672	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.946	1.404	2.657	9.000	2.657	1.404	0.946	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.

0.	0.	0.	0.	0.	0.	0.	0.
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* * * * * SLANT DISTANCE FROM HELIOSTAT TO RECEIVER * * * * *

MAX(A) = 1.2060E 03 MIN(A) = 2.6833E 02 AVR(A) = 0.

AIJ = (10 ** 3) X PRINTED VALUES

1.206	1.080	0.997	0.967	0.997	1.080	1.206	0.
1.025	0.874	0.768	0.730	0.768	0.874	1.025	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.730	0.495	0.268	0.120	0.268	0.495	0.730	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	30

0. 0. 0. 0. 0. 0. 0. 0.

***** X COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 4.8000E 02 MIN(A) = -9.6000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-9.600-9.600-9.600-9.600-9.600-9.600-9.600 0.

-7.200-7.200-7.200-7.200-7.200-7.200-7.200 0.

-4.800-4.800-4.800-4.800-4.800-4.800-4.800 0.

-2.400-2.400-2.400-2.400-2.400-2.400-2.400 0.

0. 0. 0. 0. 0. 0. 0. 0.

2.400 2.400 2.400 2.400 2.400 2.400 2.400 0.

4.800 4.800 4.800 4.800 4.800 4.800 4.800 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Y COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 7.2000E 02 MIN(A) = -7.2000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Z COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 0. MIN(A) = 0. AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

ON THE 93TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.01638 ASU
SOLAR ELEVATION= 81.8533 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
SUNRISE TIME = 6.1694 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
SUNRISE AZIMUTH=111.4494 DEGREES EAST OF SOUTH
UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES
950.140 WATTS/M2. THE TOWERTOP COLLECTOR HAS
324190.965 M2 OF EFFECTIVE AREA AND PROVIDES
308.027 MEGAWATTS OF DIRECTED POWER. 31
251.228 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.	0.141709	0.	0.989908	81.8533	0.

AT 1.028 HOURS THE SUN GIVES
945.247 WATTS/M2. THE TOMERTOP COLLECTOR HAS
322221.988 M2 OF EFFECTIVE AREA AND PROVIDES
304.579 MEGAWATTS OF DIRECTED POWER.
248.460 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
1.028	0.124403	-0.244012	0.961760	74.1039	-62.9864	74.1039

AT 2.056 HOURS THE SUN GIVES
929.618 WATTS/M2. THE TOMERTOP COLLECTOR HAS
316991.332 M2 OF EFFECTIVE AREA AND PROVIDES
294.681 MEGAWATTS OF DIRECTED POWER.
240.445 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
2.056	0.073733	-0.470448	0.879342	61.5630	-81.0926	61.5630

AT 3.085 HOURS THE SUN GIVES
899.823 WATTS/M2. THE TOMERTOP COLLECTOR HAS
309385.473 M2 OF EFFECTIVE AREA AND PROVIDES
278.392 MEGAWATTS OF DIRECTED POWER.
227.244 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
3.085	-0.006652	-0.663000	0.748590	48.4684	-90.5749	48.4684

AT 4.113 HOURS THE SUN GIVES
847.430 WATTS/M2. THE TOMERTOP COLLECTOR HAS
298056.988 M2 OF EFFECTIVE AREA AND PROVIDES
252.582 MEGAWATTS OF DIRECTED POWER.
206.232 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
4.113	-0.110963	-0.807796	0.578923	35.3748	-97.8215	35.3748

AT 5.141 HOURS THE SUN GIVES
749.628 WATTS/M2. THE TOMERTOP COLLECTOR HAS
270806.691 M2 OF EFFECTIVE AREA AND PROVIDES
203.004 MEGAWATTS OF DIRECTED POWER.
165.587 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
5.141	-0.231685	-0.894410	0.382561	22.4924	-104.5225	22.4924

AT 6.169 HOURS THE SUN GIVES
519.008 WATTS/M2. THE TOMERTOP COLLECTOR HAS
212701.107 M2 OF EFFECTIVE AREA AND PROVIDES
110.394 MEGAWATTS OF DIRECTED POWER.
89.903 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
6.169	-0.360124	-0.916601	0.173648	10.0000	-111.4494	10.0000

DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 93 DAY , DAILY NORM= 10.5580 KWH/M2 , UNIVERSITY OF HOUSTON

MAX(A) = 8.3450E 00 MIN(A) = 7.3899E 00 AVR(A) = 7.6971E 00

AIJ = (10 ** 0) X PRINTED VALUES

7.412	7.410	7.498	7.625	7.498	7.410	7.412	7.542
7.421	7.485	7.522	7.704	7.522	7.485	7.421	7.550
7.398	7.566	7.663	7.863	7.663	7.566	7.398	7.632
7.390	7.588	7.734	8.240	7.734	7.588	7.390	7.732
7.390	7.536	7.647	9.065	7.647	7.536	7.390	7.554
7.501	7.707	7.776	8.345	7.776	7.707	7.501	7.828
7.554	7.700	7.862	7.955	7.862	7.700	7.554	7.847
7.415	7.598	7.705	8.038	7.705	7.598	7.415	7.697

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CONTOUR MODE T STEP SIZE 9.5504E-02

RELATIVE TOTAL POWER, RNDIR= 7.115 KWH/M2, ON THE 93 DAY

MAX(A) = 1.1400E 00 MIN(A) = 6.0096E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

0.601 0.691 0.761 0.793 0.761 0.691 0.601 0.772
 0.730 0.848 0.916 0.959 0.916 0.848 0.730 0.902
 0.835 0.961 1.018 1.053 1.018 0.961 0.835 0.978
 0.900 1.007 1.053 1.130 1.053 1.007 0.900 1.031
 0.918 1.010 1.047 0. 1.047 1.010 0.918 1.007
 0.908 1.018 1.054 1.140 1.054 1.018 0.908 1.043
 0.841 0.966 1.030 1.049 1.030 0.966 0.841 1.019
 0.892 0.982 1.018 1.060 1.018 0.982 0.892 1.000

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 (-----)

CONTOUR MODE T STEP SIZE 5.3908E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPW

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOT
AREA ,	0.	0.	0.	0.	0.	0.	1.48E 04	2.33E 04	1.40E 04	3.97E 04	3.64E 04	2.86E 05	4.15
POWER,	0.	0.	0.	0.	0.	0.	8.11E 04	1.40E 05	8.99E 04	2.58E 05	2.19E 05	2.13E 06	2.95

ON THE 124TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.01586 ASU
 SOLAR ELEVATION= 78.4025 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
 SUNRISE TIME = 6.0255 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
 SUNRISE AZIMUTH=107.3971 DEGREES EAST OF SOUTH
 UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
 POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES
 937.493 WATTS/M2. THE TOWERTOP COLLECTOR HAS
 324346.148 M2 OF EFFECTIVE AREA AND PROVIDES
 304.072 MEGAWATTS OF DIRECTED POWER.
 247.931 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.	0.201035	0.	0.979584	78.4025	0.

AT 1.004 HOURS THE SUN GIVES
 932.556 WATTS/M2. THE TOWERTOP COLLECTOR HAS
 322591.090 M2 OF EFFECTIVE AREA AND PROVIDES
 300.834 MEGAWATTS OF DIRECTED POWER.
 245.326 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
1.004	0.184122	-0.244244	0.952073	72.1895	-52.9895

AT 2.009 HOURS THE SUN GIVES
916.790 WATTS/M2. THE TOMERTOP COLLECTOR HAS
317633.355 M2 OF EFFECTIVE AREA AND PROVIDES
291.203 MEGAWATTS OF DIRECTED POWER.
237.527 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
2.009	0.134544	-0.471703	0.871432	60.6255	-74.0803

AT 3.013 HOURS THE SUN GIVES
886.769 WATTS/M2. THE TOMERTOP COLLECTOR HAS
310206.844 M2 OF EFFECTIVE AREA AND PROVIDES
275.082 MEGAWATTS OF DIRECTED POWER.
224.455 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
3.013	0.055709	-0.666743	0.743203	48.0050	-85.2238

AT 4.017 HOURS THE SUN GIVES
834.078 WATTS/M2. THE TOMERTOP COLLECTOR HAS
299403.652 M2 OF EFFECTIVE AREA AND PROVIDES
249.726 MEGAWATTS OF DIRECTED POWER.
203.821 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
4.017	-0.046965	-0.815960	0.576198	35.1836	-93.2942

AT 5.021 HOURS THE SUN GIVES
736.018 WATTS/M2. THE TOMERTOP COLLECTOR HAS
271060.008 M2 OF EFFECTIVE AREA AND PROVIDES
199.505 MEGAWATTS OF DIRECTED POWER.
162.613 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
5.021	-0.166421	-0.909098	0.381895	22.4511	-100.3738

AT 6.026 HOURS THE SUN GIVES
506.077 WATTS/M2. THE TOMERTOP COLLECTOR HAS
212068.926 M2 OF EFFECTIVE AREA AND PROVIDES
107.323 MEGAWATTS OF DIRECTED POWER.
87.319 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
6.026	-0.294451	-0.939758	0.173648	10.0000	-107.3971

DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 124 DAY , DAILY NORM= 10.1542 KWH/M2 , UNIVERSITY OF HOUSTON

MAX(A) = 7.9577E 00 MIN(A) = 7.0815E 00 AVR(A) = 7.4177E 00

AIJ = (10 ** 0) X PRINTED VALUES

7.324	7.348	7.378	7.524	7.378	7.348	7.324	7.428
7.301	7.410	7.428	7.601	7.428	7.410	7.301	7.461
7.239	7.431	7.585	7.750	7.585	7.431	7.239	7.518
7.169	7.372	7.520	7.958	7.520	7.372	7.169	7.505
7.082	7.248	7.402	8.740	7.402	7.248	7.082	7.280
7.126	7.287	7.321	7.829	7.321	7.287	7.126	7.381
7.127	7.259	7.405	7.391	7.405	7.259	7.127	7.364
7.150	7.326	7.435	7.714	7.435	7.326	7.150	7.418

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CONTOUR MODE T STEP SIZE 8.7621E-02

RELATIVE TOTAL POWER , RNDM= 6.854 KWH/M2 , 34 THE 124 DAY

MAX(A) = 1.1334E 00 MIN(A) = 6.1648E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

0.616 0.712 0.777 0.812 0.777 0.712 0.616 0.789
 0.746 0.871 0.939 0.982 0.939 0.871 0.746 0.925
 0.848 0.980 1.046 1.078 1.046 0.980 0.848 1.000
 0.906 1.016 1.063 1.133 1.063 1.016 0.906 1.039
 0.914 1.009 1.053 0. 1.053 1.009 0.914 1.008
 0.895 0.999 1.031 1.110 1.031 0.999 0.895 1.021
 0.824 0.945 1.007 1.011 1.007 0.945 0.824 0.993
 0.893 0.983 1.019 1.056 1.019 0.983 0.893 1.000

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CONTOUR MODE T STEP SIZE 5.1696E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPOW

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	T01
AREA ,	0.	0.	0.	0.	0.	0.	9.71E 03	1.67E 04	2.22E 04	5.56E 04	4.71E 04	2.63E 05	4.15
POWER,	0.	0.	0.	0.	0.	0.	5.17E 04	9.59E 04	1.34E 05	3.52E 05	3.20E 05	1.89E 06	2.81

ON THE 155TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.01106 ASU
 SOLAR ELEVATION= 69.7120 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
 SUNRISE TIME = 5.6746 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
 SUNRISE AZIMUTH= 97.1840 DEGREES EAST OF SOUTH
 UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
 POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES
 936.004 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 324634.758 M2 OF EFFECTIVE AREA AND PROVIDES
 303.860 MEGAWATTS OF DIRECTED POWER.
 247.584 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.	0.346739	0.	0.937961	69.7120	0.

AT 0.946 HOURS THE SUN GIVES
 931.061 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 322869.188 M2 OF EFFECTIVE AREA AND PROVIDES
 300.611 MEGAWATTS OF DIRECTED POWER.
 244.945 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.946	0.331076	-0.240334	0.912484	65.8510	-35.9766

AT 1.892 HOURS THE SUN GIVES
 915.281 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 318681.848 M2 OF EFFECTIVE AREA AND PROVIDES
 291.684 MEGAWATTS OF DIRECTED POWER.
 237.715 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
1.892	0.285042	-0.466009	0.837607	56.8883	-58.5473

AT 2.837 HOURS THE SUN GIVES

885.261 WATTS/M2. THE TOWERTOP COLLECTOR HAS
311644.852 M2 OF EFFECTIVE AREA AND PROVIDES
275.887 MEGAWATTS OF DIRECTED POWER.
224.891 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
2.837	0.211445	-0.663260	0.717898	45.8812	-72.3179

AT 3.783 HOURS THE SUN GIVES
832.640 WATTS/M2. THE TOWERTOP COLLECTOR HAS
301197.633 M2 OF EFFECTIVE AREA AND PROVIDES
250.789 MEGAWATTS OF DIRECTED POWER.
204.448 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
3.783	0.114774	-0.820056	0.560656	34.1012	-82.0327

AT 4.729 HOURS THE SUN GIVES
734.925 WATTS/M2. THE TOWERTOP COLLECTOR HAS
272359.777 M2 OF EFFECTIVE AREA AND PROVIDES
200.164 MEGAWATTS OF DIRECTED POWER.
162.924 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
4.729	0.000925	-0.926832	0.375475	22.0537	-89.9428

AT 5.675 HOURS THE SUN GIVES
506.962 WATTS/M2. THE TOWERTOP COLLECTOR HAS
201220.980 M2 OF EFFECTIVE AREA AND PROVIDES
102.011 MEGAWATTS OF DIRECTED POWER.
82.569 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
5.675	-0.123157	-0.977077	0.173648	10.0000	-97.1840

DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 155 DAY , DAILY NORM= 9.5484 KWH/M2 , UNIVERSITY OF HOUSTON

MAX(A) = 7.6084E 00 MIN(A) = 6.3831E 00 AVR(A) = 6.9896E 00

AIJ = (10 ** 0) X PRINTED VALUES

7.299	7.397	7.402	7.338	7.402	7.397	7.299	7.380
7.215	7.384	7.487	7.433	7.487	7.384	7.215	7.439
7.088	7.328	7.608	7.588	7.608	7.328	7.088	7.439
6.871	7.096	7.246	7.600	7.246	7.096	6.871	7.212
6.640	6.822	7.027	8.144	7.027	6.822	6.640	6.873
6.460	6.558	6.488	6.835	6.488	6.558	6.460	6.566
6.383	6.462	6.558	6.411	6.558	6.462	6.383	6.493
6.768	6.916	7.029	7.167	7.029	6.916	6.768	6.990

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CONTOUR MODE T STEP SIZE 1.2253E-01

RELATIVE TOTAL POWER , RNORM= 6.451 KWH/M2 , ON THE 155 DAY

MAX(A) = 1.1500E 00 MIN(A) = 6.5270E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

0.653 0.761 0.829 0.841 0.829 0.761 0.653 3633

0.783 0.922 1.006 1.020 1.006 0.922 0.783 0.980
 0.882 1.027 1.114 1.121 1.114 1.027 0.882 1.051
 0.923 1.039 1.088 1.150 1.088 1.039 0.923 1.061
 0.910 1.008 1.062 0. 1.062 1.008 0.910 1.011
 0.862 0.955 0.970 1.030 0.970 0.955 0.862 0.964
 0.784 0.894 0.948 0.932 0.948 0.894 0.784 0.930
 0.897 0.985 1.023 1.041 1.023 0.985 0.897 1.000

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CONTOUR MODE T STEP SIZE 4.9728E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPOM

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOT
AREA ,	0.	0.	0.	0.	0.	0.	0.	1.48E 04	3.46E 04	7.73E 04	6.15E 04	2.27E 05	4.15
POWER,	0.	0.	0.	0.	0.	0.	0.	7.94E 04	1.96E 05	4.64E 05	3.83E 05	1.55E 06	2.68

ON THE 186TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.00321 ASU
 SOLAR ELEVATION= 58.1720 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
 SUNRISE TIME = 5.2056 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
 SUNRISE AZIMUTH= 83.4828 DEGREES EAST OF SOUTH
 UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
 POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES
 934.785 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 323902.113 M2 OF EFFECTIVE AREA AND PROVIDES
 302.779 MEGAWATTS OF DIRECTED POWER.
 246.457 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.	0.527371	0.	0.849635	58.1720	0.

AT 0.868 HOURS THE SUN GIVES
 929.799 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 322479.586 M2 OF EFFECTIVE AREA AND PROVIDES
 299.841 MEGAWATTS OF DIRECTED POWER.
 244.070 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
0.868	0.513918	-0.225188	0.827755	55.8688	-23.6620

AT 1.735 HOURS THE SUN GIVES
 913.905 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 318520.625 M2 OF EFFECTIVE AREA AND PROVIDES
 291.098 MEGAWATTS OF DIRECTED POWER.
 236.964 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
1.735	0.474253	-0.438808	0.763237	49.7504	-42.7769

AT 2.603 HOURS THE SUN GIVES
 883.747 WATTS/M2. THE TOMERTOP COLLECTOR HAS
 312529.715 M2 OF EFFECTIVE AREA AND PROVIDES
 276.197 MEGAWATTS OF DIRECTED POWER.
 224.859 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
2.603	0.410413	-0.629887	0.659397	41.2539	-56.9131

AT 3.470 HOURS THE SUN GIVES
 831.163 WATTS/M2. THE TOMERTOP COLLE 37. HAS

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
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302088.469 M2 OF EFFECTIVE AREA AND PROVIDES
251.085 MEGAWATTS OF DIRECTED POWER.
204.368 MEGAWATTS OF INCIDENT POWER.

3.470 0.325676-0.788608 0.521568 31.4375 -67.5605 31.4375

AT 4.338 HOURS THE SUN GIVES
734.587 WATTS/M2. THE TOMERTOP COLLECTOR HAS
274324.016 M2 OF EFFECTIVE AREA AND PROVIDES
201.515 MEGAWATTS OF DIRECTED POWER.
163.768 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
4.338	0.224397	-0.906817	0.356831	20.9057	-76.1011	20.9057

AT 5.206 HOURS THE SUN GIVES
515.848 WATTS/M2. THE TOMERTOP COLLECTOR HAS
204770.662 M2 OF EFFECTIVE AREA AND PROVIDES
105.631 MEGAWATTS OF DIRECTED POWER.
85.313 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN	ESUNF
5.206	0.111777	-0.978444	0.173648	10.0000	-83.4828	10.0000

DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 186 DAY , DAILY NORM= 8.7531 KWH/M2 , UNIVERSITY OF HOUSTON

MAX(A) = 7.4427E 00 MIN(A) = 5.3052E 00 AVR(A) = 6.4196E 00

AIJ = (10 ** 0) X PRINTED VALUES

7.110	7.253	7.244	7.203	7.244	7.253	7.110	7.230
6.995	7.207	7.334	7.291	7.334	7.207	6.995	7.280
6.809	7.099	7.443	7.415	7.443	7.099	6.809	7.235
6.483	6.742	6.903	7.294	6.903	6.742	6.483	6.866
6.082	6.167	6.362	7.238	6.362	6.167	6.082	6.234
5.690	5.674	5.569	5.746	5.569	5.674	5.690	5.643
5.445	5.424	5.343	5.305	5.343	5.424	5.445	5.353
6.276	6.345	6.440	6.590	6.440	6.345	6.276	6.120

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CONTOUR MODE T STEP SIZE 2.1375E-01

RELATIVE TOTAL POWER , RNORM= 5.918 KWH/M2 , ON THE 186 DAY

MAX(A) = 1.2033E 00 MIN(A) = 6.9314E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

0.693	0.814	0.884	0.901	0.884	0.814	0.693	0.890
0.828	0.981	1.074	1.091	1.074	0.981	0.828	1.045
0.923	1.084	1.188	1.194	1.188	1.084	0.923	1.115
0.949	1.076	1.130	1.203	1.130	1.076	0.949	1.101
0.909	0.994	1.048	0.	1.048	0.994	0.909	1.000

0.828 0.901 0.908 0.944 0.908 0.901 0.828 0.903
 0.729 0.818 0.842 0.841 0.842 0.818 0.729 0.836
 0.907 0.984 1.020 1.042 1.020 0.984 0.907 1.000

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CONTOUR MODE T STEP SIZE 5.1016E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPOW

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOT
AREA ,	0.	0.	0.	0.	0.	0.	0.	5.94E 04	9.71E 03	1.23E 05	3.85E 04	1.84E 05	4.15
POWER,	0.	0.	0.	0.	0.	0.	0.	2.93E 05	5.08E 04	6.69E 05	2.26E 05	1.22E 06	2.45

ON THE 216TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 0.99468 ASU
 SOLAR ELEVATION= 46.8578 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
 SUNRISE TIME = 4.7000 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
 SUNRISE AZIMUTH= 69.6806 DEGREES EAST OF SOUTH
 UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
 POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
932.672 WATTS/M2. THE TOMERTOP COLLECTOR HAS 321286.148 M2 OF EFFECTIVE AREA AND PROVIDES 299.655 MEGAWATTS OF DIRECTED POWER. 243.656 MEGAWATTS OF INCIDENT POWER.	0.	0.683811	0.	0.729659	46.8578	0.
AT 0.783 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
927.615 WATTS/M2. THE TOMERTOP COLLECTOR HAS 320084.551 M2 OF EFFECTIVE AREA AND PROVIDES 296.915 MEGAWATTS OF DIRECTED POWER. 241.425 MEGAWATTS OF INCIDENT POWER.	0.783	0.673059	-0.199512	0.712170	45.4118	-16.5112
AT 1.567 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
911.530 WATTS/M2. THE TOMERTOP COLLECTOR HAS 317039.316 M2 OF EFFECTIVE AREA AND PROVIDES 288.991 MEGAWATTS OF DIRECTED POWER. 234.982 MEGAWATTS OF INCIDENT POWER.	1.567	0.641254	-0.390663	0.660437	41.3332	-31.3505
AT 2.350 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
881.170 WATTS/M2. THE TOMERTOP COLLECTOR HAS 311654.125 M2 OF EFFECTIVE AREA AND PROVIDES 274.620 MEGAWATTS OF DIRECTED POWER. 223.287 MEGAWATTS OF INCIDENT POWER.	2.350	0.589727	-0.565441	0.576626	35.2136	-43.7956
AT 3.133 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
828.778 WATTS/M2. THE TOMERTOP COLLECTOR HAS 300622.695 M2 OF EFFECTIVE AREA AND PROVIDES 249.150 MEGAWATTS OF DIRECTED POWER. 202.460 MEGAWATTS OF INCIDENT POWER.	3.133	0.520640	-0.716522	0.464252	27.6618	-53.9971
AT 3.917 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
734.627 WATTS/M2. THE TOMERTOP COLLECTOR HAS 274807.441 M2 OF EFFECTIVE AREA AND PROVIDES						

201.881 MEGAWATTS OF DIRECTED POWER.
163.791 MEGAWATTS OF INCIDENT POWER.

3.917 0.436887-0.837574 0.328023 19.1488 -62.4530 19.1488

AT 4.700 HOURS THE SUN GIVES
533.123 WATTS/M2. THE TOWERTOP COLLECTOR HAS
226039.400 M2 OF EFFECTIVE AREA AND PROVIDES
120.507 MEGAWATTS OF DIRECTED POWER.
97.532 MEGAWATTS OF INCIDENT POWER.

HOURS USUNX USUNY USUNZ ESUN ZSUN ESUNF
4.700 0.341978-0.923524 0.173648 10.0000 -69.6806 10.0000

DAILY TOTAL KMH/M2 REFLECTED BY MIRROR/DAY ON THE 216 DAY , DAILY NORM= 7.8961 KMH/M2 , UNIVERSITY OF HOUSTON

MAX(A) = 7.1961E 00 MIN(A) = 4.1684E 00 AVR(A) = 5.7798E 00

AIJ = (10 ** 0) X PRINTED VALUES

6.682	6.737	6.905	7.048	6.905	6.737	6.682	6.954
6.609	6.752	6.907	7.112	6.907	6.752	6.609	6.899
6.388	6.670	6.848	7.196	6.848	6.670	6.388	6.792
6.051	6.338	6.525	6.804	6.525	6.338	6.051	6.454
5.505	5.496	5.573	6.134	5.573	5.496	5.505	5.531
4.997	4.906	4.666	4.751	4.666	4.906	4.997	4.784
4.567	4.385	4.168	4.197	4.168	4.385	4.567	4.231
5.751	5.726	5.743	5.979	5.743	5.726	5.751	5.780

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(7 88          9          9          88)
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CONTOUR MODE T STEP SIZE 3.0276E-01

RELATIVE TOTAL POWER , RNORM= 5.321 KMH/M2 , ON THE 216 DAY

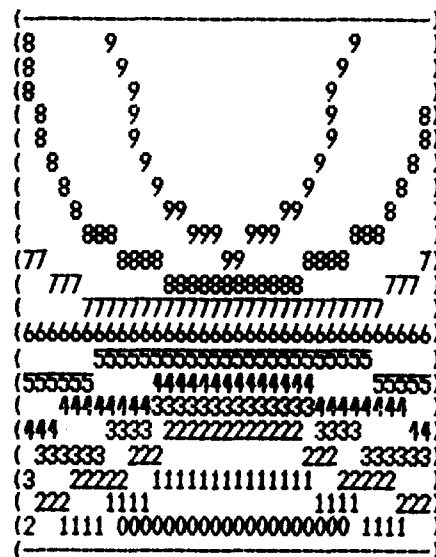
MAX(A) = 1.2888E 00 MIN(A) = 6.8020E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

0.724	0.841	0.937	0.980	0.937	0.841	0.724	0.952
0.870	1.022	1.125	1.183	1.125	1.022	0.870	1.102
0.963	1.133	1.216	1.289	1.216	1.133	0.963	1.164
0.985	1.125	1.187	1.248	1.187	1.125	0.985	1.151
0.915	0.985	1.021	0. 1.021	0.985	0.915	0.986	
0.808	0.867	0.846	0.868	0.846	0.867	0.808	0.851
0.680	0.735	0.730	0.740	0.730	0.735	0.680	0.734
0.923	0.987	1.010	1.049	1.010	0.987	0.923	1.000

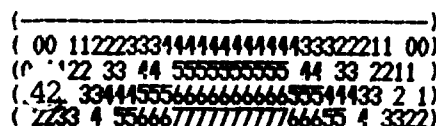
DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 246 DAY , DAILY NORM= 7.2120 KWH/M2 , UNIVERSITY OF HOUSTON

6.147	6.356	6.608	6.679	6.608	6.356	6.147	6.632
6.093	6.255	6.591	6.734	6.591	6.255	6.093	6.506
6.005	6.163	6.345	6.698	6.345	6.163	6.005	6.310
5.629	5.861	5.962	5.948	5.962	5.861	5.629	5.883
5.107	5.001	4.985	5.101	4.985	5.001	5.107	5.016
4.482	4.331	3.905	3.910	3.905	4.331	4.482	4.087
3.891	3.598	3.408	3.345	3.408	3.598	3.891	3.439
5.326	5.185	5.149	5.280	5.149	5.185	5.326	5.203



RELATIVE TOTAL POWER, R_{NORM}= 1.783 KWH/M2, ON THE 246 DAY

0.741	0.882	0.998	1.033	0.998	0.882	0.741	1.010
0.892	1.054	1.194	1.247	1.194	1.054	0.892	1.157
1.008	1.165	1.253	1.335	1.253	1.165	1.008	1.203
1.020	1.157	1.207	1.214	1.207	1.157	1.020	1.167
0.944	0.997	1.016	0.	1.016	0.997	0.944	0.994
0.807	0.851	0.788	0.795	0.788	0.851	0.807	0.908
0.645	0.671	0.664	0.656	0.664	0.671	0.645	0.664
0.951	0.995	1.006	1.029	1.006	0.995	0.951	1.000



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CONTOUR MODE T STEP SIZE 6.8990E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPON

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOT
AREA ,	0.	0.	0.	0.	4.89E 04	0.	5.43E 04	1.05E 04	2.31E 04	1.51E 04	3.66E 04	2.26E 05	4.15
POWER,	0.	0.	0.	0.	1.55E 05	0.	2.05E 05	4.06E 04	9.39E 04	6.84E 04	1.74E 05	1.25E 06	1.98

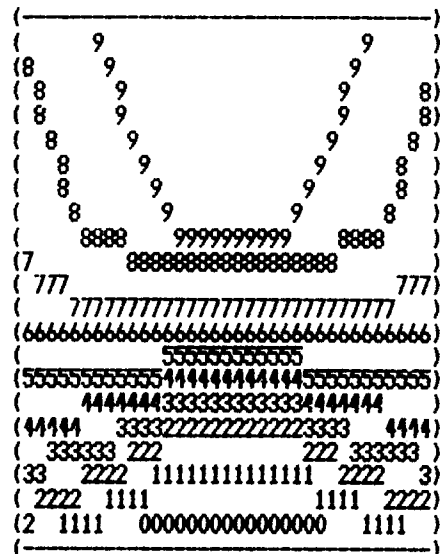
ON THE 276TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 0.98362 ASU
 SOLAR ELEVATION= 34.9778 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
 SUNRISE TIME = 4.0496 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
 SUNRISE AZIMUTH= 54.3702 DEGREES EAST OF SOUTH
 UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
 POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 0. HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
947.536 WATTS/M2. THE TOWERTOP COLLECTOR HAS 316367.324 M2 OF EFFECTIVE AREA AND PROVIDES 299.769 MEGAWATTS OF DIRECTED POWER. 243.450 MEGAWATTS OF INCIDENT POWER.	0.	0.819375	0.	0.573258	34.9778	0.
AT 0.675 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
942.680 WATTS/M2. THE TOWERTOP COLLECTOR HAS 314920.527 M2 OF EFFECTIVE AREA AND PROVIDES 296.869 MEGAWATTS OF DIRECTED POWER. 241.065 MEGAWATTS OF INCIDENT POWER.	0.675	0.811893	-0.161273	0.561089	34.1311	-11.2349
AT 1.350 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
927.295 WATTS/M2. THE TOWERTOP COLLECTOR HAS 311657.094 M2 OF EFFECTIVE AREA AND PROVIDES 288.998 MEGAWATTS OF DIRECTED POWER. 234.634 MEGAWATTS OF INCIDENT POWER.	1.350	0.789681	-0.317524	0.524960	31.6655	-21.9046
AT 2.025 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
898.520 WATTS/M2. THE TOWERTOP COLLECTOR HAS 305612.223 M2 OF EFFECTIVE AREA AND PROVIDES 274.599 MEGAWATTS OF DIRECTED POWER. 222.859 MEGAWATTS OF INCIDENT POWER.	2.025	0.753430	-0.463887	0.465996	27.7747	-31.6206
AT 2.700 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
849.740 WATTS/M2. THE TOWERTOP COLLECTOR HAS 294239.293 M2 OF EFFECTIVE AREA AND PROVIDES 250.027 MEGAWATTS OF DIRECTED POWER. 202.724 MEGAWATTS OF INCIDENT POWER.	2.700	0.704269	-0.595805	0.386033	22.7079	-40.2309
AT 3.375 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
765.149 WATTS/M2. THE TOWERTOP COLLECTOR HAS 264651.160 M2 OF EFFECTIVE AREA AND PROVIDES 202.498 MEGAWATTS OF DIRECTED POWER. 163.692 MEGAWATTS OF INCIDENT POWER.	3.375	0.643730	-0.709169	0.287562	16.7120	-47.7692
AT 4.050 HOURS THE SUN GIVES	HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
598.531 WATTS/M2. THE TOWERTOP COLLECTOR HAS 221565.234 M2 OF EFFECTIVE AREA AND PROVIDES 132.614 MEGAWATTS OF DIRECTED POWER. 106.755 MEGAWATTS OF INCIDENT POWER.	4.050	0.573696	-0.800449	0.173648	10.0000	-54.3702

DAILY TOTAL KWH/M2 REFLECTED BY MIRROR/DAY ON THE 276 DAY , DAILY NORM= 6.9857 KWH/M2 , UNIVERSITY OF HOUSTON

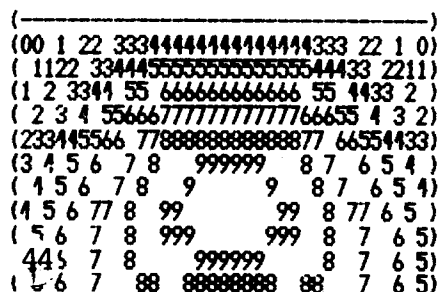
MAX(A) = 6.5921E 00 MIN(A) = 3.0592E (43 AVR(A) = 4.9975E 00

6.000	6.253	6.478	6.536	6.478	6.253	6.000	6.498
5.876	6.123	6.487	6.592	6.487	6.123	5.876	6.384
5.946	5.954	6.217	6.451	6.217	5.954	5.846	6.132
5.485	5.684	5.708	5.520	5.708	5.684	5.485	5.635
4.968	4.867	4.820	4.681	4.820	4.867	4.968	4.867
4.306	4.120	3.642	3.617	3.642	4.120	4.306	3.842
3.651	3.348	3.165	3.059	3.165	3.348	3.651	3.182
5.173	5.003	4.945	4.993	4.945	5.003	5.173	4.998



RELATIVE TOTAL POWER, RNORM: 4.591 KWH/M2, ON THE 276 DAY

0.754	0.904	1.019	1.053	1.019	0.904	0.754	1.031
0.896	1.075	1.224	1.271	1.224	1.075	0.896	1.183
1.022	1.172	1.279	1.339	1.279	1.172	1.022	1.218
1.035	1.169	1.204	1.174	1.204	1.169	1.035	1.164
0.957	1.011	1.023	0.	1.023	1.011	0.957	1.005
0.807	0.843	0.765	0.766	0.765	0.843	0.807	0.791
0.630	0.651	0.643	0.625	0.643	0.651	0.630	0.640
0.962	1.000	1.006	1.012	1.006	1.000	0.962	1.000



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CONTOUR MODE T STEP SIZE 7.1419E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPW

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOT
AREA ,	0.	0.	0.	3.65E 04	1.24E 04	0.	5.43E 04	3.36E 04	0.	0.	1.51E 04	2.63E 05	4.15
POWER,	0.	0.	0.	1.07E 05	3.69E 04	0.	1.91E 05	1.28E 05	0.	0.	6.65E 04	1.37E 06	1.90

ANNUAL TOTAL MMH/M2 REFLECTED BY MIRROR/YEAR , ANNUAL NORM= 3.1382 MMH/M2 , USEFUL HOURS/YEAR= 3714.71 ,UNIVERSITY OF

MAX(A) = 2.6266E 00 MIN(A) = 1.9278E 00 AVR(A) = 2.2879E 00

AIJ = (10 ** 0) X PRINTED VALUES

```
2.474 2.515 2.550 2.571 2.550 2.515 2.474 2.557
2.450 2.507 2.564 2.598 2.564 2.507 2.450 2.552
2.408 2.486 2.566 2.627 2.566 2.486 2.408 2.530
2.317 2.401 2.450 2.547 2.450 2.401 2.317 2.434
2.195 2.214 2.253 2.532 2.253 2.214 2.195 2.227
2.078 2.078 2.018 2.101 2.018 2.078 2.078 2.056
1.979 1.957 1.942 1.928 1.942 1.957 1.979 1.942
2.253 2.266 2.286 2.353 2.286 2.266 2.253 2.288
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CONTOUR MODE T STEP SIZE 6.9879E-02

RELATIVE TOTAL POWER , RNORM= 2.109 MMH/M2/YEAR

MAX(A) = 1.1867E 00 MIN(A) = 6.7661E-01 AVR(A) = 1.0000E 00

AIJ = (10 ** 0) X PRINTED VALUES

```
0.677 0.792 0.873 0.902 0.873 0.792 0.677 ^83
45
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0.813 0.958 1.053 1.090 1.053 0.958 0.813 1.028
 0.916 1.065 1.149 1.187 1.149 1.065 0.916 1.094
 0.952 1.075 1.125 1.179 1.125 1.075 0.952 1.095
 0.920 1.001 1.041 0. 1.041 1.001 0.920 1.002
 0.848 0.926 0.923 0.968 0.923 0.926 0.848 0.923
 0.744 0.828 0.858 0.857 0.858 0.828 0.744 0.850
 0.913 0.987 1.016 1.044 1.016 0.987 0.913 1.000

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CONTOUR MODE T STEP SIZE 5.1013E-02

DISTRIBUTIONS OF AREA AND POWER ACCORDING TO RTPOM

	UNDERFL	>.50	>.55	>.60	>.65	>.70	>.75	>.80	>.85	>.90	>.95	OVERFLO	TOTAL
AREA ,	0.	0.	0.	0.	0.	0.	0.	2.29E 04	4.62E 04	9.33E 04	4.16E 04	2.11E 05	4.15E 05
POWER,	0.	0.	0.	0.	0.	0.	0.	4.04E 04	8.39E 04	1.81E 05	8.43E 04	4.85E 05	8.75E 05

ANNUAL SUMMARY OF INSOLATION , UNIVERSITY OF HOUSTON , ANNUAL INSOLATION= 3.13820 MMH/M2

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.		
DAY = 93	950.14	945.25	929.62	899.82	847.43	749.63	519.01	0.	0.	10.558	
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.		
DAY = 124	937.49	932.56	916.79	886.77	834.08	736.02	506.08	0.	0.	10.154	
62	973.48	968.76	953.69	924.94	874.28	779.37	553.59	0.	0.		
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.		
DAY = 155	936.00	931.06	915.28	885.26	832.64	734.93	506.96	0.	0.	9.548	
31	992.54	987.90	973.06	944.73	894.79	801.13	577.97	0.	0.		
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.		
DAY = 186	934.79	929.80	913.90	883.75	831.16	734.59	515.85	0.	0.	8.753	
0	1002.44	997.75	982.76	954.22	904.08	810.86	594.37	0.	0.		
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.		
DAY = 216	932.67	927.62	911.53	881.17	828.78	734.63	533.12	0.	0.	7.896	
336	993.64	988.85	973.61	944.74	894.60	803.49	604.01	0.	0.		
HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.		
DAY = 246	937.61	932.66	916.96	887.50	837.29	749.27	571.56	0.	0.	7.212	
306	966.39	961.55	946.17	917.27	867.89	780.96	604.04	0.	0.		
HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.		
DAY = 276	947.54	942.68	927.30	898.52	849.74	765.15	598.53	0.	0.	6.986	

ANNUAL SUMMARY OF COSINES , ANNUAL AVER COSINE= 0.7548

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	46 6.17	0.	0.
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DAY = 93	0.7973	0.7920	0.7788	0.7300	0.7210	0.6918	0.6537	0.	0.	0.7513
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.	
DAY = 124	0.7985	0.7939	0.7805	0.7587	0.7296	0.6949	0.6571	0.	0.	0.7535
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.	
DAY = 155	0.7992	0.7950	0.7825	0.7622	0.7351	0.7023	0.6660	0.	0.	0.7572
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.	
DAY = 186	0.7953	0.7916	0.7809	0.7633	0.7396	0.7107	0.6782	0.	0.	0.7586
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.	
DAY = 216	0.7861	0.7832	0.7745	0.7603	0.7410	0.7173	0.6903	0.	0.	0.7563
HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.	
DAY = 246	0.7758	0.7735	0.7666	0.7554	0.7401	0.7212	0.6993	0.	0.	0.7519
HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.	
DAY = 276	0.7712	0.7692	0.7631	0.7530	0.7393	0.7223	0.7026	0.	0.	0.7498

ANNUAL SUMMARY OF FMIR , UNIVERSITY OF HOUSTON

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.	
DAY = 93	0.9809	0.9808	0.9824	0.9881	0.9911	0.9537	0.8092	0.	0.	0.
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.	
DAY = 124	0.9798	0.9803	0.9824	0.9880	0.9919	0.9507	0.8034	0.	0.	0.
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.	
DAY = 155	0.9798	0.9799	0.9832	0.9878	0.9905	0.9463	0.7674	0.	0.	0.
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.	
DAY = 186	0.9831	0.9834	0.9850	0.9891	0.9879	0.9406	0.7638	0.	0.	0.
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.	
DAY = 216	0.9873	0.9872	0.9888	0.9903	0.9822	0.9341	0.8043	0.	0.	0.
HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.	
DAY = 246	0.9905	0.9900	0.9900	0.9865	0.9741	0.9085	0.7958	0.	0.	0.
HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.	
DAY = 276	0.9911	0.9894	0.9875	0.9824	0.9662	0.9007	0.7916	0.	0.	0.

