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EVALUATION OF SURFACE ENERGY AND RADIATION BALANCE SYSTEMS ON THE KONZA PRAIRIE

Part A

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ABSTRACT

This report consists of three parts, A to C. Part A is discussed in this document. Parts B and C are results from a subcontract with Dr. Lloyd Gay from the University of Arizona and are presented in separate documents. Part B is entitled Evaluation of Surface Radiation and Energy Balance Stations on the Konza Prairie and Part C is entitled Evaluation of Atmospheric Effects on Remotely Sensed Surface Temperatures

Four Surface Energy and Radiation Balance Systems (SERBS) were installed and operated for two weeks in Kansas during July of 1986. During the first week a comparative study of various equipment was conducted by five research groups. During the second week, surface energy and radiation balances were investigated on six sites (top of a ridge, bottom land, and east, west, south, and north facing slopes) on the Konza Prairie located about 3 km south of Manhattan, KS.

Measurements were made to allow the computation of the radiation components: total solar and diffuse radiation; reflected solar radiation; net radiation; longwave radiation upward and downward. In addition, measurements were made to allow the computation of the sensible and latent heat fluxes by the Bowen ratio method using differential psychrometers on automatic exchange mechanisms. Data were sampled at 30 s intervals with battery operated computer controlled data acquisition systems. A total of 64 sensors were monitored by 4 separate systems for a total of 64 system days.

This report includes a description of the experimental sites, data acquisition systems and sensors, data acquisition system operating instructions, and software used for data acquisition and analysis. In addition, data listings and plots of the energy balance components for all days and systems are given.

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1. INTRODUCTION

This report contains the results of two activities conducted during the summer of 1986. First, a comparative study of flux densities measured over a stubble surface was conducted for a period of one week by five research groups. Second, after the comparative study, Dr. Gay and I studied the energy and radiation balances on six sites on the Konza Prairie.

The comparison study was conducted during the period July 12 to July 19, 1987 on the Ashland Experimental Farm located about 10 km south of Manhattan, Kansas. The following groups participated:

GROUP	NUMBER AND TYPE OF EQUIPMENT USED
Lloyd Gay University of Arizona	4-Bowen ratio energy balance systems
Edward Kanemasu Kansas State University	2-Bowen ratio energy balance systems
Leo Fritschen University of Washington	4-Bowen ratio energy balance systems
Harrold Weaver U. S. Geological Survey	2-Bowen ratio energy balance systems and 2-eddy correlation systems
Burt Tanner Campbell Scientific	2-Bowen ratio energy balance systems and 2-eddy correlation systems

The data I collected during this test are contained in this report. The results of the comparisons are being presented elsewhere.

Following the Ashland study, Dr. Gay and I moved our Surface Energy and Radiation Balance Systems (SERBS) to the same sites on the Konza (Figure 4.1.) that we studied during June of 1985. The Konza Prairie about 3 km south of Manhattan, KS. Data collection started on July 19, 1987 and terminated on July 26, 1987. The data collected during this period are reported hear. These studies, in addition to providing energy and radiation balance data, were also used to evaluate the systems in hot humid conditions with frequent and intense thunderstorms.

The unique instrumentation, the data acquisition systems, the method of analyses, and the data collected during the studies referred to above are presented in this report.

2. THE ASHLAND EXPERIMENTAL FARM SITES

The experimental equipment of the various groups was arrayed from west to east at 10 m intervals across the north end of the lysimeter field on the Ashland Experimental Farm which is about 10 km south of Manhattan, Kansas. The field was covered with stubble which had been knocked down. In addition, some wheat sprouting was evident. The University of Washington SERBS were located on the western most 40 m of the equipment line.

3. THE KONZA PRAIRIE SITES

The locations of the SERBS on the Konza Prairie stations operated by the University of Washington are shown in Figure 4.1 as N, S, E and W. Two additional stations operated by the University of Arizona are shown by B and T. All heights are in m msl. The sites were chosen to represent the greatest variability in the energy balance components. That is N, S, E and W exposures at midslopes below the limestone outcrops. The T site was on top of the limestone outcrop while the B site was on the deep soil in the valley bottom. The systems were located on the slopes as follows: 1, north; 7, east; 8, west; and 9, south.

