Contract NAS9-13033
DRL No. T-815
DRL Line Item 7
DRD No. DM-055TB

NASA CR-
140375

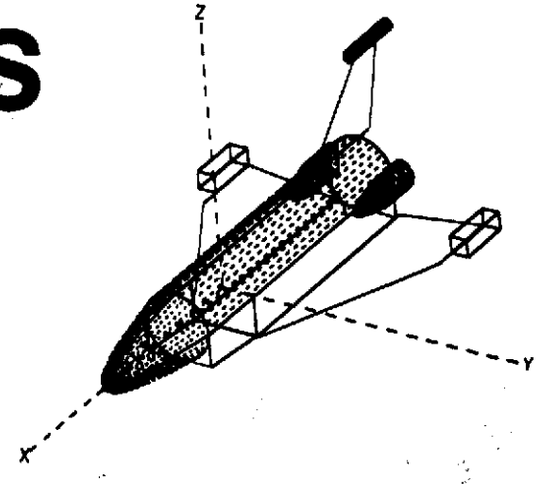
VOLUME 2

USER'S MANUAL
APPENDIX H

May
1973

Thermal Radiation Analysis System

T R A S Y S

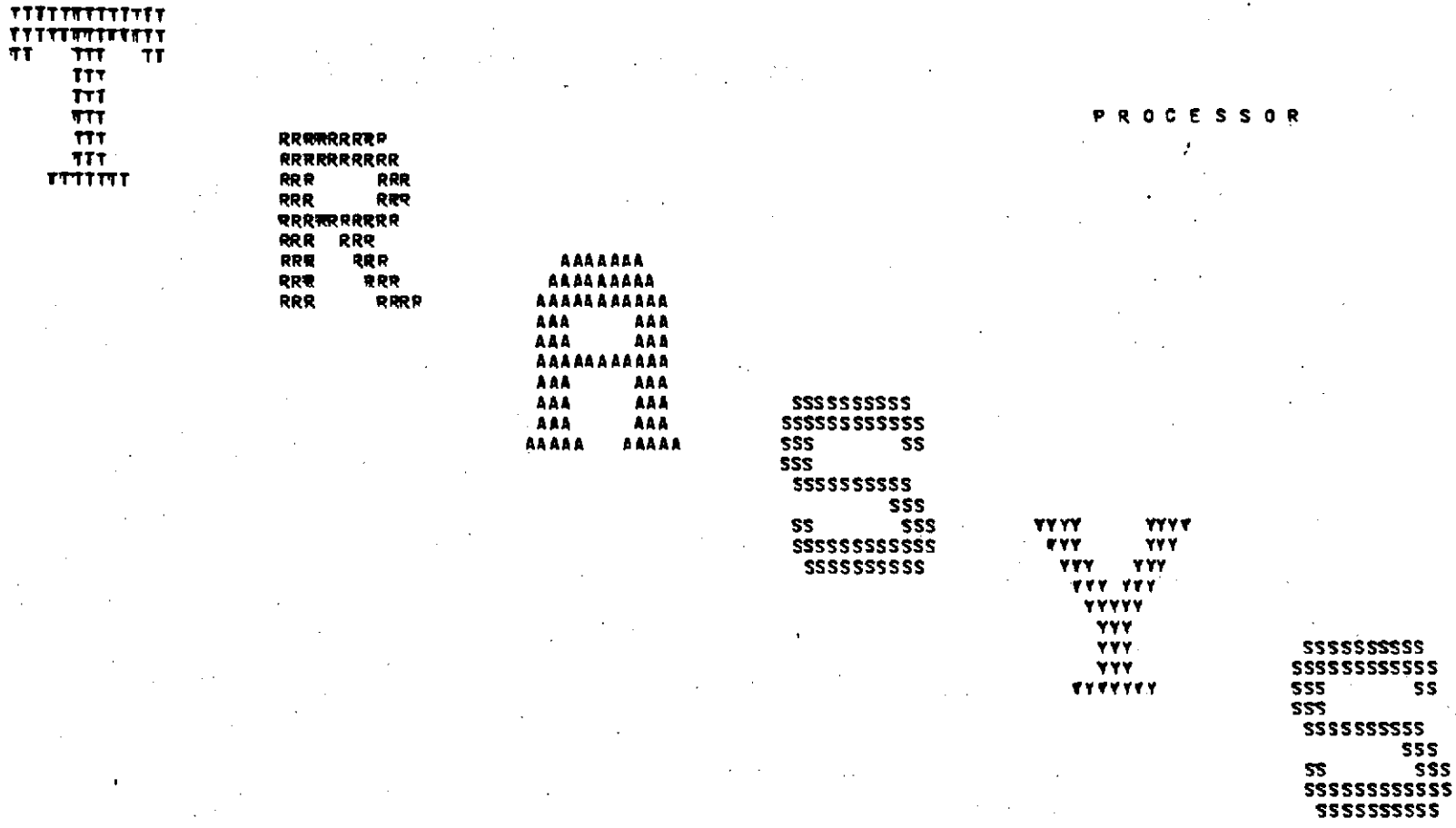


MARTIN MARIETTA

Appendix H
Sample Problems

```
HEADER  OPTIONS DATA
TITLE   SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS
HEADER  SURFACE DATA
BCS     BOX
S        SURF = 11,12,13,14,15,TYPE=BOX5,ACTIVE=IN,SHADE=BOTH
        BSHADE=BOTH,P1=2.,4.,2.,PROP=.9,.9,COM=*BOX 5 SIDES.*
S        SURF=21,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,TZ=-4.
        P1=2.,4.,0.,   COM=*RECTANGLE FACING BOX*
BCS     LID
S        SURF=30,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,P1=2.,4.,0.
        COM=*RECTANGLE LID OF BOX*
HEADER BCS DATA
BCS    BOX ,0.,0.,0.,0.,0.,0.
BCS    LID ,0.,0.,0.,0.,0.,0.
HEADER  OPERATIONS DATA
STEP  1
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
L     SFCAL
STEP  2
C     ROTATE LID 45.0 DEGREES ABOUT Y AXIS.
      CALL CHGBLK(LID,0.,0.,0.,2,1,3,0.,45.,0.)
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
L     SFCAL
END OF DATA
```

NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC6400-6500/NACE



NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM COS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

```
VIEW=3-D              SCALE=  .4620      VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =   135.0000
SECOND ROTATION ABOUT Y =    45.0000
THIRD ROTATION ABOUT  X =    45.0000

VIEW=Z-AXIS           SCALE=  .4620      VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =     0.
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.

VIEW=X-AXIS           SCALE=  .4620      VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =     0.
SECOND ROTATION ABOUT Y =    90.0000
THIRD ROTATION ABOUT  X =   -90.0000

VIEW=Y-AXIS           SCALE=  .4620      VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =   -90.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =    90.0000
```

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 11	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRARED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

CLOCK ANGLE

NODE 12	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRARED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 13	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

CLOCK ANGLE

NODE 14	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 15	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

CLOCK ANGLE

NODE 21	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.00	1.00	1.00	1.00	.92	.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.92	.92	1.00	1.00	1.00	41
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	60
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.00	1.00	1.00	1.00	.92	.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.92	.92	1.00	1.00	1.00	41
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	60
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE	30	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																					CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																					CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

PROCESSSING OPERATION DATA

NODE	DCS	AREA	ALPH	FMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
11	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
12	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
13	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
14	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
15	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
21	BOX	8.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE FACING BOX
30	LID	8.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE LID OF BOX

NCOF PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CCS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IRCTX, IRCTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

```
VIEW=3-D                SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =  135.0000
SECOND ROTATION ABOUT Y =   45.0000
THIRD ROTATION ABOUT  X =   45.0000

VIEW=Z-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    0.
SECOND ROTATION ABOUT Y =    0.
THIRD ROTATION ABOUT  X =    0.

VIEW=X-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    0.
SECOND ROTATION ABOUT Y =   90.0000
THIRD ROTATION ABOUT  X =  -90.0000

VIEW=Y-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =  -90.0000
SECOND ROTATION ABOUT Y =    0.
THIRD ROTATION ABOUT  X =   90.0000
```

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 11	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	.06	.08	.06	0	0	0	0	0	0	0	.06	.08	.06	0	0	0	120
	0	.22	.17	.33	.22	.14	.06	0	0	0	0	0	.06	.14	.22	.33	.17	.22	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	0	0	.06	.08	.06	0	0	0	0	0	0	0	.06	.08	.06	0	0	0	120
	0	.22	.17	.33	.22	.14	.06	0	0	0	0	0	.06	.14	.22	.33	.17	.22	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

CLOCK ANGLE

NODE 12	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	.14	.19	.25	.39	.17	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	.31	.35	.58	.61	.08	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	.58	.64	.61	.36	.06	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	.14	.19	.25	.39	.17	0	0	0	0	0	0	0	0	0	0	0	0	0	104
	0	.31	.35	.58	.61	.08	0	0	0	0	0	0	0	0	0	0	0	0	0	120
	0	.58	.64	.61	.36	.06	0	0	0	0	0	0	0	0	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 13	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	.28	.14	.06	0	0	0	.06	.14	.28	0	0	0	0	0	104
	0	0	0	0	0	.53	.22	.06	.03	0	.03	.06	.22	.53	0	0	0	0	0	120
	0	0	0	0	0	.81	.22	.11	.03	0	.03	.11	.22	.81	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	.28	.14	.06	0	0	0	.06	.14	.28	0	0	0	0	0	104
	0	0	0	0	0	.53	.22	.06	.03	0	.03	.06	.22	.53	0	0	0	0	0	120
	0	0	0	0	0	.81	.22	.11	.03	0	.03	.11	.22	.81	0	0	0	0	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

CLOCK ANGLE

NODE 14	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	.17	.39	.25	.19	.14	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	.08	.61	.58	.36	.31	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	.06	.36	.61	.64	.58	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
SOLAR SHADOW TABLE																				CONE ANGLE
	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	41
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
	0	0	0	0	0	0	0	0	0	0	0	0	0	.17	.39	.25	.19	.14	0	104
	0	0	0	0	0	0	0	0	0	0	0	0	0	.08	.61	.58	.36	.31	0	120
	0	0	0	0	0	0	0	0	0	0	0	0	0	.06	.36	.61	.64	.58	0	139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180

SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

CLOCK ANGLE

NODE 15 — 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360

INFRA RED SHADOW TABLE — CONE ANGLE

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	41
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
.25	.22	.22	.28	.22	0	0	0	0	0	0	0	0	0	.22	.28	.22	.22	.25	120
.50	.47	.58	.61	.14	0	0	0	0	0	0	0	0	0	.14	.61	.58	.47	.50	139
1.00	.69	.64	.17	.11	0	0	0	0	0	0	0	0	0	.11	.17	.64	.69	1.00	180
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

SOLAR SHADOW TABLE — CONE ANGLE

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	41
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
.25	.22	.22	.28	.22	0	0	0	0	0	0	0	0	0	.22	.28	.22	.22	.25	120
.50	.47	.58	.61	.14	0	0	0	0	0	0	0	0	0	.14	.61	.58	.47	.50	139
1.00	.69	.64	.17	.11	0	0	0	0	0	0	0	0	0	.11	.17	.64	.69	1.00	180
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

CLOCK ANGLE

NODE 21 — 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360

INFRA RED SHADOW TABLE — CONE ANGLE

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.00	1.00	1.00	.86	.81	.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.75	.81	.86	1.00	1.00	1.00	41
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	60
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

SOLAR SHADOW TABLE — CONE ANGLE

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.00	1.00	1.00	.86	.81	.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.75	.81	.86	1.00	1.00	1.00	41
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	60
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

```
HEADER  OPTIONS DATA
TITLE   SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.
HEADER  SURFACE DATA
BCS     BOX
S        SURF = 11,12,13,14,15,TYPE=BOXS,ACTIVE=IN,SHADE=BOTH
        BSHADE=BOTH,P1=2.,4.,2.,PROP=.9,.9,COM=*BOX 5 SIDES.*
S        SURF=21,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,TZ=-4.
        P1=2.,4.,0.,   COM=*RECTANGLE FACING BOX*
BCS     LID
S        SURF=30,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,P1=2.,4.,0.
        COM=*RECTANGLE LID OF BOX*
HEADER BCS DATA
BCS    BOX ,0.,0.,0.,0.,0.,0.
BCS    LID ,0.,0.,0.,0.,0.,0.
HEADER  OPERATIONS DATA
STEP  1
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
      CALL FFDATA(0.,0.,0.,0.,0.,0.,3HPUN)
L     FFCAL
      CALL GBDATA(1,2HIR)
C     CALCULATE GREY BODIES
L     GBCAL
      CALL RKDATA(1,3HPUN,0.,1,2HNO,0,0.,1.,2HNO)
C     CALCULATE RADKS.
L     RKCAL
STEP  2
C     ROTATE LID 45.0 DEGREES ABOUT Y AXIS.
      CALL CHGELK(LID,0.,0.,0.,2,1,3,0.,-5.,0.)
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
L     FFCAL
      CALL GBDATA(2,2HIR)
L     GBCAL
      CALL RKDATA(2,3HPUN,0.,1,5HSPACE,32767,0.,1.,2HNO)
L     RKCAL
END OF DATA
```

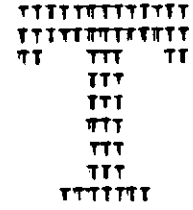
SAMPLE CASE FOR SHADOW FACTOR CALCULATIONS

SHADOW FACTOR GENERATOR LINK

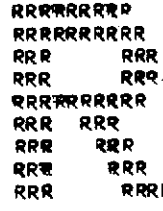
CLOCK ANGLE

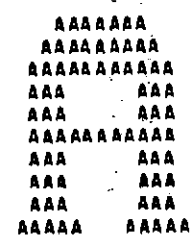
NODE	30	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
INFRA RED SHADOW TABLE																					CONE ANGLE
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.25	.28	.31	.14	.14	.14	.14	.11	.06	0	.06	.11	.14	.14	.14	.14	.14	.31	.28	.25	41
	.50	.53	.53	.42	.31	.31	.28	0	0	0	0	0	.28	.31	.31	.42	.53	.53	.50		60
	.75	.78	.78	.64	.67	.67	0	0	0	0	0	0	0	.67	.67	.64	.78	.78	.75		75
	1.00	1.00	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00	1.00	1.00		90
	1.00	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00	1.00		104
	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00		120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		180
SOLAR SHADOW TABLE																					CONE ANGLE
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	.25	.28	.31	.14	.14	.14	.14	.11	.06	0	.06	.11	.14	.14	.14	.14	.14	.31	.28	.25	41
	.50	.53	.53	.42	.31	.31	.28	0	0	0	0	0	.28	.31	.31	.42	.53	.53	.50		60
	.75	.78	.78	.64	.67	.67	0	0	0	0	0	0	0	.67	.67	.64	.78	.78	.75		75
	1.00	1.00	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00	1.00	1.00		90
	1.00	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00	1.00		104
	1.00	1.00	1.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1.00	1.00		120
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		139
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		180

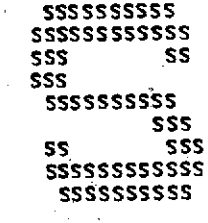
NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC6400-6500/MACE

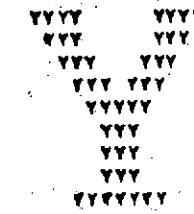


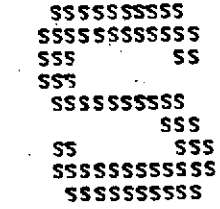
PROCESSOR











NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H?-D 1HX 1HY 1H? 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CRS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)
```

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

VIEW=3-D SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 135.0000
SECOND ROTATION ABOUT Y = 45.0000
THIRD ROTATION ABOUT X = 45.0000

VIEW=Z-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 0.

VIEW=X-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 90.0000
THIRD ROTATION ABOUT X = -90.0000

VIEW=Y-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = -90.0000
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 90.0000

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.000E+01	.90	.90
12	4.000E+01	.90	.90
13	8.000E+01	.90	.90
14	4.000E+01	.90	.90
15	8.000E+01	.90	.90
21	8.000E+01	.90	.90
30	8.000E+01	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADKS.

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.609	*
11	13	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	5.978	*
11	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	8.572	*
11	15	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	11.942	*
11	30	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	14.057	
11	FF SUM =	1.0543	ROW CP TIME =	14.062		- RECT	BOX 5 SIDES.			
12	13	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.615	*
12	14	CAL.	.069370	.069370	.069370	.069370	1.000000	1.000000	2.900	
12	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.521	*
12	30	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	8.485	*
12	FF SUM =	1.0536	ROW CP TIME =	8.491		- RECT	BOX 5 SIDES.			
13	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.615	*
13	15	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	4.220	
13	30	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	8.200	*
13	FF SUM =	1.0543	ROW CP TIME =	8.205		- RECT	BOX 5 SIDES.			
14	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.624	*
14	30	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.591	*
14	FF SUM =	1.0536	ROW CP TIME =	5.597		- RECT	BOX 5 SIDES.			
15	30	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	3.974	*
15	FF SUM =	1.0543	ROW CP TIME =	3.979		- RECT	BOX 5 SIDES.			
21	FF SUM =	0.	ROW CP TIME =	.049		+ RECT	RECTANGLE FACING BOX			
30	FF SUM =	1.0543	ROW CP TIME =	.007		+ RECT	RECTANGLE LID OF BOX			

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK 5.

FORM FACTOR CALCULATION LINK.

TOTAL CP TIME (SEC) FOR PROBLEM = 40.479

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM
11 = 1.0542714	12 = 1.0535630	13 = 1.0542714	14 = 1.0535630	15 = 1.0542714	21 = 0.	
31 = 1.0542714						

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

RADIATION CONDUCTOR LINK.

PUNCHED RADKS -	1,	11,	12,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	2,	11,	13,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	3,	11,	14,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	4,	11,	15,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	5,	11,	30,	1.7130000E-09*	2.0238494E+00	$ RADK
PUNCHED RADKS -	6,	12,	13,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	7,	12,	14,	1.7130000E-09*	2.0879439E-01	$ RADK
PUNCHED RADKS -	8,	12,	15,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	9,	12,	30,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	10,	13,	14,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	11,	13,	15,	1.7130000E-09*	2.0238494E+00	$ RADK
PUNCHED RADKS -	12,	13,	30,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	13,	14,	15,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	14,	14,	30,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	15,	15,	30,	1.7130000E-09*	1.8325188E+00	$ RADK

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
11	BOX	3.600E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
12	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
13	BOX	3.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
14	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
15	BOX	3.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
21	BOX	3.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE FACING BOX
70	LID	3.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE LID OF BOX

NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3HR-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM OCS ORIGIN IN USER'S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL NDATA (NV, IVU, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)
```

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NONE PLOTTER DATA OUTPUT

VIEW=Z-D SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 135.0000
SECOND ROTATION ABOUT Y = 45.0000
THIRD ROTATION ABOUT X = 45.0000

VIEW=Z-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 0.

VIEW=X-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 90.0000
THIRD ROTATION ABOUT X = -90.0000

VIEW=Y-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = -90.0000
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 90.0000

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.00E+01	.90	.90
12	4.00E+00	.90	.90
13	8.00E+01	.90	.90
14	4.00E+01	.90	.90
15	8.00E+01	.90	.90
21	8.00E+01	.90	.90
40	8.00E+01	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. F FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.621	*
11	13	CAL.	.259166	.259166	.259166	.259166	1.000000	1.000000	5.998	*
11	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	8.597	*
11	15	CAL.	.259166	.259166	.259166	.259166	1.000000	1.000000	11.975	*
11	21	CAL.	.015772	.015772	.015772	.661487	.256510	.256510	12.181	
11	30	CAL.	.166374	.166374	.166374	.166374	1.000000	1.000000	13.049	
11	FF SUM =	.9463	ROW CP TIME =	13.055		- RECT	BOX 5 SIDES.			
12	13	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.626	*
12	14	CAL.	.069570	.069570	.069570	.069570	1.000000	1.000000	2.915	
12	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.537	*
12	30	CAL.	.133519	.066759	.133519	.133519	1.000000	1.000000	8.911	*
12	FF SUM =	.9411	ROW CP TIME =	8.916		- RECT	BOX 5 SIDES.			
13	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.616	*
13	15	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	4.229	
13	21	CAL.	.016491	.016491	.016491	.016491	1.000000	1.000000	4.352	
13	31	CAL.	.194749	.194749	.194749	.194749	1.000000	1.000000	5.221	
13	FF SUM =	1.0064	ROW CP TIME =	5.227		- RECT	BOX 5 SIDES.			
14	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.630	*
14	30	CAL.	.133519	.066759	.133519	.133519	1.000000	1.000000	6.003	*
14	FF SUM =	.9411	ROW CP TIME =	6.008		- RECT	BOX 5 SIDES.			
15	31	CAL.	.065660	.065660	.065660	.065660	1.000000	1.000000	.867	*
15	FF SUM =	.8609	ROW CP TIME =	.873		- RECT	BOX 5 SIDES.			
21	FF SUM =	.0723	ROW CP TIME =	.053		+ RECT	RECTANGLE FACING BOX			
30	FF SUM =	.5603	ROW CP TIME =	.007		+ RECT	RECTANGLE LID OF BOX			

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

FORM FACTOR CALCULATION LINK.

TOTAL SP TIME (SEC) FOR PROBLEM = 34.238

SAMPLE CASE FOR FORM FACTORS, GREY BODIES, AND RADK S.

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM
11 -	.9462739	12 -	.3410833	13 -	1.0064454	14 -	.9410833	15 -	.6608656	21 -	.1322631
30 -	.5603114										

RADIATION CONDUCTOR LINK.

PUNCHED RADKS -	1,	11,	12,	1.71300000E-09*	8.56652935E-01	$ RADK
PUNCHED RADKS -	2,	11,	13,	1.71300000E-09*	1.79924695E+00	$ RADK
PUNCHED RADKS -	3,	11,	14,	1.71300000E-09*	8.56652935E-01	$ RADK
PUNCHED RADKS -	4,	11,	15,	1.71300000E-09*	1.78486475E+00	$ RADK
PUNCHED RADKS -	5,	11,	21,	1.71300000E-09*	1.05413566E-01	$ RADK
PUNCHED RADKS -	6,	11,	30,	1.71300000E-09*	1.19038356E+00	$ RADK
PUNCHED RADKS -	7,	12,	13,	1.71300000E-09*	8.61556585E-01	$ RADK
PUNCHED RADKS -	8,	12,	14,	1.71300000E-09*	2.60493236E-01	$ RADK
PUNCHED RADKS -	9,	12,	15,	1.71300000E-09*	8.54610336E-01	$ RADK
PUNCHED RADKS -	10,	12,	21,	1.71300000E-09*	2.77025416E-03	$ RADK
PUNCHED RADKS -	11,	12,	30,	1.71300000E-09*	4.73189506E-01	$ RADK
PUNCHED RADKS -	12,	13,	14,	1.71300000E-09*	8.60550586E-01	$ RADK
PUNCHED RADKS -	13,	13,	15,	1.71300000E-09*	1.98281606E+00	$ RADK
PUNCHED RADKS -	14,	13,	21,	1.71300000E-09*	1.09984126E-01	$ RADK
PUNCHED RADKS -	15,	13,	30,	1.71300000E-09*	1.33126766E+00	$ RADK
PUNCHED RADKS -	16,	14,	15,	1.71300000E-09*	8.54610336E-01	$ RADK
PUNCHED RADKS -	17,	14,	21,	1.71300000E-09*	2.77025416E-03	$ RADK
PUNCHED RADKS -	18,	14,	30,	1.71300000E-09*	4.73189506E-01	$ RADK
PUNCHED RADKS -	19,	15,	21,	1.71300000E-09*	6.03462285E-03	$ RADK
PUNCHED RADKS -	20,	15,	30,	1.71300000E-09*	5.17585316E-01	$ RADK
PUNCHED RADKS -	21,	21,	30,	1.71300000E-09*	4.00966176E-03	$ RADK
PUNCHED RADKS -	22,	11,	32767,	1.71300000E-09*	4.92784886E-01	$ RADK
PUNCHED RADKS -	23,	12,	32767,	1.71300000E-09*	2.55169436E-01	$ RADK
PUNCHED RADKS -	24,	13,	32767,	1.71300000E-09*	8.29956896E-02	$ RADK
PUNCHED RADKS -	25,	14,	32767,	1.71300000E-09*	2.55169436E-01	$ RADK
PUNCHED RADKS -	26,	15,	32767,	1.71300000E-09*	1.03043776E+00	$ RADK
PUNCHED RADKS -	27,	21,	32767,	1.71300000E-09*	6.96861996E+00	$ RADK
PUNCHED RADKS -	28,	30,	32767,	1.71300000E-09*	3.18935626E+00	$ RADK

```
HEADER   OPTIONS DATA
TITLE    SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.
HEADER   SURFACE DATA
BCS      BOX
S         SURF = 11,12,13,14,15,TYPE=BOX5,ACTIVE=IN,SHADE=BOTH
         BSHADE=BOTH,P1=2.,4.,2.,PROP=.9,.9,COM=*BOX 5 SIDES.*
S         SURF=21,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,TZ=-4.
         P1=2.,4.,0.,   COM=*RECTANGLE FACING BOX*
BCS      LID
S         SURF=30,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,P1=2.,4.,0.
         COM=*RECTANGLE LID OF BOX*
HEADER BCS DATA
BCS     BOX ,0.,0.,0.,0.,0.,0.
BCS     LID ,0.,0.,0.,0.,0.,0.
HEADER FORM FACTORS
NODEA=   11,   12,   13,   14,   15,   21,   30,
      END
STEPN=    1
INITL= -1.0
          11,   11,    0.
          11,   12,    9.8399310979E-01
          11,   13,    2.0725267181E+00
          11,   14,    9.8399310977E-01
          11,   15,    2.0725267182E+00
          11,   21,    0.
          11,   30,    2.3211312132E+00
          12,   12,    0.
          12,   13,    9.8399310979E-01
          12,   14,    2.7827964782E-01
          12,   15,    9.8399310979E-01
          12,   21,    0.
          12,   30,    9.8399310979E-01
          13,   13,    0.
          13,   14,    9.8399310977E-01
          13,   15,    2.3211312132E+00
          13,   21,    0.
          13,   30,    2.0725267182E+00
          14,   14,    0.
          14,   15,    9.8399310977E-01
          14,   21,    0.
          14,   30,    9.8399310977E-01
          15,   15,    0.
          15,   21,    0.
          15,   30,    2.0725267182E+00
          21,   21,    0.
          21,   30,    0.
          30,   30,    0.
 NODEA=   11,   12,   13,   14,   15,   21,   30,
       END
 STEPN=    2
 INITL= -1.0
          11,   11,    0.
          11,   12,    9.8399310979E-01
          11,   13,    2.0725267181E+00
          11,   14,    9.8399310977E-01
          11,   15,    2.0725267182E+00
          11,   21,    1.2617c51967E-01
          11,   30,    1.3309906752E+00
          12,   12,    0.
          12,   13,    9.8399310979E-01
          12,   14,    2.7827964782E-01
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          12,    15,     9.8399310979E-01
          12,    21,     0.
          12,    30,     5.3407441034E-01
          13,    13,     0.
          13,    14,     9.8399310977E-01
          13,    15,     2.3211312132E+00
          13,    21,     1.3192804224E-01
          13,    30,     1.5579902957E+00
          14,    14,     0.
          14,    15,     9.8399310977E-01
          14,    21,     0.
          14,    30,     5.3407441035E-01
          15,    15,     0.
          15,    21,     0.
          15,    30,     5.2528068649E-01
          21,    21,     0.
          21,    30,     0.
          30,    30,     0.
HEADER  OPERATIONS DATA
STEP  1
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
      CALL FFDATA(0.,0.,0.,0.,0.,0.,3HPUN)
L     FFCAL
      CALL GBDATA(1,2HIR)
C     CALCULATE GREY BODIES.
L     GBCAL
      CALL RKDATA(1,3HPUN,0.,1,2HNO,0,0.,1.,2HNO)
C     CALCULATE RADKS.
L     RKCAL
STEP  2
C     ROTATE LID 45.0 DEGREES ABOUT Y AXIS.
      CALL CHGELK(LID,0.,0.,0.,2,1,3,0.,45.,0.)
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
L     FFCAL
      CALL GBDATA(2,2HIR)
L     GBCAL
      CALL RKDATA(2,3HPUN,0.,1,5HSPACE,32767,0.,1.,2HNO)
L     RKCAL
END OF DATA
```
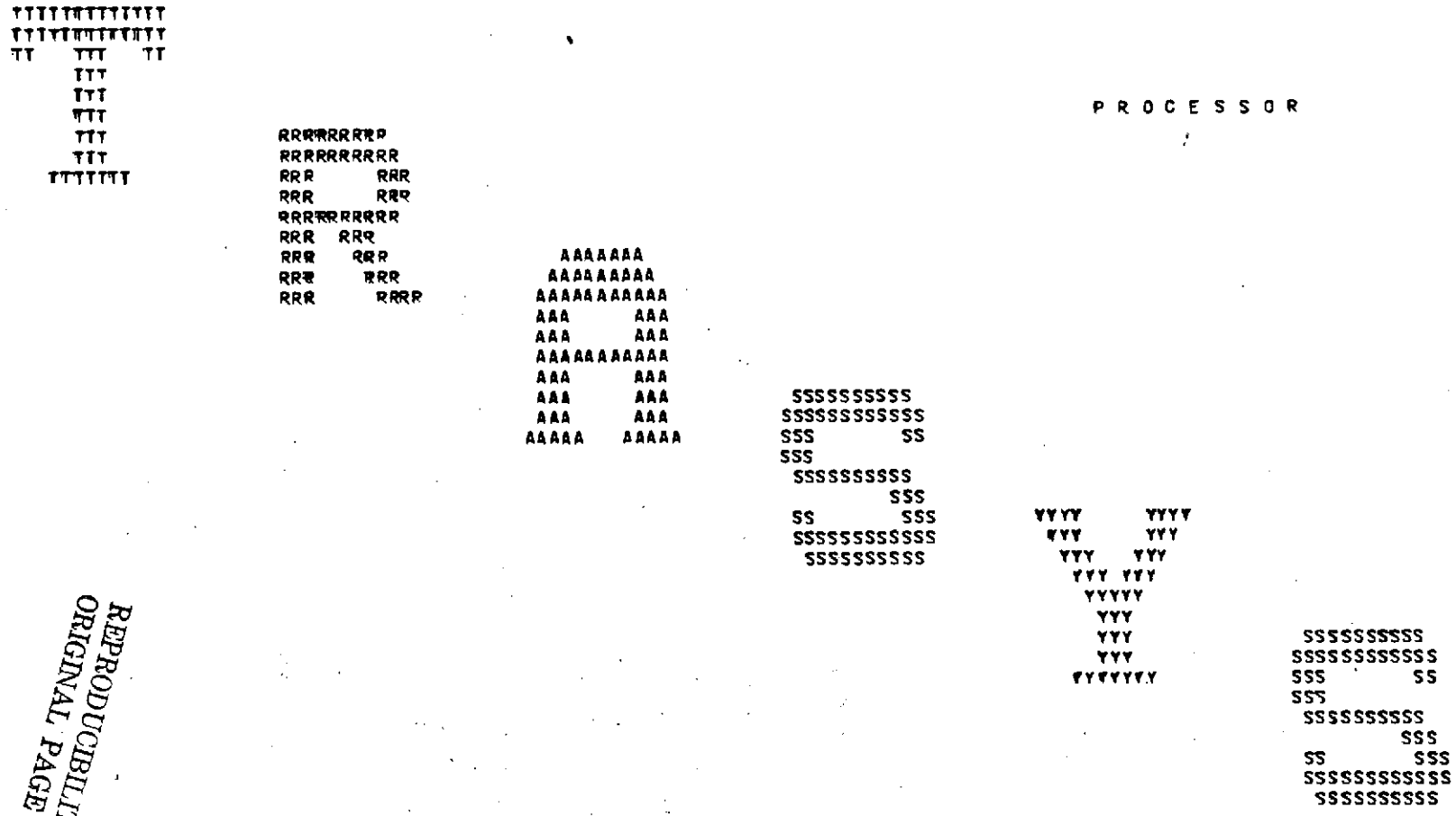

NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC6400-6500/MACE



NODF PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-5	1
IVU	VIEW	3HALL 7H3-D 1HX 1HY 1H7 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

```
VIEW=3-D                SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =  135.0000
SECOND ROTATION ABOUT Y =   45.0000
THIRD ROTATION ABOUT  X =   45.0000

VIEW=Z-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    0.
SECOND ROTATION ABOUT Y =    0.
THIRD ROTATION ABOUT  X =    0.

VIEW=X-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    0.
SECOND ROTATION ABOUT Y =   90.0000
THIRD ROTATION ABOUT  X =  -90.0000

VIEW=Y-AXIS             SCALE=  .4620        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =  -90.0000
SECOND ROTATION ABOUT Y =    0.
THIRD ROTATION ABOUT  X =   90.0000
```

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RACK S.

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.000E+01	.90	.90
12	4.000E+01	.90	.90
13	8.000E+01	.90	.90
14	4.000E+01	.90	.90
15	8.000E+01	.90	.90
44	8.000E+01	.90	.90
31	8.000E+01	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) NO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CARDS	.122999	.245998	.122999	0.	0.	0.	.016	
11	13	CARDS	.259066	.259066	.259066	0.	0.	0.	.021	
11	14	CARDS	.122999	.245998	.122999	0.	0.	0.	.025	
11	15	CARDS	.259066	.259066	.259066	0.	0.	0.	.030	
11	30	CARDS	.290141	.290141	.290141	0.	0.	0.	.036	
11	FF SUM =	1.0543	ROW CP TIME =		.040		- RECT		BOX 5 SIDES.	
12	13	CARDS	.245998	.122999	.245998	0.	0.	0.	.007	
12	14	CARDS	.069570	.069570	.069570	0.	0.	0.	.012	
12	15	CARDS	.245998	.122999	.245998	0.	0.	0.	.017	
12	30	CARDS	.245998	.122999	.245998	0.	0.	0.	.022	
12	FF SUM =	1.0536	ROW CP TIME =		.027		- RECT		BOX 5 SIDES.	
13	14	CARDS	.122999	.245998	.122999	0.	0.	0.	.007	
13	15	CARDS	.290141	.290141	.290141	0.	0.	0.	.011	
13	30	CARDS	.259066	.259066	.259066	0.	0.	0.	.017	
13	FF SUM =	1.0543	ROW CP TIME =		.022		- RECT		BOX 5 SIDES.	
14	15	CARDS	.245998	.122999	.245998	0.	0.	0.	.006	
14	30	CARDS	.245998	.122999	.245998	0.	0.	0.	.011	
14	FF SUM =	1.0536	ROW CP TIME =		.015		- RECT		BOX 5 SIDES.	
15	30	CARDS	.259066	.259066	.259066	0.	0.	0.	.006	
15	FF SUM =	1.0543	ROW CP TIME =		.011		- RECT		BOX 5 SIDES.	
21	FF SUM =	0.	ROW CP TIME =		.007		+ RECT		RECTANGLE FACING BOX	
30	FF SUM =	1.0543	ROW CP TIME =		.005		+ RECT		RECTANGLE LID OF BOX	

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

TOTAL CP TIME (SEC) FOR PROBLEM = .218

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND BACK S.

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM
11 = 1.0542714	12 = 1.053563u	13 = 1.0542714	14 = 1.0535630	15 = 1.0542714	21 = 0.	
30 = 1.0542714						

RADIATION CONDUCTOR LINK.

PUNCHED RADKS -	1,	11,	12,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	2,	11,	13,	1.713[illegible]E-09*	1.8325198E+00	$ RADK
PUNCHED RADKS -	3,	11,	14,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	4,	11,	15,	1.713[illegible]E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	5,	11,	30,	1.713[illegible]E-09*	2.0238484E+00	$ RADK
PUNCHED RADKS -	6,	12,	13,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	7,	12,	14,	1.713[illegible]E-09*	2.6879439E-01	$ RADK
PUNCHED RADKS -	8,	12,	15,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	9,	12,	30,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	10,	13,	14,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	11,	13,	15,	1.713[illegible]E-09*	2.0238484E+00	$ RADK
PUNCHED RADKS -	12,	13,	30,	1.713[illegible]E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	13,	14,	15,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	14,	14,	30,	1.713[illegible]E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	15,	15,	30,	1.713[illegible]E-09*	1.8325188E+00	$ RADK

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

PROCESSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
11	BOX	1.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
12	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
13	BOX	3.000E+01	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
14	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
15	BOX	3.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
24	BOX	3.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE FACING BOX
33	LID	1.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE LID OF BOX

NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM ORIGIN IN USER'S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

CALL NDATA (NV, IVU, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTED DATA OUTPUT

VIEW=3-D SCALE= .4623 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 135.0000
SECOND ROTATION ABOUT Y = 45.0000
THIRD ROTATION ABOUT X = 45.0000

VIEW=Z-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 0.