ANNUAL SUMMARY OF FAREA , UNIVERSITY OF HOUSTON , ANNUAL TOTAL REFLECTED POWER/MIRROR= 2.28790 MMH/M2

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.	
DAY = 93	0.7817	0.7769	0.7643	0.7460	0.7187	0.6530	0.5129	0.	0.	7.6971
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.	
DAY = 124	0.7821	0.7778	0.7659	0.7480	0.7219	0.6536	0.5113	0.	0.	7.4177
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.	
DAY = 155	0.7828	0.7785	0.7684	0.7514	0.7263	0.6567	0.4852	0.	0.	6.9896
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.	
DAY = 186	0.7810	0.7776	0.7680	0.7536	0.7284	0.6615	0.4937	0.	0.	6.4196
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.	
DAY = 216	0.7747	0.7718	0.7644	0.7515	0.7249	0.6626	0.5450	0.	0.	5.7798
HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.	
DAY = 246	0.7668	0.7642	0.7575	0.7430	0.7171	0.6439	0.5380	0.	0.	5.2031
HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.	
DAY = 276	0.7628	0.7593	0.7515	0.7369	0.7095	0.6381	0.5342	0.	0.	4.9975

***** TOTAL CLOUDLESS ANNUAL INCIDENT RECEIVER POWER , UNIVERSITY OF HOUSTON *****

TOTAL ANNUAL RECEIVER POWER= 0.7722E 06 IN MMH FOR RECEIVER DIAMETER= 10.40 AND HEIGHT= 13.50 METERS KWH

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	2.512E 08	2.485E 08	2.404E 08	2.272E 08	2.062E 08	1.656E 08	8.990E 07	0.	0.	2.605E 06
HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	2.479E 08	2.453E 08	2.375E 08	2.245E 08	2.038E 08	1.626E 08	8.732E 07	0.	0.	2.509E 06
62	2.574E 08	2.549E 08	2.471E 08	2.341E 08	2.136E 08	1.722E 08	9.552E 07	0.	0.	
HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	2.476E 08	2.449E 08	2.377E 08	2.249E 08	2.044E 08	1.629E 08	8.257E 07	0.	0.	2.362E 06
31	2.625E 08	2.599E 08	2.527E 08	2.400E 08	2.197E 08	1.776E 08	9.413E 07	0.	0.	
HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	

DAY = 186	2.465E 08	2.441E 08	2.370E 08	2.249E 08	2.044E 08	1.638E 08	8.531E 07	0.	0.	2.166E 06
0	2.643E 08	2.619E 08	2.548E 08	2.428E 08	2.223E 08	1.808E 08	9.830E 07	0.	0.	
HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	2.437E 08	2.414E 08	2.350E 08	2.233E 08	2.025E 08	1.638E 08	9.753E 07	0.	0.	1.948E 06
336	2.596E 08	2.574E 08	2.510E 08	2.394E 08	2.185E 08	1.791E 08	1.105E 08	0.	0.	
HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	2.422E 08	2.401E 08	2.340E 08	2.221E 08	2.021E 08	1.619E 08	1.028E 08	0.	0.	1.751E 06
306	2.497E 08	2.476E 08	2.414E 08	2.295E 08	2.095E 08	1.687E 08	1.087E 08	0.	0.	
HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	2.435E 08	2.411E 08	2.346E 08	2.229E 08	2.027E 08	1.637E 08	1.068E 08	0.	0.	1.681E 06

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES , UNIVERSITY OF HOUSTON

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	0.63755	0.63379	0.62366	0.60893	0.58680	0.53262	0.41767	0.	0.	0.57729
HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	0.63767	0.63431	0.62471	0.61031	0.58922	0.53272	0.41603	0.	0.	0.57786
HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	0.63779	0.63435	0.62623	0.61254	0.59205	0.53454	0.39271	0.	0.	0.57575
HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	
DAY = 186	0.63572	0.63294	0.62520	0.61350	0.59287	0.53755	0.39877	0.	0.	0.57665
HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	0.62992	0.62755	0.62158	0.61100	0.58903	0.53760	0.44112	0.	0.	0.57968
HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	0.62294	0.62079	0.61530	0.60336	0.58193	0.52097	0.43383	0.	0.	0.57130
HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	0.61951	0.61660	0.61011	0.59805	0.57525	0.51584	0.43007	0.	0.	0.56649

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES/COSI , UNIVERSITY OF HOUSTON

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	0.79964	0.79960	0.80076	0.80487	0.80719	0.76990	0.63898	0.	0.	0.77442
HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	0.79860	0.79895	0.80045	0.80447	0.80758	0.76658	0.63315	0.	0.	0.77282
HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	0.79801	0.79791	0.80028	0.80360	0.80545	0.76114	0.58969	0.	0.	0.76516
HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	
DAY = 186	0.79938	0.79953	0.80065	0.80376	0.80164	0.75635	0.58802	0.	0.	0.76419
HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	0.80131	0.80128	0.80257	0.80365	0.79492	0.74946	0.63904	0.	0.	0.77032
HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	0.80301	0.80261	0.80262	0.79874	0.78631	0.72241	0.62038	0.	0.	0.76230
HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	0.80327	0.80163	0.79955	0.79420	0.77809	0.71418	0.61214	0.	0.	0.75758

***** TOTAL CLOUDLESS ANNUAL ABSORBED RECEIVER POWER , UNIVERSITY OF HOUSTON *****

TOTAL ANNUAL RECEIVER POWER= 0.6033E 06 IN MMH FOR RECEIVER DIAMETER= 10.40 AND HEIGHT= 13.50 METERS MMH

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	2.268E 08	2.241E 08	2.165E 08	2.040E 08	1.840E 08	1.454E 08	7.350E 07	0.	0.	2.327E 06
HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	2.236E 08	2.212E 08	2.137E 08	2.013E 08	1.817E 08	1.426E 08	7.104E 07	0.	0.	2.240E 06
62	2.327E 08	2.302E 08	2.228E 08	2.105E 08	1.911E 08	1.517E 08	7.883E 07	0.	0.	
HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	2.233E 08	2.208E 08	2.139E 08	2.017E 08	1.823E 08	1.429E 08	6.653E 07	0.	0.	2.106E 06
31	2.375E 08	2.350E 08	2.282E 08	2.161E 08	1.968E 08	1.568E 08	7.752E 07	0.	0.	
HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	
DAY = 186	2.222E 08	2.200E 08	2.132E 08	2.017E 08	1.822E 08	1.437E 08	6.914E 07	0.	0.	1.934E 06
0	2.392E 08	2.369E 08	2.302E 08	2.187E 08	1.993E 08	1.598E 08	8.147E 07	0.	0.	
HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	2.194E 08	2.174E 08	2.113E 08	2.048E 08	1.804E 08	1.437E 08	8.075E 07	0.	0.	1.739E 06
336	2.347E 08	2.326E 08	2.265E 08	2.145E 08	1.957E 08	1.583E 08	9.307E 07	0.	0.	

HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	2.182E 08	2.162E 08	2.104E 08	1.991E 08	1.801E 08	1.419E 08	8.579E 07	0.	0.	1.562E 06
306	2.253E 08	2.233E 08	2.175E 08	2.061E 08	1.871E 08	1.484E 08	9.134E 07	0.	0.	

HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	2.194E 08	2.171E 08	2.110E 08	1.998E 08	1.807E 08	1.436E 08	8.951E 07	0.	0.	1.500E 06

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES , UNIVERSITY OF HOUSTON

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	0.57545	0.57172	0.56158	0.54657	0.52357	0.46768	0.34146	0.	0.	0.51258

HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	0.57516	0.57181	0.56215	0.54742	0.52533	0.46707	0.33849	0.	0.	0.51249

HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	0.57522	0.57179	0.56355	0.54943	0.52796	0.46874	0.31644	0.	0.	0.51045

HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	
DAY = 186	0.57321	0.57041	0.56252	0.55034	0.52868	0.47159	0.32317	0.	0.	0.51142

HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	0.56763	0.56522	0.55900	0.54786	0.52493	0.47163	0.36520	0.	0.	0.51450

HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	0.56117	0.55896	0.55322	0.54083	0.51853	0.45659	0.36190	0.	0.	0.50732

HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	0.55823	0.55531	0.54864	0.53619	0.51269	0.45252	0.36059	0.	0.	0.50345

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES/COSI , UNIVERSITY OF HOUSTON

HOUR =	0.	1.028	2.056	3.085	4.113	5.141	6.169	0.	0.	
DAY = 93	0.72175	0.72130	0.72106	0.72245	0.72021	0.67603	0.52239	0.	0.	0.68645

HOUR =	0.	1.004	2.009	3.013	4.017	5.021	6.026	0.	0.	
DAY = 124	0.72031	0.72022	0.72029	0.72156	0.72002	0.67211	0.51514	0.	0.	0.68423

HOUR =	0.	0.946	1.892	2.837	3.783	4.729	5.675	0.	0.	
DAY = 155	0.71973	0.71922	0.72017	0.72087	0.71826	0.66744	0.47516	0.	0.	0.67726

HOUR =	0.	0.868	1.735	2.603	3.470	4.338	5.206	0.	0.	
DAY = 186	0.72078	0.72054	0.72038	0.72101	0.71484	0.66353	0.47653	0.	0.	0.67680

HOUR =	0.	0.783	1.567	2.350	3.133	3.917	4.700	0.	0.	
DAY = 216	0.72208	0.72169	0.72177	0.72060	0.70841	0.65749	0.52906	0.	0.	0.68302

HOUR =	0.	0.707	1.415	2.122	2.829	3.536	4.244	0.	0.	
DAY = 246	0.72338	0.72267	0.72164	0.71597	0.70065	0.63315	0.51752	0.	0.	0.67643

HOUR =	0.	0.675	1.350	2.025	2.700	3.375	4.050	0.	0.	
DAY = 276	0.72381	0.72194	0.71899	0.71205	0.69348	0.62651	0.51325	0.	0.	0.67286

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW +++ U+H

DAYS	HOUR	SOUTH TO	EAST TO	TO NORTH						
93	0.	9.873	10.931	11.749	13.068	14.581	15.260	15.975	16.861	17.318
93	1.03	10.037	11.368	12.410	13.914	15.514	16.175	16.692	17.242	17.268
93	2.06	10.065	11.662	12.899	14.481	16.099	16.588	16.879	17.144	16.830
93	3.08	9.998	11.761	13.092	14.648	16.174	16.507	16.575	16.536	15.861
93	4.11	9.626	11.446	12.777	14.195	15.545	15.746	15.640	15.318	14.307
93	5.14	8.083	9.470	10.560	11.887	13.089	13.230	12.955	12.396	11.333
93	6.17	4.760	5.282	5.669	6.196	6.802	7.239	7.337	6.851	6.190
124	0.	9.524	10.558	11.399	12.800	14.396	15.146	15.924	16.863	17.356
124	1.00	9.681	11.000	12.070	13.634	15.328	16.037	16.637	17.253	17.316
124	2.01	9.714	11.303	12.566	14.199	15.880	16.464	16.851	17.175	16.896
124	3.01	9.651	11.412	12.771	14.372	15.953	16.374	16.538	16.576	15.964
124	4.02	9.328	11.136	12.479	13.941	15.345	15.620	15.600	15.361	14.428
124	5.02	7.675	9.076	10.242	11.713	13.019	13.150	12.848	12.340	11.337
124	6.03	4.527	5.087	5.487	6.060	6.699	7.066	7.161	6.734	6.041
155	0.	8.958	9.986	10.924	12.558	14.394	15.340	16.294	17.379	17.960
155	0.95	9.091	10.434	11.619	13.398	15.309	16.211	17.011	17.790	17.944
155	1.89	9.145	10.766	12.141	13.962	15.846	16.646	17.249	17.741	17.569
155	2.84	9.095	10.910	12.384	14.153	15.921	16.565	16.960	17.177	16.692
155	3.78	8.797	10.671	12.132	13.746	15.317	15.804	16.014	15.953	15.150
155	4.73	7.174	8.652	10.002	11.805	13.354	13.382	12.914	12.548	11.750
155	5.67	3.890	4.485	4.908	5.657	6.450	6.710	6.834	6.631	5.866
186	0.	8.191	9.260	10.343	12.210	14.301	15.523	16.741	17.997	18.664
186	0.87	8.295	9.678	11.018	13.052	15.220	16.373	17.426	18.395	18.663
186	1.74	8.341	10.009	11.543	13.626	15.749	16.778	17.610	18.314	18.296
186	2.60	8.296	10.173	11.803	13.807	15.677	16.695	17.345	17.801	17.516

186	3.47	8.006	9.938	11.541	13.342	15.102	15.796	16.237	16.499	16.048
186	4.34	6.771	8.415	9.840	11.361	12.729	13.107	13.191	13.242	12.718
186	5.21	3.512	4.174	5.147	5.831	6.574	6.782	6.895	7.076	6.716
216	0.	7.297	8.434	9.705	11.820	14.157	15.640	17.096	18.480	19.201
216	0.78	7.415	8.861	10.371	12.632	15.018	16.392	17.657	18.786	19.179
216	1.57	7.464	9.173	10.860	13.170	15.519	16.760	17.826	18.718	18.838
216	2.35	7.403	9.286	11.056	13.329	15.577	16.655	17.503	18.178	18.098
216	3.13	7.091	8.977	10.660	12.647	14.615	15.595	16.353	16.864	16.624
216	3.92	6.140	7.732	9.127	10.482	11.851	12.842	13.643	14.010	13.685
216	4.70	4.035	5.097	5.983	6.557	7.088	7.523	7.934	8.298	8.276
246	0.	6.608	7.792	9.224	11.572	14.126	15.809	17.435	18.902	19.650
246	0.71	6.729	8.205	9.846	12.290	14.856	16.430	17.887	19.138	19.617
246	1.41	6.771	8.476	10.269	12.783	15.332	16.747	17.977	19.020	19.280
246	2.12	6.719	8.590	10.459	12.933	15.370	16.569	17.512	18.314	18.373
246	2.83	6.467	8.345	10.081	12.165	14.304	15.602	16.687	17.202	16.823
246	3.54	5.604	7.045	8.382	9.849	11.351	12.571	13.659	14.080	13.752
246	4.24	3.948	4.896	5.790	6.329	6.774	7.492	8.249	8.831	9.199
276	0.	6.399	7.608	9.109	11.557	14.211	15.985	17.692	19.202	19.964
276	0.67	6.515	8.002	9.690	12.201	14.847	16.533	18.098	19.391	19.880
276	1.35	6.560	8.273	10.113	12.703	15.323	16.777	18.027	19.115	19.441
276	2.02	6.513	8.386	10.290	12.823	15.330	16.596	17.593	18.431	18.523
276	2.70	6.282	8.156	9.910	12.071	14.319	15.672	16.762	17.274	16.890
276	3.37	5.469	6.858	8.203	9.852	11.520	12.743	13.828	14.247	13.874
276	4.05	3.966	4.883	5.764	6.468	7.065	7.792	8.535	9.072	9.428

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW +++ U+H

DAYS	HOUR	NORTH	TO WEST	TO SOUTH						
93	0.	17.318	16.861	15.975	15.260	14.581	13.068	11.749	10.931	9.873 251.241
93	1.03	16.832	15.916	14.737	13.950	13.320	11.988	10.907	10.422	9.740 248.472
93	2.06	16.032	14.713	13.251	12.314	11.683	10.617	9.912	9.797	9.481 240.457
93	3.08	14.737	13.120	11.467	10.122	9.851	9.168	8.936	9.193	9.197 227.255
93	4.11	12.891	11.010	9.234	8.210	7.816	7.574	7.812	8.404	8.683 206.242
93	5.14	9.937	8.076	6.447	5.717	5.668	5.874	6.446	7.086	7.335 165.596
93	6.17	5.419	4.170	3.049	2.539	2.611	3.185	3.909	4.289	4.406 89.909
124	0.	17.356	16.863	15.924	15.146	14.396	12.800	11.399	10.558	9.524 247.943
124	1.00	16.886	15.953	14.729	13.866	13.152	11.739	10.588	10.070	9.389 245.338
124	2.01	16.111	14.779	13.272	12.249	11.523	10.375	9.597	9.444	9.132 237.539
124	3.01	14.869	13.240	11.531	10.377	9.685	8.901	8.588	8.815	8.838 224.466
124	4.02	13.054	11.172	9.338	8.184	7.648	7.299	7.467	8.052	8.370 203.831
124	5.02	9.988	8.192	6.556	5.698	5.497	5.594	6.087	6.680	6.922 162.622
124	6.03	5.251	4.053	2.981	2.528	2.599	3.074	3.718	4.083	4.170 87.325
155	0.	17.960	17.379	16.294	15.340	14.394	12.558	10.924	9.986	8.958 247.596
155	0.95	17.526	16.533	15.161	14.049	13.077	11.435	10.090	9.477	8.792 244.947
155	1.89	16.813	15.429	13.772	12.494	11.501	10.108	9.121	8.866	8.549 237.726
155	2.84	15.641	13.954	12.079	10.650	9.658	8.590	8.043	8.182	8.239 224.902
155	3.78	13.841	11.938	9.952	8.489	7.606	6.955	6.897	7.410	7.778 204.458
155	4.73	10.551	8.961	7.295	6.045	5.406	5.193	5.495	6.045	6.353 162.932
155	5.67	5.055	4.156	3.231	2.764	2.737	2.901	3.243	3.513	3.540 82.574
186	0.	18.664	17.997	16.741	15.523	14.301	12.210	10.343	9.260	8.191 246.469
186	0.87	18.285	17.254	15.729	14.321	13.032	11.108	9.506	8.723	7.994 244.082
186	1.74	17.619	16.242	14.450	12.861	11.513	9.773	8.468	8.045	7.719 236.975
186	2.60	16.575	14.897	12.878	11.129	9.755	8.282	7.368	7.335	7.398 224.870
186	3.47	14.906	12.991	10.841	9.051	7.755	6.649	6.192	6.541	6.936 204.378
186	4.34	11.617	10.011	8.202	6.613	5.516	4.772	4.653	5.221	5.789 163.776
186	5.21	6.026	5.294	4.382	3.480	2.829	2.388	2.334	2.648	2.926 85.317
216	0.	19.201	18.480	17.096	15.640	14.157	11.820	9.705	8.434	7.297 243.667
216	0.78	18.874	17.855	16.234	14.583	13.000	10.760	8.846	7.868	7.097 241.436
216	1.57	18.265	16.957	15.107	13.272	11.607	9.518	7.866	7.224	6.841 234.993
216	2.35	17.297	15.696	13.630	11.668	9.983	8.110	6.788	6.515	6.518 223.297
216	3.13	15.637	13.855	11.722	9.742	8.119	6.554	5.631	5.722	6.053 202.469
216	3.92	12.585	10.855	9.004	7.214	5.776	4.681	4.271	4.686	5.207 163.799
216	4.70	7.526	6.400	5.273	3.928	2.812	2.276	2.307	2.839	3.382 97.538
246	0.	19.650	18.902	17.435	15.809	14.126	11.572	9.224	7.792	6.608 242.244
246	0.71	19.368	18.372	16.697	14.884	13.090	10.603	8.426	7.263	6.423 240.132
246	1.41	18.802	17.546	15.662	13.689	11.826	9.463	7.511	6.657	6.183 234.002
246	2.12	17.707	16.254	14.243	12.193	10.327	8.158	6.498	5.984	5.878 222.069
246	2.83	15.901	14.343	12.351	10.368	8.610	6.719	5.406	5.237	5.464 202.083
246	3.54	12.788	11.136	9.351	7.759	6.356	4.968	4.173	4.327	4.735 161.894
246	4.24	8.613	7.214	5.892	4.588	3.438	2.705	2.540	2.947	3.394 102.843
276	0.	19.964	19.202	17.692	15.985	14.211	11.557	9.109	7.608	6.399 243.461
276	0.67	19.647	18.668	16.974	15.096	13.222	10.634	8.347	7.102	6.221 241.075
276	1.35	19.026	17.842	15.978	13.953	12.010	9.535	7.460	6.512	5.988 234.644
276	2.02	17.906	16.534	14.565	12.495	10.567	8.280	6.478	5.857	5.694 222.868
276	2.70	16.006	14.517	12.579	10.656	8.897	6.888	5.416	5.131	5.299 202.734
276	3.37	12.954	11.367	9.604	8.108	6.746	5.217	4.224	4.259	4.621 163.700
276	4.05	8.936	7.567	6.224	5.042	3.957	3.065	2.682	2.947	3.366 106.761

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW +++ U+H

DAYS	HOUR	SOUTH	TO EAST	TO NORTH						
93	0.	8.718	9.722	10.499	11.753	13.100	13.835	14.515	15.356	15.790
93	1.03	8.873	10.138	11.128	12.556	14.150	14.705	15.196	15.718	15.743
93	2.06	8.900	10.417	11.592	13.095	14.635	15.097	15.373	15.626	15.327

93	3.08	8.837	10.511	11.776	13.254	14.704	15.020	15.085	15.048	14.406
93	4.11	8.483	10.212	11.476	12.824	14.106	14.297	14.196	13.890	12.930
93	5.14	7.017	8.335	9.370	10.631	11.773	11.907	11.645	11.114	10.104
93	6.17	3.860	4.356	4.724	5.225	5.800	6.215	6.309	5.847	5.219
124	0.	8.386	9.369	10.168	11.498	13.014	13.727	14.466	15.359	15.827
124	1.00	8.535	9.789	10.805	12.291	13.900	14.573	15.144	15.728	15.788
124	2.01	8.567	10.076	11.276	12.828	14.425	14.980	15.346	15.655	15.389
124	3.01	8.506	10.180	11.471	12.992	14.494	14.894	15.049	15.085	14.504
124	4.02	8.200	9.918	11.193	12.582	13.916	14.177	14.159	13.932	13.045
124	5.02	6.630	7.961	9.068	10.466	11.706	11.831	11.544	11.061	10.108
124	6.03	3.639	4.171	4.551	5.095	5.703	6.051	6.142	5.736	5.078
155	0.	7.849	8.825	9.716	11.268	13.013	13.911	14.818	15.848	16.401
155	0.95	7.975	9.251	10.377	12.067	13.882	14.739	15.499	16.239	16.385
155	1.89	8.026	9.566	10.872	12.602	14.392	15.152	15.725	16.193	16.029
155	2.84	7.979	9.703	11.103	12.784	14.463	15.075	15.451	15.657	15.196
155	3.78	7.695	9.476	10.864	12.397	13.890	14.352	14.552	14.494	13.731
155	4.73	6.154	7.558	8.840	10.554	12.024	12.052	11.606	11.259	10.501
155	5.67	3.034	3.599	4.001	4.713	5.466	5.713	5.831	5.638	4.911
186	0.	7.120	8.136	9.164	10.938	12.924	14.085	15.242	16.435	17.070
186	0.87	7.219	8.532	9.806	11.738	13.797	14.893	15.893	16.814	17.068
186	1.74	7.262	8.847	10.305	12.283	14.310	15.278	16.067	16.737	16.719
186	2.60	7.219	9.003	10.552	12.455	14.358	15.199	15.816	16.249	15.978
186	3.47	6.944	8.780	10.302	12.014	13.685	14.345	14.764	15.012	14.584
186	4.34	5.771	7.333	8.686	10.131	11.431	11.790	11.870	11.919	11.420
186	5.21	2.675	3.589	4.228	4.877	5.584	5.781	5.888	6.061	5.719
216	0.	6.270	7.350	8.558	10.567	12.788	14.196	15.580	16.895	17.579
216	0.78	6.383	7.757	9.191	11.339	13.605	14.911	16.112	17.185	17.558
216	1.57	6.429	8.053	9.655	11.850	14.082	15.260	16.273	17.120	17.235
216	2.35	6.371	8.160	9.842	12.001	14.136	15.160	15.966	16.608	16.531
216	3.13	6.075	7.867	9.465	11.353	13.223	14.154	14.874	15.359	15.131
216	3.92	5.172	6.683	8.009	9.297	10.597	11.539	12.299	12.648	12.339
216	4.70	3.171	4.181	5.022	5.567	6.072	6.485	6.876	7.221	7.201
246	0.	5.616	6.741	8.101	10.331	12.759	14.357	15.902	17.295	18.005
246	0.71	5.731	7.133	8.692	11.014	13.451	14.947	16.331	17.519	17.974
246	1.41	5.771	7.391	9.094	11.483	13.903	15.248	16.417	17.407	17.654
246	2.12	5.721	7.499	9.274	11.625	13.940	15.079	15.975	16.736	16.793
246	2.83	5.482	7.266	8.915	10.895	12.927	14.161	15.191	15.681	15.321
246	3.54	4.662	6.031	7.301	8.695	10.122	11.281	12.315	12.714	12.403
246	4.24	3.089	3.989	4.839	5.351	5.774	6.455	7.175	7.728	8.078
276	0.	5.418	6.566	7.992	10.318	12.839	14.524	16.146	17.580	18.304
276	0.67	5.527	6.940	8.544	10.930	13.443	15.044	16.531	17.760	18.224
276	1.35	5.571	7.198	8.945	11.406	13.895	15.277	16.464	17.497	17.808
276	2.02	5.526	7.305	9.114	11.520	13.902	15.105	16.052	16.848	16.935
276	2.70	5.307	7.086	8.753	10.806	12.942	14.226	15.262	15.749	15.384
276	3.37	4.534	5.854	7.131	8.698	10.282	11.444	12.475	12.873	12.519
276	4.05	3.106	3.977	4.814	5.483	6.050	6.741	7.446	7.957	8.295

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW +-+ U+H

DAYS	HOUR	NORTH	TO WEST	TO SOUTH							
93	0.	15.790	15.356	14.515	13.835	13.191	11.753	10.499	9.722	8.718	226.769
93	1.03	15.329	14.459	13.339	12.591	11.993	10.727	9.700	9.239	8.591	224.139
93	2.06	14.569	13.315	11.927	11.037	10.437	9.424	8.755	8.646	8.346	216.525
93	3.08	13.339	11.803	10.232	9.240	8.697	8.048	7.828	8.072	8.075	203.983
93	4.11	11.585	9.798	8.111	7.138	6.764	6.533	6.760	7.322	7.588	184.021
93	5.14	8.778	7.010	5.463	4.770	4.723	4.918	5.462	6.070	6.307	145.407
93	6.17	4.486	3.300	2.235	1.750	1.819	2.364	3.052	3.413	3.524	73.504
124	0.	15.827	15.359	14.466	13.727	13.014	11.498	10.168	9.369	8.386	223.637
124	1.00	15.380	14.493	13.331	12.511	11.833	10.490	9.397	8.905	8.258	221.162
124	2.01	14.643	13.378	11.947	10.975	10.285	9.194	8.456	8.310	8.013	213.753
124	3.01	13.464	11.916	10.293	9.197	8.539	7.795	7.497	7.713	7.735	201.333
124	4.02	11.740	9.952	8.209	7.113	6.604	6.273	6.432	6.987	7.289	181.730
124	5.02	8.827	7.121	5.567	4.751	4.561	4.652	5.121	5.685	5.914	142.582
124	6.03	4.327	3.189	2.170	1.740	1.807	2.259	2.871	3.217	3.300	71.049
155	0.	16.401	15.848	14.818	13.911	13.013	11.268	9.716	8.825	7.849	223.307
155	0.95	15.988	15.045	13.741	12.685	11.761	10.202	8.924	8.341	7.691	220.800
155	1.89	15.311	13.996	12.422	11.207	10.264	8.941	8.003	7.761	7.460	213.931
155	2.84	14.198	12.594	10.814	9.456	8.513	7.498	6.979	7.112	7.165	201.748
155	3.78	12.487	10.680	8.793	7.403	6.564	5.945	5.890	6.378	6.728	182.326
155	4.73	9.362	7.852	6.269	5.081	4.474	4.272	4.559	5.081	5.374	142.877
155	5.67	4.141	3.287	2.408	1.965	1.938	2.094	2.419	2.676	2.701	66.536
186	0.	17.070	16.435	15.242	14.085	12.924	10.938	9.164	8.136	7.120	222.236
186	0.87	16.709	15.730	14.280	12.943	11.719	9.891	8.369	7.625	6.932	219.968
186	1.74	16.076	14.768	13.066	11.556	10.276	8.623	7.383	6.981	6.672	213.217
186	2.60	15.085	13.490	11.572	9.910	8.606	7.206	6.338	6.307	6.366	201.717
186	3.47	13.499	11.680	9.637	7.937	6.706	5.654	5.221	5.552	5.928	182.250
186	4.34	10.375	8.848	7.130	5.621	4.579	3.872	3.759	4.298	4.838	143.678
186	5.21	5.063	4.367	3.501	2.645	2.026	1.607	1.556	1.854	2.118	69.142
216	0.	17.579	16.895	15.580	14.196	12.788	10.567	8.558	7.350	6.270	219.575
216	0.78	17.268	16.301	14.760	13.192	11.688	9.561	7.742	6.813	6.080	217.455
216	1.57	16.690	15.448	13.690	11.947	10.365	8.380	6.811	6.202	5.837	211.334
216	2.35	15.771	14.250	12.287	10.423	8.822	7.043	5.787	5.527	5.530	200.223
216	3.13	14.194	12.501	10.474	8.593	7.051	5.565	4.688	4.774	5.089	180.436
216	3.92	11.294	9.651	7.893	6.192	4.622	3.785	3.396	3.790	4.285	143.700

216	4.70	6.488	5.418	4.347	3.070	2.010	1.501	1.530	2.036	2.552	80.752
246	0.	18.005	17.295	15.902	14.357	12.759	10.331	8.101	6.741	5.616	218.222
246	0.71	17.738	16.792	15.200	13.478	11.774	9.411	7.343	6.239	5.441	216.217
246	1.41	17.201	16.007	14.217	12.343	10.573	8.328	6.474	5.662	5.212	210.392
246	2.12	16.160	14.780	12.869	10.922	9.149	7.089	5.511	5.023	4.923	199.076
246	2.83	14.444	12.964	11.071	9.188	7.518	5.721	4.474	4.313	4.529	180.070
246	3.54	11.487	9.918	8.222	6.710	5.376	4.058	3.303	3.449	3.837	141.891
246	4.24	7.521	6.192	4.935	3.697	2.604	1.908	1.751	2.138	2.563	85.792
276	0.	18.304	17.580	16.146	14.524	12.839	10.318	7.992	6.566	5.418	219.379
276	0.67	18.003	17.073	15.464	13.680	11.899	9.441	7.268	6.085	5.249	217.112
276	1.35	17.413	16.288	14.518	12.594	10.748	8.397	6.425	5.525	5.027	211.003
276	2.02	16.349	15.046	13.175	11.208	9.377	7.204	5.493	4.903	4.748	199.816
276	2.70	14.544	13.129	11.288	9.461	7.790	5.882	4.484	4.213	4.373	180.688
276	3.37	11.644	10.137	8.462	7.041	5.747	4.294	3.352	3.384	3.728	143.606
276	4.05	7.827	6.527	5.251	4.128	3.098	2.250	1.886	2.138	2.536	89.514

ANNUAL SUMMARY OF DIMENSIONLESS PANEL GRADIENTS +++ U#H

DAYS	HOUR	SOUTH TO	EAST TO	NORTH							
93	0.	0.000	0.109	0.077	0.113	0.115	0.048	0.048	0.056	0.028	
93	1.03	0.032	0.133	0.093	0.121	0.116	0.042	0.033	0.034	0.002	
93	2.06	0.064	0.157	0.107	0.122	0.111	0.031	0.018	0.016	-0.019	
93	3.08	0.090	0.173	0.113	0.118	0.104	0.021	0.004	-0.002	-0.044	
93	4.11	0.111	0.185	0.117	0.111	0.095	0.013	-0.007	-0.022	-0.072	
93	5.14	0.107	0.172	0.117	0.126	0.102	0.011	-0.022	-0.047	-0.095	
93	6.17	0.091	0.121	0.081	0.101	0.104	0.069	0.015	-0.076	-0.114	
124	0.	0.000	0.111	0.082	0.123	0.124	0.053	0.052	0.060	0.030	
124	1.00	0.033	0.137	0.099	0.129	0.123	0.047	0.038	0.038	0.004	
124	2.01	0.067	0.162	0.112	0.129	0.117	0.038	0.024	0.020	-0.017	
124	3.01	0.095	0.179	0.119	0.124	0.109	0.027	0.010	0.002	-0.039	
124	4.02	0.118	0.190	0.121	0.117	0.101	0.019	-0.001	-0.016	-0.066	
124	5.02	0.114	0.182	0.130	0.143	0.112	0.011	-0.025	-0.043	-0.090	
124	6.03	0.098	0.136	0.087	0.113	0.112	0.059	0.015	-0.068	-0.122	
155	0.	0.000	0.117	0.096	0.148	0.144	0.067	0.063	0.067	0.034	
155	0.95	0.036	0.148	0.115	0.151	0.140	0.060	0.050	0.047	0.009	
155	1.89	0.073	0.175	0.128	0.147	0.133	0.051	0.037	0.029	-0.010	
155	2.84	0.107	0.195	0.135	0.141	0.123	0.041	0.025	0.013	-0.030	
155	3.78	0.134	0.207	0.136	0.132	0.114	0.033	0.014	-0.004	-0.054	
155	4.73	0.135	0.205	0.156	0.177	0.130	0.002	-0.038	-0.030	-0.070	
155	5.67	0.116	0.171	0.106	0.163	0.148	0.044	0.020	-0.034	-0.138	
186	0.	0.000	0.133	0.119	0.176	0.166	0.086	0.079	0.075	0.038	
186	0.87	0.041	0.167	0.139	0.179	0.161	0.076	0.065	0.056	0.015	
186	1.74	0.085	0.197	0.152	0.175	0.152	0.065	0.050	0.041	-0.001	
186	2.60	0.126	0.220	0.158	0.165	0.142	0.057	0.040	0.027	-0.017	
186	3.47	0.158	0.234	0.160	0.153	0.130	0.047	0.029	0.017	-0.029	
186	4.34	0.176	0.238	0.169	0.154	0.121	0.031	0.007	0.004	-0.043	
186	5.21	0.232	0.292	0.163	0.143	0.135	0.035	0.018	0.029	-0.058	
216	0.	0.000	0.159	0.152	0.210	0.190	0.104	0.093	0.081	0.040	
216	0.78	0.049	0.194	0.169	0.209	0.182	0.092	0.077	0.064	0.021	
216	1.57	0.097	0.224	0.181	0.204	0.172	0.080	0.064	0.051	0.007	
216	2.35	0.141	0.246	0.187	0.198	0.163	0.070	0.052	0.039	-0.005	
216	3.13	0.177	0.257	0.184	0.181	0.152	0.068	0.050	0.032	-0.015	
216	3.92	0.188	0.255	0.180	0.149	0.131	0.085	0.064	0.028	-0.025	
216	4.70	0.217	0.275	0.183	0.103	0.087	0.066	0.059	0.049	-0.003	
246	0.	0.000	0.182	0.183	0.242	0.210	0.118	0.102	0.084	0.040	
246	0.71	0.052	0.218	0.197	0.236	0.199	0.105	0.089	0.070	0.026	
246	1.41	0.102	0.246	0.207	0.232	0.191	0.092	0.074	0.059	0.014	
246	2.12	0.150	0.269	0.212	0.225	0.181	0.079	0.058	0.047	0.003	
246	2.83	0.190	0.280	0.204	0.200	0.171	0.091	0.070	0.032	-0.023	
246	3.54	0.194	0.256	0.190	0.174	0.152	0.108	0.088	0.032	-0.025	
246	4.24	0.186	0.254	0.192	0.100	0.076	0.112	0.106	0.074	0.044	
276	0.	0.000	0.192	0.196	0.254	0.218	0.123	0.106	0.085	0.040	
276	0.67	0.052	0.227	0.207	0.245	0.206	0.112	0.094	0.072	0.026	
276	1.35	0.103	0.255	0.217	0.242	0.197	0.095	0.075	0.061	0.018	
276	2.02	0.152	0.277	0.220	0.233	0.187	0.083	0.061	0.048	0.005	
276	2.70	0.193	0.287	0.210	0.210	0.180	0.095	0.070	0.031	-0.023	
276	3.37	0.195	0.254	0.197	0.198	0.167	0.107	0.086	0.031	-0.028	
276	4.05	0.202	0.246	0.190	0.130	0.098	0.108	0.099	0.066	0.042	

ANNUAL SUMMARY OF DIMENSIONLESS PANEL GRADIENTS +++ U#H

DAYS	HOUR	NORTH TO	WEST TO	SOUTH							
93	0.	-0.000	-0.028	-0.056	-0.048	-0.048	-0.115	-0.113	-0.077	-0.109	
93	1.03	-0.027	-0.058	-0.081	-0.058	-0.049	-0.111	-0.101	-0.049	-0.073	
93	2.06	-0.051	-0.090	-0.110	-0.078	-0.056	-0.102	-0.074	-0.013	-0.035	
93	3.08	-0.077	-0.122	-0.143	-0.102	-0.061	-0.078	-0.028	0.031	0.000	
93	4.11	-0.110	-0.167	-0.188	-0.128	-0.054	-0.035	0.034	0.080	0.036	
93	5.14	-0.140	-0.224	-0.248	-0.135	-0.010	0.040	0.105	0.105	0.038	
93	6.17	-0.151	-0.305	-0.385	-0.243	0.038	0.261	0.254	0.112	0.032	
124	0.	0.	-0.030	-0.060	-0.052	-0.053	-0.124	-0.123	-0.082	-0.111	
124	1.00	-0.026	-0.059	-0.084	-0.063	-0.056	-0.120	-0.110	-0.054	-0.075	
124	2.01	-0.050	-0.090	-0.113	-0.085	-0.044	-0.112	-0.084	-0.017	-0.036	
124	3.01	-0.074	-0.122	-0.146	-0.112	-0.052	-0.091	-0.039	0.028	0.003	
124	4.02	-0.105	-0.165	-0.192	-0.143	-0.077	-0.051	0.025	0.083	0.042	

124	5.02	-0.135	-0.214	-0.245	-0.158	-0.041	0.020	0.096	0.104	0.040
124	6.03	-0.160	-0.303	-0.380	-0.220	0.038	0.222	0.239	0.114	0.025
155	0.	0.000	-0.034	-0.067	-0.063	-0.067	-0.144	-0.148	-0.096	-0.117
155	0.95	-0.025	-0.061	-0.091	-0.080	-0.076	-0.142	-0.134	-0.068	-0.081
155	1.89	-0.046	-0.090	-0.119	-0.103	-0.088	-0.138	-0.111	-0.031	-0.040
155	2.84	-0.068	-0.120	-0.152	-0.134	-0.105	-0.127	-0.072	0.019	0.008
155	3.78	-0.095	-0.156	-0.194	-0.172	-0.120	-0.099	-0.009	0.080	0.053
155	4.73	-0.115	-0.175	-0.224	-0.209	-0.127	-0.046	0.065	0.108	0.056
155	5.67	-0.170	-0.230	-0.309	-0.203	-0.013	0.077	0.144	0.101	0.010
186	0.	0.000	-0.038	-0.075	-0.079	-0.086	-0.166	-0.176	-0.119	-0.133
186	0.87	-0.021	-0.060	-0.097	-0.098	-0.099	-0.169	-0.167	-0.093	-0.095
186	1.74	-0.039	-0.085	-0.122	-0.123	-0.117	-0.175	-0.155	-0.056	-0.045
186	2.60	-0.058	-0.112	-0.153	-0.155	-0.141	-0.177	-0.128	-0.005	0.009
186	3.47	-0.077	-0.145	-0.192	-0.193	-0.168	-0.170	-0.080	0.062	0.065
186	4.34	-0.096	-0.159	-0.215	-0.237	-0.204	-0.167	-0.030	0.134	0.118
186	5.21	-0.122	-0.147	-0.220	-0.279	-0.265	-0.230	-0.033	0.175	0.133
216	0.	-0.000	-0.040	-0.081	-0.093	-0.104	-0.190	-0.210	-0.152	-0.159
216	0.78	-0.017	-0.058	-0.099	-0.112	-0.121	-0.200	-0.210	-0.128	-0.114
216	1.57	-0.032	-0.077	-0.121	-0.136	-0.142	-0.212	-0.207	-0.094	-0.061
216	2.35	-0.047	-0.101	-0.148	-0.164	-0.166	-0.224	-0.196	-0.046	0.001
216	3.13	-0.064	-0.127	-0.176	-0.197	-0.197	-0.236	-0.171	0.018	0.064
216	3.92	-0.088	-0.157	-0.200	-0.241	-0.248	-0.242	-0.109	0.110	0.123
216	4.70	-0.104	-0.180	-0.219	-0.345	-0.417	-0.290	0.019	0.284	0.225
246	0.	0.	-0.040	-0.084	-0.102	-0.118	-0.210	-0.242	-0.183	-0.182
246	0.71	-0.013	-0.055	-0.099	-0.120	-0.135	-0.223	-0.247	-0.163	-0.137
246	1.41	-0.026	-0.072	-0.118	-0.141	-0.155	-0.238	-0.250	-0.134	-0.083
246	2.12	-0.038	-0.089	-0.138	-0.164	-0.177	-0.254	-0.250	-0.093	-0.020
246	2.83	-0.059	-0.108	-0.157	-0.186	-0.200	-0.271	-0.245	-0.036	0.049
246	3.54	-0.077	-0.147	-0.187	-0.203	-0.221	-0.279	-0.205	0.043	0.106
246	4.24	-0.071	-0.194	-0.226	-0.287	-0.347	-0.308	-0.086	0.199	0.181
276	0.	0.	-0.040	-0.085	-0.106	-0.123	-0.218	-0.254	-0.196	-0.192
276	0.67	-0.012	-0.053	-0.099	-0.122	-0.139	-0.230	-0.260	-0.177	-0.148
276	1.35	-0.022	-0.067	-0.115	-0.142	-0.158	-0.246	-0.266	-0.151	-0.094
276	2.02	-0.035	-0.083	-0.133	-0.161	-0.178	-0.262	-0.270	-0.113	-0.032
276	2.70	-0.056	-0.102	-0.151	-0.176	-0.194	-0.279	-0.270	-0.062	0.037
276	3.37	-0.072	-0.138	-0.180	-0.183	-0.202	-0.289	-0.247	0.010	0.097
276	4.05	-0.058	-0.181	-0.217	-0.239	-0.285	-0.317	-0.176	0.125	0.170

ANNUAL SUMMARY OF RECEIVER ASYMMETRY RATIOS , UNIVERSITY OF HOUSTON

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.
DAY = 93	1.844	1.841	1.874	1.927	2.189	2.528	3.705	0.	0.
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.
DAY = 124	1.922	1.920	1.956	2.021	2.267	2.598	3.613	0.	0.
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.
DAY = 155	2.132	2.137	2.176	2.254	2.490	2.833	3.027	0.	0.
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.
DAY = 186	2.452	2.470	2.524	2.578	2.878	3.213	3.956	0.	0.
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.
DAY = 216	2.879	2.899	2.962	3.032	3.336	3.725	5.015	0.	0.
HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.
DAY = 246	3.304	3.323	3.390	3.471	3.637	3.910	4.648	0.	0.
HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.
DAY = 276	3.488	3.497	3.543	3.616	3.742	3.967	4.405	0.	0.