4. THE WEATHER

Two intense storms occurred during the installation of the SERBS at the Ashland Experimental Farm. The site was under water for one day after the second storm. The wind shifted to the south and blew at 3 to 6 m s^{-1} for the rest of the week. Air temperatures increased exceeding 36 ^{o}C at 15 cm above the soil surface on the last two days of the first week. The relative humidity dropped with the increasing temperature and strong winds. The skies were very clear. The second week generally was dry. There were several cloudy days and a few showers.

5. DATA ACQUISITION

A small, inexpensive personal computer (NEC PC-8201A) was used at each site to control the psychrometer Automatic Exchange Mechanism (AEM) and to sample, process, and store the data via the data acquisition system. Model ADC-1 data acquisition systems (Remote Measurements Systems) were used for data acquisition. These systems are modified so that the instrumentation amplifier can be used with all 16 analog inputs (rather than just the first 8), and so that two separate offset voltages can be applied to the instrumentation amplifier input from an external source. The offset voltages were supplied by an auxiliary module attached to each system. These modules also supplied constant current sources, regulated output voltages and served as the interface between sensors and the ADC-1. Power consumption of the system is given in Appendix 9.6.6.

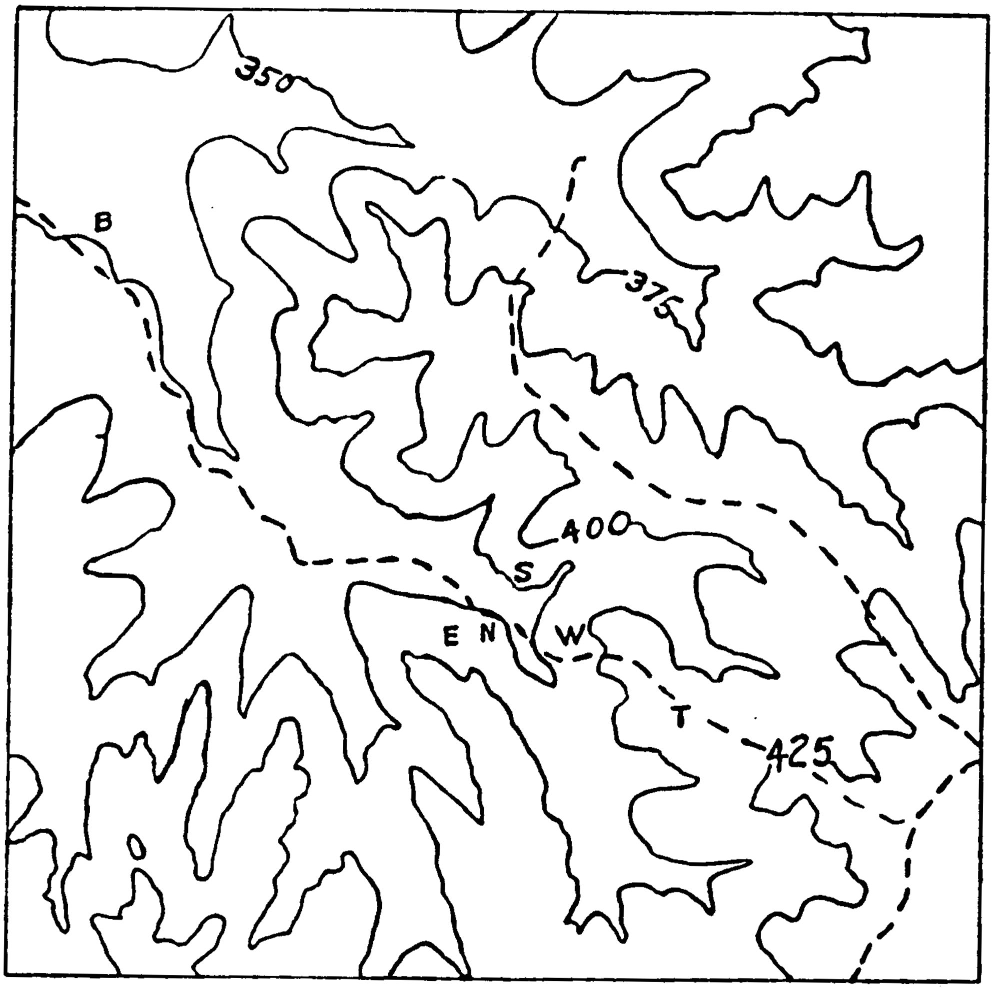


Figure 4.1. The location of the surface energy balance stations on the Konza Prairie near Manhattan, KS. The northeast corner is located at 4331000mN, 706000mE on the Swede Creek, Kans. SE/4 Manhattan 15' Quadrangle map. The sites are about 39° 05' N latitude and 96° 35' E longitude.

5.1 Computer

The computer directed the ADC-1 to sample the data channels at 30-s intervals, with digital information being passed to the computer via an RS-232 port. The computer also activated the AEM every 6 minutes to interchange the psychrometers. After activation, the computer delayed sampling for two minutes to allow the psychrometers to attain equilibrium at their new locations. Under computer control, raw data were averaged at 6 minute intervals and recorded at 30 minute intervals on the half hour on a cassette tape recorder (NEC PC-8200). The computer was programmed so that the field operator could review the instantaneous data (sampled at 30-s intervals) in raw form or in engineering units using a single a keyboard command. In addition, a third keyboard command displayed calculated values of the energy budget components, computed and updated at 6 minute intervals, and a fourth display contained the instantaneous, present 6-minute, past 6-minute and 12 minute averages of the temperatures and the temperature differences.

The computer, data system, tape recorder and two small batteries were housed in a 40 quart Coleman cooler which was covered with a space blanket. This was done to keep the computer at a reasonably constant temperature; in addition the space blanket was used to keep liquid water out of the cooler.

