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CLASS B MONITORING PROGRAM HANDBOOK FOR
SOUTHEASTERN SITES WITH DATA BASED
ON INIT2 SOFTWARE

(Applicable to Heating Season)

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ESG, Inc.
Atlanta, GA 30341

July 1983

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FOREWORD

This report, as prepared by ESG, Inc., is based, in part, upon an earlier technical effort conducted for the U.S. Department of Energy by the Southern Solar Energy Center as one of the regional solar energy centers. Key personnel worked on the project since its inception so that continuity was assured. The cooperation of personnel in the Chicago Operations Office and the Office of Conservation and Renewable Energy of the U.S. Department of Energy during this period was very important and is gratefully acknowledged.

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CLASS B MONITORING PROGRAM HANDBOOK FOR SOUTHEASTERN SITES WITH DATA BASED ON INIT2 SOFTWARE

Introduction

This document provides reference information on eight residences located in the southern part of the U.S. which are being monitored under the Class B Passive Solar Monitoring Program for the U.S. Department of Energy. ESG, Inc. has been responsible for the field instrumentation and data collection on these sites. Overall program coordination is through the Chicago Operations Office of DOE and the Solar Energy Research Institute.

This handbook provides reference information on the sites and basic test conditions for the 1982-83 winter heating season using software which is identified as "INIT2." The manual is intended for use in data analysis work but is limited to this period of time because of basic differences in the control software and the related instrumentation system.

Discussion

This document is separated into individual sections for each site. The following information is provided for each site:

- a. Site summary providing information on the structure, the passive solar features, the auxiliary heating system, and other related data.
- b. Floor layouts with the sensor locations, etc.
- c. The "One Time Value Log" which records the results of field tests and calculations to determine the thermal characteristics, air infiltration rate, and other reference data.
- d. The "Analog/Digital Channel Log" which provides calibration data.
- e. The "Status Channel Log" which defines various event sensors.
- f. Program listings as used during the specified time periods during the heating season.

Appendix A provides a summary of photographs which have been provided separately as part of the site documentation. In general, the photographs showed the individual sensor installations and elevations of each house. They can be used to provide further insight into the passive features and the installation of the data acquisition equipment.

It should be noted that the data collection activity proceeded in a very effective manner during the winter heating season. Downtime was at a minimum. This is the result of continuous attention to field operation needs and prompt action to correct problems, including those associated with interference and lighting transients. Also, good communications with the participating homeowners helped insure that they could provide assistance throughout the test period.

SITE SA

Mr. & Mrs. Jim McCaffrey
1301 Timberlake Avenue
Edmond, OK 73034

INIT2 Software Installed: 1/13/83

SITE SUMMARY SHEET

Site Identification Number
SA1

Inst. Contr. Name ESG, Inc.

Address 2231 Perimeter Park

Suite 11 Atlanta, GA 30341

Location:

Town Edmond, OK

Latitude 35°2'

Longitude 97°4'

Elevation 1280 FT

Nearest Weather Station:

Oklahoma City, OK

Building:

Type of Building

General Type of Construction

Ground Coupling

One story residence

Wood and stone veneer w/ wood frame

Slab on grade

Passive/Hybrid System(s):

Dominant Heating System Type

Dominant Heating System Area

Other System Type

Other System Area

Night Insulation

Direct gain

440 FT²

Venting through slab from clerestory

N/A

1" polystyrene

Auxiliary Heating System:

System and Distribution Type

Day Thermostat Setting

Night Thermostat Setting

Resistance forced air

68°

68°

Living Zone Floor Area

Passive Aperture Area

Loss Coefficient and Date Measured

Infiltration Rate and Date Measured

2500 FT²

440 FT²

L=509 BTU/HR OF 1/12 and 1/13/83

No pressure 1/11/83

LEGEND

ANEMOMETER

WATT HOUR METER

TEMP SENSOR

VOLTAGE SENSOR

AMP CLAMP

PDL-24

PYRANOMETER

4

One-Time Value Log

Site Edmond, OK
Site Code # SA1

Operator D.H. Gustashaw
Update Program Name INITA
Date INIT2

PDL-24

ZEOLANT KINETICS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	509	BTU h °F		
OT(2)	Furnace delivery efficiency	η_f	1.0	--		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	0	gal/hr		
OT(5)	Heating value of furnace fuel	HVF _f	0	BTU/gal		
OT(6)	Water heater burner fuel flow rate	F_w	0	gal/hr		
OT(7)	Heating value of water heater fuel	HVF _w	0	BTU/gal		
OT(8)	Water heating jacket heating factor	Q_w	347	BTUH		(.0833)(52)(140-60):347 Btuh
OT(9)	Water heating space heater factor	N_w	.2	--		
OT(10)	Aux. heating set point temperature	Tseth	68	°F		
OT(11)	Aux. cooling set point temperature	Tsetc	75	°F		
OT(12)	Net passive collector area	A_c	440	ft ²		
OT(13)	Moveable installation correction factor	N_{mi}	.77	--		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	--		
OT(15)	Elec. water heating voltage multiplier	C_s	2	--		
OT(16)	Channel M voltage multiplier	C_m	1	--		
OT(17)	Channel N voltage multiplier	C_n	0	--		

Analog/Digital Channel Log

Sensor Terminal # A10004

Operator D.H. Gustashaw

PDL-24

Site Edmond, OK

Update Program Name INITA

Site Code # SA1

Sensor Terminal Coefficient 1.0114

KEOLANKINETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-INTERCEPT or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
A	LiCor pyranometer PY 2784	Incident solar radiation on the horizontal	I _h	FNC(1)	4.72 x10 ⁶	9.976 x10 ³	478.38	0	1	1	1	0		12/81	Center roof at peak
B	LiCor pyranometer	Incident solar radiation on collector plane	I _{in}	FNC(2)	4.15 x10 ⁶	9.963 x10 ³	421.32	0	1	1	1	0		"	Center of aperture
C	AD 590J SERI BA0226	Outdoor dry bulb temperature	T _o	FNC(3)	1.7796 x10 ⁶	2030.4	775.68	-454.3	1	1	1	1		"	North side of garage
D	AD 590J SERI BA0248	Inside dry bulb temperature	T _i	FNC(4)	1.7971 x10 ⁶	2321.3	783.60	-458.3	1	1	1	1		"	51" from carpet master bedroom
E	AD 590J SERI BA0192	Inside dry bulb temperature	T _i	FNC(5)	1.7890 x10 ⁶	2320.5	779.74	-454.4	1	1	1	1		"	66" from carpet Kelly's bedroom
F	AD 590J SERI BA0144	Inside dry bulb temperature	T _i	FNC(6)	1.7695 x10 ⁶	2321.8	770.81	-450.8	1	1	1	1		"	89" from floor living room
G	AD 590J SERI BA0241	Inside dry bulb temperature	T _i	FNC(7)	1.7788 x10 ⁶	2320.9	775.16	-454.2	1	1	1	1		"	Air temperature at ridge line
H	AD 590J (no ID tag)	Inside dry bulb temperature	T _i	FNC(8)	1.7771 x10 ⁶	2320.6	774.52	-453.8	1	1	1	1		"	Air temperature in ducts below slab

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
I	General electric pulse initiating W-hr meter	Total electric power	P _{elec}	FNC(9)	40		40	0	1	1	1	0			
J	AK line voltage sensor	AC supply voltage phase to neutral.		FNC(10)	72.829		73.659	81.619	1	1	1	1			
K	Amprobe current clamp	Elec current for aux. heating	EC _{aux}	FNC(11)			221.45	.35	1	1	1	1			
L	Amprobe current clamp	Elec. current for water heating	EC _w	FNC(12)			220.60	.37	1	1	1	1			
M	Amprobe current clamp			FNC(13)			240.17	-.096	1	1	1	1			
N	Anemometer	Wind speed	W	FNC(14)			.238	0	1	1	1	1			

**Analog/Digital
Channel Log**

Sensor Terminal # A10064

Site Edmond, OK

Site Code # SA

Operator D.H. Gustashaw

Update Program Name NITA

Sensor Terminal Coefficient 1.0114

PDL-24

EDMUND

Status Channel Log

Sensor Terminal # A10064

Operator D.H. Gustashaw

Site Edmond, OK

Update Program Name INITA

Site Code # SA1

PDL-24

EDMAN KINETICS

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermoswitch burner operating time	t _f	FNS(1)	Furnace burner on	0		
2	Fenwal thermoswitch water heater burner operating time	t _w	FNS(2)	Water heater burner on	0		1-insulation in place 2-No insulation
3	Microswitch status of night insulation	t _{mi}	FNS(3)	Night insulation in place	1		

1/13/83 - 6/9/83

82/83 HEATING SEASON

```

LIST
1:END:I=USR(20):
10 DIMOT(19),X(4):C
1=1E-29:Y1=C1
15 FORI=255T01STEP-
4:POKE40961,I:NEXT
20 OT(1)=509:OT(2)=
1:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=34
7:OT(9)=.2
50 OT(10)=68:OT(11)=
75:OT(12)=440
60 OT(13)=.77:OT(14)=
2:OT(15)=2
70 OT(16)=1:OT(17)=
0
80 OT(18)=0:OT(19)=
0
99:I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1T018:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001+FNC(14)
/0:XT=X0-FNC(3)
158 XI=(OT(18)*2*XT
+(OT(19)*XW)*2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160 IFXT>0THENF(4)=
F(4)-(XL+XI)*XT*C
170 X5=FNC(10):X3=0
180 FORI=1T03:X(I)=
-3.413*(FNC(10-I)).5
)*OT(13+I)*FNC(10+I)
)*X5*C
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNS(2)*C:X7=3.4
13:FNC(9)-X3
200 F(7)=F(7)+X5:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)-
F(8)-F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*(Y2
-C)+XW*C)/Y2
315 FORI=1T017:F(I)
=(F(I)*(Y2-C)+FNC(
9)*C)/Y2:NEXT
320 F(18)=F(18)*(Y
2-C)+X0*C)/Y2
350 F(1)=1708
370 F(4)=F(4)+1
-((X2)=I*5+450RI=1)A
ND(X2<I*5+500RI=8))*
C
390 NEXT
410 X4=X4+X5*C
420 FORI=40T043:F(I)
)=F(I)+FNS(I-35)*C:N
EXT
430 FORI=44T045:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)>OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=0:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=01THENY1=0
Y4=M:G0T0999
520 Y1=0:Y5=Y5+Y2
530 FORI=25T031:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=30T039:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
580 Y3=-1:IFM=Y4THE
N999
910 PRINTTAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19T067:PRI
NT"F"1:F(I):F(I)=0:
NEXT
830 Y4=M-Y5=0
999 I=USR(22):END
PROG
TIME DEFAULTS
YEAR 83 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUND STORE INTERV
HRS 0 MINS 0 ?
FUND ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0B PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 421.32
Y-INT 0
C0C PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 775.68
Y-INT -454.3
C0D PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 783.59
Y-INT -458.2
C0E PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 779.73
Y-INT -454.46
C0F PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 770.8
Y-INT -450.8
C0G PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 775.16
Y-INT -454.22
C0H PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0I PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 40
OFFSET 0
C0J PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0K PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0L PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0M PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0N PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0O PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0P PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0Q PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0R PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0S PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0T PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0U PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0V PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0W PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0X PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0Y PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83
C0Z PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.52
Y-INT -453.83

```

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SB

Mr. & Mrs. Edward Crisp
14807 West Bend Drive
Houston, TX 77082

INIT2 Software Installed: 1/18/83

SITE SUMMARY SHEET

Site Identification Number
SB1

Inst. Contr. Name ESG, Inc.
Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Houston, TX
Latitude 29°04'
Longitude 95°02'
Elevation 50'

Nearest Weather Station:

Houston, TX

Building:

Type of Building
General Type of Construction
Ground Coupling

Two story residence
Wood frame and veneer
Slab on grade

Passive/Hybrid System(s):

Dominant Heating System Type
Dominant Heating System Area
Other System Type
Other System Area
Night Insulation

Direct gain
156 ft²
N/A
N/A
N/A

Auxiliary Heating System:

System and Distribution Type
Day Thermostat Setting
Night Thermostat Setting

Gas forced air
68°F
68°F

Living Zone Floor Area
Passive Aperture Area
Loss Coefficient and Date Measured
Infiltration Rate and Date Measured

2108 ft²
156 ft²
L=224.7 Btu/hr °F 1/16 and 1/17/83
No pressure 1/15/83

CLASS B MONITORING SITE SB
FIRST FLOOR

NOTE: For Status Channels see
STATUS CHANNEL LOG.