ANNUAL SUMMARY OF RECEIVER PANEL MAXIMA IN KW OVER PANEL NUMBER OF MAXIMA , UNIVERSITY OF HOUSTON

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.
DAY = 93	15.84	15.79	15.63	15.09	14.30	11.91	6.34	0.	0.
	9.50	8.56	7.96	7.14	6.16	5.84	6.67	0.	0.
HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.
DAY = 124	15.89	15.82	15.66	15.15	14.20	11.84	6.17	0.	0.
	9.50	8.63	8.04	7.56	6.43	5.80	6.68	0.	0.
HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.
DAY = 155	16.47	16.40	16.21	15.67	14.56	12.10	5.83	0.	0.
	9.50	8.77	8.24	7.81	7.27	5.56	6.88	0.	0.
HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.
DAY = 186	17.15	17.07	16.81	16.25	15.02	11.96	6.07	0.	0.
	9.50	8.91	8.47	8.12	7.87	7.59	7.84	0.	0.
HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.
DAY = 216	17.66	17.56	17.27	16.66	15.53	12.65	7.26	0.	0.
	9.50	9.06	8.67	8.39	8.03	8.03	8.44	0.	0.

HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.
DAY = 246	18.09	17.98	17.66	16.85	15.68	12.72	8.08	0.	0.
	9.50	9.16	8.85	8.58	8.08	8.06	8.89	0.	0.

HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.
DAY = 276	18.39	18.24	17.81	16.98	15.75	12.87	8.30	0.	0.
	9.50	9.18	8.94	8.63	8.07	8.03	8.92	0.	0.

ANNUAL SUMMARY OF RECEIVER PANEL MINIMA IN KW OVER PANEL NUMBER OF MINIMA , UNIVERSITY OF HOUSTON

HOUR =	0.	1.03	2.06	3.08	4.11	5.14	6.17	0.	0.
DAY = 93	8.59	8.57	8.34	7.83	6.53	4.71	1.71	0.	0.
	18.50	18.20	17.85	15.97	15.00	13.69	13.38	0.	0.

HOUR =	0.	1.00	2.01	3.01	4.02	5.02	6.03	0.	0.
DAY = 124	8.26	8.24	8.00	7.50	6.27	4.56	1.71	0.	0.
	18.50	18.20	17.85	16.08	15.17	14.18	13.37	0.	0.

HOUR =	0.	0.95	1.89	2.84	3.78	4.73	5.67	0.	0.
DAY = 155	7.73	7.67	7.45	6.95	5.85	4.27	1.93	0.	0.
	18.50	18.20	17.85	16.30	15.60	14.91	13.64	0.	0.

HOUR =	0.	0.87	1.74	2.60	3.47	4.34	5.21	0.	0.
DAY = 186	6.99	6.91	6.66	6.31	5.22	3.72	1.53	0.	0.
	18.50	18.21	17.84	16.84	16.07	15.67	15.65	0.	0.

HOUR =	0.	0.78	1.57	2.35	3.13	3.92	4.70	0.	0.
DAY = 216	6.14	6.06	5.83	5.50	4.61	3.40	1.45	0.	0.
	18.50	18.21	17.88	17.49	16.41	16.00	15.45	0.	0.

HOUR =	0.	0.71	1.41	2.12	2.83	3.54	4.24	0.	0.
DAY = 246	5.48	5.41	5.21	4.85	4.31	3.25	1.74	0.	0.
	18.50	18.23	17.95	17.61	16.93	16.34	15.79	0.	0.

HOUR =	0.	0.67	1.35	2.02	2.70	3.37	4.05	0.	0.
DAY = 276	5.27	5.21	5.03	4.70	4.21	3.25	1.88	0.	0.
	18.50	18.25	17.98	17.67	17.13	16.47	16.09	0.	0.

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS	HOUR	SOUTH	TO EAST	TO NORTH						
93	0.	9.872	10.929	11.747	13.066	14.579	15.258	15.973	16.858	17.315
93	1.03	10.087	11.425	12.473	13.984	15.622	16.256	16.776	17.329	17.355
93	2.06	10.286	11.917	13.181	14.798	16.452	16.952	17.249	17.520	17.199
93	3.08	10.556	12.417	13.822	15.465	17.076	17.428	17.500	17.458	16.745
93	4.11	10.791	12.832	14.323	15.913	17.427	17.651	17.533	17.171	16.039
93	5.14	10.244	12.001	13.383	15.064	16.588	16.767	16.417	15.709	14.362
93	6.17	8.712	9.668	10.377	11.342	12.450	13.250	13.431	12.541	11.330
124	0.	9.651	10.699	11.551	12.970	14.588	15.348	16.136	17.088	17.588
124	1.00	9.862	11.206	12.296	13.889	15.615	16.337	16.949	17.575	17.640
124	2.01	10.066	11.713	13.021	14.714	16.456	17.061	17.461	17.797	17.508
124	3.01	10.339	12.226	13.681	15.397	17.091	17.542	17.717	17.758	17.102
124	4.02	10.624	12.684	14.213	15.879	17.478	17.791	17.768	17.496	16.434
124	5.02	9.907	11.715	13.219	15.119	16.804	16.973	16.583	15.927	14.633
124	6.03	8.498	9.549	10.299	11.376	12.576	13.265	13.443	12.642	11.341
155	0.	9.092	10.136	11.087	12.745	14.609	15.569	16.538	17.639	18.229
155	0.95	9.276	10.646	11.856	13.671	15.620	16.541	17.357	18.152	18.309
155	1.89	9.492	11.174	12.601	14.491	16.447	17.278	17.903	18.414	18.236
155	2.84	9.761	11.708	13.289	15.188	17.085	17.777	18.200	18.433	17.913
155	3.78	10.037	12.175	13.842	15.684	17.476	18.031	18.271	18.202	17.286
155	4.73	9.274	11.184	12.929	15.260	17.262	17.299	16.693	16.220	15.189
155	5.67	7.289	8.404	9.196	10.601	12.087	12.573	12.806	12.425	10.991
186	0.	8.324	9.411	10.511	12.409	14.534	15.775	17.014	18.290	18.968
186	0.87	8.476	9.888	11.258	13.336	15.551	16.729	17.804	18.795	19.069
186	1.74	8.670	10.405	11.999	14.164	16.382	17.441	18.305	19.037	19.018
186	2.60	8.918	10.936	12.688	14.843	16.995	17.947	18.645	19.135	18.829
186	3.47	9.150	11.359	13.191	15.250	17.261	18.055	18.559	18.857	18.342
186	4.34	8.757	10.883	12.726	14.693	16.462	16.951	17.059	17.125	16.447
186	5.21	6.468	8.240	9.479	10.738	12.107	12.490	12.697	13.031	12.369
216	0.	7.432	8.590	9.885	12.039	14.420	15.930	17.414	18.824	19.557
216	0.78	7.594	9.075	10.621	12.937	15.380	16.788	18.083	19.239	19.641
216	1.57	7.779	9.560	11.318	13.726	16.174	17.467	18.578	19.508	19.633
216	2.35	7.981	10.011	11.920	14.370	16.793	17.955	18.870	19.598	19.511
216	3.13	8.128	10.291	12.219	14.496	16.753	17.876	18.745	19.330	19.056
216	3.92	7.941	9.998	11.803	13.555	15.326	16.607	17.642	18.118	17.697
216	4.70	7.190	9.083	10.662	11.684	12.631	13.405	14.139	14.786	14.748
246	0.	6.696	7.895	9.346	11.724	14.313	16.018	17.665	19.152	19.909
246	0.71	6.854	8.358	10.029	12.519	15.132	16.736	18.220	19.493	19.981
246	1.41	7.015	8.782	10.639	13.244	15.884	17.350	18.625	19.705	19.975
246	2.12	7.192	9.195	11.196	13.844	16.452	17.736	18.746	19.603	19.667
246	2.83	7.338	9.468	11.438	13.803	16.230	17.703	18.934	19.518	19.088
246	3.54	7.106	8.933	10.627	12.488	14.354	15.939	17.319	17.852	17.436
246	4.24	6.563	8.137	9.624	10.519	11.254	12.452	13.712	14.679	15.291

276	0.	6.416	7.628	9.132	11.587	14.248	16.027	17.738	19.252	20.016
276	0.67	6.565	8.064	9.765	12.296	14.962	16.661	18.238	19.542	20.034
276	1.35	6.721	8.475	10.360	13.014	15.698	17.188	18.468	19.583	19.917
276	2.02	6.887	8.867	10.879	13.558	16.208	17.547	18.601	19.487	19.584
276	2.70	7.024	9.118	11.079	13.496	16.009	17.521	18.740	19.312	18.883
276	3.37	6.790	8.515	10.184	12.232	14.303	15.822	17.169	17.689	17.226
276	4.05	6.294	7.750	9.148	10.265	11.213	12.368	13.546	14.400	14.964

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS	HOUR	NORTH	TO WEST	TO SOUTH							
93	0.	17.315	16.858	15.973	15.258	14.579	13.066	11.747	10.929	9.872	251.203
93	1.03	16.917	15.996	14.811	14.020	13.387	12.048	10.962	10.474	9.789	249.721
93	2.06	16.384	15.035	13.542	12.584	11.939	10.849	10.130	10.012	9.689	245.729
93	3.08	15.559	13.852	12.107	11.004	10.400	9.679	9.435	9.706	9.710	239.927
93	4.11	14.451	12.343	10.352	9.204	8.762	8.490	8.758	9.421	9.734	231.205
93	5.14	12.593	10.234	8.170	7.246	7.183	7.144	8.169	8.980	9.295	209.859
93	6.17	9.919	7.633	5.581	4.647	4.779	5.830	7.156	7.851	8.065	164.570
124	0.	17.588	17.088	16.136	15.348	14.588	12.970	11.551	10.699	9.651	251.251
124	1.00	17.202	16.251	15.004	14.126	13.398	11.958	10.786	10.259	9.565	249.927
124	2.01	16.694	15.314	13.753	12.692	11.940	10.751	9.945	9.786	9.462	246.144
124	3.01	15.929	14.184	12.354	11.117	10.376	9.536	9.201	9.444	9.468	240.471
124	4.02	14.868	12.725	10.635	9.321	8.711	8.314	8.505	9.171	9.533	232.159
124	5.02	12.892	10.574	8.462	7.354	7.096	7.220	7.857	8.622	8.935	209.901
124	6.03	9.857	7.609	5.596	4.745	4.878	5.771	6.980	7.664	7.828	163.925
155	0.	18.229	17.639	16.538	15.569	14.609	12.745	11.087	10.136	9.092	251.298
155	0.95	17.882	16.869	15.469	14.335	13.313	11.668	10.295	9.669	8.971	249.939
155	1.89	17.451	16.015	14.294	12.968	11.937	10.492	9.467	9.202	8.873	246.744
155	2.84	16.785	14.974	12.963	11.429	10.364	9.218	8.631	8.781	8.841	241.349
155	3.78	15.792	13.621	11.355	9.685	8.678	7.935	7.869	8.455	8.875	233.276
155	4.73	13.639	11.584	9.430	7.813	6.988	6.713	7.103	7.814	8.213	210.614
155	5.67	9.473	7.789	6.055	5.180	5.128	5.436	6.077	6.583	6.634	154.736
186	0.	18.968	18.290	17.014	15.775	14.534	12.409	10.511	9.411	8.324	250.480
186	0.87	18.682	17.629	16.070	14.632	13.316	11.350	9.713	8.913	8.167	249.384
186	1.74	18.314	16.883	15.021	13.368	11.968	10.159	8.802	8.362	8.024	246.334
186	2.60	17.818	16.014	13.843	11.963	10.486	8.903	7.920	7.885	7.952	241.728
186	3.47	17.037	14.848	12.391	10.345	8.864	7.599	7.077	7.476	7.928	233.599
186	4.34	15.024	12.946	10.607	8.553	7.134	6.172	6.017	6.752	7.487	211.803
186	5.21	11.097	9.749	8.069	6.409	5.210	4.398	4.298	4.877	5.389	157.123
216	0.	19.557	18.824	17.414	15.930	14.420	12.039	9.885	8.590	7.432	248.194
216	0.78	19.329	18.286	16.625	14.935	13.313	11.020	9.060	8.058	7.268	247.262
216	1.57	19.035	17.673	15.744	13.832	12.097	9.919	8.198	7.529	7.129	244.911
216	2.35	18.649	16.923	14.695	12.580	10.763	8.743	7.318	7.023	7.027	240.739
216	3.13	17.925	15.882	13.436	11.167	9.307	7.513	6.455	6.559	6.938	232.083
216	3.92	16.275	14.037	11.644	9.329	7.469	6.053	5.523	6.060	6.734	211.821
216	4.70	13.410	11.404	9.396	6.999	5.011	4.056	4.111	5.059	6.027	173.807
246	0.	19.909	19.152	17.665	16.018	14.313	11.724	9.346	7.895	6.696	245.445
246	0.71	19.728	18.714	17.007	15.160	13.334	10.800	8.582	7.398	6.543	244.597
246	1.41	19.480	18.178	16.226	14.183	12.252	9.804	7.782	6.897	6.405	242.434
246	2.12	18.954	17.399	15.246	13.052	11.055	8.733	6.955	6.405	6.292	237.729
246	2.83	18.041	16.273	14.013	11.764	9.769	7.623	6.133	5.942	6.200	229.285
246	3.54	16.214	14.119	11.856	9.838	8.059	6.299	5.292	5.487	6.004	205.267
246	4.24	14.316	11.991	9.792	7.626	5.714	4.496	4.221	4.898	5.641	170.937
276	0.	20.016	19.252	17.738	16.027	14.248	11.587	9.132	7.628	6.416	244.095
276	0.67	19.799	18.813	17.106	15.213	13.324	10.717	8.412	7.157	6.270	242.947
276	1.35	19.492	18.279	16.370	14.295	12.304	9.769	7.643	6.671	6.135	240.389
276	2.02	18.932	17.481	15.399	13.211	11.173	8.754	6.849	6.193	6.020	235.637
276	2.70	17.895	16.230	14.063	11.913	9.946	7.700	6.056	5.737	5.925	226.654
276	3.37	16.083	14.113	11.924	10.067	8.376	6.477	5.245	5.288	5.737	203.248
276	4.05	14.183	12.011	9.879	8.003	6.281	4.865	4.257	4.677	5.342	169.453

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS	HOUR	SOUTH	TO EAST	TO NORTH							
93	0.	8.716	9.721	10.498	11.751	13.189	13.833	14.512	15.354	15.788	
93	1.03	8.921	10.192	11.187	12.623	14.179	14.782	15.275	15.801	15.825	
93	2.06	9.110	10.660	11.861	13.397	14.968	15.443	15.725	15.983	15.677	
93	3.08	9.367	11.134	12.469	14.030	15.561	15.895	15.963	15.924	15.247	
93	4.11	9.590	11.528	12.945	14.456	15.894	16.107	15.995	15.651	14.575	
93	5.14	9.070	10.739	12.052	13.650	15.097	15.267	14.935	14.262	12.982	
93	6.17	7.615	8.523	9.196	10.113	11.166	11.926	12.097	11.252	10.102	
124	0.	8.507	9.503	10.312	11.660	13.197	13.919	14.668	15.572	16.047	
124	1.00	8.707	9.984	11.020	12.533	14.173	14.858	15.440	16.035	16.096	
124	2.01	8.901	10.465	11.709	13.316	14.971	15.546	15.926	16.246	15.971	
124	3.01	9.160	10.953	12.336	13.966	15.575	16.003	16.169	16.208	15.586	
124	4.02	9.431	11.388	12.841	14.423	15.942	16.240	16.218	15.960	14.950	
124	5.02	8.750	10.468	11.897	13.701	15.302	15.463	15.092	14.469	13.239	
124	6.03	7.411	8.410	9.123	10.145	11.285	11.940	12.109	11.348	10.112	
155	0.	7.976	8.967	9.871	11.447	13.217	14.129	15.049	16.095	16.656	
155	0.95	8.151	9.452	10.601	12.326	14.178	15.053	15.828	16.583	16.731	
155	1.89	8.356	9.954	11.310	13.105	14.963	15.752	16.346	16.832	16.662	
155	2.84	8.611	10.461	11.963	13.767	15.569	16.226	16.629	16.850	16.356	
155	3.78	8.873	10.905	12.488	14.238	15.955	16.468	16.696	16.630	15.760	
155	4.73	8.149	9.963	11.621	13.836	15.755	15.772	15.197	14.748	13.768	

155	5.67	6.263	7.322	8.075	9.409	10.821	11.283	11.504	11.142	9.780
186	0.	7.246	8.279	9.324	11.127	13.146	14.325	15.501	16.714	17.358
186	0.87	7.390	8.732	10.033	12.008	14.111	15.231	16.252	17.194	17.454
186	1.74	7.575	9.223	10.738	12.794	14.901	15.907	16.728	17.424	17.406
186	2.60	7.810	9.727	11.392	13.439	15.484	16.388	17.051	17.517	17.226
186	3.47	8.031	10.130	11.870	13.826	15.736	16.490	16.969	17.253	16.763
186	4.34	7.658	9.677	11.428	13.296	14.977	15.442	15.545	15.608	14.963
186	5.21	5.483	7.166	8.343	9.539	10.840	11.204	11.401	11.718	11.089
216	0.	6.399	7.499	8.729	10.776	13.038	14.472	15.881	17.221	17.918
216	0.78	6.553	7.960	9.429	11.628	13.950	15.287	16.517	17.615	17.998
216	1.57	6.728	8.420	10.091	12.378	14.704	15.932	16.988	17.871	17.990
216	2.35	6.921	8.849	10.662	12.990	15.292	16.396	17.265	17.957	17.874
216	3.13	7.060	9.114	10.947	13.110	15.253	16.321	17.146	17.702	17.441
216	3.92	6.882	8.837	10.551	12.216	13.898	15.115	16.099	16.550	16.150
216	4.70	6.168	7.967	9.467	10.438	11.338	12.073	12.770	13.385	13.349
246	0.	5.699	6.838	8.217	10.477	12.936	14.555	16.121	17.533	18.252
246	0.71	5.849	7.278	8.866	11.231	13.714	15.237	16.647	17.857	18.321
246	1.41	6.003	7.681	9.446	11.920	14.428	15.821	17.032	18.058	18.315
246	2.12	6.171	8.074	9.974	12.490	14.968	16.188	17.147	17.961	18.022
246	2.83	6.309	8.333	10.204	12.451	14.756	16.156	17.325	17.880	17.472
246	3.54	6.089	7.824	9.434	11.202	13.011	14.480	15.791	16.298	15.903
246	4.24	5.573	7.069	8.481	9.332	10.035	11.168	12.364	13.283	13.864
276	0.	5.433	6.585	8.014	10.346	12.874	14.564	16.189	17.627	18.354
276	0.67	5.575	6.999	8.615	11.020	13.553	15.166	16.665	17.903	18.371
276	1.35	5.723	7.390	9.181	11.701	14.251	15.667	16.883	17.942	18.260
276	2.02	5.881	7.762	9.674	12.218	14.736	16.008	17.009	17.851	17.943
276	2.70	6.011	8.001	9.864	12.159	14.547	15.983	17.141	17.685	17.278
276	3.37	5.789	7.428	9.014	10.959	12.926	14.369	15.649	16.143	15.703
276	4.05	5.318	6.701	8.029	9.091	9.991	11.088	12.207	13.018	13.555

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS	HOUR	NORTH TO WEST TO SOUTH								
93	0.	15.788	15.354	14.512	13.833	13.189	11.751	10.498	9.721	8.716 226.734
93	1.03	15.409	14.535	13.409	12.657	12.056	10.784	9.752	9.289	8.638 225.326
93	2.06	14.903	13.622	12.203	11.293	10.680	9.645	8.962	8.850	8.543 221.533
93	3.08	14.119	12.498	10.940	9.792	9.219	8.533	8.301	8.359	8.562 216.022
93	4.11	13.067	11.064	9.172	8.082	7.663	7.404	7.658	8.288	8.586 207.736
93	5.14	11.302	9.061	7.100	6.222	6.163	6.410	7.099	7.870	8.169 187.456
93	6.17	8.761	6.590	4.640	3.753	3.878	4.877	6.136	6.797	7.000 144.433
124	0.	16.047	15.572	14.668	13.919	13.197	11.660	10.312	9.503	8.507 226.779
124	1.00	15.681	14.777	13.592	12.758	12.066	10.699	9.585	9.084	8.425 225.522
124	2.01	15.198	13.887	12.403	11.396	10.681	9.551	8.786	8.635	8.328 221.927
124	3.01	14.471	12.813	11.074	9.900	9.196	8.398	8.079	8.310	8.333 216.538
124	4.02	13.463	11.427	9.442	8.193	7.614	7.236	7.418	8.051	8.395 208.642
124	5.02	11.585	9.384	7.378	6.325	6.079	6.197	6.802	7.530	7.826 187.497
124	6.03	8.702	6.567	4.654	3.847	3.973	4.820	5.969	6.619	6.775 143.819
155	0.	16.656	16.095	15.049	14.129	13.217	11.447	9.871	8.967	7.976 226.824
155	0.95	16.327	15.364	14.034	12.956	12.014	10.423	9.119	8.524	7.860 225.533
155	1.89	15.917	14.552	12.918	11.658	10.679	9.305	8.332	8.080	7.768 222.498
155	2.84	15.284	13.564	11.653	10.196	9.184	8.095	7.538	7.680	7.738 217.372
155	3.78	14.341	12.278	10.125	8.539	7.583	6.877	6.814	7.370	7.769 209.703
155	4.73	12.295	10.343	8.297	6.761	5.977	5.715	6.086	6.761	7.140 188.174
155	5.67	8.337	6.738	5.091	4.260	4.210	4.502	5.112	5.592	5.640 135.090
186	0.	17.358	16.714	15.501	14.325	13.146	11.127	9.324	8.279	7.246 226.047
186	0.87	17.086	16.086	14.605	13.239	11.988	10.120	8.566	7.805	7.097 225.006
186	1.74	16.737	15.377	13.609	12.038	10.708	8.990	7.700	7.283	6.961 222.108
186	2.60	16.265	14.551	12.489	10.703	9.300	7.796	6.863	6.829	6.893 217.732
186	3.47	15.523	13.444	11.110	9.166	7.759	6.558	6.062	6.441	6.870 210.010
186	4.34	13.611	11.637	9.415	7.463	6.115	5.202	5.055	5.753	6.451 189.303
186	5.21	9.881	8.600	7.004	5.427	4.288	3.517	3.422	3.971	4.458 137.358
216	0.	17.918	17.221	15.881	14.472	13.038	10.776	8.729	7.499	6.399 223.875
216	0.78	17.701	16.710	15.133	13.526	11.986	9.807	7.945	6.993	6.243 222.990
216	1.57	17.422	16.127	14.296	12.479	10.830	8.762	7.127	6.491	6.111 220.756
216	2.35	17.055	15.415	13.299	11.289	9.563	7.644	6.291	6.011	6.014 216.793
216	3.13	16.367	14.426	12.103	9.947	8.180	6.475	5.470	5.569	5.930 208.570
216	3.92	14.799	12.674	10.400	8.201	6.434	5.089	4.585	5.095	5.735 189.320
216	4.70	12.078	10.173	8.264	5.987	4.099	3.191	3.244	4.145	5.064 153.208
246	0.	18.252	17.533	16.121	14.555	12.936	10.477	8.217	6.838	5.699 221.263
246	0.71	18.080	17.116	15.495	13.741	12.005	9.598	7.492	6.367	5.554 220.458
246	1.41	17.844	16.607	14.753	12.812	10.977	8.652	6.731	5.890	5.423 218.403
246	2.12	17.344	15.867	13.822	11.738	9.840	7.635	5.946	5.423	5.316 213.933
246	2.83	16.478	14.798	12.651	10.514	8.619	6.581	5.165	4.983	5.228 205.912
246	3.54	14.742	12.752	10.602	8.685	6.994	5.323	4.365	4.551	5.042 183.095
246	4.24	12.938	10.730	8.641	6.583	4.766	3.610	3.349	3.991	4.697 150.481
276	0.	18.354	17.627	16.189	14.564	12.874	10.346	8.014	6.585	5.433 219.981
276	0.67	18.148	17.210	15.589	13.791	11.997	9.519	7.330	6.138	5.295 218.891
276	1.35	17.855	16.703	14.889	12.919	11.027	8.619	6.599	5.676	5.166 216.461
276	2.02	17.324	15.946	13.967	11.888	9.952	7.655	5.845	5.222	5.058 211.946
276	2.70	16.338	14.757	12.698	10.656	8.788	6.654	5.091	4.788	4.967 203.412
276	3.37	14.617	12.746	10.667	8.902	7.295	5.492	4.321	4.362	4.789 181.177
276	4.05	12.812	10.748	8.724	6.941	5.306	3.960	3.382	3.782	4.413 149.071

Appendix D. Start-up Study for a Surround Field on Equinox Day.

The main purpose of this run is to study the power tower system in greater detail for low sun elevations. More neighbors are considered for the shading and blocking calculations.

The node file used here was generated by the cylindrical receiver run shown in appendix B. However, the flux density outputs show headings for a flat receiver. This is due to an error in the input value of ICYN which affects the heading of the flux density output. The same thing happens in appendix E. ICYLN should be -1 for this type of output from a cylindrical receiver.


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( 1 2 33444556666666554433 2 1 )
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( 1 2 3 4 56788899999888765 4 3 2 1 )
( 1 23 4 567899 ** 998765 4 32 1 )
( 12 3 4 56789 ** 98765 4 3 21 )
( 12 34 5678 9***** * #9 8765 43 21 )
( 12 34 5678 9***** * #9 8765 43 21 )
( 12 3 4 56789 ** 98765 4 3 21 )
( 1 23 4 567899 ** 998765 4 32 1 )
( 1 2 3 4 56788899999888765 4 3 2 1 )
( 1 2 3 4 5667777887777665 4 3 2 1 )
( 1 2 33444556666666554433 2 1 )
( 1 22 3334444554444333 22 1 )
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CONTOUR MODE T STEP SIZE 3.0312E-02

X = FIRST SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 1.3776E 01 MIN(A) = 2.6506E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

```

1.378 1.179 1.050 1.006 1.050 1.179 1.378 0.
1.094 0.864 0.711 0.657 0.711 0.864 1.094 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.657 0.366 0.277 0.220 0.277 0.366 0.657 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

Y = SECOND SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 2.2605E 00 MIN(A) = 1.8868E 00 AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

```

2.140 2.161 2.176 2.182 2.176 2.161 2.140 0.
2.171 2.200 2.223 2.231 2.223 2.200 2.171 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.231 2.260 1.887 1.508 1.887 2.260 2.231 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

THE FOLLOWING LABEL WAS WRITTEN BY A RECEIVER SUBROUTINE TO
DESCRIBE SYSTEM GEOMETRY WITH REGARD TO INTERCEPTION DATA.
THE HEIGHT OF THE TOWER IS 120.0 METERS.
16.0-TH ORDER CELLS ARE USED.
THE FIELD MATRIX IS DIMENSIONED 7 BY 7.
THE TOWER IS AT CELL(5.00, 4.00)

THE RECEIVER SHAPE IS CYLINDRICAL .
 THE RECEIVER HEIGHT IS 15.00 METERS; WIDTH IS 10.40 METERS.
 THE RECEIVER NODE MATRIX IS DIMENSIONED 20 BY 18.
 THE HELIOSTATS ARE NOT FOCUSED AND ARE CANTED.
 THE AIMING STRATEGY IS 1 PT AIM.
 THE HELIOSTAT IS SQUARE WITH 56.42 M2 OF REFLECTIVE SURFACE.
 THE HELIOSTAT WIDTH IS 7.6541293 METERS.
 THE BEAM ERROR (DEGRADING) IS 2.83 MILLI-RADIANS
 THE NODE INTERCEPTION FRACTIONS STORED ON DISK ARE ALWAYS
 GEOMETRICAL, I.E., THERE ARE NO LOSSES DUE TO DUST,
 REFLECTIVITY, VISUAL RANGE, ETC.
 CALCULATION DAY 0 TIME 0. FROM SOLAR NOON
 DATE AND TIME(HRS)

06/18/80 11.72

THIS IS A WHOLE NODE FILE
 CANTING FOCAL LENGTH 720.0 METERS
 SEGMENT U FOC LENGTH IS , V IS METERS
 SLANT RANGE OPTION IS 0 WITH MULTIPLIER 1.000

INTERCEPTION FACTORS FROM RECEIVER PROGRAM * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.9961E-01 MIN(A) = 6.2054E-01 AVR(A) = 9.5835E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.621	0.709	0.768	0.786	0.768	0.709	0.621	0.774
0.746	0.851	0.911	0.929	0.911	0.851	0.746	0.894
0.848	0.946	0.982	0.987	0.982	0.946	0.848	0.950
0.910	0.981	0.996	1.000	0.996	0.981	0.910	0.980
0.927	0.988	0.998	0.	0.998	0.988	0.927	0.980
0.905	0.977	0.993	0.995	0.993	0.977	0.905	0.978
0.838	0.934	0.969	0.972	0.969	0.934	0.838	0.961
0.900	0.958	0.971	0.968	0.971	0.958	0.900	0.958

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(
(322111001112222222222221110011122)
(2110011112223333444433332221110011)
(1001122333444555555555444333221100)
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(12234455666777777777776665544322)
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(3445 6 7 888 999999 888 7 6 544)
(455667788 99999 99999 88776655)
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(7 8 9 9 8 )
( 7 8 9 9 8 7 )
(6 7 88 9 9 88 7 )
( 6 7 8 99 99 8 7 6 )
(556677 8 99 99 8 77665)
(4 5 67 88 99 99 88 76 5 )
)
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CONTOUR MODE T STEP SIZE 3./907E-02

FRACTION OF LOSS DUE TO HORIZONTAL VISIBILITY * * * * * UNIVERISITY OF HOUSTON AND DOE

MAX(A) = 9.7658E-01 MIN(A) = 9.2970E-01 AVR(A) = 9.6310E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.930	0.936	0.940	0.942	0.940	0.936	0.930	0.941
0.939	0.946	0.952	0.954	0.952	0.946	0.939	0.950
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.958
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.967
0.954	0.965	0.977	0.984	0.977	0.965	0.954	0.968
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.968
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.961

0.951	0.960	0.967	0.967	0.967	0.960	0.951	0.963
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INTERCEPTION FRACTIONS INCLUDING VISIBLE RANGE LOSSES * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7621E-01 MIN(A) = 5.7692E-01 AVR(A) = 9.2346E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.577	0.664	0.722	0.740	0.722	0.664	0.577	0.728
0.700	0.806	0.867	0.885	0.867	0.806	0.700	0.849
0.803	0.904	0.945	0.953	0.945	0.904	0.803	0.910
0.866	0.944	0.968	0.976	0.968	0.944	0.866	0.948
0.884	0.954	0.975	0.	0.975	0.954	0.884	0.948
0.861	0.940	0.965	0.972	0.965	0.940	0.861	0.947
0.793	0.892	0.932	0.938	0.932	0.892	0.793	0.924
0.856	0.920	0.940	0.937	0.940	0.920	0.856	0.923

* * * * * TOWER ELEVATION ANGLE IN DEGREES * * * * *

MAX(A) = 2.6565E 01 MIN(A) = 5.7106E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

0.571	0.638	0.691	0.713	0.691	0.638	0.571	0.
0.672	0.790	0.898	0.946	0.898	0.790	0.672	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.946	1.404	2.657	9.000	2.657	1.404	0.946	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.
0.	0.	0.	0.	0.	0.	0.	0.

* * * * * SLANT DISTANCE FROM HELIOSTAT TO RECEIVER * * * * *

MAX(A) = 1.2060E 03 MIN(A) = 2.6833E 02 AVR(A) = 0.

AIJ = (10 ** 3) X PRINTED VALUES

1.206	1.080	0.997	0.967	0.997	1.080	1.206	0.
1.025	0.874	0.768	0.730	0.768	0.874	1.025	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.730	0.495	0.268	0.120	0.268	0.495	0.730	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	61

0. 0. 0. 0. 0. 0. 0. 0.

***** X COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 4.8000E 02 MIN(A) = -9.6000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-9.600-9.600-9.600-9.600-9.600-9.600-9.600 0.

-7.200-7.200-7.200-7.200-7.200-7.200-7.200 0.

-4.800-4.800-4.800-4.800-4.800-4.800-4.800 0.

-2.400-2.400-2.400-2.400-2.400-2.400-2.400 0.

0. 0. 0. 0. 0. 0. 0. 0.

2.400 2.400 2.400 2.400 2.400 2.400 2.400 0.

4.800 4.800 4.800 4.800 4.800 4.800 4.800 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Y COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 7.2000E 02 MIN(A) = -7.2000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Z COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 0. MIN(A) = 0. AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

ON THE 186TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.00321 ASU
SOLAR ELEVATION= 58.1720 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
SUNRISE TIME = 5.5984 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 5.0000 DEGREES
SUNRISE AZIMUTH= 86.6276 DEGREES EAST OF SOUTH
UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 0. 1.0000
POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

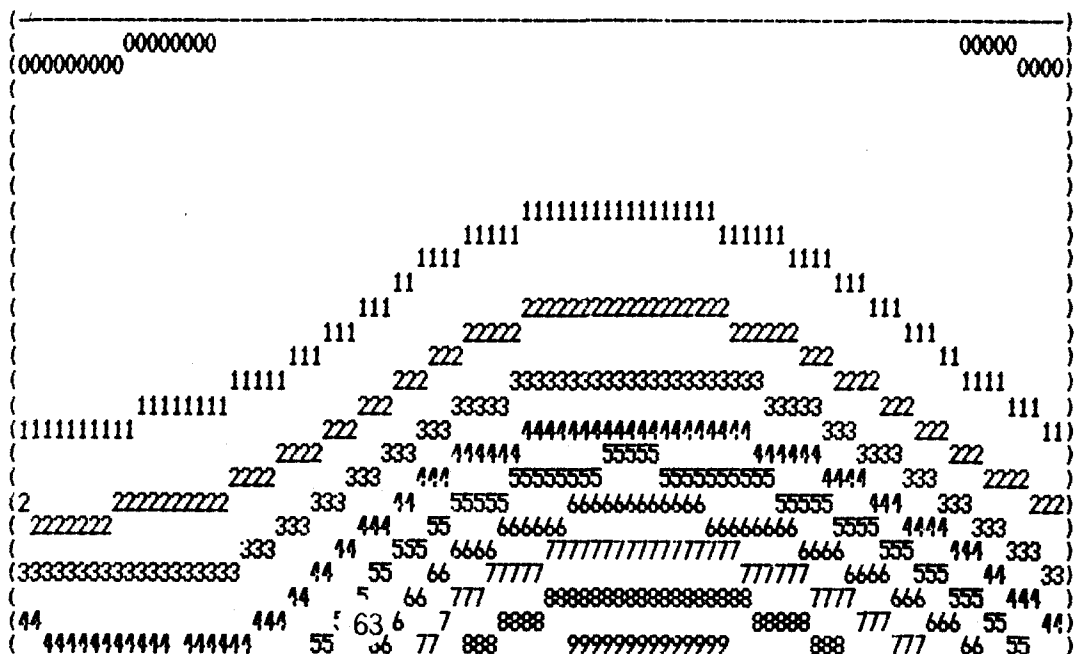
AT -5.598 HOURS THE SUN GIVES
292.860 WATTS/M2. THE TOWERTOP COLLECTOR HAS
129050.148 M2 OF EFFECTIVE AREA AND PROVIDES
37.794 MEGAWATTS OF DIRECTED POWER. 62
30.288 MEGAWATTS OF INCIDENT POWER.

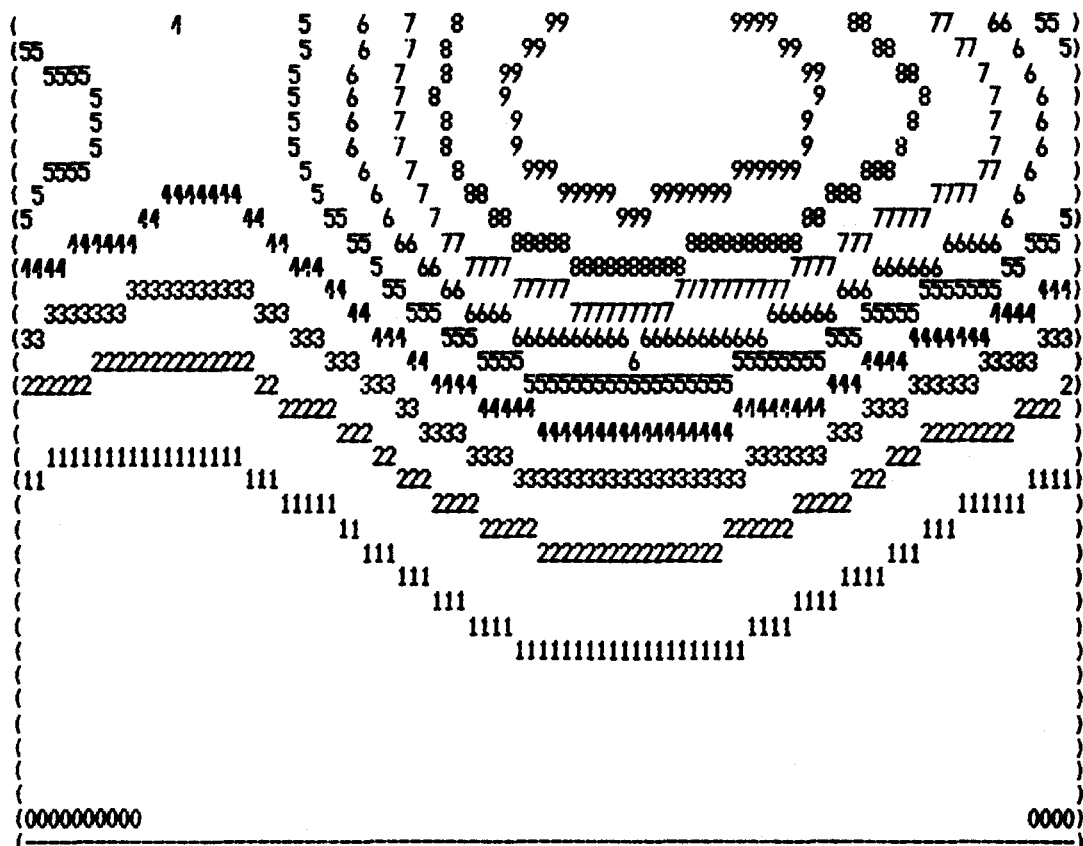
HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-5.598	0.058602	0.994470	0.087156	5.0000	86.6276

TOTAL INCIDENT RECEIVER POWER = 3.029E 07 IN WATTS AVERAGE FLUX DENSITY = 2.157E 05 CONCENTRATION= 736.6
 BZX = 0.750 BZY = 0.578

MAX(A) = 6.7947E 05 MIN(A) = 1.1468E 03 AVR(A) = 0.

