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DATA REPORT FOR THE SOUTHWEST RESIDENTIAL EXPERIMENT STATION APRIL 1982

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ABSTRACT

The Residential Experiment Stations of the Solar Photovoltaic Residential Project have been designed by Massachusetts Institute of Technology Lincoln Laboratory under Department of Energy sponsorship to develop residential photovoltaic systems and to gather and disseminate performance data for the photovoltaic community, cognizant institutions, and ultimately, the public.

The Southwest Residential Experiment Station (SW RES) is operated by the New Mexico Solar Energy Institute at New Mexico State University in Las Cruces. This report tabulates physical performance data obtained from the photovoltaic energy systems under test at the SW RES for the month of April 1982.

DATA REPORT FOR THE
SOUTHWEST RESIDENTIAL EXPERIMENT STATION
APRIL 1982

The New Mexico Solar Energy Institute, under the management of the Massachusetts Institute of Technology (MIT) Lincoln Laboratory, has established a Residential Experiment Station in Las Cruces, New Mexico, to monitor the performance of state-of-the-art residential solar photovoltaic (PV) systems. This Southwest Residential Experiment Station (SW RES) is one of two Residential Experiment Stations funded under the U.S. Department of Energy's National Photovoltaic Program--the other is the Northeast Residential Experiment Station (NE RES) established and operated by MIT Lincoln Laboratory in Concord, Massachusetts.

This report presents one month of performance data obtained from the eight SW RES Prototype Systems and five monitored residences. Data drawn from the Residential Data System (RDS) appears in several formats. Section 1 includes a one-page summary as well as a more detailed hour-by-hour tabulation for an average day of the month. In Section 2, energy histograms for each Prototype System are provided; they are based on RDS data and recording kilowatt hour meters. The histograms also present horizontal and plane-of-array insolation data as well as comments that explain data and/or energy production anomalies.

This report is distributed to the SW RES Consulting Committee, the other field centers in the National Photovoltaic Program, the Jet Propulsion Laboratory lead center, the Department of Energy (DOE), and, through DOE/Technical Information Center, the technical community involved in the development of PV energy systems. The objective of this report is to disseminate authoritative and accurate information concerning the performance of residential PV systems and the typical loads they serve. Such timely information is needed by the overall DOE PV program to ensure a uniform and correct understanding of the performance of the developmental systems.

Presently eight prototype residential PV systems are under test at the SW RES. Each Prototype System consists of a roof-mounted PV array, sized to meet at least 50 percent of the annual electric demand of an

energy-conserving house, and an enclosed structure to house the remainder of the PV system equipment, test instrumentation, and work space. All eight of these Prototype Systems were designed and built by industry participants in the SW RES effort. The arrays provide DC energy, which is converted to AC energy by the power conditioning subsystem (PCS) to service all of the usual loads of the residence. A common feature of all the Prototype Systems is that excess solar-generated electric energy is fed back to the local utility grid, thereby eliminating the need for on-site storage. To quantitatively gauge the ability of the Prototype Systems to meet residential load demands, five homes in the vicinity of the SW RES, representative of the occupancy and loads found in the area, have been equipped with instrumentation that continually measures the home's electrical energy consumption. Telephone lines carry load information from these monitored residences to the SW RES, where the data is assimilated and recorded. One of the monitored houses is chosen to command a programmable load in each Prototype System--thereby simulating a typical residential electrical load profile.

Features of the residential PV systems and monitored houses are listed in Tables 1 and 2, respectively.

Figure 1 illustrates the sequence by which the attached monthly data reports are generated from the data obtained from the PV systems, monitored houses, and weather station. The hour-by-hour tabulation of information for an average day of the month (see "Brief Monthly Report") and the monthly summary (see "Monthly Summary") are the end products of processing data measured every five seconds and compiled over six-minute intervals. The quantities measured at the monitored houses are intended for use by both electric utilities and PV system designers. This information will be particularly useful in the numerical simulation of PV system performance and in determining the system's ability to meet actual residential loads. The information concerning the Prototype Systems is also addressed to PV system designers and electric utilities, as well as to institutional observers and the institutions represented on the RES Consulting committees. It is expected that this information will provide a basis for understanding the performance implications for the various design differences among the Prototype Systems.

The "Monthly Summary" tabulations are designed to show the behavior of the SW RES PV systems, had all subsystems been operative, e.g., to represent the expected average output had there been no downtimes. All systems are not equally reliable; the entry "System Reliability" shows the reliability difference between systems at the SW RES. It is worthy of remark that when different components and instrumentation in the PV system fail at different times, the hour-by-hour tabulations of the different physical quantities affected by it are obtained by averaging over different time periods. Cognizance has to be taken of this, especially in using the "Brief Monthly Report" to evaluate component efficiencies or to do an energy balance (using the hypothetical energy flows to and from the utility).

The majority of the values presented in this report result from either an averaging or a peak-seeking process. Further, they are calculated under conditions in which some or all data may be intermittently missing because of maintenance or unavailability of the data system. Data may also be marked as invalid for reasons such as sensor failure, calibration errors, and experiments or repairs being done while data are being recorded. Because of the characteristics of the data, a detailed description of the ground rules used in the generation of this report should add to the meaningfulness of the results.

To adapt to missing or invalid data, some of the results reported in the "Monthly Summary" are computed only over time periods when data from a critical group of the quantities used in their computation are all available and valid. This is done to maintain consistency in those results by ensuring that they are computed over coincident time intervals. There are two such groups described below. The length of time for which the data were used in computation is included in the report as a fraction of total time possible. Note that the time given for each monitored house or Prototype System applies only to that specific site.

Specifically, in the "Prototype PV Array Information" and "Prototype Power Conditioning System (PCS) Information" subsections of the "Photovoltaic (PV) System Information" section, values for the group of inputs comprised of tilt irradiance, array DC output power (note that

energy is computed by integrating the recorded successive power values), and PCS AC output power for a Prototype are all required to be available at the same time before they contribute to the calculation of the following values in that subsection:

Average daily array DC energy
Average daily array DC energy/rated power
Average daily tilt insolation, PV system on
Insolation utilization efficiency
Array efficiency
Average daily PCS AC energy output
PCS efficiency
Array and PCS data hours during sunhours/sunhours

Similarly, under the "PV System-Utility Energy Flow" subsection, values for the group comprising PCS AC output power, power to utility, power from utility, and power to load must all be simultaneously available to be included in calculation of all values reported in the subsection.

Note that PCS AC output power is a constituent of both groups of required quantities. However, it might not appear in the two groups over precisely the same time intervals because of the grouping constraints. Therefore, the two values reported for it may differ and cross checks based on it may not prove out.

Table 3 gives a definition for each quantity reported in the "Monthly Summary," explaining how it is derived. Those quantities whose definitions are not self-explanatory are explained in more detail below. For background information on the data system, readings are taken once every five seconds if they are to be averaged later or sampled 10 times in five seconds if a peak is needed. These values are then recorded across all physical quantities in the entire system every six minutes. The values stored for a quantity are either the average value seen over the six minutes or the highest value, depending on how they were predefined. These values are referred to as six-minute averages and six-minute peaks, respectively. Energy computations use values calculated by integrating successive six-minute average readings; other reported quantities use the recorded readings directly. Some general comments clarifying the definitions given in Table 3 are presented below:

- Average of highest six-minute-peak (or average) readings for each day:

The highest value is selected for each day of the month and the selected values are averaged. For selected quantities indicated by "+," the day is ignored if there is a gap in the data longer than one hour between 11 a.m. and 2 p.m. local standard time.

°Average of all readings for month:

Equal weight is given to each valid value.

°Sum of average-hour values for month:

This formulation is used to derive the average daily total values in the report. First, all valid input data values for the month are accumulated by the hour in which they were taken. Then an average is calculated for each hour, giving a 24-point profile for an average day for the month. These values are called average-hour values and are used in the "Brief Monthly Report." The average-hour values are summed to yield the average daily totals. It is probable that different numbers of values will participate in the averaging calculations for various hours over the month because of the randomness of data losses. As a result, the daily averages formed this way will differ from those that would result from giving equal weight to all data points but should yield a more representative profile by smoothing out the effects of daytime maintenance and experimentation data outages.

Background information on the hardware design of the entire data collection system is contained in Reference 1. Additional information on the retrieval, processing, and dissemination of data collected by the residential data system is contained in Reference 2. Copies of these publications are available through the National Technical Information Service. Information concerning the reliability and durability of the various residential systems, as well as assessments of their performance vis-a-vis the DOE price goals and milestones, will be presented in annual reports.

For additional information on the PV system activity at MIT Lincoln Laboratory, please write to the address below:

Solar Photovoltaic Residential Project
MIT Lincoln Laboratory
Room D-437
Lexington, MA 02173

For additional information on the PV system activity at NMSEI, please write to the following address:

Information and Education Division
New Mexico Solar Energy Institute
New Mexico State University
Box 3 SOL
Las Cruces, NM 88003

REFERENCES

1. Fenton, H. A., and Much, C. H. Residential Photovoltaic Experiment Station Data System, MIT Lincoln Laboratory Report No. DOE/ET/20279-155, September 1981.