LEGEND

ANEMOMETER	▲
WATT HOUR METER	⊖
TEMP SENSOR	●
VOLTAGE SENSOR	⊠
AMP CLAMP	⊞
PDL-24	⊛
PYRANOMETER	⌒

CLASS B MONITORING SITE SB SECOND FLOOR

One-Time Value Log

Site Houston, TX
Site Code # SB1

Operator D.H. Gustashaw
Update Program Name INITB
Date INI12

PDL-24
REDUANT KINETICS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	750	Btu h OF		Note: Site was operated with analytical UA instead of coheat value. Stabilization was in question
OT(2)	Furnace delivery efficiency	η_f	.6	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	74.5	gal/hr		
OT(5)	Heating value of furnace fuel	HVF _w	1000	Btu/gal		
OT(6)	Water heater burner fuel flow rate	Q _w	39	gal/hr		
OT(7)	Heating value of water heater fuel	N _w	1000	Btu/gal		
OT(8)	Water heater jacket heating factor	T _{seth}	533	Btuh		
OT(9)	Water heater space heater factor	Tsetc	.2	-		
OT(10)	Aux. heating set point temperature	A _c	68	OF		
OT(11)	Aux. cooling set point temperature	N _{mi}	75	OF		
OT(12)	Net passive collector area	C _{auxh}	156	ft ²		
OT(13)	Moveable insulation correction factor	C _w	1	-		
OT(14)	Elec. aux. heating voltage multiplier	C _m	0	-		
OT(15)	Elec. water heating voltage multiplier	C _n	0	-		
OT(16)	Channel M voltage multiplier		2	-		
OT(17)	Channel N voltage multiplier		0	-		

Site Houston, TX
Site Code # SB1

Update Program Name INITB

Date INIT?

PDL-24

AEOLIAN KINETICS

Channel Log

Sensor Terminal # A 10068

Operator D.H. Gustashaw

PDL-24

Site Houston, TX

Update Program Name INTIB

Site Code # SB1

Sensor Terminal Coefficient 1.0144

KEOLANKINETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
A	LiCor pyranometer PY 2735	Incident solar radiation on the horizontal	I _h	FNC(1)	4.2351 x10 ⁶	9960	431.33	0	1	1	1	0		12/81	East peak
B	LiCor pyranometer PY 2786	Incident solar radiation on collector plane	I _{in}	FNC(2)	5.5847 x10 ⁶	9969	568.27	0	1	1	1	0		"	Center of aperture
C	AD 590J	Outdoor dry bulb temperature	T _o	FNC(3)	1.7792 x10 ⁶	2320	777.94	-454.24	1	1	1	1		"	East side of house
D	AD 590J	Inside dry bulb temperature	T _i	FNC(4)	1.7906 x10 ⁶	3320.4	782.09	-457.54	1	1	1	1		"	67" from living room floor
E	AD 590J	Inside dry bulb temperature	T _i	FNC(5)	1.7657 x10 ⁶	2742.6	652.38	-449.50	1	1	1	1		"	68" from floor upstairs-middle bedroom
F	AD 590J	Inside dry bulb temperature	T _i	FNC(6)	1.7750 x10 ⁶	2732.5	658.24	-452.17	1	1	1	1		"	69" from floor master bedroom
G	AD 590J		T _s	FNC(7)					0	1	1	1		"	
H	AD 590J			FNC(8)	1.7786 x10 ⁶	2320	776.98	-455.84	1	1	1	1		"	Passive water heater room

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0. AV = 1			
I	General electric pulse initiating W-lr meter	Total electric power	P _{elec}	FNC(9)	24		24	0	1	1	1	0		12/81	
J	AK line voltage sensor	AC supply voltage phase to neutral	V	FNC(10)	72.78		73.83	81.76	1	1	1	1		"	
K	Amprobe current clamp	Elec. current for aux. heating	EC _{auxh}	FNC(11)					0	1	1	1		"	
L	Amprobe current clamp	Elec. current for water heating	EC _w	FNC(12)					0	1	1	1			
M	Amprobe current clamp	Air conditioning		FNC(13)	275.8	.8468	236.91	-.12	1	1	1	1		"	
N	Anemometer	Wind speed		FNC(14)			.238	0	1	1	1	0		1/83	East peak

**Analog/Digital
Channel Log**

Sensor Terminal # A 10068

Site Houston, TX

Site Code # SB1

Operator D.H. Gustashaw

Update Program Name INITB

Sensor Terminal Coefficient 1 0144

PDL-24

AEQUANINETICS

Sensor Terminal # A 10068

Operator D.H. Gustashaw

PDL-24

Site Houston, TX

Update Program Name INITB

Site Code # SB1

AQUANETICS

Status Channel Log

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermoswitch furnace burner operating time	t_f	FNS(1)	Furnace burner on	1		1-furnace on 0-furnace off
2	Fenwal thermoswitch water heater burner operating time	t_w	FNS(2)	Water heater burner on	1		1-heater on 0-heater off
3	Microswitch status of night insulation	t_{mi}	FNS(3)	Night insulation in place	0		
4	Summer shades on southside		FNS(4)		1		1-shades up 0-shades down
5	North clerestory -Group of 3		FNS(5)		1		1-windows closed 0-windows open
6	North clerestory -Group of 2		FNS(6)		1		1-windows closed 0-windows open
7	Dryer fenwal switch		FNS(7)		1		1-dryer on 0-dryer off
8	Dryer vent position		FNS(8)		1		1-vent closed-winter mode 0-vent open-summer mode

1/17/83 - 6/9/83

82/83 HEATING SEASON

```

LIST
1:END:1=USR(20):
10 DIMOT(19),X(4):C
1=1E-29:Y1=C1
15 FORI=255T01STEP-
4:POKE48961,I:NEXT
20 OT(1)=750:OT(2)=
6:OT(3)=.75
30 OT(4)=74.5:OT(5)
=1000:OT(6)=39:
40 OT(7)=1800:OT(8)
=533:OT(9)=.2
50 OT(10)=68:OT(11)
=75:OT(12)=156
60 OT(13)=1:OT(14)=
0:OT(15)=0
70 OT(16)=2:OT(17)=
0
80 OT(18)=0:OT(19)=
0
99 I=USR(24):
110 IFY3C>-1THEN150
120 FORI=1T018:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(6)
155 Y2=Y2+C
157 KW=.001:FNC(14)
/C:XT=X0-FNC(3):IFXT
<0THENXT=0
158 X1=(OT(18)^2*XT
+(OT(19)*KW)^2)^.5
159 XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160 IFXT>0THENF(4)=
F(4)+(XL*X1)*XT*C
170 X5=FNC(10):X3=0
180 FORI=1T03:X(I)=
-3.413*(FNC(10-I))^5
)*OT(13+I)*FNC(10+I)
*X5*C
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNS(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
260 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(2)-
F(2)
305 XE=X2+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*Y2
-C)+XW*C/Y2
315 FORI=1T017:F(I)
=(F(I)*Y2-C)+FNC(
9)*C/Y2:NEXT
320 F(18)=(F(18)*C
2-C)+X0*C/Y2
360 FORI=1T08
370 F(48+I)=F(48+I)
-((X2)=1+5+450RI=1)A
ND(X2CI*5+500RI=8))*
C
390 NEXT
410 X4=X4+X5*C
420 FORI=48T043:F(I)
)=F(I)+FNS(I-35)*C:N
EXT
430 FORI=44T045:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFKE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=01THENV1=0
:Y4=M:G0T0999
520 Y1=D:Y5=Y5+Y2
530 FORI=25T021:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32T039:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINT:TAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19T067:PRI
NT!"F"1:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
PROG I:
TIME DEFAULTS
YEAR 83 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SCALE 24
OFFSET 0
C0B PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 568.27
Y-INT 0
C0C PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 236.91
Y-INT -.12
C0D PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE .238
OFFSET 0
UPDATE? 0
STATUS
S01 PRT 1
S02 PRT 1
S03 PRT 0
S04 PRT 1
S05 PRT 1
S06 PRT 1
S07 PRT 1
S08 PRT 1
UPDATE? 0
OUTPUT
# OUTPUT TERMS 0
UPDATE? 0
C0E PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.38
Y-INT -449.5
C0F PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 658.23
Y-INT -452.17
C0G PROCESS 0
C0H PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 776.98
Y-INT -455.84
C0I PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 24
OFFSET 0
C0J PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 73.829
Y-INT 81.76
C0K PROCESS 0
C0L PROCESS 0

```

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SF

Mr. & Mrs. Martin Levin
412 Camp Road
Suwanee, GA 30174

INIT2 Software Installed: 12/30/82

SITE SUMMARY SHEET

Site Identification Number
SF1

Inst. Contr. Name ESG, Inc.
Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Suwanee, GA
Latitude 33°4'
Longitude 84°3'
Elevation 1005'

Nearest Weather Station:

Atlanta, GA

Building:

Type of Building
General Type of Construction
Ground Coupling

Two story residence
Wood frame and veneer
Full basement w/partial daylighting

Passive/Hybrid System(s):

Dominant Heating System Type
Dominant Heating System Area
Other System Type
Other System Area
Night Insulation

Direct gain
158 ft²
N/A
N/A
N/A

Auxiliary Heating System:

System and Distribution Type
Day Thermostat Setting
Night Thermostat Setting

Propane:forced air (Tower floor)
Elec. resistance (upper floor)
70°
70°

Living Zone Floor Area

2200 ft²

Passive Aperture Area

158 ft²

Loss Coefficient and Date Measured

L= 604.3 Btu/hr °F 12/16 & 12/17/82

Infiltration Rate and Date Measured

No pressure 12/17/82

CLASS B MONITORING SITE SF
SECOND FLOOR

LEGEND

ANEMOMETER

WATT HOUR METER

TEMP SENSOR

VOLTAGE SENSOR

AMP CLAMP

PDL-24

PYRANOMETER

CLASS B MONITORING SITE SF
BASEMENT

Site Suwanne, GA

Operator D.H. Gustashaw

PDL-24

Site Code # SF1

Update Program Name INITF

Date

AETANKINETICS

One-Time Value Log

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	604	Btu h / °F		
OT(2)	Furnace delivery efficiency(propene)	η_f	.65	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	40	gal/hr		This was computed on the name plate
OT(5)	Heating value of furnace fuel	HVF_f	2000	Btu/SOF		rating of the propane furnace
OT(6)	Water heater burner fuel flow rate	F_w	20	gal/hr		Based on nameplate of propane water heater
OT(7)	Heating value of water heater fuel	HVF_w	2000	Btu/gal		
OT(8)	Water heater jacket heating factor	Q_w	0	Btuh		Modifications to software:
OT(9)	Water heating space heater factor	N_w	.1	-		$150 \ X(0) = (FNC(4) + FNC(5) + FNC(6) + FNC(7))/4$
OT(10)	Aux. heating set point temperature	T_{seth}	70	°F		$189 \ XA + OT(5) * OT(4) * FNS(1) * C$
OT(11)	Aux. cooling set point temperature	T_{setc}	75	°F		$250 \ F(2) = F(2) + OT(2) * XA + .95 * X(1)$
OT(12)	Net passive collector area	A_c	158	FT ²		
OT(13)	Moveable insulation correction factor	N_{mi}	1	-		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	-		
OT(15)	Elec. water heating voltage multiplier	C_w	0	-		
OT(16)	Channel M voltage multiplier	C_m	2	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

Site Suwanee, GA
Site Code # SF1

Update Program Name INITF

Date INIT2

PDL-24

ROMANTIC EPOCH

Analog/Digital Channel Log

Sensor Terminal # 10113

Operator D.H. Gustashaw

Site Suwanee, GA

Update Program Name INITF

Site Code # SF1

Sensor Terminal Coefficient 1.0100

PDL-24

VEOLIAN KINETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
A	LiCor pyranometer PY 2724 SERI	Incident solar radiation on horizontal	I _h	FNC(1)	4.7134 x10 ⁶	9.9845 x10 ³	476.79	0	1	1	1	0		3/82	Center of roof
B	LiCor pyranometer PY 2822 SERI AA0109	Incident solar radiation on the collector plane	I _{in}	FNC(2)	8.9851 x10 ⁶	1.0031 x10 ⁴	401.25	0	1	1	1	0		"	Center of aperture
C	AD 590J SERI BA0501	Outdoor dry bulb temperature	T _o	FNC(3)	1.7627 x10 ⁶	2329.8	767.12	-452.6	1	1	1	1		"	Ground level under eastside deck
D	AD 590J	Indoor dry bulb temperature	T _i	FNC(4)	1.7825 x10 ⁶	2320.4	775.17	-455.5	1	1	1	1		"	Great room, 44 " from floor
E	AD 590J SERI BA0486	Inside dry bulb temperature	T _i	FNC(5)	1.7750 x10 ⁶	2320.3	771.94	-454.2	1	1	1	1		"	Downstairs trophy room 64" from floor
F	AD 590J SERI BA0500	Inside dry bulb temperature	T _i	FNC(6)	1.7800 x10 ⁶	2320.5	774.05	-454.0	1	1	1	1		"	57" from floor master bedroom
G	AD 590J SERI BA0492	Inside dry bulb temperature (sunspace)	T _s	FNC(7)	1.7974 x10 ⁶	2728.6	664.61	-462.4	1	1	1	1		"	64" from floor hallway upstairs
H	AD 590J SERI BA0499	Inside dry bulb temperature (basement)	T _b	FNC(8)	1.7794 x10 ⁶	2732.0	657.13	-453.3	1	1	1	1		"	Basement 62" from floor level