AIJ = (10 * 5) X PRINTED VALUES

[illegible]



CONTOUR MODE T STEP SIZE 6.7832E 04

FRACTION OF MIRROR REFLECTING ON THE 186 DAY AT -5.60 HOURS , UNIVERSITY OF HOUSTON

MAX(A) = 1.0000E 00 MIN(A) = 2.1118E-01 AVR(A) = 5.2607E-01

AIJ = (10 ** 0) X PRINTED VALUES

1.000	1.000	0.768	0.343	0.642	1.000	1.000	0.581
0.851	0.725	0.908	0.354	0.840	1.000	1.000	0.752
0.802	0.612	0.476	0.360	0.717	0.582	0.681	0.574
0.452	0.377	0.211	0.323	0.589	0.619	1.000	0.461
0.639	0.361	0.232	0.196	0.779	1.000	1.000	0.634
0.527	0.291	0.335	0.265	0.385	0.405	0.732	0.372
0.555	0.449	0.500	0.331	0.616	0.932	1.000	0.529
0.602	0.433	0.398	0.323	0.621	0.734	0.873	0.526

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(
*****987654322 3 456789*****
( * ** 9876543223 456789 *****
( * ** 99999 8 765322345 6789 *****
( 999988888 8765422345678 9 *****
(99 888777 8 8754224567889 *****
(9 8 7 7778765422456788999999999
(9 8 7 666666543223567777778888888
( 8 7 6 55554443 223456 66666666777
(87776655444333 222234566 55 66677)
(665554443332222 234 5 556 7889)
(44443333222111111 2 345555 6789**)
(44433 2 1 1 23 45556666789***)
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( 5 4 3 2222  22  2 33445566778899)
(5 4 33333333 2 2 34456678889999**)
(5 44 4444 3 2234 56789******)
(-----)

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CONTOUR MODE T STEP SIZE 7.8882E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

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0033300 0000000 0000000 0000000
**33300 0000000 0000000 0000000
***3*** 2001000 **00000 0000000
2223440 2010100 0000000 8020000
1112400 2880000 **8*500 8000000
8887666 8010100 00*0000 0000000
**77**0 0001100 00*0000 0000000

```

AT -5.398 HOURS THE SUN GIVES
 423.864 WATTS/M2. THE TOWERTOP COLLECTOR HAS
 168667.078 M2 OF EFFECTIVE AREA AND PROVIDES
 71.492 MEGAWATTS OF DIRECTED POWER.
 57.475 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-5.398	0.085785	0.987615	0.131371	7.5488	85.0357

INCIDENT FLUX DENSITY FOR 1 PT AIM IN MW/M2 .

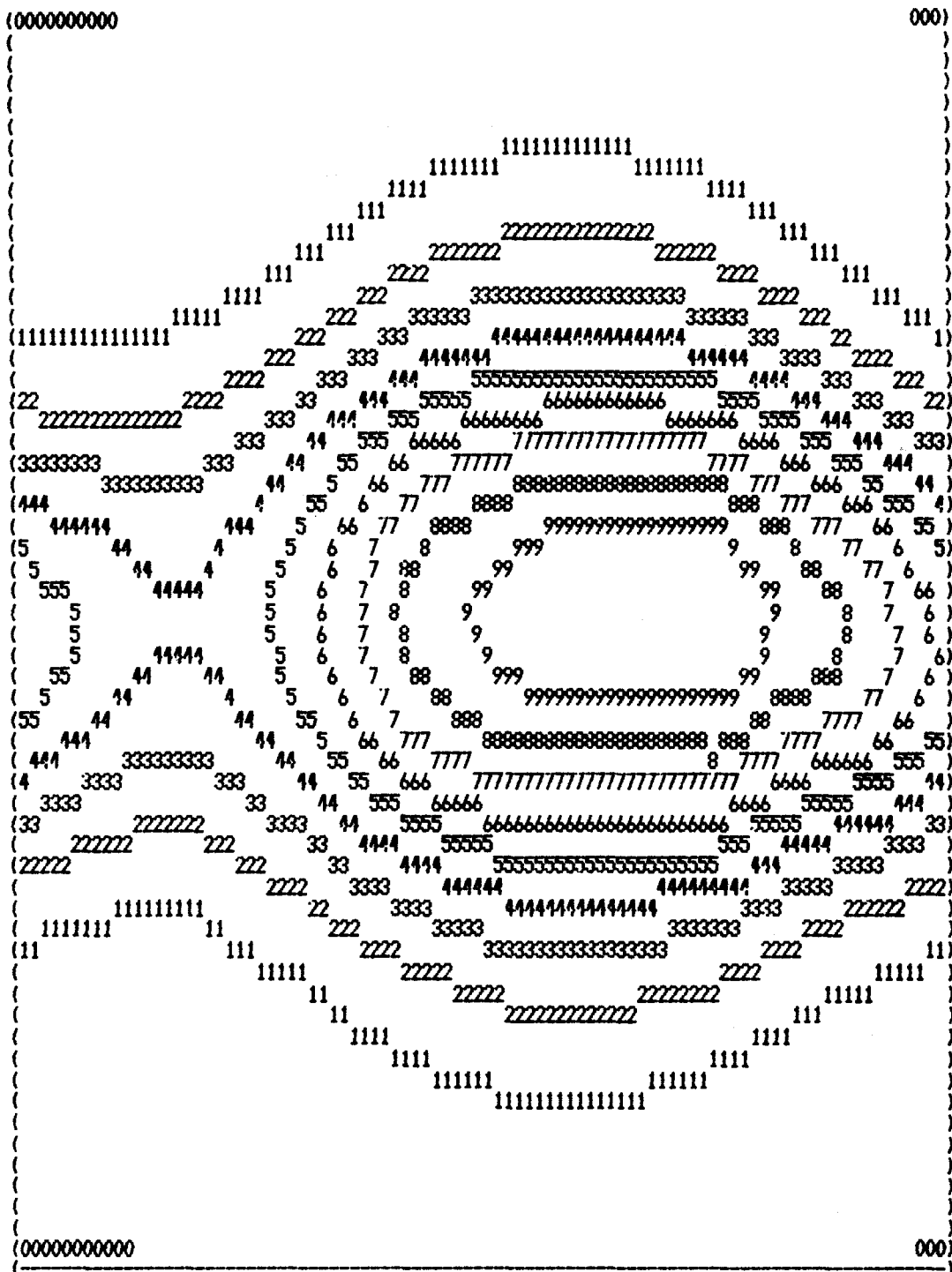
ON DAY 186 AT -5.40 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

TOTAL INCIDENT RECEIVER POWER = 5.748E 07 IN WATTS AVERAGE FLUX DENSITY = 4.094E 05 CONCENTRATION= 965.8
 DZX = 0.750 DZY = 0.578

MAX(A) = 1.2932E 06 MIN(A) = 2.0768E 03 AVR(A) = 0.

AIJ = (10 ** 6) X PRINTED VALUES

0.002	0.003	0.005	0.007	0.010	0.016	0.024	0.033	0.041	0.046	0.048	0.045	0.038	0.029	0.020	0.012	0.007	0.003	0.
0.005	0.007	0.010	0.014	0.020	0.030	0.043	0.057	0.070	0.080	0.084	0.080	0.069	0.055	0.039	0.026	0.015	0.008	0.
0.013	0.016	0.021	0.026	0.037	0.053	0.075	0.099	0.119	0.134	0.143	0.138	0.122	0.100	0.074	0.051	0.032	0.018	0.
0.031	0.035	0.041	0.051	0.068	0.094	0.131	0.168	0.198	0.222	0.236	0.231	0.209	0.178	0.137	0.097	0.065	0.040	0.
0.067	0.071	0.080	0.095	0.123	0.163	0.222	0.279	0.322	0.355	0.375	0.371	0.345	0.304	0.242	0.179	0.126	0.084	0.
0.135	0.138	0.147	0.169	0.211	0.271	0.356	0.438	0.496	0.539	0.564	0.561	0.539	0.493	0.407	0.315	0.234	0.166	0.
0.249	0.246	0.247	0.272	0.330	0.413	0.524	0.635	0.708	0.759	0.787	0.786	0.778	0.733	0.629	0.511	0.402	0.298	0.
0.404	0.388	0.367	0.388	0.457	0.564	0.698	0.837	0.919	0.977	1.008	1.006	1.022	0.982	0.873	0.747	0.621	0.478	0.
0.565	0.528	0.476	0.485	0.558	0.685	0.837	0.997	1.081	1.143	1.180	1.173	1.209	1.177	1.075	0.962	0.839	0.665	0.
0.672	0.613	0.534	0.533	0.606	0.742	0.904	1.074	1.156	1.221	1.260	1.246	1.293	1.270	1.174	1.083	0.978	0.791	0.
0.679	0.605	0.518	0.516	0.593	0.721	0.883	1.048	1.130	1.196	1.231	1.212	1.254	1.243	1.140	1.063	0.981	0.804	0.
0.585	0.511	0.435	0.441	0.524	0.629	0.781	0.926	1.012	1.075	1.100	1.081	1.107	1.107	0.988	0.910	0.846	0.699	0.
0.429	0.371	0.316	0.332	0.414	0.492	0.624	0.742	0.827	0.885	0.901	0.885	0.889	0.892	0.766	0.682	0.632	0.519	0.
0.271	0.235	0.203	0.220	0.289	0.346	0.452	0.542	0.616	0.667	0.679	0.668	0.653	0.648	0.535	0.454	0.413	0.333	0.
0.152	0.133	0.117	0.131	0.180	0.223	0.300	0.365	0.421	0.462	0.476	0.468	0.444	0.427	0.341	0.276	0.241	0.190	0.
0.077	0.069	0.063	0.072	0.102	0.134	0.186	0.231	0.270	0.301	0.315	0.309	0.284	0.260	0.203	0.157	0.129	0.098	0.
0.036	0.034	0.033	0.038	0.055	0.077	0.110	0.141	0.166	0.188	0.200	0.194	0.173	0.150	0.115	0.085	0.065	0.047	0.
0.015	0.016	0.017	0.020	0.029	0.044	0.064	0.084	0.100	0.115	0.123	0.118	0.102	0.084	0.063	0.045	0.031	0.021	0.
0.006	0.007	0.008	0.010	0.015	0.024	0.037	0.049	0.060	0.069	0.073	0.069	0.058	0.046	0.033	0.022	0.014	0.009	0.
0.002	0.003	0.004	0.005	0.008	0.013	0.021	0.028	0.035	0.040	0.042	0.039	0.032	0.024	0.017	0.011	0.006	0.003	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.



CONTOUR MODE T STEP SIZE 1.2911E 05

FRACTION OF MIRROR REFLECTING ON THE 186 DAY AT -5.40 HOURS , UNIVERSITY OF HOUSTON

MAX(A) = 1.0000E 00 MIN(A) = 2.5769E-01 AVR(A) = 6.5329E-01

AIJ = (10 ** 0) X PRINTED VALUES

1.000	1.000	0.838	0.480	0.626	1.000	1.000	0.646
0.997	1.000	0.963	0.493	0.791	1.000	1.000	0.833
0.944	0.857	0.602	0.500	0.920	0.854	0.977	0.767
0.652	0.511	0.258	0.437	0.706	0.859	1.000	0.578
0.850	0.544	0.348	0.290	0.903	1.000	1.000	0.740 66

0.707 0.441 0.420 0.381 0.468 0.494 1.000 0.488

0.828 0.709 0.759 0.472 0.708 0.982 1.000 0.690

0.788 0.627 0.505 0.452 0.720 0.845 0.995 0.653

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(-----)
(  **9 87 65433 446789***** )
( ***** 9 8765433 4 56789***** )
(  ** 9 87654 4 56789***** )
(  * 9987654 4 56 789***** )
(  ** 97654 456 78 9 ***** )
( 9999876544 567 8 9 ***** )
( 99988877654 456788 99 * )
( 99 8 7665544 45678 99 * )
(999888877665444 34567888 9 * )
(887777665543322233 34567 888 9 * )
(76665554432211122 34 5677 8 9 * )
(766 5 4 3 21 1 2 34 5677 88 9 ** )
(887665 4 32 11 2 34567 88 99 * )
(9987 654 3 2 2 3456788999 ***** )
(*987 654 3 2 2 34556788899999** * )
(98 7654 3 2 2 34455666677889*** )
(8 765 43 2222223334444456789** )
(87 655433333332222 333444456789** )
(8 7 665544444433 3344555667889*** )
( 8 77 666666654433 45566788999 )
( 88 7777777654 45 6789***** )
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CONTOUR MODE T STEP SIZE 7.4231E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

0033300	2000000	0000000	0000000
*033300	2000000	0000000	0000000
22*3***	2001100	**00000	0000000
2223440	2010100	0*0**00	8020000
1112400	2880000	8*8*000	8000000
8887660	8010000	00*0000	0000000
770	0001100	00*0000	0000000

AT -5.198 HOURS THE SUN GIVES
518.793 WATTS/M2. THE TOWERTOP COLLECTOR HAS
201605.412 M2 OF EFFECTIVE AREA AND PROVIDES
104.591 MEGAWATTS OF DIRECTED POWER.
84.447 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-5.198	0.112743	0.978053	0.175220	10.0914	83.4244

INCIDENT FLUX DENSITY FOR 1 PT AIM IN MW/M2 ,

ON DAY 186 AT -5.20 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

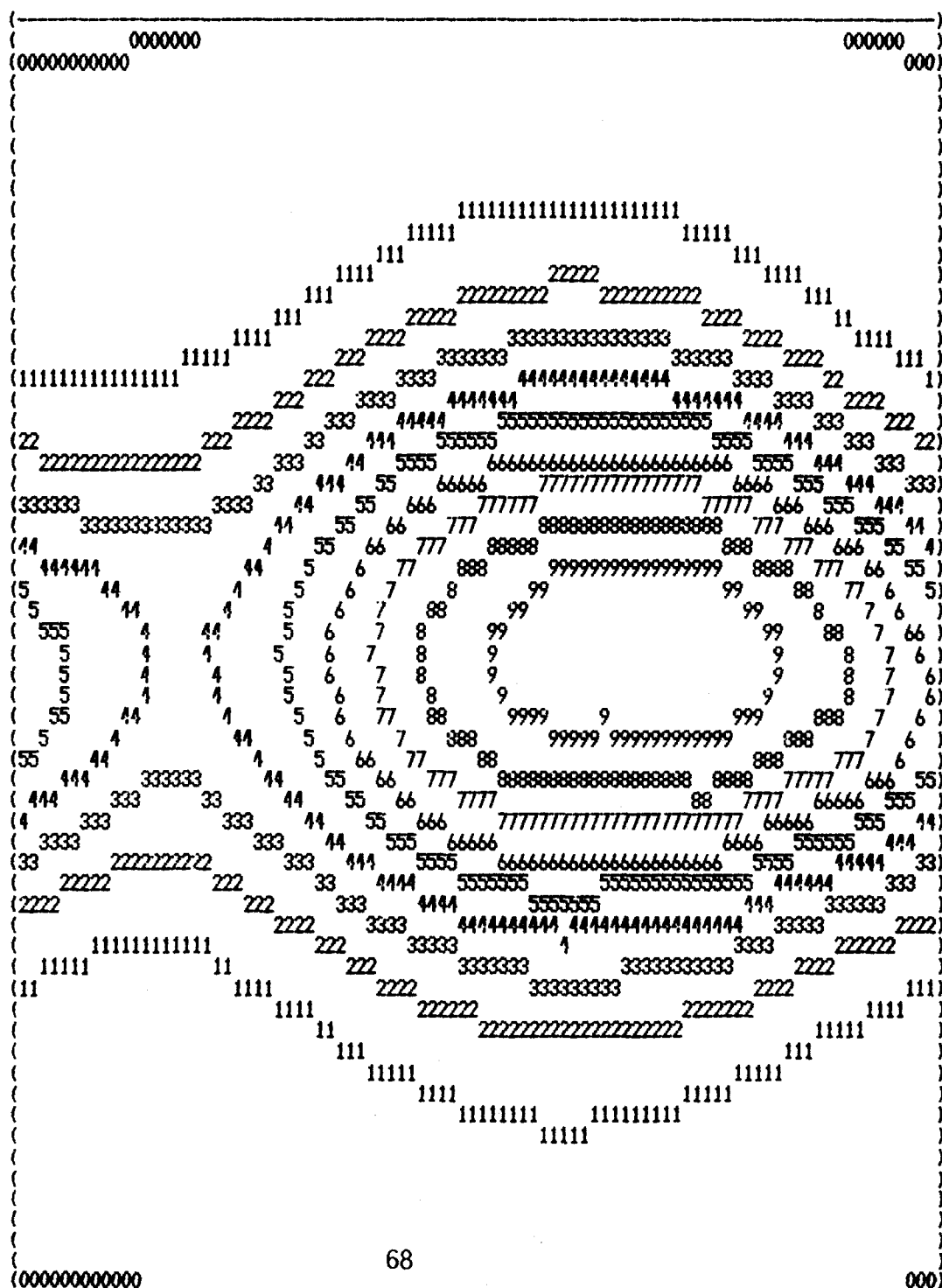
TOTAL INCIDENT RECEIVER POWER = 8.445E 07 IN WATTS AVERAGE FLUX DENSITY = 6.015E 05 CONCENTRATION= 1159.4
DZX = 0.750 DZY = 0.578

MAX(A) = 1.9506E 06 MIN(A) = 2.9117E 03 AVR(A) = 0.

AIJ = (10 ** 6) X PRINTED VALUES

0.003	0.004	0.006	0.009	0.014	0.022	0.032	0.044	0.054	0.062	0.064	0.060	0.051	0.040	0.028	0.018	0.010	0.005	0.
0.008	0.009	0.013	0.019	0.027	0.040	0.058	0.077	0.094	0.107	0.113	0.108	0.095	0.076	0.056	0.038	0.022	0.011	0.
0.019	0.022	0.028	0.037	0.050	0.073	0.103	0.134	0.161	0.183	0.195	0.189	0.169	0.141	0.107	0.075	0.047	0.026	0.
0.044	0.049	0.058	0.072	0.095	0.130	0.181	0.231	0.273	0.308	0.328	0.322	0.295	0.255	0.200	0.144	0.096	0.059	0.
0.098	0.102	0.114	0.136	0.173	0.229	0.309	0.387	0.450	0.502	0.533	0.528	0.496	0.444	0.360	0.269	0.189	0.125	0.
0.199	0.200	0.211	0.243	0.300	0.383	0.500	0.614	0.703	0.775	0.816	0.815	0.788	0.731	0.612	0.476	0.352	0.247	0.
0.370	0.360	0.357	0.393	0.472	0.587	0.741	0.897	1.014	1.106	1.157	1.158	1.155	1.102	0.956	0.779	0.608	0.448	0.
0.605	0.572	0.534	0.562	0.655	0.804	0.990	1.188	1.326	1.436	1.499	1.499	1.530	1.487	1.336	1.146	0.945	0.722	0.
0.848	0.780	0.694	0.703	0.800	0.978	1.188	1.419	1.564	1.689	1.765	1.758	1.821	1.790	1.652	1.482	1.282	1.008	0.
1.010	0.905	0.779	0.772	0.868	1.060	1.284	1.529	1.674	1.806	1.891	1.873	1.951	1.933	1.808	1.673	1.500	1.202	0.
1.021	0.893	0.755	0.748	0.849	1.030	1.253	1.467	1.635	1.767	1.845	1.820	1.889	1.891	1.756	1.643	1.505	1.222	0.

0.876	0.750	0.632	0.638	0.749	0.897	1.106	1.313	1.461	1.583	1.640	1.615	1.658	1.679	1.518	1.404	1.297	1.060	0.
0.640	0.541	0.459	0.479	0.591	0.700	0.881	1.046	1.188	1.295	1.331	1.310	1.321	1.346	1.172	1.050	0.965	0.784	0.
0.402	0.341	0.293	0.317	0.412	0.491	0.635	0.758	0.878	0.965	0.989	0.975	0.958	0.969	0.812	0.696	0.628	0.501	0.
0.223	0.192	0.168	0.188	0.255	0.314	0.418	0.505	0.593	0.660	0.681	0.671	0.641	0.630	0.512	0.419	0.365	0.283	0.
0.112	0.098	0.090	0.102	0.143	0.187	0.257	0.316	0.374	0.422	0.442	0.434	0.402	0.377	0.301	0.237	0.195	0.146	0.
0.052	0.047	0.046	0.054	0.076	0.107	0.151	0.191	0.227	0.259	0.275	0.268	0.241	0.214	0.168	0.128	0.098	0.069	0.
0.022	0.021	0.023	0.028	0.040	0.060	0.087	0.113	0.135	0.155	0.166	0.159	0.140	0.118	0.091	0.067	0.047	0.031	0.
0.009	0.009	0.011	0.014	0.021	0.033	0.049	0.066	0.080	0.092	0.098	0.092	0.079	0.063	0.047	0.033	0.022	0.013	0.
0.003	0.004	0.005	0.007	0.011	0.018	0.027	0.038	0.047	0.054	0.056	0.052	0.043	0.033	0.024	0.016	0.009	0.005	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.



CONTOUR MODE T STEP SIZE 1.9476E 05

FRACTION OF MIRROR REFLECTING ON THE 186 DAY AT -5.20 HOURS , UNIVERSITY OF HOUSTON

MAX(A) = 1.0000E 00 MIN(A) = 3.7307E-01 AVR(A) = 7.5351E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.998 1.000 0.897 0.597 0.630 0.994 1.000 0.707
 0.996 1.000 1.000 0.612 0.770 1.000 1.000 0.863
 0.982 0.923 0.814 0.618 0.983 0.999 1.000 0.873
 0.813 0.630 0.373 0.560 0.805 1.000 1.000 0.690
 0.880 0.708 0.463 0.379 0.987 1.000 1.000 0.816
 0.854 0.578 0.550 0.490 0.551 0.723 1.000 0.611
 1.000 0.931 0.888 0.600 0.838 1.000 1.000 0.817
 0.880 0.751 0.629 0.571 0.798 0.943 1.000 0.754

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(-----)
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( ** 9 87654 446789 )
( * 9987654 444 56789 ** )
( * 98654 4 556789 ** )
( *** 987644 5 66789 ***** )
( * *** 9876445 6778 9 ***** )
( * 99998765445678899 * )
( * 99 8887 654457899 )
( **9999888776665544457899 )
( 9 8877766544433 45678 99 * )
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( 8 7 65 432 1 1 234 56788 9***** )
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( 98 7 6 5432 2 3 457899 ***** )
( 9 87 65 43 22 3 456789999999* )
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( *987 654 3 223334455667789*** )
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( ** 998888887765 4 45667788999* )
( *****9999875445678899***** )
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CONTOUR MODE T STEP SIZE 6.2693E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

0033330	2000000	0000000	0000000
0003300	2000000	0000000	0000000
22*33*0	2001000	0*00000	0000000
2223400	2210100	0000000	8020000
8112400	2880000	088*000	8000000
9887660	8010000	00*0000	0080000
0*77*00	0001100	00*0000	0000000

AT -4.998 HOURS THE SUN GIVES
 589.863 WATTS/M2. THE TOWERTOP COLLECTOR HAS
 226043.318 M2 OF EFFECTIVE AREA AND PROVIDES
 133.335 MEGAWATTS OF DIRECTED POWER.
 107.927 MEGAWATTS OF INCIDENT POWER.

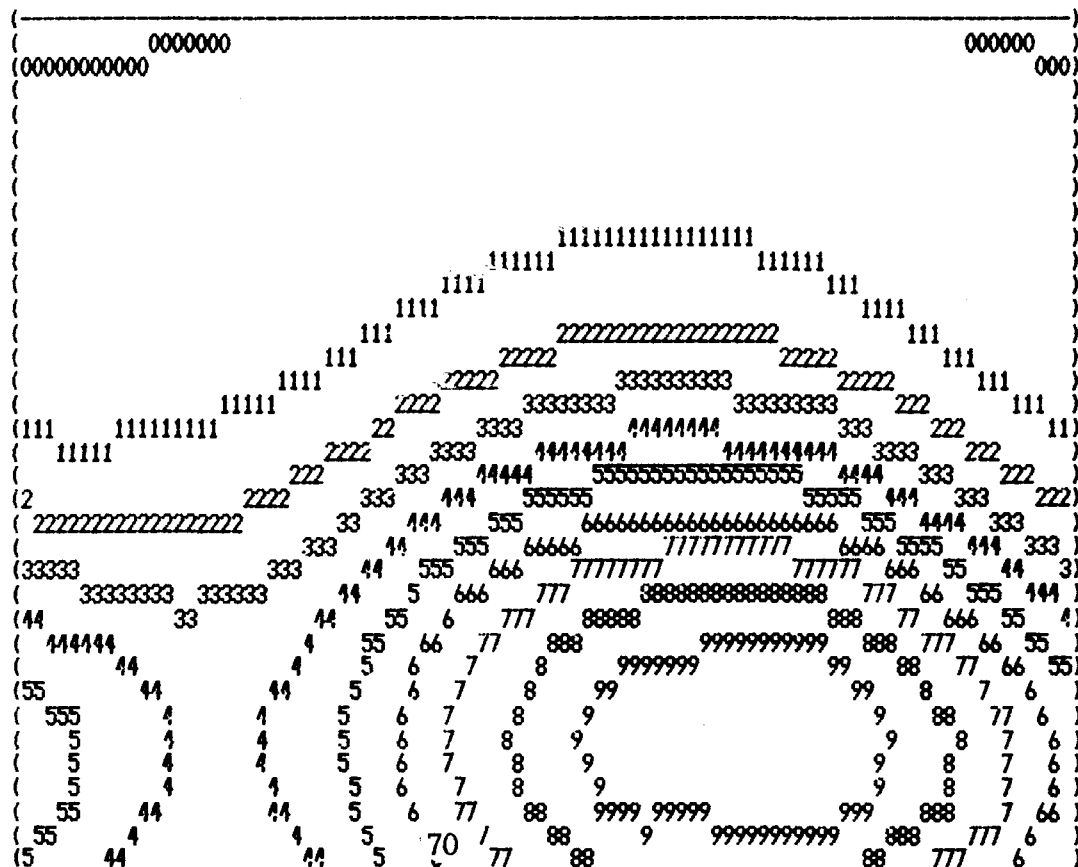
HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-4.998	0.139402	0.965810	0.218582	12.6258	81.7868

INCIDENT FLUX DENSITY FOR 1 PT AIM IN MW/M2 ,

ON DAY 186 AT -5.00 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

TOTAL INCIDENT RECEIVER POWER = 1.079E 08 IN WATTS AVERAGE FLUX DENSITY = 7.687E 05 CONCENTRATION= 1303.2
 DZX = 0.750 DZY = 0.578

AIJ = (10 ** 6) X PRINTED VALUES

[illegible]

0033330	2000000	0000000	0000000
0003300	2000000	0000000	0000000
02=3300	2001000	0000000	0000000
2223400	2210100	0000+000	8020000
8112000	2820000	088+000	8080000
8887660	8010000	00+0000	0080000
0077+00	8001100	0000000	0000000

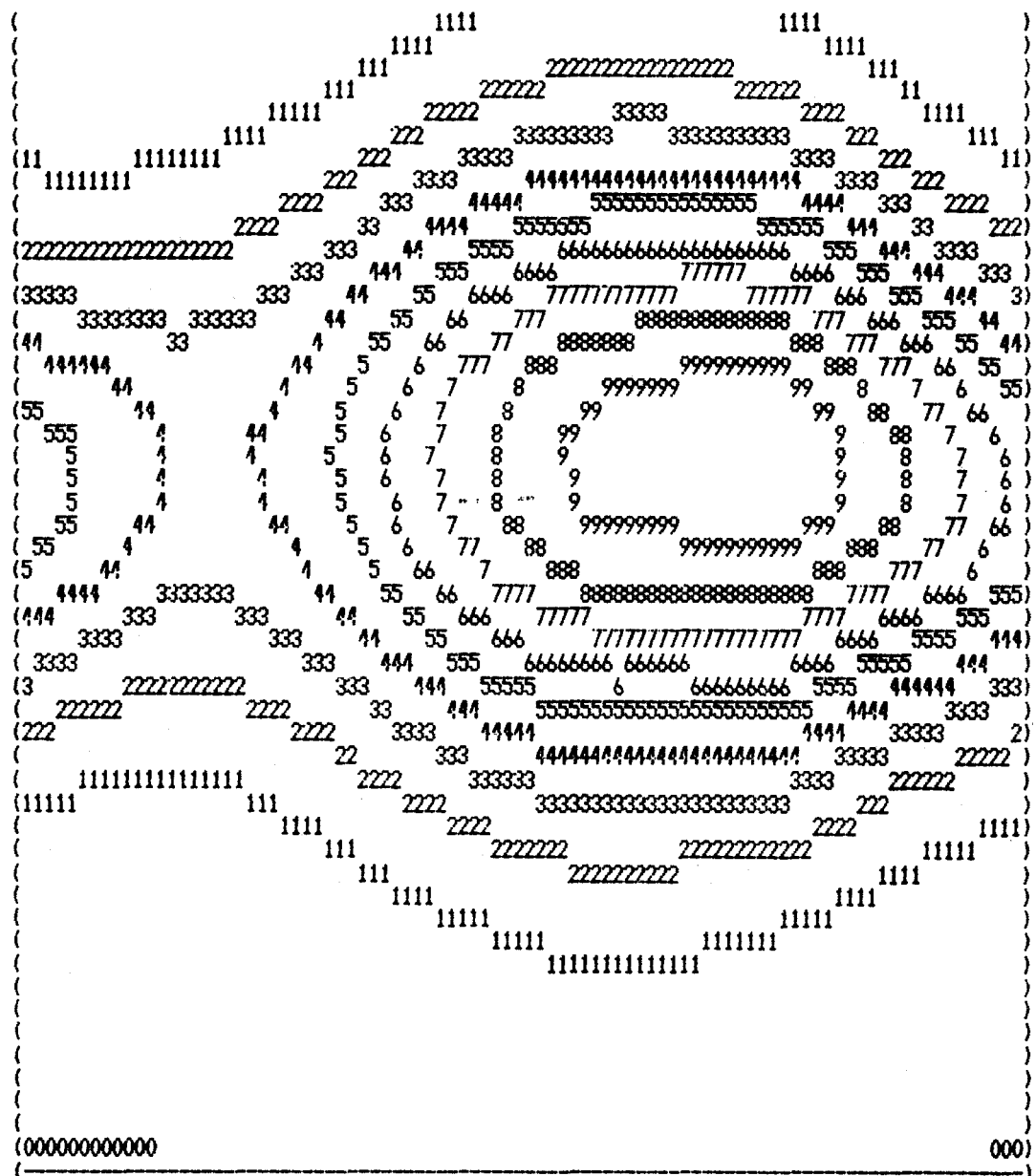
HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-4.798	0.165689	0.950920	0.261339	15.1495	80.1160

ON DAY 186 AT -4.80 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

MAX(A) = 3.0784E 06 MIN(A) = 3.9309E 03 AVR(A) = 0.

ΔIJ = (10 ± 6) X PRINTED VALUES

[illegible][illegible]



CONTOUR MODE T STEP SIZE 3.0744E 05

FRACTION OF MIRROR REFLECTING ON THE 186 DAY AT -4.80 HOURS , UNIVERSITY OF HOUSTON

MAX(A) = 1.0000E 00 MIN(A) = 5.7128E-01 AVR(A) = 8.6983E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.994	1.000	0.991	0.777	0.685	0.941	1.000	0.817
0.993	1.000	1.000	0.791	0.798	1.000	1.000	0.910
0.991	0.997	0.989	0.794	0.944	1.000	1.000	0.944
0.989	0.819	0.571	0.730	0.956	1.000	1.000	0.830
0.992	0.879	0.658	0.546	1.000	1.000	1.000	0.903
0.995	0.811	0.708	0.690	0.721	0.980	1.000	0.791
0.999	1.000	0.898	0.824	0.991	1.000	1.000	0.925
0.992	0.896	0.769	0.761	0.889	0.996	1.000	0.870

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(      987654 322235678 9 * )
(      *      98765 4 3 34578 9 )
(      98765 4 3456789 * )
(      98765 4456789 )
(      * 9 876555556789 *** * )
(      ***9 876 666789 ***** )
(      98 76 6 778 9 ***** )
(      98 76 6 78899 ***** )
(** 999998887765567 8 9 ***** )
(* * 9988876655555 567 89 ***** )
(* * 98776543222334456789 ***** )
(** 987 543211 23 45789 ***** )
(* * 98 765432 2 3456789 ***** )
(* * 9 87654322 3 456789* * ***** )
(* * 9 876 543 3 456788999 ***** ** )
(* * 98 765 43 3 455667889 * )
(** 9876 5 4 333333444456789 ** )
(** 98776655444433344456789 ** )
(* * 9888776655554555667889 * )
(** 99998877666666788999 ** ** )
( *****9988777789***** * )
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CONTOUR MODE T STEP SIZE 4.2872E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

0033330	2000000	0000000	0000000
0003300	2000000	0000000	0000000
0223300	2001000	0000000	0000000
0223000	2210100	0000000	8020000
0812000	2820000	008*000	8080000
0887660	8010000	00*0000	0080000
0077000	8001100	0000000	0000000

AT -4.598 HOURS THE SUN GIVES
688.999 WATTS/M2. THE TOPER TOP COLLECTOR HAS
258811.139 M2 OF EFFECTIVE AREA AND PROVIDES
178.323 MEGAWATTS OF DIRECTED POWER.
144.769 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ISUN
-4.598	0.191531	0.933424	0.303374	17.6603	78.4043

INCIDENT FLUX DENSITY FOR 1 PT AIM IN MM/M2 ,

ON DAY 186 AT -4.60 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

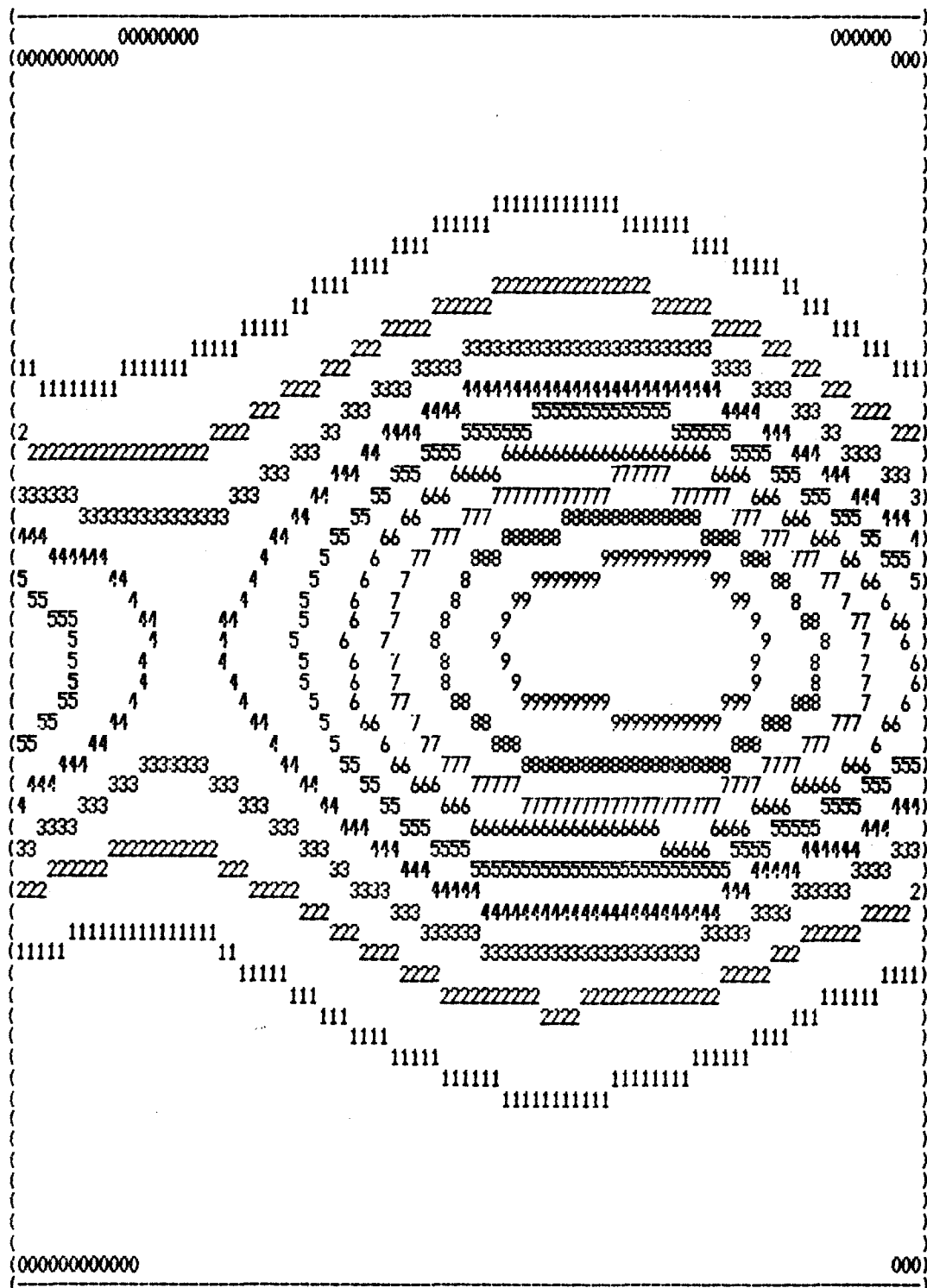
TOTAL INCIDENT RECEIVER POWER = 1.448E 08 IN WATTS AVERAGE FLUX DENSITY = 1.031E 06 CONCENTRATION= 1496.5
DZX = 0.750 DZY = 0.578

MAX(A) = 3.4831E 06 MIN(A) = 4.2635E 03 AVR(A) = 0.

AIJ = (10 ** 6) X PRINTED VALUES

0.004	0.006	0.010	0.015	0.022	0.035	0.052	0.069	0.085	0.095	0.097	0.090	0.077	0.060	0.043	0.027	0.014	0.007	0.
0.011	0.014	0.021	0.030	0.043	0.064	0.092	0.122	0.148	0.167	0.172	0.163	0.143	0.116	0.086	0.057	0.032	0.017	0.
0.029	0.034	0.045	0.060	0.083	0.117	0.164	0.212	0.256	0.289	0.301	0.292	0.262	0.220	0.168	0.115	0.070	0.039	0.
0.070	0.077	0.094	0.120	0.157	0.212	0.290	0.369	0.440	0.495	0.521	0.511	0.469	0.408	0.321	0.225	0.145	0.091	0.
0.160	0.168	0.191	0.232	0.291	0.375	0.499	0.627	0.739	0.826	0.871	0.865	0.814	0.735	0.596	0.431	0.293	0.197	0.
0.338	0.342	0.365	0.421	0.507	0.630	0.812	1.007	1.176	1.305	1.372	1.376	1.333	1.243	1.041	0.785	0.564	0.404	0.
0.649	0.635	0.632	0.687	0.798	0.968	1.211	1.484	1.717	1.895	1.990	2.007	2.002	1.912	1.659	1.319	1.007	0.758	0.
1.086	1.030	0.959	0.987	1.109	1.330	1.626	1.978	2.263	2.488	2.618	2.642	2.697	2.616	2.350	1.974	1.604	1.255	0.
1.545	1.424	1.254	1.236	1.353	1.620	1.957	2.368	2.681	2.941	3.112	3.131	3.241	3.170	2.930	2.582	2.212	1.780	0.
1.851	1.661	1.410	1.355	1.467	1.756	2.116	2.552	2.873	3.149	3.343	3.350	3.483	3.431	3.219	2.930	2.604	2.138	0.
1.869	1.633	1.362	1.306	1.431	1.705	2.063	2.482	2.805	3.074	3.253	3.250	3.368	3.355	3.129	2.878	2.610	2.172	0.
1.590	1.359	1.133	1.109	1.260	1.483	1.815	2.177	2.500	2.741	2.868	2.864	2.936	2.969	2.696	2.449	2.230	1.866	0.
1.141	0.965	0.814	0.828	0.990	1.154	1.439	1.723	2.024	2.222	2.292	2.291	2.308	2.362	2.063	1.814	1.634	1.356	0.
0.698	0.594	0.512	0.545	0.688	0.805	1.029	1.235	1.482	1.634	1.667	1.667	1.641	1.676	1.408	1.185	1.041	0.843	0.
0.374	0.324	0.289	0.321	0.425	0.511	0.672	0.813	0.974	1.097	1.117	1.115	1.068	1.065	0.869	0.700	0.590	0.460	0.

0.181 0.161 0.151 0.174 0.238 0.302 0.409 0.504 0.614 0.686 0.704 0.697 0.650 0.620 0.497 0.387 0.306 0.228 0.
0.081 0.075 0.076 0.091 0.126 0.172 0.238 0.301 0.366 0.412 0.427 0.416 0.379 0.341 0.271 0.205 0.150 0.105 0.
0.034 0.033 0.037 0.046 0.066 0.096 0.136 0.178 0.216 0.244 0.253 0.241 0.215 0.183 0.143 0.105 0.071 0.045 0.
0.013 0.014 0.018 0.023 0.034 0.053 0.077 0.104 0.127 0.143 0.147 0.137 0.118 0.096 0.073 0.051 0.032 0.018 0.
0.005 0.006 0.008 0.011 0.018 0.028 0.043 0.060 0.074 0.083 0.084 0.076 0.063 0.049 0.036 0.024 0.014 0.007 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.



CONTOUR MODE T STEP SIZE 3.4788E 05

MAX(A) = 1.0000E 00 MIN(A) = 6.5488E-01 AVR(A) = 9.0505E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.993 0.998 1.000 0.842 0.765 0.959 1.000 0.869
0.991 0.998 1.000 0.856 0.838 1.000 1.000 0.933
0.990 0.998 0.988 0.857 0.971 1.000 1.000 0.962
0.989 0.890 0.655 0.795 0.957 1.000 1.000 0.868
0.993 0.890 0.731 0.620 1.000 1.000 1.000 0.921
0.995 0.907 0.785 0.783 0.795 1.000 1.000 0.856
0.999 1.000 0.903 0.924 0.994 1.000 1.000 0.955

0.991 0.932 0.817 0.838 0.917 1.000 1.000 0.905

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(-----)
(      **987654 3 34568 9 ** )
(      * 98765 4 335678 9 ** )
(      **9876 5 44456789 * )
(      * 9876 5 56789 * )
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(      9876 66666789***** )
(      98766 7788 9***** )
(      9 8766 788999 ***** )
( *      999988877666 789 ***** )
( * 99 87765555555678 9 ***** )
( * * 9 887643222344567 89 ***** )
( * * 98 7654211 2345678 9 ***** )
( * * 98 765432 23 456789 ***** )
( * * 98 76543223 4 56789**** ***** )
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( * * 9 8 765433 4 56677899***** )
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( * 998876656666666777889***** )
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( *****9988888899***** )
(-----)
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CONTOUR MODE T STEP SIZE 3.4512E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

0003330	2200000	0000000	0000000
0003300	2200000	0000000	0000000
0023300	2201000	0000000	0000000
0223000	2210100	0000000	8020000
0812000	8820000	0083000	0080000
0887600	8010000	0000000	0080000
0077000	8001100	0000000	0000000

AT -4.398 HOURS THE SUN GIVES
724.978 WATTS/M2. THE TOWERTOP COLLECTOR HAS
271243.941 M2 OF EFFECTIVE AREA AND PROVIDES
196.646 MEGAWATTS OF DIRECTED POWER.
159.783 MEGAWATTS OF INCIDENT POWER.

HOURS	USUNX	USUNY	USUNZ	ESUN	ZSUN
-4.398	0.216859	0.913369	0.344571	20.1556	76.6437

INCIDENT FLUX DENSITY FOR 1 PT AIM IN MW/M2 ,

ON DAY 186 AT -4.40 HOURS ON A PLANE OF HEIGHT= 13.50 AND WIDTH= 10.40 AND OFFSET= 0.

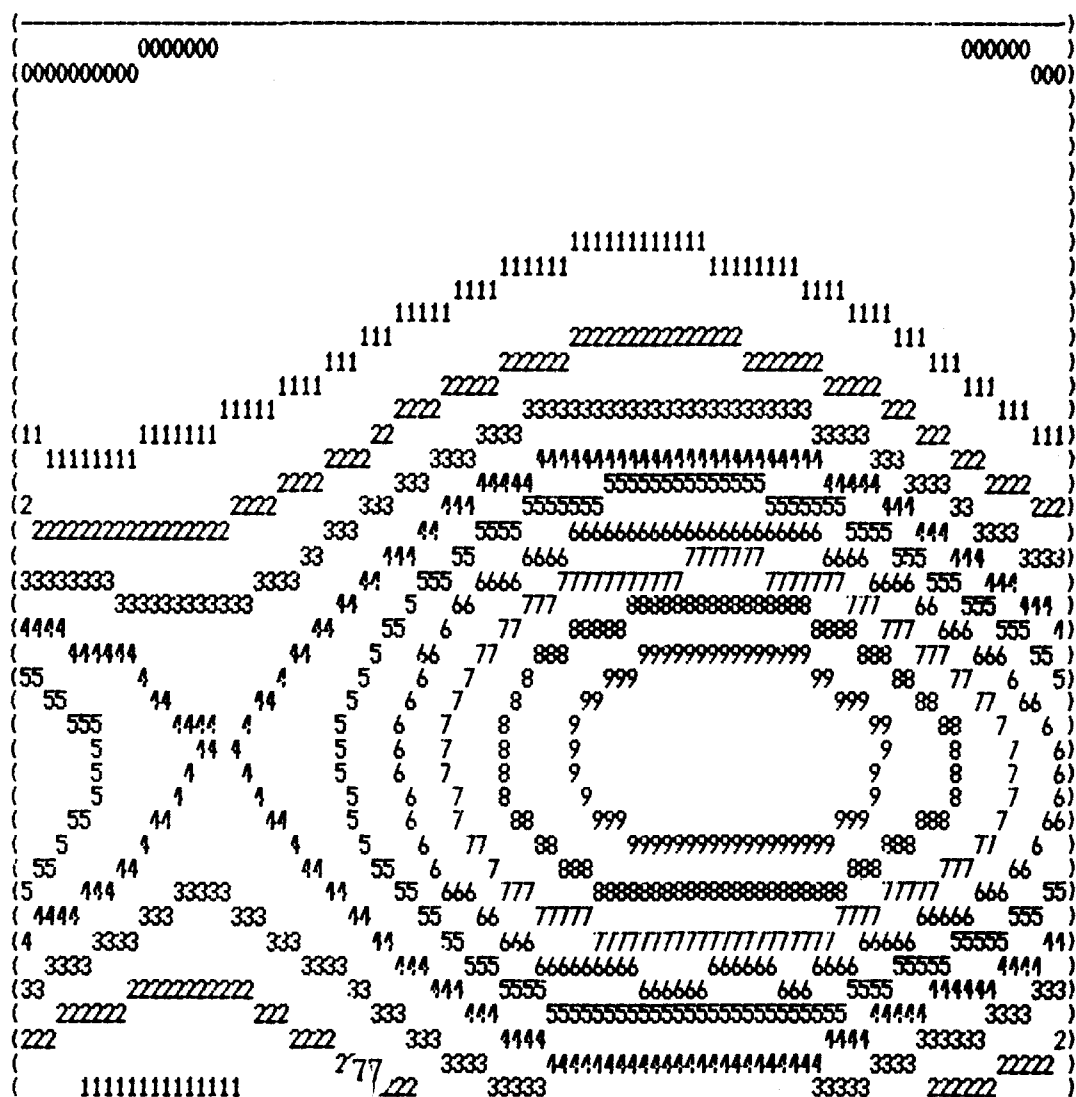
TOTAL INCIDENT RECEIVER POWER = 1.598E 08 IN WATTS AVERAGE FLUX DENSITY = 1.138E 06 CONCENTRATION= 1569.8
DZX = 0.750 DZY = 0.578

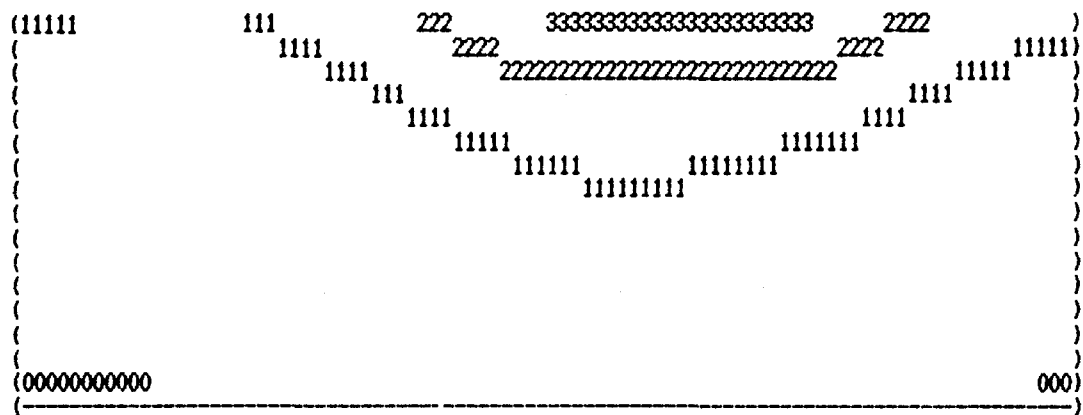
MAX(A) = 3.8191E 06 MIN(A) = 4.5450E 03 AVR(A) = 0.

AIJ = (10 ** 6) X PRINTED VALUES

0.005 0.006 0.010 0.016 0.025 0.039 0.058 0.077 0.094 0.104 0.104 0.096 0.081 0.063 0.045 0.028 0.015 0.007 0.
0.012 0.015 0.023 0.033 0.048 0.072 0.103 0.135 0.164 0.182 0.185 0.175 0.152 0.123 0.091 0.060 0.034 0.017 0.
0.031 0.037 0.049 0.067 0.092 0.131 0.182 0.236 0.287 0.316 0.326 0.313 0.279 0.234 0.179 0.122 0.074 0.042 0.

0.076	0.084	0.103	0.133	0.175	0.236	0.322	0.410	0.487	0.542	0.565	0.551	0.503	0.438	0.345	0.242	0.155	0.097	0.
0.173	0.182	0.210	0.258	0.325	0.418	0.555	0.697	0.820	0.909	0.950	0.939	0.879	0.793	0.645	0.466	0.315	0.213	0.
0.370	0.375	0.404	0.469	0.566	0.701	0.902	1.118	1.306	1.442	1.506	1.503	1.447	1.348	1.134	0.857	0.613	0.440	0.
0.716	0.702	0.703	0.768	0.892	1.077	1.343	1.649	1.911	2.100	2.195	2.204	2.182	2.079	1.815	1.447	1.105	0.833	0.
1.208	1.148	1.070	1.104	1.239	1.479	1.801	2.197	2.521	2.763	2.898	2.913	2.949	2.850	2.576	2.176	1.772	1.391	0.
1.727	1.594	1.404	1.384	1.512	1.800	2.165	2.631	2.988	3.269	3.451	3.461	3.550	3.456	3.216	2.853	2.453	1.982	0.
2.073	1.861	1.579	1.517	1.639	1.951	2.340	2.835	3.203	3.500	3.710	3.709	3.819	3.741	3.532	3.239	2.892	2.385	0.
2.093	1.829	1.524	1.461	1.599	1.893	2.280	2.756	3.129	3.416	3.608	3.599	3.693	3.655	3.430	3.180	2.897	2.423	0.
1.776	1.517	1.265	1.239	1.407	1.646	2.006	2.418	2.789	3.043	3.175	3.168	3.217	3.231	2.951	2.702	2.470	2.077	0.
1.268	1.072	0.907	0.924	1.106	1.281	1.590	1.914	2.257	2.463	2.529	2.527	2.523	2.566	2.252	1.996	1.803	1.502	0.
0.769	0.655	0.568	0.608	0.769	0.895	1.138	1.372	1.651	1.807	1.831	1.831	1.787	1.815	1.532	1.299	1.142	0.927	0.
0.408	0.355	0.319	0.358	0.475	0.568	0.744	0.904	1.100	1.209	1.221	1.217	1.158	1.149	0.941	0.764	0.642	0.501	0.
0.196	0.175	0.166	0.194	0.266	0.336	0.453	0.560	0.682	0.754	0.765	0.755	0.700	0.665	0.536	0.420	0.331	0.246	0.
0.087	0.081	0.083	0.101	0.142	0.191	0.264	0.335	0.406	0.451	0.461	0.447	0.406	0.364	0.290	0.221	0.161	0.112	0.
0.036	0.035	0.041	0.052	0.074	0.107	0.152	0.198	0.239	0.266	0.272	0.258	0.228	0.194	0.152	0.112	0.075	0.048	0.
0.014	0.015	0.019	0.026	0.038	0.059	0.086	0.115	0.141	0.157	0.158	0.146	0.125	0.101	0.077	0.055	0.034	0.020	0.
0.005	0.006	0.009	0.013	0.020	0.032	0.048	0.066	0.082	0.091	0.090	0.081	0.067	0.052	0.038	0.026	0.015	0.008	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.





CONTOUR MODE T STEP SIZE 3.8145E 05

FRACTION OF MIRROR REFLECTING ON THE 186 DAY AT -1.40 HOURS , UNIVERSITY OF HOUSTON

MAX(A) = 1.0000E 00 MIN(A) = 7.2772E-01 AVR(A) = 9.3403E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.991	0.995	1.000	0.894	0.851	0.998	1.000	0.915
0.990	0.996	1.000	0.907	0.895	1.000	1.000	0.956
0.989	0.996	1.000	0.907	1.000	1.000	1.000	0.979
0.988	0.946	0.728	0.848	0.959	1.000	1.000	0.900
0.992	0.909	0.766	0.680	1.000	1.000	1.000	0.932
0.994	0.990	0.845	0.874	0.858	1.000	1.000	0.911
0.998	1.000	0.914	0.979	0.997	1.000	1.000	0.973
0.991	0.965	0.855	0.899	0.944	1.000	1.000	0.934