2. Raghuraman, P., and Kern, E. C. Information Gathering, Data Reduction and Information Dissemination for Residential Experiment Station Operations, MIT Lincoln Laboratory Report No. DOE/ET/20279-141, June 1981.

TABLE 1
FEATURES OF THE PHOTOVOLTAIC ENERGY SYSTEMS
IN THE SOUTHWEST RES PROTOTYPES

Prototype System	Module Supplier	Array Area (m^2)	Array Peak Power (kWp)	Mounting Method	Array Tilt (°)	Inverter Supplier	Inverter Size (kva)
ARCO Solar	ARCO Solar	88.2[c]	7.4	Direct	25	Windworks	8
ARTU	ARCO Solar	55.2[c]	4.9	Standoff	45	Windworks	8
BDM	Motorola	54.0	4.5[d]	Standoff	35	Helionetics[a]	6
General Electric	General Electric	76.2[c]	6.7	Direct	26.6	Abacus	6
Solarex	Solarex	68.4[c]	5.1[b]	Standoff	26	Abacus	6
TEA	Motorola	49.4	4.3[d]	Rack	26	Abacus	6
TriSolarCorp	Applied Solar	58.0	5.3[d]	Integral	30	Windworks	8
Westinghouse	ARCO Solar	73.4[c]	5.5	Integral	30	Abacus	6

Revision Dates

[a]28 January 1982

[b]22 February 1982 (retroactive)

[c]3 March 1982 (retroactive)

[d]1 April 1982 (retroactive)

TABLE 2
MONITORED HOUSE (MH) FEATURES

	MH1	MH2	MH3	MH4	MH5
Occupants	5	3	4	4	2
Working adults (daytime)	1	1	2	2	Retired
Size/Type of home	2,060 ft^2 single family detached	2,400 ft^2 single family detached	2,650 ft^2 single family detached	1,700 ft^2 single family detached	1,600 ft^2 attached town house
Space Heating System	Electric/ solar	Heat pump	Electric	Natural gas	Heat pump
Cooling System	Evaporative	Heat pump	Evaporative	Evaporative	Heat pump
Domestic Hot Water System	Solar/ electric backup	Electric	Electric	Electric	Solar/ electric backup
Cooking	Electric	Electric	Electric	Electric	Electric
Clothes Drying	Electric	Electric	Electric	Electric	Electric

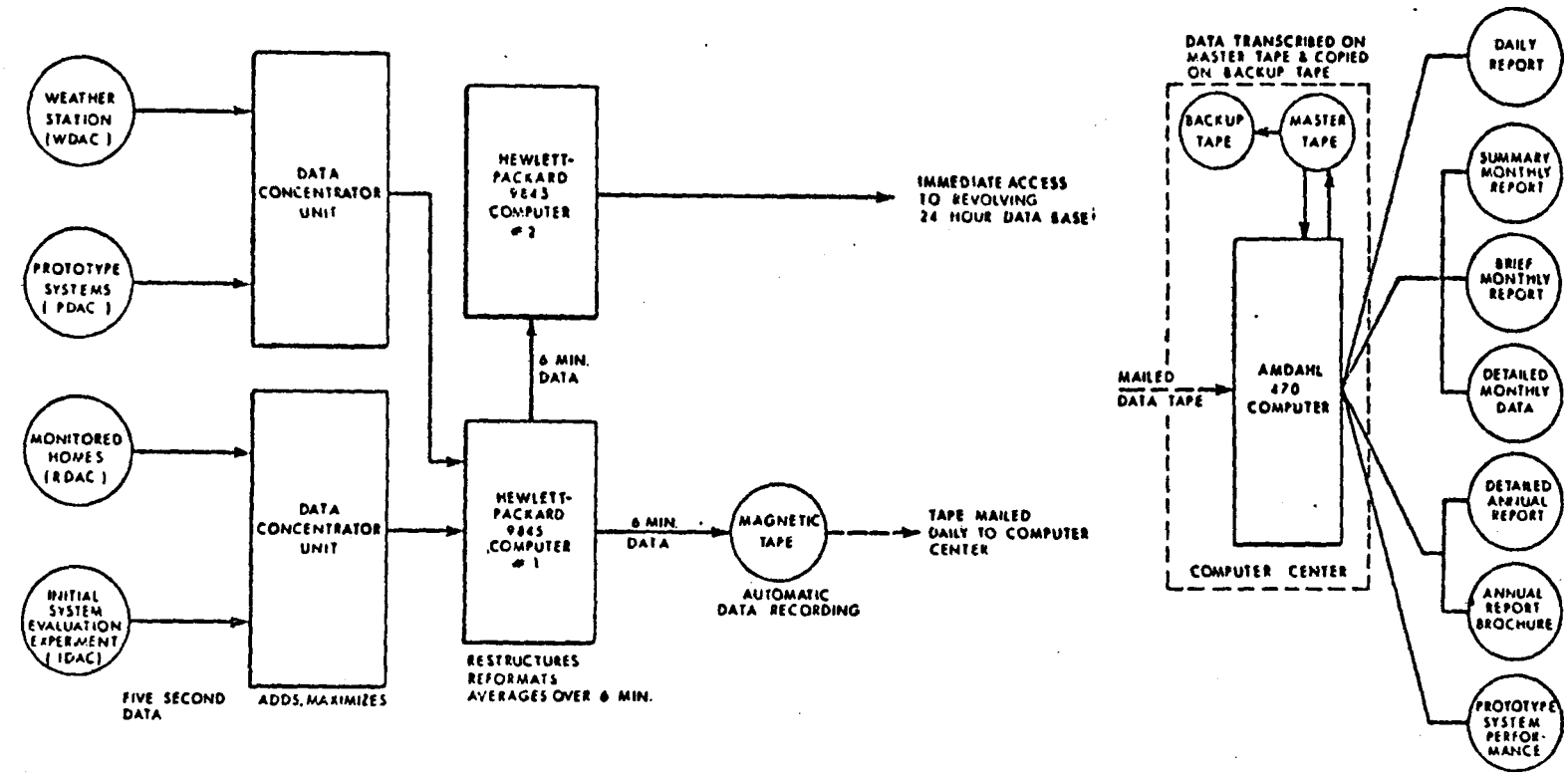


Figure 1. Flow Chart for Data Acquisition and Reporting of RES Operations

TABLE 3
DEFINITIONS OF QUANTITIES IN "MONTHLY SUMMARY"

METEOROLOGICAL INFORMATION	
Average daily maximum ambient air temp. (°C)	Average of highest 6-minute average readings for each day
Average daily minimum ambient air temp. (°C)	Average of lowest 6-minute-average readings for each day
Average ambient air temp. (°C)	Average of all 6-minute-average readings for month
Total degree days heating/cooling (°C day)	Heating base 18.3°C, cooling base 25.6°C
Total precipitation (cm)	Expressed in equivalent centimeters of water
Average wind speed (m/s)	Average of 6-minute-average readings for month
Average total horizontal insolation (kWh/m^2/day)	Sum of average-hour values for month
Sunhours (hours/month)	Algorithmically computed daylight hours
MONITORED HOUSE (MH) INFORMATION	
Average daily electric energy used (kWh/day)	Sum of average-hour values for month
Average daily electric energy used, sunhours (kWh/day)	Sum of average-hour values for month
Monitored house data hours/hours in month (%)	Percent of available data collected
PHOTOVOLTAIC (PV) SYSTEM INFORMATION	
Prototype PV Array Information*	
Average daily array DC energy (kWh/day)	Sum of average-hour values for month†
Average daily array DC energy/rated power (kWh/day/kWp)	Sum of average-hour values for month/rated peak array power†
Peak array power for month (kW)	Highest of all 6-minute-peak readings for month†
Average daily peak array power (kW)	Average of highest 6-minute-peak readings for each day†+
Average daily total tilt insolation (kWh/m^2/day)	Sum of average-hour values for month
Average daily tilt insolation, PV system on (kWh/m^2/day)	Sum of average-hour values for month
Insolation utilization efficiency (%)	Percent of total monthly insolation occurring during system on-hours†
Peak tilt irradiance for month (kW/m^2)	Highest of all 6-minute-peak readings for month
Average daily peak tilt irradiance (kW/m^2)	Average of highest 6-minute-peak readings for each day+
Array efficiency (%)	Average daily array DC energy output/average daily insolation during system on-hours/array area†
Average daily maximum array temp. (°C)	Average of highest 6-minute-average readings for each day+
Average daily minimum array temp. (°C)	Average of lowest 6-minute-average readings for each day
Prototype Power Conditioning System (PCS) Information*	
Average daily PCS AC energy output (kWh/day)	Sum of average-hour values for month†
Peak PCS power for month (kW)	Highest of all 6-minute-peak readings for month†
Average daily peak PCS power (kW)	Average of highest 6-minute-peak readings for each day†+
PCS efficiency (%)	Average daily PCU AC energy output/average daily array DC energy output†
Array and PCS data hours during sunhours/sunhours (%)	Percent available data collected during sunhours
System reliability (%)	Total hours of PV system being able to operate during sunhours/total sunhours in month
PV System-Utility Energy Flow§	
Average daily PCS AC energy output (kWh/day)	Sum of average-hour values for month
Average daily energy from utility feed (kWh/day)	Sum of average-hour values for month
Average daily energy to utility feed (kWh/day)	Sum of average-hour values for month
Average daily energy to load 5 a.m. to 8 p.m (kWh/day)	Sum of average-hour values for month
System-utility data hours/hours in month (%)	Percent of available data collected

*Requires that irradiance, array power, and inverter power data are all present.
†Values included only when inverter power was greater than 20 watts.
+Day is omitted from average if 1 consecutive hour of data is missing or invalid from 11 a.m. to 2 p.m.
§Requires that power from inverter, power to load, power to utility, and power from utility data are all present.