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-INTERCEPT or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0.AV=1			
I	General electric pulse initiating W-hr meter	Total electric power	P _{elec}	FNC(9)			40	0	1	1	1	1		12/82	Two wire connection
J	AK line voltage sensor	AC supply voltage phase to neutral	V	FNC(10)	72.98	1	73.91	81.76	1	1	1	1		3/82	Behind PDL on floor
K	Amprobe current clamp SERI EA0071	Elec current for aux. heating 0-200	EC _{auxh}	FNC(11)	262.1	.874	231.37	0.081	1	1	1	1		"	Inside breaker box
L	Amprobe current clamp	Elec. current water heating	EC _w	FNC(12)					0	1	1	1		"	
M	Amprobe current clamp SERI EA0076	AC 0-200		FNC(13)	263.6	.865	230.29	0.012	1	1	1	1		"	Inside breaker box
N	Anemometer	Wind speed	W	FNC(14)			.238	0	1	1	1	1		12/82	Center of roof on TV mast

**Analog/Digital
Channel Log**

Sensor Terminal # 10113

Site Suwanee, GA

Site Code # SF1

Operator D.H. Gustashaw

Update Program Name INITE

Sensor Terminal Coefficient 1.0100

PDL-24

LEOPOLD KINETICS

Status Channel Log

Sensor Terminal # A10113

Operator D.H. Gustashaw

Site Suwanne, GA

Update Program Name INITF

Site Code # SF1

PDL-24

2001/01/01

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermoswitch furnace burner operating time	t _f	FNS(1)	Furnace burner on	1	3/12/82	
2	Fenwal thermoswitch water heater burner operating time	t _w	FNS(2)	Water heater burner on	1	"	
3	Microswitch status of night insulation	t _{mi}	FNS(3)	Night insulation in place	0		

INIT F

12/30/82 - 5/10/83

82/83 HEATING SEASON

```

LIST
1:EM:1=USR(20):
20 DIMOT(19),X(4)
1=1E-29:Y1=0:
15 FORI=255TO1STEP
4:POKE48961,I:NEXT
20 OT(1)=684:OT(2)
65:OT(3)=.75
30 OT(4)=40:OT(5)=
000:OT(6)=20
40 OT(7)=2000:OT(8)
=0:OT(9)=.1
50 OT(10)=70:OT(11)
=75:OT(12)=158
60 OT(13)=1:OT(14)
2:OT(15)=0
70 OT(16)=2:OT(17)
0
80 OT(18)=0:OT(19)
0
99 I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1TO19:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6)+FNC(7))/4
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001*FNC(14)
/0:XT=X0-FNC(3)
158 XI=(OT(18)*2*XT
+(OT(19)*XW)/2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNC(4))
160 IFXT>0THENF(4)=
F(4)+(XL+XI)*XT*C
170 X5=FNC(20):X3=0
180 FORI=1TO3:X(1)
=3.413*(FNC(10)+I)
)*OT(13)+FNC(10+I)
)*X5*C
185 X3=X3+X(1):NEXT
189 XA=OT(5)*OT(4)
FNC(1)*C
190 F(6)=F(6)+X(1)
XA
195 X6=X(2)+OT(7)*O
T(6)*FNC(2)*C:X7=3.
13*FNC(9)-X3
200 F(7)=F(7)+X6:F
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)
F(8)+F(9)
250 F(2)=F(2)+OT(2)
*X8+.95*X(1)
280 IFXT>0THENF(3)
F(3)+X7+OT(9)*X6+OT
8)*C
300 F(1)=F(4)-F(3)
F(2)
305 XE=XE-FNC(9)
310 F(10)=F(10)+FN
(9):F(11)=(F(11)*C
-C)+XW*C)/Y2
315 FORI=12TO17:F
)=(F(1)*C*(Y2-C)+FNC
-9)*C)/Y2:NEXT
320 F(18)=F(18)*
2-C)+X0*C)/Y2
360 FORI=1TO9
370 F(48+I)=F(48+
-C(1)=1*F(1)-F(1)=1
ND(CV(11)*5-F(1)=3)
C

```

```

380 F(48+I)=F(56+I)
-((X(1)=1*F(450RI=1)A
ND(X(2)*5+580RI=8))*
C
390 NEXT
410 X4=X4+X5*C
420 FORI=48TO43:F(I)
)=F(1)+FNC(1-35)*C:N
EXT
430 FORI=44TO45:F(I)
)=F(1)+FNC(1-43)*C:N
EXT
440 IF FNC(3)>OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IF FNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IF F=0THEN500
470 IF XE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IF D=Y1THEN999
510 IFY1=C1THENY1=D
:Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25TO31:F(I)
)=F(1)+F(1-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1TO3:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32TO39:F(I)
)=(F(1)*(Y5-Y2)+F(1-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*C)
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINT!TAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19TO67:PRI
NT!"F" I:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END

```

```

PROG 1
TIME DEFAULTS

```

```

YEAR 83 ?
FRINT:INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?

```

```

CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1

```

```

C08 PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 478.79
Y-INT 0

```

```

C08 PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 401.25
Y-INT 0

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 767.12
Y-INT -452.67

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 775.16
Y-INT -455.59

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 771.94
Y-INT -454.28

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 774.05
Y-INT -454.01

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 664.61
Y-INT -462.46

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 657.13
Y-INT -453.35

```

```

C08 PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 40
OFFSET 0

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 73.909
Y-INT 81.76

```

```

C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 231.37
Y-INT 0

```

```

C08 PROCESS 0
C08 PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 230.29
Y-INT .012

```

```

C08 PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 238
OFFSET 0

```

```

UPDATE? 0
STATUS

```

```

S01 PRT 1
S02 PRT 1
S03 PRT 0
S04 PRT 0
S05 PRT 0
S06 PRT 0
S07 PRT 0
S08 PRT 0
UPDATE? 0

```

```

OUTPUT
# OUTPUT TERMS 0

```

```

UPDATE? 0

```

FUNCTION_DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SG

Mr. & Mrs. William Moore
85 Robin Hood Road
Atlanta, GA 30309

INIT2 Software Installed: 11/11/82

SITE SUMMARY SHEET

Site Identification Number
SG1

Inst. Contr. Name ESG, Inc.
Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Atlanta, GA
Latitude 33°4'
Longitude 84°3'
Elevation 1005'

Nearest Weather Station:

Atlanta, GA

Building:

Type of Building
General Type of Construction
Ground Coupling

One story residence
Wood frame w/brick veneer
Full basement

Passive/Hybrid System(s):

Dominant Heating System Type
Dominant Heating System Area
Other System Type
Other System Area
Night Insulation

Sunspace
137.5 ft²
N/A
N/A
N/A

Auxiliary Heating System:

System and Distribution Type
Day Thermostat Setting
Night Thermostat Setting

Forced air-natural gas
70°F
70°F

Living Zone Floor Area

2965 ft²

Passive Aperture Area

137.5 ft²

Loss Coefficient and Date Measured

L=367 Btu/hr°F-1/5 and 1/6/83

Infiltration Rate and Date Measured

No pressure 7/8/82

LEGEND

ANEMOMETER

WATT HOUR METER

AMP CLAMP

VOLTAGE SENSOR

TEMPERATURE SENSOR

PDL-24

PYRANOMETER

N ▲
A ▤

CLASS B MONITORING SITE SG

CLASS B MONITORING SITE SG
BASEMENT

One-Time Value Log

Site Atlanta, GA
Site Code # SG1

Operator D.H. Gustashaw
Update Program Name INITG
Date INIT2

PDL-24
ADAMKNEIGS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	937.8 367.0	Btu h °F		11/11/82 - 4/8/83 : 4/8/83 - 4/30/83
OT(2)	Furnace delivery efficiency	n_f	.60	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	183	gal/hr		
OT(5)	Heating value of furnace fuel	HVF _f	1000	Btu/gal		
OT(6)	Water heater burner fuel flow rate	F_w	47	gal/hr		
OT(7)	Heating value of water heater fuel	HVF _w	1000	Btu/gal		
OT(8)	Water heater jacket heating factor	Q_w	500	Btuh		$Q_w = (.0833)(50)(120-60)(2) = 500$
OT(9)	Water heater space heating factor	N_w	0.2	-		
OT(10)	Aux. heating set point temperature	T_{seth}	70	°F		
OT(11)	Aux. cooling set point temperature	T_{setc}	75	°F		
OT(12)	Net passive collector area	A_c	137.5 1	ft ²		11/11/82 - 4/8/83 4/8/83 - 4/30/83
OT(13)	Movable insulation correction factor	N_{mi}	1	-		
OT(14)	Elec. aux. heating voltage multiplier K	C_{auxh}	0	-		
OT(15)	Elec. water heating voltage multiplier L	C_w	0	-		
OT(16)	Channel N voltage multiplier	C_m	2	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

Site Atlanta, GA

Site Code # SG1

Operator D.H. Gustashaw

Update Program Name INITG

Date: NIT2

PDL-24

VERWANTENHOUT

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0. AV=1			
A	LiCor Pyranometer PY 2829 SERI AA 0116	Incident Solar Radiation on the Horizontal	I_h	FNC(1)	5.4692×10^6 Btuh ft ² /amp	1.0010×10^4	549.27	0	1	1	1	0		3-3-82	
B	LiCor Pyranometer PY 2830 SERI AA 0117	Incident Solar Radiation on Collector Plane	I_{in}	FNC(2)	4.2408×10^6 Btuh ft ² /amp	1.0000×10^4	426.33	0	1	1	1	0		"	
C	AD 590J SERI BA 0171	Outdoor Dry Bulb Temperature	T_o	FNC(3)	1.7753×10^6	2320.0	769.27	-452.98	1	1	1	1		"	
D	AD 590J SERI BA 0230	Inside Dry Bulb Temperature	T_i	FNC(4)	1.7773×10^6	2729.4	653.92	-453.86	1	1	1	1		"	Great Room 50" from floor
E	AD 590J SERI BA 0191	Inside Dry Bulb Temperature	T_i	FNC(5)	1.7729×10^6	2321.7	766.97	-453.11	1	1	1	1		"	Guest Room 53" from floor
F	AD 590J SERI BA 0193	Inside Dry Bulb Temperature	T_i	FNC(6)	1.7992×10^6	2321.6	778.39	-461.56	1	1	1	1		"	Basement 56" from floor
G	AD 590J SERI BA 0251	Sunspace Temperature	T_s	FNC(7)	1.7665×10^6	2745.0	646.24	-449.83	1	1	1	1		"	Sunspace 60" from floor
H	AD 590J			FNC(8)					0	1	1	1			

Analog/Digital
Channel 1 to 8

Sensor Terminal # A10020
Site Atlanta, GA
Site Code # SG1

Operator D. H. Gustashaw
Update Program Name INITG

Sensor Terminal Coefficient 1.0053/- .0006

PDL-24

REPLACEMENT

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0. AV = 1			
I	General electric pulse initiating w-hr meter	Total electric power	P _{elec}	FNC(9)			7.2	0	1	1	1	0	w-hr	11/82	Two wire connection
J	AK line voltage sensor SERI DA0026	AC supply voltage phase to neutral	V	FNC(10)	2.71	1	73.10	80.74	1	1	1	1		3/82	
K	Amprobe current clamp	Elec. current for aux. heating	EC _{aux}	FNC(11)					0	1	1	1			
L	Amprobe current clamp	Elec. current for water heating	EC _w	FNC(12)					0	1	1	1			
M	Amprobe current clamp	Air conditioner 0-200		FNC(13)	261.4	.8553	224.76	.32	1	1	1	1		3/82	Breaker box
N	Anemometer	Wind speed	W	FNC(14)	.238		.238	0	1	1	1	0		11/82	West peak

Analog/Digital Channel Log

Sensor Terminal # A10020

Site Atlanta, GA

Site Code # SG1

Operator D.H. Gustashaw

Update Program Name INITG

Sensor Terminal Coefficient 1.0053/- .0006

PDL-24

EQUANETICS

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal Thermoswitch Furnace Burner Operating Time	t _f	FNS(1)	Furnace burner on	1	3/3/82	
2	Fenwal Thermoswitch Water Heater Burner Operating Time	t _w	FNS(2)	Water heater burner on	1	"	
3	Microswitch Status of night insulation	t _{mi}	FNS(3)	Night insulation in place	0		

Sensor Terminal # 10020

Operator D. H. Gustashaw

Site Atlanta, GA

Update Program Name INITG

Site Code # SG1

PDL-24**REDUANT KINETICS****Status Channel Log**

CHANNEL DEFAULTS 11/11/82 - 4/8/83
 ANALOG/DIGITAL 82/83 HEATING SEASON

```

LIST
1:END:I=USR(20):
10 DIMOT(19),X(4):C
1=1E-29:Y1=C1
15 FORI=255T01STEP-
4:POKE40961,I:NEXT
20 OT(1)=937.8:OT(2)
)=.60:OT(3)=.75
30 OT(4)=183:OT(5)=
1000:OT(6)=47
40 OT(7)=1000:OT(8)
=500:OT(9)=.2
50 OT(10)=70:OT(11)
=75:OT(12)=137.5
60 OT(13)=1:OT(14)=
0:OT(15)=0
70 OT(16)=2:OT(17)=
0
80 OT(18)=0:OT(19)=
0
99 I=USR(24):
110 IFY3<>-1THEN150
120 FORI=1T018:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001+FNC(14)
170 XT=X0-FNC(3)
158 XI=(OT(18)*2*XT
+(OT(19)*XW)/2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNC(3)-(1-OT
(13))*FNC(4))
160 IFXT>0THENF(4)=
F(4)+(XL*XI)*XT*C
170 X5=FNC(10):X3=0
180 FORI=1T03:X(I)=
-3.413*(FNC(10+I)).5
)*OT(13+I)*FNC(10+I)
)*X5*C
185 X3=X3+X(I):NEXT
190 F(6)=F(5)+X(1)+
OT(5)*OT(4)*FNC(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNC(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*(Y2
-C)+XW*C)/Y2
315 FORI=12T017:F(I)
)=(F(1)*(Y2-C)+FNC(I
-9)*C)/Y2:NEXT
320 F(18)=(F(18)*(Y
2-C)+X6*C)/Y2
360 FORI=1T03
370 F(48+I)=F(48+I)
-((X2)=1*5+450RI=1)A
ND(X2<1*5+500RI=8))*
C
380 F(56+I)=F(56+I)
-((X2)=1*5+450RI=1)A
ND(X2<1*5+500RI=8))*
C
390 NEXT
410 X4=X4+X5*C
420 FORI=40T043:F(I)
)=F(I)+FNC(I-35)*C:N
EXT
430 FORI=44T045:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=C1THENY1=D
:Y4=M:GOT0999
520 Y1=D:Y5=Y5+Y2
530 FORI=25T031:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32T039:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINTTAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19T067:PRI
NT"IF(I):F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
C1>PDL-24
MONITORING SYSTEM
<<COPYRIGHT 1980>
AEDLIAN KINETICS
BX 100 PROV RI 02901
PROG 1
TIME DEFAULTS
YEAR 82 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 1 MINS 0 ?