```
(-----)
(      * 9876 5 446789 * )
(      *987 6 55 56789 * )
(      * 987 6 556789 )
(      * 98 7 66 6789 )
(      *98 7 666789 ** )
(      **98 7 77778 9***** )
(      98 7 7 88899 ***** )
(      * 98 77 8 99***** )
(      9999988776 789 **** )
( * 99 87655555567 89 ***** )
( * 9 8654223344567 899 ***** )
( * 9 8764211 234567 899 ***** )
( * * 9 8 754311234 56789 ***** )
( * * 9 8765432 23456 789**** ***** )
( * * 9 877653223 456 78999 * ***** )
( * 9 8876433 4 5 66778899***** )
( ** 999865444 5 666789 ***** )
( 9876555566666666789***** )
( 9 87666677777778899 ***** )
( 98 777888999999 ***** )
( *****9 8 899***** )
(-----)
```

CONTOUR MODE T STEP SIZE 2.7228E-02

MATRIX OF SHADING AND MATRIX OF BLOCKING

0003330	2200000	0000000	0000000
0003300	2200000	0000000	0000000
0003000	2201000	0000000	0000000
0223000	2210100	0000000	8020000
0882000	8820000	0003000	0080000
0887600	8010000	0000000	0080000

ANNUAL SUMMARY OF INSOLATION , UNIVERSITY OF HOUSTON , ANNUAL INSOLATION= 0. MMH/M2

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.	0.
DAY = 93	292.86	423.86	518.79	589.86	644.98	689.00	724.98	0.	0.	0.

ANNUAL SUMMARY OF COSINES , ANNUAL AVER COSINE= 0.

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.	0.
DAY = 93	0.6628	0.6706	0.6785	0.6862	0.6938	0.7013	0.7085	0.	0.	0.

ANNUAL SUMMARY OF FMIRR , UNIVERSITY OF HOUSTON

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.	0.
DAY = 93	0.5261	0.6533	0.7535	0.8215	0.8698	0.9051	0.9340	0.	0.	0.

ANNUAL SUMMARY OF FAREA , UNIVERSITY OF HOUSTON , ANNUAL TOTAL REFLECTED POWER/MIRROR= 0. MMH/M2

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.	0.
DAY = 93	0.3112	0.4067	0.4861	0.5450	0.5893	0.6241	0.6540	0.	0.	0.

***** TOTAL CLOUDLESS ANNUAL INCIDENT RECEIVER POWER , UNIVERSITY OF HOUSTON *****

TOTAL ANNUAL RECEIVER POWER= 0. IN MMH FOR RECEIVER DIAMETER= 10.40 AND HEIGHT= 13.50 METERS KMH

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	3.029E 07	5.748E 07	8.445E 07	1.079E 08	1.278E 08	1.448E 08	1.598E 08	0.	0.	0.

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES , UNIVERSITY OF HOUSTON

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	0.24937	0.32696	0.39249	0.44118	0.47783	0.50663	0.53142	0.	0.	0.41798

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES/COSI , UNIVERSITY OF HOUSTON

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	0.37626	0.48753	0.57851	0.64295	0.68873	0.72247	0.75001	0.	0.	0.60664

***** TOTAL CLOUDLESS ANNUAL ABSORBED RECEIVER POWER , UNIVERSITY OF HOUSTON *****

TOTAL ANNUAL RECEIVER POWER= 0. IN MMH FOR RECEIVER DIAMETER= 10.40 AND HEIGHT= 13.50 METERS KMH

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	1.686E 07	4.269E 07	6.832E 07	9.062E 07	1.095E 08	1.256E 08	1.399E 08	0.	0.	-1.429E 04

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES , UNIVERSITY OF HOUSTON

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	0.13885	0.24286	0.31751	0.37044	0.40942	0.43962	0.46524	0.	0.	0.34056

ANNUAL SUMMARY OF SYSTEM EFFICIENCIES/COSI , UNIVERSITY OF HOUSTON

HOUR =	-5.598	-5.398	-5.198	-4.998	-4.798	-4.598	-4.398	0.	0.	0.
DAY = 93	0.20950	0.36214	0.46800	0.53986	0.59012	0.62691	0.65661	0.	0.	0.49331

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW +++ U+H

DAYS	HOUR	SOUTH TO	EAST TO	NORTH						
93	-5.60	0.990	0.970	0.905	0.940	1.112	1.348	1.710	2.078	2.299
93	-5.40	1.903	1.744	1.574	1.653	1.998	2.473	3.131	3.775	4.190
93	-5.20	2.841	2.553	2.282	2.385	2.850	3.511	4.417	5.318	5.993
93	-5.00	3.706	3.347	2.969	3.044	3.559	4.342	5.442	6.562	7.509
93	-4.80	4.415	3.983	3.544	3.626	4.206	5.111	6.402	7.739	8.904
93	-4.60	5.079	4.568	4.057	4.148	4.795	5.785	7.213	8.770	10.147
93	-4.40	5.648	5.084	4.523	4.635	5.358	6.431	7.985	9.742	11.299

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW +++ U+H

DAYS	HOUR	NORTH TO	WEST TO	SOUTH						
93	-5.60	2.457	2.523	2.430	2.318	2.155	1.867	1.638	1.420	30.290
93	-5.40	4.500	4.652	4.592	4.572	4.398	3.829	3.321	2.888	57.479
93	-5.20	6.547	6.831	6.758	6.772	6.607	5.834	5.095	4.404	84.452
93	-5.00	8.340	8.792	8.744	8.801	8.630	7.604	6.539	5.586	107.933
93	-4.80	9.867	10.385	10.380	10.469	10.279	9.041	7.715	6.554	127.823
93	-4.60	11.183	11.713	11.707	11.755	11.477	10.191	8.749	7.451	144.777

93 -4.40 12.388 12.917 12.877 12.826 12.481 11.134 9.625 8.220 6.611 159.791

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW +++ U#H

DAYS HOUR SOUTH TO EAST TO NORTH

93	-5.60	0.279	0.260	0.199	0.231	0.395	0.619	0.963	1.313	1.523
93	-5.40	1.146	0.995	0.834	0.909	1.236	1.688	2.313	2.925	3.319
93	-5.20	2.038	1.764	1.506	1.604	2.046	2.674	3.534	4.390	5.031
93	-5.00	2.859	2.518	2.159	2.230	2.720	3.463	4.508	5.573	6.472
93	-4.80	3.532	3.123	2.705	2.783	3.334	4.194	5.420	6.691	7.797
93	-4.60	4.164	3.678	3.193	3.279	3.894	4.835	6.191	7.670	8.978
93	-4.40	4.704	4.168	3.635	3.742	4.429	5.448	6.924	8.593	10.073

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW +++ U#H

DAYS HOUR NORTH TO WEST TO SOUTH

93	-5.60	1.673	1.735	1.647	1.540	1.385	1.112	0.894	0.688	0.410	16.866
93	-5.40	3.614	3.758	3.701	3.682	3.516	2.976	2.494	2.082	1.506	42.696
93	-5.20	5.558	5.828	5.759	5.772	5.615	4.881	4.179	3.522	2.615	68.320
93	-5.00	7.262	7.691	7.645	7.700	7.537	6.563	5.550	4.645	3.529	90.627
93	-4.80	8.712	9.204	9.200	9.284	9.088	7.927	6.668	5.565	4.290	109.523
93	-4.60	9.962	10.466	10.460	10.506	10.255	9.020	7.650	6.417	5.008	125.629
93	-4.40	11.107	11.609	11.571	11.523	11.196	9.916	8.482	7.147	5.619	139.892

ANNUAL SUMMARY OF DIMENSIONLESS PANEL GRADIENTS +++ U#H

DAYS HOUR SOUTH TO EAST TO NORTH

93	-5.60	-0.381	-0.069	-0.268	0.152	0.523	0.443	0.434	0.308	0.148
93	-5.40	-0.272	-0.111	-0.176	0.086	0.305	0.309	0.313	0.233	0.126
93	-5.20	-0.248	-0.144	-0.158	0.063	0.242	0.266	0.277	0.216	0.136
93	-5.00	-0.210	-0.127	-0.153	0.032	0.198	0.241	0.262	0.211	0.149
93	-4.80	-0.194	-0.123	-0.143	0.029	0.180	0.228	0.255	0.210	0.153
93	-4.60	-0.184	-0.124	-0.141	0.027	0.171	0.216	0.246	0.213	0.157
93	-4.40	-0.177	-0.121	-0.137	0.029	0.168	0.206	0.239	0.215	0.159

ANNUAL SUMMARY OF DIMENSIONLESS PANEL GRADIENTS +++ U#H

DAYS HOUR NORTH TO WEST TO SOUTH

93	-5.60	0.094	0.037	-0.052	-0.067	-0.106	-0.219	-0.217		
		-0.261	-0.506							
93	-5.40	0.085	0.039	-0.015	-0.005	-0.046	-0.167	-0.176		
		-0.180	-0.321							
93	-5.20	0.100	0.047	-0.012	0.002	-0.028	-0.140	-0.155		
		-0.170	-0.296							
93	-5.00	0.115	0.057	-0.006	0.007	-0.021	-0.138	-0.167		
		-0.178	-0.273							
93	-4.80	0.111	0.055	-0.001	0.009	-0.021	-0.136	-0.173		
		-0.180	-0.259							
93	-4.60	0.104	0.049	-0.001	0.004	-0.024	-0.128	-0.164		
		-0.175	-0.247							
93	-4.40	0.098	0.044	-0.003	-0.004	-0.029	-0.121	-0.156		
		-0.171	-0.239							

ANNUAL SUMMARY OF RECEIVER ASYMMETRY RATIOS , UNIVERSITY OF HOUSTON

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.
DAY = 93	8.788	4.534	3.902	3.609	3.472	3.333	3.239	0.	0.

ANNUAL SUMMARY OF RECEIVER PANEL MAXIMA IN KW OVER PANEL NUMBER OF MAXIMA , UNIVERSITY OF HOUSTON

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.
DAY = 93	1.74	3.76	5.84	7.71	9.29	10.52	11.66	0.	0.
	10.91	11.22	11.30	12.75	12.80	12.65	11.43	0.	0.

ANNUAL SUMMARY OF RECEIVER PANEL MINIMA IN KW OVER PANEL NUMBER OF MINIMA , UNIVERSITY OF HOUSTON

HOUR =	-5.60	-5.40	-5.20	-5.00	-4.80	-4.60	-4.40	0.	0.
DAY = 93	0.20	0.83	1.50	2.14	2.68	3.16	3.60	0.	0.
	3.15	3.18	3.22	3.33	3.34	3.35	3.33	0.	0.

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS HOUR SOUTH TO EAST TO NORTH

93	-5.60	3.211	3.148	2.937	3.049	3.608	4.374	5.547	6.742	7.458
93	-5.40	4.265	3.908	3.528	3.705	4.478	5.542	7.018	8.461	9.392
93	-5.20	5.203	4.676	4.179	4.368	5.219	6.430	8.088	9.738	10.973
93	-5.00	5.969	5.390	4.782	4.903	5.733	6.993	8.764	10.569	12.093
93	-4.80	6.502	5.867	5.219	5.341	6.195	7.528	9.429	11.399	13.114
93	-4.60	7.003	6.299	5.594	5.719	6.612	7.977	9.945	12.092	13.990
93	-4.40	7.401	6.662	5.927	6.074	7.000	8.427	10.463	12.766	14.807

ANNUAL SUMMARY OF INCIDENT PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ U#

DAYS HOUR NORTH TO WEST TO SOUTH

93	-5.60	7.970	8.184	7.883	7.519	6.989	6.056	5.313	4.607	3.659	98.257
93	-5.40	10.087	10.427	10.292	10.248	9.857	8.582	7.444	6.472	5.115	128.826
93	-5.20	11.989	12.509	12.375	12.401	12.098	10.683	9.330	8.065	6.315	154.646
93	-5.00	13.432	14.160	14.083	14.175	13.899	12.247	10.531	8.996	7.104	173.830
93	-4.80	14.534	15.297	15.289	15.420	15.116	13.317	11.364	9.653	7.678	188.272
93	-4.60	15.420	16.150	16.142	16.208	15.943	14.051	12.063	10.274	8.228	199.620
93	-4.40	16.233	16.926	16.874	16.808	16.355	14.590	12.612	10.771	8.663	209.387

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ UH

DAYS HOUR SOUTH TO EAST TO NORTH

93	-5.60	2.389	2.329	2.129	2.234	2.766	3.494	4.608	5.744	6.424
93	-5.40	3.390	3.051	2.690	2.858	3.592	4.604	6.006	7.376	8.261
93	-5.20	4.281	3.780	3.308	3.488	4.296	5.447	7.022	8.590	9.763
93	-5.00	5.008	4.459	3.882	3.996	4.784	5.982	7.664	9.379	10.827
93	-4.80	5.516	4.912	4.297	4.413	5.224	6.490	8.296	10.168	11.797
93	-4.60	5.991	5.322	4.653	4.772	5.620	6.917	8.786	10.826	12.629
93	-4.40	6.369	5.668	4.969	5.109	6.009	7.344	9.278	11.466	13.405

ANNUAL SUMMARY OF ABSORBED PANEL POWER IN MW FOR A CONSTANT DIRECT BEAM INTENSITY AT ALL TIMES OF 950.0 WATTS/M2' +++ UH

DAYS HOUR NORTH TO WEST TO SOUTH

93	-5.60	6.910	7.113	6.827	6.482	5.978	5.092	4.385	3.715	2.814	81.435
93	-5.40	8.921	9.244	9.116	9.074	8.703	7.491	6.410	5.487	4.197	110.476
93	-5.20	10.728	11.222	11.095	11.120	10.831	9.487	8.202	7.000	5.338	135.005
93	-5.00	12.099	12.791	12.717	12.805	12.542	10.973	9.343	7.885	6.087	153.230
93	-4.80	13.145	13.870	13.863	13.988	13.699	11.989	10.134	8.509	6.632	166.949
93	-4.60	13.987	14.681	14.673	14.736	14.390	12.687	10.799	9.099	7.155	177.730
93	-4.40	14.760	15.418	15.368	15.306	14.876	13.199	11.320	9.571	7.568	187.008

EOF

Appendix E. Cloud Study for a Surround Field at 3 PM on Winter Solstice.

The main purpose of this run is to study the response of the power tower system to a specified cloud transit.

The output of the CLOUD subroutine is reproduced in its entirety. However, we also provide a source listing of the CLOUD subroutine because it is user defined and contains many internal inputs which were not discussed in section 5.

DESCRIPTION OF SUBROUTINE CLOUD AND CLOUD TRANSIT INPUT PARAMETERS

In keeping with the input format of the cellwise performance code and the expected infrequent use of the CLOUD routine, a few input parameters are contained within the CLOUD routine. A listing of the CLOUD routine begins on the next page. Any factors not sufficiently commented in the listing will be discussed here.

The set of panel powers is output to file 06 and file 30 for each cloud field increment. The 06 is for standard printed output and the 30 is formatted for punched card output. File 40 must be available from the performance code. It will be read and used by the CLOUD routine.

On line 38, CA is a list of cloud directions. It is convenient to run many transits, varying the direction of propagation in a single run. The array CANM contains mnemonics for the direction of the cloud front.

The array XCLD is not normally required in the CLOUD routine. It is a part of the particular cloud model that is being used at present. XCLD are the x-coordinates of data points in the cloud field. The width of the cloud field is XCLD(4)-XCLD(1). It is being used here to correct the cloud field coordinates so the cloud field center will more nearly pass over the geometric center of the field. This is being done since the cloud field is defined only for a region about the same width as the collector field. If this correction is not applied, the center of the cloud field will pass over the center of the tower cell.

ITYP identifies the cloud case being processed. In the samples to be given, there are five different cloud fields. The currently inactive cloud field data are commented.

ISM is the number of increments required to move the cloud field across the collector field. It may be less than or equal to the combined depth of the cloud field DMAX and collector field divided by the incremental distance. The receiver power levels are written to 06 and 30 at each increment.

DM is the distance the cloud moves at each increment. It should be small compared to cloud field features.

A is the distance from the tower to the cloud front at the start of the first increment. If it is desirable to start the simulation with the collector field clear of clouds, then A should be equal to or greater than the maximum distance of heliostats from the tower.

ICA and NCA are the indices of the first and last directions of cloud propagation across the field. The cloud is incremented across the field ISM times for each value from ICA to NCA.

DMAX represents the depth of the cloud field. In this model DMAX is the length of the cloud front measured along its direction of motion.

The statement at line no. 169 shifts the X coordinate from the tower center to the geometric center of the field. It will be necessary to change this for other fields. The statement at line 175 shifts the X cloud field coordinate to the geometric centerline of the cloud field. The cloud field is assumed to be defined over a region of width, W, where the X coordinate is in the range $-W/2$ to $+W/2$ and over a region of depth, DMAX, where y is in the range 0 to DMAX. If Y is outside this range, then the cloud transmission is set to 1.00.

The cloud model is contained in subroutine CLO. XS and YS are the input coordinates of a point in the cloud field in the cloud field coordinate system. The subroutine returns the transmission of the cloud field at that point. In the sample cases given, the model was prepared from actual insolation data taken over a region in size comparable to the collector field. The coefficients given in the model are the solutions to the set of equations that result from applying a Gaussian weighting distribution to the insolation data. It is a method of interpolation for sparse data. Details on the formation of these cloud models are given in references 10 and 11.

An example of the use of the cloud transit simulation is given in reference 12.

```

1*#RUN *:=HSELCG1122/NS/R-CLOUD (BCD,NOGO,OPTZ)
2C                                     HSELCG1122/NS/CLOUD
3C
4C CLOUD TRANSIT SIMULATION FOR THE UH XY SYSTEM
5C CALLED FROM YEAR C. LAURENCE 8/22/79
6C
7C THE CLOUD TRANSIT TIME IS CONSIDERED SHORT COMPARED
8C TO THE PASSAGE OF TIME IN A DAY
9C THE PANEL SUM FILE (40) IS READ IN ITS ENTIRETY
10C THE CONTRIBUTION TO THE TOTAL PANEL POWER IS MODIFIED
11C BY THE TRANSMISSION AT EACH CELL LOCATION
12C GIVEN BY THE CLOUD MODEL
13C
14C
15C FILES REQUIRED
16C
17C 06 - STANDARD PRINT OUTPUT
18C 30 - PUNCH OUTPUT 25 ENTRIES EACH TIME INCREMENT
19C 40 - INPUT RECEIVER PANEL SUM DATA FROM THE XY CODE SYSTEM
20C
21C A CLOUD MODEL IN THE FORM OF SUBROUTINE CLD IS
22C REQUIRED. IT MUST DEFINE THE EFFECTIVE TRANSMISSION
23C OF THE CLOUD FIELD AS A FUNCTION OF LOCATION
24C OVER A REGION AS WIDE AS THE COLLECTOR FIELD
25C
26C
27 SUBROUTINE CLOUD(NCELI,NCELJ,JGREC,JGRECP,PANELV,XC,YC,CPOWR)
28 CHARACTER CANM*5(5)
29 DIMENSION XC(NCELI,NCELJ),YC(NCELI,NCELJ),CPOWR(NCELI,NCELJ)
30 DIMENSION PANS(25,13,15),PANELV(JGRECP),CA(5),XCLO(4)
31 * COMMON /CELL/ORDER,DA,AC,XTOWI,YTOWJ,NBOR,KORY,LRAY,LGEO,DTRIM
32 COMMON /TOWER/ICYLN,HCYLNT,WCYLNT,HCYLN,WCYLN,OFSET,REFLT,ABSOR,
33 & FRLOS,NPANS,INODE1,INODE2,JNODE1,JNODE2
34 COMMON /TIMEV/ IHOR,DHOURX,DAY,NDAY,ATCOS,ATSOL,HYRS
35 COMMON /TIMEX/IDAYS,IHORS,NDAY1,HOUR0,HOUR1,HOUR2,NHRS,DHOUR
36 COMMON /GRPLS/ASDCS(7,10),ASDIN(12,10)
37 COMMON /COEF/ COEFX(6),COEFY(6),ICOF,ITWR
38 DATA CA /0.0,45.0,90.0,135.0,180.0 /
39 DATA (CANM(I),I=1,5)/'N-S','NW-SE','W-E','SW-NE','S-N'/
40C
41C * * * * * OPTIONAL * * * * *
42C THE CLOUD DATA COORD BELOW ARE USED TO CENTER THE CLOUD
43C FIELD OVER THE COLLECTOR FIELD AND MAY NOT BE REQUIRED
44C FOR OTHER CLOUD MODELS
45C
46C X DATA POINT COORDINATES ; -1185,-568,242,1210 FT CASE NO. 1
47C X DATA POINT COORDINATES ; -1065,-491,797,1090 FT CASE NO. 2
48C X DATA POINT COORDINATES ; - 939,-682,805,1178 FT CASE NO. 3
49C X DATA POINT COORDINATES ; -1210,-242,568,1185 FT CASE NO. 4
50C X DATA POINT COORDINATES ; - 939,-682,805,1178 FT CASE NO. 5
51C
52 DATA (XCLO(I),I=1,4) ;* DATA ENTERED IN METERS
53 & /-361.188,-173.1264,+73.7616,+368.808 / ;* CASE NO. 1
54C & / -324.612,-149.657,+242.926,+332.232 / ;* CASE NO. 2
55C & / -286.21,-207.87,+245.36,+359.05 / ;* CASE NO. 3
56C & / -368.81,- 73.76,+173.13,+361.19 / ;* CASE NO. 4
57C & / -286.21,-207.87,+245.36,+359.05 / ;* CASE NO. 5
58C * * * * * OPTIONAL * * * * *
59C
60C INPUTS FOR THE SIMULATION
61C

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62C ISM - TOTAL NUMBER OF INCREMENTS REQUIRED TO PASS THE CLOUD
63C DM - SPACIAL DISTANCE IN METERS REPRESENTED BY ONE INCREMENT
64C A - INITIAL DISTANCE FROM THE TOWER TO THE CLOUD SYSTEM FRONT
65C CA - CLOUD APPROACH ANGLE (DEG WEST OF NORTH, 0 TO 180)
66C ITYP- CLOUD TYPE, CASE OR SAMPLE NUMBER
67C THIS INDEX IS USED ONLY TO PUT IN THE OUTPUT FILES
68C (PRINT AND PUNCH) FOR IDENTIFICATION
69C DMAX- DEPTH OF THE CLOUD FIELD IN METERS
70C
71 ITYP = 1 ;* CLOUD TYPE (CASE NUMBER)
72 ISM = 92 ;* FROM FULL OPEN TO FULL OPEN
73 DM = 50.0 ;* METERS
74 A = 500.0 ;* METERS FOR CA 0 TO 90
75 ICA = 1 ;* INDEX TO START OF CLOUD DIRECTION ARRAY
76 NCA = 5 ;* INDEX LAST CLOUD DIRECTION
77 DMAX = 2985. ;* DEPTH OF CLOUD FIELD CASE NO. 1
78C DMAX = 16581. ;* DEPTH OF CLOUD FIELD CASE NO. 2
79C DMAX = 3648. ;* DEPTH OF CLOUD FIELD CASE NO. 3
80C DMAX = 3979. ;* DEPTH OF CLOUD FIELD CASE NO. 4
81C DMAX = 22385. ;* DEPTH OF CLOUD FIELD CASE NO. 5
82C
83C * * * * * OPTIONAL * * * * *
84C CLOUD FIELD GEOM CENTER TO ORIG OF COORD SYS
85 DISP = 0.5*(XCLD(1) + XCLD(4))
86C * * * * * OPTIONAL * * * * *
87C
88C INITIALIZATION OUTSIDE OF CLOUD LOOP
89C
90C READ THE PANSUM FROM 40
91 NTOWI = INT(.5+XTOWI)
92 NTOWJ = INT(.5+YTOWJ)
93 DO 10 I = 1,NCELI
94 DO 10 J = 1,NCELI
95 IF(ITWR.EQ.1) GO TO 11
96 IF ( I.EQ. NTOWI .AND. J.EQ. NTOWJ) GO TO 10
97 11 DO 9 K = JNODE1,JNODE2
98 9 READ (40,903) PANS(K,I,J)
99 READ (40,903) PANS(JGRECP,I,J)
100 903 FORMAT (1X,A6)
101 10 CONTINUE
102C
103 RAD = 57.2957795
104C
105C MAJOR LOOP ON CLOUD DIRECTIONS (CASES)
106 DO 700 NC = ICA,NCA
107C
108 SCA = SIN(CA(NC)/RAD)
109 CCA = COS(CA(NC)/RAD)
110C
111C WRITE ONE TIME DESCRIPTIVE QUANTITIES TO 6 AND 30
112C
113 WRITE (6,900)
114 900 FORMAT ('1 CLOUD TRANSIT SIMULATION')
115 WRITE (30,901)
116 901 FORMAT (' CLOUD TRANSIT SIMULATION')
117 WRITE (6,902) NDAY1,HOURL,ITYP,CA(NC),CANM(NC),
118 & DM,A
119 902 FORMAT (' DAY ',I4,' TIME ',F6.2,' HOURS CASE NO.(CLOUD',
120 & ' TYPE) ',I3,' DIRECTION ',F6.1,' DEG',2X,A5/
121 & ' SPACIAL INCREMENT ',F6.1,' METERS STARTING DIST',
122 & 'ANCE FROM TOWER ',F6.1,' METERS')
123 WRITE(6,701)
124 701 FORMAT(1H0,' DIST(M.) **** INCIDENT , 85 L POWER IN MW +++ U*H')

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125 WRITE (30,904) NDAY1,HOURL0,ITYP,CA(NC),
126 & CANM(NC),DM,A
127 904 FORMAT (' DAY ',I4,' TIME ',F6.2,' HOURS CASE NO.(CLOUD',
128 & ' TYPE) ',I3/' DIRECTION ',F6.1,' DEG',2X,AS,
129 & ' SPACIAL INCREMENT ',F6.1,' METERS'/' STARTING DIST',
130 & ' ANCE FROM TOWER ',F6.1,' METERS')
131 WRITE(30,701)
132C
133C CLOUD MOVEMENT LOOP INDEPENDENT EFFIEIENCIES
134C
135C ASDIN IS THE DN INSOLATION
136 RSOL = REFLT*ASDIN(NDAY,IHUR)
137C
138C CLOUD SPATIAL MOVEMENT LOOP
139C
140C START CLOUD MOVEMENT LOOP
141C
142 DO 600 IS = 1,ISM
143C
144C DEPTH OF CLOUDS ONTO FIELD FROM INITIAL POSITION AT A
145 VT = (IS-1)*DM
146C
147C INITIALIZE SUMMERS
148 DO 4 J = 1,JGRECP
149 4 PANELV(J) = 0.0
150C
151C LOOP OVER FIELD CELLS
152C
153 DO 500 I = 1,NCELI
154 DO 500 J = 1,NCELJ
155C
156C SKIP THE TOWER CELL
157 IF(ITWR.EQ.1) GO TO 13
158 IF (I .EQ. NTOWI .AND. J .EQ. NTOWJ) GO TO 500
159 13 CONTINUE
160C
161C LOCATE THE CELL IN THE CLOUD COORD SYSTEM
162C
163C SHIFT TO THE GEOMETRIC CENTER OF THE COLLECTOR FIELD
164C
165C XC,YC ARE THE HELIOSTAT COORDINATES - COLLECTOR COORD SYS
166C TRANSLATE AND ROTATE INTO THE CLOUD COORDINATE SYSTEM
167C XS,YS HELIO LOCATION IN THE CLOUD COORD SYS
168C
169 X = XC(I,J) + 89.0 ;* METERS = 0.5(402-224)
170 XS = YC(I,J)*CCA - X*SCA
171 YS = VT - A - X*CCA - YC(I,J)*SCA
172C
173C * * * * * OPTIONAL * * * * *
174C FROM GEOM CENTER OF CLOUD SHIFT TO CLOUD FIELD COORD SYS
175 XS = XS + DISP
176C * * * * * OPTIONAL * * * * *
177C
178C IS THE CELL IN THE CLOUD FIELD
179C
180 IF (YS .LT. 0.0 .OR. YS .GT. DMAX) GO TO 6
181C CLOUD MODEL XS,YS, IN THE CLOUD SPATIAL COORD SYSTEM
182C TRCLD - OUTPUT TRANSMISSION DUE TO CLOUDS
183 CALL CLDM(XS,YS,TRCLD)
184 GO TO 8
185C
186C
187C * * * * * OPTIONAL * * * * *

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188C OUTSIDE THE CLOUD FIELD ASSUME CLEAR SKY
189   6 TRCLD = 1.0
190C * * * * * OPTIONAL * * * * *
191C
192   8 TR = TRCLD*CPWR(I,J)*RSOL
193C
194C SUM OVER ALL PANELS AND TOTAL
195C
196   DO 400 JREC = JNODE1,JNODE2
197   PANELV(JREC) = PANELV(JREC) + TR*PANS(JREC,I,J)
198 400 CONTINUE
199   PANELV(JGRECP) = PANELV(JGRECP) + TR*PANS(JGRECP,I,J)
200C
201C END CELL LOOP
202 500 CONTINUE
203C
204C OUTPUT TO 6 AND 30 THE PANEL POWERS
205C
206   WRITE (6,905) VT,(PANELV(L),L=1,JGRECP)
207   WRITE (30,906) VT,(PANELV(L),L=1,JGRECP)
208 905 FORMAT (1H0,F10.1,-6P12F8.3/,11X,15F8.3)
209 906 FORMAT (1X,F10.1,-6P7F8.3/(11X,7F8.3))
210C
211C END CLOUD MOVEMENT LOOP
212 600 CONTINUE
213C END NO. CLOUD CASES LOOP
214 700 CONTINUE
215   RETURN
216   END
217   SUBROUTINE CLDM(X,Y,T)
218C
219C * * * * * CLOUD MODELS * * * * *
220C
221C THESE CLOUD MODELS WERE PREPARED FOR THE BARSTOW SOLAR ONE
222C CLOUD TRANSIT STUDY BY B. ROBERT JOHNSON OF THE
223C AEROSPACE CORP., EL SEGUNDO, CALIF.
224C THE MODELS ARE BASED ON INTERPOLATIONS OF ACTUAL INSOLATION
225C MEASUREMENTS OVER A REGION COMPERABLE IN SIZE TO THE
226C COLLECTOR FIELD
227C THE DATA COLLECTION IS DETAILED IN
228C
229C AEROSPACE CORP. TECHNICAL REPORT ATR-79(7747)-2 30 DEC. 1978
230C "MEASUREMENTS OF INSOLATION VARIATION OVER A SOLAR COLLECTOR
231C FIELD" BY C.M. RANDALL, M.E. WHITSON, JR., AND B.R. JOHNSON
232C
233C PREPARATION OF THE CLOUD MODEL, INTERPOLATION TECHNIQUE, AND
234C SELECTION OF THE DATA ARE DETAILED IN
235C
236C AEROSPACE CORP. TECHNICAL REPORT ATR-80(7747)-2 MAY 1980
237C "MEASUREMENTS OF TYPICAL INSOLATION VARIATION AT DAGGETT,
238C CALIFORNIA" BY C.M. RANDALL, M.E. WHITSON, JR., AND B.R. JOHNSON
239C
240C DESCRIPTION OF THE CASES
241C
242C ABBREVIATIONS:
243C   TSC - TOTAL SKY COVER IN 1/10 UNITS
244C   TOSC - TOTAL OPAQUE SKY COVER IN 1/10 UNITS
245C   PAT - CLOUD TYPE PRESENT AT THE TIME
246C   PDD - CLOUD TYPE PRESENT DURING THE DAY BUT NOT
247C         REPORTED AT THE TIME
248C   CTNG - CLOUD TYPE NOT GIVEN
249C
250C