VIEW=X-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 90.0000
THIRD ROTATION ABOUT X = -90.0000

VIEW=Y-AXIS SCALE= .4620 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = -90.0000
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 90.0000

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.000E+01	.90	.90
12	4.000E+01	.90	.90
13	8.000E+01	.90	.90
14	4.000E+01	.90	.90
15	8.000E+01	.90	.90
21	8.000E+01	.90	.90
70	8.000E+01	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CARDS	.122999	.245998	.122999	0.	0.	0.	.014	
11	13	CARDS	.259066	.259066	.259066	0.	0.	0.	.019	
11	14	CARDS	.122999	.245998	.122999	0.	0.	0.	.024	
11	15	CARDS	.259066	.259066	.259066	0.	0.	0.	.029	
11	21	CARDS	.015772	.015772	.015772	0.	0.	0.	.037	
11	30	CARDS	.166374	.166374	.166374	0.	0.	0.	.042	
11	FF SUM =	.9463	ROW CP TIME =	.047		- RECT		BOX 5 SIDES.		
12	13	CARDS	.245998	.122999	.245998	0.	0.	0.	.006	
12	14	CARDS	.069577	.069577	.069577	0.	0.	0.	.011	
12	15	CARDS	.245998	.122999	.245998	0.	0.	0.	.016	
12	30	CARDS	.133519	.066759	.133519	0.	0.	0.	.021	
12	FF SUM =	.9411	ROW CP TIME =	.026		- RECT		BOX 5 SIDES.		
13	14	CARDS	.122999	.245998	.122999	0.	0.	0.	.005	
13	15	CARDS	.290141	.290141	.290141	0.	0.	0.	.010	
13	21	CARDS	.016491	.016491	.016491	0.	0.	0.	.015	
13	30	CARDS	.194749	.194749	.194749	0.	0.	0.	.020	
13	FF SUM =	1.0064	ROW CP TIME =	.025		- RECT		BOX 5 SIDES.		
14	15	CARDS	.245998	.122999	.245998	0.	0.	0.	.008	
14	30	CARDS	.133519	.066759	.133519	0.	0.	0.	.013	
14	FF SUM =	.9411	ROW CP TIME =	.017		- RECT		BOX 5 SIDES.		
15	30	CARDS	.065660	.065660	.065660	0.	0.	0.	.007	
15	FF SUM =	.8609	ROW CP TIME =	.011		- RECT		BOX 5 SIDES.		
21	FF SUM =	.0323	ROW CP TIME =	.007		+ RECT		RECTANGLE FACING BOX		
30	FF SUM =	.9613	ROW CP TIME =	.007		+ RECT		RECTANGLE LID OF BOX		

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

TOTAL CP TIME (SEC) FOR PROBLEM = .252

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADK S.

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM NODE I =	FF SUM
11 =	.9462759	12 = .9410833	13 = 1.0064454	14 = .9410833	15 = .8608656	21 = .0322631	
3u =	.5503014						

SAMPLE CASE FOR FORM FACTOR RESTART, GREY BODIES AND RADKS.

RADIATION CONDUCTOR LINK.

PUNCHED RADKS -	1,	11,	12,	1.7130C00E-09*	8.9665293E-01	$ RADK
PUNCHED RADKS -	2,	11,	13,	1.7130C00E-09*	1.7992469E+00	$ RADK
PUNCHED RADKS -	3,	11,	14,	1.7130C00E-09*	8.9665293E-01	$ RADK
PUNCHED RADKS -	4,	11,	15,	1.7130C00E-09*	1.7846475E+00	$ RADK
PUNCHED RADKS -	5,	11,	21,	1.7130C00E-09*	1.0341356E-01	$ RADK
PUNCHED RADKS -	6,	11,	30,	1.7130C00E-09*	1.1503035E+00	$ RADK
PUNCHED RADKS -	7,	12,	13,	1.7130C00E-09*	8.6955058E-01	$ RADK
PUNCHED RADKS -	8,	12,	14,	1.7130C00E-09*	2.6345323E-01	$ RADK
PUNCHED RADKS -	9,	12,	15,	1.7130C00E-09*	9.5461913E-01	$ RADK
PUNCHED RADKS -	10,	12,	21,	1.7130C00E-09*	2.7702541E-03	$ RADK
PUNCHED RADKS -	11,	12,	30,	1.7130C00E-09*	4.7318950E-01	$ RADK
PUNCHED RADKS -	12,	13,	14,	1.7130C00E-09*	8.6955058E-01	$ RADK
PUNCHED RADKS -	13,	13,	15,	1.7130C00E-09*	1.9820160E+00	$ RADK
PUNCHED RADKS -	14,	13,	21,	1.7130C00E-09*	1.0998412E-01	$ RADK
PUNCHED RADKS -	15,	13,	30,	1.7130C00E-09*	1.3312676E+00	$ RADK
PUNCHED RADKS -	16,	14,	15,	1.7130C00E-09*	8.9461033E-01	$ RADK
PUNCHED RADKS -	17,	14,	21,	1.7130C00E-09*	2.7702541E-03	$ RADK
PUNCHED RADKS -	18,	14,	30,	1.7130C00E-09*	4.7318950E-01	$ RADK
PUNCHED RADKS -	19,	15,	21,	1.7130C00E-09*	6.0846228E-03	$ RADK
PUNCHED RADKS -	20,	15,	30,	1.7130C00E-09*	5.1758531E-01	$ RADK
PUNCHED RADKS -	21,	21,	30,	1.7130C00E-09*	4.0196617E-03	$ RADK
PUNCHED RADKS -	22,	11,	32767,	1.7130C00E-09*	4.9278488E-01	$ RADK
PUNCHED RADKS -	23,	12,	32767,	1.7130C00E-09*	2.5216943E-01	$ RADK
PUNCHED RADKS -	24,	13,	32767,	1.7130C00E-09*	8.2995688E-12	$ RADK
PUNCHED RADKS -	25,	14,	32767,	1.7130C00E-09*	2.5216943E-01	$ RADK
PUNCHED RADKS -	26,	15,	32767,	1.7130C00E-09*	1.0904377E+00	$ RADK
PUNCHED RADKS -	27,	21,	32767,	1.7130C00E-09*	6.9686199E+00	$ RADK
PUNCHED RADKS -	28,	30,	32767,	1.7130C00E-09*	3.1897562E+00	$ RADK

```
HEADER  OPTIONS DATA
TITLE   SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS
HEADER  ARRAY DATA
C       ARRAY OF STEP NUMBERS USED IN GOCAL COMPUTATION.
        IOCAR1 =1,2,3,4
        IOCAR2 =5,6,7,8
HEADER  SURFACE DATA
BCS     BOX
S        SURF = 11,12,13,14,15,TYPE=BOX5,ACTIVE=IN,SHADE=BOTH
        BSHADE=BOTH,P1=2.,4.,2.,PROP=.9,.9,COM=*BOX 5 SIDES.*
S        SURF=21,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,TZ=-4.
        P1=2.,4.,0.,   COM=*RECTANGLE FACING BO)*
BCS     LID
S        SURF=30,TYPE=RECT,ACTIVE=TOP,PROP=.9,.9,P1=2.,4.,0.
        COM=*RECTANGLE LID OF BOX*
HEADER BCS DATA
BCS     BOX ,0.,0.,0.,0.,0.,0.
BCS     LID ,0.,0.,0.,0.,0.,0.
HEADER  OPERATIONS DATA
STEP  1
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
      CALL FFDATA(0.,0.,0.,0.,0.,0.,3HPUN)
L     FFCAL
      CALL GBDATA(1,4HBOTH)
C     CALCULATE GREY BODIES.
L     GRCAL
      CALL RKDATA(1,3HPUN,0.,1,2HNO,0,0.,1.,2HNO)
C     CALCULATE RADKS.
L     RKCAL
C     DEFINE ORBIT AND VEHICLE ORIENTATION
      CALL ORBIT2(3HEAR,30.,60.,0.,0.,220.*6080.,0.)
      CALL ORIENT(3HSUN,1,2,3,0.,0.,0.)
      CALL DDATAS(1,5HDIGMA,0.,0.,0.,30.,0.,0.)
L     DPLOT
C     CALCULATE DIRECT FLUXES
L     DICAL
C     CALCULATE ABSORBED Q
L     AQCAL
STEP  2
      TRUEAN        =120.
L     DPLOT
      ISKPSO        =6HSKIPSO
L     DICAL
      CALL AQDATA(1,2,2,1,1)
L     AQCAL
STEP  3
      TRUEAN        =210.
L     DPLOT
      ISKPSO        =2HNO
L     DICAL
      CALL AQDATA(3,3,3,1,1)
L     AQCAL
STEP  4
      TRUEAN        =300.
L     DPLOT
      ISKPSO        =6HSKIPSO
L     DICAL
      CALL AQDATA(1,4,4,1,1)
      AQCAL
```

```
      CALL GODATA(IQGAR1,1,2HNO,3HPUN,0,0,0,0,3HTAB,0)
L     GOCAL
STEP  5
C     ROTATE LID 45.0 DEGREES ABOUT Y AXIS.
      CALL CHGBLK(LID,0.,0.,0.,2,1,3,0.,45.,0.)
      CALL BUILDC(BOX)
      CALL ADD(LID)
L     NPLOT
L     FFCAL
      CALL GBDATA(5,4HBOT4)
L     GBCAL
      CALL PKDATA(5,3HPUN,0.,1,5HSPACE,32767,0.,1.,2HNO)
L     PKCAL
      TRUFAN        =30.
L     OPLOT
      ISKPSO        =2HNO
L     DICAL
L     AQCAL
STEP  6
      TRUFAN        =120.
L     OPLOT
      ISKPSO        =6HSKIPSO
L     DICAL
      CALL AQDATA(5,6,6,5,5)
L     AQCAL
STEP  7
      TRUFAN        =210.
L     OPLOT
      ISKPSO        =2HNO
L     DICAL
      CALL AQDATA(7,7,7,5,5)
L     AQCAL
STEP  8
      TRUFAN        =300.
L     OPLOT
      ISKPSO        =6HSKIPSO
L     DICAL
      CALL AQDATA(5,8,8,5,5)
L     AQCAL
      CALL GODATA(IQGAR2,100,2HNO,3HPUN,0,0,0,0,3HTAB,0)
L     GOCAL
END OF DATA
```

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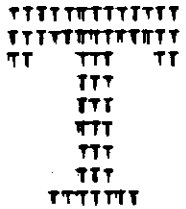
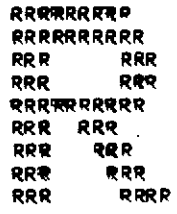
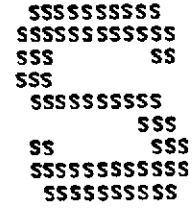
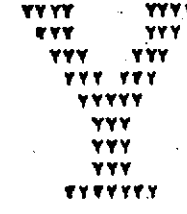
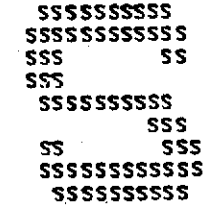






PROCESSOR





NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CCS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

```
VIEW=3-D                SCALE=   .4620
FIRST ROTATION ABOUT    Z =   135.0000
SECOND ROTATION ABOUT   Y =    45.0000
THIRD ROTATION ABOUT    X =    45.0000

VIEW=Z-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =     0.
SECOND ROTATION ABOUT   Y =     0.
THIRD ROTATION ABOUT    X =     0.

VIEW=X-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =     0.
SECOND ROTATION ABOUT   Y =    90.0000
THIRD ROTATION ABOUT    X =   -90.0000

VIEW=Y-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =   -90.0000
SECOND ROTATION ABOUT   Y =     0.
THIRD ROTATION ABOUT    X =    90.0000
```

VIEW NUMBER=1

VIEW NUMBER=1

VIEW NUMBER=1

VIEW NUMBER=1

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.000E+00	.90	.90
12	4.000E+00	.90	.90
13	8.000E+00	.90	.90
14	4.000E+00	.90	.90
15	8.000E+00	.90	.90
21	8.000E+00	.90	.90
30	8.000E+00	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) NO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.598	*
11	13	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	5.958	*
11	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	8.540	*
11	15	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	11.892	*
11	30	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	13.989	
11	FF SUM =	1.0543	ROW CP TIME =		13.995		- RECT	BOX 5 SIDES.		
12	13	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.613	*
12	14	CAL.	.069570	.069570	.069570	.069570	1.000000	1.000000	2.896	
12	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.509	*
12	30	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	8.460	*
12	FF SUM =	1.0536	ROW CP TIME =		8.465		- RECT	BOX 5 SIDES.		
13	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.607	*
13	15	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	4.197	
13	30	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	8.158	*
13	FF SUM =	1.0543	ROW CP TIME =		8.163		- RECT	BOX 5 SIDES.		
14	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.610	*
14	30	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.564	*
14	FF SUM =	1.0536	ROW CP TIME =		5.570		- RECT	BOX 5 SIDES.		
15	30	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	3.965	*
15	FF SUM =	1.0543	ROW CP TIME =		3.971		- RECT	BOX 5 SIDES.		
21	FF SUM =	0.	ROW CP TIME =		.048		+ RECT	RECTANGLE FACING BOX		
30	FF SUM =	1.0543	ROW CP TIME =		.005		+ RECT	RECTANGLE LID OF BOX		

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

FORM FACTOR CALCULATION LINK.

TOTAL CP TIME (SEC) FOR PROBLEM = 40.309

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I - FF SUM NODE I - FF SUM NODE I - FF SUM NODE I - FF SUM NODE I - FF SUM NODE I - FF SUM

11 - 1.0542714 12 - 1.0535630 13 - 1.0542714 14 - 1.0535630 15 - 1.0542714 21 - 0.
30 - 1.0542714

RADIATION CONDUCTOR LINK.

PUNCHED RADKS -	1,	11,	12,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	2,	11,	13,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	3,	11,	14,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	4,	11,	15,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	5,	11,	30,	1.7130000E-09*	2.0238484E+00	$ RADK
PUNCHED RADKS -	6,	12,	13,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	7,	12,	14,	1.7130000E-09*	2.6879439E-01	$ RADK
PUNCHED RADKS -	8,	12,	15,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	9,	12,	30,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	10,	13,	14,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	11,	13,	15,	1.7130000E-09*	2.0238484E+00	$ RADK
PUNCHED RADKS -	12,	13,	30,	1.7130000E-09*	1.8325188E+00	$ RADK
PUNCHED RADKS -	13,	14,	15,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	14,	14,	30,	1.7130000E-09*	8.7551813E-01	$ RADK
PUNCHED RADKS -	15,	15,	30,	1.7130000E-09*	1.8325188E+00	$ RADK

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGNA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

```
CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)
```

CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
30.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
0.	PLANET-SUN DISTANCE	PSO		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

```
VIEW=CIGMA              SCALE=  .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000         0.            0.
      0.            1.000         0.
      0.            0.            1.000


 ++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
      -.866          .000          .500
      -.000        -1.000          0.
       .500          -.000          .866


 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.              0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

++++++++ NSTEP NO = 1

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
30.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 1

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

DIRECT IRRADIATION CALCULATION LINK.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

SOLAR DIRECT INCIDENT FLUX FOR STEP NO 1 TRUE ANOMALY = 30.00000 TIME = .12861
++++ IN THE SUN ++++

NODE NUMBER	DIRECT FLUX (QDS)	DIRECT ABS. FLUX	SHADOW FACTOR	COMPUTATION	CP TIME (SECONDS)	SURFACE ELEMENTS	SHADOWING SURFACES
11	0.	0.	0.		.024	8	0
12	0.	0.	0.		.032	9	0
13	0.	0.	0.		.041	8	0
14	0.	0.	0.		.051	9	0
15	0.	0.	0.		.106	28	5
21	0.	0.	0.		.115	8	0
30	0.	0.	0.		.124	8	0

TOTAL ELAPSED TIME IN PROBLEM = 211.358 SECONDS

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 1 TRUE ANOMALY = 30.00000 TIME = .12861
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	0.	0.	0.	0.	0.	.029	52	2	5
12		0.	0.	0.	0.	0.	0.	.843	55	9	4
13		0.	0.	0.	0.	0.	0.	3.641	93	18	5
14		6.655E-11	4.655E-11	5.989E-11	4.189E-11	.000	.000	4.502	52	9	4
15		0.	0.	0.	0.	0.	0.	4.965	52	1	5
21		5.243E+01	3.464E+01	4.719E+01	3.117E+01	.831	.836	7.124	69	18	3
30		0.	0.	0.	0.	0.	0.	9.061	69	18	6

TOTAL ELAPSED TIME IN PROBLEM = 220.936 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3HB-O 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME ▸ 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN ▸ 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE†,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

```
CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)
```

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
120.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGMA              SCALE=  .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000        0.           0.
      0.           1.000        0.
      0.           0.           1.000


 ++++ PLANET TRANSFORM SET (PLDC(3,3)) ++++
       .000         .866         .500
     -1.000         .000        0.
      -.000        -.500         .866


 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.            0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

******** NSTEP NO = 2

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
120.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 2

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 2 TRUE ANOMALY = 120.00000 TIME = .51446
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	0.	0.	0.	0.	0.	.027	52	8	5
12		0.	0.	0.	0.	0.	0.	.195	52	9	5
13		0.	0.	0.	0.	0.	0.	1.023	55	8	5
14		0.	0.	0.	0.	0.	0.	3.992	93	16	4
15		0.	0.	0.	0.	0.	0.	4.815	52	8	5
21		8.974E-01	2.033E+01	8.077E-01	1.830E+01	.953	.959	5.687	55	8	2
30		0.	0.	0.	0.	0.	0.	6.494	55	8	6

TOTAL ELAPSED TIME IN PROBLEM = 230.355 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-O 4HBETA 5HCIGNA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
210.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

**** COMPUTED OR INPUT ORBIT DATA ****

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		33.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

**** PLANET --EARTH -- DATA ****

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGMA              SCALE=  .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.

 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000          0.           0.
      0.             1.000        0.
      0.             0.           1.000

 ++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
       .866          0.            .500
      0.             1.000        0.
     -.500           0.            .866

 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.              0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 3

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
210.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 3

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

SOLAR DIRECT INCIDENT FLUX FOR STEP NO 3 TRUE ANOMALY = 210.00000 TIME = .90030
++++ IN THE SHADE ++++

NODE NUMBER	DIRECT FLUX (ODS)	DIRECT ABS. FLUX	SHADOW FACTOR	COMPUTATION	CP TIME (SECONDS)	SURFACE ELEMENTS	SHADOWING SURFACES
11	0.	0.	0.		.025	R	0
12	0.	0.	0.		.029	R	0
13	0.	0.	0.		.034	R	0
14	0.	0.	0.		.039	R	0
15	0.	0.	0.		.044	R	0
21	0.	0.	0.		.048	R	0
30	0.	0.	0.		.054	R	0

TOTAL ELAPSED TIME IN PROBLEM = 232.516 SECONDS

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 3 TRUE ANOMALY = 210.00000 TIME = .90030
++++ IN THE SHADE ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	0.	0.	0.	0.	0.	.330	72	18	5
12		0.	0.	0.	0.	0.	0.	.927	52	9	4
13		0.	0.	0.	0.	0.	0.	1.374	52	1	5
14		0.	0.	0.	0.	0.	0.	2.256	55	9	4
15		0.	0.	0.	0.	0.	0.	5.022	77	18	5
21		0.	7.054E+00	0.	6.348E+00	0.	1.000	5.474	52	2	2
30		0.	0.	0.	0.	0.	0.	5.975	52	2	6

TOTAL ELAPSED TIME IN PROBLEM = 240.389 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGNA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

OR

CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
300.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		33.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGMA              SCALE=   .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.

 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000          0.             0.
      0.             1.000          0.
      0.             0.             1.000

 ++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
       .000         -.866            .500
      1.000          .000           0.
      -.000          .500            .866

 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.              0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 4

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
300.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

******** NSTEP NO = 4

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 4 TRUE ANOMALY = 300.00000 TIME = 1.28614
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	0.	0.	0.	0.	0.	.026	52	8	5
12		0.	0.	0.	0.	0.	0.	2.940	93	16	4
13		0.	0.	0.	0.	0.	0.	3.788	55	8	5
14		0.	0.	0.	0.	0.	0.	3.954	52	9	5
15		0.	0.	0.	0.	0.	0.	4.835	52	8	5
21		8.974E-01	2.033E+01	8.077E-01	1.830E+01	.953	.959	5.706	55	8	2
30		0.	0.	0.	0.	0.	0.	6.556	55	8	6

TOTAL ELAPSED TIME IN PROBLEM = 249.919 SECONDS

ABSORBED Q OUTPUT COMPUTATION LINK.

ABSORBED HEAT FLUX TABLES PUNCHED

Q = INPUT * FMPF WHERE FMPF = 1.00000E+00
TIME = INPUT * TMPF WHERE TMPF = 1.00000E+00
AREA IS ON SUBROUTINE CALL CAROS

```
    1$ TIME ARRAY
 1.286E-01, 5.145E-01, 9.003E-01, 1.286E+00
END$
    2$  HEAT FLUX ARRAY
 1.375E-12, 0.       , 0.       , 0.
END$
    3$  HEAT FLUX ARRAY
 8.444E-13, 0.       , 0.       , 0.
END$
    4$  HEAT FLUX ARRAY
 1.375E-12, 0.       , 0.       , 0.
END$
    5$  HEAT FLUX ARRAY
 1.083E-10, 0.       , 0.       , 0.
END$
    6$  HEAT FLUX ARRAY
 0.         , 0.       , 0.       , 0.
END$
    7$  HEAT FLUX ARRAY
 7.836E+01, 1.911E+01, 6.348E+00, 1.911E+01
END$
    8$  HEAT FLUX ARRAY
 0.         , 0.       , 0.       , 0.
END$
```

ABSORBED Q OUTPUT COMPUTATION LINK.

DA11MC SUBROUTINE CALL CARDS

```
                              AREA = INPUT (UNITS) * AMPF  WHERE AMPF =  1.00000E+00
DA11MC( 1.54324458E+00,TIMEM,A   1,A   2, 8.00000000E+00,Q   11) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   3, 4.00000000E+00,Q   12) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   4, 8.00000000E+00,Q   13) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   5, 4.00000000E+00,Q   14) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   6, 8.00000000E+00,Q   15) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   7, 8.00000000E+00,Q   21) $
DA11MC( 1.54324458E+00,TIMEM,A   1,A   8, 8.00000000E+00,Q   30) $
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
11	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
12	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
13	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
14	BOX	4.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
15	BOX	8.000E+00	.900	.900	RECTANGLE	BOTTOM	BOX 5 SIDES.
21	BOX	8.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE FACING BOX
30	LID	8.000E+00	.900	.900	RECTANGLE	TOP	RECTANGLE LID OF BOX

NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CCS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE*,

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE* IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NODE PLOTTER DATA OUTPUT

```
VIEW=3-D                SCALE=   .4620
FIRST ROTATION ABOUT    Z =   135.0000
SECOND ROTATION ABOUT   Y =    45.0000
THIRD ROTATION ABOUT    X =    45.0000

VIEW=Z-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =     0.
SECOND ROTATION ABOUT   Y =     0.
THIRD ROTATION ABOUT    X =     0.

VIEW=X-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =     0.
SECOND ROTATION ABOUT   Y =    90.0000
THIRD ROTATION ABOUT    X =   -90.0000

VIEW=Y-AXIS             SCALE=   .4620
FIRST ROTATION ABOUT    Z =   -90.0000
SECOND ROTATION ABOUT   Y =     0.
THIRD ROTATION ABOUT    X =    90.0000
```

VIEW NUMBER=1

VIEW NUMBER=1

VIEW NUMBER=1

VIEW NUMBER=1

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
11	8.000E+00	.90	.90
12	4.000E+00	.90	.90
13	8.000E+00	.90	.90
14	4.000E+00	.90	.90
15	8.000E+00	.90	.90
21	8.000E+00	.90	.90
30	8.000E+00	.90	.90

NUMBER OF NODES = 7 NUMBER OF SURFACES = 7

FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
11	12	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.597	*
11	13	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	5.952	*
11	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	8.539	*
11	15	CAL.	.259066	.259066	.259066	.259066	1.000000	1.000000	11.893	*
11	21	CAL.	.015772	.015772	.015772	.061487	.256510	.256510	12.094	
11	30	CAL.	.166374	.166374	.166374	.166374	1.000000	1.000000	12.953	
11	FF SUM =	.9463	ROW CP TIME =	12.959		- RECT		BOX 5 SIDES.		
12	13	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.612	*
12	14	CAL.	.069570	.069570	.069570	.069570	1.000000	1.000000	2.896	
12	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	5.515	*
12	30	CAL.	.133519	.066759	.133519	.133519	1.000000	1.000000	8.885	*
12	FF SUM =	.9411	ROW CP TIME =	8.890		- RECT		BOX 5 SIDES.		
13	14	CAL.	.122999	.245998	.122999	.122999	1.000000	1.000000	2.618	*
13	15	CAL.	.290141	.290141	.290141	.290141	1.000000	1.000000	4.223	
13	21	CAL.	.016491	.016491	.016491	.016491	1.000000	1.000000	4.345	
13	30	CAL.	.194749	.194749	.194749	.194749	1.000000	1.000000	5.208	
13	FF SUM =	1.0064	ROW CP TIME =	5.214		- RECT		BOX 5 SIDES.		
14	15	CAL.	.245998	.122999	.245998	.245998	1.000000	1.000000	2.625	*
14	30	CAL.	.133519	.066759	.133519	.133519	1.000000	1.000000	6.001	*
14	FF SUM =	.9411	ROW CP TIME =	6.007		- RECT		BOX 5 SIDES.		
15	30	CAL.	.065660	.065660	.065660	.065660	1.000000	1.000000	.865	*
15	FF SUM =	.8609	ROW CP TIME =	.870		- RECT		BOX 5 SIDES.		
21	FF SUM =	.0323	ROW CP TIME =	.049		+ RECT		RECTANGLE FACING BOX		
30	FF SUM =	.5603	ROW CP TIME =	.006		+ RECT		RECTANGLE LID OF BOX		

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

FORM FACTOR CALCULATION LINK.

TOTAL CP TIME (SEC) FOR PROBLEM = 34.092

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I =	FF SUM	NODE I =	FF SUM	NODE I =	FF SUM	NODE I =	FF SUM	NODE I =	FF SUM	NODE I =	FF SUM
11 =	.9462759	12 =	.9410833	13 =	1.0064454	14 =	.9410833	15 =	.8608656	21 =	.0322631
30 =	.5603014										

RADIATION CONDUCTOR LINK.

```
PUNCHED RADKS  -      1,      11,      12,  1.7130000E-09*  8.5665293E-01 $ RADK
PUNCHED RADKS  -      2,      11,      13,  1.7130000E-09*  1.7992469E+00 $ RADK
PUNCHED RADKS  -      3,      11,      14,  1.7130000E-09*  8.5665293E-01 $ RADK
PUNCHED RADKS  -      4,      11,      15,  1.7130000E-09*  1.7846475E+00 $ RADK
PUNCHED RADKS  -      5,      11,      21,  1.7130000E-09*  1.0541356E-01 $ RADK
PUNCHED RADKS  -      6,      11,      30,  1.7130000E-09*  1.1503335E+00 $ RADK
PUNCHED RADKS  -      7,      12,      13,  1.7130000E-09*  8.6055058E-01 $ RADK
PUNCHED RADKS  -      8,      12,      14,  1.7130000E-09*  2.6045323E-01 $ RADK
PUNCHED RADKS  -      9,      12,      15,  1.7130000E-09*  8.5461003E-01 $ RADK
PUNCHED RADKS  -     10,      12,      21,  1.7130000E-09*  2.7702541E-03 $ RADK
PUNCHED RADKS  -     11,      12,      30,  1.7130000E-09*  4.7318950E-01 $ RADK
PUNCHED RADKS  -     12,      13,      14,  1.7130000E-09*  8.6055058E-01 $ RADK
PUNCHED RADKS  -     13,      13,      15,  1.7130000E-09*  1.9828160E+00 $ RADK
PUNCHED RADKS  -     14,      13,      21,  1.7130000E-09*  1.0998412E-01 $ RADK
PUNCHED RADKS  -     15,      13,      30,  1.7130000E-09*  1.3312576E+00 $ RADK
PUNCHED RADKS  -     16,      14,      15,  1.7130000E-09*  8.5461003E-01 $ RADK
PUNCHED RADKS  -     17,      14,      21,  1.7130000E-09*  2.7702541E-03 $ RADK
PUNCHED RADKS  -     18,      14,      30,  1.7130000E-09*  4.7318950E-01 $ RADK
PUNCHED RADKS  -     19,      15,      21,  1.7130000E-09*  6.0846228E-03 $ RADK
PUNCHED RADKS  -     20,      15,      30,  1.7130000E-09*  5.1758531E-01 $ RADK
PUNCHED RADKS  -     21,      21,      30,  1.7130000E-09*  4.0096618E-03 $ RADK
PUNCHED RADKS  -     22,      11,   32767,  1.7130000E-09*  4.9278488E-01 $ RADK
PUNCHED RADKS  -     23,      12,   32767,  1.7130000E-09*  2.5516943E-01 $ RADK
PUNCHED RADKS  -     24,      13,   32767,  1.7130000E-09*  8.2995688E-02 $ RADK
PUNCHED RADKS  -     25,      14,   32767,  1.7130000E-09*  2.5516943E-01 $ RADK
PUNCHED RADKS  -     26,      15,   32767,  1.7130000E-09*  1.0504377E+00 $ RADK
PUNCHED RADKS  -     27,      21,   32767,  1.7130000E-09*  6.9686199E+00 $ RADK
PUNCHED RADKS  -     28,      30,   32767,  1.7130000E-09*  3.1893562E+00 $ RADK
```

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

```
CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)
```

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
30.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN GIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR GIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSO		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

```
VIEW=CIGMA              SCALE=   .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
     1.000          0.           0.
     0.             1.000        0.
     0.             0.           1.000


++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
     -.866           .000         .500
     -.000         -1.000         0.
      .500          -.000          .866


++++ SUN VECTOR  ++++
  POSITION VECTORS =  1.00000000E+15 0.            0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 5

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
30.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 5

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

SOLAR DIRECT INCIDENT FLUX FOR STEP NO 5 TRUE ANOMALY = 30.00000 TIME = .12661
++++ IN THE SUN ++++

NODE NUMBER	DIRECT FLUX (QDS)	DIRECT ABS. FLUX	SHADOW FACTOR	COMPUTATION	CP TIME (SECONDS)	SURFACE ELEMENTS	SHADOWING SURFACES
11	0.	0.	0.		.025	8	0
12	0.	0.	0.		.034	9	0
13	0.	0.	0.		.043	8	0
14	0.	0.	0.		.051	9	0
15	0.	0.	0.		.107	28	5
21	0.	0.	0.		.116	8	0
30	3.03349E+02	2.73014E+02	1.0000		.195	28	6

TOTAL ELAPSED TIME IN PROBLEM = 287.799 SECONDS

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 5 TRUE ANOMALY = 30.00000 TIME = .12861
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	0.	0.	0.	0.	0.	.027	52	2	5
12		0.	0.	0.	0.	0.	0.	.841	55	9	4
13		9.981E-01	7.280E-01	8.983E-01	6.552E-01	.012	.012	3.639	93	18	5
14		0.	0.	0.	0.	0.	0.	4.488	52	9	4
15		0.	0.	0.	0.	0.	0.	4.947	52	1	5
21		5.108E+01	3.377E+01	4.597E+01	3.039E+01	.810	.815	7.067	69	18	3
30		9.839E-01	6.477E-01	8.855E-01	5.829E-01	.047	.048	7.782	52	6	6

TOTAL ELAPSED TIME IN PROBLEM = 296.099 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME ▸ 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN ▸ 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE!,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

OR

```
      CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)

NOTE:   IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL
        RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.
```

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
120.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGNA              SCALE=  .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000          0.             0.
      0.             1.000          0.
      0.             0.             1.000


 ++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
       .000           .866           .500
     -1.000           .000           0.
      -.000          -.500           .866


 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.            0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 6

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
120.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 6

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 6 TRUE ANOMALY = 120.00000 TIME = .51446
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		1.172E-01	2.912E+00	1.055E-01	2.621E+00	.127	.137	.026	52	8	5
12		0.	0.	0.	0.	0.	0.	.197	52	9	5
13		0.	9.957E-01	0.	8.961E-01	0.	.046	1.023	55	8	5
14		4.310E-01	6.836E+00	3.879E-01	6.152E+00	.163	.102	3.987	93	16	4
15		5.782E-01	3.486E+00	5.203E-01	3.137E+00	.191	.162	4.808	52	8	5
21		8.804E-01	1.975E+01	7.924E-01	1.778E+01	.935	.932	5.682	55	8	2
30		1.601E+00	1.140E+01	1.441E+00	1.026E+01	.703	.533	6.655	52	8	6

TOTAL ELAPSED TIME IN PROBLEM = 305.743 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

OR

```
CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)
```

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
210.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGMA              SCALE=   .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
     1.000          0.             0.
     0.             1.000          0.
     0.             0.             1.000


++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
      .866          0.              .500
     0.             1.000          0.
     -.500          0.              .866


++++ SUN VECTOR  ++++
  POSITION VECTORS =  1.00000000E+15 0.            0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 7

INPUT VALUE	DESCRIPTION	USER OPTIONS	DFFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
210.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 7

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

SOLAR DIRECT INCIDENT FLUX FOR STEP NO 7 TRUE ANOMALY = 210.00000 TIME = .90033
++++ IN THE SHADE ++++

NODE NUMBER	DIRECT FLUX (QDS)	DIRECT ABS. FLUX	SHADOW FACTOR	COMPUTATION	CP TIME (SECONDS)	SURFACE ELEMENTS	SHADOWING SURFACES
11	0.	0.	0.		.024	R	0
12	0.	0.	0.		.030	R	0
13	0.	0.	0.		.035	R	0
14	0.	0.	0.		.042	R	0
15	0.	0.	0.		.046	R	0
21	0.	0.	0.		.052	R	0
30	0.	0.	0.		.057	R	0

TOTAL ELAPSED TIME IN PROBLEM = 307.969 SECONDS

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 7 TRUE ANOMALY = 210.00000 TIME = .90030
++++ IN THE SHADE ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		0.	7.481E+00	0.	6.733E+00	0.	.181	.026	72	18	5
12		0.	5.053E+00	0.	4.548E+00	0.	.239	.920	52	9	4
13		0.	2.926E-02	0.	2.633E-02	0.	.100	1.368	52	1	5
14		0.	4.922E+00	0.	4.430E+00	0.	.230	2.247	55	9	4
15		0.	1.620E+01	0.	1.458E+01	0.	.271	4.992	77	18	5
21		0.	7.054E+00	0.	6.348E+00	0.	1.000	5.446	52	2	2
30		0.	2.539E+01	0.	2.285E+01	0.	.827	6.846	60	10	6

TOTAL ELAPSED TIME IN PROBLEM = 316.713 SECONDS

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME ▸ 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN ▸ 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE*,

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

OR

```
CALL ODATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)
```

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
300.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

ORBIT PLOTTER DATA OUTPUT

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.00000E+15	PLANET-SUN DISTANCE	PSD		1.54324E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=CIGMA              SCALE=   .1137          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =    30.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.


 ++++ ORIENT AND SPIN SET (DUM1(3,3)) ++++
      1.000        0.           0.
      0.           1.000        0.
      0.           0.           1.000


 ++++ PLANET TRANSFORM SET (PLOC(3,3)) ++++
       .000       -.866          .500
      1.000        .000        0.
      -.000        .500         .866


 ++++ SUN VECTOR  ++++
   POSITION VECTORS =  1.00000000E+15 0.              0.
```

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 8

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
SHAD	SHADOWING OVERRIDE FLAG	SHAD,NOSH	SHAD	DINOSH
.250	PLANETARY ACCURACY FACTOR		0.25	DIACC
.100	SHADOWING ACCURACY FACTOR		0.10	DIACCS
	FLUX COMPUTATION FLAG	SOL,PLAN,ALL	ALL	ICALFL
0	STEP NO. FOR PLANET-ORIENTED DATA		0	NSPFF
300.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
1.33760E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
1.33760E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
0.	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX,IROTY,IROTZ		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

++++++++ NSTEP NO = 6

++++ COMPUTED OR INPUT ORBIT DATA ++++

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
60.000	SUN BETA ANGLE, DEGREES		30.000	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

++++ PLANET --EARTH -- DATA ++++

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
1.54324E+00	ORBIT PERIOD	PERIOD				
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS

DIRECT IRRADIATION CALCULATION LINK.

ALBEDO AND PLANETARY DIRECT INCIDENT FLUXES FOR STEP NO 8 TRUE ANOMALY = 300.00000 TIME = 1.28614
++++ IN THE SUN ++++

NODE NUMBER	COMPUT	---DIRECT INCID. FLUX-- ALBEDO	PLANETARY	---DIRECT ABS. FLUX--- ALBEDO	PLANETARY	--SHADOW FACTORS-- ALBEDO	PLAN	CP TIME (SECONDS)	--ELEMENTS-- PLAN	SURF	SHAD SURF
11		1.172E-01	2.912E+00	1.055E-01	2.621E+00	.127	.137	.026	52	8	5
12		4.310E-01	6.836E+00	3.879E-01	6.152E+00	.163	.102	2.948	93	16	4
13		0.	9.957E-01	0.	8.961E-01	0.	.046	3.801	55	8	5
14		0.	0.	0.	0.	0.	0.	3.971	52	9	5
15		5.782E-01	3.486E+00	5.203E-01	3.137E+00	.191	.162	4.852	52	8	5
21		8.804E-01	1.975E+01	7.924E-01	1.778E+01	.935	.932	5.729	55	8	2
30		1.601E+00	1.140E+01	1.441E+00	1.026E+01	.703	.533	6.724	52	8	6

TOTAL ELAPSED TIME IN PROBLEM = 326.448 SECONDS

ABSORBED Q OUTPUT COMPUTATION LINK.