```

SENSOR TERMS 1

COA PROCESS 1

A/D 0
 T/A 0
 STORE 1
 PRT 1
 SLOPE 549.27
 Y-INT 0

COB PROCESS 1

A/D 0
 T/A 0
 STORE 1
 PRT 1
 SLOPE 426.33
 Y-INT 0

COK PROCESS 0

COC PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 769.27
 Y-INT -452.98

COL PROCESS 0

COM PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 224.76
 Y-INT .32

COD PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 653.91
 Y-INT -453.86

CON PROCESS 1

COE PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 766.97
 Y-INT -453.11

UPDATE? 0

STATUS

COF PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 778.38
 Y-INT -461.56

SCALE .238

OFFSET 0

S01 PRT 1

S02 PRT 1

S03 PRT 0

S04 PRT 0

S05 PRT 0

S06 PRT 0

S07 PRT 0

S08 PRT 0

UPDATE? 0

COG PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 646.23
 Y-INT -449.33

OUTPUT

OUTPUT TERMS 0

UPDATE? 0

COH PROCESS 0

COI PROCESS 1

A/D 1
 T/A 0
 STORE 1
 PRT 1
 SCALE 7.2
 OFFSET 0

COJ PROCESS 1

A/D 0
 T/A 1
 STORE 1
 PRT 1
 SLOPE 778.38
 Y-INT -461.56

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

4/8/83 - 5/6/83

```

LIST
1:END:I=USR(20):
10:DI0MT(19),X(4):C
1=1E-29:Y1=C1
15:FORI=255TO1STEP-
4:POKE40961,I:NEXT
20:OT(1)=367:OT(2)=
60:OT(3)=.75
30:OT(4)=183:OT(5)=
1000:OT(6)=47
40:OT(7)=1000:OT(8)=
500:OT(9)=.2
50:OT(10)=70:OT(11)=
75:OT(12)=1
60:OT(13)=1:OT(14)=
0:OT(15)=0
70:OT(16)=2:OT(17)=
0
80:OT(18)=0:OT(19)=
0
99:I=USR(24):
110:IFV3<0:THEN150
120:FORI=1TO18:F(I)
=0:NEXT
140:X4=0:Y2=0:Y3=0
150:X0=FNC(4)+FNC(
5)+FNC(6)/3
151:X1=FNC(4):X2=FN
C(7)
155:Y2=Y2+C
157:KW=.001*FNC(14)
/C:XT=X0-FNC(3):IFXT
<0:THENXT=0
158:XI=(OT(19)*2*XT
+(OT(19)*KW)^2)^.5
159:XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160:IFXT<0:THENF(4)=
F(4)+(XL*XI)*XT*C
170:X5=FNC(10):X3=0
180:FORI=1TO3:X(I)=
-3.413*(FNC(10-I)).5
)*OT(13+I)*FNC(10+I)
*X5*C
185:X3=X3+X(I):NEXT
190:F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195:X6=X(2)+OT(7)*0
T(6)*FNS(2)*C:X7=3.4
13*FNC(9)-X3
200:F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240:F(5)=F(6)+F(7)+
F(8)+F(9)
250:F(2)=OT(2)*F(6)
260:IFXT<0:THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300:F(1)=F(4)-F(3)-
F(2)
305:WE=WE-FNC(9)
310:F(10)=F(10)+FNC
(9):F(11)=(F(11)*Y2
-C)+XW*C)/Y2
315:FORI=12TO17:F(I)
=(F(I)*(Y2-C)+FNC(I)
-9)*C)/Y2:NEXT
320:F(18)=(F(18)*Y
2-C)+X8*C)/Y2
350:FORI=1TO8
370:Y48+1=F(48+I)
-1*(X12)+1*5-450R1=10A
ND:X(11)=5-500R1=9)*

```

```

380 F(55-1)=F(56+1)
-((K2)=1*5+450R1=1)A
ND(K2CI*5+500R1=8))**
C
390 NEXT
410 K4=K4+K5+C
420 FORI=40T043:F(I)
)=F(I)+FNC(I-35)*C:N
EXT
430 FORI=44T045:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)>OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFXEDF(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=C1THENY1=D
:Y4=M:G0T0999
520 Y1=D:Y5=Y5+Y2
530 FORI=25T031:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32T039:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
M999
810 PRINT!TAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=45T067:PRI
NT!"F"1:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
C<D>PDL-24
MONITORING SYSTEM
PROGRAM 1 144,000
TIME DEFAULTS-
YEAR 82 ? 83
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
SENSOR TERMS 1
PROCESS 1
A/D 0
I/A 0
STORE 1
PRT 1
SLOPE 519.27
V-INT 0

```

COL PROCEEDS 4

FDATE? 0

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SJ

Mr. & Mrs. Jack Cook
P.O. Box 449
Manning, SC 29102

INIT2 Software Installed: 11/15/82

SITE SUMMARY SHEET

Site Identification Number
SJ1

Inst. Contr. Name ESG, Inc.
Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Manning, S.C.
Latitude 34°0'
Longitude 80°3'
Elevation 291'

Nearest Weather Station:

Sumter-Shaw AFB

Building:

Type of Building
General Type of Construction
Ground Coupling

One story residence
Wood frame and brick veneer
Crawlspace

Passive/Hybrid System(s):

Dominant Heating System Type
Dominant Heating System Area
Other System Type
Other System Area
Night Insulation

Sunspace
191 ft²
Trombe wall
200 ft²
N/A

Auxiliary Heating System:

System and Distribution Type
Day Thermostat Setting
Night Thermostat Setting

Electric forced air
68°F
68°F

Living Zone Floor Area
Passive Aperture Area
Loss Coefficient and Date Measured
Infiltration Rate and Date Measured

2765 ft²
391 ft²
L=325.2 Btu 3/2 and 3/3/83
No pressure 8/9/82

LEGEND

ANEMOMETER	▲
WATT HOUR METER	⊖
TEMP SENSOR	●
VOLTAGE SENSOR	☑
AMP CLAMP	■
PDL-24	⬢
PYRANOMETER	◐

CLASS B MONITORING SITE SJ

SOUTH
▼

One-Time Value Log

Site Manning, S.C.
Site Code # SJ1

Operator D.H. Gustashaw
Update Program Name INITJ
Date INIT2

PDL-24

KEQUANKEETCS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	827 325.2	Btu h °F		11/15/82 - 2/28/83 3/3/83 - 4/30/83
OT(2)	Furnace delivery efficiency	η_f	.95	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	0	gal/hr		
OT(5)	Heating value of furnace fuel	HVF _f	0	Btu/gal		
OT(6)	Water heater burner fuel flow rate	Q_w	0	gal/hr		
OT(7)	Heating value of water heater fuel	HVF _w	0	Btu/gal		
OT(8)	Water heater jacket heater factor	Q_w	0	Btuh		Water heater in attic
OT(9)	Water heater space heating factor	N_w	.1	-		
OT(10)	Aux. heating set point temperature	T_{seth}	68	°F		
OT(11)	Aux. cooling set point temperature	T_{setc}	75	°F		
OT(12)	Net passive collector area	A_c	391	ft ²		
OT(13)	Moveable insulation correction factor	N_{mi}	1	-		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	-		
OT(15)	Elec. water heating voltage multiplier	C_w	2	-		
OT(16)	Channel M voltage multiplier	C_m	2	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

[illegible]

Site Manning, S.C.

Site Code # S.11

Operator D.H. Gustashaw

Update Program Name INITJ

Date INIT2

PDL-24

AEON KINETICS

One-Time Value Log

Analog/Digital Channel Log

Sensor Terminal # A 10124

Operator D.H. Gustashaw

PDL-24

Site Manning, S.C.

Update Program Name INITJ

Site Code # SJJ

Sensor Terminal Coefficient 1.0048

KEOLANKNETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
A	LiCor pyranometer PY 2730 SERI AA0127	Incident solar radiation on the horizontal	I_h	FNC(1)	4.00259959×10^6		403.83	0	1	1	1	0		12/81	Center of roof
B	LiCor pyranometer PY 2731 SERI AA0128	Incident solar radiation on collector plane	I_{in}	FNC(2)	5.69129971×10^6		573.52	0	1	1	1	0		"	Center of trombe wall
C	AD 590J	Outdoor dry bulb temperature	T_o	FNC(3)	$1.78472320.5 \times 10^6$		772.79	-458.56	1	1	1	1		"	West side of house
D	AD 590J	Inside dry bulb temperature	T_i	FNC(4)	1.7821×10^6		2731.0654.98	-455.7	1	1	1	1		"	Master bedroom 4'-7½" from floor
E	AD 590J	Inside dry bulb temperature	T_i	FNC(5)	1.7932×10^6		2760.2652.08	-458.7	1	1	1	1		"	Hobby room 5'-0" from floor
F	AD 590J	Inside dry bulb temperature	T_i	FNC(6)	1.7868×10^6		2735.2655.70	-457.8	1	1	1	1		"	Living room
G	AD 590J	Sunspace dry bulb temperature	T_s	FNC(7)	1.7592×10^6		2728.9647.05	-448.7	1	1	1	1		"	
H	AD 590J			FNC(8)					0	1	1	1		"	

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0. AV = 1			
I	General electric pulse initiating W-nr meter	Total electric power	P _{elec}	FNC(9)	40		40	0	1	1	1	0		12/82	
J	AK line voltage sensor	AC supply voltage phase to neutral	V	FNC(10)	73.44		73.79	81.53	1	1	1	1		"	
K	Amprobe current clamp	Elec. current for aux. heating	EC _{aux}	FNC(11)	260.8 (0-200)	.8427	220.83	.37	1	1	1	1		"	
L	Amprobe current clamp	Elec. current for water heating	EC _w	FNC(12)	263.7 (0-200)	.8513	225.56	.39	1	1	1	1		"	
M	Amprobe current clamp	Air conditioner		FNC(13)	262.7 (0-200)	.8364	220.78	.31	1	1	1	1		"	
N	Anemometer	Wind speed	W	FNC(14)	.238		.238	0	1	1	1	0		11/82	Center of roof on TV mast

**Analog/Digital
Channel Log**

Sensor Terminal # A 10124

Site Manning, S.C.