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251C CASE NO. 1
 252C DATE DATA TAKEN: AUG. 8, 1978
 253C DRIFT VELOCITY : 5.5 METERS/SEC
 254C DRIFT DIRECTION: NE-SW
 255C REGION REPRESENTED: 730 BY 2985 METERS
 256C CLOUD TYPE : TOWERING CUMULUS (PAT)
 257C TSC : 4 TO 3
 258C TOSC : 4 TO 3
 259C
 260C CASE NO. 2
 261C DATE DATA TAKEN: AUG. 26, 1978
 262C DRIFT VELOCITY : 30.5 METERS/SEC
 263C DRIFT DIRECTION: W-E
 264C REGION REPRESENTED: 657 BY 16581 METERS
 265C CLOUD TYPE : CIRRUS (PDD)
 266C TSC : 7 TO 5
 267C TOSC : 3 TO 2
 268C
 269C CASE NO. 3
 270C DATE DATA TAKEN: MAR. 29, 1979
 271C DRIFT VELOCITY : 6.7 METERS/SEC
 272C DRIFT DIRECTION: W-E
 273C REGION REPRESENTED: 645 BY 3648 METERS
 274C CLOUD TYPE : ALTOCUMULUS (PDD)
 275C TSC : 5
 276C TOSC : 5
 277C
 278C CASE NO. 4
 279C DATE DATA TAKEN: APRIL 26, 1979
 280C DRIFT VELOCITY : 7.3 METERS/SEC
 281C DRIFT DIRECTION: SW-NE
 282C REGION REPRESENTED: 730 BY 3979 METERS
 283C CLOUD TYPE : ALTOCUMULUS (PAT)
 284C TSC : 0 TO 1
 285C TOSC : 0 TO 1
 286C
 287C CASE NO. 5
 288C DATE DATA TAKEN: JULY 8, 1979
 289C DRIFT VELOCITY : 41.0 METERS/SEC
 290C DRIFT DIRECTION: W-E
 291C REGION REPRESENTED: 645 BY 22385 METERS
 292C CLOUD TYPE : CTNG
 293C TSC : 8
 294C TOSC : 3
 295C
 296 DIMENSION C(35,4),XC(4)
 297C Y DATA SPACING (288FT) ; INTERPOLATION REGION OF INFLUENCE
 298C (810 FT)**2 , (290 FT)**2 ; NO. Y DATA ENTRIES (35) CASE NO. 1
 299C (1200 FT)**2 , (1600 FT)**2 ; NO. Y DATA ENTRIES (35) CASE NO. 2
 300C (1200 FT)**2 , (350 FT)**2 ; NO. Y DATA ENTRIES (35) CASE NO. 3
 301C (850 FT)**2 , (385 FT)**2 ; NO. Y DATA ENTRIES (35) CASE NO. 4
 302C (900 FT)**2 , (2160 FT)**2 ; NO. Y DATA ENTRIES (35) CASE NO. 5
 303C ALL DATA CARD ENTRIES ARE IN METERS AND M2
 304 DATA YD,SX2,SY2,NCRD
 305 & / 87.7824,60953.684,7813.146,35 / ;* CASE NO. 1
 306C & /187.68,133780.4,237831.8,35 / ;* CASE NO. 2
 307C & /107.29,133780.4,11380.6,35 / ;* CASE NO. 3
 308C & /117.04,67122.45,13770.55,35 / ;* CASE NO. 4
 309C & /658.37,75251.46,433448.42,35 / ;* CASE NO. 5
 310C X DATA POINT COORDINATES ; -1185,-568,242,1210 FT CASE NO. 1
 311C X DATA POINT COORDINATES ; -1065,-491,797,1090 FT CASE NO. 2
 312C X DATA POINT COORDINATES ; - 939,-682,805, 88' FT CASE NO. 3
 313C X DATA POINT COORDINATES ; -1210,-242,568,1185 FT CASE NO. 4

314C X DATA POINT COORDINATES : - 939,-682,805,1178 FT CASE NO. 5
 315 DATA (XC(I),I=1,4) ;* ENTRIES ARE CONVERTED TO METERS
 316 & /-361.188,-173.1264,+73.7616,+368.808 / ;* CASE NO. 1
 317C & / -324.612,-149.657,+242.926,+332.232 / ;* CASE NO. 2
 318C & / -286.21,-207.87,+245.36,+359.05 / ;* CASE NO. 3
 319C & / -368.81,- 73.76,+173.13,+361.19 / ;* CASE NO. 4
 320C & / -286.21,-207.87,+245.36,+359.05 / ;* CASE NO. 5

321C
 322C COEFFICIENTS FOR THE INTERPOLATION - DETERMINED FROM THE
 323C CLOUD DATA MATRIX INVERSION
 324C

325 DATA ((C(I,J),J=1,4),I=1,35) /
 326C 1 2 3 4 ROW NUMBER
 327 & 1.12616, .59250, 1.97706, 1.19091, ;*1 CASE NO. 1
 328 & .66553, 2.14039,-1.59414, .51274, ;*2 CASE NO. 1
 329 & .93583, .07888, .51733, .53071, ;*3 CASE NO. 1
 330 & -.35960, 1.13346, -.54680, .02846, ;*4 CASE NO. 1
 331 & .62271, -.26917, .18571, .19536, ;*5 CASE NO. 1
 332 & .74938, .58507, -.21687, .16270, ;*6 CASE NO. 1
 333 & -1.49885, 3.81385,-1.64736, .79952, ;*7 CASE NO. 1
 334 & 1.35095, .19986, -.07001, .72707, ;*8 CASE NO. 1
 335 & .72708, 1.76783, -.76908, .63318, ;*9 CASE NO. 1
 336 & 2.25455,-1.26646, 1.29595, -.42599, ;*10 CASE NO. 1
 337 & 1.83420, -.84953, 2.41721, -.57278, ;*11 CASE NO. 1
 338 & 2.78766,-2.50075, 2.34781, -.26554, ;*12 CASE NO. 1
 339 & 3.52049,-3.04186, 2.85255, -.62847, ;*13 CASE NO. 1
 340 & -.26037, 1.31081, .83527, 1.06987, ;*14 CASE NO. 1
 341 & -1.40310, 2.39744, .66594, .39096, ;*15 CASE NO. 1
 342 & .21319, .06031, 1.33355, 1.05977, ;*16 CASE NO. 1
 343 & 1.45267, .22578, 1.35840, .63991, ;*17 CASE NO. 1
 344 & 2.99979,-2.98525, 2.45272, .80692, ;*18 CASE NO. 1
 345 & 2.26913,-1.47922, 1.66976, .74097, ;*19 CASE NO. 1
 346 & 1.00616, -.58988, .05133, 1.27110, ;*20 CASE NO. 1
 347 & .25814, .52749, .52780, 1.08718, ;*21 CASE NO. 1
 348 & .23881, -.39000, 1.92591, .78268, ;*22 CASE NO. 1
 349 & .88854, -.13234, 1.26829, .99932, ;*23 CASE NO. 1
 350 & -.05212, -.22725, 1.73635, .67371, ;*24 CASE NO. 1
 351 & .27820, -.26636, .57241, 1.54009, ;*25 CASE NO. 1
 352 & -1.72259, 3.35702, -.50740, .32960, ;*26 CASE NO. 1
 353 & 1.23278, -.80570, 1.46738, .23175, ;*27 CASE NO. 1
 354 & -.60376, 1.90599, .73947, .71589, ;*28 CASE NO. 1
 355 & -.94037, 1.89669, .29541, .46261, ;*29 CASE NO. 1
 356 & .95590, .26316, 1.34248, .99828, ;*30 CASE NO. 1
 357 & -.70380, 1.40067, 1.50757, .21198, ;*31 CASE NO. 1
 358 & 2.37973, -.70496, .44465, .89333, ;*32 CASE NO. 1
 359 & -.74698, 2.55861, .33473, .44784, ;*33 CASE NO. 1
 360 & 1.56177, .18305, 1.09105, -.01603, ;*34 CASE NO. 1
 361 & .73647, 1.32996, .75046, 1.02693/ ;*35 CASE NO. 1
 362C 1 2 3 4 ROW NUMBER
 363C & .47852, 1.70070, -.01220, 1.85386, ;*1 CASE NO. 2
 364C & 2.48276, -.96621, 3.85133,-1.37429, ;*2 CASE NO. 2
 365C & -.31179, 2.23894,-1.01157, 2.07798, ;*3 CASE NO. 2
 366C & 1.24140, .47309, 1.15595, .21975, ;*4 CASE NO. 2
 367C & 1.33654, .29022, .51688, .88512, ;*5 CASE NO. 2
 368C & 2.81951,-2.42867, 6.09340,-4.22230, ;*6 CASE NO. 2
 369C & -2.36942, 4.62948,-5.11461, 4.60990, ;*7 CASE NO. 2
 370C & 1.63366, -.00569, 1.62878, -.05272, ;*8 CASE NO. 2
 371C & -.49570, 3.04258,-3.12339, 3.34880, ;*9 CASE NO. 2
 372C & .69636, 1.25248, 2.21158, .17598, ;*10 CASE NO. 2
 373C & 4.43505,-4.22649, 6.29210,-4.01669, ;*11 CASE NO. 2
 374C & -3.45399, 5.28003,-4.50920, 5.35437, ;*12 CASE NO. 2
 375C & 2.23765, -.05844, .96041, 1.24538, ;*13 CASE NO. 2
 376C & 2.20859,-1.52140, 5.41237,-3.25846, ;*14 CASE NO. 2

377C	& .90367, -.15429, -1.00096, 2.71931,	;	*15 CASE NO. 2
378C	& -.14440, .83980, -.62154, .61489,	;	*16 CASE NO. 2
379C	& -2.13436, 3.79251, -2.87102, 3.47774,	;	*17 CASE NO. 2
380C	& 1.88514, -.05295, .02272, .94838,	;	*18 CASE NO. 2
381C	& .20715, 1.01078, 1.35233, .77818,	;	*19 CASE NO. 2
382C	& 1.40742, .01712, .95107, -.38717,	;	*20 CASE NO. 2
383C	& .01650, .22446, -.40036, 1.19883,	;	*21 CASE NO. 2
384C	& -1.32206, 2.96593, -2.64824, 3.78387,	;	*22 CASE NO. 2
385C	& .75179, 1.28922, .13623, 1.73447,	;	*23 CASE NO. 2
386C	& .75249, 1.52640, .57061, 1.37176,	;	*24 CASE NO. 2
387C	& 1.67942, -.43523, 2.98142, -.68278,	;	*25 CASE NO. 2
388C	& 2.03613, -.93715, .84880, .72757,	;	*26 CASE NO. 2
389C	& -.00565, .96203, 1.50571, -.44787,	;	*27 CASE NO. 2
390C	& 1.66405, -.87812, -.56919, 2.51106,	;	*28 CASE NO. 2
391C	& -.13293, 1.07870, 2.16152, -1.88703,	;	*29 CASE NO. 2
392C	& 1.53182, .32906, -1.10637, 2.63297,	;	*30 CASE NO. 2
393C	& 1.88654, -1.58294, 3.55979, -2.87334,	;	*31 CASE NO. 2
394C	& -.74683, 2.54861, -1.87779, 2.46078,	;	*32 CASE NO. 2
395C	& -.83694, 2.81722, -3.16118, 3.50903,	;	*33 CASE NO. 2
396C	& .40596, 1.90405, -1.19965, 2.67842,	;	*34 CASE NO. 2
397C	& 2.30557, -1.05829, 3.47422, -1.26270 /	;	*35 CASE NO. 2
398C	1 2 3 4	ROW NUMBER	
399C	& -3.99387, 6.56530, -4.43765, 6.21479,	;	*1 CASE NO. 3
400C	& 16.16144, -15.71549, 16.39634, -13.59268,	;	*2 CASE NO. 3
401C	& -28.31283, 29.91489, -7.98917, 6.09438,	;	*3 CASE NO. 3
402C	& -39.36650, 42.82829, -15.21268, 11.56505,	;	*4 CASE NO. 3
403C	& 17.46655, -19.00169, 6.99399, -5.39082,	;	*5 CASE NO. 3
404C	& -7.57219, 8.28534, -3.87182, 3.17638,	;	*6 CASE NO. 3
405C	& 5.59708, -6.24134, 4.87560, -4.35427,	;	*7 CASE NO. 3
406C	& -6.64565, 7.66795, -9.95584, 9.27400,	;	*8 CASE NO. 3
407C	& -41.68531, 43.95747, 1.85266, -4.61591,	;	*9 CASE NO. 3
408C	& 23.46327, -26.52659, 10.55703, -6.12386,	;	*10 CASE NO. 3
409C	& -11.98887, 14.98284, -3.66197, 4.52946,	;	*11 CASE NO. 3
410C	& 8.35015, -7.05576, 3.92705, -1.33060,	;	*12 CASE NO. 3
411C	& .75311, 1.10045, .85076, 1.06694,	;	*13 CASE NO. 3
412C	& 4.60945, -3.11787, 2.96714, -.69682,	;	*14 CASE NO. 3
413C	& 1.41961, .43628, 1.38402, .59716,	;	*15 CASE NO. 3
414C	& 1.04309, .65416, .62691, 1.44027,	;	*16 CASE NO. 3
415C	& 10.80849, -9.34988, 4.58621, -1.85190,	;	*17 CASE NO. 3
416C	& -30.95444, 33.24744, -7.97483, 7.43583,	;	*18 CASE NO. 3
417C	& 16.44414, -18.12414, 7.19802, -3.23825,	;	*19 CASE NO. 3
418C	& 2.51279, -3.00721, 7.45304, -5.69476,	;	*20 CASE NO. 3
419C	& 1.83371, -.29116, -14.77652, 15.52468,	;	*21 CASE NO. 3
420C	& 2.36075, -3.06817, 8.65266, -6.05585,	;	*22 CASE NO. 3
421C	& 46.08204, -47.44773, 13.41625, -7.70532,	;	*23 CASE NO. 3
422C	& -8.65018, 10.96674, 2.67135, -1.09769,	;	*24 CASE NO. 3
423C	& -3.11555, 5.64943, -10.16227, 10.83104,	;	*25 CASE NO. 3
424C	& 3.94720, -2.49770, 4.70538, -2.29579,	;	*26 CASE NO. 3
425C	& 6.09297, -5.13479, 6.67321, -3.81640,	;	*27 CASE NO. 3
426C	& -.97367, 4.20015, -10.66384, 11.17928,	;	*28 CASE NO. 3
427C	& -4.30968, 7.73230, -16.99676, 17.32217,	;	*29 CASE NO. 3
428C	& -44.25611, 47.38356, -17.41264, 13.88803,	;	*30 CASE NO. 3
429C	& 34.53429, -34.77209, 12.16357, -9.76917,	;	*31 CASE NO. 3
430C	& 15.73457, -15.45370, 2.14158, -.78611,	;	*32 CASE NO. 3
431C	& 36.77050, -37.43508, 17.04894, -14.79396,	;	*33 CASE NO. 3
432C	& 13.39390, -11.76126, -9.87143, 11.86089,	;	*34 CASE NO. 3
433C	& 25.97608, -25.12050, 1.01741, 1.41636 /	;	*35 CASE NO. 3
434C	1 2 3 4	ROW NUMBER	
435C	& 1.07364, 1.00315, 1.00372, 1.00609,	;	*1 CASE NO. 4
436C	& .80587, .98886, .98209, .98320,	;	*2 CASE NO. 4
437C	& .90410, 1.05264, .96245, 1.00690,	;	*3 CASE NO. 4
438C	& .90771, .86569, 1.06435, .95200,	;	*4 CASE NO. 4
439C	& .77479, 1.44515, .56819, 1.21237,	;	*5 CASE NO. 4

440C	& 1.08566,	.21925,	1.58742,	.68352,	:*6	CASE NO. 4
441C	& .85477,	.88815,	.92074,	1.03572,	:*7	CASE NO. 4
442C	& .95986,	1.12795,	.96849,	.99817,	:*8	CASE NO. 4
443C	& .81598,	1.06486,	.76353,	1.10928,	:*9	CASE NO. 4
444C	& .93613,	.96649,	1.19627,	.89673,	:*10	CASE NO. 4
445C	& .61632,	1.44215,	.13412,	1.40780,	:*11	CASE NO. 4
446C	& 1.45548,	.45260,	2.23845,	-1.32927,	:*12	CASE NO. 4
447C	& -.15514,	.97146,	2.74994,	-1.47971,	:*13	CASE NO. 4
448C	& .08651,	-.50389,	2.94458,	-1.90757,	:*14	CASE NO. 4
449C	& -.03553,	.47174,	1.26795,	-.20272,	:*15	CASE NO. 4
450C	& .52441,	-1.03239,	1.80718,	-1.03124,	:*16	CASE NO. 4
451C	& 1.74794,	-1.92451,	4.77333,	-2.49426,	:*17	CASE NO. 4
452C	& .69010,	1.64438,	1.04365,	-.53206,	:*18	CASE NO. 4
453C	& 1.15133,	-.11035,	2.72334,	-.82267,	:*19	CASE NO. 4
454C	& .74272,	1.53565,	.08213,	1.92692,	:*20	CASE NO. 4
455C	& .92896,	.72640,	1.28442,	.66480,	:*21	CASE NO. 4
456C	& .79106,	1.20409,	.58145,	1.28222,	:*22	CASE NO. 4
457C	& .85579,	.95844,	1.10586,	.89562,	:*23	CASE NO. 4
458C	& .73894,	1.18538,	.61102,	1.22401,	:*24	CASE NO. 4
459C	& .89925,	.96186,	1.07421,	.90684,	:*25	CASE NO. 4
460C	& .76731,	1.06400,	.94459,	1.03292,	:*26	CASE NO. 4
461C	& .96107,	.78580,	1.50684,	.20000,	:*27	CASE NO. 4
462C	& .85019,	1.02617,	.94708,	1.01369,	:*28	CASE NO. 4
463C	& .96529,	.65782,	1.57053,	.20091,	:*29	CASE NO. 4
464C	& .82530,	1.15415,	.69849,	1.33228,	:*30	CASE NO. 4
465C	& .94664,	.77389,	1.19768,	.77880,	:*31	CASE NO. 4
466C	& .80936,	1.10060,	.80970,	1.12947,	:*32	CASE NO. 4
467C	& .91558,	.92572,	.98841,	.98011,	:*33	CASE NO. 4
468C	& .82512,	1.07330,	.87637,	1.05751,	:*34	CASE NO. 4
469C	& .87240,	.96937,	.94487,	1.01622 /	:*35	CASE NO. 4
470C	1	2	3	4	ROW NUMBER	
471C	& .27418,	1.87861,	.91637,	1.05919,	:*1	CASE NO. 5
472C	& 2.92173,	-1.32111,	1.26124,	.80982,	:*2	CASE NO. 5
473C	& 2.02375,	-.34017,	.32056,	1.58817,	:*3	CASE NO. 5
474C	& 1.92509,	-.50755,	.55539,	1.13172,	:*4	CASE NO. 5
475C	& 1.35914,	.18803,	.19039,	1.35041,	:*5	CASE NO. 5
476C	& 1.68968,	-.61880,	.75607,	.65371,	:*6	CASE NO. 5
477C	& -.16776,	1.39478,	.33753,	.89690,	:*7	CASE NO. 5
478C	& 1.40694,	.05499,	.12774,	1.12825,	:*8	CASE NO. 5
479C	& 1.85538,	-.52552,	2.20711,	-.92799,	:*9	CASE NO. 5
480C	& .88745,	.76993,	-.50903,	1.90701,	:*10	CASE NO. 5
481C	& 3.42715,	-2.24657,	2.97818,	-1.44375,	:*11	CASE NO. 5
482C	& 1.61003,	.07119,	-1.22112,	2.77362,	:*12	CASE NO. 5
483C	& -.12780,	1.14469,	1.43674,	-.27855,	:*13	CASE NO. 5
484C	& 2.78570,	-1.36851,	.15292,	1.26340,	:*14	CASE NO. 5
485C	& -.02005,	.99348,	.09890,	1.15417,	:*15	CASE NO. 5
486C	& 3.51776,	-1.98276,	1.43527,	-.26669,	:*16	CASE NO. 5
487C	& 2.27655,	-1.09478,	1.52116,	.01223,	:*17	CASE NO. 5
488C	& 4.64311,	-3.39283,	2.07979,	-.37410,	:*18	CASE NO. 5
489C	& .45779,	1.11924,	1.08534,	.61369,	:*19	CASE NO. 5
490C	& 5.79618,	-4.64581,	-.08662,	1.88049,	:*20	CASE NO. 5
491C	& -1.42008,	2.64236,	1.74376,	-.29553,	:*21	CASE NO. 5
492C	& 4.14953,	-2.85886,	-1.40047,	3.04047,	:*22	CASE NO. 5
493C	& 1.18370,	-.15818,	1.32781,	-.38637,	:*23	CASE NO. 5
494C	& .97630,	-.34165,	-.38427,	1.49976,	:*24	CASE NO. 5
495C	& 3.08366,	-2.08174,	.20179,	.63405,	:*25	CASE NO. 5
496C	& .97061,	-.47945,	1.64154,	-.74181,	:*26	CASE NO. 5
497C	& 2.07295,	-1.28328,	.92276,	.09980,	:*27	CASE NO. 5
498C	& 1.37887,	-1.25071,	-.14283,	1.10947,	:*28	CASE NO. 5
499C	& .16698,	.90841,	1.34964,	-.70351,	:*29	CASE NO. 5
500C	& 5.38860,	-5.06096,	1.99809,	-.95380,	:*30	CASE NO. 5
501C	& 1.90889,	-.04594,	2.96513,	-1.61112,	91	CASE NO. 5
502C	& 3.24354,	-1.27067,	2.39039,	-.40130,	:*32	CASE NO. 5

```

503C  & 1.91531, -.44523,-1.48263, 3.31928,  ;*33 CASE NO. 5
504C  & 2.06587, -.84105, .23940, 1.24604,  ;*34 CASE NO. 5
505C  & 1.23763, -.25740, .11255, 1.01066 / ;*35 CASE NO. 5
506C
507C  VARIABLE DISCRIPTION FOR CLOUD MODEL
508C      YD IS THE DISTANCE BETWEEN Y DATA POINTS
509C      SX,SY REGION OF INTERPOLATION INFLUENCE OF THE
510C      DATA POINTS
511C
512      CW = 0.
513      W = 0.
514C
515      DO 100 I=1,NCRD
516      YI = FLOAT(I-1)*YD      ;*DISTANCE BETWEEN Y DATA POINTS
517      Y2 = ((Y-YI)**2)/SY2
518C
519      DO 100 J=1,4
520C
521C  GAUSSIAN WEIGTHING FUNCTION
522C
523      R = Y2+((X-XC(J))**2)/SX2
524      IF(R.GT.10.0)GO TO 100
525      WW = EXP(-R)
526C
527C  SUM OVER THE REGION WITH WEIGHTS AND NORMALIZATION
528C
529      W = W+WW
530      CW = CW+WW*C(I,J)
531  100 CONTINUE
532C
533      T = CW/W
534      IF(T.GT.1.0)T = 1.
535      IF(T.LT.0.)T = 0.
536      RETURN
537      END

```

end of file - request executed 537 times

```

100N.J.MONT
20:IDENT:0382DOE-1$100M,XYANN
30:NOTE:*****
40:: TEST RUN FOR CELLWISE PERFORMANCE CODES
50:: THIS EXECUTION FOR ANNUAL BEHAVIOR
60:: 35 DEGREES NORTH LATITUDE
70:: MONAHANS REPOWERING PLANT
80:NOTE:*****
90:OPTION:FORTRAN
100:FORTRAN:XREF,OPTZ
110:LIMITS:50K
120:SELECT(HSELCG1122/NS/MAIN:M)
130:SELECT(HSELCG1122/NS/HELIO:M)
140:SELECT(HSELCG1122/NS/RECVR:M)
150:SELECT(HSELCG1122/NS/FIELD:M)
160:SELECT:HSELCG1122/NS/R-YEAR
170:SELECT:HSELCG1122/NS/R-RSABS
180:SELECT:HSELCG1122/NS/R-ANNUAL
190:SELECT:HSELCG1122/NS/R-FINTS
200:SELECT:HSELCG1122/NS/R-CLOUD
210:EXECUTE
220:LIMITS:5,50K
230:PRNFI:06,W,S,HSELCG1122/OUTPUT4
240:PRNFI:14,R,S,HSELCG1123/MIN7X7
250:PRNFI:20,R,S,HSELCG1122/NS/X-ANNUAL
260:PRNFI:30,W,S,HSELCG1122/CARDS
270:ENDJOB

```

XNC= 0.446 0.985 1.550 1.238 1.550 0.985 0.446

YNC= 0.256 0.578 1.122 1.587 1.282 1.526 0.848 7.200

NGON = 4 ; MAX. NUMBER OF HELIOS./CELL= 1021.0 ; RHeli = 0.9630 ; TOTAL GLASS =0.4147E 06 ; TOTAL LAND =0.2189E 07

TRIM CONTROL MATRIX 7351. HELIOS /HELI= 58.5857 ASEG= 4.0298 HGLASS= 56.1176 CELLS= 38.00
0044400
0144440
4444444
4413444
4430344
3413443
0344430

***** NUMBER OF HELIOSTATS PER CELL***** ; HT= 120.0 METERS FOCAL HEIGHT

```

0. 0. 86.0 89.6 86.0 0. 0.
0. 103.4 124.4 134.2 124.4 103.4 0.
103.4 146.0 204.5 238.0 204.5 146.0 103.4
124.4 204.5 340.3 282.1 340.3 204.5 124.4
134.2 238.0 282.1 0. 282.1 238.0 134.2
93.3 204.5 340.3 282.1 340.3 204.5 93.3
0. 109.5 204.5 238.0 204.5 109.5 0.

```

FRACTION OF GROUND COVERED UNIVERSITY OF HOUSTON

MAX(A) = 3.6844E-01 MIN(A) = 6.5316E-02 AWR(A) = 1.8948E-01

AIJ = (10 ** 0) X PRINTED VALUES

```

0.065 0.076 0.084 0.088 0.084 0.076 0.065 1.000
0.081 0.101 0.122 0.131 0.122 0.101 0.081 1.000
0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000
0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000
0.131 0.233 0.368 0.581 0.368 0.233 0.131 1.000
0.122 0.200 0.333 0.368 0.333 0.200 0.122 1.000
0.101 0.143 0.200 0.233 0.200 0.143 0.101 1.000

```

```

(-----)
( 00000000000000000000 )
( 0000 0000 )
( 00 1111111111 00 )
( 0 1111 1111 )
( 11 2222 11 )
( 111 22223333332222 111 )
( 1 22 3333444443333 22 1 )
( 1 22 33 444 5555 444 33 22 1 )
( 1 2 3344455666666665544433 2 1 )
( 1 2 3 4 5667777887777665 4 3 2 1 )
( 1 2 3 4 5678899999988765 4 3 2 1 )
( 1 23 4 567899 ** 998765 4 32 1 )
( 12 3 4 56789 ** 98765 4 3 21 )
( 12 34 5678 9***** * #9 8765 43 21 )
( 12 34 5678 9***** * #9 8765 43 21 )
( 12 3 4 56789 ** 98765 4 3 21 )
( 1 23 4 567899 ** 998765 4 32 1 )
( 1 2 3 4 5678899999988765 4 3 2 1 )
( 1 2 3 4 5667777887777665 4 3 2 1 )
( 1 2 3344455666666665544433 2 1 )
( 1 22 3334444554444333 22 1 )
(-----)

```

CONTOUR MODE T STEP SIZE 3.0312E-02

X = FIRST SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 1.3776E 01 MIN(A) = 2.6506E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

```

1.378 1.179 1.050 1.006 1.050 1.179 1.378 0.
1.094 0.864 0.711 0.657 0.711 0.864 1.094 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.657 0.366 0.277 0.220 0.277 0.366 0.657 0.
0.711 0.425 0.265 0.277 0.265 0.425 0.711 0.
0.864 0.601 0.425 0.366 0.425 0.601 0.864 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

Y = SECOND SPACING PARAMETER IN UNITS OF DMIR

MAX(A) = 2.2605E 00 MIN(A) = 1.8868E 00 AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

```

2.140 2.161 2.176 2.182 2.176 2.161 2.140 0.
2.171 2.200 2.223 2.231 2.223 2.200 2.171 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.231 2.260 1.887 1.508 1.887 2.260 2.231 0.
2.223 2.261 2.180 1.887 2.180 2.261 2.223 0.
2.200 2.239 2.261 2.260 2.261 2.239 2.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

```

THE FOLLOWING LABEL WAS WRITTEN BY A RECEIVER SUBROUTINE TO
DESCRIBE SYSTEM GEOMETRY WITH REGARD TO INTERCEPTION DATA.
THE HEIGHT OF THE TOWER IS 120.0 METERS.
16.0-TH ORDER CELLS ARE USED.
THE FIELD MATRIX IS DIMENSIONED 7 BY 7.

THE TOWER IS AT CELL(5.00, 4.00)
 THE RECEIVER SHAPE IS CYLINDRICAL .
 THE RECEIVER HEIGHT IS 15.00 METERS; WIDTH IS 10.40 METERS.
 THE RECEIVER NODE MATRIX IS DIMENSIONED 20 BY 18.
 THE HELIOSTATS ARE NOT FOCUSED AND ARE CANTED.
 THE AIMING STRATEGY IS 1 PT AIM.
 THE HELIOSTAT IS SQUARE WITH 56.42 M2 OF REFLECTIVE SURFACE.
 THE HELIOSTAT WIDTH IS 7.6541293 METERS.
 THE BEAM ERROR (DEGRADING) IS 2.83 MILLI-RADIANS
 THE NODE INTERCEPTION FRACTIONS STORED ON DISK ARE ALWAYS
 GEOMETRICAL, I.E., THERE ARE NO LOSSES DUE TO DUST,
 REFLECTIVITY, VISUAL RANGE, ETC.
 CALCULATION DAY 0 TIME 0. FROM SOLAR NOON
 DATE AND TIME(HRS)

06/18/80 11.72

THIS IS A WHOLE NODE FILE
 CANTING FOCAL LENGTH 720.0 METERS
 SEGMENT U FOC LENGTH IS , V IS METERS
 SLANT RANGE OPTION IS 0 WITH MULTIPLIER 1.000

INTERCEPTION FACTORS FROM RECEIVER PROGRAM * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.9961E-01 MIN(A) = 6.2054E-01 AVR(A) = 9.5835E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.621	0.709	0.768	0.786	0.768	0.709	0.621	0.774
0.746	0.851	0.911	0.929	0.911	0.851	0.746	0.894
0.848	0.946	0.982	0.987	0.982	0.946	0.848	0.950
0.910	0.981	0.996	1.000	0.996	0.981	0.910	0.980
0.927	0.988	0.998	0.	0.998	0.988	0.927	0.980
0.905	0.977	0.993	0.995	0.993	0.977	0.905	0.978
0.838	0.934	0.969	0.972	0.969	0.934	0.838	0.961
0.900	0.958	0.971	0.968	0.971	0.958	0.900	0.958