ABSORBED HEAT FLUX TABLES PUNCHED

Q = INPUT * FMPF WHERE FMPF = 1.00000E+00
TIME = INPUT * TMPF WHERE TMPF = 1.00000E+00
AREA IS ON SUBROUTINE CALL CARDS

```
  100$ TIME ARRAY
 1.286E-01, 5.145E-01, 9.003E-01, 1.286E+00
END$
  101$  HEAT FLUX ARRAY
 5.040E+00, 8.029E+00, 7.686E+00, 8.029E+00
END$
  102$  HEAT FLUX ARRAY
 4.056E+00, 4.333E+00, 5.428E+00, 1.100E+01
END$
  103$  HEAT FLUX ARRAY
 7.390E+00, 7.015E+00, 1.013E+00, 6.928E+00
END$
  104$  HEAT FLUX ARRAY
 4.015E+00, 1.120E+01, 5.424E+00, 4.256E+00
END$
  105$  HEAT FLUX ARRAY
 2.200E+00, 6.251E+00, 1.603E+01, 6.251E+00
END$
  106$  HEAT FLUX ARRAY
 7.665E+01, 1.865E+01, 6.372E+00, 1.865E+01
END$
  107$  HEAT FLUX ARRAY
 2.915E+02, 3.023E+02, 2.426E+01, 3.023E+02
END$
```

ABSORBED Q OUTPUT COMPUTATION LINK.

DA11MC SUBROUTINE CALL CARDS

```
                        AREA = INPUT (UNITS) * AMPF  WHERE AMPF =  1.00000E+00
DA11MC( 1.54324458E+00,TIMEM,A 100,A 101, 8.00000000E+00,Q   11)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 102, 4.00000000E+00,Q   12)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 103, 8.00000000E+00,Q   13)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 104, 4.00000000E+00,Q   14)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 105, 8.00000000E+00,Q   15)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 106, 8.00000000E+00,Q   21)$
DA11MC( 1.54324458E+00,TIMEM,A 100,A 107, 8.00000000E+00,Q   30)$
```

```
HEADER  OPTIONS DATA
TITLE   COUNT DRACULA VON BLOCKHEAD IN ORBIT
HEADER QUANTITIES DATA
        KOUNT       =0
HEADER ARRAY DATA
       TIT1=* COUNT DRACULA VON BLOCKHEAD IN REPOSE $.*
       TIT2=* COUNT DRACULA VON BLOCKHEAD EMERGING  $.*
HEADER  SURFACE DATA
ICS    100 ,13.5 , -3.125 , 4.0 , ROTY = 90.0
ICS    101 ,13.5 ,  3.125 , 4.0 , ROTY = 90.0
ICS    102 ,4.0  ,  0.0   , 4.0 , ROTY=  90.,ROTZ=180.
ICS    103 , -.796, 8.0   , 0.0 , 0.,0., 5.7
BCS     LID
S       SURFN = 11,12,13,14,TYPE=POLY,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 = 0.0 , 0.0  ,0.0
      P2 = 0.0 , -8.0 ,0.0
      P3 =20.0 ,-10.0 ,0.0
      P4 =28.0 , -8.0 ,0.0
      P5 =28.0 ,  0.0 ,0.0
      P6 =20.0 ,  2.0 ,0.0
      ICSN = 103
      COM=* TOP OF COFFIN *
BCS     BOX
S       SURFN = 21,22,23,24,TYPE=POLY,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 = 0.0 , -4.0 ,0.0
      P2 =20.0 , -6.0 ,0.0
      P3 =28.0 , -4.0 ,0.0
      P4 =28.0 ,  4.0 ,0.0
      P5 =20.0 ,  6.0 ,0.0
      P6 = 0.0 ,  4.0 ,0.0
      COM=* BOTTOM OF COFFIN *
S       SURFN = 1,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 = 0.0 , -4.0 ,8.0
      P2 = 0.0 , -4.0 ,0.0
      P3 =20.0 , -6.0 ,0.0
      COM=* RECTANGE 1*
S       SURFN = 2,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 =20.0 , -6.0 ,8.0
      P2 =20.0 , -6.0 ,0.0
      P3 =28.0 , -4.0 ,0.0
      COM=* RECTANGE 2*
S       SURFN = 3,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 =28.0 , -4.0 ,8.0
      P2 =28.0 , -4.0 ,0.0
      P3 =28.0 ,  4.0 ,0.0
      COM=* RECTANGE 3*
S       SURFN = 4,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 =28.0 ,  4.0 ,8.0
      P2 =28.0 ,  4.0 ,0.0
      P3 =20.0 ,  6.0 ,0.0
      COM=* RECTANGE 4*
S       SURFN = 5,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        BSHADE=BOTH,PROP=.9,.9
      P1 =20.0 ,  6.0 ,8.0
      P2 =20.0 ,  6.0 ,0.0
```

```
      P3 = 0.0 ,  4.0 ,0.0
      COM=* RECTANGE 5*
S       SURFN = 6,          TYPE=RECT,ACTIVE=BOTTOM,SHADE=BOTH
        PSHADE=BOTH,PROP=.9,.9
      P1 = 0.0 ,  4.0 ,3.0
      P2 = 0.0 ,  4.0 ,0.0
      P3 = 0.0 , -4.0 ,0.0
      COM=* RECTANGE 6          *
BCS   BODY
S     SURFN =15
      TYPE=BOXS
      ACTIVE =OUT
      P1 =   1.25  ,   1.25  ,  20.25
      P2 =   1.25  ,  -1.25  ,  20.25
      P3 =  -1.25  ,  -1.25  ,  20.25
      P4 =  -1.25  ,  -1.25  ,  21.00
      ICSN=102
      COM=*TOP OF HEAD*
      PROP=0.2,0.9
S     SURFN          =20
      TYPE           =BOXS
      ACTIVE         =OUT
      P1 =   1.25  ,  -1.25  ,  20.25
      P2 =   1.25  ,   1.25  ,  20.25
      P3 =  -1.25  ,   1.25  ,  20.25
      P4 =  -1.25  ,   1.25  ,  18.0
      ICSN = 102
      COM=*   HEAD     *
      PROP           =0.2,0.9
S     SURFN          =25
      TYPE           =CYLINDER
      ACTIVE         =OUT
      P1 =   0.00  ,  -1.50  ,  19.50
      P2 =   0.00  ,  -1.50  ,  19.25
      P3 =   0.00  ,  -1.50  ,  19.25
      P4 =   0.00  ,  -1.25  ,  19.25
      COM=*RIGHT EAR  *
      PROP           =0.2,0.9
      ICSN=102
S     SURFN         =26
      TYPE           =CYLINDER
      ACTIVE         =OUT
      P1 =   0.00  ,   1.50  ,  19.50
      P2 =   0.00  ,   1.50  ,  19.25
      P3 =   0.00  ,   1.50  ,  19.25
      P4 =   0.00  ,   1.25  ,  19.25
      COM=*LEFT EAR   *
      PROP           =0.2,0.9
      ICSN=102
S     SURFN         =27
      TYPE           =DISC
      ACTIVE         =TOP
      DIMENSION= 0.0 , 0.0 , 0.2 , -240.0 , 60.0
      POSITION = 1.26 , -0.6 , 19.6 , 0.0 , 90.0 , 0.0
      ICSN = 102
      COM=* RIGHT EYE  *
      PROP           =0.2,0.9
C
S     SURFN         =28
      TYPE           =DISC
      ACTIVE         =TOP
      DIMENSION= 0.0 , 0.0 , 0.2 , -60.0 , 240.0
```

```
      POSITION = 1.26 ,  0.6 , 19.6 , 0.0 , 90.0 , 0.0
C
      COM=* LEFT EYE     *
      PROP          =0.2,0.9
      ICSN = 102
S     SURFN        =29
      TYPE          =RECT
      ACTIVE        =TOP
C
C
      P1 =   1.26  ,   0.50  ,  18.80
      P2 =   1.26  ,  -0.50  ,  18.80
      P3 =   1.26  ,  -0.50  ,  18.60
      COM=* MOUTH      *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =43
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =   0.00  ,   0.00  ,  18.00
      P2 =   0.00  ,  -0.50  ,  18.00
      P3 =   0.00  ,  -0.50  ,  18.00
      P4 =   0.00  ,  -0.50  ,  17.00
      COM=*  NECK      *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =30
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =   0.00  ,   0.00  ,  17.00
      P2 =   0.00  ,  -2.50  ,  17.00
      P3 =   0.00  ,  -2.50  ,  17.00
      P4 =   0.00  ,  -2.50  ,  14.00
      COM=* CHEST      *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =31
      TYPE          =CONE
      ACTIVE        =OUT
      P1 =   1.00  ,   1.00  ,  15.00
      P2 =   3.00  ,   1.00  ,  15.00
      P3 =   3.00  ,   0.75  ,  15.00
      P4 =   3.00  ,   0.75  ,  15.00
      COM=* STAKE      *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =32
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =   0.00  ,  -3.125 ,  17.00
      P2 =   0.00  ,  -2.50  ,  17.00
      P3 =   0.00  ,  -2.50  ,  17.00
      P4 =   0.00  ,  -2.50  ,  10.00
      COM=*RIGHT ARM   *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =33
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =   0.00  ,   3.125 ,  17.00
      P2 =   0.00  ,   2.50  ,  17.00
      P3 =   0.00  ,   2.50  ,  17.00
```

```
      P4 =    0.00  ,   2.50  ,  10.00
      COM=* LEFT ARM  *
      PROP          =0.2,0.9
      ICSN=102
S     SURFN        =34
      TYPE          =SPHERE
      ACTIVE        =OUT
      ICSN          =100
      DIMS          =0.625 , -0.6245 , 0.5 , 0.0 , 360.0
      COM=* RIGHT HAND *
      PROP          =0.2,0.9
S     SURF         =35
      TYPE          =SPHERE
      ACTIVE        =OUT
      ICSN          =101
      DIMS          =0.625 , -0.6245 , 0.5 , -180.0 , 180.0
      COM=* LEFT HAND *
      PROP          =0.2,0.9
S     SURF         =36
      TYPE          =CONE
      ACTIVE        =OUT
      P1 =    0.00  ,    0.00  ,    0.00
      P2 =    0.00  ,    0.00  ,   14.00
      P3 =    0.00  ,   -2.50  ,   14.00
      P4 =    0.00  ,   -2.50  ,   14.00
      P5 =    0.00  ,   -2.00  ,   11.20
      COM=* TORSO     *
      PROP          =0.2,0.9
      ICSN=102
S     SURF         =37
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =    0.00  ,    0.00  ,   11.20
      P2 =    0.00  ,   -2.00  ,   11.20
      P3 =    0.00  ,   -2.00  ,   11.20
      P4 =    0.00  ,   -2.00  ,   10.50
      COM=* BELT      *
      PROP          =0.2,0.9
      ICSN=102
S     SURF         =38
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =    0.00  ,    0.00  ,   10.50
      P2 =    0.00  ,   -2.00  ,   10.50
      P3 =    0.00  ,   -2.00  ,   10.50
      P4 =    0.00  ,   -2.00  ,    8.00
      COM=* HIPS      *
      PROP          =0.2,0.9
      ICSN=102
BCS   LEGS
S     SURF         =39
      TYPE          =CYLINDER
      ACTIVE        =OUT
      P1 =    0.00  ,   -1.00  ,    8.00
      P2 =    0.00  ,    0.00  ,    8.00
      P3 =    0.00  ,    0.00  ,    8.00
      P4 =    0.00  ,    0.00  ,    0.00
      COM=* RIGHT LEG *
      PROP          =0.2,0.9
      ICSN=102
S     SURF         =40
      TYPE          =CYLINDER
```

```
      ACTIVE        =OUT
      P1 =    0.00  ,    1.00  ,    8.00
      P2 =    0.00  ,    0.00  ,    8.00
      P3 =    0.00  ,    0.00  ,    8.00
      P4 =    0.00  ,    0.00  ,    0.00
      COM=* LEFT LEG  *
      PROP          =0.2,0.9
      ICSN=102
S     SURF          =41
      TYPE           =SPHERE
      ACTIVE         =OUT
      P1 =    0.00  ,   -1.00  ,   -0.75
      P2 =    0.00  ,   -1.00  ,   -1.75
      P3 =    0.00  ,-0.33856  ,    0.00
      P4 =    0.00  ,-0.33856  ,    0.00
      COM=* RIGHT FOOT*
      PROP          =0.2,0.9
      ICSN=102
S     SURF          =42
      TYPE           =SPHERE
      ACTIVE         =OUT
      P1 =    0.00  ,    1.00  ,   -0.75
      P2 =    0.00  ,    1.00  ,   -1.75
      P3 =    0.00  , 0.33856  ,    0.00
      P4 =    0.00  , 0.33856  ,    0.00
      COM=* LEFT FOOT *
      PROP          =0.2,0.9
      ICSN=102
HEADER  BCS DATA
BCS     BOX ,0.,0.,0.,0.,0.,0.
BCS     LID ,0. ,-4.0 , 8.0 ,0.,0.,-5.7
BCS     BODY , 0.0 , 0.0 , 0.0 ,    0.0 ,  0.0 , 0.0
BCS     LEGS , 0.0 , 0.0 , 0.0 ,    0.0 ,  0.0 , 0.0
HEADER  OPERATIONS DATA
STEP  1
        KOUNT         =0
        CALL QDATAS(1,3H3-D,2.3,1.8,1.0,-90.,0.,0.)
        CALL ORBIT2(3HEAR,0.0,90.0,0.0,0.0,100.*6030.,100.*6030.)
        CALL ORIENT(3HSUN,1,2,3,0.0,0.0,180.)
 200    TRUEAN        =TRUEAN+90.
        TEST1         =SHADIN-TRUEAN
        TEST2         =SHADUT-TRUEAN
        IF(TEST1.GT.0.)              GO TO 300
        IF(TEST2.GT.0.)              GO TO 700
        TEST1         =TEST1+360.
        TEST2         =TEST2+360.
        IF(TEST1.LE.0.)              GO TO 400
 300    IF(TEST2)                    700,700,600
 400    IF(TEST2.LE.0.)              GO TO 600
        GO TO 700
 600    CALL CHGBLK(LID,0.,-4.,8.,1,2,3,0.,0.,-5.7)
        CALL CHGBLK(BODY,0.,0.,0.,1,2,3,0.,0.,0.)
        CALL BUILDC(BOX)
        CALL ADD(LID)
        CALL ADD(BODY)
        CALL ADD(LEGS)
        GO TO 1000
 700    CALL CHGBLK(LID,0.,-4.,8.,3,2,1, 120.,0.,-5.7)
        CALL CHGBLK(BODY,17.0,0.0,-8.0,1,2,3,0.0,-90.0,0.0)
        CALL BUILDC(BOX)
        CALL ADD(LID)
        CALL ADD(BODY)
```

```
        CALL ADD(LEGS)
 1000   KOUNT        =KOUNT+1
        NSSTEP       =1
L      OPLOT
        IF(KOUNT.LT.4)                GO TO 200
STEP  2
        CALL CHGBLK(LID,0.,-4.,8.,1,2,3,0.,0.,-5.7)
        CALL CHGBLK(BODY,0.,0.,0.,1,2,3,0.,0.,0.)
        CALL BUILDC(BOX)
        CALL ADD(LID)
        CALL ADD(BODY)
        CALL ADD(LEGS)
        CALL NDATAS(2,3HALL,0.)
L       NPLOT
STEP  3
        CALL CHGBLK(LID,0.,-4.,8.,3,2,1, 120.,0.,-5.7)
        CALL CHGBLK(BODY,17.0,0.0,-8.0,1,2,3,0.0,-90.0,0.0)
        CALL BUILDC(BOX)
        CALL ADD(LID)
        CALL ADD(BODY)
        CALL ADD(LEGS)
        CALL NDATAS(2,3HALL,0.)
L       NPLOT
END OF DATA
```

NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC6400-6500/MACE

TTTTTTTTTTT
TTTTTTTTTTT
TT TTT TT
TTT
TTT
TTT
TTT
TTTTTTT

RRRRRRRRR
RRRRRRRRRR
RRR RRR
RRR RRR
RRRRRRRRRR
RRR RRR
RRR RRR
RRR RRR
RRR RRRR

PROCESSOR

AAAAAAA
AAAAAAAAA
AAAAAAAAAAA
AAA AAA
AAA AAA
AAAAAAAAAAA
AAA AAA
AAA AAA
AAA AAA
AAAAA AAAAA

SSSSSSSSSS
SSSSSSSSSSS
SSS SS
SSS
SSSSSSSSSS
SSS
SS SSS
SSSSSSSSSSS
SSSSSSSSSS

YYYY YYYY
YYY YYY
YYY YYY
YYY YYY
YYYYY
YYY
YYY
YYY
YYYYYYY

SSSSSSSSSS
SSSSSSSSSSS
SSS SS
SSS
SSSSSSSSSS
SSS
SS SSS
SSSSSSSSSSS
SSSSSSSSSS

H-148

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HRETA 5HCIGNA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)

OR

```
CALL ODATAS (INV, VU, SCL, SCLP, RPLN, TRUEAN, TIMEST, TIME)

NOTE:  IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL
       RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.
```

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
0.	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
6.030000E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
6.030000E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
180.000	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

ORBIT PLOTTER DATA OUTPUT

COUNT DRACULA VON BLOCKHEAD IN ORBIT

**** COMPUTED OR INPUT ORBIT DATA ****

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
90.000	SUN BETA ANGLE, DEGREES		0.	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

**** PLANET --EARTH -- DATA ****

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
0.	PLANET-SUN DISTANCE	PSD		1.46741E+03	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29300E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=3-D                SCALE=  .0293          VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =   135.0000
SECOND ROTATION ABOUT Y =    45.0000
THIRD ROTATION ABOUT  X =    45.0000
```

COUNT ORACULA VON BLOCKHEAD IN ORBIT

PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
21	BOX	2.800E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
22	BOX	1.120E+02	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
23	BOX	5.000E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
24	BOX	8.000E+01	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
1	BOX	1.600E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 1
2	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 2
3	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 3
4	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 4
5	BOX	1.600E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 5
6	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 6
11	LID	8.000E+01	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
12	LID	6.000E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
13	LID	1.120E+02	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
14	LID	2.800E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
15	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
16	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
17	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
18	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
19	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
20	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	HEAD
21	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
22	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
23	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
24	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
25	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	RIGHT EAR
26	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	LEFT EAR
27	BODY	1.047E-01	.200	.900	DISC	TOP	RIGHT EYE
28	BODY	1.047E-01	.200	.900	DISC	TOP	LEFT EYE
29	BODY	2.000E-01	.200	.900	RECTANGLE	TOP	MOUTH
43	BODY	3.142E+00	.200	.900	CYLINDER	OUTSID	NECK
30	BODY	4.712E+01	.200	.900	CYLINDER	OUTSID	CHEST
31	BODY	1.583E+00	.200	.900	CONE	OUTSID	STAKE
32	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	RIGHT ARM
33	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	LEFT ARM
34	BODY	4.415E+00	.200	.900	SPHERE	OUTSID	RIGHT HAND
35	BODY	4.415E+00	.200	.900	SPHERE	OUTSID	LEFT HAND
36	BODY	4.021E+01	.200	.900	CONE	OUTSID	TORSO
37	BODY	9.796E+00	.200	.900	CYLINDER	OUTSID	BELT
38	BODY	3.142E+01	.200	.900	CYLINDER	OUTSID	HIPS
39	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	RIGHT LEG
40	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	LEFT LEG
41	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	RIGHT FOOT
42	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	LEFT FOOT

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTY, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)
OR
```

CALL ODATAS (NV, VU, SCL, SCLP, PPLN, TRUEAN, TIMEST, TIME)

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
90.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	OINC
6.03000E+05	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
6.03000E+05	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE, DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
180.000	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

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COUNT ORACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

**** COMPUTED OR INPUT ORBIT DATA ****

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
90.000	SUN BETA ANGLE, DEGREES		0.	SUN GIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR GIGMAS ANGLE, DEGREES

**** PLANET --EARTH -- DATA ****

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET OS EMISS POWER	WOS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
0.	PLANET-SUN DISTANCE	PSO		1.46741E+09	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29000E+02	SOLAR CONSTANT AT PSO	SOL

VIEW=3-D SCALE= .0293

FIRST ROTATION ABOUT Z = 135.0000

SECOND ROTATION ABOUT Y = 45.0000

THIRD ROTATION ABOUT X = 45.0000

VIEW NUMBER=1

COUNT DRACULA VON BLOCKHEAD IN ORBIT

PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
21	BOX	2.800E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
22	BOX	1.121E+02	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
23	BOX	6.001E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
24	BOX	8.001E+01	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
1	BOX	1.600E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 1
2	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 2
3	BOX	6.401E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 3
4	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 4
5	BOX	1.609E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 5
6	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 6
11	LID	8.000E+01	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
12	LID	5.000E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
13	LID	1.120E+02	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
14	LID	2.800E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
15	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
16	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
17	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
18	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
19	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
20	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	HEAD
21	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
22	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
23	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
24	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
25	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	RIGHT EAR
26	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	LEFT EAR
27	BODY	1.047E-01	.200	.900	DISC	TOP	RIGHT EYE
28	BODY	1.047E-01	.200	.900	DISC	TOP	LEFT EYE
29	BODY	2.000E-01	.200	.900	RECTANGLE	TOP	MOUTH
43	BODY	3.142E+00	.200	.900	CYLINDER	OUTSID	NECK
30	BODY	4.712E+01	.200	.900	CYLINDER	OUTSID	CHEST
31	BODY	1.583E+00	.200	.900	CONE	OUTSID	STAKE
32	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	RIGHT ARM
33	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	LEFT ARM
34	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	RIGHT HAND
35	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	LEFT HAND
36	BODY	4.021E+01	.200	.900	CONE	OUTSID	TORSO
37	BODY	8.796E+00	.200	.900	CYLINDER	OUTSID	BELT
38	BODY	3.142E+01	.200	.900	CYLINDER	OUTSID	HIPS
39	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	RIGHT LEG
40	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	LEFT LEG
41	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	RIGHT FOOT
42	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	LEFT FOOT

ORBIT PLOTTER DATA OUTPUT

ODATA, ODATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.6)	REAL NO.	8.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)
```

OR

```
CALL ODATAS (NV, VU, SCL, SCLP, RPLN, TRUEAN, TIMEST, TIME)
```

NOTE: IF NO CALLS TO ODATA/ODATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
180.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	CINC
6.03000E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
6.03000E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
180.000	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

**** COMPUTED OR INPUT ORBIT DATA ****

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
90.000	SUN BETA ANGLE, DEGREES		0.	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

**** PLANET --EARTH -- DATA ****

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09030E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
0.	PLANET-SUN DISTANCE	PSD		1.46741E+00	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29300E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=3-D                  SCALE=   .0265        VIEW NUMBER=1
FIRST ROTATION ABOUT  Z =   135.0000
SECOND ROTATION ABOUT Y =    45.0000
THIRD ROTATION ABOUT  X =    45.0000
```

COUNT DRACULA VON BLOCKHEAD IN ORBIT

PROCESSSING OPERATION DATA

NODE	BDS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
21	BOX	2.800E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
22	BOX	1.120E+02	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
23	BOX	5.000E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
24	BOX	8.000E+01	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
1	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 1
2	BOX	5.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 2
3	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 3
4	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 4
5	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 5
6	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 6
11	LID	8.000E+01	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
12	LID	5.000E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
13	LID	1.120E+02	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
14	LID	2.800E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
15	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
16	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
17	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
18	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
19	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
20	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	HEAD
21	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
22	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
23	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
24	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
25	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	RIGHT EAR
26	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	LEFT EAR
27	BODY	1.047E-01	.200	.900	DISC	TOP	RIGHT EYE
28	BODY	1.047E-01	.200	.900	DISC	TOP	LEFT EYE
29	BODY	2.000E-01	.200	.900	RECTANGLE	TOP	MOUTH
43	BODY	3.142E+00	.200	.900	CYLINDER	OUTSID	NECK
30	BODY	4.712E+01	.200	.900	CYLINDER	OUTSID	CHEST
31	BODY	1.583E+00	.200	.900	CONE	OUTSID	STAKE
32	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	RIGHT ARM
33	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	LEFT ARM
34	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	RIGHT HAND
35	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	LEFT HAND
36	BODY	4.021E+01	.200	.900	CONE	OUTSID	TORSO
37	BODY	9.796E+00	.200	.900	CYLINDER	OUTSID	BELT
38	BODY	3.142E+01	.200	.900	CYLINDER	OUTSID	HIPS
39	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	RIGHT LEG
40	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	LEFT LEG
41	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	RIGHT FOOT
42	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	LEFT FOOT

ORBIT PLOTTER DATA OUTPUT

ODATA, OJATAS INPUT

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
VU	VIEW	3HALL 3H3-D 4HBETA 5HCIGMA 3HSUN 3HGEN	3HALL
SCL	VEHICLE SURFACE SCALING FACTOR INPUT IN INCHES (MAX VALUE = (3.15-SCLR)/2.)	REAL NO.	(3.15-SCLR)/2.
SCLR	ORBIT RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.5)	REAL NO.	6.*RPLN/7.
RPLN	PLANET RADIUS INPUT IN INCHES FROM CENTER OF PLOT (RECOMMENDED VALUE = 1.4)	REAL NO.	1.4
TRUEAN	TRUE ANOMALY (PRESENT VEHICLE POSITION IN DEGREES FROM PERIAPSIS)	REAL NO.	COMPUTED IF TIME > 0.
TIMEST	TIME OF PERIAPSIS PASSAGE	L NO.	NONE
TIME	TIME AT PRESENT VEHICLE POSITION	REAL NO.	COMPUTED IF TRUEAN > 0.
ISELN	ARRAY NAME CONTAINING NUMBER OF SURFACES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL SURFACES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL ODATA (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME, ISELN, ITIT, IROTX, IROTY, IROTZ, ROTX, ROTY, ROTZ)
0
```

CALL DDATAS (NV, VU, SCL, SCLR, RPLN, TRUEAN, TIMEST, TIME)

NOTE: IF NO CALLS TO DDATA/DDATAS ARE MADE, A CALL TO OPLOT WILL RESULT IN ALL VIEWS BEING AUTOMATICALLY SCALED AND GENERATED.

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

INPUT VALUE	DESCRIPTION	USER OPTIONS	DEFAULT VALUE	VARIABLE NAME
	++++ BASIC CONTROL PARAMETERS ++++			
270.000	TRUE ANOMALY ANGLE, DEGREES		0.0	TRUEAN
0.	INITIAL TIME (AT PERIAPSIS)		0.0	TIMEST
	++++ BASIC ORBIT DATA ++++			
0.	LONGITITUDE OF ASCENDING NODE, DEGREES		0.0	ALAN
0.	ARGUMENT OF PERIFOCUS, DEGREES		0.0	APER
0.	ORBIT INCLINATION, DEGREES		0.0	CINC
6.030000E+06	ORBIT ALTITUDE AT PERIAPSIS		0.0	HP
6.030000E+06	ORBIT ALTITUDE AT APOAPSIS		0.0	HA
0.	ORBIT ECCENTRICITY		0.0	ECC
0.	SUN RA ANGLE, DEGREES		0.0	SUNRA
0.	SUN DEC ANGLE,DEGREES,		0.0	SUNDEC
0.	REFERENCE STAR RA ANGLE, DEGREES		0.0	STRRA
0.	REFERENCE STAR DEC ANGLE, DEGREES		0.0	STRDEC
	++++ SUN -ORIENTED, ORIENTATION DATA ++++			
0.	ROTATION ABOUT VCS X-AXIS TO CCS		0.0	ROTX
0.	ROTATION ABOUT VCS Y-AXIS TO CCS		0.0	ROTY
180.000	ROTATION ABOUT VCS Z-AXIS TO CCS		0.0	ROTZ
1 2 3	ROTATION ORDER -- IROTX, IROTY, IROTZ,		1 2 3	
	++++ SPIN DATA ++++			
0.	CLOCK ANGLE, DEGREES (ABOUT CCS Z-AXIS CW=POSITIVE)		0.0	CLOCK
0.	CONE ANGLE, DEGREES		0.0	CONE
0.	ROTATION RATE- CCW POSITIVE		0.0	RATE

COUNT DRACULA VON BLOCKHEAD IN ORBIT

ORBIT PLOTTER DATA OUTPUT

**** COMPUTED OR INPUT ORBIT DATA ****

VALUE	VARIABLE DESCRIPTION	***	VALUE	VARIABLE DESCRIPTION
90.000	SUN BETA ANGLE, DEGREES		0.	SUN CIGMA ANGLE, DEGREES
0.	STAR BETAS ANGLE, DEGREES		0.	STAR CIGMAS ANGLE, DEGREES

**** PLANET --EARTH -- DATA ****

VALUE	DESCRIPTION	NAME	***	VALUE	DESCRIPTION	NAME
.300	PLANET ALBEDO	PALB		7.50732E+01	PLANET DS EMISS POWER	WDS
2.09000E+07	PLANET RADIUS	PRAD		7.50732E+01	PLANET SS EMISS POWER	WSS
0.	PLANET-SUN DISTANCE	PSD		1.46741E+01	ORBIT PERIOD	PERIOD
4.17312E+08	PLANET GRAV CONSTANT	GRAV		4.29100E+02	SOLAR CONSTANT AT PSD	SOL

```
VIEW=T-0                    SCALE=  .0293
FIRST ROTATION ABOUT  Z =   135.0000
SECOND ROTATION ABOUT Y =    45.0000
THIRD ROTATION ABOUT  X =    45.0000
```

VIEW NUMBER=1

COUNT DRACULA VON BLOCKHEAD IN ORBIT

PROCESSSING OPERATION DATA

NODE	BOS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
21	BOX	2.800E+01	.300	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
22	BOX	1.120E+02	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
23	BOX	5.300E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
24	BOX	8.000E+01	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
1	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 1
2	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 2
3	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 3
4	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 4
5	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 5
6	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 6
11	LID	8.000E+01	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
12	LID	6.000E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
13	LID	1.120E+02	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
14	LID	2.800E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
15	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
16	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
17	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
18	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
19	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
20	BODY	6.250E+00	.200	.900	RECTANGLE	TOP	HEAD
21	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
22	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
23	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
24	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
25	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	RIGHT EAR
26	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	LEFT EAR
27	BODY	1.047E-01	.200	.900	DISC	TOP	RIGHT EYE
28	BODY	1.047E-01	.200	.900	DISC	TOP	LEFT EYE
29	BODY	2.000E-01	.200	.900	RECTANGLE	TOP	MOUTH
43	BODY	3.142E+00	.200	.900	CYLINDER	OUTSID	NECK
30	BODY	4.712E+01	.200	.900	CYLINDER	OUTSID	CHEST
31	BODY	1.583E+00	.200	.900	CONE	OUTSID	STAKE
32	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	RIGHT ARM
33	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	LEFT ARM
34	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	RIGHT HAND
35	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	LEFT HAND
36	BODY	4.071E+01	.200	.900	CONE	OUTSID	TORSO
37	BODY	8.796E+00	.200	.900	CYLINDER	OUTSID	BELT
38	BODY	3.142E+01	.200	.900	CYLINDER	OUTSID	HIPS
39	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	RIGHT LEG
40	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	LEFT LEG
41	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	RIGHT FOOT
42	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	LEFT FOOT

NCOF PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CCS ORIGIN IN USER'S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

CALL NDATA (NV, IVV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NCOR PLOTTER DATA OUTPUT

```
VIEW=3-D                SCALE=   .0803        VIEW NUMBER=2
FIRST ROTATION ABOUT  Z =   135.0000
SECOND ROTATION ABOUT Y =    45.0000
THIRD ROTATION ABOUT  X =    45.0000

VIEW=Z-AXIS             SCALE=   .0803        VIEW NUMBER=2
FIRST ROTATION ABOUT  Z =     0.
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =     0.

VIEW=Y-AXIS             SCALE=   .0803        VIEW NUMBER=2
FIRST ROTATION ABOUT  Z =     0.
SECOND ROTATION ABOUT Y =    90.0000
THIRD ROTATION ABOUT  X =   -90.0000