Site Code # SJ1

Operator D.H. Gustashaw

Update Program Name INITJ

Sensor Terminal Coefficient 1.0048

PDL-24

AEQUANETICS

Status Channel Log

Sensor Terminal # A 10124

Operator D.H. Gustashaw

PDL-24

Site Manning, SC

Update Program Name INITJ

Site Code # SJ1

REDIANT KINETICS

55

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermoswitch furnace burner operating time	t _f	FNS(1)	Furnace burner on	0		
2	Fenwal thermoswitch water heater burner operating time	t _w	FNS(2)	Water heater burner on	0		
3	Microswitch status of night insulation	t _{mi}	FNS(3)	Night insulation in place	0		
4	Vents from sunspace into furnace return		FNS(4)	Vents open	1		
5	Vents on trombe wall		FNS(5)	Vents open	1		

INIT J

11/15/82 - 2/28/83

82/83 HEATING SEASON

```

380 F(56)=F(56)+1: F(56)=F(56)+1: C08 PROCESS 1
-((X2)=1*5+450RI=1)*A A/D 0
ND(X2CI+5+500RI=8))* T/A 0
C STORE 1
390 NEXT PRT 1
410 X4=X4+X5*C SLOPE 573.52
420 FORI=40T043: F(I) Y-INT 0
)=F(I)+FNS(I-35)*C:N
EXT C09 PROCESS 1
430 FORI=44T045: F(I) A/D 0
)=F(I)+FNC(I-43)*C:N T/A 1
EXT STORE 1
440 IFFNC(3)>OT(10) PRT 1
THENF(47)=F(47)+(OT( SLOPE 772.79
10)-FNC(3))*C Y-INT -458.56
450 IFFNC(3)>OT(11) C00 PROCESS 1
THENF(48)=F(48)+(FNC A/D 0
(3)-OT(11))*C T/A 1
460 IFF=0 THEN 500 STORE 1
470 IFXE=F(65) THEN PRT 1
(65)=XE: F(66)=D: F(67 SLOPE 654.98
)=H Y-INT -455.73
480 XE=0 C0M PROCESS 1
500 IFD=Y1 THEN 999 A/D 0
510 IFY1=0 THEN Y1=D T/A 1
:Y4=M: G0T0999 STORE 1
520 Y1=D: Y5=Y5+Y2 PRT 1
530 FORI=25T031: F(I) SLOPE 220.78
)=F(I)+F(I-21): NEXT Y-INT 31
540 F(19)=F(19)+F(1 C0N PROCESS 1
): F(21)=F(21)+F(2): F A/D 1
(23)=F(23)+F(3) T/A 0
550 FORI=1T03: F(2*I STORE 1
+18)=F(2*I+17)/(F(25 PRT 1
)+C1): NEXT SCALE 238
560 FORI=32T039: F(I) OFFSET 0
)=F(I)*(Y5-Y2)+F(I- UPDATE? 0
21)*Y2)/Y5: NEXT STATUS
570 F(46)=F(46)*(Y S01 PRT 0
5-Y2)+X4)/Y5 S02 PRT 0
800 Y3=-1: IFM=Y4 THE S03 PRT 0
N999 S04 PRT 1
810 PRINT: TAB(20)"M S05 PRT 1
ONTH"Y4"PRINTOUT" S06 PRT 0
820 FORI=19T067: PRI S07 PRT 0
NT!"F" I: F(I): F(I)=0: S08 PRT 0
NEXT UPDATE? 0
830 Y4=M: Y5=0 C0I PROCESS 1
999 I=USR(22): END A/D 1
999 I=USR(22): END T/A 0
<<PDL-24 STORE 1
MONITORING SYSTEM PRT 1
SCALE 40
PROG I OFFSET 0
TIME DEFAULTS C0J PROCESS 1
YEAR 82 ? A/D 0
PRINT INTERVAL T/A 1
HRS 24 MINS 0 ? STORE 1
CH STORE INTERVAL PRT 1
HRS 1 MINS 0 ? SCALE 40
FUNG STORE INTERVAL OFFSET 0
HRS 0 MINS 0 ? C0K PROCESS 1
FUNG ZERO INTERVAL A/D 0
HRS 0 MINS 0 ? T/A 1
CHANNEL DEFAULTS STORE 1
ANALOG/DIGITAL PRT 1
# SENSOR TERMS 1 SLOPE 220.83
Y-INT 37
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 403.82
Y-INT 0

```

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

3/3/83 - 5/22/83

82/83 HEATING SEASON

```

LIST
1:END: I=USR(20)
10 DIMOT(19),X(4)
1:15-29:Y1=C1
15 FORI=355TO1STEP
4:POKE40961,I: NEXT
20 OT(1)=325.2:OT(
)=.95:OT(3)=.75
30 OT(4)=0:OT(5)=0
OT(6)=0
40 OT(7)=0:OT(8)=0
OT(9)=1
50 OT(10)=68:OT(11
)=75:OT(12)=391
60 OT(13)=1:OT(14)
2:OT(15)=2
70 OT(16)=2:OT(17)
0
80 OT(18)=0:OT(19)
0
99 I=USR(24)
110 IFY3<0-1THEN15
120 FORI=1TO18:F(I
)=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC
5)+FNC(6))/3
151 X1=FNC(4):X2=F
C(7)
155 Y2=Y2+C
157 XW=.001*FNC(14
/D:XT=X0-FNC(3):IFX
COT:ENXT=0
158 X1=(OT(18)*2*X
)+(OT(19)*XW)/2+.5
159 XL=OT(1)*(1-(1-
OT(12))*FNC(3)-(1-0
(13))*FNC(4))
160 IFXT>0THENF(4)
F(4)+(XL+X1)*XT*C
170 X5=FNC(10):X1=
180 FORI=1TO3:X(1)=
-3.413*(FNC(10+I))/5
)*OT(13+I)*FNC(10+I
)*X5*C
185 X3=X3+X(1):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNC(1)*C
195 X6=X(2)+OT(7)*O
T(6)*FNC(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9
)+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X5+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*(Y2
-C)+XW*C)/Y2
315 FORI=12TO17:F(I
)=(F(I)*(Y2-C)+FNC(I
-9)*C)/Y2:NEXT
320 F(18)=(F(18)*(Y
2-C)+0*C)/Y2
350 F(1)=1709
370 F(48)=F(48+I)
-((X1)=1*5-450*F(1)=13A
ND(X1)=5-500*F(1)=8))
C
380 F(55)=1:F(56)
-((X2)=1*5+450*F(1)=1
ND(X2)=5+500*F(1)=8)
C
390 NEXT
410 X4=X4+X5*C
420 FORI=40TO43:F(
)=F(I)+FNC(I-35)*C
EXT
430 FORI=44TO45:F(
)=F(I)+FNC(I-43)*C
EXT
440 IFFNC(3)>OT(10
)THENF(47)=F(47)+(O
10)-FNC(3))*C
450 IFFNC(3)>OT(11
)THENF(48)=F(48)+(F
(3)-OT(11))*C
460 IFF=0THEN500
470 IFKE>F(65)THE
(65)=XE:F(66)=D:F(6
7)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=01THENY1=
:Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25TO31:F(
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(
21):F(21)=F(21)+F(2
23)=F(23)+F(3)
550 FORI=1TO3:F(2
+18)=F(2*I+17)/(F(2
)+C1):NEXT
560 FORI=32TO39:F
)=(F(I)*(Y5-Y2)+F(
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4TH
N999
810 PRINT:TAB(20)
ONTH"Y4"PRINTOUT"
820 FORI=19TO67:PR
INT"F(I):F(I):F(I)=
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
COPDL-24
MONITORING SYSTEM
PROG 1
TIME DEFAULTS
UPDATE? 1
YEAR 82 ? 83
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
EXAMINED? 1
# SENSOR TERMS 1
C0B PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 573.52
Y-INT 0
C0C PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 772.79
Y-INT -458.56
C0D PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 654.98
Y-INT -455.73
C0E PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.08
Y-INT -458.77
C0F PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 655.7
Y-INT -457.88
C0G PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 647.05
Y-INT -448.72
C0H PROCESS 0
C0I PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 40
OFFSET 0
C0J PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 73.789
Y-INT 81.529
C0K PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 220.82
Y-INT .37
C0L PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 225.56
Y-INT .39
C0M PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 220.78
Y-INT .31
C0N PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE .238
OFFSET 0
UPDATE? 0
STATUS
EXAMINE? 1
S01 PRT 0
S02 PRT 0
S03 PRT 0
S04 PRT 1
S05 PRT 1
S06 PRT 0
S07 PRT 0
S08 PRT 0
UPDATE? 0
OUTPUT
EXAMINE? 1
# OUTPUT TERMS 0

```


FUNCTION DEFAULTS

#.FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SK

Mr. & Mrs. Jerry Sams
105 5th Street
Black Mountain, NC 28711

INIT2 Software Installed: 02/03/83

SITE SUMMARY SHEET

Site Identification Number
SK1

Inst. Contr. Name ESG, Inc.
Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Black Mountain, NC
Latitude 35°03'
Longitude 82°03'
Elevation 217'

Nearest Weather Station:

Asheville, NC

Building:

Type of Building
General Type of Construction
Ground Coupling

One story residence
Wood frame and veneer
Slab on grade

Passive/Hybrid System(s):

Dominant Heating System Type
Dominant Heating System Area
Other System Type
Other System Area
Night Insulation

Direct gain/Trombette walls
87.9 ft²
N/A
N/A
Yes, window quilts(south only)

Auxiliary Heating System:

System and Distribution Type
Day Thermostat Setting
Night Thermostat Setting

Baseboard resistance heaters
68°
68°

Living Zone Floor Area
Passive Aperture Area
Loss Coefficient and Date Measured
Infiltration Rate and Date Measured

893 ft²
87.9 ft²
L=207.8 Btu/hr^{°F}: 2/2 and 2/3/83
.115M3/sec. @ 4 Pa 8/10/82

LEGEND

- ANEMOMETER ▲
- WATT HOUR METER ⊖
- TEMP SENSOR ⊙
- VOLTAGE SENSOR ☑
- AMP CLAMP ☒
- PDL-24 ☒

CLASS B MONITORING SITE SK

SOUTH

One-Time Value Log

Site Black Mountain, NC Operator D.H. Gustashaw

Site Code # SK1

Update Program Name INITK

Date INIT2

PDL-24

ZEON KINETICS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	208.0	Btu h °F		
OT(2)	Furnace delivery efficiency	n_f	1.0	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	0	gal/hr		
OT(5)	Heating value of furnace fuel	HVF_f	0	Btu/gal		
OT(6)	Water heater burner fuel flow rate	F_w	0	gal/hr		
OT(7)	Heating value of water heater fuel	HVF_w	0	Btu/gal		
OT(8)	Water heater jacket heating factor	Q_w	267	Btuh		$Q_w = (0.0833)(10)(140-60)(1) = (267)$
OT(9)	Water heater space heating factor	N_w	.2	-		
OT(10)	Aux. heating set point temperature	T_{seth}	68	°F		
OT(11)	Aux. cooling set point temperature	T_{setc}	75	°F		
OT(12)	Net passive collector area	A_c	87.9	ft ²		
OT(13)	Moveable insulation correction factor	N_{mi}	1.0	-		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	-		
OT(15)	Elec. water heating voltage multiplier	C_w	2	-		
OT(16)	Channel M voltage multiplier	C_m	1	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

Site Black Mountain, N.C. Operator D.H. Gustashaw

Site Code # SK1

Update Program Name INITK

Date INITO

PDL-24

RESEARCH DESIGN

One-Time Value Log

Channel Log

Sensor Terminal # 10024

Operator D. H. Gustashaw

PDL-24

Site Black Mountain, NC

Update Program Name INITK

Site Code # SK1

Sensor Terminal Coefficient 1.0041

VEOLIANETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
A	LiCor pyranometer PY 2825 SERI AA 0112	Incident solar radiation on the horizontal	I _h	FNC(1)	5.1163 x10 ⁶	9.958 x10 ³	515.89	0	1	1	1	0		10/81	West peak
B	LiCor pyranometer PY 2826 SERI AA 0113	Incident solar radiation on collector plane	I _{in}	FNC(2)	6.119 x10 ⁶	9.956 x10 ³	616.41	0	1	1	1	0		"	Center of south aperture
C	AD 590J SERI BA 0246	Outdoor dry bulb temperature	T _o	FNC(3)	1.7857 x10 ⁶	2732.2	656.26	-457.22	1	1	1	1		"	North side
D	AD 590J SERI BA 0237	Inside dry bulb temperature	T _i	FNC(4)	1.8226 x10 ⁶	2736.7	668.02	-463.80	1	1	1	1		"	Master bedroom 60" from floor
E	AD 590J SERI BA 0206	Inside dry bulb temperature	T _i	FNC(5)	1.7943 x10 ⁶	2745.9	655.43	-461.39	1	1	1	1		"	Small bedroom 65" from floor
F	AD 590J SERI BA 0238	Inside dry bulb temperature	T _s	FNC(6)	1.7972 x10 ⁶	2744.9	654.75	-460.07	1	1	1	1		"	Living room 64" from floor
G	AD 590J		T _s	FNC(7)					0	1	1	1		"	
H	AD 590J			FNC(8)					0	1	1	1		"	

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-INTERCEPT or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0. AV = 1			
I	General electric pulse-initiating W-hr meter	Total electric power	P _{elec}	FNC(9)	3.6		3.6	0	1	1	1	0		10/81	Westinghouse Two wire connection
J	AK line voltage sensor SERI DA 0028	AC supply voltage phase to neutral	V	FNC(10)	72.77		73.07	81.97	1	1	1	1		"	
K	Amprobe current clamp SERI EA 0069	Elec. current for aux. heating	EC _{aux}	FNC(11)	262.1	.8496	223.59	.29	1	1	1	1		"	Breaker box
L	Amprobe current clamp SERI EA 0073	Elec. current for water heating	EC _w	FNC(12)	256.9	.8454	213.07	.26	1	1	1	1		"	Breaker box
M	Amprobe current SERI EA 0070	Whole house fan		FNC(13)	275.2	.86	237.64	-.22	1	1	1	1		"	
N	Anemometer	Wind speed	W	FNC(14)	.238		.238	0	1	1	1	0		2/83	West peak

Analog/Digital
Channel Log

Sensor Terminal # 10024

Site Black Mountain, N.C.

