APPENDIX
C

SAMPLE TRNSYS DECKS

Two sample TRNSYS decks illustrate how to use the Type 71 and Type 99 subroutines.

C.1 NSTF Deck

The NSTF experimental UTC plate is simulated with the TRNSYS deck shown below. This deck is used to generate Figure 4.1.1a.

```
ASSIGN  nstf.lst                        6
ASSIGN  nstft.plt                      12
ASSIGN  nstfq.plt                      13
ASSIGN  MADISN.WI                      14
ASSIGN  MADISN.ALL                     15
* LOGICAL UNIT 14 = SEL TMY DATA FILE.
* LOGICAL UNIT 15 = FULL TMY DATA FILE.

SIMULATION  1  8760  1
WIDTH  72

UNIT 9 TYPE 9 DATA READER
PARAMETERS 26
*MODE  N  TD  21*(CONVERSION FACTORS)  LOGICAL-UNIT  FRMT
-2  8  1  -1 1 0  -2 1 0  -3 1 0  -4 1 0  5 0.1 0  6 0.0001 0  8 10 0
14  -1
*OUTPUTS 8
*MONTH  HR  IDN  I  TDB  HUMRAT  WINDVEL  WINDDIR

UNIT 10 TYPE 9 DATA READER 2
PARAMETERS 35
*MODE  N  TD  30*(CONVERSION FACTORS) LOGICAL-UNIT  FRMT
-2  10  1  -1 1 0  -2 1 0  -3 1 0  -4 1 0  -5 1 0  -6 1 0  -7 1 0
-8 1 0  -9 1 0  -10 1 0  15  1
(72X, F4.0, 1X, 4F1.0, 17X, F5.0, 4X, F4.0, 7X, 2F2.0, F1.0)
*OUTPUTS 10
*CEILING  SC(1-4)  PATM  TDP  NTOT  NOPAQ  SNOW

EQUATIONS 2
```

```
SNOW = [69,3]
RHOG = 0.2 + SNOW * 0.5

UNIT 16 TYPE 16 RADIATION PROCESSOR
PARAMETERS 9
*MODE  TRACK-MODE  SURF-MODE  DAY  LAT  SC  SHFT  SMOOTH  IE
7  1  1  1  43.1  4871  0  0  -1
INPUTS 7
*I  IDN  TD1  TD2  RHOG  SLOPE  AZIMUTH
9,4  9,3  9,19  9,20  RHOG  0,0  0,0
0.0  0.0  0.0  1.0  0.2  90.0  0.0

UNIT 69 TYPE 69 TSKY ESTIMATOR
INPUTS 12
*CEILING  SC(1-4)  PATM  TDP  NTOT  NOPAQ  SNOW  HOUR  TAMB
10,1  10,2  10,3  10,4  10,5  10,6  10,7  10,8  10,9  10,10
9,2  9,5
7777.0  0.0  0.0  0.0  0.0  10125.0  0.0  0.0  0.0  0.0
0.0  0.0
*OUTPUTS 3
*TSKY  PATM  SNOW

UNIT 71 TYPE 71 TRANSPIRED COLLECTOR
PARAMETERS 14
*AREA  HT  DIAM  PITCH  EMISC  ABSOR  DEPTH  EMISW  RWALL  UA
*TROOM  TBYPASS  QMAX  NITEBP
4.465  2.44  0.00159  0.0151  0.9  0.9  0.0762  1.0  1.0  1.0
25.0  25.0  100000.0  1.0
INPUTS 11
*MONTH  HR  RAD  TAMB  TSKY  PATM  GAIN  FLOW1  MINOUT1  FLOW2
*OUT2
9,1  9,2  16,6  9,5  69,1  69,2  0,0  0,0  0,0  0,0
0,0
0.0  0.0  0.0  0.0  0.0  101.3  0.0  562.6  562.6  0.0
0.0
*OUTPUTS 21
*TPLENUM  TOUT  TMIX  TSUP  TCOL  QSAVE  QVCOL  QVWALL  QRCOL  QRWALL
*QDWALL  QRED  QABS  QAUX  OUTFLOW  EFFHX  SOLEFF  DELP  BYPASS  QTRAD
*FANPW

UNIT 25 TYPE 25 PRINTER
PARAMETERS 5
*STEP  START  STOP  LOGICAL-UNIT  UNITS
1  1  8760  12  2
INPUTS 10
9,5  71,1  71,2  71,3  71,4  71,5  71,15  71,16  71,17  16,6
TAMB  TPLENUM  TOUT  TMIX  TSUP  TCOL  OUTFLOW  EFFHX  SOLEFF  RAD

UNIT 26 TYPE 25 PRINTER 2
PARAMETERS 5
*STEP  START  STOP  LOGICAL-UNIT  UNITS
1  1  8760  13  2
INPUTS 10
71,6  71,7  71,8  71,9  71,10  71,11  71,12  71,13  71,14  71,18
QSAVE  QVCOL  QVWALL  QRCOL  QRWALL  QDWALL  QRED  QABS  QAUX  DELP
```

```
END
```