VIEW=X-AXIS             SCALE=   .0803        VIEW NUMBER=2
FIRST ROTATION ABOUT  Z =   -90.0000
SECOND ROTATION ABOUT Y =     0.
THIRD ROTATION ABOUT  X =    90.0000
```

COUNT DRACULA VON BLOCKHEAD IN ORBIT

PROCESSSING OPERATION DATA

NODE	BOS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
21	BOX	2.8[illegible]E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
22	BOX	1.12[illegible]E+02	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
23	BOX	6.000E+01	.900	.900	TRAPEZOID	BOTTOM	BOTTOM OF COFFIN
24	BOX	8.000E+01	.900	.900	TRAPEZOID	TOP	BOTTOM OF COFFIN
1	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 1
2	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 2
3	BOX	6.403E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 3
4	BOX	6.597E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 4
5	BOX	1.608E+02	.900	.900	RECTANGLE	BOTTOM	RECTANGE 5
6	BOX	6.400E+01	.900	.900	RECTANGLE	BOTTOM	RECTANGE 6
11	LID	8.000E+01	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
12	LID	5.000E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
13	LID	1.120E+02	.900	.900	TRAPEZOID	BOTTOM	TOP OF COFFIN
14	LID	2.801E+01	.900	.900	TRAPEZOID	TOP	TOP OF COFFIN
15	BODY	6.25[illegible]E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
16	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
17	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
18	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
19	BODY	1.875E+00	.200	.900	RECTANGLE	TOP	TOP OF HEAD
20	BODY	5.25[illegible]E+00	.200	.900	RECTANGLE	TOP	HEAD
21	BODY	5.626E+00	.200	.900	RECTANGLE	TOP	HEAD
22	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
23	BODY	5.626E+00	.200	.900	RECTANGLE	TOP	HEAD
24	BODY	5.625E+00	.200	.900	RECTANGLE	TOP	HEAD
25	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	RIGHT EAR
26	BODY	3.927E-01	.200	.900	CYLINDER	OUTSID	LEFT EAR
27	BODY	1.047E-01	.200	.900	DISC	TOP	RIGHT EYE
28	BODY	1.047E-01	.200	.900	DISC	TOP	LEFT EYE
29	BODY	2.000E-01	.200	.900	RECTANGLE	TOP	MOUTH
43	BODY	3.142E+00	.200	.900	CYLINDER	OUTSID	NECK
30	BODY	4.712E+01	.200	.900	CYLINDER	OUTSID	CHEST
31	BODY	1.5[illegible]E+00	.200	.900	CONE	OUTSID	STAKE
32	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	RIGHT ARM
33	BODY	2.749E+01	.200	.900	CYLINDER	OUTSID	LEFT ARM
34	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	RIGHT HAND
35	BODY	4.416E+00	.200	.900	SPHERE	OUTSID	LEFT HAND
36	BODY	4.021E+01	.200	.900	CONE	OUTSID	TORSO
37	BODY	3.795E+00	.200	.900	CYLINDER	OUTSID	BELT
38	BODY	3.142E+01	.200	.900	CYLINDER	OUTSID	HIPS
39	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	RIGHT LEG
40	LEGS	5.027E+01	.200	.900	CYLINDER	OUTSID	LEFT LEG
41	LEGS	1.103E+01	.200	.900	SPHERE	OUTSID	RIGHT FOOT
42	LEGS	1.100E+01	.200	.900	SPHERE	OUTSID	LEFT FOOT

NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM GCS ORIGIN IN USER'S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

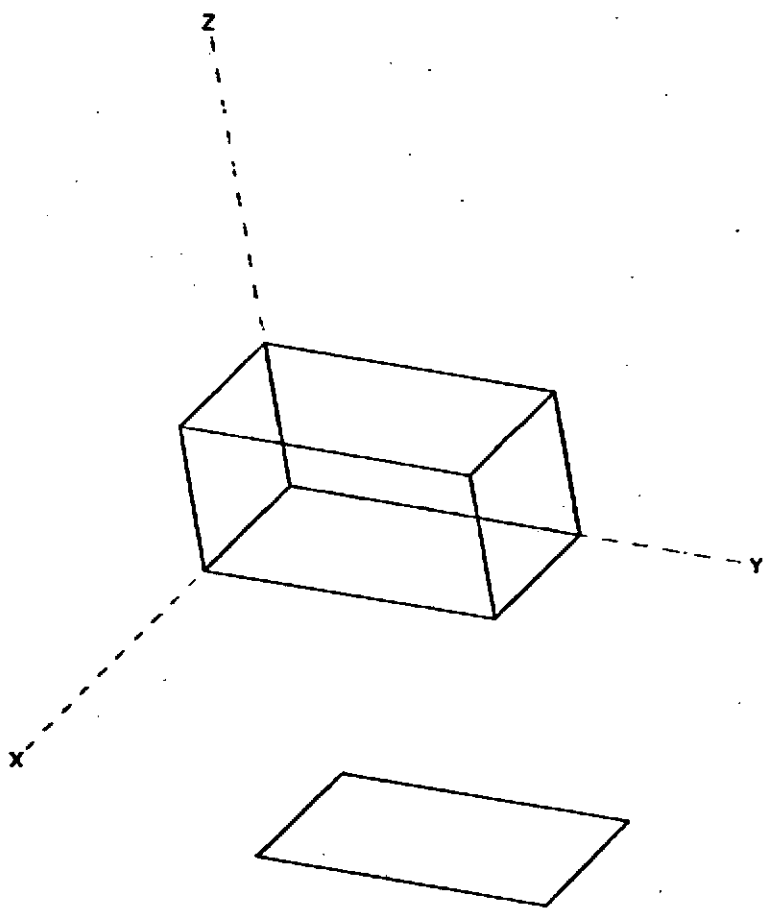
CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

NCOE PLOTTED DATA OUTPUT

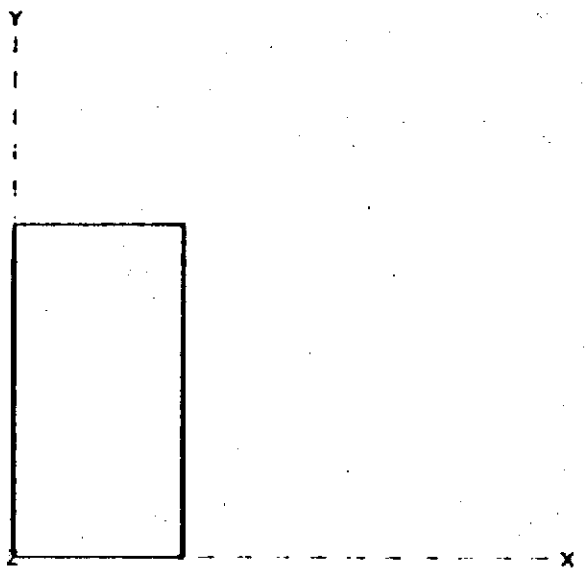
VIEW=3-D	SCALE= .0727	VIEW NUMBER=2
FIRST ROTATION ABOUT	Z = 135.0000	
SECOND ROTATION ABOUT	Y = 45.0000	
THIRD ROTATION ABOUT	X = 45.0000	
VIEW=Z-AXIS	SCALE= .0727	VIEW NUMBER=2
FIRST ROTATION ABOUT	Z = 0.	
SECOND ROTATION ABOUT	Y = 0.	
THIRD ROTATION ABOUT	X = 0.	
VIEW=X-AXIS	SCALE= .0727	VIEW NUMBER=2
FIRST ROTATION ABOUT	Z = 0.	
SECOND ROTATION ABOUT	Y = 90.0000	
THIRD ROTATION ABOUT	X = -90.0000	
VIEW=Y-AXIS	SCALE= .0727	VIEW NUMBER=2
FIRST ROTATION ABOUT	Z = -90.0000	
SECOND ROTATION ABOUT	Y = 0.	
THIRD ROTATION ABOUT	X = 90.0000	

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



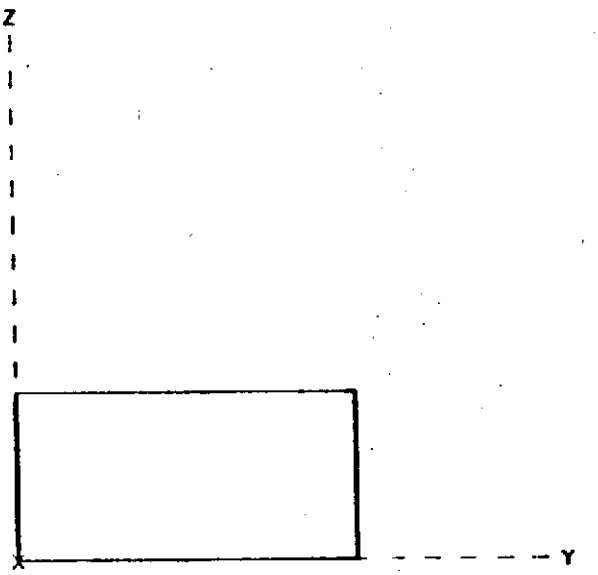
VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .4620	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	45.00

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



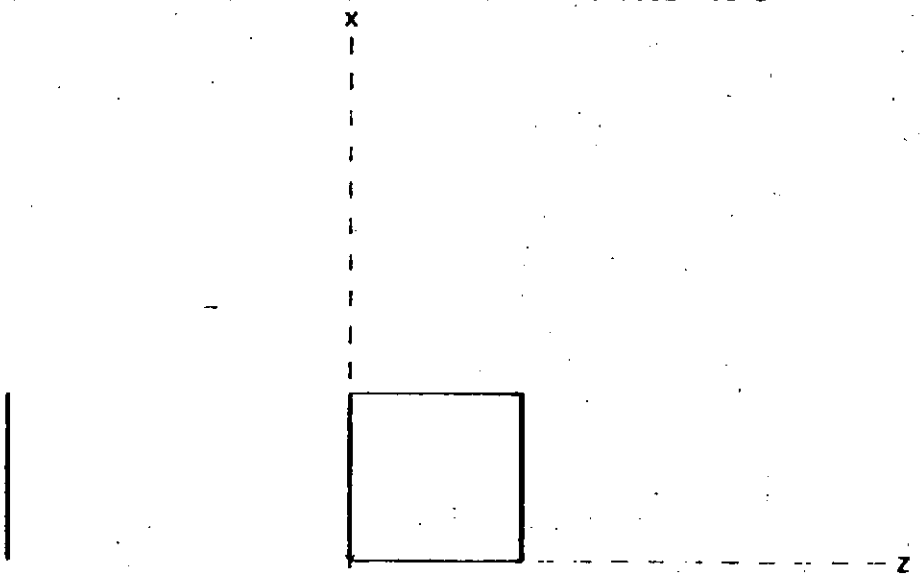
VIEW	= Z-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .4620	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



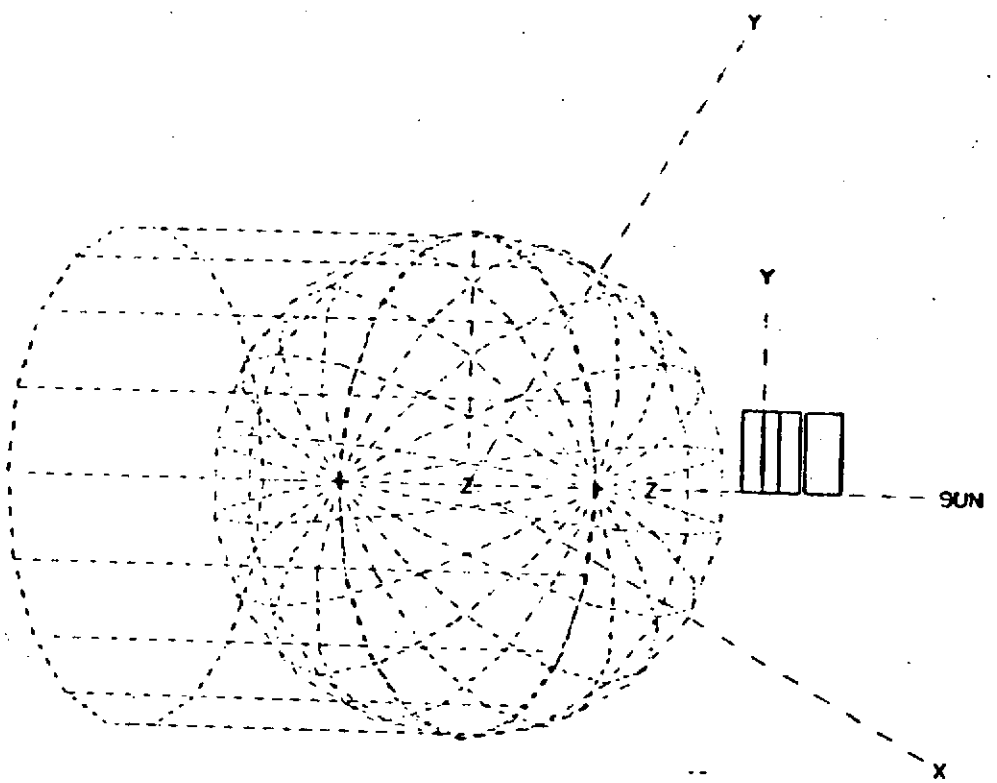
VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .4620	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	-90.00

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW	= Y-AXIS	1ST ROTATION ABOUT Z =	-90.00
SCALE	= .4620	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	90.00

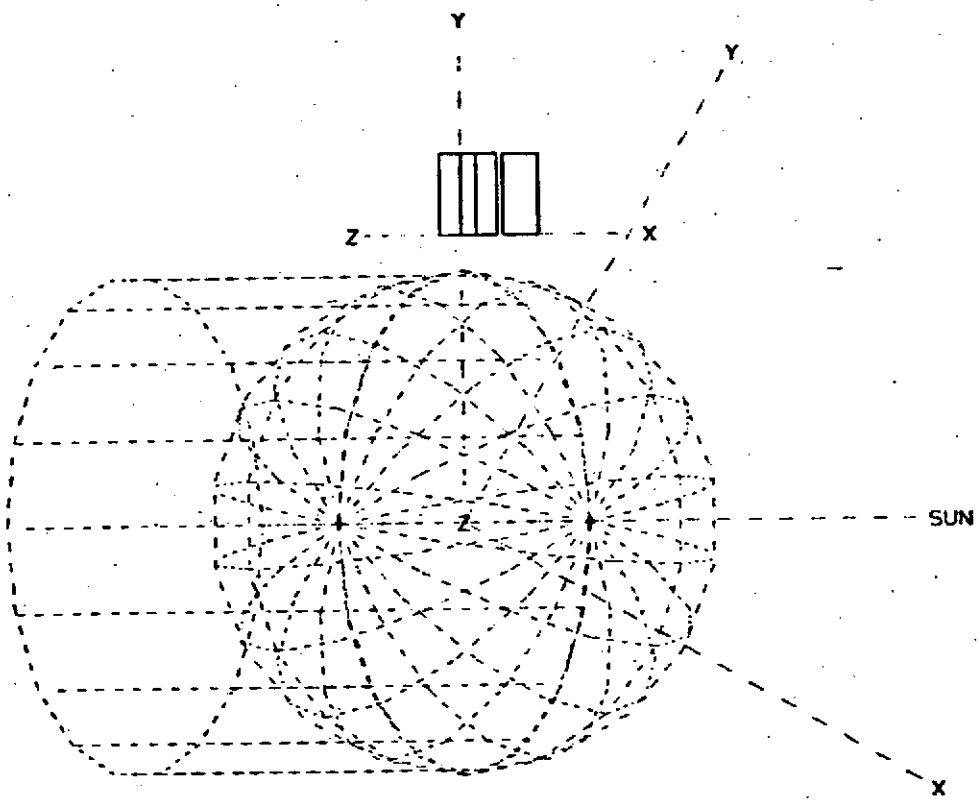
SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW = CIGMA
SCALE = .1137
VIEW NUMBER = 1

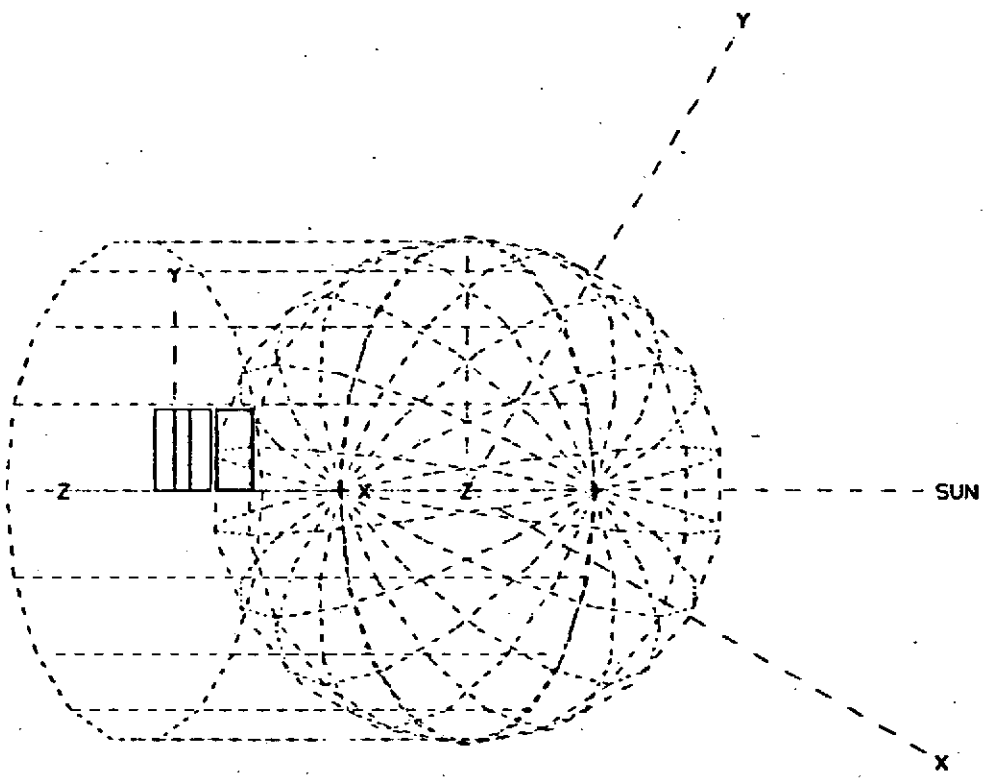
1ST ROTATION ABOUT Z = 30.00
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



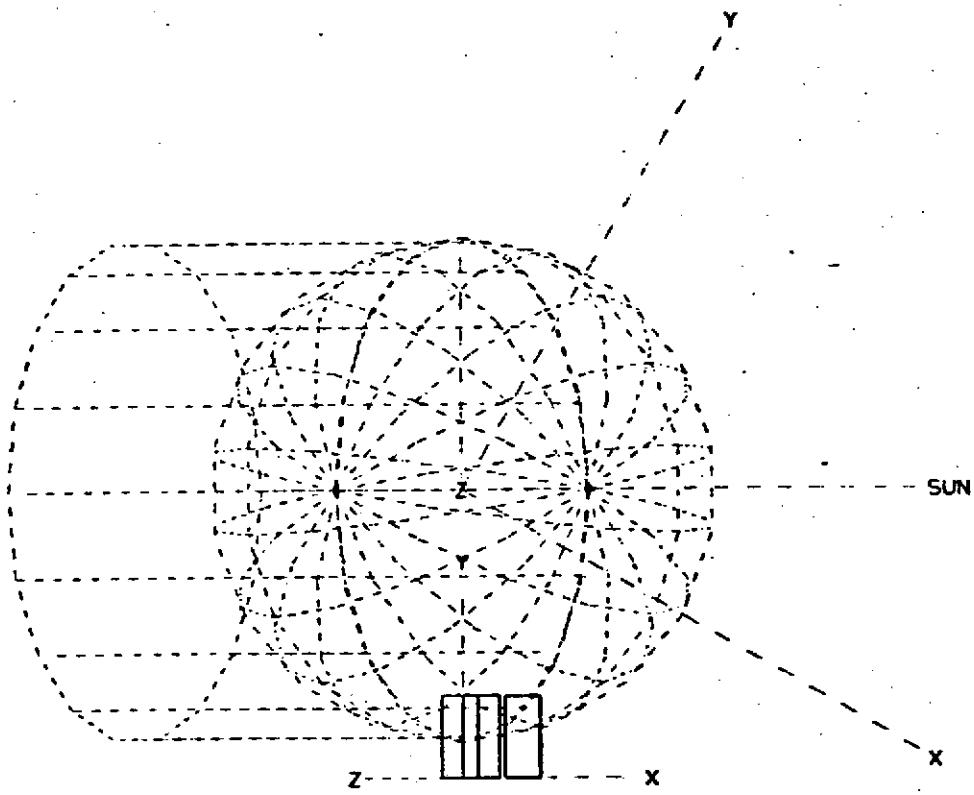
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



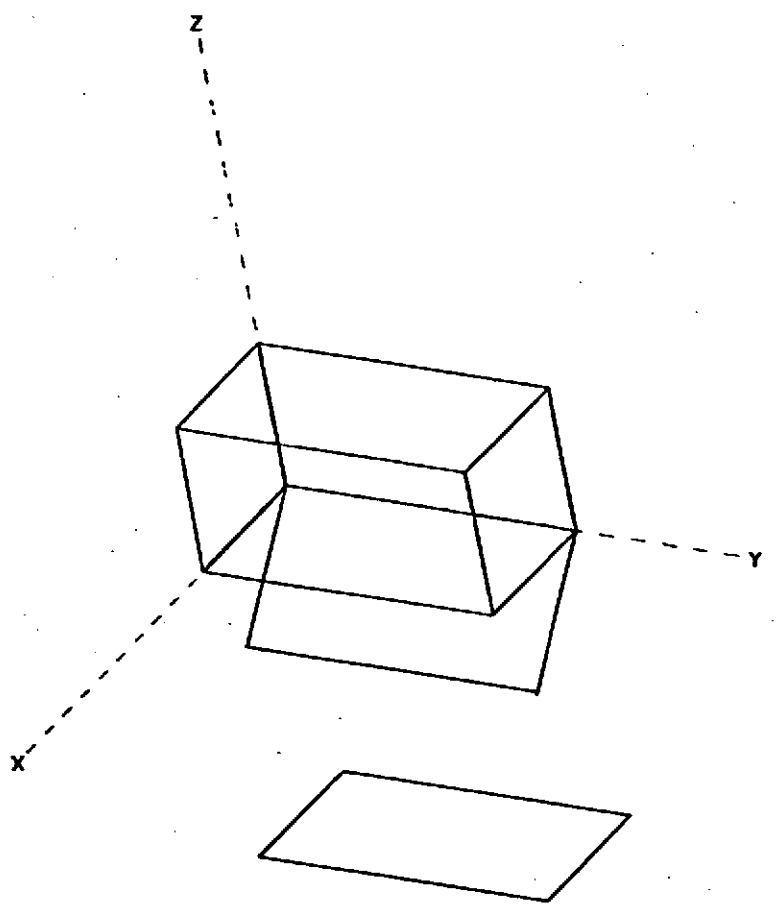
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

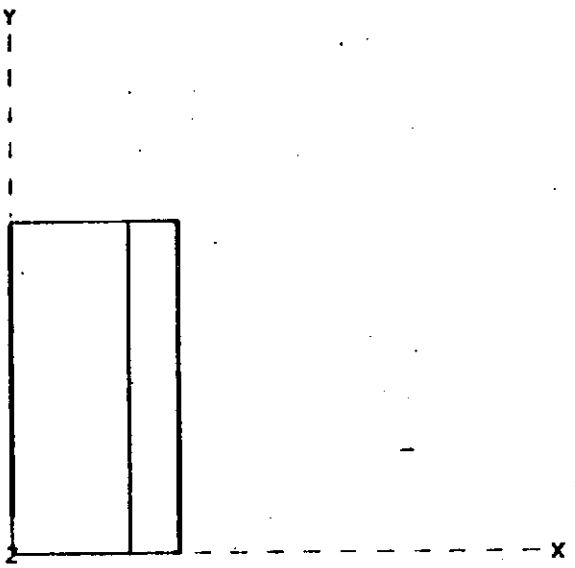
SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW = 3-D
SCALE = .4620
VIEW NUMBER = 1

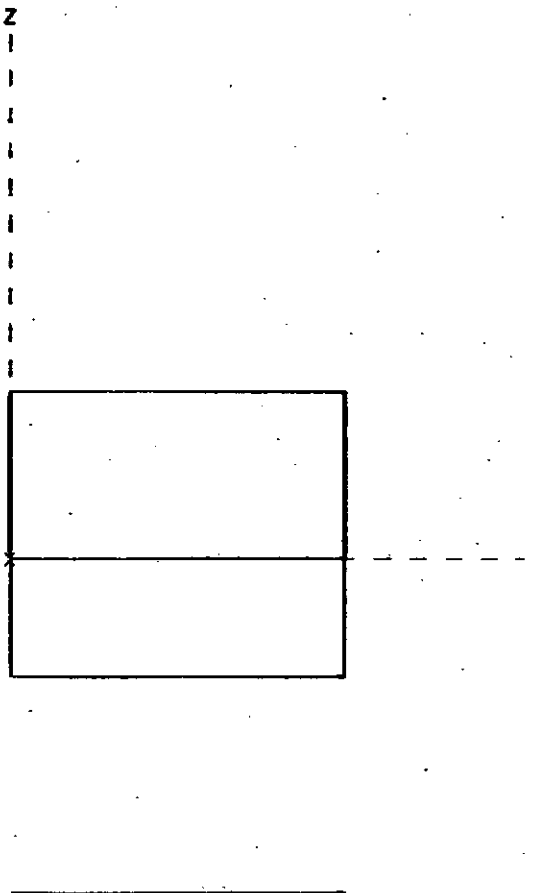
1ST ROTATION ABOUT Z = 135.00
2ND ROTATION ABOUT Y = 45.00
3RD ROTATION ABOUT X = 45.00

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



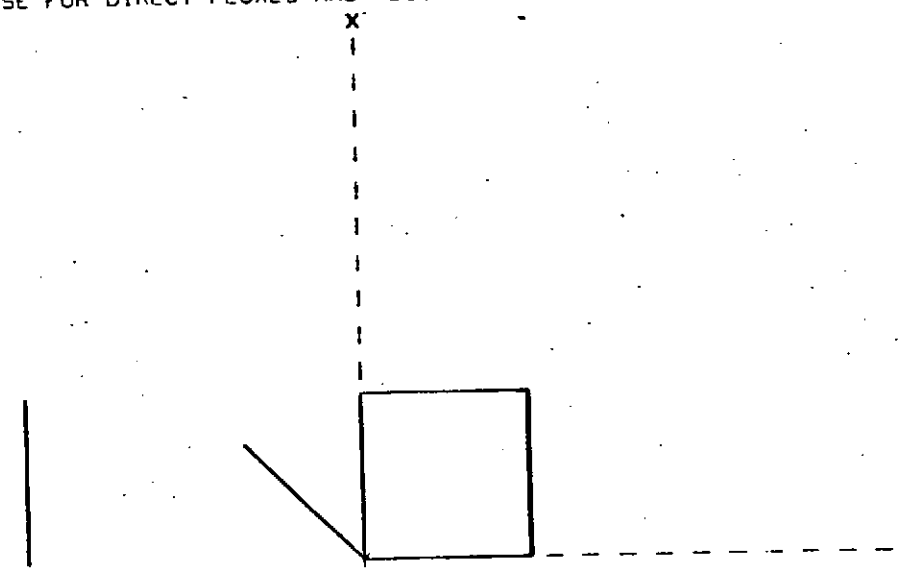
VIEW	= Z-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .4620	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .4620	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	-90.00

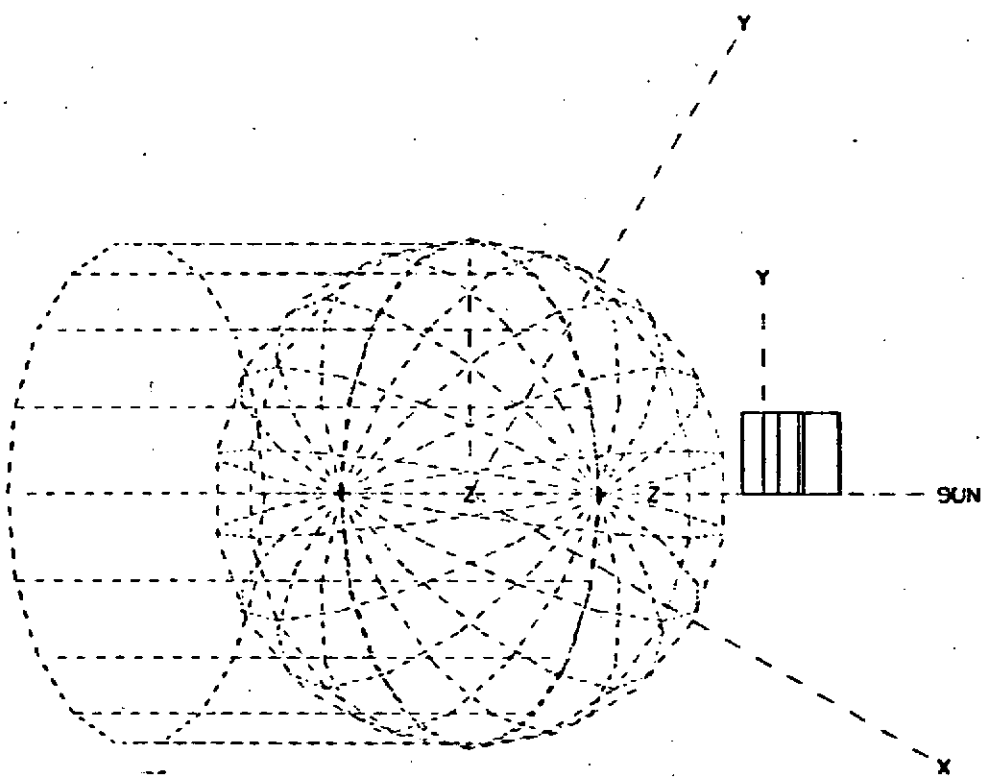
SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



VIEW = Y-AXIS
SCALE = .4620
VIEW NUMBER = 1

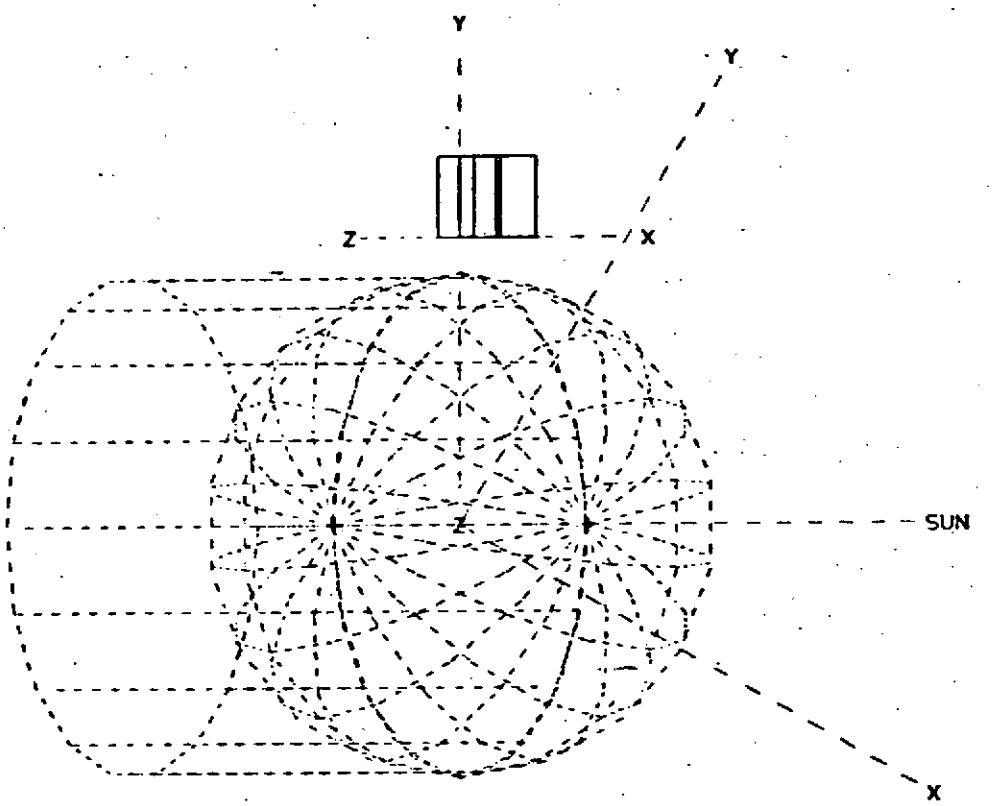
1ST ROTATION ABOUT Z = -90.00
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 90.00

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



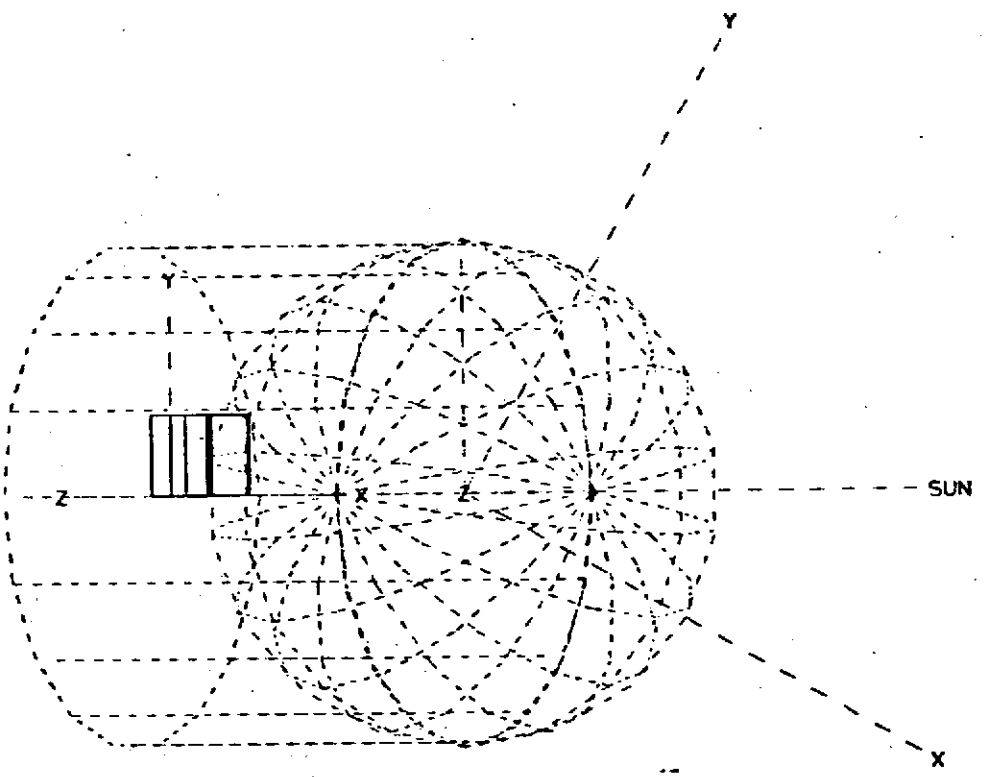
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



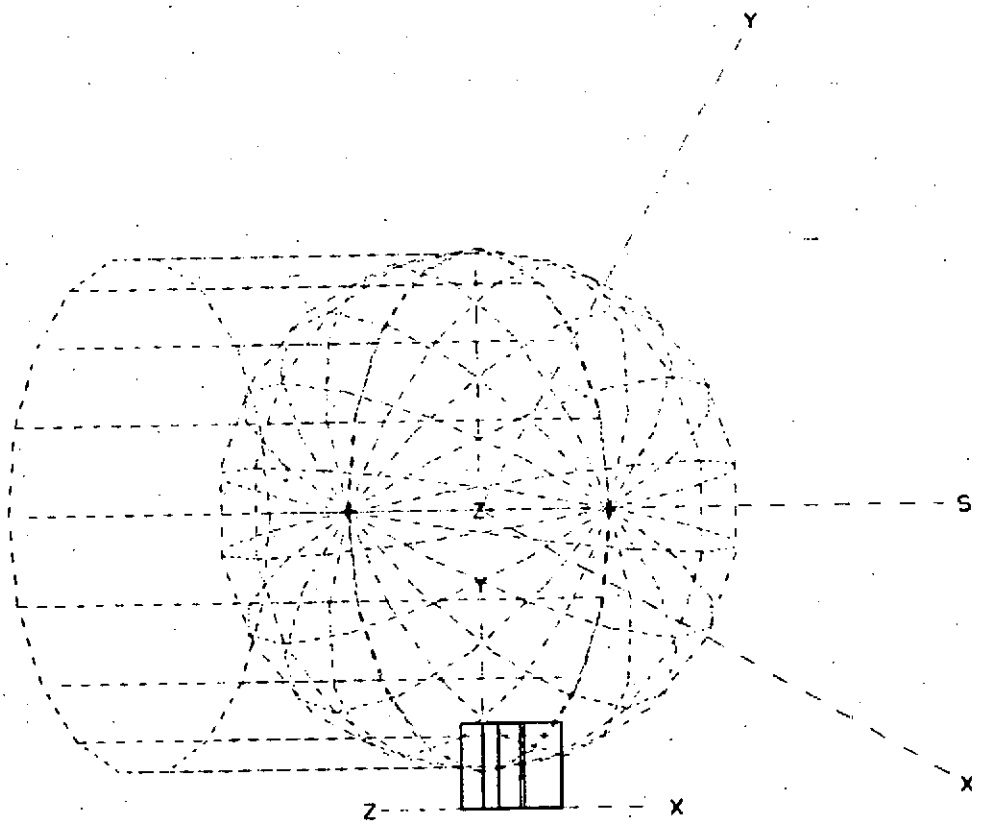
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



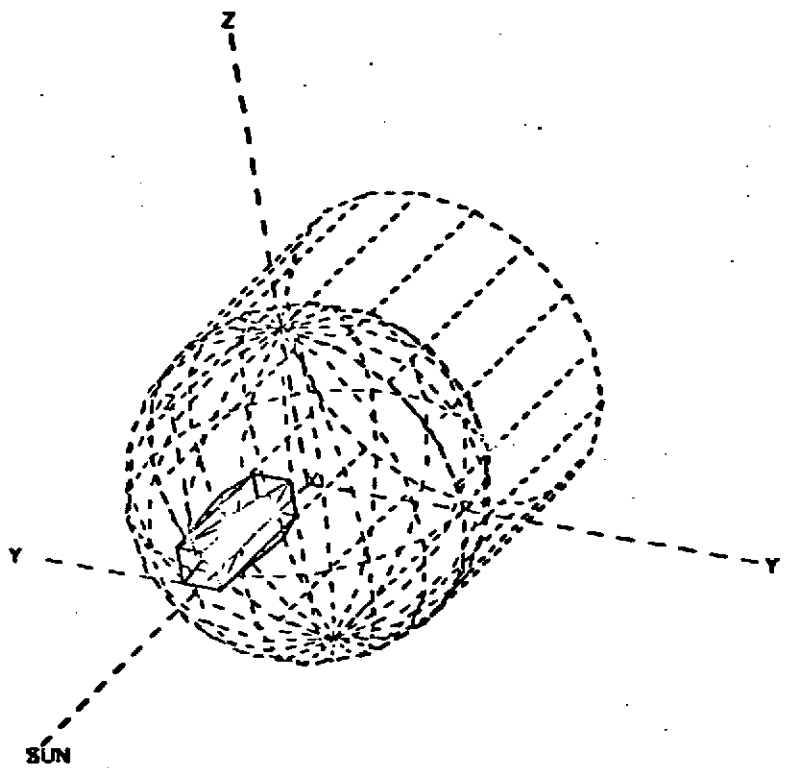
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIRECT FLUXES AND ABSORBED HEAT CALCULATIONS



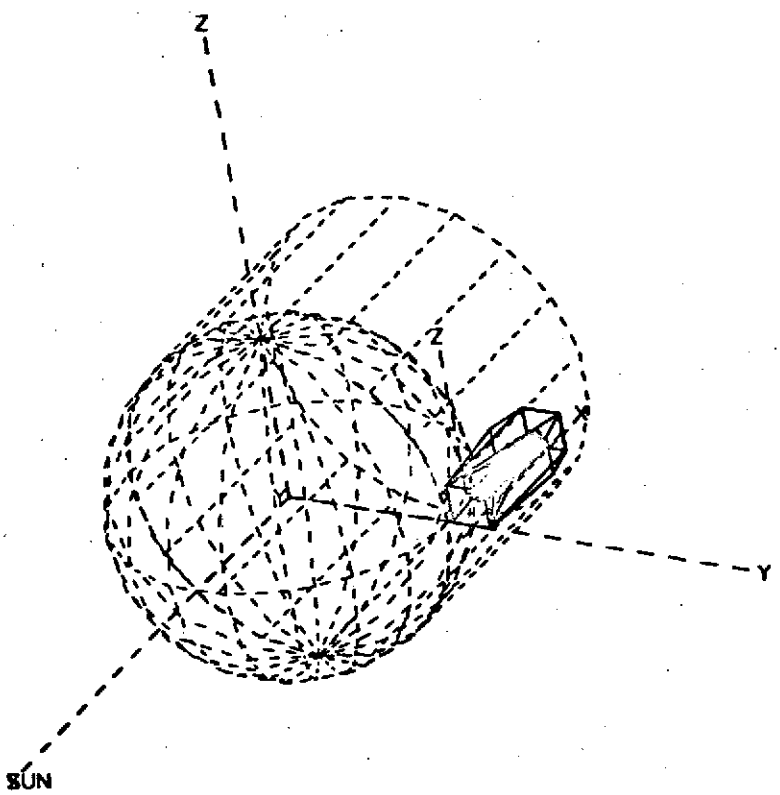
VIEW	= CIGMA	1ST ROTATION ABOUT Z =	30.00
SCALE	= .1137	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

COUNT ORACULA VON BLOCKHEAD IN ORBIT



VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .0293	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	45.00

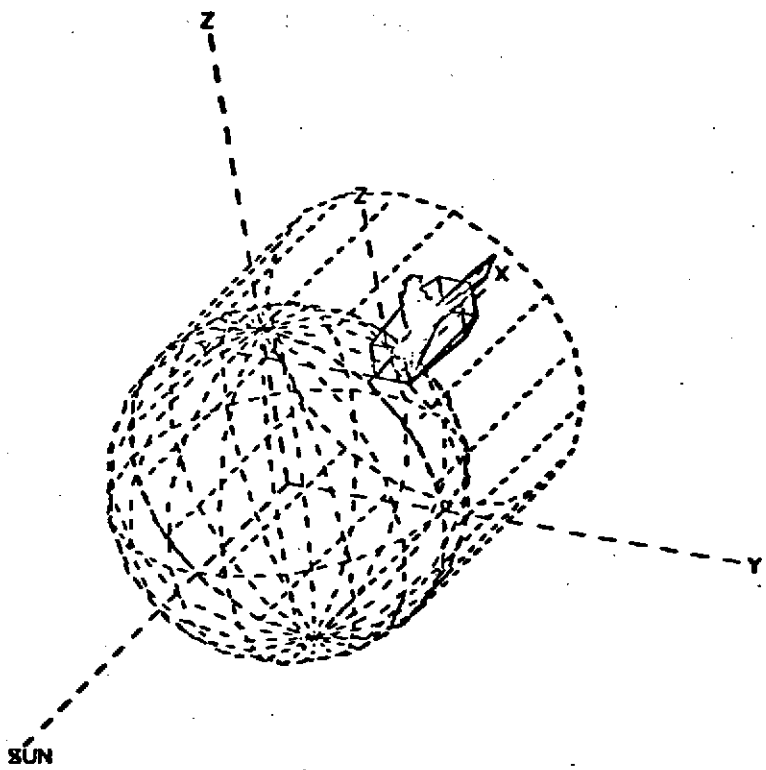
COUNT DRACULA VON BLOCKHEAD IN ORBIT



VIEW = 3-D
SCALE = .0293
VIEW NUMBER = 1

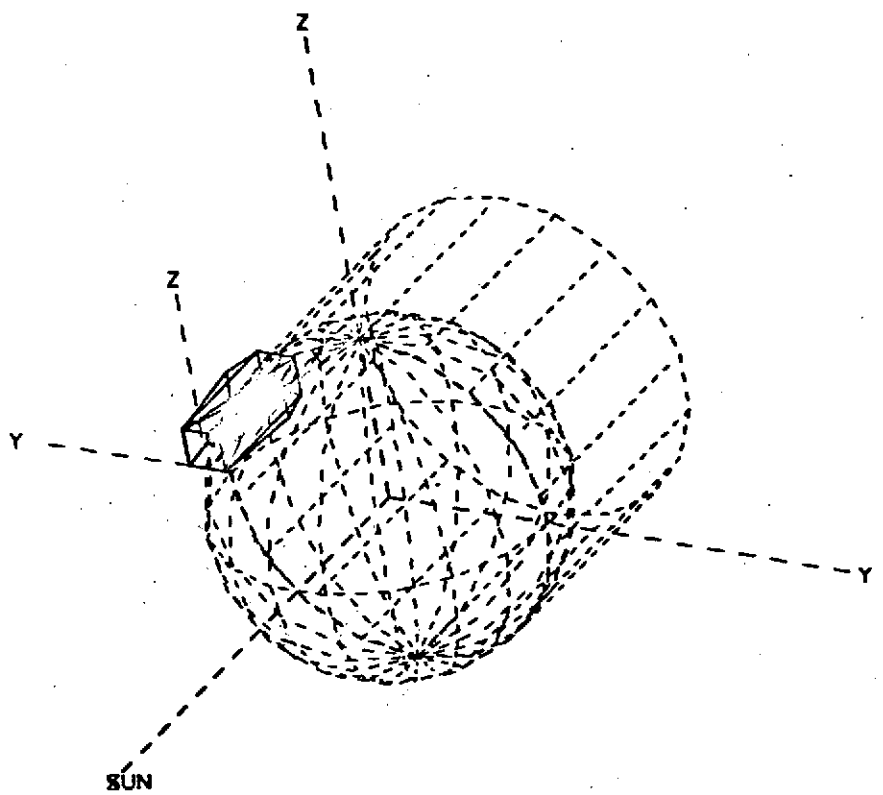
1ST ROTATION ABOUT Z = 135.00
2ND ROTATION ABOUT Y = 45.00
3RD ROTATION ABOUT X = [illegible]

COUNT DRACULA VON BLOCKHEAD IN ORBIT



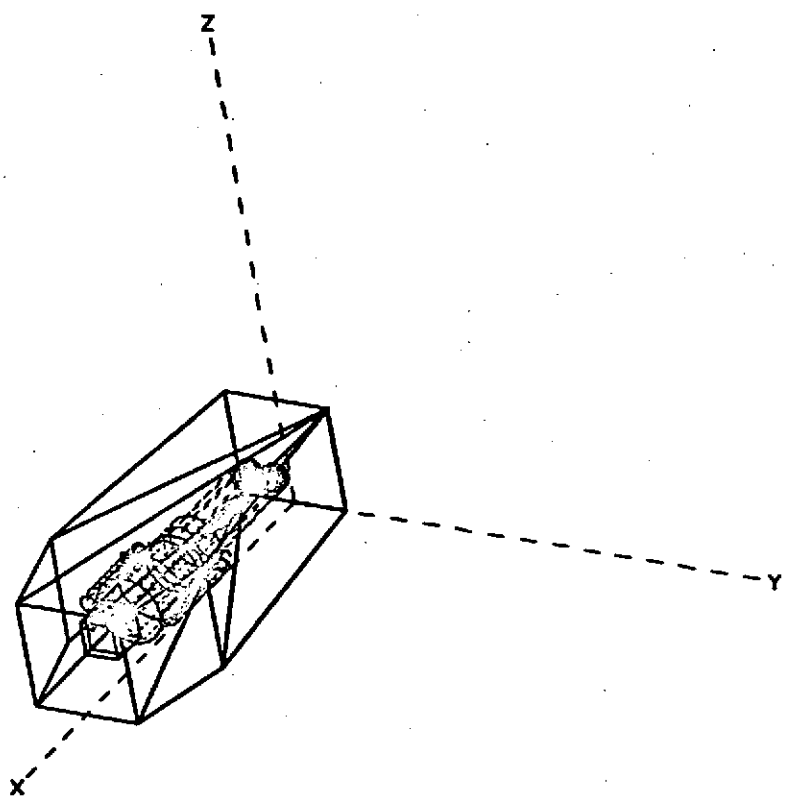
VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .0265	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	45.00

COUNT DRACULA VON BLOCKHEAD IN ORBIT



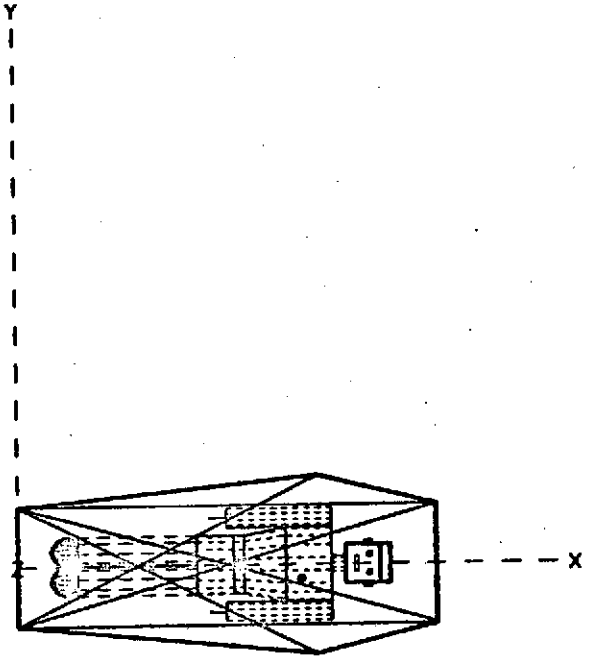
VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .0293	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	45.00

COUNT DRACULA VON BLOCKHEAD IN REPOSE



VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .0803	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 2	3RD ROTATION ABOUT X =	45.00

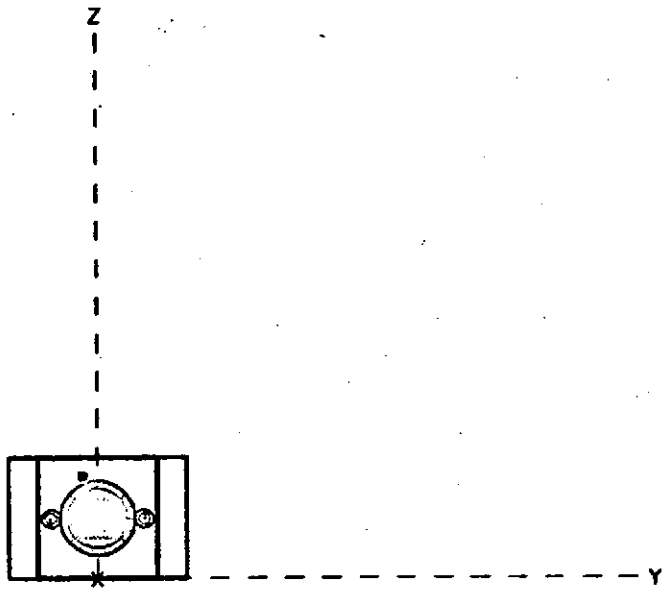
COUNT DRACULA VON BLOCKHEAD IN REPOSE



VIEW = Z-AXIS
SCALE = .0803
VIEW NUMBER = 2

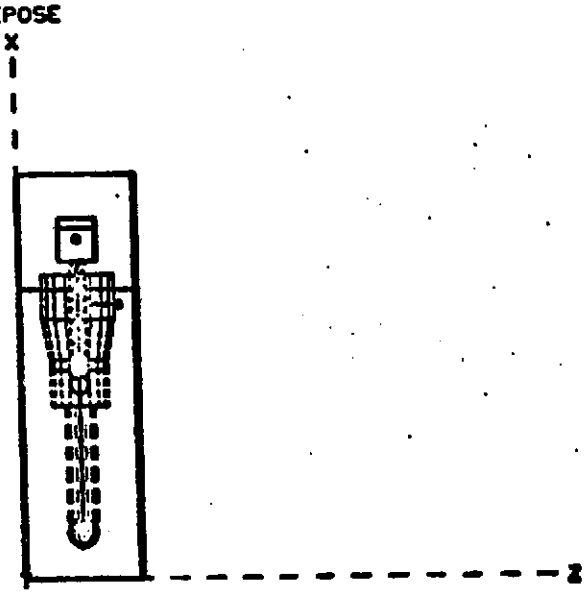
1ST ROTATION ABOUT Z = 0.
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 0.

COUNT DRACULA VON BLOCKHEAD IN REPOSE



VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .0803	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 2	3RD ROTATION ABOUT X =	-90.00

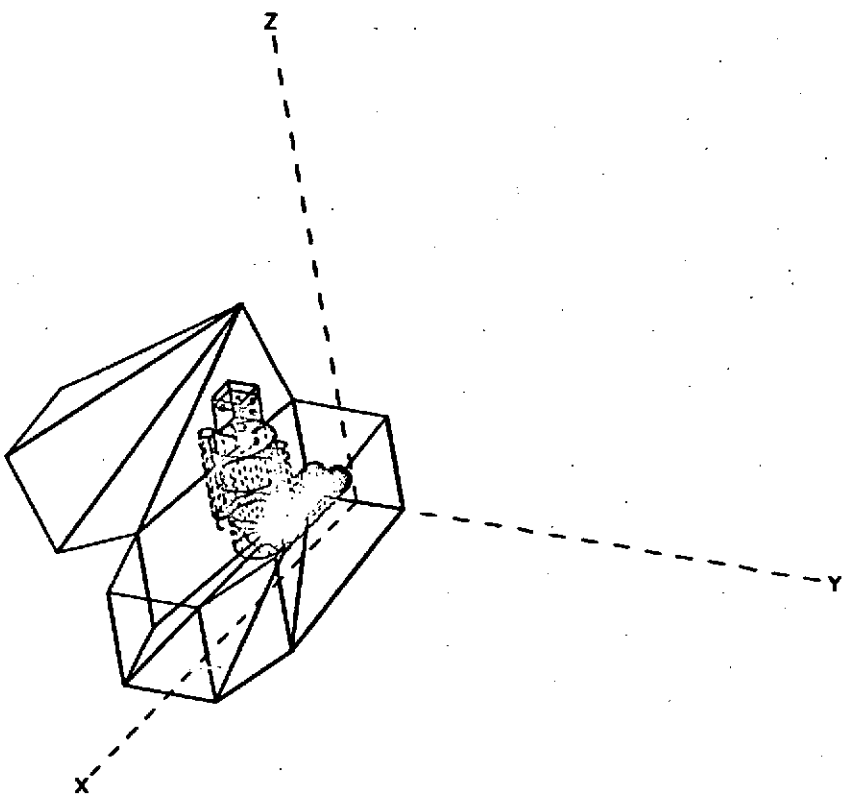
COUNT DRACULA VON BLOCKHEAD IN REPOSE



VIEW = Y-AXIS
SCALE = .0803
VIEW NUMBER = 2

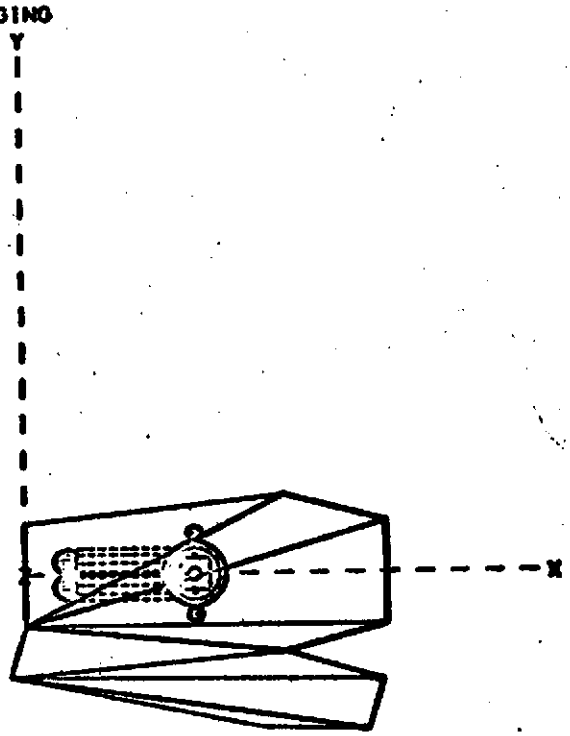
1ST ROTATION ABOUT Z = -90.00
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 90.00

COUNT DRACULA VON BLOCKHEAD EMERGING



VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .0727	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 3	3RD ROTATION ABOUT X =	45.00

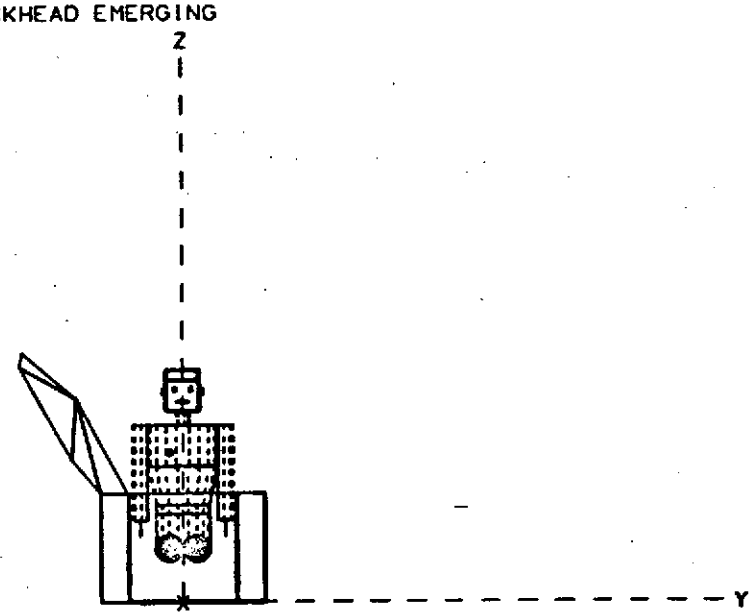
COUNT DRACULA VON BLOCKHEAD EMERGING



VIEW = Z-AXIS
SCALE = .0727
VIEW NUMBER = 3

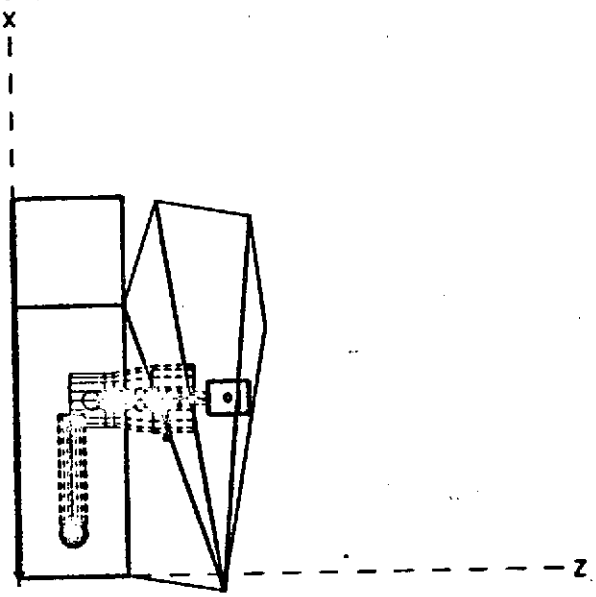
1ST ROTATION ABOUT Z = 0.
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 0.

COUNT DRACULA VON BLOCKHEAD EMERGING



VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .0727	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 3	3RD ROTATION ABOUT X =	-90.00

COUNT DRACULA VON BLOCKHEAD EMERGING



VIEW = Y-AXIS
SCALE = .0727
VIEW NUMBER = 3

1ST ROTATION ABOUT Z = -90.00
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 90.00