5.2 Data Acquisition System

The data acquisition system was connected to the RS-232 port of each computer. The ADC-1 contains 16 channels for analog inputs, 4 channels for digital inputs and 6 output functions. The basic millivolt ranges were + 400 (low gain) and + 20 mV (high gain, using the instrumentation amplifier). Schematic diagram of the system are shown in Appendix 9.5.

The basic systems were modified so that two offset voltages, nominally 140 and 270 mV, could be applied to the instrumentation amplifier signal input. Four possible gain/offset combinations resulted, randomly accessible to any of the 16 channels: low gain; high gain; high gain with 140 mV offset; and high gain with 270 mV offset. A schematic diagram of these modifications (Figure 9.8) is supplied as an overlay to the basic system schematic (Figure 9.7).

5.3 Auxiliary Module

Auxiliary modules were constructed for each system and attached underneath. These modules supplied the ADC-1 offset voltages through the use of one constant current source and a series string of precision resistors. Two other constant current sources supplied the various temperature sensors. A 5 V regulator supplied power to the data system while a 6 V regulator supplied power to the computer. The sensors were interfaced to the terminal strips supplied on the ADC-1 by means of seven plug connectors on the auxiliary module. Primary power was supplied by a 12 Vdc deep cycle RV battery.

A schematic of the sensor interface wiring is given in Appendix 9.1. Wiring diagrams, detailed descriptions and adjustment procedures for the constant current sources and the offset voltages are given in Appendix 9.3.2.

The potentiometers used for current source adjustment are accessible through the side of the auxiliary module. The current source circuit is described in the National Semiconductor Application note "LM-334 3-Terminal Adjustable Current Source". The location and identification of these adjustments are shown in Figure 9.4. The offset voltage is adjusted with a ten turn potentiometer and ten turn dial located on the side of the auxiliary module. Wiring diagrams, detailed descriptions and adjustment procedure for the constant current sources and the offset voltages are given in Appendix 9.3. A schematic of the sensor interface wiring is given in Appendix 9.1.

5.4 System calibration

There are two basic adjustments for the analog input section of the ADC-1: the analog to digital converter (A/D) reference voltage via trimpot R1 and the instrumentation gain adjustment via trimpot R50 (see the ADC-1 Owner's Manual supplied by Remote Measurement Systems for component identification and details). Small holes were drilled in the side of the ADC-1 where the RS-232 connector is located to make these adjustments accessible with the ADC-1 completely assembled. R1 is accessible using a long, narrow screwdriver through the hole on the right hand side. R50 can be adjusted by inserting a small screwdriver into the flexible plastic tubing protruding slightly from the right-hand hole on the RS-232 connector.