SECTION 1

RDS DATA FOR APRIL

MONTHLY SUMMARY

Month: April Year: 1982

SW RES Site Location
Latitude: 32°17' N
Longitude: 106°45' W
Elevation: 1,198 meters

METEOROLOGICAL INFORMATION	SW RES
Average daily maximum ambient air temp. (°C)	23.39
Average daily minimum ambient air temp. (°C)	8.77
Average ambient air temp. (°C)	16.82
Total degree days heating/cooling (°C day)	61./0
Total precipitation (cm/month)	0.10
Average wind speed (m/s)	3.72
Average total horizontal insolation (kWh/m²/day)	6.02
Sunhours (hours/month)	384.27

MONITORED HOUSE (MH) INFORMATION	MH1	MH2	MH3	MH4	MH5
Average daily electric energy used (kWh/day)	42.84	32.67	41.17	26.72	18.96
Average daily electric energy used, sunhours (kWh/day)	23.97	17.78	23.99	14.79	11.03
Monitored house data hours/hours in month (%)	95.31	89.51	91.44	95.22	95.17

PHOTOVOLTAIC (PV) SYSTEM INFORMATION

Prototype PV Array Information	TSC	SX	ARTU	ARCO	TEA	BDM	GE	WST
Average daily array DC energy (kWh/day)	28.85	-----	25.32	37.68	23.85	24.17	35.20	-----
Average daily array DC energy/rated power (kWh/day/kWp)	5.44	-----	5.17	5.09	5.55	5.37	5.25	-----
Peak array power for month (kW)	6.41	-----	6.33	9.14	5.72	5.70	7.85	-----
Average daily peak array power (kW)	5.23	-----	4.83	7.20	3.99	4.47	6.47	-----
Average daily total tilt insolation (kWh/m²/day)	6.32	6.20	5.78	6.34	6.21	6.04	6.27	6.36
Average daily tilt insolation PV system on (kWh/m²/day)	6.28	-----	5.73	6.31	6.14	5.96	6.23	-----
Insolation utilization efficiency (%)	99.28	-----	98.94	99.46	68.88	96.81	97.33	-----
Peak tilt irradiance for month (kW/m²)	1.43	1.40	1.31	1.41	1.37	1.33	1.36	1.34
Average daily peak tilt irradiance (kW/m²)	1.17	1.14	1.09	1.16	1.13	1.07	1.13	1.13
Array efficiency (%)	7.92	-----	8.01	6.77	7.87	7.51	7.41	-----
Average daily maximum array temp. (°C)	45.24	63.98	46.91	54.38	48.28	49.78	61.59	52.64
Average daily minimum array temp. (°C)	5.80	5.48	6.96	3.86	5.47	6.79	4.78	5.22

Prototype Power Conditioning System (PCS) Information	TSC	SX	ARTU	ARCO	TEA	BDM	GE	WST
Average daily PCS AC energy output (kWh/day)	26.86	-----	22.08	34.13	19.93	21.73	29.69	-----
Peak PCS power for month (kW)	6.00	-----	5.61	7.95	4.85	5.19	6.58	-----
Average daily peak PCS power (kW)	4.83	-----	4.28	6.51	3.42	4.09	5.47	-----
PCS efficiency (%)	0.93	-----	0.87	0.91	0.84	0.90	0.84	-----
Array and PCS data hours during sunhours/sunhours (%)	94.41	-----	94.41	94.31	65.98	91.62	93.97	-----
System reliability (%)	100	-----	100	100	76	97	100	-----

PV System-Utility Energy Flow	TSC	SX	ARTU	ARCO	TEA	BDM	GE	WST
Average daily PCS AC energy output (kWh/day)	26.75	-----	21.82	-----	19.10	21.56	29.07	-----
Average daily energy from utility feed (kWh/day)	6.10	-----	6.50	-----	7.06	6.51	7.61	-----
Average daily energy to utility feed (kWh/day)	19.42	-----	15.24	-----	13.33	14.59	22.10	-----
Average daily energy to load 5 a.m. to 8 p.m. (kWh/day)*	12.69	-----	12.36	-----	12.56	12.54	14.29	-----
System-utility data hours/hours in month (%)	94.28	-----	93.80	-----	59.01	88.59	92.98	-----

*Load imposed by MH5.

Notes: Power isolation system shut down April 6. Systemwide data losses on April 14 for 6 1/2 hours due to power outage and tape drive problem; on April 20-21 for 20 hours because of a tape-drive problem and change in SW RES/utility interface transformer and distribution boxes.
MH2 off-line April 28-30 for 43 hours due to a data transmission problem.
MH3 lost data due to intermittent data transmission.
TSC system on-line all month. Pyranometer adjusted on April 12.
SX PV system off-line all month due to inverter failure.
ARTU PV system on-line all month. Programmable load was off April 20 for 4 hours.
ARCO PV system on-line all month. Programmable load was off all month.
TEA PV system off-line 93 hours during sunhours due to "wake up" problems.
BDM PV system on-line all month until new site transformer was installed, then it went off-line three times for a total of 10 hours. The new transformer had raised the site line voltage. At times of peak line voltage (>254 volts), the inverter tripped out as per design. After the inverter cutoff voltage was increased, there were no more problems.
GE PV system on-line all month.
WST PV system off-line all month due to an inverter failure.

MONTHLY REPORT FOR MONITORED HOUSES

MONTHLY HOURLY AVERAGE
APRIL 1982

TOTAL ELECTRIC ENERGY USED (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	1.75	1.16	1.12	0.91	0.93	1.15	1.27	2.17	2.39	2.19	1.72	1.61	1.89	2.07	1.76	1.79	1.64	2.04	2.16	2.29	2.30	2.50	2.30	1.98	43.08
MH2	0.89	0.85	0.86	0.82	0.90	0.86	1.18	1.63	1.38	1.54	1.48	1.13	1.32	1.25	1.26	1.29	1.53	1.78	1.65	2.15	2.33	1.82	1.88	1.14	32.91
MH3	0.83	0.81	0.84	0.82	0.87	1.19	3.57	4.61	2.94	1.40	1.17	0.99	1.29	1.57	1.19	1.22	1.78	1.92	2.34	2.96	2.33	2.94	2.15	0.94	42.76
MH4	0.98	0.57	0.48	0.47	0.50	0.50	0.79	1.59	1.67	1.27	0.72	0.92	1.05	0.93	1.14	1.05	1.17	1.72	1.38	1.70	1.81	1.70	1.60	1.24	26.94
MH5	0.63	0.51	0.42	0.35	0.40	0.48	0.71	0.81	0.92	0.89	0.82	0.78	1.23	0.98	0.84	0.83	0.75	0.90	0.93	1.00	0.93	1.04	1.05	0.90	19.12

MONTHLY REPORT FOR PROTOTYPES

MONTHLY HOURLY AVERAGE
APRIL 1982

DC ARRAY OUTPUT (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.0	0.0	0.0	0.0	0.0	0.0	0.12	1.07	2.15	2.98	3.41	3.69	3.76	3.67	3.11	2.55	1.65	0.63	0.02	0.0	0.0	0.0	0.0	0.0	28.81
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.0	0.0	0.0	0.0	0.0	0.00	0.10	0.84	1.82	2.60	3.04	3.34	3.40	3.34	2.79	2.24	1.37	0.44	0.01	0.00	0.00	0.00	0.00	0.00	25.31
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.19	1.13	2.50	3.75	4.68	5.13	5.25	5.13	4.16	3.22	1.92	0.69	0.04	0.0	0.0	0.0	0.0	0.0	37.71
TEA	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.87	1.66	2.38	2.79	3.19	3.30	3.09	2.60	1.94	1.27	0.49	0.03	0.00	0.00	0.00	0.00	0.00	23.75
BDM	0.0	0.0	0.0	0.0	0.0	0.00	0.17	0.85	1.70	2.49	2.87	3.18	3.26	3.07	2.64	2.07	1.31	0.54	0.05	0.0	0.0	0.0	0.0	0.0	24.20
GE	0.0	0.0	0.0	0.0	0.0	0.00	0.10	1.14	2.49	3.64	4.19	4.63	4.79	4.49	3.75	2.99	1.85	0.53	0.01	0.0	0.0	0.0	0.0	0.0	34.62
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