```
HEADER  OPTIONS DATA
TITLE   SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
        MODEL       = LOUVER
HEADER  SURFACE DATA
BCS     BLADE1
S       SURFN       = 1
        TYPE        = RECT
        ACTIVE      = TOP
        SHADE       = FF
        BSHADE      = FF
        PROP        = 0.2,0.05
        SPRI        = 0.95
        P1          =-2.5,0.,0.005
        P2          = 2.5,0.,0.005
        P3          = 2.5,10.,0.005
        COM         = *  LOUVER BLADE NUMBER 1  *
S       SURFN       = 2
        TYPE        = RECT
        ACTIVE      = BOTTOM
        SHADE       = FF
        BSHADE      = FF
        PROP        = 0.2,0.05
        SPRI        = 0.95
        P1          =-2.5,0.,-0.005
        P2          = 2.5,0.,-0.005
        P3          = 2.5,10.,-0.005
        COM         = *  LOUVER BLADE NUMBER 1  *
BCS     BLADE2
S       SURFN       = 3
        TYPE        = RECT
        ACTIVE      = TOP
        SHADE       = FF
        BSHADE      = FF
        PROP        = 0.2,0.05
        SPRI        = 0.95
        P1          =-2.5,0.,0.005
        P2          = 2.5,0.,0.005
        P3          = 2.5,10.,0.005
        COM         = *  LOUVER BLADE NUMBER 2  *
S       SURFN       = 4
        TYPE        = RECT
        ACTIVE      = BOTTOM
        SHADE       = FF
        BSHADE      = FF
        PROP        = 0.2,0.05
        SPRI        = 0.95
        P1          =-2.5,0.,-0.005
        P2          = 2.5,0.,-0.005
        P3          = 2.5,10.,-0.005
        COM         = *  LOUVER BLADE NUMBER 2  *
BCS     BASE
S       SURFN       = 5
        TYPE        = RECT
        ACTIVE      = TOP
        BSHADE      = FF
        PROP        = 0.2,0.88
        P1          = 0.,10.,0.
        P2          = 0.,0.,0.
        P3          = 10.,0.,0.
        NNX         = 3
        UNNX        = 2.5,7.5
```

```
        COM          = *  LOUVER SYSTEM SUBSTRATE  *
S       SURFN        = 8
        TYPE         = RECT
        ACTIVE       = BOTTOM
        BSHADE       = FF
        PROP         = 0.2,0.06
        P1           = 0.,0.,2.5
        P2           = 0.,0.,0.
        P3           = 10.,0.,0.
        NNX          = 3
        UNNX         = 2.5,7.5
        COM          = *  LOUVER SYSTEM SIDERAIL  *
S       SURFN        = 11
        TYPE         = RECT
        ACTIVE       = TOP
        BSHADE       = FF
        PROP         = 0.2,0.06
        P1           = 0.,0.,2.5
        P2           = 0.,0.,0.
        P3           = 0.,10.,0.
        COM          = *  LOUVER SYSTEM END CLOSURE  *
S       SURFN        = 12
        TYPE         = RECT
        ACTIVE       = TOP
        BSHADE       = FF
        PROP         = 0.2,0.06
        P1           = 10.,10.,0.
        P2           = 10.,0.,0.
        P3           = 10.,0.,2.5
        COM          = *  LOUVER SYSTEM END CLOSURE  *
S       SURFN        = 13
        TYPE         = RECT
        ACTIVE       = TOP
        BSHADE       = FF
        PROP         = 0.2,0.06
        P1           = 0.,10.,2.5
        P2           = 0.,10.,0.
        P3           = 10.,10.,0.
        NNX          = 3
        UNNX         = 2.5,7.5
        COM          = *  LOUVER SYSTEM SIDERAIL  *
HEADER  BCS DATA
BCS     BLADE1,2.5,0.,2.5,0.,0.,0.
BCS     BLADE2,7.5,0.,2.5,0.,0.,0.
BCS     BASE,0.,0.,0.,0.,0.,0.
```

```
HEADER OPERATIONS DATA
STEP   1
       CALL BUILDC(BLADE1)
       CALL ADD(BLADE2)
       CALL ADD(BASE)
L      NPLOT
       FFPNCH       = 3HPUN
L      FFCAL
       CALL GBDATA(1,2HIR)
L      GBCAL
       CALL RKDATA(1,2HNO,0.,0,5HSPACE,999,0.,0.,2HNO)
L      RKCAL
STEP   2
       CALL CHGBLK(BLADE1,0.,0.,0.,1,2,3,0.,30.,0.)
       CALL CHGBLK(BLADE2,0.,0.,0.,1,2,3,0.,30.,0.)
       CALL BUILDC(BLADE1)
       CALL ADD(BLADE2)
       CALL ADD(BASE)
L      NPLOT
       FFPNCH       = 3HPUN
L      FFCAL
       CALL GBDATA(2,2HIR)
L      GBCAL
       IRKNGB       = 2
L      RKCAL
END OF PROBLEM
```

NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC 6400-6500/MACE

TTTTTTTTTTTT
TTTTTTTTTTTT
TT TTT TT
TTT
TTT
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TTT
TTT
TTTTTTT

RRRRRRRRR
RRRRRRRRRR
RRR RRR
RRR RRR
RRRRRRRRRR
RRR RRR
RRR RRR
RRR RRR
RRR RRRR

AAAAAAA
AAAAAAAAA
AAAAAAAAAAA
AAA AAA
AAA AAA
AAAAAAAAAAA
AAA AAA
AAA AAA
AAA AAA
AAAAA AAAAA

PROCESSOR

SSSSSSSSS
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SSSSSSSSS

YYYY YYYY
YYY YYY
YYY YYY
YYY YYY
YYYYY
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SSS SS
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SSSSSSSSS

H-209

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
PROCESSSING OPERATION DATA

NODE	OCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
1	BLADE1	5.000E+01	.200	.050	RECTANGLE	TOP	LOUVER BLADE NUMBER 1
2	BLADE1	5.000E+01	.200	.050	RECTANGLE	BOTTOM	LOUVER BLADE NUMBER 1
3	BLADE2	5.000E+01	.200	.050	RECTANGLE	TOP	LOUVER BLADE NUMBER 2
4	BLADE2	5.000E+01	.200	.050	RECTANGLE	BOTTOM	LOUVER BLADE NUMBER 2
5	BASE	2.500E+01	.200	.890	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
6	BASE	5.000E+01	.200	.890	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
7	BASE	2.500E+01	.200	.890	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
8	BASE	6.250E+00	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
9	BASE	1.250E+01	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
10	BASE	6.250E+00	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
11	BASE	2.500E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM END CLOSURE
12	BASE	2.500E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM END CLOSURE
13	BASE	6.250E+00	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL
14	BASE	1.250E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL
15	BASE	6.250E+00	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
NODE PLOTTER DATA OUTPUT

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM CCS ORIGIN IN USER S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:,

CALL NDATA (NV, IVU, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
NODE PLOTTER DATA OUTPUT

VIEW=3-D SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 135.0000
SECOND ROTATION ABOUT Y = 45.0000
THIRD ROTATION ABOUT X = 45.0000

VIEW=Z-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 0.

VIEW=X-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 90.0000
THIRD ROTATION ABOUT X = -90.0000

VIEW=Y-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = -90.0000
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 90.0000

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

MODEL = LOUVER STEP = 1
FORM FACTOR CALCULATION LINK.

FORM FACTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
FFACC	.0500	0.05	ORIENTATION ACCURACY PARAMETER	N/A
FFACCS	.1000	0.10	SHADOWING ACCURACY PARAMETER	N/A
FFMIN	1.0E-06	1.E-6	PARAMETER TO ELIMINATE SMALL FORM FACTORS	N/A
FFNOSH	SHAD	4HSHAD	OVER RIDE SHADOWING PARAMETER	(4HSHAD,4HNOSH)
FFPNCH	PUN	2HNO	PARAMETER TO PUNCH FORM FACTORS	(3HPUN,2HNO)
FFPRNT	PRINT	5HPRINT	FLAG FOR COMPREHENSIVE PRINT	(5HPRINT,2HNO)
FFRATL	15.0	15.0	RATIO FOR USING SUB NODE TECHNIQUE	N/A

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
1	5.000E+01	.20	.05
2	5.000E+01	.20	.05
3	5.000E+01	.20	.05
4	5.000E+01	.20	.05
5	2.500E+01	.20	.03
6	5.000E+01	.20	.03
7	2.500E+01	.20	.03
8	6.250E+00	.20	.06
9	1.250E+01	.20	.06
10	6.250E+00	.20	.06
11	2.500E+01	.20	.06
12	2.500E+01	.20	.06
13	6.250E+00	.20	.06
14	1.250E+01	.20	.06
15	6.250E+00	.20	.06

NUMBER OF NODES = 15 NUMBER OF SURFACES = 9

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

1 FF SUM = 0. ROW CP TIME = .534 + RECT LOUVER BLADE NUMBER 1

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) NO/SHAD	SHAD. S FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
2	5	CAL.	.259468	.518936	.259468	.259468	1.000000	1.000000	3.181	
2	6	CAL.	.359322	.359322	.359322	.359322	1.000000	1.000000	5.726	
2	7	CAL.	.016541	.033082	.016541	.016541	1.000000	1.000000	5.875	
2	8	CAL.	.038497	.307979	.038497	.038497	1.000000	1.000000	8.762	*
2	9	CAL.	.050330	.201319	.050330	.050330	1.000000	1.000000	21.269	*
2	10	CAL.	.002410	.019279	.002410	.002410	1.000000	1.000000	21.418	
2	11	CAL.	.166114	.332223	.166114	.166114	1.000000	1.000000	25.915	*
2	12	CAL.	.016214	.032427	.016214	.016214	1.000000	1.000000	25.057	
2	13	CAL.	.038497	.307979	.038497	.038497	1.000000	1.000000	26.944	*
2	14	CAL.	.050330	.201319	.050330	.050330	1.000000	1.000000	41.440	*
2	15	CAL.	.002410	.019279	.002410	.002410	1.000000	1.000000	41.591	

2 FF SUM = 1.0001 ROW CP TIME = 41.595 + RECT LOUVER BLADE NUMBER 1

3 FF SUM = 0. ROW CP TIME = .457 + RECT LOUVER BLADE NUMBER 2

4	5	CAL.	.016541	.033082	.016541	.016541	1.000000	1.000000	.150	
4	6	CAL.	.359322	.359322	.359322	.359322	1.000000	1.000000	2.695	
4	7	CAL.	.259468	.518936	.259468	.259468	1.000000	1.000000	5.790	
4	8	CAL.	.002410	.019279	.002410	.002410	1.000000	1.000000	5.940	
4	9	CAL.	.050330	.201319	.050330	.050330	1.000000	1.000000	18.390	*
4	10	CAL.	.038497	.307979	.038497	.038497	1.000000	1.000000	21.266	*
4	11	CAL.	.016214	.032427	.016214	.016214	1.000000	1.000000	21.412	
4	12	CAL.	.166114	.332228	.166114	.166114	1.000000	1.000000	25.875	*
4	13	CAL.	.002410	.019279	.002410	.002410	1.000000	1.000000	26.025	
4	14	CAL.	.050330	.201319	.050330	.050330	1.000000	1.000000	38.483	*
4	15	CAL.	.038497	.307979	.038497	.038497	1.000000	1.000000	41.364	*

4 FF SUM = 1.0001 ROW CP TIME = 41.369 + RECT LOUVER BLADE NUMBER 2

5	8	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	3.340	*
5	9	CAL.	.020932	.041864	.020932	.020932	1.000000	1.000000	5.688	*
5	10	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	5.962	
5	11	CAL.	.249876	.249876	.249876	.249876	1.000000	1.000000	14.299	*
5	12	CAL.	.010699	.010699	.010699	.010699	1.000000	1.000000	14.459	
5	13	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	18.222	*
5	14	CAL.	.020932	.041864	.020932	.020932	1.000000	1.000000	20.073	*

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
5	15	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	20.245	
5	FF SUM =	1.0243	RUN CP TIME =		20.270		+ RECT		LOUVER SYSTEM SUBSTRATE	
6	8	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	3.863	*
6	9	CAL.	.078627	.314509	.078627	.078627	1.000000	1.000000	5.994	*
6	10	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	9.818	*
6	11	CAL.	.045089	.090173	.045089	.045089	1.000000	1.000000	10.170	
6	12	CAL.	.045089	.090173	.045089	.045089	1.000000	1.000000	10.519	
6	13	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	14.338	*
6	14	CAL.	.078627	.314509	.078627	.078627	1.000000	1.000000	16.469	*
6	15	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	20.294	*
6	FF SUM =	1.0091	RUN CP TIME =		20.299		+ RECT		LOUVER SYSTEM SUBSTRATE	
7	8	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	.170	
7	9	CAL.	.020932	.041864	.020932	.020932	1.000000	1.000000	2.818	*
7	10	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	5.776	*
7	11	CAL.	.010899	.010899	.010899	.010899	1.000000	1.000000	5.937	
7	12	CAL.	.239976	.239976	.239976	.239976	1.000000	1.000000	14.349	*
7	13	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	14.523	
7	14	CAL.	.020932	.041864	.020932	.020932	1.000000	1.000000	16.373	*
7	15	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	20.131	*
7	FF SUM =	1.0243	RUN CP TIME =		20.137		+ RECT		LOUVER SYSTEM SUBSTRATE	
8	11	CAL.	.251769	.062942	.251769	.251769	1.000000	1.000000	3.867	*
8	12	CAL.	.026576	.026644	.026576	.026576	1.000000	1.000000	4.044	
8	13	CAL.	.019294	.019294	.019294	.019294	1.000000	1.000000	4.219	
8	14	CAL.	.030079	.015040	.030079	.030079	1.000000	1.000000	4.371	
8	15	CAL.	.004159	.004159	.004159	.004159	1.000000	1.000000	4.550	
8	FF SUM =	1.0082	RUN CP TIME =		4.556		- RECT		LOUVER SYSTEM SIDERAIL	
9	11	CAL.	.072752	.036376	.072752	.072752	1.000000	1.000000	.290	
9	12	CAL.	.072752	.036376	.072752	.072752	1.000000	1.000000	.520	
9	13	CAL.	.015040	.030079	.015040	.015040	1.000000	1.000000	.669	
9	14	CAL.	.037166	.037166	.037166	.037166	1.000000	1.000000	.811	
9	15	CAL.	.015040	.030079	.015040	.015040	1.000000	1.000000	.963	

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

(* INDICATRS NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)	
9	FF SUM = 1.0136	ROW CP TIME = .988				- RECT		LOUVER SYSTEM SIDERAIL		
10	11	CAL.	.026576	.006644	.026576	.026576	1.000000	1.000000	.175	
10	12	CAL.	.251769	.062942	.251769	.251769	1.000000	1.000000	3.915	*
10	13	CAL.	.008159	.008159	.008159	.008159	1.000000	1.000000	4.084	
10	14	CAL.	.030079	.015040	.030079	.030079	1.000000	1.000000	4.245	
10	15	CAL.	.013294	.013294	.013294	.013294	1.000000	1.000000	4.413	
10	FF SUM = 1.0082	ROW CP TIME = 4.424				- RECT		LOUVER SYSTEM SIDERAIL		
11	12	CAL.	.062903	.062903	.062903	.062903	1.000000	1.000000	.212	
11	13	CAL.	.063350	.253399	.063350	.063350	1.000000	1.000000	3.729	*
11	14	CAL.	.036376	.072752	.036376	.036376	1.000000	1.000000	3.960	
11	15	CAL.	.006644	.026576	.006644	.006644	1.000000	1.000000	4.177	
11	FF SUM = 1.0309	ROW CP TIME = 4.142				+ RECT		LOUVER SYSTEM END CLOSURE		
12	13	CAL.	.006644	.026576	.006644	.006644	1.000000	1.000000	.175	
12	14	CAL.	.036376	.072752	.036376	.036376	1.000000	1.000000	.403	
12	15	CAL.	.063350	.253399	.063350	.063350	1.000000	1.000000	3.886	*
12	FF SUM = 1.0309	ROW CP TIME = 3.891				+ RECT		LOUVER SYSTEM END CLOSURE		
13	FF SUM = 1.0095	ROW CP TIME = .092				+ RECT		LOUVER SYSTEM SIDERAIL		
14	FF SUM = 1.0136	ROW CP TIME = .043				+ RECT		LOUVER SYSTEM SIDERAIL		
15	FF SUM = 1.0095	ROW CP TIME = .006				+ RECT		LOUVER SYSTEM SIDERAIL		

TOTAL CP TIME (SEC) FOR PROBLEM = 162.964

MODEL = LOUVER STEP = 1
FORM FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

FORM FACTOR SUMS FROM NODE I

NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM
1 -	0.	2 -	1.0001327	3 -	0.	4 -	1.0001327	5 -	1.0242779	6 -	1.0000666
7 -	1.0242779	8 -	1.0001580	9 -	1.0136234	10 -	1.0001580	11 -	1.0309438	12 -	1.0309438
13 -	1.0097869	14 -	1.0136234	15 -	1.0097869						

TOTAL TIME FOR FORM FACTORS163.02

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
IMAGE FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS	SPECULAR REFL(UV)	SPECULAR REFL(IR)
1	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
2	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
3	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
4	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
5	2.500E+01	2.000E-01	8.800E-01	0.	0.
6	5.000E+01	2.000E-01	8.800E-01	0.	0.
7	2.500E+01	2.000E-01	8.800E-01	0.	0.
8	6.250E+00	2.000E-01	6.000E-02	0.	0.
9	1.250E+01	2.000E-01	6.000E-02	0.	0.
10	6.250E+00	2.000E-01	6.000E-02	0.	0.
11	2.500E+01	2.000E-01	6.000E-02	0.	0.
12	2.500E+01	2.000E-01	6.000E-02	0.	0.
13	6.250E+00	2.000E-01	6.000E-02	0.	0.
14	1.250E+01	2.000E-01	6.000E-02	0.	0.
15	6.250E+00	2.000E-01	6.000E-02	0.	0.

NUMBER OF NODES = 15 NUMBER OF SURFACES = 9

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
IMAGE FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	IFE(I,J) W/SHAD	IFE(J,I) W/SHAD	IFA(I,J) W/SHAD	CP TIME (SEC)	
1	8	CAL.	.074319	.594551	0.	7.851	
1	9	CAL.	.096050	.384202	0.	23.399	
1	11	CAL.	.333957	.667914	0.	26.731	
1	13	CAL.	.074319	.594551	0.	29.338	
1	14	CAL.	.096050	.384202	0.	44.886	
1	ROW CP TIME =	45.254	+ RECT			LOUVER BLADE NUMBER 1	
2	5	CAL.	.259468	.518936	.259468	2.542	
2	6	CAL.	.359322	.359322	.359322	4.344	
2	7	CAL.	.016541	.033082	.016541	4.707	
2	8	CAL.	.075070	.600558	.038497	7.597	
2	9	CAL.	.098143	.392572	.050330	26.348	
2	10	CAL.	.002410	.019279	.002410	26.710	
2	11	CAL.	.323923	.647845	.166114	31.326	
2	12	CAL.	.016214	.032427	.016214	31.684	
2	13	CAL.	.075070	.600558	.038497	34.871	
2	14	CAL.	.098143	.392572	.050330	53.334	
2	15	CAL.	.002410	.019279	.002410	53.700	
2	ROW CP TIME =	53.705	- RECT			LOUVER BLADE NUMBER 1	
3	9	CAL.	.095313	.381253	0.	24.863	
3	10	CAL.	.070617	.564932	0.	27.913	
3	12	CAL.	.314706	.629412	0.	32.852	
3	14	CAL.	.095313	.381253	0.	51.669	
3	15	CAL.	.070617	.564932	0.	54.721	
3	ROW CP TIME =	54.726	+ RECT			LOUVER BLADE NUMBER 2	
4	5	CAL.	.016541	.033082	.016541	.503	
4	6	CAL.	.359322	.359322	.359322	2.625	
4	7	CAL.	.259468	.518936	.259468	5.172	
4	8	CAL.	.002410	.019279	.002410	5.533	
4	9	CAL.	.098143	.392572	.050330	23.987	
4	10	CAL.	.075070	.600558	.038497	27.169	
4	11	CAL.	.016214	.032427	.016214	27.532	
4	12	CAL.	.323923	.647845	.166114	32.112	
4	13	CAL.	.002410	.019279	.002410	32.479	
4	14	CAL.	.098143	.392572	.050330	50.921	
4		CAL.	.075070	.600558	.038497	54.104	

MODEL = LOUVER STEP = 1
IMAGE FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)
4	ROW CP TIME =	54.128	- RECT	LOUVER BLADE NUMBER 2					
5	5	CAL.	.320816	.320816	0.				.725
5	6	CAL.	.336976	.168488	0.				1.303
5	7	CAL.	.344018	.344018	0.				1.676
5	8	CAL.	.123532	.494126	.063350				7.311
5	9	CAL.	.040817	.081634	.020932				13.816
5	10	CAL.	.001411	.005646	.001411				11.437
5	11	CAL.	.565453	.565453	.289976				20.097
5	12	CAL.	.010899	.010899	.010899				20.691
5	13	CAL.	.123532	.494126	.063350				26.327
5	14	CAL.	.040817	.081634	.020932				29.834
5	15	CAL.	.001411	.005646	.001411				30.455
5	ROW CP TIME =	30.459	+ RECT	LOUVER SYSTEM SUBSTRATE					
6	6	CAL.	.552451	.552451	0.				1.410
6	7	CAL.	.168488	.336976	0.				1.983
6	8	CAL.	.020957	.167660	.010747				7.833
6	9	CAL.	.153323	.613293	.078627				13.415
6	10	CAL.	.020957	.167660	.010747				16.353
6	11	CAL.	.045089	.090178	.045089				17.252
6	12	CAL.	.045089	.090178	.045089				19.313
6	13	CAL.	.020957	.167660	.010747				24.170
6	14	CAL.	.153323	.613293	.078627				26.754
6	15	CAL.	.020957	.167660	.010747				32.698
6	ROW CP TIME =	32.702	+ RECT	LOUVER SYSTEM SUBSTRATE					
7	7	CAL.	.320816	.320816	0.				.730
7	8	CAL.	.001411	.005646	.001411				1.333
7	9	CAL.	.040817	.081634	.020932				4.855
7	10	CAL.	.123341	.492165	.063350				10.306
7	11	CAL.	.010899	.010899	.010899				10.892
7	12	CAL.	.565953	.565953	.289976				19.499
7	13	CAL.	.001411	.005646	.001411				20.093
7	14	CAL.	.040817	.081634	.020932				23.623
7	15	CAL.	.123341	.492165	.063350				29.093
7	ROW CP TIME =	29.097	+ RECT	LOUVER SYSTEM SUBSTRATE					
8	11	CAL.	.490950	.122737	.251769				11.083
8	12	CAL.	.026576	.006644	.026576				11.697
8	13	CAL.	.019294	.019294	.019294				12.313

MODEL = LOUVER STEP = 1
IMAGE FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	IFE(I,J) W/SHAD	IFE(J,I) W/SHAD	IFA(I,J) W/SHAD	CP TIME (SEC)	
8	14	CAL.	.030079	.015040	.030079	12.859	
8	15	CAL.	.008159	.008159	.008159	13.503	
8	ROW CP TIME =		13.507	- RECT		LOUVER SYSTEM SIDERAIL	
9	11	CAL.	.072752	.036376	.072752	1.353	
9	12	CAL.	.072752	.036376	.072752	1.704	
9	13	CAL.	.015040	.030079	.015040	2.256	
9	14	CAL.	.037166	.037166	.037166	2.774	
9	15	CAL.	.015040	.030079	.015040	3.336	
9	ROW CP TIME =		3.341	- RECT		LOUVER SYSTEM SIDERAIL	
10	11	CAL.	.026576	.006644	.026576	.819	
10	12	CAL.	.624381	.156095	.251769	9.927	
10	13	CAL.	.008159	.008159	.008159	10.546	
10	14	CAL.	.030079	.015040	.030079	11.110	
10	15	CAL.	.019294	.019294	.019294	11.751	
10	ROW CP TIME =		11.754	- RECT		LOUVER SYSTEM SIDERAIL	
11	12	CAL.	.062903	.062903	.062903	1.092	
11	13	CAL.	.123532	.494126	.063350	11.247	
11	14	CAL.	.036376	.072752	.036376	11.889	
11	15	CAL.	.006644	.026576	.006644	12.515	
11	ROW CP TIME =		12.523	+ RECT		LOUVER SYSTEM END CLOSURE	
12	13	CAL.	.006644	.026576	.006644	.994	
12	14	CAL.	.036376	.072752	.036376	1.655	
12	15	CAL.	.156502	.626010	.063350	10.584	
12	ROW CP TIME =		10.589	+ RECT		LOUVER SYSTEM END CLOSURE	
13	ROW CP TIME =		1.173	+ RECT		LOUVER SYSTEM SIDERAIL	

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
IMAGE FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)
14	ROW CP TIME =	.740		+ RECT		LOUVER SYSTEM SIDERAIL			
15	ROW CP TIME =	.394		+ RECT		LOUVER SYSTEM SIDERAIL			

TOTAL CP TIME (SEC) FOR PROBLEM = 354.385

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
GREY BODIES COMPUTATION LINK.

GREY BODIES

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IGBSFF	1	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR FORM FACTORS	N/A
GBWBND	IR	NONE	WAVEBAND DEFINITION PARAMETER	(2HIR,3HSOL,4HBOTH)

IR GREY BODIES STORED IN STEP 1

TOTAL TIME TO COMPUTE GREY BODIES .25

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
RADIATION CONDUCTOR LINK.

RADIATION CONDUCTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IRKNGB	1	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR GREY BODIES	N/A
RKPNCH	NO	2HNO	PUNCH/NO PUNCH PARAMETER FOR RADK S	(3HPUN,2HNO)
RKMIN	1.0E-04	0.0001	PARAMETER TO ELIMINATE SMALL RADK S	N/A
IRKCN	1	1	INITIAL RADIATION CONDUCTOR ID NUMBER	N/A
RKSP	SPACE	2HNO	MNEMONIC FLAG FOR COMPUTATION OF RADKS TO SPACE	(5HSPACE,2HNO)
IRKNSP	999	32767	SPACE NODE ID NUMBER	N/A
SIGMA	1.71E-09	1.713E-9	STEFAN-BOLTZMANN CONSTANT	N/A
RKAMPF	1.00	1.0	AREA MULTIPLYING FACTOR	N/A
RKTAPE	NO	2HNO	PARAMETER TO OUTPUT TO BCD TAPE	(4HTAPE,2HNO)

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
RADIATION CONDUCTOR LINK.

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

PUNCHED RADKS -	1,	1,	2,	1.7130000E-09*	7.9705075E-02	$ RADK
PUNCHED RADKS -	2,	1,	3,	1.7130000E-09*	2.2210500E-02	$ RADK
PUNCHED RADKS -	3,	1,	4,	1.7130000E-09*	2.8429724E-02	$ RADK
PUNCHED RADKS -	4,	1,	5,	1.7130000E-09*	1.0275210E+00	$ RADK
PUNCHED RADKS -	5,	1,	6,	1.7130000E-09*	6.7597222E-01	$ RADK
PUNCHED RADKS -	6,	1,	7,	1.7130000E-09*	2.4765051E-01	$ RADK
PUNCHED RADKS -	7,	1,	8,	1.7130000E-09*	2.2294836E-02	$ RADK
PUNCHED RADKS -	8,	1,	9,	1.7130000E-09*	2.0327965E-02	$ RADK
PUNCHED RADKS -	9,	1,	10,	1.7130000E-09*	3.4763511E-03	$ RADK
PUNCHED RADKS -	10,	1,	11,	1.7130000E-09*	7.9582638E-02	$ RADK
PUNCHED RADKS -	11,	1,	12,	1.7130000E-09*	1.4177871E-02	$ RADK
PUNCHED RADKS -	12,	1,	13,	1.7130000E-09*	2.2353171E-02	$ RADK
PUNCHED RADKS -	13,	1,	14,	1.7130000E-09*	2.0326237E-02	$ RADK
PUNCHED RADKS -	14,	1,	15,	1.7130000E-09*	3.4812664E-03	$ RADK
PUNCHED RADKS -	15,	2,	3,	1.7130000E-09*	2.8081129E-02	$ RADK
PUNCHED RADKS -	16,	2,	4,	1.7130000E-09*	3.7663796E-02	$ RADK
PUNCHED RADKS -	17,	2,	5,	1.7130000E-09*	1.7047962E+00	$ RADK
PUNCHED RADKS -	18,	2,	6,	1.7130000E-09*	1.6295737E+00	$ RADK
PUNCHED RADKS -	19,	2,	7,	1.7130000E-09*	3.8874466E-01	$ RADK
PUNCHED RADKS -	20,	2,	8,	1.7130000E-09*	2.3853333E-02	$ RADK
PUNCHED RADKS -	21,	2,	9,	1.7130000E-09*	2.2635827E-02	$ RADK
PUNCHED RADKS -	22,	2,	10,	1.7130000E-09*	5.1482892E-03	$ RADK
PUNCHED RADKS -	23,	2,	11,	1.7130000E-09*	8.3760316E-02	$ RADK
PUNCHED RADKS -	24,	2,	12,	1.7130000E-09*	2.0283712E-02	$ RADK
PUNCHED RADKS -	25,	2,	13,	1.7130000E-09*	2.3914731E-02	$ RADK
PUNCHED RADKS -	26,	2,	14,	1.7130000E-09*	2.2633954E-02	$ RADK
PUNCHED RADKS -	27,	2,	15,	1.7130000E-09*	5.1554792E-03	$ RADK
PUNCHED RADKS -	28,	3,	4,	1.7130000E-09*	8.6521794E-02	$ RADK
PUNCHED RADKS -	29,	3,	5,	1.7130000E-09*	2.3823333E-01	$ RADK
PUNCHED RADKS -	30,	3,	6,	1.7130000E-09*	7.0494578E-01	$ RADK
PUNCHED RADKS -	31,	3,	7,	1.7130000E-09*	1.1254370E+00	$ RADK
PUNCHED RADKS -	32,	3,	8,	1.7130000E-09*	3.0034599E-03	$ RADK
PUNCHED RADKS -	33,	3,	9,	1.7130000E-09*	2.0566677E-02	$ RADK
PUNCHED RADKS -	34,	3,	10,	1.7130000E-09*	2.5369387E-02	$ RADK
PUNCHED RADKS -	35,	3,	11,	1.7130000E-09*	1.3432630E-02	$ RADK
PUNCHED RADKS -	36,	3,	12,	1.7130000E-09*	8.6293761E-02	$ RADK
PUNCHED RADKS -	37,	3,	13,	1.7130000E-09*	3.0132804E-03	$ RADK
PUNCHED RADKS -	38,	3,	14,	1.7130000E-09*	2.0567529E-02	$ RADK
PUNCHED RADKS -	39,	3,	15,	1.7130000E-09*	2.5401776E-02	$ RADK
PUNCHED RADKS -	40,	4,	5,	1.7130000E-09*	3.7985081E-01	$ RADK
PUNCHED RADKS -	41,	4,	6,	1.7130000E-09*	1.6634597E+00	$ RADK
PUNCHED RADKS -	42,	4,	7,	1.7130000E-09*	1.8716889E+00	$ RADK
PUNCHED RADKS -	43,	4,	8,	1.7130000E-09*	4.5324350E-03	$ RADK
PUNCHED RADKS -	44,	4,	9,	1.7130000E-09*	2.3284229E-02	$ RADK
PUNCHED R[redacted] -	45,	4,	10,	1.7130000E-09*	2.5531814E-02	$ RADK

MODEL = LOUVER STEP = 1
RADIATION CONDUCTOR LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

PUNCHED RADKS -	46,	4,	11,	1.7130000E-09*	1.9469926E-02	$ RADK
PUNCHED RADKS -	47,	4,	12,	1.7130000E-09*	9.6029378E-02	$ RADK
PUNCHED RADKS -	48,	4,	13,	1.7130000E-09*	4.5464577E-03	$ RADK
PUNCHED RADKS -	49,	4,	14,	1.7130000E-09*	2.3282858E-02	$ RADK
PUNCHED RADKS -	50,	4,	15,	1.7130000E-09*	2.8567833E-02	$ RADK
PUNCHED RADKS -	51,	5,	6,	1.7130000E-09*	1.4547941E+01	$ RADK
PUNCHED RADKS -	52,	5,	7,	1.7130000E-09*	4.3638956E+00	$ RADK
PUNCHED RADKS -	53,	5,	8,	1.7130000E-09*	3.3566259E-01	$ RADK
PUNCHED RADKS -	54,	5,	9,	1.7130000E-09*	1.4513885E-01	$ RADK
PUNCHED RADKS -	55,	5,	10,	1.7130000E-09*	5.3165891E-02	$ RADK
PUNCHED RADKS -	56,	5,	11,	1.7130000E-09*	1.1985882E+00	$ RADK
PUNCHED RADKS -	57,	5,	12,	1.7130000E-09*	2.1196067E-01	$ RADK
PUNCHED RADKS -	58,	5,	13,	1.7130000E-09*	3.3654118E-01	$ RADK
PUNCHED RADKS -	59,	5,	14,	1.7130000E-09*	1.4511284E-01	$ RADK
PUNCHED RADKS -	60,	5,	15,	1.7130000E-09*	5.3259329E-02	$ RADK
PUNCHED RADKS -	61,	6,	7,	1.7130000E-09*	1.5358557E+01	$ RADK
PUNCHED RADKS -	62,	6,	8,	1.7130000E-09*	1.4173677E-01	$ RADK
PUNCHED RADKS -	63,	6,	9,	1.7130000E-09*	5.1958044E-01	$ RADK
PUNCHED RADKS -	64,	6,	10,	1.7130000E-09*	1.6527084E-01	$ RADK
PUNCHED RADKS -	65,	6,	11,	1.7130000E-09*	4.4162826E-01	$ RADK
PUNCHED RADKS -	66,	6,	12,	1.7130000E-09*	5.0350761E-01	$ RADK
PUNCHED RADKS -	67,	6,	13,	1.7130000E-09*	1.4206935E-01	$ RADK
PUNCHED RADKS -	68,	6,	14,	1.7130000E-09*	5.1956652E-01	$ RADK
PUNCHED RADKS -	69,	6,	15,	1.7130000E-09*	1.6545792E-01	$ RADK
PUNCHED RADKS -	70,	7,	8,	1.7130000E-09*	4.8073784E-02	$ RADK
PUNCHED RADKS -	71,	7,	9,	1.7130000E-09*	1.5489167E-01	$ RADK
PUNCHED RADKS -	72,	7,	10,	1.7130000E-09*	4.1192208E-01	$ RADK
PUNCHED RADKS -	73,	7,	11,	1.7130000E-09*	2.0943441E-01	$ RADK
PUNCHED RADKS -	74,	7,	12,	1.7130000E-09*	1.3730625E+00	$ RADK
PUNCHED RADKS -	75,	7,	13,	1.7130000E-09*	4.8223736E-02	$ RADK
PUNCHED RADKS -	76,	7,	14,	1.7130000E-09*	1.5487249E-01	$ RADK
PUNCHED RADKS -	77,	7,	15,	1.7130000E-09*	4.0243746E-01	$ RADK
PUNCHED RADKS -	78,	8,	9,	1.7130000E-09*	1.0928079E-03	$ RADK
PUNCHED RADKS -	79,	8,	10,	1.7130000E-09*	6.7528152E-04	$ RADK
PUNCHED RADKS -	80,	8,	11,	1.7130000E-09*	1.5329504E-02	$ RADK
PUNCHED RADKS -	81,	8,	12,	1.7130000E-09*	3.0177923E-03	$ RADK
PUNCHED RADKS -	82,	8,	13,	1.7130000E-09*	2.5592177E-03	$ RADK
PUNCHED RADKS -	83,	8,	14,	1.7130000E-09*	1.7304385E-03	$ RADK
PUNCHED RADKS -	84,	8,	15,	1.7130000E-09*	8.4468329E-04	$ RADK
PUNCHED RADKS -	85,	9,	10,	1.7130000E-09*	1.3997650E-03	$ RADK
PUNCHED RADKS -	86,	9,	11,	1.7130000E-09*	6.2838819E-03	$ RADK
PUNCHED RADKS -	87,	9,	12,	1.7130000E-09*	6.9603977E-03	$ RADK
PUNCHED RADKS -	88,	9,	13,	1.7130000E-09*	1.7353446E-03	$ RADK
PUNCHED RADKS -	89,	9,	14,	1.7130000E-09*	2.9986437E-03	$ RADK
PUNCHED RADKS -	90,	9,	15,	1.7130000E-09*	2.0403137E-03	$ RADK
PUNCHED RADKS -	91,	10,	11,	1.7130000E-09*	3.3130719E-03	$ RADK

MODEL = LOUVER STEP = 1 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
RADIATION CONDUCTOR LINK.

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