Site Code # SK1

Operator D. H. Gustashaw

Update Program Name INITK

Sensor Terminal Coefficient 1.0001

PDL-24

RECEIVED

Status Channel Log

Sensor Terminal # 10024

Operator D.H. Gustashaw

PDL-24

Site Black Mountain, NC

Update Program Name INITK

Site Code # SK1

4000KNETICS

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermostwitch burner operating time	t _f	FNS(1)	Furnace burner on	0		
2	Fenwal thermostwitch burner operating time	t _w	FNS(2)	Water heater burner	0		
3	Microswitch status of night insulation	t _{mi}	FNS(3)	Night insulation in place	0		

2/3/83 - 5/19/83

82/83 HEATING SEASON

```

LIST
1:END:I=USR(20):
10 DIMOT(19),X(4):C
1=1E-25:Y1=0:
15 FORI=255TO1STEP-
4:POKE40961,I:NEXT
20 OT(1)=200:OT(2)=
1.0:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=26
7:OT(9)=.2
50 OT(10)=68:OT(11)=
75:OT(12)=87.9
60 OT(13)=1.0:OT(14)=
2:OT(15)=2
70 OT(16)=1:OT(17)=
0
80 OT(18)=13.62:OT(
19)=10.47
99:I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1TO10:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+0
157 XW=.001*FNC(14)
/0:XT=X0-FNC(3):IFXT
<0THENXT=0
158 XI=(OT(10)*2+XT
+(OT(19)*XW)/2)/5
159 XL=OT(1)*(1-(1-
OT(12))*FNC(3)-(1-OT
(13))*FNC(4))
160 IFXT>0THENF(4)=
F(4)+(XL+XI)*XT*0
170 X5=FNC(10):X3=0
180 FORI=1TO3:X(I)=
-3.413*(FNC(10+I)).5
)*OT(13+I)*FNC(10+I)
*X5*0
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)+FNC(1)*0
195 X6=X(2)+OT(7)*0
T(6)+FNC(2)*0:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
260 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*0
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=F(11)*(Y2
=0)+XW*0/Y2
315 FORI=12TO17:F(I)
=(F(I)*(Y2=0)+FNC(I
-9)*0)/Y2:NEXT
320 F(18)=(F(18)*(Y
2=0)+X6*0)/Y2
360 FORI=1TO3
370 F(4)=F(4)+F(1)
-((X2)=1)*5+450RI=10A
ND(X2<1)*5+500RI=0))*
C
390 NEXT
410 X4=X4+X5*0
420 FORI=43TO43:F(I)
)=F(I)+FNC(I-35)*0:N
EXT
430 FORI=44TO45:F(I)
)=F(I)+FNC(I-43)*0:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*0
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*0
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 X5=0
500 IFD=Y1THEN999
510 IFY1<1THENY1=D
:Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25TO31:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1TO3:F(2*I
+18)=F(2*I+17)/(F(25
)+0.1):NEXT
560 FORI=32TO39:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINTTAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19TO67:PRI
NT!"F" I:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
C<>PDL-24
MONITORING SYSTEM
COPYRIGHT 1980)
AEOLIAN KINETICS
BX 100 PROV RI 02901
PROG I
TIME DEFAULTS
YEAR 83 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSIT TERMS 1

```

COB PROCESS 1

```

A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 515.88
Y-INT 0

```

COB PROCESS 1

```

A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 616.41
Y-INT 0

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 656.26
Y-INT -457.22

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 668.02
Y-INT -463.8

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 655.43
Y-INT -461.39

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 656.75
Y-INT -460.07

```

COB PROCESS 0

COB PROCESS 0

COB PROCESS 1

```

A/D 1
T/A 0
STORE 1
PRT 1
SCALE 3.6
OFFSET 0

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 73.069
Y-INT 81.97

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 111.50
Y-INT 10

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 218.07
Y-INT .26

```

COB PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 237.64
Y-INT -.22

```

COB PROCESS 1

```

A/D 1
T/A 0
STORE 1
PRT 1
SCALE .228
OFFSET 0

```

UPDATE? 0

STATUS

```

501 PRT 0
502 PRT 0
503 PRT 0
504 PRT 0
505 PRT 0
506 PRT 0
507 PRT 0
508 PRT 0
UPDATE? -1

```

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SL

Mr. & Mrs. Robert Greateorex
4950 Essex Circle
Stephens City, VA 22655

INIT2 Software Installed: 11/20/82

SITE SUMMARY SHEET

Site Identification Number

SL1

Inst. Contr. Name ESG, Inc.

Address 2231 Perimeter Park

Suite 11 Atlanta, GA 30341

Location:

Town Stephens City, VA

Latitude 39° 1'

Longitude 78° 1'

Elevation 750'

Nearest Weather Station:

Winchester, VA

Building:

Type of Building

One story residence

General Type of Construction

Wood frame

Ground Coupling

Slab on grade

Passive/Hybrid System(s):

Dominant Heating System Type

Water wall

Dominant Heating System Area

210.5 ft²

Other System Type

N/A

Other System Area

N/A

Night Insulation

Yes, window quilts on all windows

Auxiliary Heating System:

System and Distribution Type

Resistance baseboard heaters

Day Thermostat Setting

65°F

Night Thermostat Setting

65°F

Living Zone Floor Area

1200 ft²

Passive Aperture Area

210.5 ft²

Loss Coefficient and Date Measured

L=177.6 Btu/hr°F: 1/29 and 1/30/83

Infiltration Rate and Date Measured

.045 M³/sec @ 4 Pa 8/12/82

LEGEND

ANEMOMETER
 WATT HOUR METER
 TEMP SENSOR
 VOLTAGE SENSOR
 AMP CLAMP
 PDL-24
 PYRANOMETER

CLASS B MONITORING SITE SL

SOUTH

One-Time Value Log

Site Stephens City, VA

Operator D.H. Gustashaw

Site Code # SL1

Update Program Name INITL

Date INIT2

PDL-24

MECHANICAL

Variable Name in Function's	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	overall heat loss coefficient	L	449 178	Btu h °F		11/20/82 - 1/29/83 1/29/83 - 4/30/83
OT(2)	Furnace delivery efficiency	η_f	1.0	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	0	gal/hr		
OT(5)	Heating value of furnace fuel	HVF _f	0	Btu/gal		
OT(6)	Water heater burner fuel flow rate	F_w	0	gal/hr		
OT(7)	Heating value of water heater fuel	HVF _w	0	Btu/gal		
OT(8)	Water heater jacket heater factor	Q_w	303	Btuh		$Q_w = (.0833)(52 \text{ gal})(70)(1)$
OT(9)	Water heater space heater factor	N_w	.2	-		
OT(10)	Aux. heating set point temperature	T_{seth}	65	°F		
OT(11)	Aux. cooling set point temperature	T_{setc}	75	°F		
OT(12)	Net passive collector area	A_c	210.5	ft ²		
OT(13)	Movable insulation correction factor	N_{mi}	.97	-		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	-		
OT(15)	Elec. water heating voltage multiplier	C_w	2	-		
OT(16)	Channel M voltage multiplier	C_m	0	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0, AV = 1			
A	Licor Pyranometer PY 2832 SERI AA 0119	Incident Solar Radiation on the horizontal	I _h	FNC(1)	5.01 x 10 ⁶	9.935 x 10 ³	504.48	-.35	1	1	1	0		10/81	East peak
B	LiCor Pyranometer PY 2831 SERI AA 0118	Incident Solar Radiation on collector plane	I _{in}	FNC(2)	5.217 x 10 ⁶	9.963 x 10 ³	523.85	-.37	1	1	1	0		"	Center of aperture
C	AD 590J SERI BA 0250	Outdoor Dry Bulb Temperature	T _o	FNC(3)	1.7893 x 10 ⁶	2741.3	652.86	-457.33	1	1	1	1		"	North side
D	AD 590J SERI BA 0253	Inside Dry Bulb Temperature	T _i	FNC(4)	1.7835 x 10 ⁶	2321.0	768.03	-458.04	1	1	1	1		"	Dining Room 54" from floor
E	AD 590J SERI BA 0255	Inside Dry Bulb Temperature	T _i	FNC(5)	1.7842 x 10 ⁶	2730.5	652.99	-455.42	1	1	1	1		"	Front Bedroom 57" from floor
F	AD 590J SERI BA 0215	Inside Dry Bulb Temperature	T _i	FNC(6)	1.7950 x 10 ⁶	2320.3	773.22	-460.28	1	1	1	1		"	Master Bedroom 55" from floor
G	AD 590J SERI BA 0234	Living Room Water Wall	T _s	FNC(7)	1.7853 x 10 ⁶	2730.3	653.45	-456.01	1	1	1	1		"	
H	AD 590J			FNC(8)					0	1	1	1		"	

**Analog/Digital
Channel Log**

Sensor Terminal # A10027
Site Stephens City, VA
Site Code # SL1

Operator D. H. Gustashaw
Update Program Name INITL
Sensor Terminal Coefficient 1.0004

PDL-24
RECEIVED

Analog/Digital Channel Log

Sensor Terminal # A10027

Operator D. H. Gustashaw

Site Stephens City, VA

Update Program Name INITI

Site Code # SL

Sensor Terminal Coefficient 1.0004

DL-24

AEOLIAN KINETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-INTERCEPT or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0, AV=1			
I	General Electric Pulse-Initiating W-hr Meter	Total Electric Power	P _{elec}	FNC(9)	14.4	1	14.4	0	1	1	1	0		10/81	
J	AK Line Voltage Sensor	AC Supply Voltage Phase to Neutral	V	FNC(10)	72.88	--	72.91	82.78	2	1	1	1		"	
K	Amprobe Current Clamp	Elec. Current for aux. heating	EC _{aux}	FNC(11)	258.5 ($\frac{A}{V}$) (0-200)	.8406	217.38	.30	1	1	1	1		"	
L	SERI EA 0075 Amprobe Current	Elec. current for water htg.	EC _w	FNC(12)	263.5 ($\frac{A}{V}$) (0-200)	.8555	225.51	.34	1	1	1	1		"	
M	Amprobe Current Clamp			FNC(13)					0	1	1	1		"	
N	Anemometer	Wind Speed	W	FNC(14)	.238		.238	0	1	1	1	0		11/82	West peak

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal Thermoswitch Furnace Burner Operating Time	t_f	FNS(1)	Furnace burner on	0		
2	Fenwal Thermoswitch Water Heater Burner Operating Time	t_w	FNS(2)	Water heater burner on	0		
3	Microswitch Status of night insulation	t_{mi}	FNS(3)	Night insulation in place	1		Closed=1 Open=0 When insulated door is closed switch is closed

Sensor Terminal # A10027

Operator D. H. Gustashaw

Site Stephens City, VA

Update Program Name INITL

Site Code # SL1

Status Channel Log**PDL-24****AERIAN KINETICS**

11/20/82 - 1/29/83

82/83 HEATING SEASON

```

LIST
1 END I=USR(20)
10 DIMOT(19)/X(4):C
1=1E-29:Y1=C1
15 FORI=255TO1STEP-
4:POKE48961,1:NEXT
20 OT(1)=449:OT(2)=
1.0:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=30
3:OT(9)=.2
50 OT(10)=65:OT(11)
=75:OT(12)=210.5
60 OT(13)=.97:OT(14)
)=2:OT(15)=2
70 OT(16)=0:OT(17)=
0
80 OT(18)=5.34:OT(1
9)=4.82
99 I=USR(24)
110 IFV3<0-1THEN150
120 FORI=1TO18:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=001*FNC(14)
/C:XT=X0-FNC(3):IFXT
<0THENXT=0
158 XI=(OT(18)*2*XT
+(OT(19)*XW)*2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNC(3)-(1-OT
(13))*FNC(4))
160 IFXT>0THENF(4)=
F(4)+(XL*XI)*XT*C
170 X5=FNC(18):X3=0
180 FORI=1TO3:X(I)=
-3.443*(FNC(18+I)).5
)*OT(13+I)*FNC(18+I)
)*X5*C
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNC(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNC(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(2)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*(Y2
-C)+XW*C)/Y2
315 FORI=12TO17:F(I
)=(F(I)*(Y2-C)+FNC(I
-9)*C)/Y2:NEXT
320 F(18)=(F(18)*(Y
2-C)+X0*C)/Y2
360 FORI=1TO8
370 F(48+I)=(F(48+I)
-((X2)=1*5-500RI=1)A
ND(X2CI*5-500RI=8))*
C
390 NEXT
410 X4=X4+X5*C
420 FORI=40TO43:F(I
)=F(I)+FNC(I-35)*C:N
EXT
430 FORI=44TO45:F(I
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFX=0THEN500
470 IFX<0F(65)THENF
(65)=XE:F(66)=0:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=01THENY1=D
:Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25TO31:F(I
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1TO3:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32TO39:F(I
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINTTAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19TO67:PRI
NT"FI:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
C()PDL-24
MONITORING SYSTEM
PROG I T
TIME DEFAULTS
YEAR 82 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 584.48
Y-INT -.15

```

```

C0E PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 523.84
Y-INT -.37

```

```

C0C PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.86
Y-INT -457.33

```

```

C0D PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 768.02
Y-INT -458.04

```