5.4.1 Pre-experimental calibration

The ADC-1's and the offset voltages were calibrated using a precision potentiometric bridge with 1 microvolt resolution, and an absolute accuracy of $\pm$ 0.02% of the reading $\pm$ 1 digit (Electro Scientific Industries model 300PVB. The offset voltages were adjusted using potentiometers OS1 and OS2 (Figure 9.4) to adjust the voltage measured by the ESI. The ADC-1 low gain was calibrated using potentiometer R1 of the ADC-1 and the ESI as a precision voltage source set to 300 mV. All systems were adjusted to read 3000 raw A/D units. The standard deviation of 10 readings was 0 units. Once this was set, high gain was selected and calibrated with the input set at 15 mV. All systems were adjusted to read 3000 raw A/D units. The standard deviation of 10 readings was $\pm$ 0.7 units.

5.4.2 Previous calibration and temperature coefficient determination

A calibration performed after the 1984 ASCOT experiment gave results which agreed to within +_ 1 digit of the pre-experimental calibrations. Temperature coefficients of the combined ADC-1/Auxiliary module package were then determined using a controlled-temperature chamber. To improve system stability over extremes of temperature, components U29, VR, R1, R33, R34, R50, R51 and R52 were upgraded to components with temperature coefficients of < 15 ppm $^{o}C^{--1}$ (See Appendix E-4, ADC-1 Owner's

Manual for part identification). The Instrumentation amplifier (U34) supplied a standard system already meet this specification. The results of this test are shown in Table 5.1. The temperature coefficient (TC) was reduced significantly for the ADC-1 itself (Item 1). Item 2 included the TC of the current source being measured, while Item 3 included the TC of the constant voltage source used to offset the input in this case (270 mV). The smaller or negligible improvement in Items 2 and 3 are due to the temperature coefficients of the current sources/voltage reference circuits.

The constant current sources would reduced the latter two TC's. Post ASCOT 84 experimental calibration of the current sources indicated the Rset should be 293 ohms and R1 should be 2404 ohms. Using these values the current varied only 7.3×10^{-9} A $^{o}C^{-1}$, or 15 ppm $^{o}C^{-1}$, over the temperature range from 0 to 55 ^{o}C, and 15×10^{-9} A $^{o}C^{-1}$, or 30 ppm $^{o}C^{-1}$, over the temperature range from -25 to 55 ^{o}C.

Table 5.1. Data acquisition system temperature coefficients (TC's) in parts per million (ppm) over the range of -25 to +35 ^{o}C.

Component	ADC-1 range	TC (ppm $^{o}C^{-1}$) standard	TC (ppm $^{o}C^{-1}$) Low TC
1. Constant 10 mv input	high	40	8a
2. Constant current source	high	180	120
3. Fixed resistance (simulates error in temperature sensors)	high (270 mV offset)	300b	300b

a 1 digit on the ADC-1 is the limit of resolution of the test, equivalent to 8 ppm.
b Equivalent to 0.03 ^{o}C $^{o}C^{-1}$.

6. SENSORS

The instrumentation at each site consisted of: upward and downward facing pyranometers; pyranometer with shadow band; net radiometer; upward and downward facing total hemispherical radiometer; three soil heat flow transducer at 5 cm depth; three vertical soil temperature sensor, 0 to 5 cm; wind vane; three cup anemometer; and two psychrometers mounted on an automatic exchange mechanism (AEM). With these instruments all of the components of the radiation and energy balances were obtained. The signals from these sensors were measured and recorded by the battery operated data acquisition system.

The wiring connections between the sensors and the data acquisition system are shown in Appendix 9.1.