AC INVERTER - REAL ENERGY OUTPUT (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.0	0.0	0.0	0.0	0.0	0.00	0.14	1.02	2.01	2.76	3.15	3.41	3.47	3.39	2.88	2.37	1.55	0.62	0.03	0.0	0.0	0.0	0.0	0.0	26.82
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.68	1.58	2.28	2.67	2.94	3.00	2.94	2.45	1.95	1.16	0.32	0.00	0.00	0.00	0.00	0.00	0.00	22.06
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.12	0.98	2.26	3.42	4.19	4.68	4.79	4.68	3.80	2.93	1.72	0.56	0.01	0.0	0.0	0.0	0.0	0.0	34.14
TEA	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.60	1.35	2.00	2.37	2.73	2.82	2.64	2.20	1.60	0.97	0.22	0.0	0.0	0.0	0.0	0.0	0.0	19.54
BDM	0.0	0.0	0.0	0.0	0.0	0.0	0.08	0.71	1.52	2.26	2.61	2.90	2.97	2.80	2.40	1.87	1.15	0.41	0.01	0.0	0.0	0.0	0.0	0.0	21.68
GE	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.88	2.16	3.12	3.57	3.94	4.07	3.82	3.19	2.54	1.53	0.37	0.0	0.0	0.0	0.0	0.0	0.0	29.21
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

LOAD IMPOSED ON THE PROTOTYPE (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.0	0.0	0.00	0.00	0.04	0.46	0.76	0.85	0.89	0.90	0.82	0.81	1.18	0.86	0.73	0.83	0.78	0.93	0.95	0.82	0.13	0.0	0.0	0.0	12.75
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.0	0.0	0.0	0.0	0.04	0.45	0.73	0.83	0.87	0.87	0.82	0.79	1.16	0.86	0.71	0.81	0.76	0.91	0.92	0.79	0.13	0.0	0.0	0.0	12.43
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TEA	0.0	0.0	0.0	0.0	0.0	0.38	0.61	0.95	0.97	1.09	0.89	0.85	1.04	0.87	0.73	0.74	0.74	0.90	0.93	0.77	0.13	0.00	0.0	0.0	12.61
BDM	0.00	0.00	0.00	0.01	0.04	0.48	0.68	0.76	0.82	0.87	0.76	0.80	1.15	0.81	0.75	0.88	0.84	0.90	0.96	0.82	0.21	0.00	0.02	0.00	12.58
GE	0.0	0.0	0.00	0.0	0.0	0.49	0.72	0.84	0.89	0.86	0.92	0.83	1.05	0.92	0.92	1.11	1.10	1.15	1.20	0.94	0.29	0.10	0.00	0.0	14.32
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY REPORT FOR PROTOTYPES

MONTHLY HOURLY AVERAGE
APRIL 1982

ENERGY SUPPLIED TO UTILITY (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.51	1.33	2.09	2.41	2.68	2.65	2.70	2.22	1.70	0.95	0.17	0.00	0.0	0.0	0.0	0.0	0.0	19.41
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.27	0.97	1.66	2.02	2.18	2.19	2.25	1.76	1.32	0.62	0.05	0.0	0.0	0.0	0.0	0.0	0.0	15.29
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TEA	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.24	0.73	1.32	1.67	2.01	2.18	2.00	1.59	1.09	0.50	0.04	0.0	0.0	0.0	0.0	0.0	0.0	13.36
BDM	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.28	0.90	1.61	1.89	2.15	2.15	2.13	1.69	1.17	0.54	0.05	0.00	0.0	0.0	0.0	0.0	0.0	14.57
GE	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.48	1.55	2.48	2.76	3.25	3.32	3.09	2.45	1.72	0.88	0.12	0.0	0.0	0.0	0.0	0.0	0.0	22.10
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

ENERGY SUPPLIED BY UTILITY (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.05	0.04	0.05	0.05	0.08	0.50	0.66	0.36	0.26	0.21	0.13	0.09	0.36	0.19	0.09	0.18	0.20	0.50	0.94	0.85	0.17	0.04	0.04	0.04	6.12
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.02	0.02	0.02	0.02	0.06	0.51	0.76	0.43	0.30	0.24	0.15	0.11	0.41	0.22	0.10	0.21	0.24	0.65	1.02	0.81	0.15	0.02	0.02	0.02	6.52
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TEA	0.02	0.02	0.02	0.02	0.02	0.42	0.61	0.60	0.40	0.45	0.24	0.14	0.40	0.29	0.18	0.27	0.29	0.75	0.97	0.80	0.15	0.02	0.02	0.02	7.10
BDM	0.05	0.05	0.05	0.06	0.09	0.53	0.64	0.36	0.26	0.23	0.11	0.10	0.38	0.19	0.09	0.23	0.25	0.57	0.99	0.87	0.26	0.06	0.06	0.05	6.53
GE	0.02	0.02	0.02	0.02	0.02	0.51	0.71	0.45	0.31	0.18	0.15	0.16	0.31	0.21	0.20	0.31	0.45	0.81	1.22	0.96	0.31	0.12	0.02	0.02	7.64
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

MAXIMUM INVERTER AC POWER (KW)
MAX POWER FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
TSC	0.0	0.0	0.0	0.0	0.0	0.00	0.50	1.59	2.60	3.37	3.75	3.86	4.06	3.90	3.51	2.93	2.17	1.10	0.14	0.0	0.0	0.0	0.0	0.0
SX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARTU	0.0	0.0	0.0	0.0	0.0	0.0	0.23	1.17	2.11	2.83	3.22	3.35	3.53	3.40	3.01	2.46	1.72	0.71	0.0	0.0	0.0	0.0	0.0	0.0
ARCO	0.0	0.0	0.0	0.0	0.0	0.0	0.41	1.66	3.06	4.31	5.06	5.32	5.50	5.41	4.67	3.70	2.53	1.08	0.04	0.0	0.0	0.0	0.0	0.0
TEA	0.0	0.0	0.0	0.0	0.0	0.0	0.20	1.08	1.84	2.41	2.80	3.10	3.24	3.11	2.73	2.15	1.49	0.56	0.0	0.0	0.0	0.0	0.0	0.0
BDM	0.0	0.0	0.0	0.0	0.0	0.0	0.29	1.14	2.04	2.74	3.17	3.33	3.41	3.28	2.91	2.36	1.65	0.78	0.04	0.0	0.0	0.0	0.0	0.0
GE	0.0	0.0	0.0	0.0	0.0	0.0	0.27	1.56	2.83	3.78	4.30	4.45	4.66	4.49	3.96	3.23	2.27	0.94	0.0	0.0	0.0	0.0	0.0	0.0
WST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

TOTAL TILT INSOLATION (KWH/M**2)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
TSC	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.26	0.45	0.63	0.76	0.83	0.85	0.83	0.65	0.50	0.32	0.14	0.02	0.00	0.00	0.00	0.00	0.00	6.31
SX	0.0	0.0	0.0	0.0	0.0	0.00	0.07	0.24	0.43	0.60	0.73	0.81	0.83	0.81	0.65	0.52	0.34	0.15	0.02	0.0	0.0	0.0	0.0	0.0	6.19
ARTU	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.19	0.37	0.53	0.66	0.76	0.80	0.77	0.63	0.50	0.33	0.16	0.02	0.00	0.00	0.00	0.00	0.00	5.78
ARCO	0.0	0.00	0.00	0.00	0.00	0.00	0.08	0.26	0.45	0.62	0.74	0.83	0.85	0.83	0.66	0.51	0.33	0.15	0.02	0.0	0.0	0.0	0.00	0.00	6.34
TEA	0.0	0.0	0.0	0.0	0.0	0.00	0.07	0.27	0.45	0.63	0.72	0.81	0.84	0.80	0.64	0.50	0.32	0.14	0.01	0.0	0.0	0.0	0.0	0.0	6.20
BDM	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.21	0.39	0.57	0.68	0.78	0.83	0.79	0.66	0.53	0.36	0.17	0.02	0.00	0.00	0.00	0.00	0.00	6.05
GE	0.0	0.0	0.0	0.0	0.0	0.00	0.07	0.26	0.45	0.64	0.74	0.82	0.85	0.80	0.65	0.50	0.32	0.14	0.01	0.0	0.0	0.0	0.0	0.0	6.26
WST	0.0	0.0	0.0	0.0	0.0	0.00	0.06	0.25	0.46	0.63	0.71	0.82	0.86	0.84	0.69	0.52	0.32	0.15	0.02	0.0	0.0	0.0	0.0	0.0	6.34

BRIEF MONTHLY REPORT FOR MONITORED HOUSE

MONTHLY HOURLY AVERAGE
APRIL 1982

ARCO - HYPOTHETICAL ENERGY TO UTILITY IF ARCO WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.13	0.84	1.83	2.62	3.27	3.20	2.92	2.32	1.61	0.67	0.04	0.0	0.0	0.0	0.0	0.0	0.0	19.45
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.25	1.40	2.46	3.07	3.66	3.70	3.62	2.70	1.91	0.84	0.07	0.0	0.0	0.0	0.0	0.0	0.0	23.69
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.09	0.67	1.90	3.14	3.71	3.60	3.34	2.69	1.92	0.66	0.06	0.0	0.0	0.0	0.0	0.0	0.0	21.78
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.31	1.30	2.48	3.49	3.77	3.76	3.75	2.78	2.01	0.87	0.09	0.0	0.0	0.0	0.0	0.0	0.0	24.62
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.46	1.60	2.81	3.46	3.93	3.77	3.83	3.01	2.22	1.09	0.13	0.0	0.0	0.0	0.0	0.0	0.0	26.32