```

C0E PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.98
Y-INT -455.42

```

```

C0F PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 773.22
Y-INT -460.28

```

```

C0G PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 653.45
Y-INT -456.01

```

```

C0H PROCESS 0
C0I PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 14.4
OFFSET 0

```

```

C0J PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 72.909
Y-INT 82.279

```

```

C0K PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 217.38
Y-INT .45

```

```

C0L PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 225.51
Y-INT .5

```

C0M PROCESS 0

```

C0N PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 238
OFFSET 0

```

UPDATE? 0

STATUS

```

S01 PRT 0
S02 PRT 0
S03 PRT 1
S04 PRT 0
S05 PRT 0
S06 PRT 0
S07 PRT 0
S08 PRT 0
UPDATE? 0

```

OUTPUT

OUTPUT TERMS 0

UPDATE? 0

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

1/29/83- 5/20/83

82/83 HEATING SEASON

```

LIST
1 END: I=USR(20):
10 DIMOT(19),X(4):C
11E-29:Y1=C1
15 FORI=255T01STEP-
4:POKE40961,I:NEXT
20 OT(1)=178:OT(2)=
1.0:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=30
3:OT(9)=.2
50 OT(10)=65:OT(11)=
75:OT(12)=210.5
60 OT(13)=.97:OT(14)=
2:OT(15)=2
70 OT(16)=0:OT(17)=
0
80 OT(18)=5.34:OT(1
9)=4.82
99 I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1T018:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=X1-FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001*(FNC(14)
/0:XT=X0-FNC(3):IFXT
<0THENXT=0
158 XI=(OT(18)*2*XT
+(OT(19)*XW)/2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160 IFXT>0THENF(4)=
F(4)+(XL+XI)*XT*C
170 X5=FNC(10):X3=0
180 FORI=1T03:X(I)=
-3.413*(FNC(10+I))/5
)*OT(13+I)*FNC(10+I)
)*X5*C
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNS(2)*C:X7=3.4
13*(FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(5
)+X(3)
240 F(5)=F(6)+F(7)-
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FN
(9):F(11)=(F(11)+C)
-C)*XW*C)/Y2
315 FORI=1T017:F(
I)=F(11)*(Y2-C)+FNC
(9)*C)/Y2:NEXT
319 F(18)=F(19)*
2-C+X0*C)/Y2
350 FORI=1T08
370 F(48+I)=F(48+1
-1*(X2)=1+5+500RI=1)
ND=X2*(1+5+500RI=3))
C
360 F(56+I)=F(56+I)
-((X2)=1+5+500RI=1)A
ND(X2*(1+5+500RI=3))
C
390 NEXT
410 X4=X4+X5*C
420 FORI=40T043:F(I
)=F(I)+FNS(I-35)*C:N
EXT
430 FORI=44T045:F(I
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=C1THENY1=0
:Y4=M:GOT0999
520 Y1=D:Y5=Y5+Y2
530 FORI=25T031:F(I
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32T039:F(I
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
600 Y3=-1:IFM=Y4THE
N999
810 PRINT!TAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19T067:PRI
NT!"F" I:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
<ID>PDL-24
MONITORING SYSTEM
YEAR 83 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 504.48
Y-INT -.15

```

C0B PROCESS 1

```

A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 523.84
Y-INT -.37

```

C0C PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.86
Y-INT -457.33

```

C0D PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 768.02
Y-INT -458.04

```

C0E PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 652.98
Y-INT -455.42

```

C0F PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 773.22
Y-INT -460.28

```

C0G PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 653.45
Y-INT -456.01

```

C0H PROCESS 0

C0I PROCESS 1

```

A/D 1
T/A 0
STORE 1
PRT 1
SCALE 14.4
OFFSET 0

```

C0J PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 72.909
Y-INT 82.279

```

C0K PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 217.38
Y-INT .45

```

C0L PROCESS 1

```

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 215.51
Y-INT .5

```

C0M PROCESS 0

C0N PROCESS 1

```

A/D 1
T/A 0
STORE 1
PRT 1
SCALE .238
OFFSET 0

```

UPDATE? 0

STATUS

```

S01 PRT 0
S02 PRT 0
S03 PRT 1
S04 PRT 0
S05 PRT 0
S06 PRT 0
S07 PRT 0
S08 PRT 0
UPDATE? 0

```

OUTPUT

OUTPUT TERMS 0

UPDATE? 0

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

SITE SN

Mr. & Mrs. Carl Mullin
10649 West Providence Road
Richmond, VA 23236

INIT2 Software Installed: 11/19/82

SITE SUMMARY SHEET

Site Identification Number
SN1

Inst. Contr. Name ESG, Inc.
 Address 2231 Perimeter Park
Suite 11 Atlanta, GA 30341

Location:

Town Richmond, VA
 Latitude 3703'
 Longitude 7702'
 Elevation 162'

Nearest Weather Station:

Richmond, VA

Building:

Type of Building
 General Type of Construction
 Ground Coupling

Two story residence
Wood frame
Crawlspace

Passive/Hybrid System(s):

Dominant Heating System Type
 Dominant Heating System Area
 Other System Type
 Other System Area
 Night Insulation

Water walls
260.8 ft²
N/A
N/A
None

Auxiliary Heating System:

System and Distribution Type
 Day Thermostat Setting
 ? Night Thermostat Setting

Resistance baseboard heaters
65°F
65°F

Living Zone Floor Area
 Passive Aperture Area
 Loss Coefficient and Date Measured
 Infiltration Rate and Date Measured

1236 ft²
260.8 ft²
L=268.9 Btu/hr °F: 1/31 and 2/1/82
0.68 m³/SEC @ 4 PA 8/11/82

LEGEND

ANEMOMETER
WATT HOUR METER
TEMP SENSOR
VOLTAGE SENSOR
AMP CLAMP
PDL-24
PYRANOMETER

CLASS B MONITORING SITE SN
FIRST FLOOR

CLASS B MONITORING SITE SN
SECOND FLOOR

One-Time Value Log

Site Richmond, VA

Operator D.H. Gustashaw

Site Code # SN1

Update Program Name INITN

Date 10/14/81

PDL-24

ZEON KINETICS

Variable Name in Functions	Description	Designation	Numerical Value	Units	Line #	Program
OT(1)	Overall heat loss coefficient	L	441.3 269.0	Btu h OF		11/19/82 - 1/31/83 1/31/81 - 4/30/83
OT(2)	Furnace delivery efficiency	n_f	1.0	-		
OT(3)	Air infiltration rate	I	.75	ACH		
OT(4)	Furnace burner fuel flow rate	F_f	0	gal/hr		
OT(5)	Heating value of furnace fuel	HVF_f	0	Btu/gal		
OT(6)	Water heater burner fuel flow rate	F_w	0	gal/hr		
OT(7)	Heating value of water heater fuel	HVF_w	0	Btu/gal		
OT(8)	Water heater jacket heating factor	Q_w	233	Btuh		$Q_w = (.0833)(40 \text{ gal})(140-70^\circ\text{F})(1) = 233$
OT(9)	Water heater space heating factor	N_w	.1	-		
OT(10)	Aux. heating set point temperature	T_{seth}	65	OF		
OT(11)	Aux. cooling set point temperature	T_{setc}	75	OF		
OT(12)	Net passive collector area	A_c	261	ft ²		
OT(13)	Moveable insulation correction factor	N_{mi}	1	-		
OT(14)	Elec. aux. heating voltage multiplier	C_{auxh}	2	-		
OT(15)	Elec. water heating voltage multiplier	C_w	2	-		
OT(16)	Channel M voltage multiplier	C_m	0	-		
OT(17)	Channel N voltage multiplier	C_n	0	-		

Analog/Digital Channel Log

Sensor Terminal # A10123

Operator D. H. Gustashaw

PDL-24

Site Richmond, VA

Update Program Name INITN

Site Code # SN1

Sensor Terminal Coefficient .9916

ZEOMANTINETICS

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES = 1 NO = 0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total = 0, AV = 1			
A	LiCor pyranometer PY 2730	Incident solar radiation on the horizontal	I _h	FNC(1)	4.66 x10 ⁶	B= 9.958 x10 ³	-464.03 0		1	1	1	0		10/81	East peak
B	LiCor pyranometer PY 2731	Incident solar radiation on collector plane	I _{in}	FNC(2)	5.358 x10 ⁶	B= 9.955 x10 ³	533.70 0		1	1	1	0		"	Center of trombe wall
C	AD 590J SERI BA0269	Outdoor dry bulb temperature	T _o	FNC(3)	1.7996 x10 ⁶	2741.1	651.01 -461.52		1	1	1	1		"	Northside
D	AD 590J SERI BA0321	Inside dry bulb temperature	T _i	FNC(4)	1.7986 x10 ⁶	2742.8	649.54 -457.47		1	1	1	1		"	Upstairs east bedroom 60" from floor.
E	AD 590J SERI BA0257	Inside dry bulb temperature	T _i	FNC(5)	1.7961 x10 ⁶	2749.0	647.18 -456.28		1	1	1	1		"	Upstairs west bedroom(master) 58" from floor.
F	AD 590J SERI BA0145	Inside dry bulb temperature	T _i	FNC(6)	1.7613 x10 ⁶	2752.4	633.84 -449.44		1	1	1	1		"	Living room 60" from floor
G	AD 590J SERI 0247	Temperature in water wall room	T _s	FNC(7)	1.7933 x10 ⁶	2321.9	765.15 -455.09		1	1	1	1		"	
H	AD 590J			FNC(8)					0	1	1	1		"	

Channel	Sensor Type and Serial #	Parameter Measured	Designation	Variable Name in Functions	Sensor Slope or Scale	Signal Cond. Card Coef. or Prescale	Programmed SLOPE or SCALE	Y-Intercept or OFFSET	YES=1 NO=0				Units	Date Installed	Remarks
									Process?	Print?	Store?	Total=0. AV=1			
I	SERI CA004 Duncan pulse iniriating W-hr meter	Total electric power	P _{elec}	FNC(9)	40		40	0	1	1	1	0		10/81	
J	AK line voltage sensor	AC supply voltage phase to neutral	V	FNC(10)	72.39		71.78	81.79	1	1	1	1			
K	Amprobe current clamp	Elec. current for aux. heating	EC _{aux}	FNC(11)	259 5	B= .8485	218.59	.50	1	1	1	1			
L	Amprobe current clamp	Elec. current for water heating	EC _w	FNC(12)	261.9	B= .8453	291.52	.41	1	1	1	1			
M	Amprobe current clamp			FNC(13)					0	1	1	1			
N	Anemometer	Wind speed	W	FNC(14)	.238		.238	0	1	1	1	0		11/82	West peak

**Analog/Digital
Channel Log**

Sensor Terminal # A10123

Site Richmond, VA

Site Code # SN1

Operator D.H. Gustashaw

Update Program Name INITN

Sensor Terminal Coefficient

0016

PDL-24

REDUNDANT

Status Channel Log

Sensor Terminal # A10123

Operator D.H. Gustashaw

PDL-24

Site Richmond, VA

Update Program Name INITN

Site Code #

VEQUANKINETICS

Channel	Sensor type & Parameter Measured	Designation	Variable Name in Functions	Switch Closed Condition	Print?	Date Installed	Comments
1	Fenwal thermostatic furnace burner operating time	t _f	FNS(1)	Furnace burner on	0		
2	Fenwal thermostatic heater burner operating time	t _w	FNS(2)	Water heater burner on	0		
3	Microswitch status of night insulation	t _{mi}	FNS(3)	Night insulation in place	0		

INIT N

11/19/82 - 1/31/83

82/83 HEATING SEASON

LIST

```

1 END: I=USR(20):
10 DIMOT(19),X(4):C
1=1E-23:Y1=0:1
15 FORI=255TO1STEP-
4:POKE40961,I:NEXT
20 OT(1)=441.3:OT(2)
=1:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=23
3:OT(9)=.1
50 OT(10)=75:OT(11)
=65:OT(12)=261
60 OT(13)=1:OT(14)=
2:OT(15)=2
70 OT(16)=0:OT(17)=
0
80 OT(18)=9.05:OT(1
9)=5.81
99 I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1TO18:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001*FNC(14)
160 XT=X0-FNC(3):IFXT
<0THENXT=0
158 XI=(OT(18)*2*XT
+OT(19)*XW)/2+.5
159 XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160 IFXT>0THENF(4)=
F(4)+(XL+XI)*XT*C
170 X5=FNC(10):X3=0
180 FORI=1TO3:X(I)=
-3.413*(FNC(10+I)).5
)*OT(13+I)*FNC(10+I)
)*X5*C
185 X2=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195 X6=X(2)+OT(7)*0
T(6)*FNS(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT>0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=X5+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*Y2
-C)+XW*C)/Y2
315 FORI=12TO17:F(I)
)=(F(I)*Y2-C)+FNC(I
-9)*C)/Y2:NEXT
320 F(18)=(F(18)*(Y
2-C)+X0*C)/Y2
330 FORI=1TO8
370 F(48+I)=F(48+I)
-((X2)=1+5+450R1=1)*R
ND(X2(1)+5+500R1=8))*
390 NEXT
410 Y4=X4+X5+C
420 FORI=40TO43:F(I)
)=F(I)+FNC(I-35)*C:N
EXT
430 FORI=44TO45:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)>OT(10)
THENF(47)=F(47)+OT(
10)-FNC(3)*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+FNC
(3)-OT(11)*C
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN999
510 IFY1=01THENY1=D
Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25TO31:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1TO3:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32TO39:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINT:TAB(20)"M
ONTH"Y4"PRINTOUT"
820 FORI=19TO67:PRI
NT!"F" I:F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
<<>PDL-24
MONITORING SYSTEM
PROG I
TIME DEFAULTS
YEAR 82 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUNC STORE INTERVAL
HRS 0 MINS 0 ?
FUNC ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C0A PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 404.03
Y-INT 0
C0B PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 533.7
Y-INT 0
C0C PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 651.01
Y-INT -461.52
C0D PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 649.54
Y-INT -457.47
C0E PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 647.18
Y-INT -456.28
C0F PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 633.84
Y-INT -449.44
C0G PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 765.15
Y-INT -455.89
C0H PROCESS 0
C0I PROCESS 1
A/D 1
T/A 0
STORE 1
PRT 1
SCALE 40
OFFSET 0
C0J PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 71.779
Y-INT 81.789
C0K PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 218.59
Y-INT .5
C0L PROCESS 1
A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 219.52
Y-INT .42