```
PUNCHED RADKS -    92,    10,    12,  1.7130000E-09*  2.0972998E-02 $ RADK
PUNCHED RADKS -    93,    10,    13,  1.7130000E-09*  8.4597229E-04 $ RADK
PUNCHED RADKS -    94,    10,    14,  1.7130000E-09*  2.0374485E-03 $ RADK
PUNCHED RADKS -    95,    10,    15,  1.7130000E-09*  4.0647501E-03 $ RADK
PUNCHED RADKS -    96,    11,    12,  1.7130000E-09*  1.3710440E-02 $ RADK
PUNCHED RADKS -    97,    11,    13,  1.7130000E-09*  1.5415681E-02 $ RADK
PUNCHED RADKS -    98,    11,    14,  1.7130000E-09*  6.2579035E-03 $ RADK
PUNCHED RADKS -    99,    11,    15,  1.7130000E-09*  3.3176121E-03 $ RADK
PUNCHED RADKS -   100,    12,    13,  1.7130000E-09*  3.0274924E-03 $ RADK
PUNCHED RADKS -   101,    12,    14,  1.7130000E-09*  6.9538098E-03 $ RADK
PUNCHED RADKS -   102,    12,    15,  1.7130000E-09*  2.1021413E-02 $ RADK
PUNCHED RADKS -   103,    13,    14,  1.7130000E-09*  1.0970435E-03 $ RADK
PUNCHED RADKS -   104,    13,    15,  1.7130000E-09*  6.7871308E-04 $ RADK
PUNCHED RADKS -   105,    14,    15,  1.7130000E-09*  1.4020698E-03 $ RADK
PUNCHED RADKS -   106,     1,   999,  1.7130000E-09*  2.3249360E-01 $ RADK
PUNCHED RADKS -   107,     2,   999,  1.7130000E-09* -1.5759716E+00 $ RADK
PUNCHED RADKS -   108,     3,   999,  1.7130000E-09*  9.6860794E-02 $ RADK
PUNCHED RADKS -   109,     4,   999,  1.7130000E-09* -1.8156697E+00 $ RADK
PUNCHED RADKS -   110,     5,   999,  1.7130000E-09* -2.4393414E+01 $ RADK
PUNCHED RADKS -   111,     6,   999,  1.7130000E-09* -2.9594029E+01 $ RADK
PUNCHED RADKS -   112,     7,   999,  1.7130000E-09* -2.8177367E+01 $ RADK
PUNCHED RADKS -   113,     8,   999,  1.7130000E-09* -2.3173682E-01 $ RADK
PUNCHED RADKS -   114,     9,   999,  1.7130000E-09* -1.8032761E-01 $ RADK
PUNCHED RADKS -   115,    10,   999,  1.7130000E-09* -3.4469456E-01 $ RADK
PUNCHED RADKS -   116,    11,   999,  1.7130000E-09* -6.3131444E-01 $ RADK
PUNCHED RADKS -   117,    12,   999,  1.7130000E-09* -9.1413820E-01 $ RADK
PUNCHED RADKS -   118,    13,   999,  1.7130000E-09* -2.3336361E-01 $ RADK
PUNCHED RADKS -   119,    14,   999,  1.7130000E-09* -1.8025769E-01 $ RADK
PUNCHED RADKS -   120,    15,   999,  1.7130000E-09* -3.4578697E-01 $ RADK
```

TOTAL TIME TO COMPUTE RADK S .51

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
1	BLADE1	5.0)1E+01	.200	.050	RECTANGLE	TOP	LOUVER BLADE NUMBER 1
2	BLADE1	5.0)1E+01	.200	.050	RECTANGLE	BOTTOM	LOUVER BLADE NUMBER 1
3	BLADE2	5.0)1E+01	.200	.050	RECTANGLE	TOP	LOUVER BLADE NUMBER 2
4	BLADE2	5.0)1E+01	.200	.050	RECTANGLE	BOTTOM	LOUVER BLADE NUMBER 2
5	BASE	2.5)1E+01	.200	.080	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
6	BASE	5.0)1E+01	.200	.080	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
7	BASE	2.5)1E+01	.200	.080	RECTANGLE	TOP	LOUVER SYSTEM SUBSTRATE
8	BASE	6.25)E+00	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
9	BASE	1.25)E+01	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
10	BASE	6.25)E+00	.200	.060	RECTANGLE	BOTTOM	LOUVER SYSTEM SIDERAIL
11	BASE	2.5)1E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM END CLOSURE
12	BASE	2.5)1E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM END CLOSURE
13	BASE	6.25)E+00	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL
14	BASE	1.25)E+01	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL
15	BASE	6.25)E+00	.200	.060	RECTANGLE	TOP	LOUVER SYSTEM SIDERAIL

MODEL = LOUVER STEP = 2
NODE PLOTTER DATA OUTPUT

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

NODE PLOTTER

PARAMETER	DESCRIPTION	OPTION *,	DEFAULT
NV	VIEW NUMBER	1-6	1
IVU	VIEW	3HALL 3H3-D 1HX 1HY 1HZ 3HGEN	3HALL
SCL	SCALE FACTOR (3.15/LARGEST DISTANCE FROM OCS ORIGIN IN USER'S UNITS)		AUTOMATIC SCALE
ISELN	ARRAY NAME CONTAINING NUMBER OF NODES TO BE SELECTIVELY PLOTTED	ARRAY NAME	PLOTS ALL NODES
ITIT	ARRAY NAME OF PLOT TITLE	ARRAY NAME	USES JOB TITLE
ROTX, ROTY, ROTZ,	VIEW ROTATIONS (FOR IVU = 3HGEN)	0 ≤ ANG ≤ 360	0.0 0.0 0.0
IROTX, IROTY, IROTZ	ORDER OF ROTATIONS (FOR IVU = 3HGEN)	1,2,3 (ANY ORDER)	1,2,3

*INPUT ZERO FOR DEFAULT ACTION

CALLING SEQUENCE:

```
CALL NDATA (NV, IUV, SCL, ISELN, ITIT, ROTX, ROTY, ROTZ, IROTX, IROTY, IROTZ)