MONTHLY HOURLY AVERAGE
APRIL 1982

ARTU - HYPOTHETICAL ENERGY TO UTILITY IF ARTU WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.04	0.43	0.98	1.37	1.76	1.70	1.51	1.20	0.89	0.31	0.01	0.0	0.0	0.0	0.0	0.0	0.0	10.20
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.10	0.80	1.40	1.67	1.97	1.97	1.93	1.48	1.05	0.41	0.02	0.0	0.0	0.0	0.0	0.0	0.0	12.80
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.36	1.04	1.69	2.02	1.94	1.79	1.43	1.05	0.33	0.02	0.0	0.0	0.0	0.0	0.0	0.0	11.72
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.16	0.77	1.45	2.01	2.11	2.10	2.08	1.54	1.14	0.44	0.03	0.0	0.0	0.0	0.0	0.0	0.0	13.82
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.25	0.98	1.71	1.99	2.21	2.14	2.19	1.71	1.30	0.60	0.04	0.0	0.0	0.0	0.0	0.0	0.0	15.11

MONTHLY HOURLY AVERAGE
APRIL 1982

BDM - HYPOTHETICAL ENERGY TO UTILITY IF BDM WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.03	0.38	0.91	1.32	1.72	1.61	1.38	1.16	0.85	0.31	0.01	0.0	0.0	0.0	0.0	0.0	0.0	9.70
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.10	0.74	1.32	1.60	1.92	1.87	1.85	1.44	1.00	0.41	0.03	0.0	0.0	0.0	0.0	0.0	0.0	12.38
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.05	0.35	1.00	1.62	1.98	1.96	1.73	1.39	1.01	0.31	0.03	0.0	0.0	0.0	0.0	0.0	0.0	11.44
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.15	0.70	1.33	1.98	2.08	2.04	2.01	1.50	1.09	0.42	0.04	0.0	0.0	0.0	0.0	0.0	0.0	13.36
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.27	0.93	1.60	1.92	2.17	2.11	2.07	1.67	1.26	0.59	0.06	0.0	0.0	0.0	0.0	0.0	0.0	14.64

MONTHLY HOURLY AVERAGE
APRIL 1982

GE - HYPOTHETICAL ENERGY TO UTILITY IF GE WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.12	0.75	1.52	2.08	2.60	2.53	2.20	1.81	1.33	0.55	0.03	0.0	0.0	0.0	0.0	0.0	0.0	15.52
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.24	1.27	2.10	2.50	2.93	3.03	2.83	2.17	1.57	0.70	0.05	0.0	0.0	0.0	0.0	0.0	0.0	19.40
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.09	0.60	1.58	2.55	2.98	2.91	2.59	2.13	1.57	0.55	0.04	0.0	0.0	0.0	0.0	0.0	0.0	17.59
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.30	1.18	2.11	2.88	3.05	3.09	2.94	2.23	1.67	0.73	0.06	0.0	0.0	0.0	0.0	0.0	0.0	20.24
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.44	1.46	2.43	2.85	3.19	3.12	3.03	2.44	1.86	0.92	0.08	0.0	0.0	0.0	0.0	0.0	0.0	21.83

BRIEF MONTHLY REPORT FOR MONITORED HOUSE

MONTHLY HOURLY AVERAGE
APRIL 1982

SX - HYPOTHETICAL ENERGY TO UTILITY IF SX WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

TEA - HYPOTHETICAL ENERGY TO UTILITY IF TEA WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.04	0.36	0.70	1.16	1.49	1.52	1.17	1.02	0.70	0.21	0.00	0.0	0.0	0.0	0.0	0.0	0.0	8.37
MH2	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.05	0.63	1.11	1.39	1.71	1.86	1.82	1.28	0.81	0.33	0.02	0.0	0.0	0.0	0.0	0.0	0.0	11.01
MH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.25	0.74	1.37	1.89	1.80	1.48	1.22	0.82	0.24	0.01	0.0	0.0	0.0	0.0	0.0	0.0	9.87
MH4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.11	0.60	1.16	1.80	2.00	1.91	1.86	1.34	0.93	0.34	0.02	0.0	0.0	0.0	0.0	0.0	0.0	12.09
MH5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.21	0.74	1.30	1.71	1.92	2.11	1.95	1.47	1.01	0.46	0.04	0.0	0.0	0.0	0.0	0.0	0.0	12.91

MONTHLY HOURLY AVERAGE
APRIL 1982

TSC - HYPOTHETICAL ENERGY TO UTILITY IF TSC WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.14	0.67	1.31	1.75	2.14	2.07	1.86	1.54	1.18	0.54	0.05	0.0	0.0	0.0	0.0	0.0	0.0	13.25
MH2	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.26	1.16	1.83	2.08	2.40	2.40	2.35	1.86	1.42	0.69	0.08	0.0	0.0	0.0	0.0	0.0	0.0	16.52
MH3	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.09	0.54	1.38	2.13	2.46	2.35	2.16	1.81	1.41	0.55	0.07	0.0	0.0	0.0	0.0	0.0	0.0	14.96
MH4	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.33	1.08	1.86	2.47	2.55	2.53	2.50	1.92	1.51	0.72	0.11	0.0	0.0	0.0	0.0	0.0	0.0	17.60
MH5	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.50	1.36	2.16	2.44	2.66	2.55	2.60	2.12	1.69	0.93	0.14	0.00	0.0	0.0	0.0	0.0	0.0	19.17

MONTHLY HOURLY AVERAGE
APRIL 1982

WST - HYPOTHETICAL ENERGY TO UTILITY IF WST WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MH5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

BRIEF MONTHLY REPORT FOR MONITORED HOUSE

MONTHLY HOURLY AVERAGE
APRIL 1982

ARCO - HYPOTHETICAL ENERGY FROM UTILITY IF ARCO WERE INSTALLED AT EACH MH(KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	1.83	1.16	1.22	1.00	0.96	1.33	1.27	1.27	0.83	0.46	0.13	0.20	0.31	0.35	0.29	0.57	0.75	1.58	2.07	2.30	2.43	2.68	2.23	1.92	29.14
MH2	0.93	0.86	0.88	0.78	0.97	0.93	1.24	0.92	0.28	0.43	0.22	0.04	0.09	0.05	0.22	0.39	0.73	1.31	1.56	1.93	2.20	1.90	2.07	1.13	22.05
MH3	0.88	0.81	0.84	0.88	0.87	1.41	3.90	3.83	1.20	0.18	0.07	0.03	0.04	0.20	0.12	0.12	0.83	1.57	2.04	2.83	2.16	3.22	1.99	0.90	31.05
MH4	0.84	0.56	0.45	0.48	0.46	0.48	0.78	0.89	0.46	0.12	0.02	0.01	0.04	0.01	0.11	0.17	0.35	1.33	1.38	1.60	1.84	1.66	1.44	1.00	16.59
MH5	0.64	0.55	0.44	0.34	0.41	0.50	0.63	0.33	0.24	0.17	0.08	0.04	0.22	0.15	0.06	0.17	0.16	0.52	0.85	0.93	0.92	1.05	1.10	0.96	11.55

MONTHLY HOURLY AVERAGE
APRIL 1982

ARTU - HYPOTHETICAL ENERGY FROM UTILITY IF ARTU WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	1.83	1.16	1.22	0.99	0.96	1.37	1.40	1.50	1.14	0.79	0.37	0.41	0.62	0.68	0.51	0.84	0.99	1.81	2.12	2.30	2.43	2.67	2.22	1.92	32.24
MH2	0.92	0.85	0.88	0.78	0.97	0.98	1.36	1.08	0.37	0.58	0.31	0.11	0.13	0.15	0.33	0.51	0.85	1.51	1.61	1.93	2.19	1.90	2.07	1.13	23.50
MH3	0.87	0.80	0.84	0.99	0.87	1.45	4.03	4.12	1.59	0.38	0.16	0.08	0.18	0.40	0.19	0.25	1.07	1.80	2.09	2.83	2.15	3.22	1.99	0.90	33.26
MH4	0.94	0.55	0.45	0.48	0.46	0.52	0.90	1.03	0.60	0.23	0.05	0.10	0.15	0.07	0.21	0.28	0.48	1.54	1.43	1.59	1.83	1.66	1.43	1.00	17.98
MH5	0.64	0.54	0.44	0.34	0.41	0.54	0.75	0.41	0.33	0.27	0.13	0.06	0.37	0.23	0.10	0.23	0.24	0.70	1.00	0.92	0.91	1.05	1.08	0.95	12.66