6.1 Solar Radiation

The pyranometers used to measure total and reflected radiation Kipp and Zonen CM2 pyranometers. The pyranometers were mounted horizontally, 150 cm above the soil surface, at all stations on the end of a horizontal pipe. The horizontal pipe was pointed true south. The Kipp sensors were mounted in an adapter consisting of a tee and two floor flanges (PVC). The flanges were turned to accept the sensors. This mount was threaded on the end of the horizontal pipe. The upper sensor was leveled with a bubble level placed on a plastic cylinder located around the glass dome of the sensor. A sun shade was used with the upper pyranometer.

6.2 Diffuse Radiation

A silicon cell pyranometer manufactured by LiCor was used with a shadow band to measure diffuse radiation. The shadow band was specially fabricated in the shop to allow the sensor to be mounted parallel with the slope. The operation of the shadow band is given in Appendix 9.4.

6.3 Net Radiation

Net radiation was measured with high output miniature net radiometers (Micromet Systems). The net radiometers were oriented to the south at a height of 150 cm above the soil surface.

6.4 Total Hemispherical Radiation

The upward total hemispherical radiation was measured with specially built radiometers (Micromet Systems). The radiometer consists of two high output thermopiles mounted on either side of an aluminum heat sink. The temperature of the aluminum heat sink was measured with a 100 ohm RTD. The thermopiles were protected with polyethylene wind shields. The total hemaspherical radiometers were mounted at 150 cm above the soil surface.

6.5 Soil Heat Flux Density

Soil heat flux density at the surface consisted of the sum of the change in energy storage of the 0 to 5 cm layer of soil and the soil heat flux measured at 5 cm. The soil heat flow was measured at 5 cm with three high output heat flow transducer (Micromet Systems).

The change in energy storage of the 0 to 5 cm layer was calculated as the product of the soil heat capacity and the change of the mean soil temperature of the 0 to 5 cm layer. The mean temperature of the layer of soil above 5 cm was monitored with three 10-cm platinum resistance temperature detector connected in series and inserted in the soil at a 45° angle.

6.6 Air Temperature and Vapor Pressure

Vertical temperature and vapor pressure gradients were measured at each station using a pair of fan-aspirated updraft psychrometers that could be interchanged at selected time intervals by means of an AEM. The bottom psychrometers were located 10 cm above the top of the vegetation while the upper psychrometer was 1 m above the lower psychrometer. Each psychrometer was aspirated with a small 12 Vdc fan (Micronel V581L). The intake of the psychrometer was pointed to the north and doward facing exhausts were installed on the psychrometer to reduce the effect of south winds on the ventilation rate. The fan drew 50 mA of current and provided 530 l/min air flow.

The psychrometer temperature sensors consisted of a 500 ohm platinum resistance element encased in a stainless steel tube. Each tube has a serial number located near the wire end of the tube. The four resistance elements were connected in series to a constant current source, as described by Fritschen and Simpson (1982). With this technique, the same current was flowing through all resistance elements. The voltage drop across each resistance element was determined after it was offset with the 270 mV offset voltage. This technique increased the recording sensitivity to 0.006 $_{o}$C and allowed a 40 $_{o}$C temperature range. Ceramic wicks were used for the wet bulbs. The wicks were one bar low flow ceramic with a constant head water supply of one cm.

6.7 Wind Speed and Direction

The wind vanes and anemometers used were manufactured by R. M. Young. The E and N stations has shop built anemometers.

6.8 Automatic Exchange Mechanism

The AEM utilized was similar in principle to that described by Gay and Fritschen (1982). The AEM's were plastic chain driven with a small 12 Vdc Brevel reversing motor which drew 450 mA for 30 s each 6 minutes. Two AEM's were designed to allow for a gradient distance to be adjusted from 0 to 100 cm while the other could be adjusted from 0 to 200 cm.

The wiring diagram for the AEM's is given in Appendix 9.2.

6.9 Batteries

Three batteries were required at each station. A 12 Vdc deep cycle RV battery was used to power the psychrometer fans, to operate the AEM and to power the three constant current sources. Two voltage regulators were operated from the 12 V battery. A 6 V regulator supplied the computer while a 5 V regulator supplied the power for the data acquisition system. A 6 V gel cell was used to supply the voltage for the offset voltages. A 6 V lantern cell was used to power the tape recorder. These additional batteries were need because of ground loop problems and were large enough to last longer than the recording period. The 12 V battery voltage was monitored and the battery was replaced with a fully charged battery when the voltage dropped below 10 V. A 12 W solar panel was connected to the main battery to keep it fully charged.