OR

CALL NDATAS (NV, IVU, SCL)
```

NOTE: IF NO CALLS TO NDATA/NDATAS ARE MADE, A CALL TO NPLOT WILL RESULT IN ALL VIEWS AUTOMATICALLY SCALED GENERATED FOR NODES.

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
NODE PLOTTER DATA OUTPUT

VIEW=3-D SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 135.0000
SECOND ROTATION ABOUT Y = 45.0000
THIRD ROTATION ABOUT X = 45.0000

VIEW=Z-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 0.

VIEW=X-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = 0.
SECOND ROTATION ABOUT Y = 90.0000
THIRD ROTATION ABOUT X = -90.0000

VIEW=Y-AXIS SCALE= .1920 VIEW NUMBER=1
FIRST ROTATION ABOUT Z = -90.0000
SECOND ROTATION ABOUT Y = 0.
THIRD ROTATION ABOUT X = 90.0000

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

FORM FACTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
FFACC	.0500	0.05	ORIENTATION ACCURACY PARAMETER	N/A
FFACCS	.1000	0.10	SHADOWING ACCURACY PARAMETER	N/A
FFMIN	1.0E-05	1.E-6	PARAMETER TO ELIMINATE SMALL FORM FACTORS	N/A
FFNOSH	SHAD	4HSHAD	OVER RIDE SHADOWING PARAMETER	(4HSHAD,4HNOSH)
FFPNCH	PUN	2HNO	PARAMETER TO PUNCH FORM FACTORS	(3HPUN,2HNO)
FFPRNT	PRINT	5HPRINT	FLAG FOR COMPREHENSIVE PRINT	(5HPRINT,2HNO)
FFRATL	15.0	15.0	RATIO FOR USING SUB NODE TECHNIQUE	N/A

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

MODEL = LOUVER STEP = 2
FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
1	5.000E+01	.20	.05
2	5.000E+01	.20	.05
3	5.000E+01	.20	.05
4	5.000E+01	.20	.05
5	2.500E+01	.20	.88
6	5.000E+01	.20	.88
7	2.500E+01	.20	.88
8	6.250E+00	.20	.06
9	1.250E+01	.20	.06
10	6.250E+00	.20	.06
11	2.500E+01	.20	.06
12	2.500E+01	.20	.06
13	6.250E+00	.20	.06
14	1.250E+01	.20	.06
15	6.250E+00	.20	.06

NUMBER OF NODES = 15 NUMBER OF SURFACES = 9

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
1	4	CAL.	.170756	.170756	.170756	.170756	1.000000	1.000000	1.246	
1	7	CAL.	.006393	.012706	.006393	.006393	1.000000	1.000000	1.468	
1	9	CAL.	.018983	.075931	.018983	.018983	1.000000	1.000000	9.354	*
1	10	CAL.	.002039	.022716	.002039	.003958	.717321	.717321	9.503	
1	14	CAL.	.018983	.075931	.018983	.018983	1.000000	1.000000	17.596	*
1	15	CAL.	.002039	.022716	.002839	.003958	.717321	.717321	17.745	
1	FF SUM =	.2208	ROW CP TIME =		17.750		+ RECT		LOUVER BLADE NUMBER 1	
2	5	CAL.	.239120	.476239	.239120	.239120	1.000000	1.000000	3.215	
2	6	CAL.	.264016	.254016	.264016	.264016	1.000000	1.000000	12.502	*
2	8	CAL.	.040550	.324399	.040550	.040550	1.000000	1.000000	14.083	
2	9	CAL.	.026874	.107495	.026874	.026874	1.000000	1.000000	21.200	*
2	11	CAL.	.209184	.418368	.209184	.209184	1.000000	1.000000	23.999	
2	13	CAL.	.040550	.324399	.040550	.040550	1.000000	1.000000	25.582	
2	14	CAL.	.026874	.107495	.026874	.026874	1.000000	1.000000	32.698	*
2	FF SUM =	.8472	ROW CP TIME =		32.743		- RECT		LOUVER BLADE NUMBER 1	
3	10	CAL.	.011225	.089800	.011225	.011225	1.000000	1.000000	2.951	*
3	12	CAL.	.131245	.262489	.131245	.131245	1.000000	1.000000	10.349	*
3	15	CAL.	.011225	.089800	.011225	.011225	1.000000	1.000000	13.147	*
3	FF SUM =	.1537	ROW CP TIME =		13.153		+ RECT		LOUVER BLADE NUMBER 2	
4	5	CAL.	.008513	.017026	.008513	.039769	.214062	.214062	.204	
4	6	CAL.	.332520	.332520	.332520	.352839	.942412	.942412	2.775	
4	7	CAL.	.250104	.500207	.250104	.250104	1.000000	1.000000	5.916	
4	9	CAL.	.050864	.203455	.050864	.059391	.856421	.856421	7.887	*
4	10	CAL.	.026587	.211092	.026387	.026387	1.000000	1.000000	13.036	*
4	12	CAL.	.026087	.052173	.026087	.026087	1.000000	1.000000	14.502	*
4	14	CAL.	.050864	.203455	.050864	.059391	.856421	.856421	16.472	*
4	15	CAL.	.026387	.211092	.026387	.026387	1.000000	1.000000	21.619	*
4	FF SUM =	.9425	ROW CP TIME =		21.625		- RECT		LOUVER BLADE NUMBER 2	
5	8	CAL.	.253350	.253398	.063350	.063350	1.000000	1.000000	3.857	*
5	9	CAL.	.016215	.032429	.016215	.020932	.774640	.774640	5.662	*
5	10	CAL.	.001004	.004017	.001004	.001411	.711555	.711555	5.832	
5	11	CAL.	.289976	.289976	.289976	.289976	1.000000	1.000000	14.358	*
5	12	CAL.	.010899	.010899	.010899	.010899	1.000000	1.000000	14.520	

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) NO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)	
5	13	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	18.310	*
5	14	CAL.	.016215	.032429	.016215	.020932	.774640	.774640	20.133	*
5	15	CAL.	.001004	.004017	.001004	.001411	.711555	.711555	20.304	
5	FF SUM = .9573		ROW CP TIME = 20.309				+ RECT		LOUVER SYSTEM SUBSTRATE	
6	8	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	3.891	*
6	9	CAL.	.073276	.293106	.073276	.078627	.931947	.931947	6.004	*
6	10	CAL.	.008265	.066117	.008265	.010747	.768983	.768983	9.760	*
6	11	CAL.	.045089	.090178	.045089	.045089	1.000000	1.000000	10.113	
6	12	CAL.	.013762	.027524	.013762	.045089	.305222	.305222	10.428	
6	13	CAL.	.010747	.085979	.010747	.010747	1.000000	1.000000	14.283	*
6	14	CAL.	.073276	.293106	.073276	.078627	.931947	.931947	16.396	*
6	15	CAL.	.008265	.066117	.008265	.010747	.768983	.768983	20.152	*
6	FF SUM = .9400		ROW CP TIME = 20.158				+ RECT		LOUVER SYSTEM SUBSTRATE	
7	8	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	.174	
7	9	CAL.	.019439	.038879	.019439	.020932	.928698	.928698	2.000	*
7	10	CAL.	.052932	.211727	.052932	.063350	.835552	.835552	5.690	*
7	11	CAL.	.010899	.010899	.010899	.010899	1.000000	1.000000	5.854	
7	12	CAL.	.243465	.243465	.243465	.269976	.839604	.839604	14.114	*
7	13	CAL.	.001411	.005646	.001411	.001411	1.000000	1.000000	14.287	
7	14	CAL.	.019439	.038879	.019439	.020932	.928698	.928698	16.114	*
7	15	CAL.	.052932	.211727	.052932	.063350	.835552	.835552	19.803	*
7	FF SUM = .9149		ROW CP TIME = 19.809				+ RECT		LOUVER SYSTEM SUBSTRATE	
8	11	CAL.	.251769	.052942	.251769	.251769	1.000000	1.000000	3.884	*
8	12	CAL.	.013288	.003322	.013288	.026576	.500000	.500000	4.045	
8	13	CAL.	.019294	.019294	.019294	.019294	1.000000	1.000000	4.220	
8	14	CAL.	.023745	.011872	.023745	.030079	.789418	.789418	4.367	
8	15	CAL.	.003188	.003188	.003188	.008159	.390780	.390780	4.530	
8	FF SUM = .9807		ROW CP TIME = 4.535				- RECT		LOUVER SYSTEM SIDERAIL	
9	11	CAL.	.051727	.025664	.051727	.072752	.705508	.705508	.266	
9	12	CAL.	.036376	.018188	.036376	.072752	.500000	.500000	.474	
9	13	CAL.	.011872	.023745	.011872	.015040	.789418	.789418	.622	
9	14	CAL.	.021633	.021633	.021633	.037166	.582077	.582077	.761	
9	15	CAL.	.009823	.019646	.009823	.015040	.653152	.653152	.908	

MODEL = LOUVER STEP = 2
FORM FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATRS NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)	
9	FF SUM = .8823	ROW CP TIME = .936					- RECT	LOUVER SYSTEM SIDERAIL		
10	11	CAL.	.013288	.003322	.013288	.026576	.500000	.500000	.164	
10	12	CAL.	.189600	.047400	.189600	.251769	.753070	.753070	3.771	*
10	13	CAL.	.003188	.003188	.003188	.003159	.390780	.390780	3.935	
10	14	CAL.	.019646	.009823	.019646	.030079	.653152	.653152	4.082	
10	15	CAL.	.012134	.012134	.012134	.019294	.628891	.628891	4.251	
10	FF SUM = .3433	ROW CP TIME = 4.256					- RECT	LOUVER SYSTEM SIDERAIL		
11	13	CAL.	.063350	.253398	.063350	.063350	1.000000	1.000000	3.695	*
11	14	CAL.	.025664	.051327	.025664	.036376	.705508	.705508	3.899	
11	15	CAL.	.003322	.013288	.003322	.006644	.500000	.500000	4.062	
11	FF SUM = .9937	ROW CP TIME = 4.067					+ RECT	LOUVER SYSTEM END CLOSURE		
12	13	CAL.	.003322	.013288	.003322	.006644	.500000	.500000	.164	
12	14	CAL.	.018188	.036376	.018188	.036376	.500000	.500000	.371	
12	15	CAL.	.047883	.191533	.047883	.063350	.755857	.755857	3.738	*
12	FF SUM = .7349	ROW CP TIME = 3.743					+ RECT	LOUVER SYSTEM END CLOSURE		
13	FF SUM = .9823	ROW CP TIME = .092					+ RECT	LOUVER SYSTEM SIDERAIL		
14	FF SUM = .8823	ROW CP TIME = .051					+ RECT	LOUVER SYSTEM SIDERAIL		
15	FF SUM = .8453	ROW CP TIME = .004					+ RECT	LOUVER SYSTEM SIDERAIL		

TOTAL CP TIME (SEC) FOR PROBLEM = 163.422

MODEL = LOUVER STEP = 2
FORM FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

FORM FACTOR SUMS FROM NODE I

NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM
1 -	.2207936	2 -	.3471675	3 -	.1536947	4 -	.9424798	5 -	.9572773	6 -	.8399641
7 -	.9149226	8 -	.9007169	9 -	.8823260	10 -	.8433258	11 -	.9936843	12 -	.7348540
13 -	.9823359	14 -	.8823260	15 -	.8452597						

TOTAL TIME FOR FORM FACTORS163.46

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
IMAGE FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS	SPECULAR REFL(UV)	SPECULAR REFL(IR)
1	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
2	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
3	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
4	5.000E+01	2.000E-01	5.000E-02	0.	9.500E-01
5	2.500E+01	2.000E-01	8.800E-01	0.	0.
6	5.000E+01	2.000E-01	8.800E-01	0.	0.
7	2.500E+01	2.000E-01	8.800E-01	0.	0.
8	6.250E+00	2.000E-01	6.000E-02	0.	0.
9	1.250E+01	2.000E-01	6.000E-02	0.	0.
10	6.250E+00	2.000E-01	6.000E-02	0.	0.
11	2.500E+01	2.000E-01	6.000E-02	0.	0.
12	2.500E+01	2.000E-01	6.000E-02	0.	0.
13	6.250E+00	2.000E-01	6.000E-02	0.	0.
14	1.250E+01	2.000E-01	6.000E-02	0.	0.
15	6.250E+00	2.000E-01	6.000E-02	0.	0.

NUMBER OF NODES = 15 NUMBER OF SURFACES = 9

MODEL = LOUVER STEP = 2
IMAGE FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	IFE(I,J) W/SHAD	IFE(J,I) W/SHAD	IFA(I,J) W/SHAD	CP TIME (SEC)	
1	1	CAL.	.276819	.276819	0.	.823	
1	4	CAL.	.170756	.170756	.170756	2.053	
1	6	CAL.	.258443	.258443	0.	6.543	
1	7	CAL.	.006393	.012786	.006393	7.094	
1	9	CAL.	.083133	.332521	.018993	24.433	
1	10	CAL.	.002839	.022716	.002839	24.903	
1	14	CAL.	.083130	.332521	.018983	43.933	
1	15	CAL.	.002839	.022716	.002839	44.399	
1	ROW CP TIME =		44.404	+ RECT		LOUVER BLADE NUMBER 1	
2	5	CAL.	.239120	.478239	.239120	2.943	
2	6	CAL.	.514832	.514832	.264016	11.615	
2	8	CAL.	.040550	.324399	.040550	13.109	
2	9	CAL.	.077934	.311735	.026874	30.645	
2	11	CAL.	.209184	.418368	.209184	32.905	
2	13	CAL.	.040550	.324399	.040550	34.421	
2	14	CAL.	.077934	.311735	.026874	51.955	
2	ROW CP TIME =		52.232	+ RECT		LOUVER BLADE NUMBER 1	
3	9	CAL.	.056552	.226209	0.	5.769	
3	10	CAL.	.057354	.458833	.011825	14.317	
3	12	CAL.	.404666	.809372	.131245	26.517	
3	14	CAL.	.056552	.226209	0.	28.303	
3	15	CAL.	.057354	.458833	.011225	36.853	
3	ROW CP TIME =		36.858	+ RECT		LOUVER BLADE NUMBER 2	
4	4	CAL.	.276819	.276819	0.	.778	
4	5	CAL.	.008513	.017026	.008513	1.230	
4	6	CAL.	.332520	.332520	.332520	3.585	
4	7	CAL.	.250104	.500207	.250104	6.623	
4	9	CAL.	.147505	.590019	.050864	10.087	
4	10	CAL.	.087326	.698605	.026387	20.363	
4	12	CAL.	.199843	.399685	.026087	28.827	
4	14	CAL.	.147505	.590019	.050864	32.284	
4	15	CAL.	.087326	.698605	.026387	42.559	
4	ROW CP TIME =		42.563	- RECT		LOUVER BLADE NUMBER 2	

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
IMAGE FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	IFE(I,J) W/SHAD	IFE(J,I) W/SHAD	IFA(I,J) W/SHAD	CP TIME (SEC)	
5	5	CAL.	.146861	.146861	0.	.504	
5	6	CAL.	.196977	.096468	0.	1.004	
5	7	CAL.	.018310	.018310	0.	1.293	
5	8	CAL.	.123532	.494126	.063350	6.905	
5	9	CAL.	.047022	.094045	.016215	10.386	
5	10	CAL.	.001004	.004017	.001004	10.913	
5	11	CAL.	.565453	.565453	.289976	19.782	
5	12	CAL.	.010899	.010899	.010899	20.287	
5	13	CAL.	.123532	.494126	.063350	25.907	
5	14	CAL.	.047022	.094045	.016215	29.397	
5	15	CAL.	.001004	.004017	.001004	29.916	
5	ROW CP TIME =		29.920	+ RECT		LOUVER SYSTEM SUBSTRATE	
6	6	CAL.	.530997	.530997	0.	11.618	
6	7	CAL.	.066441	.132881	0.	11.969	
6	8	CAL.	.020957	.167660	.010747	17.912	
6	9	CAL.	.223508	.894030	.073276	21.972	
6	10	CAL.	.026665	.229477	.008265	27.865	
6	11	CAL.	.045069	.090178	.045039	29.056	
6	12	CAL.	.013762	.027524	.013762	29.778	
6	13	CAL.	.020957	.167663	.010747	35.743	
6	14	CAL.	.223508	.894030	.073276	39.813	
6	15	CAL.	.026665	.229477	.008265	45.697	
6	ROW CP TIME =		45.702	+ RECT		LOUVER SYSTEM SUBSTRATE	
7	7	CAL.	.218063	.218063	0.	.576	
7	8	CAL.	.001411	.005646	.001411	1.197	
7	9	CAL.	.056374	.112748	.019439	4.711	
7	10	CAL.	.172315	.689260	.052932	10.153	
7	11	CAL.	.010899	.010899	.010899	10.774	
7	12	CAL.	.795420	.795420	.243465	14.222	
7	13	CAL.	.001411	.005646	.001411	19.847	
7	14	CAL.	.056374	.112748	.019439	23.366	
7	15	CAL.	.172315	.689260	.052932	28.816	
7	ROW CP TIME =		28.821	+ RECT		LOUVER SYSTEM SUBSTRATE	
8	11	CAL.	.490950	.122737	.251769	6.625	
8	12	CAL.	.013288	.003322	.013288	7.247	
8	13	CAL.	.019294	.019294	.019294	7.864	
8	14	CAL.	.023745	.011872	.023745	8.426	

MODEL = LOUVER STEP = 2
IMAGE FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	IFE(I,J) W/SHAC	IFE(J,I) W/SHAD	IFA(I,J) W/SHAD	CP TIME (SEC)	
8	15	CAL.	.003168	.003188	.003188	9.050	
8	ROW CP TIME =		9.071	- RECT		LOUVER SYSTEM SIDERAIL	
9	11	CAL.	.051327	.025664	.051327	1.142	
9	12	CAL.	.036376	.018188	.036376	1.806	
9	13	CAL.	.011872	.023745	.011872	2.367	
9	14	CAL.	.029585	.029585	.021633	2.912	
9	15	CAL.	.009823	.019646	.009823	3.475	
9	ROW CP TIME =		3.479	- RECT		LOUVER SYSTEM SIDERAIL	
10	11	CAL.	.013288	.003322	.013288	.957	
10	12	CAL.	.353807	.212702	.189600	8.070	
10	13	CAL.	.003188	.003188	.003188	8.714	
10	14	CAL.	.019646	.009823	.019646	9.281	
10	15	CAL.	.012134	.012134	.012134	9.925	
10	ROW CP TIME =		9.929	- RECT		LOUVER SYSTEM SIDERAIL	
11	11	CAL.	.063068	.063068	0.	.405	
11	13	CAL.	.123532	.494126	.063350	6.798	
11	14	CAL.	.025664	.051327	.025664	7.445	
11	15	CAL.	.003322	.013288	.003322	8.065	
11	ROW CP TIME =		8.069	+ RECT		LOUVER SYSTEM END CLOSURE	
12	12	CAL.	.087009	.087009	0.	1.292	
12	13	CAL.	.003322	.013288	.003322	1.924	
12	14	CAL.	.018168	.036376	.018188	2.595	
12	15	CAL.	.212394	.649574	.047883	9.613	
12	ROW CP TIME =		9.622	+ RECT		LOUVER SYSTEM END CLOSURE	
13	ROW CP TIME =		1.006	+ RECT		LOUVER SYSTEM SIDERAIL	

MODEL = LOUVER STEP = 2
IMAGE FACTOR CALCULATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)	
14		ROW CP TIME =	.581		+ RECT		LOUVER SYSTEM SIDERAIL			
15		ROW CP TIME =	.259		+ RECT		LOUVER SYSTEM SIDERAIL			

TOTAL CP TIME (SEC) FOR PROBLEM = 322.838

MODEL = LOUVER STEP = 2
GREY BODIES COMPUTATION LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

GREY BODIES

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IGBSFF	?	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR FORM FACTORS	N/A
GBWBND	IR	NONE	WAVEBAND DEFINITION PARAMETER	(2HIR,3HSOL,4HBOTH)

IR GREY BODIES STORED IN STEP 2

TOTAL TIME TO COMPUTE GREY BODIES .29

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
RADIATION CONDUCTOR LINK.

RADIATION CONDUCTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IRKNGB	2	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR GREY BODIES	N/A
RKPNCH	NO	2HNO	PUNCH/NO PUNCH PARAMETER FOR RADK S	(3HPUN,2HNO)
RKMIN	1.0E-04	0.0001	PARAMETER TO ELIMINATE SMALL RADK S	N/A
IRKCN	1	1	INITIAL RADIATION CONDUCTOR ID NUMBER	N/A
RKSP	SPACE	2HNO	MNEMONIC FLAG FOR COMPUTATION OF RADKS TO SPACE	(5HSPACE,2HNO)
IRKNSP	999	32767	SPACE NODE ID NUMBER	N/A
SIGMA	1.71E-09	1.713E-9	STEFAN-BOLTZMANN CONSTANT	N/A
RKAMPF	1.00	1.0	AREA MULTIPLYING FACTOR	N/A
RKTAPE	NO	2HNO	PARAMETER TO OUTPUT TO BCD TAPE	(4HTAPE,2HNO)

MODEL = LOUVER STEP = 2
RADIATION CONDUCTOR LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

PUNCHED RADKS	-	1,	1,	2,	1.7130000E-09*	1.2950244E-02	$ RADK
PUNCHED RADKS	-	2,	1,	3,	1.7130000E-09*	1.1854908E-02	$ RADK
PUNCHED RADKS	-	3,	1,	4,	1.7130000E-09*	4.3582639E-02	$ RADK
PUNCHED RADKS	-	4,	1,	5,	1.7130000E-09*	9.3681331E-02	$ RADK
PUNCHED RADKS	-	5,	1,	6,	1.7130000E-09*	1.0427401E+00	$ RADK
PUNCHED RADKS	-	6,	1,	7,	1.7130000E-09*	2.0475520E-01	$ RADK
PUNCHED RADKS	-	7,	1,	8,	1.7130000E-09*	8.6285995E-04	$ RADK
PUNCHED RADKS	-	8,	1,	9,	1.7130000E-09*	1.5203168E-02	$ RADK
PUNCHED RADKS	-	9,	1,	10,	1.7130000E-09*	2.5947234E-03	$ RADK
PUNCHED RADKS	-	10,	1,	11,	1.7130000E-09*	3.3676662E-03	$ RADK
PUNCHED RADKS	-	11,	1,	12,	1.7130000E-09*	7.2594702E-03	$ RADK
PUNCHED RADKS	-	12,	1,	13,	1.7130000E-09*	8.8535035E-04	$ RADK
PUNCHED RADKS	-	13,	1,	14,	1.7130000E-09*	1.5203151E-02	$ RADK
PUNCHED RADKS	-	14,	1,	15,	1.7130000E-09*	2.5926421E-03	$ RADK
PUNCHED RADKS	-	15,	2,	3,	1.7130000E-09*	1.4551902E-02	$ RADK
PUNCHED RADKS	-	16,	2,	4,	1.7130000E-09*	2.9410234E-02	$ RADK
PUNCHED RADKS	-	17,	2,	5,	1.7130000E-09*	1.2646316E+00	$ RADK
PUNCHED RADKS	-	18,	2,	6,	1.7130000E-09*	1.8978431E+00	$ RADK
PUNCHED RADKS	-	19,	2,	7,	1.7130000E-09*	2.5242862E-01	$ RADK
PUNCHED RADKS	-	20,	2,	8,	1.7130000E-09*	1.4735857E-02	$ RADK
PUNCHED RADKS	-	21,	2,	9,	1.7130000E-09*	1.8186432E-02	$ RADK
PUNCHED RADKS	-	22,	2,	10,	1.7130000E-09*	3.0925166E-03	$ RADK
PUNCHED RADKS	-	23,	2,	11,	1.7130000E-09*	5.6835413E-02	$ RADK
PUNCHED RADKS	-	24,	2,	12,	1.7130000E-09*	9.2819831E-03	$ RADK
PUNCHED RADKS	-	25,	2,	13,	1.7130000E-09*	1.4797546E-02	$ RADK
PUNCHED RADKS	-	26,	2,	14,	1.7130000E-09*	1.6185626E-02	$ RADK
PUNCHED RADKS	-	27,	2,	15,	1.7130000E-09*	3.0897426E-03	$ RADK
PUNCHED RADKS	-	28,	3,	4,	1.7130000E-09*	1.3311064E-01	$ RADK
PUNCHED RADKS	-	29,	3,	5,	1.7130000E-09*	1.6378432E-01	$ RADK
PUNCHED RADKS	-	30,	3,	6,	1.7130000E-09*	8.8720697E-01	$ RADK
PUNCHED RADKS	-	31,	3,	7,	1.7130000E-09*	2.9309696E+00	$ RADK
PUNCHED RADKS	-	32,	3,	8,	1.7130000E-09*	1.9805619E-03	$ RADK
PUNCHED RADKS	-	33,	3,	9,	1.7130000E-09*	1.5986262E-02	$ RADK
PUNCHED RADKS	-	34,	3,	10,	1.7130000E-09*	4.8312380E-02	$ RADK
PUNCHED RADKS	-	35,	3,	11,	1.7130000E-09*	6.3219158E-03	$ RADK
PUNCHED RADKS	-	36,	3,	12,	1.7130000E-09*	1.7178715E-01	$ RADK
PUNCHED RADKS	-	37,	3,	13,	1.7130000E-09*	1.9853334E-03	$ RADK
PUNCHED RADKS	-	38,	3,	14,	1.7130000E-09*	1.5957043E-02	$ RADK
PUNCHED RADKS	-	39,	3,	15,	1.7130000E-09*	4.7963160E-02	$ RADK
PUNCHED RADKS	-	40,	4,	5,	1.7130000E-09*	2.7787238E-01	$ RADK
PUNCHED RADKS	-	41,	4,	6,	1.7130000E-09*	2.0815978E+00	$ RADK
PUNCHED RADKS	-	42,	4,	7,	1.7130000E-09*	3.1650830E+00	$ RADK
PUNCHED RADKS	-	43,	4,	8,	1.7130000E-09*	2.7790360E-03	$ RADK
PUNCHED RADKS	-	44,	4,	9,	1.7130000E-09*	3.1325233E-02	$ RADK
PUNCHED RADKS	-	45,	4,	10,	1.7130000E-09*	4.6737221E-02	$ RADK

MODEL = LOUVER STEP = 2 SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM
RADIATION CONDUCTOR LINK.

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

PUNCHED RADKS -	46,	4,	11,	1.7130000E-09*	9.7373898E-03	$	RADK
PUNCHED RADKS -	47,	4,	12,	1.7130000E-09*	1.3913744E-01	$	RADK
PUNCHED RADKS -	48,	4,	13,	1.7130000E-09*	2.7862865E-03	$	RADK
PUNCHED RADKS -	49,	4,	14,	1.7130000E-09*	3.1925792E-02	$	RADK
PUNCHED RADKS -	50,	4,	15,	1.7130000E-09*	4.6597347E-02	$	RADK
PUNCHED RADKS -	51,	5,	6,	1.7130000E-09*	1.1061a7E+01	$	RADK
PUNCHED RADKS -	52,	5,	7,	1.7130000E-09*	3.6155557E+00	$	RADK
PUNCHED RADKS -	53,	5,	8,	1.7130000E-09*	3.3313556E-01	$	RADK
PUNCHED RADKS -	54,	5,	9,	1.7130000E-09*	1.3629542E-01	$	RADK
PUNCHED RADKS -	55,	5,	10,	1.7130000E-09*	4.3972915E-02	$	RADK
PUNCHED RADKS -	56,	5,	11,	1.7130000E-09*	1.2295250E+00	$	RADK
PUNCHED RADKS -	57,	5,	12,	1.7130000E-09*	1.4020534E-01	$	RADK
PUNCHED RADKS -	58,	5,	13,	1.7130000E-09*	3.3403735E-01	$	RADK
PUNCHED RADKS -	59,	5,	14,	1.7130000E-09*	1.3627661E-01	$	RADK
PUNCHED RADKS -	60,	5,	15,	1.7130000E-09*	4.3930251E-02	$	RADK
PUNCHED RADKS -	61,	6,	7,	1.7130000E-09*	1.8367588E+01	$	RADK
PUNCHED RADKS -	62,	6,	8,	1.7130000E-09*	1.3759390E-01	$	RADK
PUNCHED RADKS -	63,	6,	9,	1.7130000E-09*	7.3619439E-01	$	RADK
PUNCHED RADKS -	64,	6,	10,	1.7130000E-09*	2.6199467E-01	$	RADK
PUNCHED RADKS -	65,	6,	11,	1.7130000E-09*	4.2214462E-01	$	RADK
PUNCHED RADKS -	66,	6,	12,	1.7130000E-09*	6.9091302E-01	$	RADK
PUNCHED RADKS -	67,	6,	13,	1.7130000E-09*	1.3790403E-01	$	RADK
PUNCHED RADKS -	68,	6,	14,	1.7130000E-09*	7.3619123E-01	$	RADK
PUNCHED RADKS -	69,	6,	15,	1.7130000E-09*	2.6179591E-01	$	RADK
PUNCHED RADKS -	70,	7,	8,	1.7130000E-09*	4.2006910E-02	$	RADK
PUNCHED RADKS -	71,	7,	9,	1.7130000E-09*	2.2475932E-01	$	RADK
PUNCHED RADKS -	72,	7,	10,	1.7130000E-09*	1.0055718E+00	$	RADK
PUNCHED RADKS -	73,	7,	11,	1.7130000E-09*	1.3736365E-01	$	RADK
PUNCHED RADKS -	74,	7,	12,	1.7130000E-09*	3.3577046E+00	$	RADK
PUNCHED RADKS -	75,	7,	13,	1.7130000E-09*	4.2110290E-02	$	RADK
PUNCHED RADKS -	76,	7,	14,	1.7130000E-09*	2.2477496E-01	$	RADK
PUNCHED RADKS -	77,	7,	15,	1.7130000E-09*	1.0046097E+00	$	RADK
PUNCHED RADKS -	78,	8,	9,	1.7130000E-09*	9.2881817E-04	$	RADK
PUNCHED RADKS -	79,	8,	10,	1.7130000E-09*	5.3688832E-04	$	RADK
PUNCHED RADKS -	80,	8,	11,	1.7130000E-09*	1.6036775E-02	$	RADK
PUNCHED RADKS -	81,	8,	12,	1.7130000E-09*	1.8179888E-03	$	RADK
PUNCHED RADKS -	82,	8,	13,	1.7130000E-09*	2.7161474E-03	$	RADK
PUNCHED RADKS -	83,	8,	14,	1.7130000E-09*	1.4380761E-03	$	RADK
PUNCHED RADKS -	84,	8,	15,	1.7130000E-09*	6.0056789E-04	$	RADK
PUNCHED RADKS -	85,	9,	10,	1.7130000E-09*	2.1206229E-03	$	RADK
PUNCHED RADKS -	86,	9,	11,	1.7130000E-09*	4.9277512E-03	$	RADK
PUNCHED RADKS -	87,	9,	12,	1.7130000E-09*	7.7607642E-03	$	RADK
PUNCHED RADKS -	88,	9,	13,	1.7130000E-09*	1.4419415E-03	$	RADK
PUNCHED RADKS -	89,	9,	14,	1.7130000E-09*	3.1966138E-03	$	RADK
PUNCHED RADKS -	90,	9,	15,	1.7130000E-09*	2.5422799E-03	$	RADK
PUNCHED RADKS -	91,	10,	11,	1.7130000E-09*	1.8335675E-03	$	RADK

MODEL = LOUVER STEP = 2
RADIATION CONDUCTOR LINK.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM

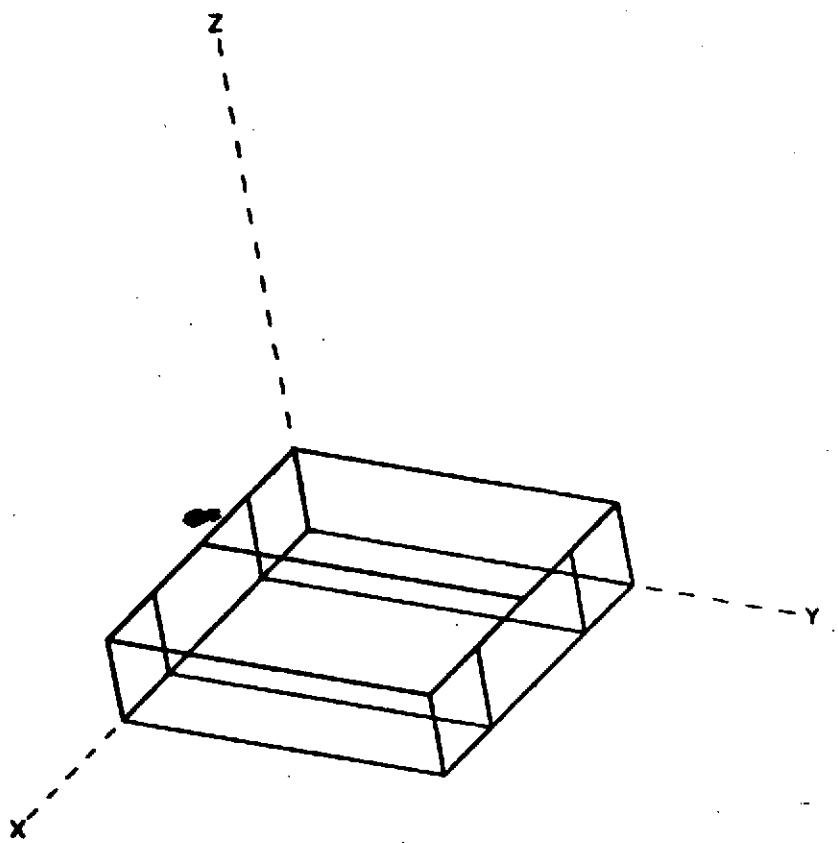
RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = 1.00000

PUNCHED RADKS	-	92,	10,	12,	1.7130000E-09*	4.7975269E-02	$ RADK
PUNCHED RADKS	-	93,	10,	13,	1.7130000E-09*	6.0250358E-04	$ RADK
PUNCHED RADKS	-	94,	10,	14,	1.7130000E-09*	2.5447298E-03	$ RADK
PUNCHED RADKS	-	95,	10,	15,	1.7130000E-09*	1.1485868E-02	$ RADK
PUNCHED RADKS	-	96,	11,	12,	1.7130000E-09*	5.1394899E-03	$ RADK
PUNCHED RADKS	-	97,	11,	13,	1.7130000E-09*	1.6128000E-02	$ RADK
PUNCHED RADKS	-	98,	11,	14,	1.7130000E-09*	4.9258011E-03	$ RADK
PUNCHED RADKS	-	99,	11,	15,	1.7130000E-09*	1.8318431E-03	$ RADK
PUNCHED RADKS	-	100,	12,	13,	1.7130000E-09*	1.6219249E-03	$ RADK
PUNCHED RADKS	-	101,	12,	14,	1.7130000E-09*	7.7613713E-03	$ RADK
PUNCHED RADKS	-	102,	12,	15,	1.7130000E-09*	4.7914460E-02	$ RADK
PUNCHED RADKS	-	103,	13,	14,	1.7130000E-09*	9.3219118E-04	$ RADK
PUNCHED RADKS	-	104,	13,	15,	1.7130000E-09*	5.3691617E-04	$ RADK
PUNCHED RADKS	-	105,	14,	15,	1.7130000E-09*	2.1186057E-03	$ RADK
PUNCHED RADKS	-	106,	1,	999,	1.7130000E-09*	1.0424265E+00	$ RADK
PUNCHED RADKS	-	107,	2,	999,	1.7130000E-09*	-1.1090409E+00	$ RADK
PUNCHED RADKS	-	108,	3,	999,	1.7130000E-09*	-1.9564933E+00	$ RADK
PUNCHED RADKS	-	109,	4,	999,	1.7130000E-09*	-3.5413830E+00	$ RADK
PUNCHED RADKS	-	110,	5,	999,	1.7130000E-09*	-1.5438135E+01	$ RADK
PUNCHED RADKS	-	111,	6,	999,	1.7130000E-09*	-4.6712024E+01	$ RADK
PUNCHED RADKS	-	112,	7,	999,	1.7130000E-09*	-7.5240198E+01	$ RADK
PUNCHED RADKS	-	113,	8,	999,	1.7130000E-09*	-1.8449233E-01	$ RADK
PUNCHED RADKS	-	114,	9,	999,	1.7130000E-09*	-4.5639330E-01	$ RADK
PUNCHED RADKS	-	115,	10,	999,	1.7130000E-09*	-1.1153086E+00	$ RADK
PUNCHED RADKS	-	116,	11,	999,	1.7130000E-09*	-4.4476265E-01	$ RADK
PUNCHED RADKS	-	117,	12,	999,	1.7130000E-09*	-3.2529914E+00	$ RADK
PUNCHED RADKS	-	118,	13,	999,	1.7130000E-09*	-1.6549319E-01	$ RADK
PUNCHED RADKS	-	119,	14,	999,	1.7130000E-09*	-4.5336575E-01	$ RADK
PUNCHED RADKS	-	120,	15,	999,	1.7130000E-09*	-1.1139156E+00	$ RADK

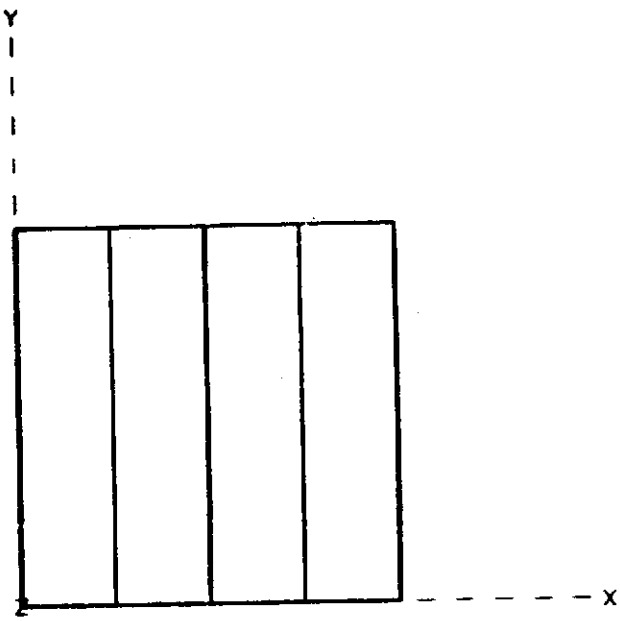
TOTAL TIME TO COMPUTE RADK S .62

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



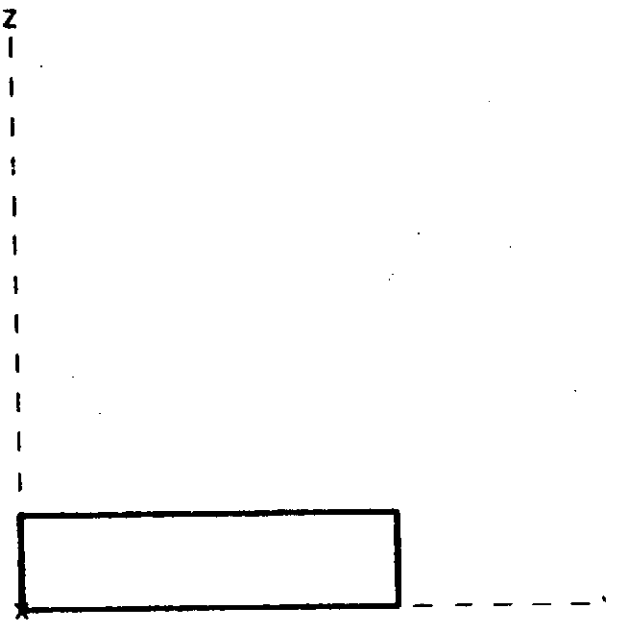
VIEW	= 3-D	1ST ROTATION ABOUT Z =	135.00
SCALE	= .1920	2ND ROTATION ABOUT Y =	45.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	45.00

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



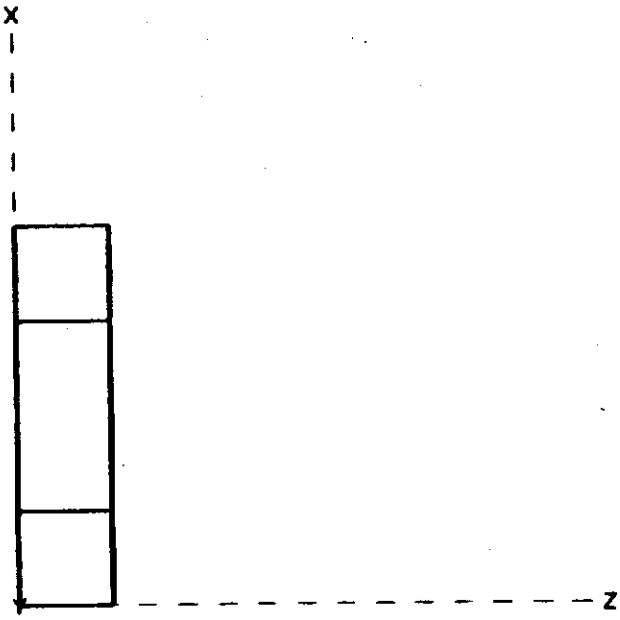
VIEW	= Z-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .1920	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



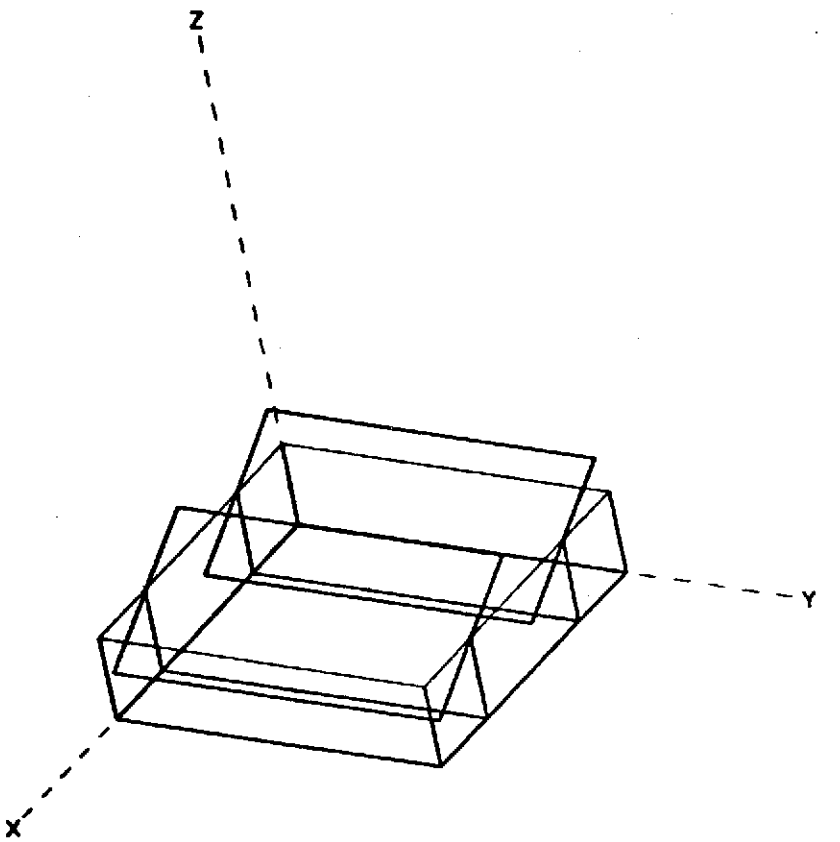
VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .1920	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	-90.00

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



VIEW	= Y-AXIS	1ST ROTATION ABOUT Z =	-90.00
SCALE	= .1920	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	90.00

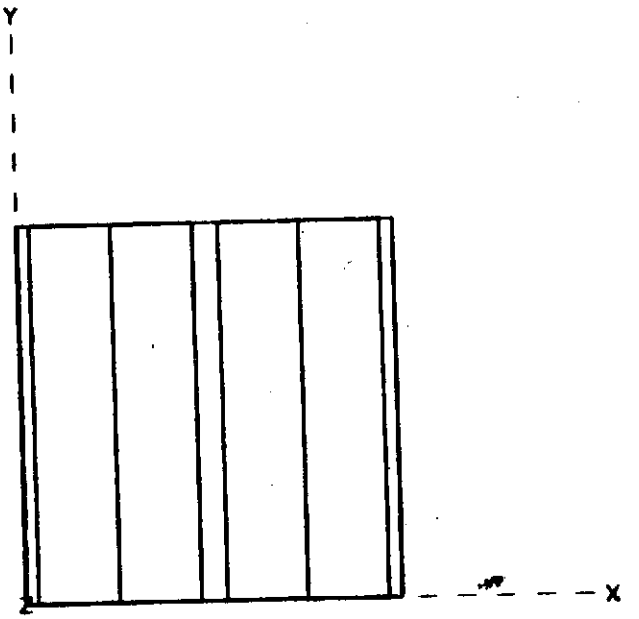
SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



VIEW = 3-D
SCALE = .1920
VIEW NUMBER = 1

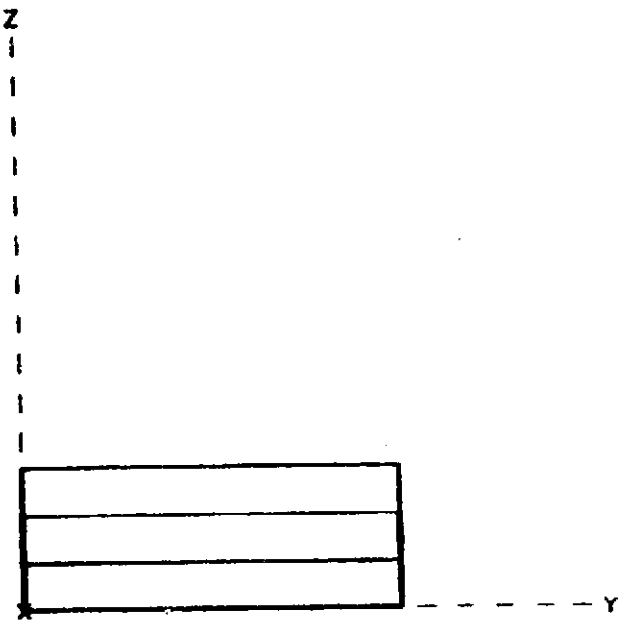
1ST ROTATION ABOUT Z = 135.00
2ND ROTATION ABOUT Y = 45.00
3RD ROTATION ABOUT X = 45.00

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



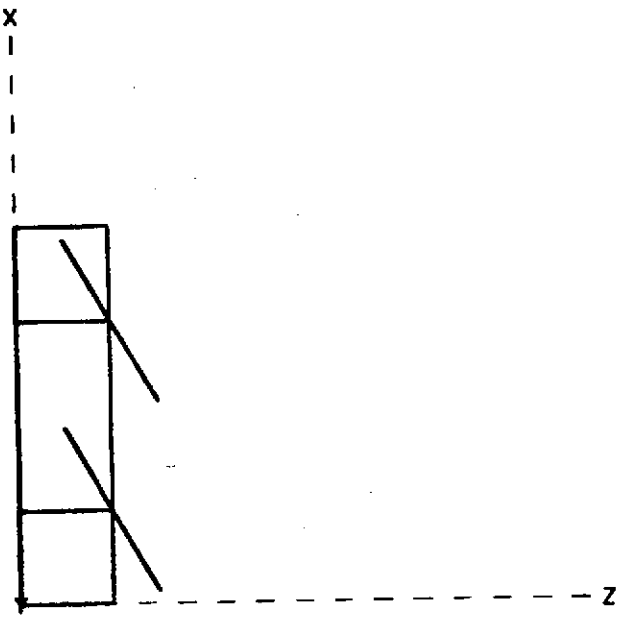
VIEW	= Z-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .1920	2ND ROTATION ABOUT Y =	0.
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	0.

SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



VIEW	= X-AXIS	1ST ROTATION ABOUT Z =	0.
SCALE	= .1920	2ND ROTATION ABOUT Y =	90.00
VIEW NUMBER	= 1	3RD ROTATION ABOUT X =	-90.00