MONTHLY HOURLY AVERAGE
APRIL 1982

BDM - HYPOTHETICAL ENERGY FROM UTILITY IF BDM WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	1.78	1.18	1.21	1.02	0.99	1.38	1.36	1.49	1.20	0.82	0.39	0.40	0.62	0.67	0.52	0.86	0.98	1.73	2.01	2.34	2.45	2.67	2.28	1.98	32.35
MH2	0.96	0.86	0.90	0.81	0.98	0.96	1.31	1.11	0.39	0.61	0.33	0.10	0.10	0.15	0.34	0.53	0.89	1.49	1.57	1.89	2.26	1.97	2.15	1.17	23.94
MH3	0.92	0.81	0.88	1.00	0.91	1.46	4.08	4.12	1.52	0.35	0.17	0.09	0.26	0.48	0.20	0.24	1.12	1.70	2.08	2.94	2.23	3.30	2.04	0.94	33.82
MH4	1.00	0.58	0.49	0.49	0.47	0.50	0.83	1.03	0.64	0.24	0.04	0.09	0.14	0.13	0.22	0.29	0.50	1.48	1.35	1.63	1.90	1.73	1.41	1.01	19.19
MH5	0.67	0.58	0.47	0.37	0.44	0.52	0.65	0.40	0.35	0.28	0.13	0.06	0.34	0.24	0.11	0.26	0.28	0.63	0.92	0.94	0.94	1.07	1.09	0.92	12.65

MONTHLY HOURLY AVERAGE
APRIL 1982

GE - HYPOTHETICAL ENERGY FROM UTILITY IF GE WERE INSTALLED AT EACH MH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
MH1	1.85	1.18	1.23	1.01	0.98	1.35	1.38	1.37	0.93	0.56	0.20	0.27	0.43	0.48	0.39	0.67	0.84	1.78	2.05	2.32	2.45	2.69	2.24	1.94	30.62
MH2	0.95	0.88	0.90	0.80	0.98	0.95	1.34	0.98	0.32	0.50	0.26	0.07	0.06	0.08	0.26	0.43	0.78	1.51	1.55	1.95	2.22	1.92	2.09	1.15	22.92
MH3	0.90	0.82	0.86	1.00	0.89	1.42	4.01	3.94	1.31	0.24	0.10	0.05	0.08	0.28	0.16	0.16	0.83	1.78	2.03	2.85	2.18	3.24	2.01	0.92	32.16
MH4	0.96	0.57	0.47	0.49	0.48	0.50	0.88	0.98	0.52	0.16	0.03	0.05	0.08	0.03	0.17	0.21	0.41	1.53	1.36	1.61	1.86	1.68	1.45	1.02	17.51
MH5	0.66	0.56	0.46	0.36	0.43	0.51	0.73	0.41	0.28	0.21	0.10	0.06	0.25	0.19	0.10	0.19	0.20	0.70	0.93	0.94	0.94	1.07	1.11	0.98	12.38

BRIEF MONTHLY REPORT FOR MONITORED HOUSE

MONTHLY HOURLY AVERAGE
APRIL 1982

SX - HYPOTHETICAL ENERGY FROM UTILITY IF SX WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONTHLY HOURLY AVERAGE
APRIL 1982

TEA - HYPOTHETICAL ENERGY FROM UTILITY IF TEA WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	1.70	1.21	1.21	1.04	0.92	1.13	1.28	1.54	0.98	1.03	0.42	0.40	0.40	0.70	0.68	0.89	1.00	1.92	1.87	3.28	2.52	2.87	2.34	1.92	32.29
HH2	1.03	0.74	0.85	0.75	1.05	0.97	1.19	1.20	0.44	0.99	0.49	0.14	0.05	0.19	0.42	0.45	0.76	1.60	1.61	2.06	2.26	1.88	1.87	1.22	24.35
HH3	0.85	0.81	0.93	1.05	0.92	1.10	4.68	4.83	1.80	0.33	0.14	0.05	0.17	0.32	0.20	0.35	1.22	1.77	2.01	2.54	2.16	2.21	1.96	0.87	34.37
HH4	1.07	0.59	0.46	0.46	0.46	0.35	0.90	0.99	0.60	0.30	0.05	0.08	0.19	0.10	0.30	0.38	0.48	1.59	1.40	1.73	1.95	1.73	1.47	1.00	19.63
HH5	0.76	0.59	0.41	0.34	0.36	0.40	0.56	0.49	0.35	0.44	0.17	0.05	0.40	0.24	0.18	0.33	0.30	0.76	0.96	0.95	0.98	1.14	1.20	1.04	13.40

MONTHLY HOURLY AVERAGE
APRIL 1982

TSC - HYPOTHETICAL ENERGY FROM UTILITY IF TSC WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	1.85	1.18	1.24	1.01	0.88	1.36	1.25	1.23	0.92	0.62	0.28	0.33	0.81	0.58	0.42	0.70	0.81	1.83	2.00	2.31	2.45	2.69	2.24	1.84	30.43
HH2	0.85	0.87	0.90	0.80	0.88	0.95	1.21	0.88	0.29	0.50	0.27	0.07	0.10	0.11	0.29	0.44	0.75	1.26	1.50	1.84	2.21	1.92	2.00	1.15	22.43
HH3	0.90	0.82	0.86	1.01	0.88	1.42	3.88	3.79	1.33	0.27	0.11	0.05	0.12	0.32	0.15	0.17	0.90	1.52	1.98	2.85	2.17	2.24	2.01	0.92	31.68
HH4	0.96	0.57	0.47	0.48	0.48	0.48	0.77	0.88	0.50	0.16	0.04	0.07	0.12	0.04	0.14	0.22	0.36	1.29	1.31	1.61	1.85	1.68	1.45	1.02	17.01
HH5	0.66	0.56	0.46	0.36	0.43	0.51	0.62	0.31	0.26	0.21	0.10	0.05	0.30	0.20	0.09	0.20	0.18	0.48	0.88	0.84	0.93	1.07	1.11	0.98	11.89

MONTHLY HOURLY AVERAGE
APRIL 1982

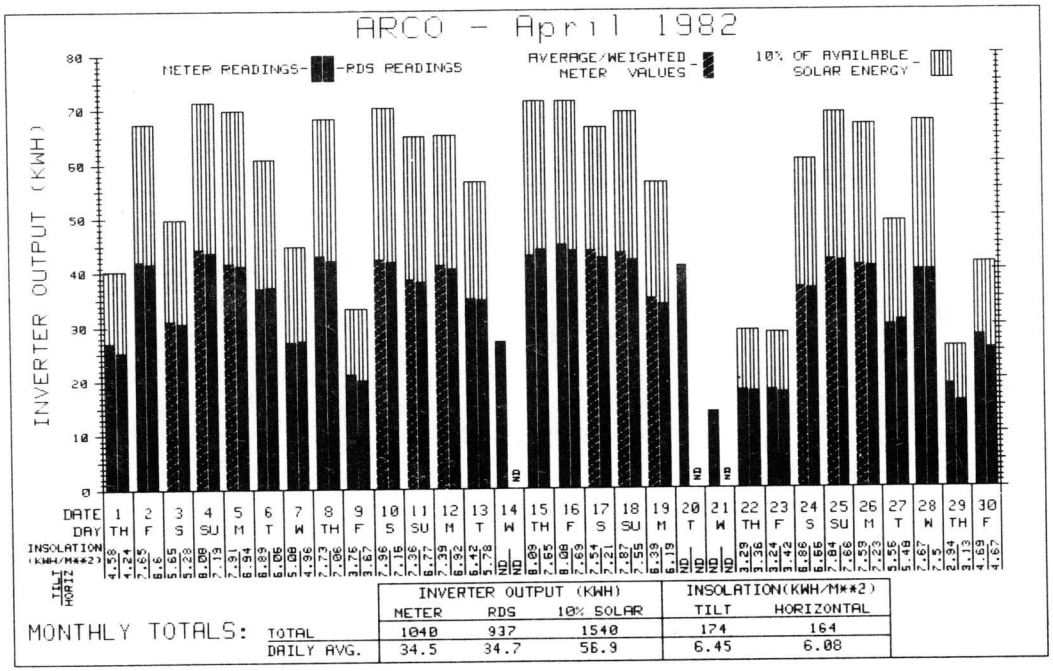
WST - HYPOTHETICAL ENERGY FROM UTILITY IF WST WERE INSTALLED AT EACH HH (KWH)
ENERGY FOR EACH HOUR ENDING AT LOCAL STANDARD TIME

HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
HH1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HH5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SECTION 2

ENERGY HISTOGRAMS FOR APRIL

Source of data is RDS and recording kilowatt hour meters. Comments on each histogram explain data and/or energy production anomalies. No RDS data is included for April 14, 20, and 21. A significant fraction of data was lost on those dates due to data collection system problems.