6.10 Sensor Calibration

All sensors used were calibrated at the University of Washington (UW). These sensors include: platinum resistance elements; radiometers; soil heat flow transducers; soil temperature probes and anemometers.

6.10.1 Radiometers

All radiometers were calibrated against an Eppley PSP pyranometer SN 9030D2 on the roof of Bloedel Hall. The pyranometers were calibrated by correlation while the net and total hemispherical radiometers were calibrated using the shading technique.

6.10.2. Platinum Resistance thermometers

The 500 ohm platinum resistance temperature sensors were calibrated by comparing the resistance of the elements encased in the stainless steel tubes located in a constant temperature air bath (Delta Design MK2300) against the bath temperature as indicated by a 100 ohm platinum resistance element (Laboratory Standard). This was done to adjust the 0 ^{o}C resistance of the platinum elements. The universal resistance-temperature relation (line 1550 of SAMP.BA, Appendix 9.8.1) was used to compute other temperatures. Previous test indicate that the universal relation applies quite well (Fritschen and Simpson, 1982). The results from these calibrations are shown in Table 6.1.

6.10.3 Soil heat flow

The soil temperature probes were calibrated in the oven using the PLS as a standard.

The soil heat flow transducers were calibrated in a chamber at UW. The heat flow calibration chamber consists of two aluminum tanks (7.6 x 33.0 x 43.2 cm) spaced by 5.84 cm. The facing sides of the tanks consist of aluminum plates (0.635 x 35.6 x 45.7 cm). The plates are spaced by 1.27 x 5.84 cm pieces of plastic creating a void between the tanks of 5.84 x 33.0 x 43.2 cm. The void has a cross section of 1425.6 cm^2 and a volume

Table 6.2. Platinum resistance element calibrations. Air bath temperature was 21.80 ^{o}C for the calibration.

SERIAL NO.	OUTPUT (mV)	ZERO RESISTANCE (ohms)
1	270.80	499.209
2	270.92	499.430
3	270.68	498.987
4	270.92	499.430
5	271.09	499.743
6	271.08	499.725
7	271.19	499.928
8	271.17	499.891
9	271.12	499.798
10	271.05	499.669
11	271.15	499.854
12	271.14	499.835
13	271.09	499.743
14	271.04	499.651
15	271.10	499.762
16	271.12	499.798
17	271.13	499.817
18	271.21	499.964
19	271.15	499.854
20	271.22	499.983

of 8,325.5 cm^3. The plastic spacers have a total cross section of 145.3 cm^2 and a volume of 848.5 cm^3.

The void between the tanks is filled with glass beads 10 microns in diameter. The porosity of the beads is 36 percent. One junction of a thermocouple loop is cemented onto the surface of each aluminum plate so that the temperature difference between the inside surfaces of the aluminum plates (or the temperature difference across the glass beads) can be measured directly.

If water of temperature, T1, is circulated through tank one and water of temperature, T2, is circulated through tank two, then the heat flowing from tank one to tank two (T1 > T2) can be expressed by:

$$G = (k/l)(T1 - T2)$$

Where G is the heat flow in W m^{-2}, k is the thermal conductivity of the water glass bead mixture 0.94 W (m $^{o}K)^{-1}$ and l is the distance between the plates (5.04 cm).

The heat flow is related to the mV signal of the transducers placed in the glass bead water mixture.

7. SOFTWARE DESCRIPTION

Two categories of software will be considered. The first consists of programs written for the NEC personal computers that were used for field data acquisition, data transfer, and data acquisition system testing. The second consists of a series of programs used for post-experimental data processing, including energy and radiation balance calculations, plots and printed summaries used in this report.

Listings of the various programs are given in Appendix 9.8. All software is still in the development stages, and as such is not free from errors, nor have all the refinements been incorporated to make their operation "user friendly". This is especially true of the auxiliary, supporting software. However, based on the excellent field performance of the primary data acquisition and processing program SAMP.BA, it is felt that the software is basically sound.