```
(-----)
(322111001112222222222221110011122)
(211001112223333444433332221110011)
(100112233344455555555444333221100)
(011223344555666666666655544332211)
(12234455666777777777776665544322)
(23 45566777 88888 88888 77766554 3)
(3445 6 7 888 999999 888 7 6 544)
(455667788 99999 99999 88776655)
(5 6 7 8 9 9 8 7 6 )
(66 7 8 99 99 8 7 6)
( 77 8 9 9 8 77)
( 7 8 9 9 8 7)
(7 8 9 9 8 )
( 8 9 9 8 )
( 8 9 9 8 )
(7 8 9 9 8 )
( 7 8 9 9 8 7)
(6 7 88 9 9 88 7 )
( 6 7 8 99 99 8 7 6)
(556677 8 99 99 8 77665)
(4 5 67 88 99 99 88 76 5 )
(-----)
```

CONTOUR MODE T STEP SIZE 3.7907E-02

FRACTION OF LOSS DUE TO HORIZONTAL VISIBILITY * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7658E-01 MIN(A) = 9.2970E-01 AVR(A) = 9.6310E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.930	0.936	0.940	0.942	0.940	0.936	0.930	0.941
0.939	0.946	0.952	0.954	0.952	0.946	0.939	0.950
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.958
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.967
0.954	0.965	0.977	0.984	0.977	0.965	0.954	0.968
0.952	0.963	0.972	0.977	0.972	0.963	0.952	0.968
0.946	0.956	0.963	0.965	0.963	0.956	0.946	0.961
0.951	0.960	0.967	0.967	0.967	0.960	0.951	0.963

INTERCEPTION FRACTIONS INCLUDING VISIBLE RANGE LOSSES * * * * * UNIVERSITY OF HOUSTON AND DOE

MAX(A) = 9.7621E-01 MIN(A) = 5.7692E-01 AVR(A) = 9.2346E-01

AIJ = (10 ** 0) X PRINTED VALUES

0.577	0.664	0.722	0.740	0.722	0.664	0.577	0.728
0.700	0.806	0.867	0.885	0.867	0.806	0.700	0.849
0.803	0.904	0.945	0.953	0.945	0.904	0.803	0.910
0.866	0.944	0.968	0.976	0.968	0.944	0.866	0.948
0.884	0.954	0.975	0.	0.975	0.954	0.884	0.948
0.861	0.940	0.965	0.972	0.965	0.940	0.861	0.947
0.793	0.892	0.932	0.938	0.932	0.892	0.793	0.924
0.856	0.920	0.940	0.937	0.940	0.920	0.856	0.923

* * * * * TOWER ELEVATION ANGLE IN DEGREES * * * * *

MAX(A) = 2.6565E 01 MIN(A) = 5.7106E 00 AVR(A) = 0.

AIJ = (10 ** 1) X PRINTED VALUES

0.571	0.638	0.691	0.713	0.691	0.638	0.571	0.
0.672	0.790	0.898	0.946	0.898	0.790	0.672	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.946	1.404	2.657	9.000	2.657	1.404	0.946	0.
0.898	1.260	1.947	2.657	1.947	1.260	0.898	0.
0.790	1.002	1.260	1.404	1.260	1.002	0.790	0.
0.	0.	0.	0.	0.	0.	0.	0.

* * * * * SLANT DISTANCE FROM HELIOSTAT TO RECEIVER * * * * *

MAX(A) = 1.2060E 03 MIN(A) = 2.6833E 02 AVR(A) = 0.

AIJ = (10 ** 3) X PRINTED VALUES

1.206	1.080	0.997	0.967	0.997	1.080	1.206	0.
1.025	0.874	0.768	0.730	0.768	0.874	1.025	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.730	0.495	0.268	0.120	0.268	0.495	0.730	0.
0.768	0.550	0.360	0.268	0.360	0.550	0.768	0.
0.874	0.689	0.550	0.495	0.550	0.689	0.874	0.

0. 0. 0. 0. 0. 0. 0. 0.

***** X COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 4.8000E 02 MIN(A) = -9.6000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-9.600-9.600-9.600-9.600-9.600-9.600-9.600 0.

-7.200-7.200-7.200-7.200-7.200-7.200-7.200 0.

-4.800-4.800-4.800-4.800-4.800-4.800-4.800 0.

-2.400-2.400-2.400-2.400-2.400-2.400-2.400 0.

0. 0. 0. 0. 0. 0. 0. 0.

2.400 2.400 2.400 2.400 2.400 2.400 2.400 0.

4.800 4.800 4.800 4.800 4.800 4.800 4.800 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Y COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 7.2000E 02 MIN(A) = -7.2000E 02 AVR(A) = 0.

AIJ = (10 ** 2) X PRINTED VALUES

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

-7.200-4.800-2.400 0. 2.400 4.800 7.200 0.

0. 0. 0. 0. 0. 0. 0. 0.

***** Z COORDINATE FROM HELIOSTAT TO RECEIVER*****

MAX(A) = 0. MIN(A) = 0. AVR(A) = 0.

AIJ = (10 ** 0) X PRINTED VALUES

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0.

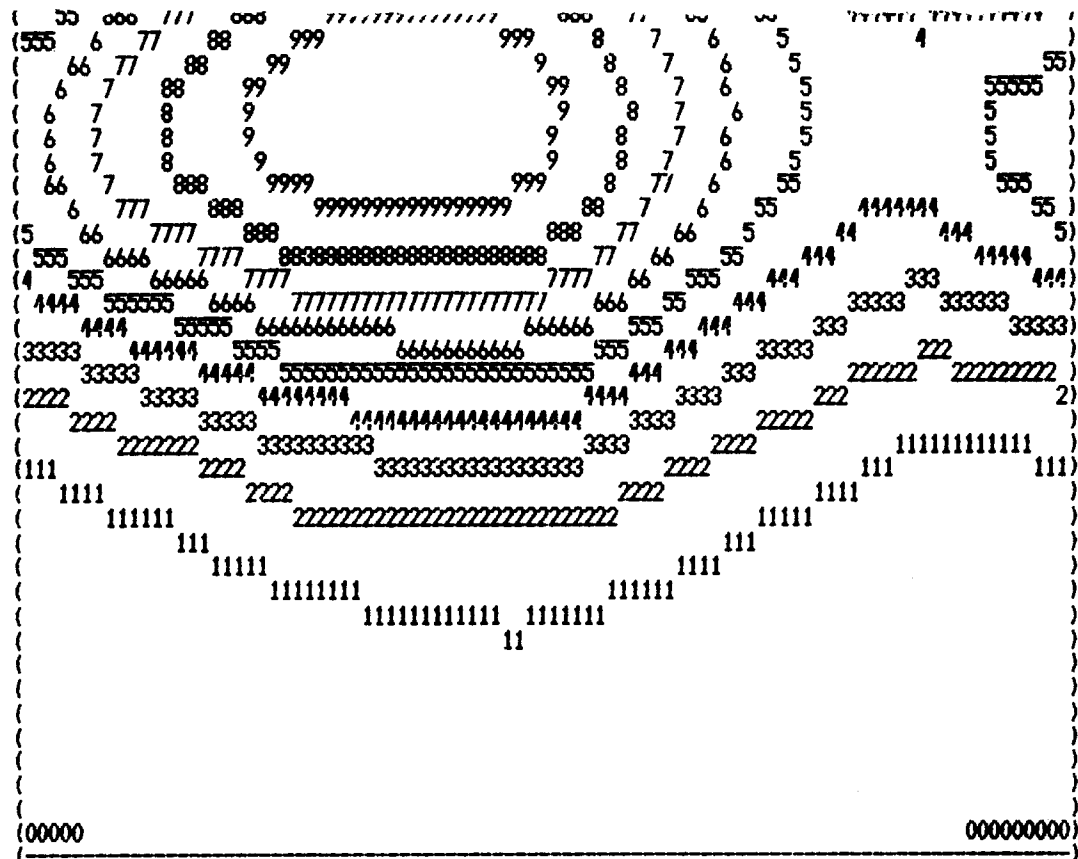
0. 0. 0. 0. 0. 0. 0. 0.

ON THE 186TH DAY AFTER VERNAL EQUINOX THE SOLAR DISTANCE = 1.00321 ASU
SOLAR ELEVATION= 58.1720 DEGREES AT NOON FOR LATITUDE= 31.5830 DEGREES
SUNRISE TIME = 5.2056 HOURS BEFORE NOON FOR A SOLAR ELEVATION OF 10.0000 DEGREES
SUNRISE AZIMUTH= 83.4828 DEGREES EAST OF SOUTH
UPWARD UNIT NORMAL TO COLLECTOR FIELD 0. 1.0000
POSITION OF RECEIVER PROJECTED TO THE GROUND PLANE 0. 0.

AT 3.450 HOURS THE SUN GIVES
832.774 WATTS/M2. THE TOWERTOP COLLECTOR HAS
302463.508 M2 OF EFFECTIVE AREA AND 97 VIDES
251.884 MEGAWATTS OF DIRECTED POWER.

HOURS USUNX USUNY USUNZ ESUN ZSUN
3.450 0.327879-0.785310 0.525151 31.6784 -67.3387





CONTOUR MODE T STEP SIZE 1.8227E 05

CLOUD TRANSIT SIMULATION
 DAY 186 TIME 3.45 HOURS CASE NO. (CLOUD TYPE) 1 DIRECTION 0. DEG N-S
 SPACIAL INCREMENT 50.0 METERS STARTING DISTANCE FROM TOWER 500.0 METERS

DIST(M.) **** INCIDENT PANEL POWER IN MW *** U=H

0.	7.077 7.765	8.783 6.839	10.200 5.899	11.781 5.491	13.200 5.792	13.375 6.135	12.952 167.897	12.186	11.221	10.568	9.821	8.805
50.0	7.077 7.690	8.783 6.808	10.200 5.894	11.777 5.491	13.185 5.792	13.347 6.135	12.911 166.988	12.121	11.110	10.385	9.615	8.658
100.0	7.077 7.619	8.783 6.777	10.200 5.887	11.773 5.491	13.155 5.792	13.271 6.135	12.769 165.539	11.906	10.857	10.130	9.395	8.515
150.0	7.077 7.532	8.783 6.740	10.191 5.875	11.716 5.488	12.963 5.792	12.761 6.135	11.690 158.157	10.250	9.115	8.904	8.834	8.303
200.0	7.077 7.447	8.783 6.709	10.180 5.863	11.653 5.486	12.768 5.792	12.270 6.135	10.676 151.149	8.722	7.493	7.727	8.273	8.087
250.0	7.077 7.316	8.783 6.662	10.173 5.847	11.617 5.483	12.677 5.792	12.084 6.135	10.386 148.396	8.374	7.090	7.260	7.834	7.799
300.0	7.077 7.072	8.783 6.550	10.166 5.807	11.585 5.476	12.598 5.792	11.938 6.135	10.227 146.379	8.291	7.035	7.043	7.406	7.390
350.0	7.077 6.762	8.783 6.399	10.157 5.754	11.542 5.467	12.483 5.792	11.683 6.135	9.824 142.816	7.839	6.640	6.642	6.914	6.918
400.0	7.077 6.576	8.777 6.299	10.101 5.716	11.323 5.456	11.766 5.790	9.848 6.135	7.065 130.126	5.346	4.827	5.283	6.142	6.591
450.0	7.077 6.518	8.771 6.293	10.055 5.717	11.155 5.452	11.243 5.789	8.610 6.135	5.366 122.969	3.988	3.921	4.610	5.792	6.467
500.0	7.077 6.202	8.767 6.184	10.031 5.686	11.077 5.441	11.054 5.788	8.343 6.135	5.222 121.731	4.051	4.096	4.782	5.702	6.086
550.0	7.077 5.470	8.763 5.824	10.006 5.556	11.000 5.406	10.850 5.784	8.020 6.135	4.946 118.743	3.947	4.210	4.965	5.460	5.314
600.0	7.075 4.683	8.742 5.407	9.885 5.398	10.589 5.363	10.99 5.363	7.137 6.135	4.159 112.234	3.433	4.007	4.839	5.018	4.474

650.0	7.067 4.491	8.651 5.282	9.382 5.329	8.878 5.336	7.553 5.771	5.379 6.134	3.664 104.418	3.435	4.088	4.840	4.879	4.252
700.0	7.060 4.846	8.588 5.242	9.065 5.204	7.848 5.294	6.112 5.760	4.668 6.133	3.996 104.307	4.161	4.727	5.318	5.406	4.871
750.0	7.056 5.087	8.562 4.851	8.982 4.835	7.645 5.178	5.858 5.736	4.585 6.130	4.138 106.577	4.539	5.292	6.004	6.319	5.773
800.0	7.052 4.690	8.527 3.975	8.845 4.227	7.246 4.980	5.294 5.695	4.144 6.126	3.766 103.896	4.342	5.468	6.426	6.925	6.162
850.0	6.528 4.179	7.669 3.225	7.742 3.735	6.064 4.767	4.269 5.474	3.563 5.784	3.445 95.994	4.173	5.554	6.573	7.087	6.156
900.0	5.215 4.247	5.612 3.174	5.395 3.620	4.452 4.571	3.672 4.966	3.671 4.911	3.887 88.420	4.719	6.074	6.844	7.140	6.246
950.0	4.571 5.098	4.687 3.839	4.364 3.753	3.856 4.259	3.729 4.474	4.257 4.385	4.932 91.181	5.947	7.138	7.539	7.528	6.819
1000.0	4.528 5.756	4.687 4.335	4.296 3.694	3.722 3.746	3.676 4.035	4.364 4.212	5.397 94.052	6.738	7.902	7.998	7.754	7.211
1050.0	4.324 5.673	4.336 4.190	3.787 3.269	3.286 3.125	3.347 3.579	3.891 3.982	5.017 88.396	6.656	7.845	7.752	7.390	6.947
1100.0	3.236 5.426	3.090 4.060	2.734 2.992	2.778 2.655	3.100 2.987	3.343 3.183	4.506 79.135	6.493	7.734	7.495	6.894	6.428
1150.0	1.926 5.384	1.891 4.303	2.106 3.143	2.883 2.505	3.639 2.460	3.896 2.209	5.144 77.889	7.259	8.406	7.880	6.773	6.082
1200.0	1.501 5.950	1.609 5.122	2.103 3.775	3.253 2.736	4.339 2.306	4.952 1.816	6.599 87.700	8.831	9.836	9.058	7.461	6.451
1250.0	1.513 5.767	1.579 5.388	2.038 4.109	3.228 2.978	4.452 2.375	5.596 1.792	7.796 92.010	9.985	10.648	9.515	7.312	5.936
1300.0	1.354 5.216	1.324 5.070	1.772 3.934	2.806 2.997	3.799 2.410	5.266 1.712	7.883 86.725	9.977	10.383	9.068	6.609	5.144
1350.0	1.213 4.891	1.205 4.727	1.702 3.733	2.455 3.017	3.026 2.430	4.729 1.615	7.767 82.156	9.903	10.112	8.640	6.181	4.809
1400.0	1.312 4.855	1.626 4.646	2.399 3.814	3.240 3.162	3.760 2.455	5.395 1.585	8.437 87.489	10.539	10.444	8.697	6.224	4.897
1450.0	1.459 5.523	1.958 5.092	2.932 4.312	4.060 3.592	5.064 2.697	7.057 1.716	9.878 100.473	11.527	11.128	9.377	7.183	5.914
1500.0	1.591 4.801	1.913 4.534	2.839 4.286	4.289 3.900	5.898 3.093	8.198 2.027	10.641 104.356	11.840	11.358	9.731	7.605	5.810
1550.0	1.822 4.204	1.855 4.042	2.426 4.020	3.833 3.872	5.732 3.318	8.134 2.378	10.413 100.436	11.539	11.034	9.336	7.173	5.300
1600.0	2.210 3.952	2.128 3.887	2.298 3.829	3.423 3.657	5.524 3.343	8.246 2.694	10.660 98.584	11.660	10.822	8.839	6.575	4.837
1650.0	2.897 4.045	3.055 4.074	3.177 3.906	4.091 3.619	6.201 3.472	9.153 3.110	11.654 105.047	12.264	10.841	8.554	6.255	4.678
1700.0	3.459 5.038	3.911 4.723	4.272 4.199	5.584 3.739	8.043 3.668	10.587 3.475	12.453 116.862	12.547	10.694	8.411	6.548	5.509
1750.0	3.518 4.988	4.166 4.019	4.769 3.506	6.352 3.339	8.958 3.492	11.114 3.454	12.448 116.590	12.103	10.029	7.965	6.555	5.812
1800.0	3.350 4.480	4.060 3.685	4.704 3.232	6.225 3.032	8.789 3.174	10.962 3.218	12.277 110.887	11.758	9.540	7.426	5.878	5.096
1850.0	3.539 3.883	4.245 3.336	4.857 3.034	6.506 2.908	9.229 3.091	11.345 3.276	12.520 110.120	11.918	9.626	7.258	5.256	4.292
1900.0	4.266 3.808	5.019 3.466	5.650 3.235	7.504 3.166	10.330 3.450	12.144 3.821	13.010 117.666	12.372	10.015	7.350	5.027	4.030
1950.0	5.057 4.468	6.043 4.341	6.967 3.770	8.870 3.460	11.288 3.833	12.621 4.375	13.107 126.837	12.263	9.884	7.221	4.998	4.268
2000.0	5.285 4.597	6.352 4.371	7.364 3.431	9.284 3.074	11.473 3.702	12.460 4.434	12.100 125.65	11.544	9.360	6.991	5.030	4.369

2050.0	5.189 3.974	6.265 3.753	7.265 3.038	9.234 2.867	11.412 3.538	12.225 4.288	12.083 121.476	11.075	9.137	7.011	5.044	4.075
2100.0	5.266 3.281	6.604 3.156	7.795 2.655	9.697 2.627	11.702 3.378	12.442 4.221	12.345 122.000	11.438	9.577	7.309	4.934	3.568
2150.0	5.610 3.022	7.286 3.178	8.701 2.906	10.429 2.902	12.183 3.583	12.975 4.428	13.171 129.067	12.396	10.369	7.765	4.918	3.242
2200.0	5.950 3.128	7.708 3.528	9.123 3.494	10.703 3.470	12.321 3.979	13.007 4.755	13.202 133.917	12.536	10.621	8.049	5.074	3.264
2250.0	5.924 3.218	7.679 3.421	9.060 3.412	10.461 3.393	11.952 3.891	12.605 4.724	12.688 131.953	11.903	10.289	8.220	5.497	3.608
2300.0	5.660 2.877	7.532 2.900	9.028 2.893	10.377 2.868	11.643 3.409	11.919 4.369	11.613 124.883	10.778	9.665	8.170	5.625	3.551
2350.0	5.519 2.274	7.635 2.364	9.284 2.471	10.708 2.462	11.915 2.986	11.908 4.029	11.362 121.382	10.556	9.541	8.026	5.310	3.026
2400.0	5.452 2.115	7.751 2.172	9.542 2.425	11.076 2.546	12.390 2.987	12.475 3.903	11.985 124.685	11.183	9.988	8.245	5.418	3.027
2450.0	5.088 2.113	7.352 2.199	9.315 2.562	11.076 2.734	12.421 3.023	12.408 3.689	11.854 124.546	11.194	10.198	8.490	5.656	3.167
2500.0	4.677 2.455	6.878 2.331	8.883 2.489	10.791 2.533	11.996 2.745	11.359 3.327	10.324 119.502	10.102	9.949	8.731	6.189	3.734
2550.0	4.686 2.543	6.951 2.021	8.869 2.041	10.525 2.173	11.211 2.523	9.879 3.214	8.651 113.701	9.048	9.628	8.869	6.654	4.207
2600.0	5.083 2.425	7.478 1.536	9.322 1.533	10.722 1.917	11.166 2.560	9.810 3.461	8.886 115.780	9.504	9.987	9.136	6.881	4.368
2650.0	5.361 2.700	7.819 1.508	9.610 1.370	10.989 1.800	11.605 2.618	10.596 3.665	10.043 123.580	10.721	11.001	9.920	7.432	4.817
2700.0	5.120 2.605	7.601 1.521	9.417 1.468	10.628 1.840	11.195 2.576	10.499 3.507	10.227 123.588	11.004	11.449	10.389	7.706	4.831
2750.0	4.891 2.956	7.336 1.971	8.950 1.782	9.379 1.891	9.372 2.482	9.141 3.331	9.478 118.093	10.479	11.177	10.398	7.952	5.122
2800.0	5.108 3.485	7.392 2.280	8.612 1.778	8.280 1.706	7.837 2.427	8.199 3.493	9.206 114.977	10.224	10.754	10.196	8.284	5.708
2850.0	5.478 3.915	7.729 2.486	8.860 1.633	8.518 1.401	8.198 2.297	8.893 3.684	10.091 120.363	10.847	11.025	10.448	8.678	6.176
2900.0	5.503 4.108	7.802 2.655	9.105 1.650	9.141 1.323	9.093 2.198	9.744 3.645	10.875 127.164	11.670	11.942	11.273	9.096	6.336
2950.0	5.269 3.898	7.194 2.455	8.439 1.661	8.945 1.571	9.122 2.420	9.404 3.665	10.276 124.658	11.324	12.033	11.540	9.205	6.231
3000.0	5.039 4.459	6.177 2.797	6.790 2.006	7.530 2.072	8.274 2.869	8.745 3.855	9.634 120.480	10.829	11.699	11.410	9.469	6.824
3050.0	4.931 5.336	5.722 3.280	5.972 2.196	6.892 2.158	8.236 2.909	9.055 3.865	9.907 121.428	10.888	11.457	11.167	9.763	7.692
3100.0	4.978 5.783	6.086 3.759	6.563 2.544	7.755 2.192	9.433 2.753	10.280 3.736	11.118 132.172	12.225	12.589	11.898	10.302	8.178
3150.0	5.079 5.587	6.482 3.707	7.193 2.604	8.344 2.257	9.666 2.810	9.962 3.755	10.556 133.934	12.043	12.886	12.314	10.556	8.131
3200.0	4.985 5.640	6.234 3.600	6.972 2.485	7.931 2.361	8.840 3.092	9.057 3.927	9.964 131.546	11.870	13.010	12.530	10.754	8.291
3250.0	4.676 6.443	5.540 4.367	6.254 2.962	7.330 2.672	8.366 3.372	8.943 4.026	10.203 132.688	12.088	13.076	12.584	10.967	8.819
3300.0	4.667 7.151	5.568 5.237	6.409 3.549	7.591 2.894	8.899 3.443	9.959 4.047	11.390 140.183	12.848	13.384	12.743	11.184	9.218
3350.0	5.190 7.314	6.433 5.456	7.372 3.867	8.265 3.177	9.712 3.661	11.742 4.331	13.688 152.967	14.470	14.197	13.202	11.479	9.409
3400.0	5.750 7.136	6.995 5.228	7.618 3.756	7.852 3.214	8.610 3.611	11.156 4.763	13.482 152.313	14.421	14.191	13.198	11.449	9.323

3450.0	5.758 7.327	6.731 5.489	7.035 3.901	7.071 3.243	8.141 3.947	10.714 4.864	13.323 150.179	14.382	14.187	13.200	11.469	9.396
3500.0	5.197 7.734	6.137 6.175	6.673 4.590	7.228 3.641	8.640 3.898	11.081 4.469	13.439 151.751	14.405	14.189	13.204	11.505	9.542
3550.0	4.898 7.907	5.946 6.538	6.870 5.100	8.247 4.066	10.149 3.960	12.098 4.226	13.779 156.777	14.482	14.198	13.204	11.512	9.591
3600.0	5.300 7.937	6.209 6.568	7.211 5.150	9.607 4.264	12.360 4.302	13.651 4.623	14.290 164.595	14.598	14.211	13.204	11.512	9.594
3650.0	5.614 7.984	6.141 6.452	6.701 5.025	9.041 4.291	12.035 4.560	13.529 5.013	14.256 163.639	14.593	14.211	13.204	11.510	9.577
3700.0	5.438 7.946	5.856 6.607	6.337 5.273	8.698 4.508	11.834 4.648	13.453 4.968	14.235 162.918	14.591	14.211	13.204	11.512	9.595
3750.0	5.156 8.018	5.931 6.802	6.802 5.614	9.162 4.836	12.074 4.726	13.537 4.735	14.257 164.789	14.593	14.211	13.204	11.515	9.614
3800.0	5.200 8.023	6.415 6.835	7.782 5.723	10.099 5.034	12.577 4.889	13.721 4.747	14.308 168.501	14.600	14.211	13.204	11.514	9.614
3850.0	5.809 8.025	7.460 6.846	9.262 5.771	11.350 5.179	13.207 5.204	13.944 5.202	14.371 174.789	14.607	14.211	13.204	11.515	9.615
3900.0	5.887 8.022	7.377 6.839	9.115 5.767	11.249 5.212	13.164 5.318	13.932 5.366	14.370 174.776	14.607	14.211	13.204	11.515	9.615
3950.0	5.932 8.030	7.393 6.845	9.099 5.828	11.228 5.307	13.152 5.410	13.928 5.430	14.369 175.131	14.607	14.211	13.204	11.515	9.616
4000.0	6.176 8.035	7.706 6.883	9.354 5.874	11.361 5.388	13.201 5.519	13.940 5.581	14.370 176.549	14.607	14.211	13.204	11.515	9.616
4050.0	6.532 8.034	8.149 6.883	9.718 5.832	11.557 5.426	13.275 5.627	13.958 5.798	14.372 178.370	14.607	14.211	13.204	11.515	9.616
4100.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4150.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4200.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4250.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4300.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4350.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4400.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4450.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4500.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4550.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616

CLOUD TRANSIT SIMULATION
DAY 186 TIME 3.45 HOURS CASE NO.(CLOUD TYPE) 1 DIRECTION 45.0 DEG NW-SE
SPACIAL INCREMENT 50.0 METERS STARTING DISTANCE FROM TOWER 500.0 METERS

DIST(M.) **** INCIDENT PANEL POWER IN MW +++ U+H

0.	7.077 6.872	8.783 6.377	10.200 5.745	11.799 5.460	13.361 5.790	13.946 6.135	14.175 171.205	14.038	13.027	11.339	9.331	7.743
50.0	7.077 6.702	8.783 6.264	10.200 5.691	11.799 5.442	13.361 5.788	13.940 6.135	14.158 170.332	14.006	12.972	11.252	9.194	7.562
100.0	7.077 6.364	8.783 6.109	10.200 5.622	11.799 5.414	13.355 5.781	13.894 6.135	14.102 165.52	13.672	12.306	10.160	8.009	6.815

150.0	7.077 6.016	8.783 5.951	10.200 5.559	11.799 5.390	13.349 5.774	13.848 6.134	13.881 161.033	13.347	11.679	9.173	6.952	6.114
200.0	7.077 5.767	8.783 5.800	10.200 5.496	11.799 5.367	13.345 5.766	13.825 6.133	13.828 159.688	13.248	11.542	9.031	6.792	5.880
250.0	7.077 5.363	8.783 5.581	10.200 5.387	11.799 5.319	13.335 5.748	13.773 6.129	13.679 156.015	12.874	10.886	8.404	6.303	5.367
300.0	7.076 4.739	8.783 5.281	10.200 5.228	11.799 5.247	13.319 5.721	13.685 6.123	13.402 148.559	12.143	9.531	6.921	5.032	4.321
350.0	7.076 4.321	8.783 5.003	10.200 5.070	11.799 5.186	13.309 5.703	13.642 6.119	13.276 144.879	11.839	9.009	6.341	4.445	3.750
400.0	7.075 4.126	8.783 4.751	10.200 4.895	11.798 5.115	13.297 5.682	13.608 6.113	13.184 143.310	11.653	8.814	6.228	4.359	3.624
450.0	7.073 4.010	8.783 4.505	10.200 4.642	11.789 4.974	13.233 5.625	13.387 6.096	12.498 134.429	10.012	6.504	4.289	3.409	3.395
500.0	7.071 3.882	8.783 4.166	10.200 4.296	11.781 4.808	13.183 5.566	13.219 6.080	11.998 127.949	8.892	4.986	3.031	2.764	3.234
550.0	7.069 3.809	8.783 3.812	10.200 3.925	11.777 4.639	13.162 5.514	13.167 6.070	11.889 127.448	8.828	5.139	3.319	2.973	3.365
600.0	7.062 3.790	8.782 3.597	10.198 3.626	11.740 4.439	12.941 5.427	12.303 6.041	10.243 122.350	7.429	4.697	3.377	3.136	3.516
650.0	7.047 3.866	8.780 3.500	10.196 3.390	11.695 4.185	12.669 5.270	11.233 5.980	8.168 114.814	5.432	3.575	2.899	3.170	3.753
700.0	7.023 4.110	8.778 3.396	10.195 3.120	11.676 3.824	12.580 4.989	10.929 5.870	7.622 113.582	4.954	3.383	3.031	3.717	4.381
750.0	6.979 4.412	8.760 3.509	10.090 3.012	11.243 3.422	11.857 4.592	10.248 5.701	7.260 112.083	4.915	3.579	3.385	4.228	4.884
800.0	6.885 4.630	8.701 3.943	9.768 3.111	9.929 2.991	9.625 4.099	7.969 5.450	5.660 103.155	4.097	3.435	3.578	4.387	4.892
850.0	6.556 4.944	8.506 4.575	9.578 3.408	9.323 2.768	8.566 3.673	6.801 5.033	4.839 99.621	3.815	3.605	3.988	4.694	4.941
900.0	6.075 5.320	8.229 5.047	9.532 3.676	9.421 2.751	8.693 3.362	6.869 4.516	5.029 101.581	4.187	3.951	4.422	5.211	5.287
950.0	5.411 5.394	7.266 5.182	8.349 3.914	8.030 2.913	7.033 3.147	5.575 4.003	4.473 93.961	4.068	3.898	4.475	5.402	5.422
1000.0	4.783 5.210	6.324 5.099	7.163 4.103	6.623 3.054	5.354 2.919	4.205 3.523	3.779 86.121	3.908	4.095	4.834	5.687	5.449
1050.0	4.276 5.239	5.734 5.087	6.595 4.155	6.230 2.988	5.071 2.667	4.039 3.119	3.777 84.930	4.083	4.525	5.397	6.192	5.749
1100.0	3.926 5.352	5.151 5.106	5.707 4.215	5.360 3.113	4.554 2.746	3.920 2.978	3.850 83.216	4.129	4.744	5.792	6.548	6.019
1150.0	3.768 5.202	4.474 4.973	4.294 4.368	3.615 3.638	3.150 3.242	3.291 3.145	3.794 80.318	4.339	5.465	6.699	6.901	5.952
1200.0	3.750 4.789	4.031 4.546	3.538 4.278	2.906 3.996	2.741 3.642	3.375 3.377	4.274 82.386	5.250	6.902	8.010	7.287	5.688
1250.0	3.804 4.806	3.815 4.480	3.330 4.289	2.933 4.171	2.965 3.878	3.654 3.605	4.427 85.963	5.625	7.780	8.895	7.705	5.796
1300.0	3.756 4.930	3.501 4.422	2.865 4.290	2.392 4.357	2.555 4.189	3.388 3.844	4.108 85.602	5.449	7.972	9.260	8.135	6.185
1350.0	3.772 4.508	3.515 3.548	2.857 3.779	2.193 4.455	2.374 4.579	3.419 4.108	4.361 87.443	5.981	8.707	9.968	8.786	6.532
1400.0	3.890 4.480	3.876 3.139	3.388 3.485	2.593 4.464	2.648 4.763	3.717 4.247	4.822 91.394	6.466	9.020	10.226	9.216	6.952
1450.0	4.018 4.751	4.051 3.354	3.619 3.635	2.977 4.541	3.054 4.814	3.881 4.323	5.001 94.708	6.734	9.111	10.258	9.375	7.212
1500.0	4.169 4.658	3.984 3.591	3.443 3.855	3.282 4.616	3.7103 4.8	4.244 4.455	5.516 99.430	7.853	10.177	10.801	9.338	6.877

1550.0	4.450 4.479	4.225 3.621	3.690 3.519	4.052 4.136	4.932 4.676	5.310 4.565	6.441 104.774	8.918	11.041	11.156	9.140	6.421
1600.0	4.629 4.735	4.491 4.171	4.032 3.925	4.668 4.293	5.689 4.740	5.830 4.651	6.682 109.326	9.054	11.088	11.150	9.074	6.403
1650.0	4.384 4.697	4.317 4.309	3.936 3.956	4.572 4.148	5.556 4.499	5.889 4.391	7.127 108.448	9.587	11.359	11.057	8.642	6.020
1700.0	4.125 4.198	4.340 3.927	4.186 3.281	4.883 3.022	5.920 3.456	6.533 3.818	8.222 107.009	10.748	12.053	11.066	7.989	5.240
1750.0	4.245 4.046	4.791 3.962	4.791 3.224	5.383 2.549	6.289 2.913	6.748 3.618	8.350 107.442	10.880	12.138	10.978	7.660	4.878
1800.0	4.374 4.058	4.892 4.010	4.991 3.315	5.729 2.571	6.690 2.943	7.113 3.746	8.554 109.913	10.910	12.172	11.114	7.804	4.927
1850.0	4.285 3.569	4.507 3.373	4.770 2.977	6.087 2.611	7.565 3.081	8.586 3.841	10.186 113.868	11.938	12.525	11.267	7.913	4.784
1900.0	4.099 3.133	4.351 2.834	4.899 2.821	6.561 2.760	8.174 2.971	9.491 3.565	11.232 115.668	12.564	12.600	11.154	7.837	4.618
1950.0	4.226 3.212	4.634 2.776	5.446 3.131	7.096 3.564	8.476 3.683	9.617 3.856	11.305 120.430	12.596	12.576	11.181	8.098	4.955
2000.0	3.895 3.381	4.851 2.713	6.146 3.193	7.855 3.807	9.293 3.717	10.383 3.515	11.811 124.048	12.692	12.276	10.861	8.257	5.400
2050.0	3.350 3.389	5.073 2.571	7.000 3.088	8.772 3.754	10.270 3.491	11.361 2.922	12.448 125.911	12.712	11.747	10.261	8.123	5.579
2100.0	3.428 3.425	5.481 2.571	7.592 3.013	9.128 3.856	10.383 3.827	11.424 3.096	12.498 127.684	12.696	11.637	10.075	7.987	5.565
2150.0	3.486 3.533	5.575 2.669	7.729 2.955	9.402 3.778	10.733 3.857	11.668 3.146	12.668 130.056	13.003	12.093	10.354	7.920	5.486
2200.0	3.401 3.632	5.360 2.507	7.568 2.525	9.781 3.202	11.565 3.392	12.251 2.958	12.747 130.944	13.091	12.522	10.779	8.068	5.593
2250.0	3.648 3.618	5.345 2.292	7.384 2.141	9.820 2.732	11.877 3.136	12.446 3.106	12.619 129.437	12.810	12.279	10.613	7.973	5.595
2300.0	4.090 3.457	5.462 2.167	7.241 1.935	9.589 2.429	11.646 3.085	12.362 3.489	12.702 128.576	12.851	12.210	10.549	7.890	5.420
2350.0	4.078 3.582	5.120 2.158	6.761 1.784	9.078 2.179	11.164 2.954	12.328 3.553	13.115 127.181	13.058	12.006	10.416	8.128	5.714
2400.0	3.903 3.816	4.741 1.965	6.301 1.437	8.652 1.862	10.747 2.719	12.070 3.407	12.986 123.509	12.710	11.378	10.053	8.455	6.302
2450.0	3.925 4.013	4.742 2.064	6.241 1.409	8.691 1.748	10.888 2.535	12.182 3.290	12.988 122.299	12.476	10.839	9.525	8.290	6.447
2500.0	3.642 4.222	4.442 2.497	6.106 1.678	9.064 1.721	11.601 2.326	12.708 3.018	13.095 121.836	12.240	10.360	8.971	7.850	6.288
2550.0	2.833 4.680	3.689 2.977	5.706 1.809	9.271 1.361	12.090 1.728	12.924 2.301	12.778 118.927	11.599	9.825	8.769	7.969	6.611
2600.0	2.479 5.083	3.568 3.204	5.791 1.787	9.341 1.073	12.038 1.364	12.741 1.913	12.339 117.586	10.947	9.425	8.878	8.454	7.158
2650.0	2.514 5.012	3.908 3.027	6.170 1.676	9.484 1.027	12.095 1.316	12.691 1.840	12.103 117.932	10.710	9.409	9.043	8.644	7.259
2700.0	2.273 5.212	3.878 3.273	6.125 1.866	9.337 1.037	12.016 1.109	12.258 1.523	11.255 117.316	10.335	9.819	9.605	8.963	7.426
2750.0	1.994 5.652	3.718 3.854	5.948 2.133	9.046 0.941	11.655 0.807	11.505 1.160	10.075 114.301	9.673	9.998	9.797	8.870	7.468
2800.0	2.129 5.998	3.888 4.175	6.092 2.433	8.921 1.243	11.256 1.001	11.108 1.265	9.763 114.883	9.431	9.871	9.712	8.889	7.701
2850.0	2.443 6.054	4.154 4.153	6.336 2.540	8.871 1.590	10.844 1.427	10.946 1.633	10.107 116.875	9.679	9.751	9.581	8.940	7.819
2900.0	2.596 6.237	4.222 4.593	6.336 2.890	8.622 1.727	10.119 1.551	10.150 1.813	9.104 117.966	10.114	10.258	9.990	9.058	7.741

2950.0	2.543 6.431	4.086 5.060	6.136 3.226	8.482 1.730	9.870 1.440	9.605 1.752	9.479 117.392	10.078	10.500	10.232	9.083	7.653
3000.0	2.507 6.613	4.123 4.938	6.285 3.049	8.782 1.633	10.153 1.421	9.602 1.724	9.134 117.974	9.660	10.262	10.337	9.564	8.180
3050.0	2.672 6.942	4.546 5.054	6.794 3.305	8.934 2.037	10.026 1.733	9.815 1.872	9.679 123.852	10.055	10.446	10.719	10.313	8.904
3100.0	2.942 7.212	4.944 5.648	7.102 4.091	8.737 2.722	9.499 2.118	9.770 2.100	10.228 126.592	10.363	10.087	10.158	9.987	8.879
3150.0	3.220 7.453	4.910 6.021	6.695 4.331	8.181 2.821	9.039 2.302	9.457 2.428	10.048 126.501	10.286	10.137	10.233	10.000	8.932
3200.0	3.529 7.620	5.083 6.101	6.566 4.274	8.051 2.780	9.160 2.409	9.432 2.662	9.635 128.041	9.987	10.434	10.769	10.377	9.164
3250.0	3.916 7.840	5.636 6.411	7.022 4.914	8.369 3.751	9.585 3.241	9.802 3.101	9.711 136.630	10.168	11.153	11.605	10.916	9.484
3300.0	3.898 7.898	5.813 6.611	7.340 5.371	8.625 4.345	9.697 3.627	9.747 3.157	9.552 139.526	10.179	11.355	11.793	11.002	9.508
3350.0	3.714 7.938	5.693 6.624	7.390 5.204	8.728 3.944	9.581 3.232	9.326 2.912	9.189 138.455	10.349	11.819	12.123	11.142	9.543
3400.0	4.165 8.005	5.989 6.729	7.572 5.319	8.781 4.156	9.566 3.666	9.335 3.456	9.535 144.661	11.342	13.014	12.930	11.481	9.614
3450.0	4.823 8.026	6.470 6.838	7.792 5.689	8.674 4.919	9.384 4.624	9.351 4.298	9.737 149.200	11.485	13.056	12.935	11.480	9.615
3500.0	4.985 8.033	6.624 6.868	7.799 5.782	8.468 5.061	9.096 4.736	9.360 4.404	10.241 150.824	12.009	13.264	12.986	11.489	9.616
3550.0	5.108 8.033	6.547 6.858	7.623 5.751	8.436 4.989	9.208 4.686	10.096 4.492	11.929 155.419	13.545	13.860	13.126	11.511	9.616
3600.0	5.516 8.034	6.499 6.872	7.466 5.820	8.555 5.212	9.340 5.149	10.022 5.095	11.758 156.838	13.440	13.818	13.113	11.510	9.616
3650.0	5.766 8.035	6.691 6.888	7.653 5.889	8.716 5.404	9.494 5.482	10.281 5.438	12.002 159.425	13.565	13.865	13.125	11.511	9.616
3700.0	5.809 8.035	7.110 6.888	8.206 5.882	8.997 5.378	9.672 5.417	10.729 5.339	12.488 162.027	13.824	13.965	13.154	11.512	9.616
3750.0	5.997 8.036	7.269 6.889	8.247 5.890	9.190 5.413	10.358 5.516	11.781 5.497	13.324 166.063	14.221	14.106	13.193	11.515	9.616
3800.0	6.296 8.036	7.346 6.889	8.045 5.899	9.010 5.460	10.401 5.667	11.877 5.786	13.368 166.750	14.234	14.107	13.193	11.515	9.616
3850.0	6.572 8.036	7.654 6.889	8.317 5.902	9.350 5.481	10.893 5.742	12.289 5.960	13.584 169.462	14.322	14.137	13.197	11.515	9.616
3900.0	6.758 8.036	8.051 6.889	8.938 5.903	10.258 5.488	12.085 5.769	13.231 6.034	14.058 174.549	14.511	14.198	13.204	11.515	9.616
3950.0	6.699 8.036	7.944 6.889	8.831 5.903	10.170 5.488	11.993 5.765	13.162 6.012	14.026 173.954	14.500	14.197	13.204	11.515	9.616
4000.0	6.757 8.036	8.070 6.889	9.028 5.903	10.400 5.488	12.193 5.770	13.289 6.033	14.082 174.998	14.520	14.200	13.204	11.515	9.616
4050.0	6.901 8.036	8.342 6.889	9.393 5.903	10.792 5.490	12.536 5.783	13.511 6.088	14.181 176.944	14.555	14.205	13.204	11.515	9.616
4100.0	6.989 8.036	8.569 6.889	9.829 5.903	11.361 5.491	13.024 5.789	13.807 6.115	14.309 179.259	14.597	14.211	13.204	11.515	9.616
4150.0	6.983 8.036	8.564 6.889	9.841 5.903	11.396 5.491	13.060 5.788	13.828 6.111	14.318 179.357	14.598	14.211	13.204	11.515	9.616
4200.0	7.011 8.036	8.632 6.889	9.956 5.903	11.529 5.491	13.162 5.789	13.880 6.118	14.337 179.886	14.601	14.211	13.204	11.515	9.616
4250.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4300.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.5105 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616

4350.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4400.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4450.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4500.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4550.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616

CLOUD TRANSIT SIMULATION

DAY 186 TIME 3.45 HOURS CASE NO. (CLOUD TYPE) 1 DIRECTION 90.0 DEG W-E
SPACIAL INCREMENT 50.0 METERS STARTING DISTANCE FROM TOWER 500.0 METERS

DIST(M.) **** INCIDENT PANEL POWER IN MW +++ U#H

0.	7.074 6.973	8.783 5.887	10.200 5.224	11.799 5.160	13.361 5.680	13.979 6.109	14.373 176.283	14.604	14.164	13.023	11.073	8.812
50.0	7.071 6.223	8.783 5.350	10.200 4.952	11.799 5.054	13.361 5.642	13.979 6.097	14.372 173.233	14.591	14.104	12.848	10.671	8.130
100.0	7.067 5.177	8.782 4.612	10.200 4.600	11.799 4.929	13.361 5.597	13.979 6.081	14.370 168.996	14.567	14.012	12.592	10.095	7.171
150.0	7.058 4.783	8.780 4.223	10.200 4.300	11.799 4.747	13.361 5.512	13.979 6.051	14.369 166.869	14.553	13.964	12.476	9.871	6.837
200.0	7.042 4.737	8.778 4.061	10.200 4.049	11.799 4.518	13.361 5.383	13.979 5.999	14.368 165.788	14.543	13.935	12.419	9.805	6.806
250.0	7.021 4.570	8.774 3.894	10.200 3.830	11.799 4.292	13.361 5.237	13.979 5.934	14.367 164.247	14.529	13.890	12.317	9.636	6.611
300.0	6.994 3.462	8.768 3.303	10.199 3.477	11.799 4.099	13.361 5.115	13.977 5.865	14.341 156.928	14.420	13.557	11.419	7.937	4.832
350.0	6.972 2.400	8.760 2.679	10.198 3.141	11.799 3.975	13.361 5.034	13.975 5.811	14.309 149.841	14.299	13.204	10.501	6.265	3.151
400.0	6.922 2.150	8.748 2.416	10.196 2.878	11.799 3.651	13.361 4.718	13.974 5.654	14.289 147.017	14.236	13.051	10.207	5.895	2.865
450.0	6.809 2.181	8.719 2.413	10.192 2.687	11.799 3.135	13.361 4.143	13.973 5.333	14.272 144.917	14.184	12.937	10.044	5.820	2.908
500.0	6.666 2.120	8.682 2.464	10.188 2.491	11.799 2.554	13.361 3.488	13.971 4.947	14.250 141.520	14.118	12.770	9.699	5.359	2.586
550.0	6.536 2.048	8.624 2.445	10.171 2.375	11.796 2.315	13.361 3.210	13.929 4.736	13.954 131.820	12.866	10.234	7.090	3.944	2.180
600.0	6.407 2.155	8.522 2.477	10.137 2.528	11.790 2.632	13.361 3.449	13.893 4.742	13.732 127.150	11.958	8.439	5.386	3.288	2.245
650.0	5.922 2.415	8.205 2.775	10.044 2.953	11.777 3.125	13.361 3.614	13.878 4.426	13.673 127.032	11.806	8.172	5.179	3.289	2.412
700.0	5.088 2.586	7.723 3.164	9.906 3.346	11.756 3.309	13.361 3.285	13.861 3.612	13.622 124.689	11.688	7.959	4.975	3.127	2.313
750.0	4.266 2.820	7.270 3.486	9.754 3.516	11.658 3.138	13.204 2.649	13.527 2.678	13.014 118.365	10.860	7.056	4.303	2.858	2.303
800.0	4.046 3.066	7.070 3.627	9.552 3.579	11.158 3.185	12.253 2.617	11.731 2.523	10.100 107.012	8.010	5.478	3.738	2.802	2.470
850.0	4.376 3.477	6.928 3.791	9.127 3.763	10.525 3.710	11.398 3.416	10.538 3.240	8.440 104.037	6.491	4.857	3.808	3.171	2.976
900.0	4.483 3.959	6.316 4.051	8.199 4.025	9.772 4.253	10.852 4.194	10.278 3.874	8.422 104.572	6.399	4.720	3.810	3.447	3.513
950.0	3.889 3.942	5.222 3.999	7.061 4.048	9.041 4.400	10.416 4.339	10.003 3.746	8.183 98.929	6.052	4.392	3.519	3.218	3.452
1000.0	3.107 3.838	4.231 3.728	6.121 3.828	8.249 4.232	9.495 4.079	8.806 3.243	6.8106 88.46	5.026	3.903	3.227	3.030	3.469

1050.0	3.358 4.146	4.262 3.698	5.812 3.708	7.369 4.125	7.811 4.125	6.643 3.482	5.040 82.196	4.054	3.681	3.334	3.442	4.098
1100.0	4.515 4.983	5.080 4.165	5.980 3.878	6.830 4.202	6.811 4.575	5.648 4.471	4.417 87.078	3.908	3.922	3.908	4.480	5.299
1150.0	5.278 5.702	5.606 4.573	6.047 3.903	6.592 4.060	6.648 4.755	5.625 5.109	4.333 92.148	3.876	4.066	4.329	5.342	6.298
1200.0	5.077 5.579	5.241 4.362	5.627 3.559	6.388 3.702	6.741 4.550	5.658 5.024	4.130 88.712	3.660	3.780	4.069	5.281	6.276
1250.0	4.656 5.306	4.713 4.008	5.110 3.269	5.956 3.564	6.293 4.434	5.020 4.796	3.500 82.576	3.370	3.535	3.802	5.128	6.110