	INVERTER OUTPUT (KWH)			INSOLATION(KWH/M**2)	
	METER	RDS	10% SOLAR	TILT	HORIZONTAL
TOTAL	1040	937	1540	174	164
DAILY AVG.	34.5	34.7	56.9	6.45	6.08

ARCO - April 1982

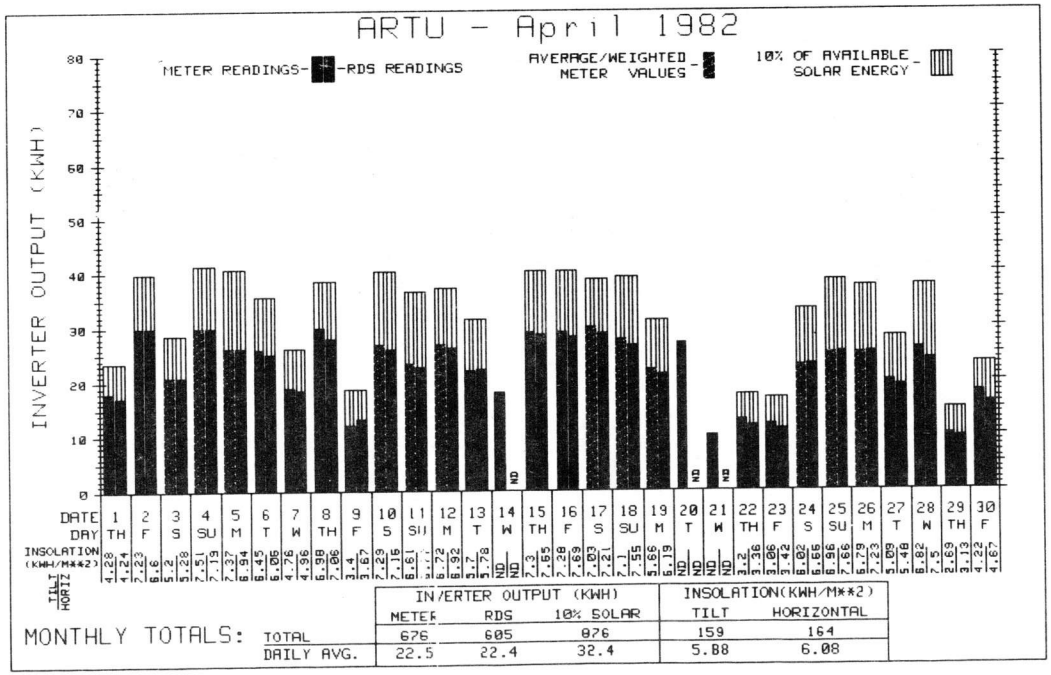
COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

4-12 PYRANOMETER ADJUSTED



	IN/ERTER OUTPUT (KWH)			INSOLATION(KWH/M**2)	
	METER	RDS	10% SOLAR	TILT	HORIZONTAL
TOTAL	676	605	876	159	164
DAILY AVG.	22.5	22.4	32.4	5.88	6.08

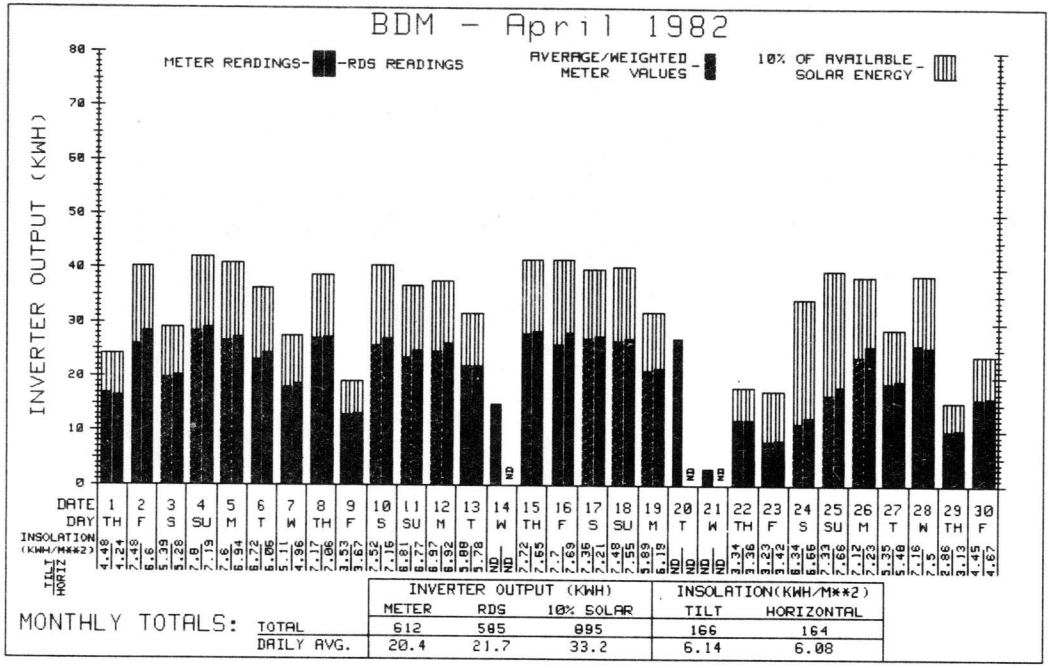
ARTU - April 1982

COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE



BDM - April 1982

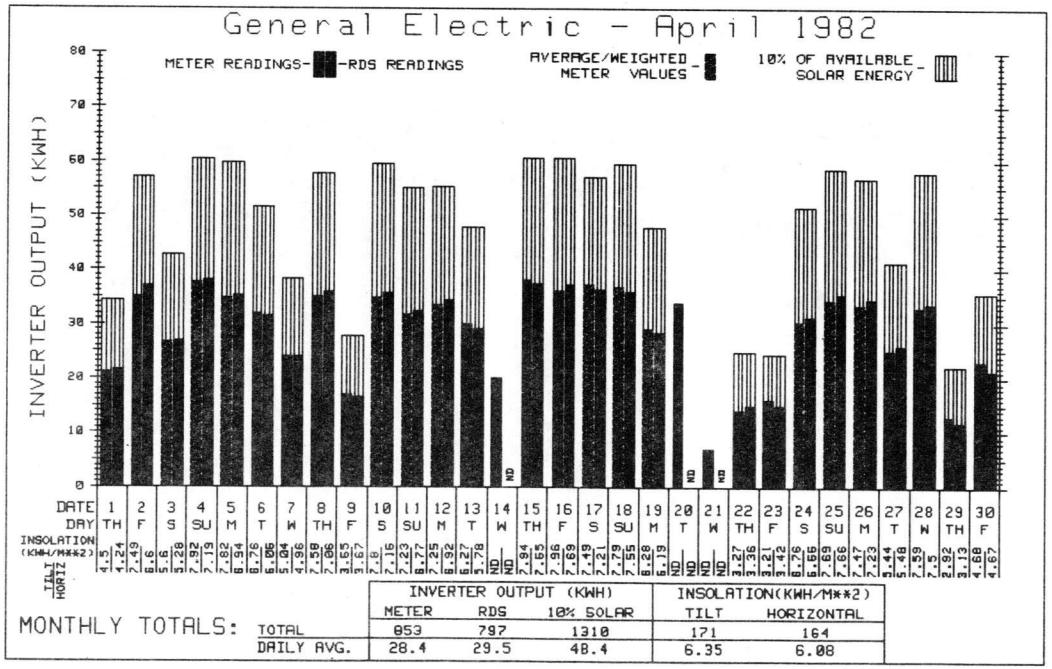
COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

4-8 PYRANOMETER ADJUSTED



General Electric - April 1982

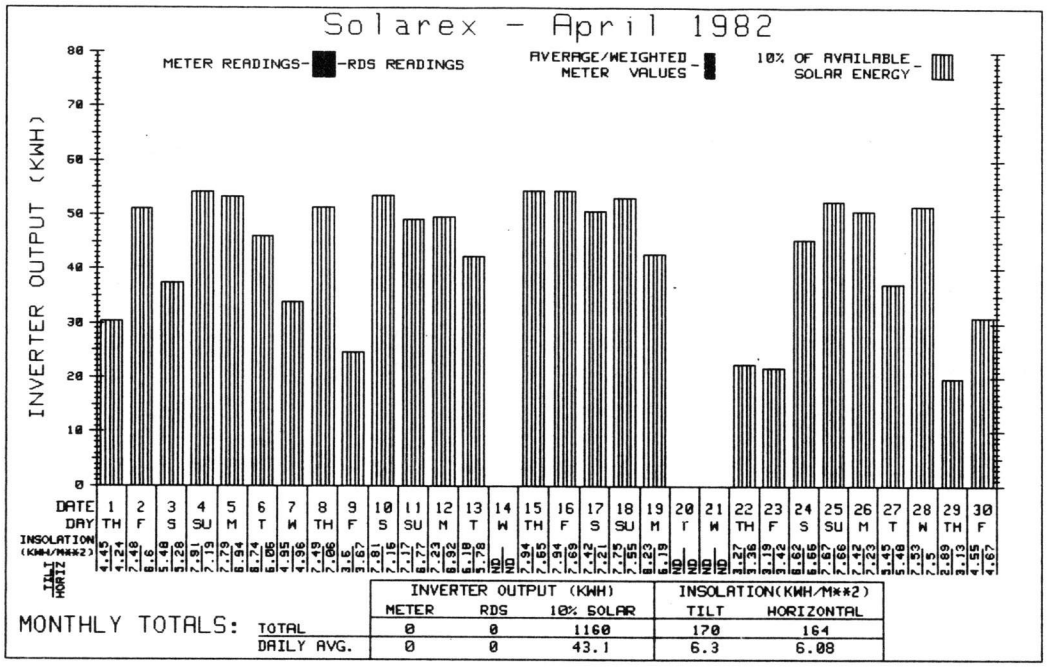
COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

4-13 INVERTER MODIFICATIONS PERFORMED.