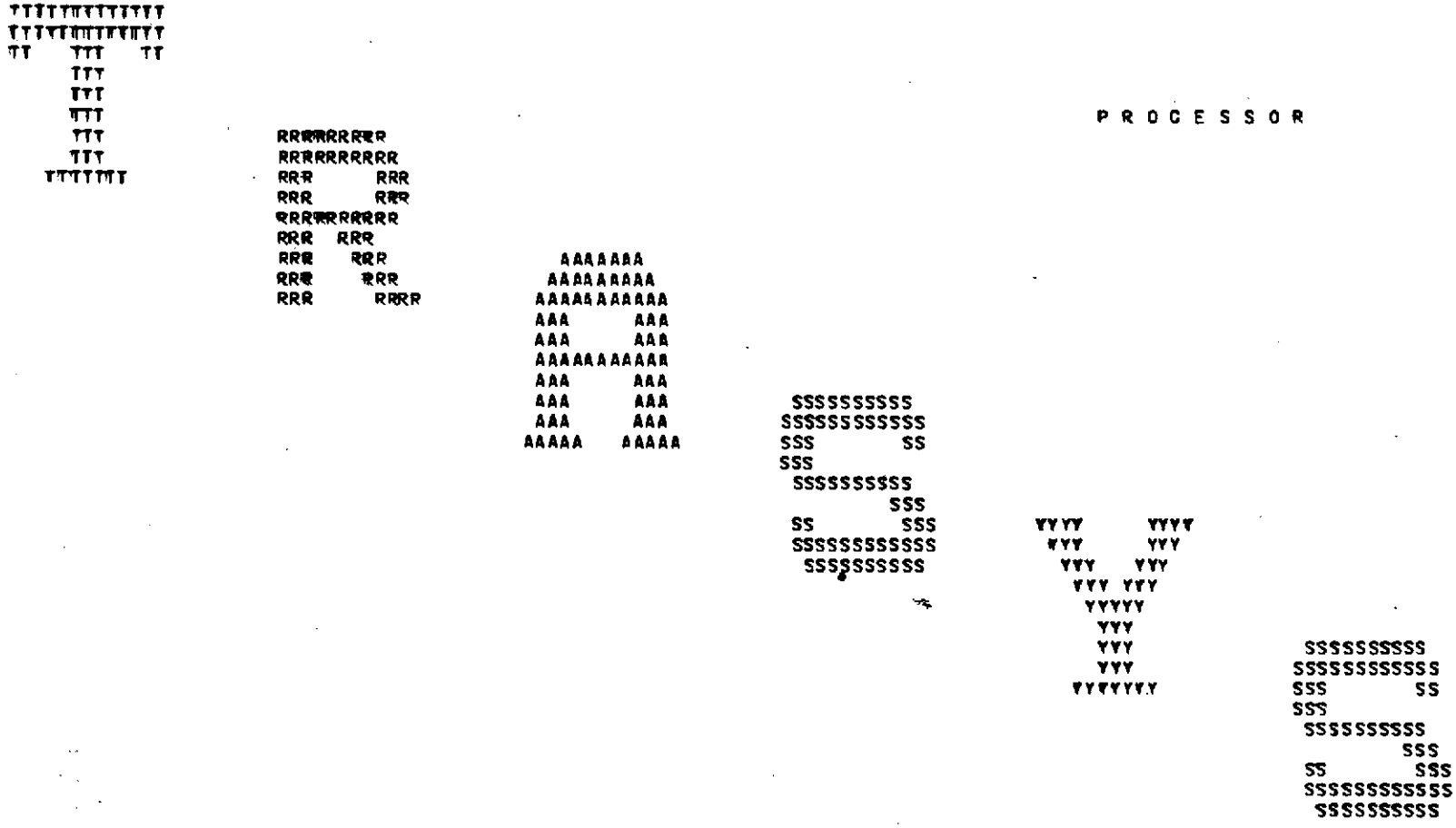
SAMPLE CASE FOR DIFFUSE-PLUS-SPECULAR SYSTEM



VIEW = Y-AXIS
SCALE = .1920
VIEW NUMBER = 1

1ST ROTATION ABOUT Z = -90.00
2ND ROTATION ABOUT Y = 0.
3RD ROTATION ABOUT X = 90.00

NASA/MARTIN MARIETTA
THERMAL RADIATION ANALYSIS SYSTEM
CDC6400-6500/MACE



MODEL = MAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
PROCESSSING OPERATION DATA

NODE	BCS	AREA	ALPH	EMISS	SURF. TYPE	ACTIVE	--------COMMENTS----------
1	ALLBLK	9.000E+01	.100	.100	RECTANGLE	TOP	
2	ALLBLK	1.312E+01	.900	.900	RECTANGLE	TOP	
3	ALLBLK	9.750E+00	.900	.900	RECTANGLE	TOP	
4	ALLBLK	9.750E+00	.900	.900	RECTANGLE	TOP	
5	ALLBLK	9.100E+00	.900	.900	RECTANGLE	TOP	
6	ALLBLK	7.178E+01	.900	.900	RECTANGLE	TOP	
7	ALLBLK	7.207E+01	.900	.900	RECTANGLE	TOP	
8	ALLBLK	6.947E+01	.900	.900	RECTANGLE	TOP	
9	ALLBLK	3.150E+01	.900	.900	RECTANGLE	TOP	
10	ALLBLK	2.975E+01	.900	.900	RECTANGLE	TOP	
11	ALLBLK	6.820E+01	.900	.900	RECTANGLE	TOP	
12	ALLBLK	7.909E+01	.900	.900	RECTANGLE	TOP	
13	ALLBLK	8.854E+01	.900	.900	RECTANGLE	TOP	
14	ALLBLK	8.819E+01	.900	.900	RECTANGLE	TOP	
15	ALLBLK	8.854E+01	.900	.900	RECTANGLE	TOP	
16	ALLBLK	5.843E+01	.900	.900	RECTANGLE	TOP	

MODEL = MAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
FORM FACTOR CALCULATION LINK.

FORM FACTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
FFACC	.0500	0.05	ORIENTATION ACCURACY PARAMETER	N/A
FFACCS	.1000	0.10	SHADOWING ACCURACY PARAMETER	N/A
FFMIN	1.0E-06	1.E-6	PARAMETER TO ELIMINATE SMALL FORM FACTORS	N/A
FFNOSH	SHAD	4HSHAD	OVER RIDE SHADOWING PARAMETER	(4HSHAD,4HNOSH)
FFPNCH	PUN	2HNO	PARAMETER TO PUNCH FORM FACTORS	(3HPUN,2HNO)
FFPRNT	PRINT	5HPRINT	FLAG FOR COMPREHENSIVE PRINT	(5HPRINT,2HNO)
FFRATL	15.0	15.0	RATIO FOR USING SUB NODE TECHNIQUE	N/A

MODEL = HAD STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
FORM FACTOR CALCULATION LINK.

NODE	AREA	ALPH	EMISS
1	9.000E+01	.10	.10
2	1.312E+01	.90	.90
3	9.750E+00	.90	.90
4	9.750E+00	.90	.90
5	9.100E+00	.90	.90
6	7.178E+01	.90	.90
7	7.207E+01	.90	.90
8	6.947E+01	.90	.90
9	3.150E+01	.90	.90
10	2.975E+01	.90	.90
11	6.020E+01	.90	.90
12	7.909E+01	.90	.90
13	8.854E+01	.90	.90
14	8.819E+01	.90	.90
15	8.854E+01	.90	.90
16	5.843E+01	.90	.90

NUMBER OF NODES = 16 NUMBER OF SURFACES = 2

MODEL = HAD STEP = 1
FORM FACTOR CALCULATION LINK.

RADIATION CONDENSER SAMPLE PROBLEM

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)
1	2	CARDS	.037798	.259186	.037798	0.	0.	0.	.015
1	3	CARDS	.005768	.053243	.005768	0.	0.	0.	.020
1	4	CARDS	.006289	.058052	.006289	0.	0.	0.	.026
1	6	CARDS	.104575	.131110	.104575	0.	0.	0.	.031
1	7	CARDS	.118291	.147730	.118291	0.	0.	0.	.036
1	8	CARDS	.060140	.077913	.060140	0.	0.	0.	.041
1	9	CARDS	.043028	.122937	.043028	0.	0.	0.	.046
1	10	CARDS	.032649	.098770	.032649	0.	0.	0.	.050
1	11	CARDS	.027951	.041787	.027951	0.	0.	0.	.055
1	12	CARDS	.119425	.135894	.119425	0.	0.	0.	.061
1	13	CARDS	.161426	.164093	.161426	0.	0.	0.	.065
1	14	CARDS	.106845	.109834	.106845	0.	0.	0.	.071
1	15	CARDS	.119568	.121544	.119568	0.	0.	0.	.076
1	16	CARDS	.053506	.082411	.053506	0.	0.	0.	.081
1	FF SUM =	.9973	ROW CP TIME =	.086			+ RECT		
2	5	CARDS	.160944	.029427	.160944	0.	0.	0.	.008
2	7	CARDS	.040225	.007326	.040225	0.	0.	0.	.013
2	11	CARDS	.043852	.009561	.043852	0.	0.	0.	.018
2	12	CARDS	.216057	.035853	.216057	0.	0.	0.	.024
2	13	CARDS	.020062	.002974	.020062	0.	0.	0.	.029
2	14	CARDS	.115854	.017122	.115054	0.	0.	0.	.034
2	15	CARDS	.025691	.003809	.025691	0.	0.	0.	.039
2	16	CARDS	.007440	.001671	.007440	0.	0.	0.	.045
2	FF SUM =	.8885	ROW CP TIME =	.049			+ RECT		
3	5	CARDS	.021628	.002938	.021628	0.	0.	0.	.008
3	8	CARDS	.280861	.039418	.280861	0.	0.	0.	.013
3	11	CARDS	.300885	.048731	.300885	0.	0.	0.	.018
3	12	CARDS	.174021	.021452	.174021	0.	0.	0.	.023
3	14	CARDS	.081130	.008969	.081130	0.	0.	0.	.029
3	FF SUM =	.9118	ROW CP TIME =	.034			+ RECT		
4	6	CARDS	.004979	.000676	.004979	0.	0.	0.	.007
4	7	CARDS	.049930	.006755	.049930	0.	0.	0.	.012
4	8	CARDS	.117956	.016555	.117956	0.	0.	0.	.017
4	9	CARDS	.050425	.015608	.050425	0.	0.	0.	.022
4	10	CARDS	.010519	.003447	.010519	0.	0.	0.	.027
4	12	CARDS	.183472	.022617	.183472	0.	0.	0.	.032

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTOR	SHAD. A FACTOR	CP TIME (SEC)
4	13	CARDS	.133690	.014722	.133690	0.	0.	0.	.037
4	14	CARDS	.024245	.002680	.024245	0.	0.	0.	.061
4	15	CARDS	.134895	.014855	.134895	0.	0.	0.	.066
4	16	CARDS	.086810	.014351	.086010	0.	0.	0.	.071
4	FF SUM =	.8542	ROW CP TIME =	.076		+ RECT			
5	6	CARDS	.028614	.003627	.028614	0.	0.	0.	.006
5	7	CARDS	.008978	.001134	.008978	0.	0.	0.	.011
5	8	CARDS	.239230	.031337	.239230	0.	0.	0.	.016
5	9	CARDS	.003409	.000985	.003409	0.	0.	0.	.020
5	10	CARDS	.000480	.000147	.000480	0.	0.	0.	.025
5	11	CARDS	.029433	.004449	.029433	0.	0.	0.	.030
5	14	CARDS	.548228	.056568	.548228	0.	0.	0.	.035
5	15	CARDS	.063784	.006504	.063284	0.	0.	0.	.040
5	16	CARDS	.004413	.000687	.004413	0.	0.	0.	.045
5	FF SUM =	.9261	ROW CP TIME =	.050		+ RECT			
6	8	CARDS	.111438	.115152	.111438	0.	0.	0.	.006
6	9	CARDS	.024525	.055890	.024525	0.	0.	0.	.011
6	10	CARDS	.009124	.022016	.009124	0.	0.	0.	.015
6	11	CARDS	.166134	.198105	.166134	0.	0.	0.	.020
6	12	CARDS	.254095	.230617	.254095	0.	0.	0.	.025
6	13	CARDS	.029230	.023699	.029230	0.	0.	0.	.031
6	14	CARDS	.280099	.227988	.280099	0.	0.	0.	.035
6	15	CARDS	.034727	.028156	.034727	0.	0.	0.	.040
6	16	CARDS	.013945	.017131	.013945	0.	0.	0.	.045
6	FF SUM =	1.0911	ROW CP TIME =	.050		+ RECT			
7	8	CARDS	.044039	.045684	.044039	0.	0.	0.	.006
7	9	CARDS	.063644	.145603	.063644	0.	0.	0.	.010
7	10	CARDS	.054888	.132958	.054888	0.	0.	0.	.015
7	11	CARDS	.013817	.016540	.013817	0.	0.	0.	.020
7	12	CARDS	.026117	.023796	.026117	0.	0.	0.	.025
7	13	CARDS	.263905	.214806	.263905	0.	0.	0.	.030
7	14	CARDS	.034592	.028266	.034592	0.	0.	0.	.035
7	15	CARDS	.280429	.228256	.280429	0.	0.	0.	.040
7	16	CARDS	.160389	.197807	.160389	0.	0.	0.	.045

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
FORM FACTOR CALCULATION LINK.

(* INDICATRS NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. E FACTER	SHAD. A FACTOR	CP TIME (SEC)
7	FF SUM =	1.1048	ROW CP TIME =	.070		+ RECT			
8	11	CARDS	.154383	.178156	.154383	0.	0.	0.	.006
8	12	CARDS	.176175	.154740	.176175	0.	0.	0.	.011
8	13	CARDS	.051308	.040258	.051308	0.	0.	0.	.016
8	14	CARDS	.223080	.175721	.223080	0.	0.	0.	.021
8	15	CARDS	.054380	.042669	.054380	0.	0.	0.	.026
8	16	CARDS	.014259	.016952	.014259	0.	0.	0.	.031
8	FF SUM =	.9996	ROW CP TIME =	.036		+ RECT			
9	11	CARDS	.009565	.005005	.009565	0.	0.	0.	.007
9	12	CARDS	.029146	.011608	.029146	0.	0.	0.	.012
9	13	CARDS	.271163	.096475	.271163	0.	0.	0.	.017
9	14	CARDS	.038298	.013679	.038298	0.	0.	0.	.022
9	15	CARDS	.275746	.098106	.275746	0.	0.	0.	.027
9	16	CARDS	.085091	.045871	.085091	0.	0.	0.	.032
9	FF SUM =	1.0500	ROW CP TIME =	.037		+ RECT			
10	11	CARDS	.006827	.002978	.006027	0.	0.	0.	.005
10	12	CARDS	.008478	.003189	.008478	0.	0.	0.	.010
10	13	CARDS	.247228	.083073	.247228	0.	0.	0.	.015
10	14	CARDS	.010768	.003632	.010768	0.	0.	0.	.020
10	15	CARDS	.251456	.084494	.251456	0.	0.	0.	.024
10	16	CARDS	.291733	.148530	.291733	0.	0.	0.	.030
10	FF SUM =	1.0730	ROW CP TIME =	.035		+ RECT			
11	12	CARDS	.220815	.168069	.220815	0.	0.	0.	.005
11	13	CARDS	.010974	.007462	.010974	0.	0.	0.	.010
11	14	CARDS	.257296	.175629	.257296	0.	0.	0.	.015
11	15	CARDS	.017966	.012216	.017966	0.	0.	0.	.020
11	16	CARDS	.028121	.028971	.028121	0.	0.	0.	.025
11	FF SUM =	1.0405	ROW CP TIME =	.030		+ RECT			
12	14	CARDS	.154333	.138408	.154333	0.	0.	0.	.009
12	15	CARDS	.044610	.039852	.044610	0.	0.	0.	.014
12	16	CARDS	.009757	.013207	.009757	0.	0.	0.	.019

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
FORM FACTOR CALCULATION LINK.

(* INDICATES NODE PAIR HAS BEEN SUBDIVIDED)

NODE I	NODE J	COMPUTATION	FE(I,J) W/SHAD	FE(J,I) W/SHAD	FA(I,J) W/SHAD	F (I,J) WO/SHAD	SHAD. F FACTOR	SHAD. A FACTOR	CP TIME (SEC)
12	FF SUM =	1.0165	ROW CP TIME =	.044		+ RECT			
13	14	CARDS	.052702	.052908	.052702	0.	0.	0.	.006
13	15	CARDS	.198592	.198592	.198592	0.	0.	0.	.011
13	16	CARDS	.158787	.240593	.158787	0.	0.	0.	.016
13	FF SUM =	1.0576	ROW CP TIME =	.021		+ RECT			
14	16	CARDS	.013765	.020776	.013765	0.	0.	0.	.007
14	FF SUM =	1.0244	ROW CP TIME =	.012		+ RECT			
15	16	CARDS	.170217	.257911	.170217	0.	0.	0.	.004
15	FF SUM =	1.0493	ROW CP TIME =	.009		+ RECT			
16	FF SUM =	1.0869	ROW CP TIME =	.006		+ RECT			

TOTAL CP TIME (SEC) FOR PROBLEM = .815

RADIATION CONDENSER SAMPLE PROBLEM

MODEL = HAO STEP = 1
FORM FACTOR CALCULATION LINK.

FORM FACTOR SUMS FROM NODE I

NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM	NODE I -	FF SUM
1 -	.9972590	2 -	.8885113	3 -	.9117681	4 -	.8541733	5 -	.9260690	6 -	1.0910950
7 -	1.1047654	8 -	.9996438	9 -	1.0500318	10 -	1.0730281	11 -	1.0404852	12 -	1.0165357
13 -	1.0576402	14 -	1.0243696	15 -	1.0492692	16 -	1.0868708				

TOTAL TIME FOR FORM FACTORS .85

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
GREY BODIES COMPUTATION LINK.

GREY BODIES

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IGBSEE	1	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR FORM FACTORS	N/A
GBWBND	TR	NONE	WAVEBAND DEFINITION PARAMETER	(2HIR,3HSOL,4HBOTH)

IR GREY BODIES STORED IN STEP 1

TOTAL TIME TO COMPUTE GREY BODIES .31

RADIATION CONDENSER SAMPLE PROBLEM

MODEL = HAO STEP = 1
RADIATION CONDENSER LINK.

RADIATION CONDUCTORS

VARIABLE NAME	CURRENT VALUE	DEFAULT	DEFINITION	OPTIONS
IRKNGB	1	CURRENT STEP NO.	STEP NUMBER REFERENCE FOR GREY BODIES	N/A
RKPNCH	PUN	2HNO	PUNCH/NO PUNCH PARAMETER FOR RADK S	(3HPUN,2HNO)
RKMIN	1.0E-04	0.0001	PARAMETER TO ELIMINATE SMALL RADK S	N/A
IRKCN	1000	1	INITIAL RADIATION CONDUCTOR ID NUMBER	N/A
RKSP	NO	2HNO	MNEMONIC FLAG FOR COMPUTATION OF RADKS TO SPACE	(5HSPACE,2HNO)
IRKNSP	32767	32767	SPACE NODE ID NUMBER	N/A
SIGMA	1.71E-09	1.713E-9	STEFAN-BOLTZMANN CONSTANT	N/A
RKAMPF	.01	1.0	AREA MULTIPLYING FACTOR	N/A
RKTAPE	NO	2HNO	PARAMETER TO OUTPUT TO RCD TAPE	(4HTAPE,2HNO)
RFRAC	7.0E-01	0.7	SIGNIFICANT RADIATION FRACTION	(0. TO 1.)
NERN	91	4HNONE	EFFECTIVE RADIATION NODE (ERN) NUMBER	N/A

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

ORIGINAL RADIATION CONDUCTORS

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = .00694

ORIGINAL RADKS -	1000,	2266,	2266,	1.7130000E-09*	8.9172904E-05	$ RADK
ORIGINAL RADKS -	1001,	2266,	2270,	1.7130000E-09*	3.0848569E-03	$ RADK
ORIGINAL RADKS -	1002,	2266,	2255,	1.7130000E-09*	6.4710082E-03	$ RADK
ORIGINAL RADKS -	1003,	2266,	2254,	1.7130000E-09*	7.3292987E-03	$ RADK
ORIGINAL RADKS -	1004,	2266,	2252,	1.7130000E-09*	3.8920842E-03	$ RADK
ORIGINAL RADKS -	1005,	2266,	2243,	1.7130000E-09*	2.7198305E-03	$ RADK
ORIGINAL RADKS -	1006,	2266,	2253,	1.7130000E-09*	2.1104669E-03	$ RADK
ORIGINAL RADKS -	1007,	2266,	51,	1.7130000E-09*	2.0617208E-03	$ RADK
ORIGINAL RADKS -	1008,	2266,	2264,	1.7130000E-09*	7.3004653E-03	$ RADK
ORIGINAL RADKS -	1009,	2266,	2265,	1.7130000E-09*	9.8381308E-03	$ RADK
ORIGINAL RADKS -	1010,	2266,	2259,	1.7130000E-09*	6.6512534E-03	$ RADK
ORIGINAL RADKS -	1011,	2266,	2258,	1.7130000E-09*	7.5250154E-03	$ RADK
ORIGINAL RADKS -	1012,	2266,	2240,	1.7130000E-09*	3.5769107E-03	$ RADK
ORIGINAL RADKS -	1013,	2255,	2255,	1.7130000E-09*	1.3506741E-02	$ RADK
ORIGINAL RADKS -	1014,	2255,	2254,	1.7130000E-09*	8.7430539E-03	$ RADK
ORIGINAL RADKS -	1015,	2255,	2252,	1.7130000E-09*	5.3953754E-02	$ RADK
ORIGINAL RADKS -	1016,	2255,	2243,	1.7130000E-09*	1.3083779E-02	$ RADK
ORIGINAL RADKS -	1017,	2255,	2253,	1.7130000E-09*	6.0947004E-03	$ RADK
ORIGINAL RADKS -	1018,	2255,	51,	1.7130000E-09*	7.3956052E-02	$ RADK
ORIGINAL RADKS -	1019,	2255,	2264,	1.7130000E-09*	1.1405945E-01	$ RADK
ORIGINAL RADKS -	1020,	2255,	2265,	1.7130000E-09*	2.2799317E-02	$ RADK
ORIGINAL RADKS -	1021,	2255,	2259,	1.7130000E-09*	1.2449679E-01	$ RADK
ORIGINAL RADKS -	1022,	2255,	2258,	1.7130000E-09*	2.2814735E-02	$ RADK
ORIGINAL RADKS -	1023,	2255,	2240,	1.7130000E-09*	1.0222865E-02	$ RADK
ORIGINAL RADKS -	1024,	2254,	2254,	1.7130000E-09*	1.5133893E-02	$ RADK
ORIGINAL RADKS -	1025,	2254,	2252,	1.7130000E-09*	2.3697221E-02	$ RADK
ORIGINAL RADKS -	1026,	2254,	2243,	1.7130000E-09*	3.1325803E-02	$ RADK
ORIGINAL RADKS -	1027,	2254,	2253,	1.7130000E-09*	2.7495948E-02	$ RADK
ORIGINAL RADKS -	1028,	2254,	51,	1.7130000E-09*	9.0758330E-03	$ RADK
ORIGINAL RADKS -	1029,	2254,	2264,	1.7130000E-09*	1.9788304E-02	$ RADK
ORIGINAL RADKS -	1030,	2254,	2265,	1.7130000E-09*	1.2313490E-01	$ RADK
ORIGINAL RADKS -	1031,	2254,	2259,	1.7130000E-09*	2.2800376E-02	$ RADK
ORIGINAL RADKS -	1032,	2254,	2258,	1.7130000E-09*	1.2743596E-01	$ RADK
ORIGINAL RADKS -	1033,	2254,	2240,	1.7130000E-09*	7.3787359E-02	$ RADK
ORIGINAL RADKS -	1034,	2252,	2252,	1.7130000E-09*	7.7558399E-03	$ RADK
ORIGINAL RADKS -	1035,	2252,	2243,	1.7130000E-09*	2.5109146E-03	$ RADK
ORIGINAL RADKS -	1036,	2252,	2253,	1.7130000E-09*	1.8926657E-03	$ RADK
ORIGINAL RADKS -	1037,	2252,	51,	1.7130000E-09*	6.5869834E-02	$ RADK
ORIGINAL RADKS -	1038,	2252,	2264,	1.7130000E-09*	7.7546645E-02	$ RADK
ORIGINAL RADKS -	1039,	2252,	2265,	1.7130000E-09*	2.7521183E-02	$ RADK
ORIGINAL RADKS -	1040,	2252,	2259,	1.7130000E-09*	9.6251261E-02	$ RADK
ORIGINAL RADKS -	1041,	2252,	2258,	1.7130000E-09*	2.7458483E-02	$ RADK
ORIGINAL RADKS -	1042,	2252,	2240,	1.7130000E-09*	9.1658296E-03	$ RADK
ORIGINAL RADKS -	1043,	2243,	2243,	1.7130000E-09*	2.3618083E-03	$ RADK
ORIGINAL RADKS -	1044,	2243,	2253,	1.7130000E-09*	2.1001655E-03	$ RADK

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

ORIGINAL RADIATION CONDUCTORS

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = .00694

ORIGINAL RADKS -	1045,	2243,	51,	1.7130000E-09*	3.1130863E-03	$ RADK
ORIGINAL RADKS -	1046,	2243,	2264,	1.7130000E-09*	8.7961073E-03	$ RADK
ORIGINAL RADKS -	1047,	2243,	2265,	1.7130000E-09*	5.4224884E-02	$ RADK
ORIGINAL RADKS -	1048,	2243,	2259,	1.7130000E-09*	1.0258625E-02	$ RADK
ORIGINAL RADKS -	1049,	2243,	2258,	1.7130000E-09*	5.4199264E-02	$ RADK
ORIGINAL RADKS -	1050,	2243,	2240,	1.7130000E-09*	1.8704403E-02	$ RADK
ORIGINAL RADKS -	1051,	2253,	2253,	1.7130000E-09*	2.2817178E-03	$ RADK
ORIGINAL RADKS -	1052,	2253,	51,	1.7130000E-09*	2.0563678E-03	$ RADK
ORIGINAL RADKS -	1053,	2253,	2264,	1.7130000E-09*	4.1280029E-03	$ RADK
ORIGINAL RADKS -	1054,	2253,	2265,	1.7130000E-09*	4.7225780E-02	$ RADK
ORIGINAL RADKS -	1055,	2253,	2259,	1.7130000E-09*	4.4374665E-03	$ RADK
ORIGINAL RADKS -	1056,	2253,	2258,	1.7130000E-09*	4.7353827E-02	$ RADK
ORIGINAL RADKS -	1057,	2253,	2240,	1.7130000E-09*	5.1851497E-02	$ RADK
ORIGINAL RADKS -	1058,	51,	51,	1.7130000E-09*	6.3540994E-03	$ RADK
ORIGINAL RADKS -	1059,	51,	2264,	1.7130000E-09*	8.1748610E-02	$ RADK
ORIGINAL RADKS -	1060,	51,	2265,	1.7130000E-09*	8.3339206E-03	$ RADK
ORIGINAL RADKS -	1061,	51,	2259,	1.7130000E-09*	9.4308550E-02	$ RADK
ORIGINAL RADKS -	1062,	51,	2258,	1.7130000E-09*	9.9554979E-03	$ RADK
ORIGINAL RADKS -	1063,	51,	2240,	1.7130000E-09*	1.1382929E-02	$ RADK
ORIGINAL RADKS -	1064,	2264,	2264,	1.7130000E-09*	1.5279187E-02	$ RADK
ORIGINAL RADKS -	1065,	2264,	2265,	1.7130000E-09*	1.2663150E-02	$ RADK
ORIGINAL RADKS -	1066,	2264,	2259,	1.7130000E-09*	8.2811667E-02	$ RADK
ORIGINAL RADKS -	1067,	2264,	2258,	1.7130000E-09*	2.9545158E-02	$ RADK
ORIGINAL RADKS -	1068,	2264,	2240,	1.7130000E-09*	9.4566049E-03	$ RADK
ORIGINAL RADKS -	1069,	2265,	2265,	1.7130000E-09*	2.3788468E-02	$ RADK
ORIGINAL RADKS -	1070,	2265,	2259,	1.7130000E-09*	3.7524044E-02	$ RADK
ORIGINAL RADKS -	1071,	2265,	2258,	1.7130000E-09*	1.1778398E-01	$ RADK
ORIGINAL RADKS -	1072,	2265,	2240,	1.7130000E-09*	8.9774600E-02	$ RADK
ORIGINAL RADKS -	1073,	2259,	2259,	1.7130000E-09*	1.7189131E-02	$ RADK
ORIGINAL RADKS -	1074,	2259,	2258,	1.7130000E-09*	1.8258201E-02	$ RADK
ORIGINAL RADKS -	1075,	2259,	2240,	1.7130000E-09*	1.1784193E-02	$ RADK
ORIGINAL RADKS -	1076,	2258,	2258,	1.7130000E-09*	1.8844163E-02	$ RADK
ORIGINAL RADKS -	1077,	2258,	2240,	1.7130000E-09*	9.4329762E-02	$ RADK
ORIGINAL RADKS -	1078,	2270,	2255,	1.7130000E-09*	2.0529962E-02	$ RADK
ORIGINAL RADKS -	1079,	2270,	2254,	1.7130000E-09*	1.0522859E-02	$ RADK
ORIGINAL RADKS -	1080,	2270,	2252,	1.7130000E-09*	3.7983964E-02	$ RADK
ORIGINAL RADKS -	1081,	2270,	2243,	1.7130000E-09*	4.6015674E-03	$ RADK
ORIGINAL RADKS -	1082,	2270,	2253,	1.7130000E-09*	1.9119042E-03	$ RADK
ORIGINAL RADKS -	1083,	2270,	51,	1.7130000E-09*	2.4501229E-02	$ RADK
ORIGINAL RADKS -	1084,	2270,	2264,	1.7130000E-09*	4.1101234E-02	$ RADK
ORIGINAL RADKS -	1085,	2270,	2265,	1.7130000E-09*	1.4366548E-02	$ RADK
ORIGINAL RADKS -	1086,	2270,	2259,	1.7130000E-09*	4.7884091E-02	$ RADK
ORIGINAL RADKS -	1087,	2270,	2258,	1.7130000E-09*	1.6996875E-02	$ RADK
ORIGINAL RADKS -	1088,	2270,	2240,	1.7130000E-09*	7.8726807E-03	$ RADK

MODEL = M80 STEP = 1
RADIATION CONDENSER LINK.

RADIATION CONDENSER SAMPLE PROBLEM

SPECIAL RADIATION NODES

NONE

MESS SPECIAL NODES

PRIMARY	SECONDARY
51	52

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = .00694

ORIGINAL CONDUCTOR NUMBER	NEW CONDUCTOR NUMBER	ENCLOSURE NODE NUMBERS		SIGMA	A*SCRIPT F
1056	- 1000,	-51,	52,	1.713E-09*	6.35410E-03
	- 1001,	-52,	2240,	1.713E-09*	1.13829E-02
1063	- 1002,	-2240,	51,	1.713E-09*	1.13829E-02
1050	- 1003,	2243,	2240,	1.713E-09*	1.87044E-02
	- 1004,	-52,	2243,	1.713E-09*	3.11309E-03
1045	- 1005,	-2243,	51,	1.713E-09*	3.11309E-03
	- 1006,	-52,	2252,	1.713E-09*	6.58698E-02
1037	- 1007,	-2252,	51,	1.713E-09*	6.58698E-02
1057	- 1008,	2253,	2240,	1.713E-09*	5.18515E-02
	- 1009,	-52,	2253,	1.713E-09*	2.05637E-03
1052	- 1010,	-2253,	51,	1.713E-09*	2.05637E-03
1033	- 1011,	2254,	2240,	1.713E-09*	7.37874E-02
1026	- 1012,	2254,	2243,	1.713E-09*	3.13258E-02
	- 1013,	-52,	2254,	1.713E-09*	9.07583E-03
1028	- 1014,	-2254,	51,	1.713E-09*	9.07583E-03
	- 1015,	-52,	2255,	1.713E-09*	7.39561E-02
1018	- 1016,	-2255,	51,	1.713E-09*	7.39561E-02
1015	- 1017,	2255,	2252,	1.713E-09*	5.30538E-02
1032	- 1018,	2258,	2254,	1.713E-09*	1.27436E-01
1077	- 1019,	2258,	2240,	1.713E-09*	9.43298E-02
1049	- 1020,	2258,	2243,	1.713E-09*	5.41993E-02
1056	- 1021,	2258,	2253,	1.713E-09*	4.73538E-02
	- 1022,	-52,	2258,	1.713E-09*	9.95550E-03
1062	- 1023,	-2258,	51,	1.713E-09*	9.95550E-03
1021	- 1024,	2259,	2255,	1.713E-09*	1.24497E-01
1040	- 1025,	2259,	2252,	1.713E-09*	9.62513E-02
	- 1026,	-52,	2259,	1.713E-09*	9.43086E-02
1061	- 1027,	-2259,	51,	1.713E-09*	9.43086E-02
1019	- 1028,	2264,	2255,	1.713E-09*	1.14059E-01
1066	- 1029,	2264,	2259,	1.713E-09*	8.20117E-02
	- 1030,	-52,	2264,	1.713E-09*	8.17486E-02
1059	- 1031,	-2264,	51,	1.713E-09*	8.17486E-02
1038	- 1032,	2264,	2252,	1.713E-09*	7.75466E-02
1030	- 1033,	2265,	2254,	1.713E-09*	1.23135E-01
1071	- 1034,	2265,	2258,	1.713E-09*	1.17784E-01
1072	- 1035,	2265,	2240,	1.713E-09*	8.97746E-02
1047	- 1036,	2265,	2243,	1.713E-09*	5.42249E-02
1054	- 1037,	2265,	2253,	1.713E-09*	4.72258E-02
	- 1038,	-52,	2265,	1.713E-09*	8.33392E-03

MODEL = MAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

RADIATION CONDUCTOR (RADK) CARDS PUNCHED

AREA UNITS = INPUT UNITS * AMPF, WHERE AMPF = .00694

ORIGINAL CONDUCTOR NUMBER	NEW CONDUCTOR NUMBER	ENCLOSURE NODE NUMBERS		SIGMA	A*SCRIPT F
1060	- 1039,	-2265,	51,	1.713E-09*	8.33392E-03
1009	- 1040,	2265,	2265,	1.713E-09*	9.83813E-03
1011	- 1041,	2266,	2258,	1.713E-09*	7.52502E-03
1003	- 1042,	2266,	2254,	1.713E-09*	7.32930E-03
1008	- 1043,	2266,	2264,	1.713E-09*	7.30047E-03
1010	- 1044,	2266,	2259,	1.713E-09*	6.65125E-03
1002	- 1045,	2266,	2255,	1.713E-09*	6.47101E-03
	- 1046,	-52,	2266,	1.713E-09*	2.06172E-03
1007	- 1047,	-2266,	51,	1.713E-09*	2.06172E-03
1086	- 1048,	2270,	2259,	1.713E-09*	4.78841E-02
1084	- 1049,	2270,	2264,	1.713E-09*	4.11012E-02
1080	- 1050,	2270,	2252,	1.713E-09*	3.79840E-02
	- 1051,	-52,	2270,	1.713E-09*	2.45012E-02
1093	- 1052,	-2270,	51,	1.713E-09*	2.45012E-02
1078	- 1053,	2270,	2255,	1.713E-09*	2.05300E-02

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

CONDENSED ENCLOSURE RADIATION COUPLINGS

- 1075,	2240,	2259,	1.713E-09*	1.17542E-02
- 1023,	2240,	2255,	1.713E-09*	1.02229E-02
- 1068,	2240,	2264,	1.713E-09*	9.45660E-03
- 1042,	2240,	2252,	1.713E-09*	9.16683E-03
- 1088,	2240,	2270,	1.713E-09*	7.87268E-03
- 1012,	2240,	2266,	1.713E-09*	3.57691E-03
- 1054,	2240,	91,	1.713E-09*	5.20801E-02 EFFECTIVE RADIATION NODE (ERN)

- 1016,	2243,	2255,	1.713E-09*	1.30838E-02
- 1048,	2243,	2259,	1.713E-09*	1.02586E-02
- 1046,	2243,	2264,	1.713E-09*	8.79611E-03
- 1081,	2243,	2270,	1.713E-09*	4.60157E-03
- 1005,	2243,	2266,	1.713E-09*	2.71983E-03
- 1035,	2243,	2252,	1.713E-09*	2.51091E-03
- 1044,	2243,	2253,	1.713E-09*	2.10017E-03
- 1055,	2243,	91,	1.713E-09*	4.40710E-02 EFFECTIVE RADIATION NODE (ERN)

- 1039,	2252,	2265,	1.713E-09*	2.75212E-02
- 1041,	2252,	2258,	1.713E-09*	2.74585E-02
- 1025,	2252,	2254,	1.713E-09*	2.36972E-02
- 1042,	2252,	2240,	1.713E-09*	9.16683E-03
- 1004,	2252,	2266,	1.713E-09*	3.89208E-03
- 1035,	2252,	2243,	1.713E-09*	2.51091E-03
- 1036,	2252,	2253,	1.713E-09*	1.89267E-03
- 1056,	2252,	91,	1.713E-09*	9.61394E-02 EFFECTIVE RADIATION NODE (ERN)

- 1027,	2253,	2254,	1.713E-09*	2.74959E-02
- 1017,	2253,	2255,	1.713E-09*	6.09470E-03
- 1055,	2253,	2259,	1.713E-09*	4.43747E-03
- 1053,	2253,	2264,	1.713E-09*	4.12800E-03
- 1006,	2253,	2266,	1.713E-09*	2.11047E-03
- 1044,	2253,	2243,	1.713E-09*	2.10017E-03
- 1082,	2253,	2270,	1.713E-09*	1.91190E-03
- 1036,	2253,	2252,	1.713E-09*	1.89267E-03

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

CONDENSED ENCLOSURE RADIATION COUPLINGS

- 1057,	2253,	91,	1.713E-09* 5.01713E-02	EFFECTIVE RADIATION NODE (ERN)
- 1027,	2254,	2253,	1.713E-09* 2.74959E-02	
- 1025,	2254,	2252,	1.713E-09* 2.36972E-02	
- 1031,	2254,	2259,	1.713E-09* 2.28004E-02	
- 1029,	2254,	2264,	1.713E-09* 1.97883E-02	
- 1079,	2254,	2270,	1.713E-09* 1.05229E-02	
- 1014,	2254,	2255,	1.713E-09* 8.74305E-03	
- 1058,	2254,	91,	1.713E-09* 1.13048E-01	EFFECTIVE RADIATION NODE (ERN)
- 1022,	2255,	2258,	1.713E-09* 2.28147E-02	
- 1020,	2255,	2265,	1.713E-09* 2.27993E-02	
- 1016,	2255,	2243,	1.713E-09* 1.70838E-02	
- 1023,	2255,	2240,	1.713E-09* 1.02229E-02	
- 1014,	2255,	2254,	1.713E-09* 8.74305E-03	
- 1017,	2255,	2253,	1.713E-09* 6.09470E-03	
- 1059,	2255,	91,	1.713E-09* 8.37585E-02	EFFECTIVE RADIATION NODE (ERN)
- 1067,	2258,	2264,	1.713E-09* 2.95452E-02	
- 1041,	2258,	2252,	1.713E-09* 2.74585E-02	
- 1022,	2258,	2255,	1.713E-09* 2.28147E-02	
- 1087,	2258,	2270,	1.713E-09* 1.69969E-02	
- 1074,	2258,	2259,	1.713E-09* 1.02582E-02	
- 1068,	2258,	91,	1.713E-09* 1.07073E-01	EFFECTIVE RADIATION NODE (ERN)
- 1070,	2259,	2265,	1.713E-09* 3.75240E-02	
- 1031,	2259,	2254,	1.713E-09* 2.28004E-02	
- 1075,	2259,	2240,	1.713E-09* 1.17842E-02	
- 1048,	2259,	2243,	1.713E-09* 1.02586E-02	
- 1074,	2259,	2258,	1.713E-09* 1.02582E-02	
- 1055,	2259,	2253,	1.713E-09* 4.43747E-03	

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

CONDENSED ENCLOSURE RADIATION COUPLINGS

- 1061,	2259,	91,	1.713E-09* 9.70629E-02	EFFECTIVE RADIATION NODE (ERN)
- 1067,	2264,	2258,	1.713E-09* 2.95452E-02	
- 1029,	2264,	2254,	1.713E-09* 1.97883E-02	
- 1065,	2264,	2265,	1.713E-09* 1.26631E-02	
- 1068,	2264,	2240,	1.713E-09* 9.45660E-03	
- 1046,	2264,	2243,	1.713E-09* 8.79611E-03	
- 1053,	2264,	2253,	1.713E-09* 4.12800E-03	
- 1062,	2264,	91,	1.713E-09* 8.43773E-02	EFFECTIVE RADIATION NODE (ERN)
- 1070,	2265,	2259,	1.713E-09* 3.75240E-02	
- 1039,	2265,	2252,	1.713E-09* 2.75212E-02	
- 1020,	2265,	2255,	1.713E-09* 2.27993E-02	
- 1085,	2265,	2270,	1.713E-09* 1.43665E-02	
- 1065,	2265,	2264,	1.713E-09* 1.26631E-02	
- 1063,	2265,	91,	1.713E-09* 1.14874E-01	EFFECTIVE RADIATION NODE (ERN)
- 1004,	2266,	2252,	1.713E-09* 3.89208E-03	
- 1012,	2266,	2240,	1.713E-09* 3.57691E-03	
- 1001,	2266,	2270,	1.713E-09* 3.08486E-03	
- 1005,	2266,	2243,	1.713E-09* 2.71983E-03	
- 1006,	2266,	2253,	1.713E-09* 2.11047E-03	
- 1064,	2266,	91,	1.713E-09* 1.53841E-02	EFFECTIVE RADIATION NODE (ERN)
- 1087,	2270,	2258,	1.713E-09* 1.69969E-02	
- 1085,	2270,	2265,	1.713E-09* 1.43665E-02	
- 1079,	2270,	2254,	1.713E-09* 1.05229E-02	
- 1088,	2270,	2240,	1.713E-09* 7.87268E-03	
- 1081,	2270,	2243,	1.713E-09* 4.60157E-03	
- 1001,	2270,	2266,	1.713E-09* 3.08486E-03	
- 1082,	2270,	2253,	1.713E-09* 1.91190E-03	

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

CONDENSED ENCLOSURE RADIATION COUPLINGS

- 1069,	2270,	91,	1.7135-09* 5.93573E-02	EFFECTIVE RADIATION NODE (ERN)

MODEL = HAO STEP = 1 RADIATION CONDENSER SAMPLE PROBLEM
RADIATION CONDENSER LINK.

SIGNIFICANT RADIATION FRACTION IS .700

ENCLOSURE HAS 78 COUPLINGS 37 COUPLINGS HAVE BEEN CONDENSED

13 COUPLINGS HAVE BEEN ADDED FOR MESS SPECIAL NODES

15.4 PERCENT REDUCTION IN NUMBER OF COUPLINGS

81.8 PERCENT OF ENCLOSURE TOTAL EMISSIVE POWER IS EXACTLY COUPLED

TOTAL TIME TO COMPUTE AND CONDENSE RADKS 2.59