C.2 Commercial Building A Deck

A UTC system on commercial building A in Madison, WI is simulated with the TRNSYS deck shown below. This is used to generate the data in Table 6.2.1.

```
ASSIGN  commer.lst                    6
ASSIGN  commer.out                   11
ASSIGN  commert.plt                  12
ASSIGN  commerq.plt                  13
ASSIGN  MADISN.WI                    14
ASSIGN  MADISN.ALL                   15
ASSIGN  COMMER.DAT                   16
* LOGICAL UNIT 14 = SEL TMY DATA FILE.
* LOGICAL UNIT 15 = FULL TMY DATA FILE.
* LOGICAL UNIT 16 = HOURLY DATA ON INTERNAL GAINS AND AIR FLOW RATES.

SIMULATION  1  8760  1
WIDTH  72

UNIT 9 TYPE 9 DATA READER
PARAMETERS 26
*MODE  N  TD  21*(CONVERSION FACTORS)  LOGICAL-UNIT  FRMT
-2  8  1  -1 1 0  -2 1 0  -3 1 0  -4 1 0  5 0.1 0  6 0.0001 0  8 10 0
14  -1
*OUTPUTS 8
*MONTH  HR  IDN  I  TDB  HUMRAT  WINDVEL  WINDDIR

UNIT 10 TYPE 9 DATA READER 2
PARAMETERS 35
*MODE  N  TD  30*(CONVERSION FACTORS) LOGICAL-UNIT  FRMT
-2  10  1  -1 1 0  -2 1 0  -3 1 0  -4 1 0  -5 1 0  -6 1 0  -7 1 0
-8 1 0  -9 1 0  -10 1 0  15  1
(72X, F4.0, 1X, 4F1.0, 17X, F5.0, 4X, F4.0, 7X, 2F2.0, F1.0)
*OUTPUTS 10
*CEILING  SC(1-4)  PATM  TDP  NTOT  NOPAQ  SNOW

UNIT 11 TYPE 9 DATA READER 3
PARAMETERS 5
*MODE  N  TD  LOGICAL-UNIT  FRMT
-2  4  1  16  -1
*OUTPUTS 4
*HR  LSENSIBLE  FLOW1  MINOUT1

EQUATIONS 2
SNOW = [69,3]
RHOG = 0.2 + SNOW * 0.5

UNIT 16 TYPE 16 RADIATION PROCESSOR
PARAMETERS 9
```

```
*MODE  TRACK-MODE  SURF-MODE  DAY  LAT  SC  SHFT  SMOOTH  IE
7  1  1  1  43.1  4871  0  0  -1
INPUTS 7
*I  IDN  TD1  TD2  RHOG  SLOPE  AZIMUTH
9,4  9,3  9,19  9,20  RHOG  0,0  0,0
0.0  0.0  0.0  1.0  0.2  90.0  0.0

UNIT 69 TYPE 69 TSKY ESTIMATOR
INPUTS 12
*CEILING  SC(1-4)  PATM  TDP  NTOT  NOPAQ  SNOW  HOUR  TAMB
10,1  10,2  10,3  10,4  10,5  10,6  10,7  10,8  10,9  10,10
9,2  9,5
7777.0  0.0  0.0  0.0  0.0  10125.0  0.0  0.0  0.0  0.0
0.0  0.0
*OUTPUTS 3
*TSKY  PATM  SNOW

UNIT 71 TYPE 71 TRANSPIRED COLLECTOR
PARAMETERS 14
*AREA  HT  DIAM  PITCH  EMISC  ABSOR  DEPTH  EMISW  RWALL  UA
*TROOM  TBYPASS  QMAX  NITEBP
50.0  2.74  0.0009  0.01  0.9  0.9  0.08  0.9  0.489  7197.0
20.0  15.0  1000000000.0  1.0
INPUTS 11
*MONTH  HR  RAD  TAMB  TSKY  PATM  GAIN  FLOW1  MINOUT1  FLOW2
*OUT2
9,1  9,2  16,6  9,5  69,1  69,2  11,2  11,3  11,4  0,0
0,0
0.0  0.0  0.0  0.0  0.0  101.3  0.0  0.0  0.0  30000.0
0.0
*OUTPUTS 21
*TPLENUM  TOUT  TMIX  TSUP  TCOL  QSAVE  QVCOL  QVWALL  QRCOL  QRWALL
*QDWALL  QRED  QABS  QAUX  OUTFLOW  EFFHX  SOLEFF  DELP  BYPASS  QTRAD
*FANPW

UNIT 24 TYPE 24 INTEGRATOR
PARAMETERS 1
*INTERVAL
8760
INPUTS 8
*QSAVE  QVCOL  QVWALL  QRED  QABS  QAUX  QTRAD  HR
71,6  71,7  71,8  71,12  71,13  71,14  71,20  71,19
0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0

UNIT 25 TYPE 25 PRINTER
PARAMETERS 5
*STEP  START  STOP  LOGICAL-UNIT  UNITS
8760  1  8760  11  1
INPUTS 8
24,1  24,2  24,3  24,4  24,5  24,6  24,7  24,8
QSAVE  QVCOL  QVWALL  QRED  QABS  QAUX  QTRAD  HR
KJ  KJ  KJ  KJ  KJ  KJ  KJ  HR

UNIT 26 TYPE 25 PRINTER 2
PARAMETERS 5
*STEP  START  STOP  LOGICAL-UNIT  UNITS
```

```
1  1  8760  12  2
INPUTS 10
9,5  69,1  71,1  71,2  71,4  71,5  71,15  71,16  71,17  16,6
TAMB  TSKY  TPLENUM  TOUT  TSUP  TCOL  OUTFLOW  EFFHX  SOLEFF  RAD

UNIT 27 TYPE 25 PRINTER 3
PARAMETERS 5
*STEP  START  STOP  LOGICAL-UNIT  UNITS
1  1  8760  13  2
INPUTS 10
71,6  71,7  71,8  71,9  71,10  71,11  71,12  71,13  71,14  71,18
QSAVE  QVCOL  QVWALL  QRCOL  QRWALL  QDWALL  QRED  QABS  QAUX  DELP

END
```