Solarex - April 1982

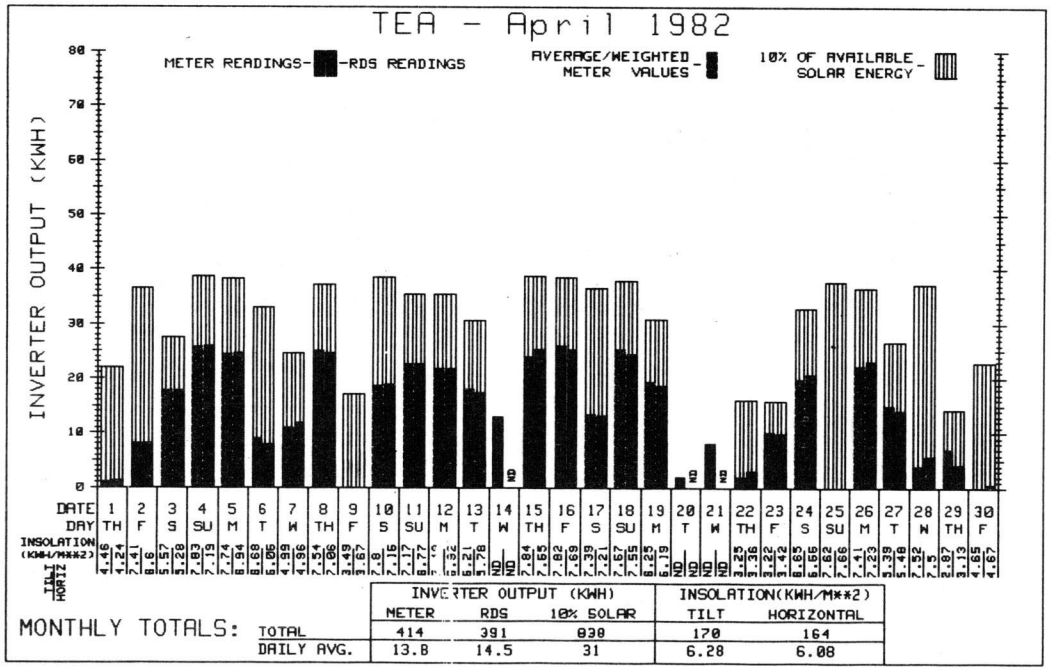
COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

SOLAREX NOT OPERATED THIS MONTH



TEA - April 1982

COMMENTS:

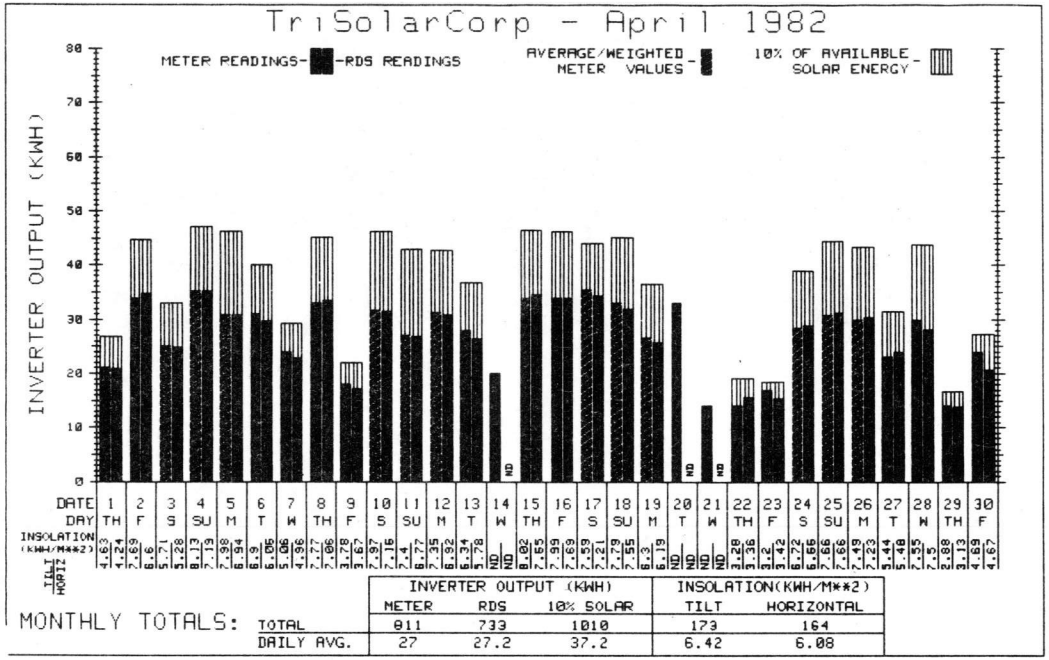
'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

TEA EXPERIENCED MORNING START-UP PROBLEMS 4-2,3,6,7,9,13, 17,19,21,22,30.

4-1 REPLACED DC SHUNT @ 1200 HRS.



MONTHLY TOTALS:

	INVERTER OUTPUT (KWH)			INSOLATION(KWH/M**2)	
	METER	RDS	10% SOLAR	TILT	HORIZONTAL
TOTAL	811	733	1010	173	164
DAILY AVG.	27	27.2	37.2	6.42	6.08

TriSolarCorp - April 1982

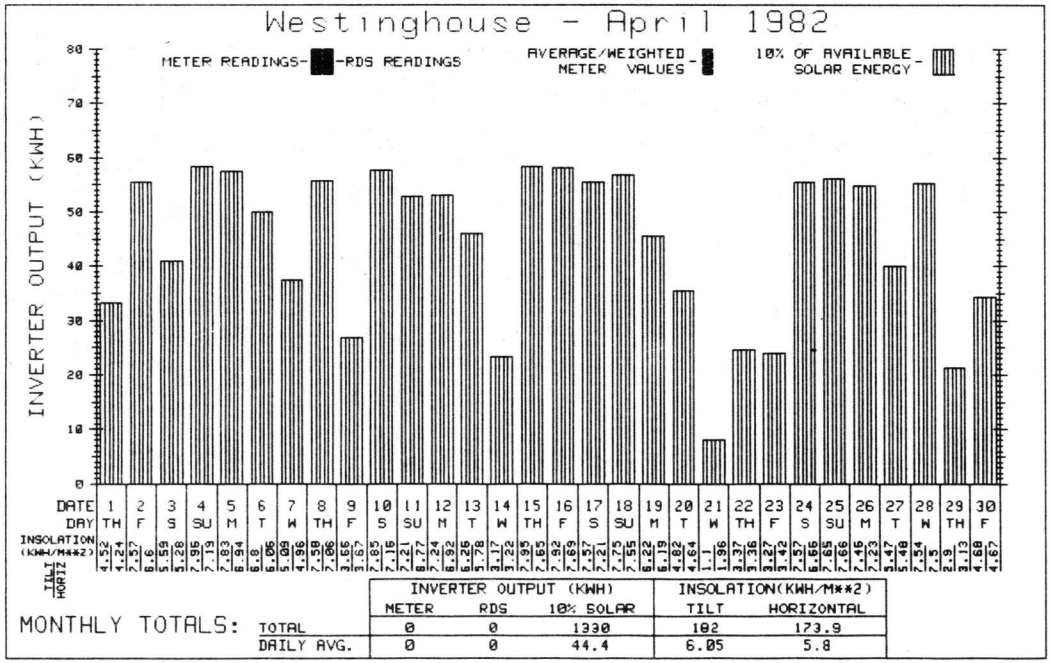
COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

4-12 PYRANOMETER ADJUSTED



MONTHLY TOTALS:

	INVERTER OUTPUT (KWH)			INSOLATION(KWH/M**2)	
	METER	RDS	10% SOLAR	TILT	HORIZONTAL
TOTAL	0	0	1330	182	173.9
DAILY AVG.	0	0	44.4	6.05	5.8

Westinghouse - April 1982

COMMENTS:

'ND'=NO RDS DATA

WHEN METER READINGS SPAN MORE THAN ONE DAY, VALUES ARE DETERMINED BY WEIGHTING WITH RDS DATA IF APPLICABLE OR BY AVERAGING. WHEN THE SYSTEM OUTPUT (METER AND/OR RDS VALUES) ARE EQUAL TO OR GREATER THAN THE VALUE CALCULATED FOR THE '% OF AVAILABLE SOLAR ENERGY' BENCHMARK, THE LATTER VALUE IS REPRESENTED BY A SINGLE HORIZONTAL LINE IN THE COLUMN(S) IN WHICH IT IS THE LESSER VALUE. THE BENCHMARK IS PROVIDED TO SHOW WHAT THE ENERGY OUTPUT WOULD BE IF THE SYSTEM (ARRAY AND PCU) WAS 10% EFFICIENT.

DATE

4-12 PYRANOMETER ADJUSTED.