1300.0	4.864 5.414	5.138 3.968	5.344 3.201	5.527 3.510	5.290 4.373	4.014 4.792	2.997 82.846	3.586	4.195	4.534	5.688	6.403
1350.0	5.618 5.911	6.336 4.428	6.304 3.520	5.619 3.591	4.770 4.409	3.614 5.049	3.112 91.769	4.259	5.374	5.950	6.837	7.062
1400.0	5.834 6.277	7.047 4.893	7.089 3.752	6.143 3.239	5.056 3.741	3.730 4.663	3.239 97.552	4.575	6.070	7.001	7.726	7.476
1450.0	5.609 6.226	6.956 4.921	7.127 3.628	6.401 2.748	5.470 3.099	3.986 4.210	3.253 95.574	4.319	5.790	6.908	7.621	7.300
1500.0	5.520 6.114	6.724 4.656	6.850 3.364	6.266 2.536	5.510 2.976	4.243 4.162	3.656 93.698	4.266	5.368	6.644	7.549	7.291
1550.0	5.544 6.206	6.763 4.440	6.927 3.197	6.311 2.544	5.556 3.011	4.828 4.176	4.923 99.262	5.388	6.076	7.325	8.245	7.800
1600.0	5.662 6.270	6.998 4.386	7.385 3.373	6.783 3.134	5.950 3.651	5.645 4.495	6.344 110.298	6.884	7.486	8.591	9.062	8.196
1650.0	4.458 5.929	6.416 4.120	7.475 3.447	7.069 3.535	6.136 3.664	5.900 3.567	6.832 111.224	7.519	8.310	9.347	9.388	8.108
1700.0	3.863 5.536	6.098 3.660	7.413 3.123	6.951 3.365	5.911 3.335	5.761 2.972	6.733 106.542	7.327	8.101	9.187	9.278	7.925
1750.0	3.747 5.455	6.058 3.378	7.378 2.767	6.807 3.051	5.814 3.073	5.912 2.784	6.858 105.443	7.312	8.173	9.364	9.465	8.045
1800.0	3.870 5.734	6.028 3.462	7.275 2.652	7.023 2.886	6.524 3.037	6.917 2.900	7.796 112.206	8.248	9.218	10.237	9.987	8.408
1850.0	4.873 5.741	6.215 3.477	7.051 2.598	7.479 2.932	7.802 3.598	8.418 4.028	9.192 123.156	9.718	10.501	10.974	10.183	8.372
1900.0	4.474 5.324	4.784 3.336	5.705 2.527	7.209 2.908	8.276 3.854	8.911 4.397	9.493 121.258	10.224	11.058	11.187	9.851	7.735
1950.0	4.223 5.143	4.314 3.371	5.155 2.494	6.866 2.624	8.081 3.482	8.745 4.138	9.265 117.017	10.069	11.030	11.111	9.558	7.343
2000.0	3.976 5.423	4.121 3.588	4.964 2.453	6.590 2.232	7.810 2.964	8.746 3.738	9.583 116.898	10.479	11.370	11.370	9.842	7.643
2050.0	4.114 5.944	4.542 3.790	5.393 2.348	6.844 1.867	8.189 2.590	9.483 3.572	10.699 123.796	11.558	12.060	11.851	10.521	8.426
2100.0	4.827 6.040	5.756 3.861	6.414 2.353	7.523 1.770	9.057 2.515	10.471 3.737	11.684 131.560	12.267	12.286	11.825	10.591	8.578
2150.0	4.845 5.914	5.883 4.014	6.353 2.629	7.259 2.025	8.956 2.633	10.470 3.706	11.773 130.487	12.198	11.912	11.363	10.242	8.308
2200.0	4.156 5.596	5.423 4.078	5.936 2.806	6.532 2.055	8.097 2.324	9.883 3.049	11.598 123.740	12.129	11.711	10.962	9.679	7.721
2250.0	3.532 5.474	4.971 3.986	5.538 2.655	5.903 1.688	7.368 1.709	9.613 2.337	11.860 119.997	12.621	12.245	11.285	9.656	7.550
2300.0	3.252 5.717	4.961 3.991	5.773 2.550	6.127 1.464	7.511 1.316	9.978 1.915	12.451 123.928	13.368	13.151	12.158	10.273	7.967
2350.0	3.400 5.777	5.297 4.179	6.352 2.652	6.759 1.457	7.881 1.253	9.952 1.919	12.054 125.414	13.110	13.237	12.248	10.116	7.769
2400.0	3.559 5.663	5.210 4.550	6.198 2.986	6.657 1.666	7.6107 1.45	9.426 2.181	11.263 122.184	12.526	12.995	11.862	9.321	7.011

2450.0	2.927 5.324	4.287 4.700	5.366 3.250	6.090 1.882	7.209 1.550	9.223 1.945	11.154 114.694	12.336	12.512	10.892	8.037	6.008
2500.0	2.037 5.310	3.375 4.606	4.716 3.272	5.858 1.968	7.330 1.362	9.752 1.333	11.970 112.923	12.917	12.551	10.635	7.875	6.055
2550.0	1.618 5.809	2.859 4.804	4.350 3.517	5.867 2.354	7.679 1.630	10.451 1.225	12.976 118.425	13.722	12.972	11.076	8.616	6.896
2600.0	1.610 6.227	2.902 5.190	4.311 3.728	5.742 2.337	7.410 1.499	9.964 1.108	12.535 117.161	13.338	12.490	10.764	8.737	7.266
2650.0	1.875 6.176	3.147 5.323	4.304 3.809	5.472 2.274	6.999 1.460	9.448 1.227	12.038 111.767	12.605	11.214	9.481	7.987	6.922
2700.0	1.817 5.826	2.703 5.155	3.650 3.898	5.032 2.517	6.913 1.722	9.450 1.410	11.848 105.375	11.883	9.833	8.100	7.172	6.441
2750.0	1.602 5.879	1.950 5.158	2.757 4.093	4.610 2.884	7.107 2.074	9.936 1.589	12.244 106.727	12.091	9.997	8.389	7.612	6.751
2800.0	1.823 6.421	1.731 5.563	2.333 4.404	4.322 3.242	7.120 2.588	10.141 2.110	12.444 113.120	12.500	10.860	9.429	8.569	7.514
2850.0	1.491 6.505	1.661 5.736	2.449 4.475	4.427 3.128	7.035 2.324	9.570 1.729	11.444 110.325	11.867	10.915	9.590	8.520	7.454
2900.0	1.517 6.294	1.956 5.648	2.989 4.576	5.103 3.386	7.570 2.516	9.298 1.752	10.079 106.448	10.205	9.751	8.842	7.915	7.048
2950.0	1.746 6.056	2.165 5.491	3.216 4.785	5.388 4.113	7.909 3.341	9.329 2.257	9.462 106.112	9.154	8.910	8.436	7.605	6.745
3000.0	2.235 6.216	2.530 5.687	3.255 5.022	5.113 4.490	7.709 3.832	9.628 2.766	10.217 112.277	9.938	9.681	9.148	7.950	6.857
3050.0	2.689 6.867	2.911 6.309	3.397 5.312	5.084 4.415	7.690 3.740	9.895 2.979	10.974 119.428	10.991	10.665	9.840	8.361	7.306
3100.0	2.220 6.932	2.434 6.475	3.293 5.431	5.540 4.421	8.264 3.621	9.987 2.698	10.799 117.781	10.903	10.379	9.310	7.925	7.147
3150.0	2.735 6.944	2.704 6.448	3.584 5.560	6.162 4.861	8.817 4.311	9.662 3.407	9.742 117.819	9.819	9.464	8.661	7.724	7.210
3200.0	3.822 7.196	3.372 6.533	3.912 5.697	6.297 5.243	8.753 5.117	9.402 4.564	9.358 122.611	9.408	9.182	8.758	8.248	7.749
3250.0	4.352 7.972	4.113 6.889	4.536 5.892	6.443 5.385	8.689 5.312	9.852 4.878	10.388 134.170	10.395	9.952	9.921	9.979	9.221
3300.0	4.069 7.951	4.215 6.889	4.810 5.874	6.722 5.292	9.064 5.039	10.504 4.436	11.243 135.115	10.879	9.760	9.506	9.734	9.130
3350.0	4.073 7.927	4.045 6.889	4.633 5.878	6.867 5.318	9.425 5.116	10.604 4.535	10.972 133.141	10.325	9.071	8.970	9.465	9.024
3400.0	5.165 7.930	5.160 6.889	5.388 5.897	7.032 5.433	9.086 5.516	9.805 5.336	9.946 134.941	9.629	8.971	9.134	9.575	9.047
3450.0	6.111 7.965	6.513 6.889	6.516 5.902	7.294 5.478	8.688 5.709	9.223 5.819	9.433 140.832	9.740	9.962	10.218	10.143	9.223
3500.0	6.172 8.031	6.726 6.889	6.975 5.903	7.912 5.486	9.384 5.736	9.922 5.859	10.014 150.930	10.797	12.037	12.318	11.221	9.544
3550.0	5.796 8.029	6.270 6.889	6.851 5.903	8.465 5.478	10.397 5.687	10.777 5.696	10.254 151.330	10.503	11.630	12.071	11.116	9.514
3600.0	6.048 8.027	6.674 6.889	7.224 5.903	8.712 5.482	10.532 5.714	10.767 5.794	10.039 151.405	10.074	11.195	11.823	11.015	9.487
3650.0	6.666 8.028	7.720 6.889	8.230 5.903	9.010 5.490	10.073 5.774	10.226 6.027	9.960 154.238	10.333	11.420	11.931	11.056	9.498
3700.0	6.911 8.031	8.253 6.889	8.950 5.903	9.495 5.490	10.124 5.789	10.273 6.105	10.553 159.542	11.378	12.269	12.358	11.222	9.544
3750.0	6.885 8.036	8.257 6.889	9.111 5.903	10.039 5.491	11.044 5.785	11.451 6.087	12.216 168.073	13.267	13.577	12.967	11.454	9.611
3800.0	6.795 8.036	8.099 6.889	8.999 5.903	10.211 5.491	11.462 5.779	11.684 6.055	12.108 167.8	13.037	13.410	12.888	11.430	9.609

3850.0	6.898 8.036	8.316 6.889	9.293 5.903	10.408 5.491	11.472 5.785	11.581 6.089	11.931 168.081	12.844	13.285	12.833	11.415	9.608
3900.0	7.019 8.036	8.567 6.889	9.617 5.903	10.587 5.491	11.435 5.791	11.586 6.127	12.083 169.466	13.012	13.394	12.885	11.431	9.609
3950.0	7.034 8.036	8.615 6.889	9.726 5.903	10.778 5.491	11.711 5.791	11.993 6.128	12.606 171.920	13.466	13.663	13.006	11.467	9.612
4000.0	7.054 8.036	8.688 6.889	9.915 5.903	11.207 5.491	12.471 5.792	13.005 6.133	13.612 176.694	14.179	14.031	13.157	11.512	9.616
4050.0	7.056 8.036	8.706 6.889	9.966 5.903	11.306 5.491	12.589 5.792	13.062 6.133	13.595 176.944	14.141	14.002	13.145	11.511	9.616
4100.0	7.063 8.036	8.726 6.889	10.006 5.903	11.354 5.491	12.630 5.792	13.091 6.134	13.606 177.131	14.138	13.998	13.143	11.511	9.616
4150.0	7.070 8.036	8.746 6.889	10.060 5.903	11.457 5.491	12.784 5.792	13.278 6.135	13.773 177.992	14.242	14.046	13.157	11.512	9.616
4200.0	7.073 8.036	8.762 6.889	10.118 5.903	11.599 5.491	13.019 5.792	13.561 6.135	14.019 179.221	14.395	14.117	13.178	11.513	9.616
4250.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4300.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4350.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4400.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4450.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4500.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4550.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616

CLOUD TRANSIT SIMULATION
DAY 186 TIME 3.45 HOURS CASE NO. (CLOUD TYPE) 1 DIRECTION 135.0 DEG SW-NE
SPACIAL INCREMENT 50.0 METERS STARTING DISTANCE FROM TOWER 500.0 METERS

DIST(M.)	****	INCIDENT PANEL POWER IN MW						+++	U#H			
0.	7.005 7.655	8.771 6.072	10.200 4.684	11.799 4.373	13.361 5.152	13.979 5.879	14.373 176.295	14.607	14.211	13.201	11.483	9.483
50.0	6.937 7.557	8.753 5.873	10.197 4.385	11.799 4.050	13.361 4.879	13.979 5.709	14.373 174.792	14.607	14.211	13.200	11.472	9.446
100.0	6.849 7.520	8.727 5.828	10.193 4.331	11.799 3.901	13.361 4.631	13.979 5.510	14.373 173.916	14.607	14.211	13.198	11.465	9.427
150.0	6.758 6.994	8.704 5.051	10.190 3.569	11.799 3.149	13.361 4.032	13.979 5.226	14.373 169.789	14.607	14.209	13.181	11.394	9.208
200.0	6.592 6.588	8.631 4.446	10.168 2.929	11.795 2.485	13.361 3.491	13.979 4.913	14.373 166.104	14.607	14.207	13.166	11.334	9.033
250.0	6.301 6.510	8.480 4.353	10.119 2.782	11.786 2.220	13.361 3.154	13.979 4.560	14.373 164.247	14.607	14.206	13.158	11.311	8.982
300.0	5.910 5.746	8.228 3.499	10.016 2.234	11.758 1.976	13.357 2.917	13.979 4.198	14.373 159.863	14.607	14.196	13.110	11.163	8.592
350.0	5.499 4.574	7.921 2.159	9.877 1.357	11.718 1.639	13.350 2.715	13.978 3.882	14.373 153.806	14.606	14.179	13.038	10.937	7.998
400.0	5.033 4.207	7.535 1.818	9.708 1.139	11.669 1.522	13.340 2.557	13.977 3.559	14.373 150.797	14.606	14.169	12.998	10.826	7.755
450.0	4.525 4.069	7.020 1.957	9.434 1.290	11.573 1.574	13.314 2.465	13.974 3.264	14.373 148.312	14.603	14.144	12.878	10.501	7.351
500.0	3.976 3.071	6.368 1.616	9.001 1.257	11.387 1.668	13.240 2.409	13.964 2.979	14.372 141.428	14.593	14.055	12.436	9.255	5.746

550.0	3.519 2.451	5.737 1.378	8.446 1.347	11.112 1.968	13.180 2.537	13.950 2.767	14.372 136.912	14.586	14.000	12.181	8.548	4.827
600.0	3.301 2.528	5.196 1.538	7.746 1.645	10.708 2.385	13.066 2.802	13.928 2.753	14.370 136.036	14.584	13.987	12.155	8.512	4.826
650.0	3.395 2.405	4.648 1.650	6.757 1.809	10.047 2.532	12.838 2.991	13.867 3.015	14.248 128.540	13.910	12.545	10.438	7.214	4.224
700.0	3.684 2.113	4.213 1.619	5.836 1.812	9.283 2.453	12.386 3.089	13.655 3.452	14.097 120.208	13.286	11.205	8.773	5.812	3.433
750.0	3.946 2.258	4.064 1.825	5.378 2.043	8.546 2.621	11.587 3.346	13.172 3.887	13.968 118.382	13.207	11.041	8.511	5.573	3.404
800.0	4.264 2.382	4.367 1.927	5.360 2.233	7.888 2.842	10.674 3.572	12.411 4.172	13.360 115.527	12.690	10.547	8.037	5.344	3.453
850.0	4.710 2.201	4.986 1.831	5.482 2.193	7.263 2.797	9.790 3.519	11.399 4.266	12.052 106.405	11.225	8.905	6.426	4.337	3.019
900.0	5.033 2.249	5.244 2.025	5.286 2.393	6.600 2.926	8.924 3.584	10.524 4.386	11.109 101.018	10.317	8.071	5.657	3.851	2.833
950.0	5.249 2.333	5.385 2.218	5.269 2.649	6.274 3.219	8.251 3.852	9.874 4.597	10.562 100.204	9.942	7.966	5.698	3.953	2.910
1000.0	5.277 2.420	5.690 2.530	5.678 2.920	6.288 3.322	7.799 3.870	9.184 4.560	9.335 94.789	8.190	6.407	4.792	3.662	2.862
1050.0	5.441 2.765	6.508 3.147	6.681 3.284	6.791 3.222	7.834 3.637	8.724 4.410	8.232 92.932	6.752	5.114	4.006	3.451	2.930
1100.0	5.530 3.260	6.923 3.835	7.111 3.659	7.084 3.179	8.058 3.503	8.472 4.329	7.626 94.864	6.380	5.034	4.109	3.631	3.138
1150.0	5.472 3.377	7.015 4.201	7.366 3.976	7.410 3.360	8.188 3.545	8.073 4.250	6.947 93.981	5.802	4.635	3.908	3.475	2.977
1200.0	4.987 3.449	7.001 4.473	7.947 4.327	7.999 3.683	8.167 3.470	7.591 3.741	6.367 91.323	5.063	3.819	3.326	3.120	2.791
1250.0	4.179 3.799	6.707 4.800	8.210 4.684	8.272 4.001	8.015 3.303	7.388 2.971	6.482 91.609	5.204	3.793	3.358	3.322	3.120
1300.0	3.858 3.899	6.608 4.806	8.352 4.771	8.503 4.182	8.127 3.334	7.460 2.705	6.692 93.059	5.466	4.003	3.506	3.467	3.318
1350.0	4.057 4.253	6.793 4.989	8.517 4.781	8.696 4.098	8.269 3.329	7.277 2.840	6.094 93.411	4.895	3.921	3.572	3.470	3.561
1400.0	3.986 5.005	6.471 5.441	8.384 4.805	8.860 3.823	8.521 3.162	7.295 2.918	5.731 96.046	4.674	4.405	4.293	4.034	4.234
1450.0	3.954 5.254	6.031 5.528	8.026 4.755	8.765 3.727	8.645 3.235	7.564 3.172	6.029 99.697	5.183	5.317	5.240	4.658	4.606
1500.0	4.409 5.298	6.293 5.483	8.143 4.651	8.788 3.652	8.663 3.390	7.649 3.609	6.155 102.055	5.347	5.530	5.428	4.823	4.737
1550.0	4.063 5.835	5.429 5.663	7.165 4.438	8.340 3.197	8.623 3.041	7.688 3.430	6.212 100.243	5.381	5.530	5.519	5.255	5.427
1600.0	3.726 6.186	4.136 5.768	5.303 4.229	7.229 2.789	8.386 2.754	7.968 3.309	6.844 98.088	6.005	5.992	5.908	5.665	5.882
1650.0	4.385 6.094	4.517 5.763	5.179 4.245	7.198 2.806	8.644 2.908	8.413 3.730	7.461 101.872	6.629	6.437	6.110	5.615	5.734
1700.0	4.127 6.348	4.441 5.912	5.332 4.391	7.618 2.849	9.157 2.757	8.581 3.448	7.342 105.256	6.782	6.862	6.691	6.333	6.279
1750.0	3.541 6.824	4.286 6.054	5.086 4.453	7.179 2.747	9.102 2.298	8.542 2.732	7.187 106.969	7.082	7.526	7.568	7.485	7.270
1800.0	3.694 6.948	5.330 6.089	6.328 4.505	7.775 2.814	9.402 2.206	8.833 2.514	7.616 112.917	7.727	8.024	7.838	7.747	7.520
1850.0	3.963 6.829	6.277 5.926	7.516 4.538	8.329 3.118	9.405 2.449	8.905 2.576	8.109 117.963	8.307	8.375	8.019	7.807	7.509
1900.0	3.852 6.808	6.233 5.636	7.247 4.401	7.238 3.285	7.758 2.564	8.096 2.494	8.411 118.147	9.239	9.241	8.928	8.579	7.929

1950.0	3.609 6.703	6.046 5.399	7.314 4.264	6.958 3.314	6.860 2.567	7.765 2.377	9.282 118.638	10.092	9.773	9.334	8.910	8.069
2000.0	3.520 6.835	6.027 5.551	7.798 4.282	7.592 3.255	7.114 2.583	8.018 2.411	9.708 121.282	10.435	9.897	9.313	8.862	8.081
2050.0	3.175 7.166	5.355 5.953	7.104 4.465	7.138 3.257	6.897 2.619	7.891 2.359	9.551 121.431	10.503	10.464	9.993	9.259	8.281
2100.0	2.718 7.186	4.485 6.062	6.060 4.505	6.259 3.246	6.234 2.618	7.325 2.196	9.089 118.115	10.429	11.055	10.745	9.620	8.281
2150.0	2.516 7.157	4.044 5.998	5.734 4.421	6.739 3.141	7.276 2.529	8.004 2.093	9.261 119.598	10.478	11.224	10.939	9.730	8.308
2200.0	2.313 7.236	3.586 5.982	5.282 4.448	6.912 3.154	7.907 2.470	8.220 1.992	8.975 118.325	10.089	10.821	10.638	9.770	8.524
2250.0	1.867 7.126	2.961 5.749	4.701 4.509	6.481 3.479	7.391 2.651	7.383 1.836	8.059 113.461	9.506	10.541	10.552	9.946	8.717
2300.0	1.643 6.891	2.637 5.451	4.367 4.476	6.349 3.746	7.559 2.898	7.448 1.850	7.838 111.808	9.259	10.394	10.467	9.894	8.636
2350.0	1.897 6.636	2.757 5.069	4.318 4.176	6.341 3.647	7.814 3.015	7.715 2.137	7.948 113.426	9.474	10.833	10.916	10.116	8.612
2400.0	2.262 6.431	2.676 4.818	3.750 4.019	5.534 3.672	6.956 3.274	7.006 2.588	7.553 112.790	9.708	11.630	11.733	10.540	8.632
2450.0	2.292 5.933	2.233 4.575	2.977 4.101	4.741 3.980	6.176 3.627	6.476 2.846	7.383 109.818	9.875	11.968	11.957	10.458	8.212
2500.0	1.982 5.756	1.789 4.578	2.510 4.243	4.347 4.140	5.940 3.663	6.723 2.685	8.003 109.213	10.346	12.122	11.976	10.389	8.017
2550.0	2.146 5.769	1.984 4.803	2.501 4.398	4.084 4.149	5.663 3.623	6.818 2.701	8.341 109.454	10.438	12.098	11.991	10.197	7.747
2600.0	2.329 5.630	1.845 5.032	2.006 4.484	3.328 4.120	4.921 3.748	6.386 2.933	8.146 105.202	10.168	11.859	11.721	9.499	6.998
2650.0	2.530 5.458	1.904 5.056	1.857 4.469	2.860 4.160	4.392 3.968	6.088 3.286	8.063 102.811	10.058	11.653	11.441	9.044	6.521
2700.0	2.762 5.360	2.435 4.872	2.444 4.400	3.176 4.262	4.562 4.134	6.217 3.426	8.208 104.296	10.134	11.406	11.042	8.899	6.554
2750.0	3.021 5.574	2.702 4.947	2.651 4.437	3.301 4.255	4.531 4.202	5.964 3.638	7.928 104.247	9.985	11.044	10.520	8.742	6.802
2800.0	3.540 5.775	2.806 5.167	2.290 4.454	2.957 4.051	4.263 4.193	5.591 4.050	7.457 101.569	9.602	10.625	9.893	8.178	6.675
2850.0	3.499 5.600	2.526 5.159	1.845 4.561	2.548 4.197	3.934 4.314	5.366 4.119	7.321 99.749	9.653	10.853	9.973	7.934	6.345
2900.0	3.490 5.440	2.829 5.082	2.437 4.751	2.976 4.602	3.939 4.579	5.347 4.100	7.564 102.529	9.959	11.004	10.079	8.045	6.305
2950.0	4.364 5.494	3.989 4.892	3.223 4.745	3.138 4.842	3.872 4.910	5.449 4.592	7.976 106.978	10.185	10.631	9.709	8.250	6.716
3000.0	5.157 5.506	4.804 4.713	3.778 4.576	3.552 4.810	4.347 5.124	5.789 5.136	8.084 110.184	10.016	10.217	9.381	8.275	6.918
3050.0	5.039 5.432	4.446 4.883	3.569 4.755	3.813 4.957	4.956 5.302	6.243 5.271	8.049 110.359	9.670	10.020	9.299	8.037	6.616
3100.0	5.373 5.647	5.150 5.456	4.461 5.256	4.390 5.306	5.326 5.569	6.777 5.495	8.562 117.075	9.897	10.231	9.584	8.090	6.504
3150.0	6.225 5.586	6.826 5.516	6.329 5.313	5.384 5.327	5.481 5.636	6.994 5.782	9.051 124.530	10.310	10.493	9.790	8.119	6.364
3200.0	6.379 5.703	6.882 5.713	6.182 5.429	5.114 5.367	5.160 5.688	6.772 5.888	9.067 123.717	10.463	10.477	9.518	7.741	6.175
3250.0	6.184 5.925	6.397 5.965	5.777 5.562	5.231 5.413	5.555 5.726	7.007 5.884	9.153 123.783	10.554	10.512	9.379	7.467	6.091
3300.0	6.591 6.484	7.329 6.468	7.267 5.830	6.795 5.486	6.711 5.776	9.440 6.030	131.610	10.463	10.210	9.147	7.475	6.424

3350.0	6.900 6.649	8.103 6.516	8.358 5.838	7.816 5.487	7.554 5.790	8.297 6.110	9.712 136.307	10.312	9.807	8.845	7.523	6.688
3400.0	6.861 6.928	7.941 6.594	7.967 5.856	7.519 5.488	7.671 5.791	8.508 6.106	9.707 136.214	10.180	9.613	8.679	7.686	7.116
3450.0	6.934 7.471	8.173 6.738	8.493 5.883	8.514 5.491	8.851 5.792	9.066 6.117	9.583 142.336	10.085	9.761	8.955	8.379	8.045
3500.0	7.037 7.480	8.550 6.739	9.400 5.883	9.900 5.491	10.140 5.792	9.660 6.131	9.647 147.547	10.175	9.938	9.075	8.440	8.063
3550.0	7.030 7.563	8.537 6.770	9.364 5.889	9.742 5.491	9.885 5.792	9.671 6.131	10.043 148.660	10.544	10.025	9.201	8.717	8.261
3600.0	7.009 7.803	8.497 6.850	9.324 5.903	9.797 5.491	10.132 5.792	10.218 6.128	10.792 154.714	11.275	10.770	10.241	9.801	8.888
3650.0	7.049 7.803	8.664 6.848	9.788 5.903	10.757 5.491	11.422 5.792	11.235 6.132	11.186 158.969	11.213	10.687	10.263	9.830	8.901
3700.0	7.074 7.825	8.742 6.853	9.993 5.903	11.188 5.491	12.026 5.792	11.729 6.135	11.371 161.590	11.205	10.812	10.499	9.981	8.964
3750.0	7.064 7.847	8.688 6.861	9.854 5.903	10.941 5.491	11.810 5.792	11.763 6.135	11.606 162.366	11.472	11.131	10.813	10.158	9.031
3800.0	7.070 7.892	8.722 6.870	9.974 5.903	11.218 5.491	12.266 5.792	12.311 6.135	12.174 166.999	12.077	11.866	11.504	10.547	9.179
3850.0	7.076 7.900	8.770 6.871	10.127 5.903	11.548 5.491	12.736 5.792	12.734 6.135	12.458 169.233	12.282	12.011	11.592	10.598	9.202
3900.0	7.077 7.934	8.776 6.877	10.134 5.903	11.573 5.491	12.797 5.792	12.883 6.135	12.734 170.885	12.610	12.308	11.831	10.746	9.277
3950.0	7.077 7.996	8.775 6.889	10.134 5.903	11.587 5.491	12.867 5.792	13.097 6.135	13.175 174.015	13.257	12.979	12.356	11.066	9.433
4000.0	7.077 7.994	8.780 6.889	10.163 5.903	11.660 5.491	12.986 5.792	13.209 6.135	13.188 174.127	13.186	12.901	12.301	11.039	9.426
4050.0	7.077 8.003	8.782 6.889	10.186 5.903	11.725 5.491	13.117 5.792	13.402 6.135	13.400 175.403	13.396	13.091	12.435	11.113	9.460
4100.0	7.077 8.016	8.782 6.889	10.189 5.903	11.746 5.491	13.180 5.792	13.552 6.135	13.657 176.845	13.708	13.375	12.630	11.215	9.503
4150.0	7.077 8.029	8.783 6.889	10.196 5.903	11.771 5.491	13.254 5.792	13.721 6.135	13.948 178.576	14.081	13.728	12.873	11.342	9.555
4200.0	7.077 8.030	8.783 6.889	10.196 5.903	11.774 5.491	13.269 5.792	13.757 6.135	14.011 178.921	14.159	13.798	12.921	11.366	9.563
4250.0	7.077 8.032	8.783 6.889	10.198 5.903	11.785 5.491	13.304 5.792	13.841 6.135	14.144 179.689	14.323	13.951	13.028	11.423	9.584
4300.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4350.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4400.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4450.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4500.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616
4550.0	7.077 8.036	8.783 6.889	10.200 5.903	11.799 5.491	13.361 5.792	13.979 6.135	14.373 180.978	14.607	14.211	13.204	11.515	9.616

CLOUD TRANSIT SIMULATION

DAY 186 TIME 3.45 HOURS CASE NO. (CLOUD TYPE) 1 DIRECTION 180.0 DEG S-N
 SPACIAL INCREMENT 50.0 METERS STARTING DISTANCE FROM TOWER 500.0 METERS

DIST(M.) **** INCIDENT PANEL POWER IN MW *** U+H

0.	6.000 8.021	8.228 6.809	9.996 5.620	11.739 4.774	13.348 4.565	13.975 4.733	14.112 175.357	14.607	14.211	13.204	11.515	9.615
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50.0	5.372 8.014	7.720 6.776	9.698 5.513	11.614 4.511	13.309 4.098	13.967 4.123	14.372 172.247	14.607	14.211	13.204	11.515	9.615
100.0	4.982 8.011	7.197 6.768	9.292 5.498	11.416 4.490	13.241 4.048	13.952 3.955	14.371 170.379	14.607	14.211	13.204	11.515	9.614
150.0	4.566 8.006	6.680 6.749	8.875 5.445	11.197 4.382	13.160 3.874	13.932 3.690	14.370 168.083	14.607	14.211	13.204	11.515	9.614
200.0	3.735 7.958	6.019 6.568	8.477 4.946	10.983 3.524	13.063 2.897	13.899 2.785	14.362 162.360	14.606	14.211	13.204	11.514	9.604
250.0	2.785 7.878	5.337 6.286	8.096 4.196	10.752 2.303	12.945 1.608	13.853 1.678	14.347 155.184	14.604	14.211	13.204	11.512	9.586
300.0	2.396 7.836	4.735 6.157	7.362 3.912	10.228 1.907	12.725 1.219	13.786 1.337	14.329 151.037	14.602	14.211	13.204	11.510	9.575
350.0	2.407 7.811	4.221 6.101	6.323 3.849	9.338 1.904	12.303 1.285	13.644 1.448	14.292 148.019	14.598	14.211	13.204	11.509	9.567
400.0	2.389 7.772	3.725 5.988	5.237 3.621	8.290 1.632	11.740 1.122	13.438 1.450	14.236 143.710	14.591	14.211	13.204	11.508	9.555
450.0	2.325 7.060	3.398 4.898	4.591 2.770	7.639 1.228	11.317 0.938	13.235 1.391	14.167 137.769	14.575	14.209	13.202	11.475	9.353
500.0	2.357 6.281	3.483 3.768	4.755 2.067	7.673 1.151	11.104 1.040	13.026 1.451	14.091 134.770	14.554	14.206	13.198	11.436	9.127
550.0	2.596 6.058	4.028 3.464	5.405 1.925	7.658 1.220	10.371 1.180	12.407 1.589	13.902 134.194	14.518	14.202	13.196	11.419	9.053
600.0	3.020 5.975	4.755 3.350	5.897 1.838	6.972 1.147	8.844 1.192	11.308 1.773	13.545 131.875	14.444	14.195	13.194	11.408	9.018
650.0	3.337 5.695	5.132 2.963	5.786 1.602	5.693 1.068	7.002 1.236	10.100 1.979	13.136 126.777	14.353	14.185	13.192	11.388	8.930
700.0	3.502 4.469	5.277 2.401	5.814 1.464	5.269 1.149	6.261 1.420	9.512 2.206	12.787 116.926	13.749	13.065	11.762	9.661	7.155
750.0	3.722 3.696	5.485 2.263	6.411 1.694	6.214 1.595	6.981 1.912	9.595 2.595	12.368 114.416	13.020	12.067	10.609	8.340	5.847
800.0	4.022 3.540	5.908 2.217	7.389 1.821	7.721 1.887	8.146 2.301	9.563 2.956	11.395 116.771	12.123	11.607	10.349	8.144	5.647
850.0	4.037 3.341	6.014 2.088	7.738 1.680	8.193 1.821	8.163 2.346	8.638 3.009	9.931 113.207	11.126	11.268	10.255	8.062	5.490
900.0	3.812 2.956	5.585 1.938	7.191 1.500	7.629 1.657	7.309 2.289	7.356 2.927	8.555 103.385	10.163	10.627	9.649	7.393	4.845
950.0	3.867 2.568	5.249 1.921	6.686 1.519	7.473 1.752	7.383 2.527	7.180 3.160	7.974 94.884	9.236	9.127	7.747	5.717	3.794
1000.0	4.451 2.630	5.528 2.245	6.893 1.943	8.322 2.287	8.873 3.194	8.374 3.853	8.326 98.757	8.798	8.135	6.608	4.872	3.420
1050.0	4.986 2.655	5.753 2.375	7.056 2.259	9.158 2.856	10.359 3.893	9.623 4.527	8.884 105.479	8.699	7.811	6.435	4.786	3.359
1100.0	4.841 2.417	5.182 2.141	6.309 2.212	8.793 3.044	10.259 4.087	9.443 4.601	8.723 102.021	8.471	7.551	6.282	4.565	3.093
1150.0	4.573 2.153	4.762 1.784	5.789 1.973	8.151 2.974	9.381 3.992	8.571 4.424	8.247 94.363	8.108	7.013	5.689	4.025	2.749
1200.0	4.460 2.213	4.635 1.840	5.660 2.045	7.837 3.087	9.003 4.094	8.495 4.420	8.332 90.846	7.799	6.202	4.742	3.399	2.580
1250.0	4.772 2.656	5.175 2.349	6.329 2.544	8.400 3.504	9.805 4.455	9.781 4.705	9.374 98.343	8.034	5.881	4.338	3.356	2.882
1300.0	5.263 2.931	5.718 2.876	6.382 3.183	7.927 4.002	9.746 4.827	10.510 5.088	10.268 104.088	8.567	6.068	4.358	3.382	2.986
1350.0	5.315 2.777	5.539 2.951	5.466 3.339	6.350 4.053	8.409 4.869	9.774 5.177	9.978 99.081	8.587	6.205	4.372	3.205	2.716
1400.0	4.910 2.421	5.100 2.752	5.120 3.259	6.013 3.964	7.113 4.727	9.094 4.915	9.155 93.463	8.085	6.126	4.349	3.089	2.433

1450.0	4.437 2.581	4.536 2.899	4.682 3.502	5.888 4.220	8.009 4.771	8.980 4.650	8.742 92.833	7.811	6.223	4.644	3.494	2.765
1500.0	4.317 3.220	4.776 3.529	5.562 4.042	7.288 4.590	9.395 4.869	10.087 4.495	9.550 104.434	8.513	6.964	5.424	4.308	3.499
1550.0	4.221 3.808	5.204 4.180	6.452 4.445	7.611 4.651	8.630 4.677	9.440 4.188	9.498 107.942	8.840	7.465	5.871	4.755	3.998
1600.0	3.746 3.751	4.665 4.141	5.856 4.391	6.654 4.526	7.217 4.391	8.244 3.765	8.668 99.868	8.332	7.240	5.700	4.632	3.942
1650.0	3.441 3.558	3.961 4.046	5.006 4.380	6.079 4.543	6.879 4.355	7.917 3.653	8.208 94.815	7.851	7.010	5.644	4.529	3.747
1700.0	3.509 3.977	3.729 4.516	4.620 4.730	5.731 4.760	6.653 4.565	7.909 3.870	8.410 98.557	8.148	7.589	6.446	5.199	4.188
1750.0	3.575 4.852	3.847 5.167	5.100 5.098	7.034 4.943	8.628 4.689	9.598 3.986	9.654 113.134	9.212	8.714	7.659	6.252	5.120
1800.0	3.407 5.395	3.860 5.474	5.444 5.160	7.927 4.786	9.325 4.413	8.959 3.744	8.768 115.827	9.121	9.143	8.328	6.863	5.702
1850.0	3.270 5.333	3.620 5.433	4.856 5.058	7.012 4.594	8.320 4.209	7.953 3.591	8.077 109.824	8.787	9.001	8.308	6.808	5.587
1900.0	3.385 5.408	3.448 5.499	4.182 5.132	5.878 4.707	7.221 4.409	7.215 3.820	7.607 105.914	8.431	8.791	8.247	6.858	5.671
1950.0	3.514 5.915	3.218 5.764	3.601 5.361	5.237 5.039	6.829 4.821	7.081 4.165	7.543 108.156	8.456	9.021	8.676	7.513	6.398
2000.0	3.557 6.529	3.101 6.077	3.458 5.505	5.488 5.160	7.858 4.988	8.795 4.301	9.118 118.459	9.491	9.829	9.482	8.428	7.292
2050.0	3.705 6.626	3.445 5.999	3.844 5.377	5.740 5.005	8.047 4.801	8.970 4.213	8.916 119.437	9.072	9.694	9.634	8.749	7.598
2100.0	3.974 6.532	3.867 5.826	4.035 5.148	5.284 4.696	6.996 4.478	7.850 4.127	7.844 113.247	8.176	9.108	9.239	8.536	7.528
2150.0	3.951 6.727	3.588 5.947	3.314 5.130	4.176 4.548	5.755 4.325	6.738 4.078	6.766 105.905	7.216	8.458	8.921	8.552	7.710
2200.0	3.756 7.157	3.140 6.331	2.588 5.403	3.267 4.698	4.952 4.402	6.384 4.057	6.790 104.889	7.272	8.452	9.082	8.973	8.182
2250.0	3.711 7.381	3.079 6.446	2.480 5.470	3.141 4.765	5.086 4.446	7.080 4.059	7.918 109.155	8.212	8.876	9.285	9.233	8.487
2300.0	3.991 7.278	3.638 6.398	3.137 5.240	3.714 4.350	5.563 4.159	7.333 4.080	7.976 109.051	8.050	8.434	8.770	8.768	8.170
2350.0	4.318 7.112	4.315 6.084	3.832 4.594	3.936 3.537	5.161 3.669	6.416 4.057	6.998 103.993	7.256	7.812	8.376	8.529	7.989
2400.0	4.410 7.209	4.392 5.949	3.705 4.315	3.203 3.301	3.780 3.613	5.015 4.118	6.087 99.658	6.839	7.802	8.679	8.942	8.301
2450.0	4.724 7.546	4.698 6.182	4.072 4.616	3.241 3.768	3.163 4.124	4.269 4.515	5.737 104.007	7.029	8.385	9.403	9.671	8.864
2500.0	5.132 7.497	4.996 6.164	4.179 4.786	3.150 4.148	3.058 4.595	4.349 4.983	6.019 107.650	7.478	8.800	9.646	9.787	8.880
2550.0	5.253 7.075	5.095 5.579	4.138 4.403	3.267 4.025	3.622 4.580	5.009 5.058	6.374 106.930	7.519	8.547	9.255	9.478	8.653
2600.0	5.032 6.361	5.165 4.545	4.400 3.640	3.680 3.603	3.975 4.191	4.845 4.672	5.700 101.572	6.860	8.148	9.046	9.325	8.382
2650.0	4.917 6.220	5.344 4.319	4.734 3.557	3.901 3.621	3.739 4.072	3.875 4.423	4.423 98.609	6.055	8.077	9.333	9.561	8.437
2700.0	5.276 6.617	5.827 4.809	5.465 4.026	4.876 4.027	4.470 4.389	3.808 4.701	3.841 103.701	5.569	7.986	9.513	9.794	8.706
2750.0	5.637 6.640	5.994 5.058	5.396 4.194	4.665 4.109	4.160 4.564	3.649 5.028	3.957 103.437	5.643	7.808	9.176	9.370	8.390
2800.0	5.679 5.979	6.098 4.774	5.482 3.941	4.567 3.817	3.938 4.361	3.896 4.967	4.7114 101.611	6.281	7.859	8.799	8.526	7.357

2850.0	5.534 5.113	6.504 4.339	6.557 3.739	5.723 3.627	4.609 4.084	4.264 4.646	5.121 101.301	6.513	7.938	8.704	7.938	6.343
2900.0	5.601 5.232	6.970 4.583	7.481 3.954	6.730 3.691	5.345 4.065	4.493 4.599	4.781 104.681	5.997	7.731	8.806	8.147	6.469
2950.0	6.171 5.861	7.418 5.081	7.709 4.230	7.041 3.839	6.136 4.504	5.269 5.213	5.010 111.785	5.878	7.637	8.947	8.648	7.140
3000.0	6.426 5.932	7.591 4.957	7.597 3.967	6.593 3.664	5.497 4.504	4.691 5.415	4.874 110.386	6.138	7.825	8.918	8.583	7.211
3050.0	6.535 5.409	7.905 4.498	8.269 3.669	7.472 3.583	6.143 4.515	4.983 5.451	5.287 112.014	6.823	8.278	8.749	7.906	6.534
3100.0	6.659 5.069	8.284 4.378	9.200 3.830	9.204 3.925	8.203 4.768	6.322 5.562	5.842 118.801	7.121	8.413	8.570	7.416	6.031
3150.0	6.811 5.359	8.484 4.557	9.514 4.192	9.873 4.431	9.280 5.147	7.387 5.769	6.474 126.535	7.338	8.548	8.879	7.930	6.556
3200.0	7.064 5.601	8.648 4.587	9.535 4.531	9.666 5.085	9.061 5.717	7.657 6.128	6.983 132.693	7.790	9.082	9.572	8.746	7.235
3250.0	7.062 5.234	8.636 4.161	9.492 4.266	9.556 4.991	8.813 5.695	7.248 6.125	6.600 130.822	7.772	9.395	9.862	8.824	7.082
3300.0	7.072 4.881	8.725 4.056	9.832 4.254	10.459 4.984	10.246 5.691	8.543 6.125	7.357 133.476	8.052	9.266	9.360	8.117	6.450
3350.0	7.077 5.171	8.776 4.640	10.084 4.662	11.215 5.116	11.722 5.718	10.412 6.128	8.784 138.904	8.415	8.735	8.544	7.485	6.213
3400.0	7.077 6.183	8.780 6.133	10.128 5.674	11.425 5.438	12.170 5.786	11.149 6.135	9.738 147.216	9.160	9.111	8.826	7.732	6.562
3450.0	7.077 5.924	8.768 5.983	10.054 5.616	11.215 5.420	11.710 5.784	10.642 6.135	9.734 148.110	9.746	10.017	9.717	8.129	6.432
3500.0	7.077 5.507	8.770 5.755	10.064 5.531	11.240 5.397	11.774 5.782	10.778 6.135	9.893 147.828	9.951	10.302	9.888	7.968	6.010
3550.0	7.077 5.519	8.781 5.757	10.156 5.531	11.560 5.397	12.568 5.782	12.103 6.135	11.169 151.520	10.593	10.236	9.481	7.697	5.969
3600.0	7.077 6.139	8.783 6.070	10.198 5.642	11.746 5.427	13.063 5.785	13.064 6.135	12.372 157.141	11.421	10.337	9.313	7.928	6.634
3650.0	7.077 7.344	8.783 6.630	10.191 5.828	11.725 5.478	13.060 5.792	13.181 6.135	12.772 164.912	12.135	11.196	10.245	9.168	8.164
3700.0	7.077 7.211	8.783 6.554	10.172 5.799	11.635 5.473	12.848 5.792	12.828 6.135	12.466 164.573	12.203	11.655	10.664	9.240	8.030
3750.0	7.077 7.043	8.783 6.471	10.181 5.772	11.679 5.469	12.962 5.792	13.061 6.135	12.799 165.232	12.531	11.885	10.707	9.078	7.802
3800.0	7.077 7.085	8.783 6.497	10.198 5.782	11.774 5.470	13.230 5.792	13.581 6.135	13.483 167.695	13.064	12.070	10.710	9.102	7.854
3850.0	7.077 7.355	8.783 6.626	10.200 5.827	11.794 5.478	13.310 5.792	13.764 6.135	13.791 170.610	13.424	12.381	11.044	9.547	8.273
3900.0	7.077 7.802	8.783 6.817	10.200 5.893	11.791 5.491	13.303 5.792	13.781 6.135	13.909 175.234	13.769	13.057	11.995	10.566	9.068
3950.0	7.077 7.766	8.783 6.796	10.200 5.889	11.785 5.491	13.278 5.792	13.744 6.135	13.883 175.267	13.802	13.159	12.077	10.569	9.032
4000.0	7.077 7.732	8.783 6.783	10.200 5.887	11.791 5.491	13.307 5.792	13.809 6.135	13.990 175.507	13.917	13.230	12.079	10.521	8.976
4050.0	7.077 7.753	8.783 6.796	10.200 5.889	11.798 5.491	13.341 5.792	13.877 6.135	14.089 176.048	14.020	13.298	12.126	10.567	9.008
4100.0	7.077 7.829	8.783 6.829	10.200 5.895	11.798 5.491	13.347 5.792	13.894 6.135	14.126 176.997	14.106	13.444	12.323	10.769	9.153
4150.0	7.077 7.965	8.783 6.877	10.200 5.903	11.799 5.491	13.356 5.792	13.938 6.135	14.245 179.284	14.361	13.859	12.831	11.222	9.445
4200.0	7.077 7.967	8.783 6.876	10.200 5.903	11.799 5.491	13.411 5.792	13.952 6.135	14.279 179.583	14.419	13.931	12.893	11.260	9.461

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