```

C0B PROCESS 1

A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 533.7
Y-INT 0

C0C PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 651.01
Y-INT -461.52

C0D PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 649.54
Y-INT -457.47

C0E PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 647.18
Y-INT -456.28

C0F PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 633.84
Y-INT -449.44

C0G PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 765.15
Y-INT -455.89

C0H PROCESS 0

C0I PROCESS 1

A/D 1
T/A 0
STORE 1
PRT 1
SCALE 40
OFFSET 0

C0J PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 71.779
Y-INT 81.789

C0K PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 218.59
Y-INT .5

C0L PROCESS 1

A/D 0
T/A 1
STORE 1
PRT 1
SLOPE 219.52
Y-INT .42

C0M PROCESS 0

C0N PROCESS 1

A/D 1
T/A 0
STORE 1
PRT 1
SCALE 230
OFFSET 0

UPDATE? 0

STATUS

S01 PRT 0
S02 PRT 0
S03 PRT 0
S04 PRT 0
S05 PRT 0
S06 PRT 0
S07 PRT 0
S08 PRT 0

UPDATE? 0

OUTPUT TERMS 0

UPDATE? 0

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

1/31/83 - 5/20/83

82/83 HEATING SEASON

LIST:

```

1:END:1=USR(20):
10 DIMOT(19),X(4):C
1=4E-29:Y1=C1
15 FORI=255T01STEP-
4:POKE48951,I:NEXT
20 OT(1)=269:OT(2)=
1:OT(3)=.75
30 OT(4)=0:OT(5)=0:
OT(6)=0
40 OT(7)=0:OT(8)=23
3:OT(9)=.1
50 OT(10)=75:OT(11)=
65:OT(12)=261
60 OT(13)=1:OT(14)=
2:OT(15)=2
70 OT(16)=0:OT(17)=
0
80 OT(18)=9.05:OT(1
9)=5.81
99 I=USR(24):
110 IFY3<0-1THEN150
120 FORI=1T018:F(I)
=0:NEXT
140 X4=0:Y2=0:Y3=0
150 X0=(FNC(4)+FNC(
5)+FNC(6))/3
151 X1=FNC(4):X2=FN
C(7)
155 Y2=Y2+C
157 XW=.001*FNC(14)
70:XT=X0-FNC(3):IFXT
<0THENXT=0
158 XI=(OT(18)*2*XT
+(OT(19)*XW)*2)/.5
159 XL=OT(1)*(1-(1-
OT(12))*FNS(3)-(1-OT
(13))*FNS(4))
160 IFXT<0THENF(4)=
F(4)+(XL+XI)*XT+C
170 X5=FNC(10):X2=0
180 FORI=1T03:X(I)=
-3.413*(FNC(10+I))/5
)*OT(13+1)*FNC(10+1)
)*X5+C
185 X3=X3+X(I):NEXT
190 F(6)=F(6)+X(1)+
OT(5)*OT(4)*FNS(1)*C
195 X6=X(2)+OT(7)*C
T(6)*FNS(2)*C:X7=3.4
13*FNC(9)-X3
200 F(7)=F(7)+X6:F(
8)=F(8)+X7:F(9)=F(9)
)+X(3)
240 F(5)=F(6)+F(7)+
F(8)+F(9)
250 F(2)=OT(2)*F(6)
280 IFXT<0THENF(3)=
F(3)+X7+OT(9)*X6+OT(
8)*C
300 F(1)=F(4)-F(3)-
F(2)
305 XE=XE+FNC(9)
310 F(10)=F(10)+FNC
(9):F(11)=(F(11)*(Y2
-C)+XW*C)/Y2
315 FORI=12T017:F(I)
)=(F(I)*(Y2-C)+FNC(I
-9)*C)/Y2:NEXT
320 F(18)=F(18)*(Y
2-C)+X0*C)/Y2
360 FORI=1T08
370 F(48+I)=F(48+I)
-((X2I=1*5-450RI=1)*A
ND(X2I*5+500RI=8))*
C
390 NEXT
410 K4=X4+X5*C
420 FORI=40T043:F(I)
)=F(I)+FNS(I-35)*C:N
EXT
430 FORI=44T045:F(I)
)=F(I)+FNC(I-43)*C:N
EXT
440 IFFNC(3)<OT(10)
THENF(47)=F(47)+(OT(
10)-FNC(3))*C
450 IFFNC(3)>OT(11)
THENF(48)=F(48)+(FNC
(3)-OT(11))*C
460 IFF=0THEN500
470 IFXE>F(65)THENF
(65)=XE:F(66)=D:F(67
)=H
480 XE=0
500 IFD=Y1THEN399
510 IFY1=C1THENY1=0
:Y4=M:GOTO999
520 Y1=D:Y5=Y5+Y2
530 FORI=25T031:F(I)
)=F(I)+F(I-21):NEXT
540 F(19)=F(19)+F(1
):F(21)=F(21)+F(2):F
(23)=F(23)+F(3)
550 FORI=1T03:F(2*I
+18)=F(2*I+17)/(F(25
)+C1):NEXT
560 FORI=32T039:F(I)
)=(F(I)*(Y5-Y2)+F(I-
21)*Y2)/Y5:NEXT
570 F(46)=(F(46)*(Y
5-Y2)+X4)/Y5
800 Y3=-1:IFM=Y4THE
N999
810 PRINTITAB(20)*M
ONTH"Y4"PRINTOUT"
820 FORI=19T067:PRI
NTI"F(I):F(I):F(I)=0:
NEXT
830 Y4=M:Y5=0
999 I=USR(22):END
999 I=USR(22):END
C)POL-24
MONITORING SYSTEM
PROG I
TIME DEFAULTS
YEAR 83 ?
PRINT INTERVAL
HRS 24 MINS 0 ?
CH STORE INTERVAL
HRS 1 MINS 0 ?
FUND STORE INTERVAL
HRS 0 MINS 0 ?
FUND ZERO INTERVAL
HRS 0 MINS 0 ?
CHANNEL DEFAULTS
ANALOG/DIGITAL
# SENSOR TERMS 1
C08 PROCESS 1
A/D 0
T/A 0
STORE 1
PRT 1
SLOPE 464.00
Y-INT 0

```

C08 PROCESS 1

A/D 0

T/A 0

STORE 1

PRT 1

SLOPE 533.7

Y-INT 0

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 651.01

Y-INT -461.52

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 649.54

Y-INT -457.47

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 647.18

Y-INT -456.28

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 633.84

Y-INT -449.44

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 765.15

Y-INT -455.09

C08 PROCESS 0

C08 PROCESS 1

A/D 1

T/A 0

STORE 1

PRT 1

SCALE 40

OFFSET 0

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 71.779

Y-INT 81.789

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 210.59

Y-INT .5

C08 PROCESS 1

A/D 0

T/A 1

STORE 1

PRT 1

SLOPE 210.52

Y-INT .41

C08 PROCESS 0

C08 PROCESS 1

A/D 1

T/A 0

STORE 1

PRT 1

SCALE 238

OFFSET 0

UPDATE? 0

STATUS

S01 PRT 0

S02 PRT 0

S03 PRT 0

S04 PRT 0

S05 PRT 0

S06 PRT 0

S07 PRT 0

S08 PRT 0

UPDATE? 0

OUTPUT

OUTPUT TERMS 0

UPDATE? 0

FUNCTION DEFAULTS

FUNCTIONS 67

F 1	STORE 0	PRT 1
F 2	STORE 0	PRT 1
F 3	STORE 0	PRT 1
F 4	STORE 0	PRT 1
F 5	STORE 0	PRT 1
F 6	STORE 0	PRT 1
F 7	STORE 0	PRT 1
F 8	STORE 0	PRT 1
F 9	STORE 0	PRT 1
F10	STORE 0	PRT 1
F11	STORE 0	PRT 1
F12	STORE 0	PRT 1
F13	STORE 0	PRT 1
F14	STORE 0	PRT 1
F15	STORE 0	PRT 1
F16	STORE 0	PRT 1
F17	STORE 0	PRT 1
F18	STORE 0	PRT 1
F19	STORE 0	PRT 1
F20	STORE 0	PRT 1
F21	STORE 0	PRT 1
F22	STORE 0	PRT 1
F23	STORE 0	PRT 1
F24	STORE 0	PRT 1
F25	STORE 0	PRT 1
F26	STORE 0	PRT 1
F27	STORE 0	PRT 1
F28	STORE 0	PRT 1
F29	STORE 0	PRT 1
F30	STORE 0	PRT 1
F31	STORE 0	PRT 1
F32	STORE 0	PRT 1
F33	STORE 0	PRT 1
F34	STORE 0	PRT 1
F35	STORE 0	PRT 1
F36	STORE 0	PRT 1
F37	STORE 0	PRT 1
F38	STORE 0	PRT 1
F39	STORE 0	PRT 1
F40	STORE 0	PRT 1
F41	STORE 0	PRT 1
F42	STORE 0	PRT 1
F43	STORE 0	PRT 1
F44	STORE 0	PRT 1
F45	STORE 0	PRT 1
F46	STORE 0	PRT 1
F47	STORE 0	PRT 1
F48	STORE 0	PRT 1
F49	STORE 0	PRT 1
F50	STORE 0	PRT 1
F51	STORE 0	PRT 1
F52	STORE 0	PRT 1
F53	STORE 0	PRT 1
F54	STORE 0	PRT 1
F55	STORE 0	PRT 1
F56	STORE 0	PRT 1
F57	STORE 0	PRT 1
F58	STORE 0	PRT 1
F59	STORE 0	PRT 1
F60	STORE 0	PRT 1
F61	STORE 0	PRT 1
F62	STORE 0	PRT 1
F63	STORE 0	PRT 1
F64	STORE 0	PRT 1
F65	STORE 0	PRT 1
F66	STORE 0	PRT 1
F67	STORE 0	PRT 1

APPENDIX A

SITE PHOTOGRAPH TABULATION

A number of photographs were taken to provide installation details of most of the sensors used as part of the instrumentation system. Elevation views of each house were also made as part of the overall documentation and will help provide information on the passive design features. These photographs were in 35 MM slide format and were provided to SERI in transmittals on February 15 and April 14, 1983.

The following table provides a listing of these photographs for each site location.

SITE PHOTOGRAPHS TABULATION

Channel	Description	SA	SB	SF	SG	SJ	SK	SL	SN
A	Horizontal Pyranometer	X	X	X	X	X	X	X	X
B	Vertical Pyranometer	X	X	X	X	X	X	X	X
C	Outside Temperature	X	X	X	X	X	X	X	X
D	Inside Temperature	X	X	X	X	X	X	X	X
E	Inside Temperature	X	X	X	X	X	X	X	X
F	Inside Temperature	X	X	X	X	X	X	X	X
G	Inside Temperature	X	-	X	X	X	-	X	
H	Inside Temperature		X	X	-	-	-	-	-
I	Watt-Hour Meter	X	X	X	X	X	X	X	X
J	Voltage Sensor	X		X	X	X	X	X	X
K	Auxiliary Heat Amprobe		-	X	-	X	X	X	X
L	Water Heat Amprobe		-	-	-	X	X	X	X
M	Air Conditioning Amprobe			X	-	X		-	-
N	Anemometer	X	X	X	X	X	X	X	X
	Status 1	-		X	X	-	-	-	-
	Status 2	-	X	X	X	-	-	-	-
	Status 3	X	-	-	-	-	-	-	-
	Status 4	-	X	-	-	X	-	-	-
	Status 5	-	X	-	-	X	-	-	-
	Status 6	-	X	-	-	-	-	-	-
	Status 7	-		-	-	-	-	-	-
	Status 8	-	X	-	-	-	-	-	-
	North Elevation	X	X	X	X	X	X	X	X
	South Elevation	X	X	X	X	X	X	X	X
	East Elevation	X	X	X	X	X	X	X	X
	West Elevation	X	X	X	X	X	X	X	X