7.1 Data acquisition (SAMP.DO, INDATx.DO)

Data acquisition and field procession was controlled by program SAMP.BA, a BASIC program written for the NEC portable computer. This program, listed in Appendix 9.8.1, is largely self documenting. Statements 1000 to 1192 constitute the main program, with control of subroutine calls routed through a jump table in lines 100 to 300.

The program is customized for a particular location, system, and set of sensors through the use of an input file named "INDATx.DO", where x was an identifier set equal to the particular system number. Files INDAT1.DO through INDAT9.DO for the four systems used in the present experiment are listed in Tables 7.1 to 7.4. Control parameters set by files INDATx.DO are partially identified in lines 1, 3 and 5, and the last two columns of the actual file, or by comparison with program lines 9110-9195 where the data is read by SAMP.BA. A decription of these identifiers is found in Table 7.5.

The psychrometer separation and site elevation are included in the INDAT files. A standard atmosphere (101.3 kPa) is assumed in the calculation of atmospheric pressure (P), which is then corrected for altitude using a lapse rate of -0.01055 kPa m^{-1}.

Table 7.1. Input file for station 1 (W).

```
M N1 N2 N3 N4 N5 N8 GO M7
18, 30,30, 1,30, 3, 0, 2,16
LG    HG    HOME REF   01   02    RC NCRTD
9.997,200.7,7,  0,264.94,159.96,.4981466,9
DELZ  ELEV  CSOIL  DZ    REF   HOME
1.00, 315,  .27,   0.05,  0,  7
CN   RG   GAIN   BIAS  TYPE  DESC.   SER. NO.
1,   2,   30.742, 0,     4   G       16
2,   0,   22.36,  0,     4   Q       Q86004
3,   2,   82.13,  0,     4   Kdn     3750
4,   2,   82.92,  0,     4   Kup     3701
5,   2,  153.39,  0,     4   D       1577
6,   0,   11.85,  0,     4   Qdn     THR86004
7,   2,    1.00,  0,     6   Home
8,   0,    3.488, 0,     3   DIR     1 GILL
9,   1,  499.96,  0,     2   TAT     11 3/4
10,  1,  500.00,  0,     2   TWB     11 5/6
11,  1,  500.00,  0,     2   TAT     12 3/4
12,  1,  500.01,  0,     2   TWT    12 5/6
13,  3,  301.62,  0,     2   TS      300OHM
14,  0,  100,     0,     2   Tthr    86004
15,  0,  0.2027, 0.7,    4   U       GILL1
16,  0,   12.28,  0,     4   Qup     THR86004
INDAT7.DO                  15:33    1/16/87
BASED ON INDAT8.DO OF 5/17/86
```

Table 7.2. Input file for station 7 (S).

```
M N1 N2 N3 N4 N5 N8 GO M7
18, 6,30, 1,30 3, 2, 2,16
LG   HG   HOME REF  O1  O2   RC NCRTD
10.0,193.3,7,   0, 264.67,160.54,.49829,9
DELZ  ELEV  CSOIL  DZ   REF   HOME
1.00, 315,  .15,   0.05,  0,  7
CN  RG  GAIN   BIAS  TYPE  DESC.   SER. NO.
1,  2,  30.293, 0,      4  G       76
2,  0,  22.81,  0,      4  Q       Q86021
3,  2,  80.88,  0,      4  Kdn     773743
4,  2,  80.45,  0,      4  Kup     773741
5,  2,  88.90,  0,      4  D       6712
6,  0,  16.63,  0,      4  Qdn     PYR86002
7,  2,   1.00,  0,      6  Home
8,  0,   3.837, 0,      3  DIR     73 GILL
9,  1, 499.89,  0,      2  TAB     71 3/4
10, 1, 500.10,  0,      2  TWB     71 5/6
11, 1, 500.03,  0,      2  TAT     72 3/4
12, 1, 499.97,  0,      2  TWT   72 5/6
13, 3, 302.22,  0,      2  TS      300OHM
14, 0, 100,     0,      2  TQ      PYR86002
15, 0,   0.1924, 0.7,   4  U       73 GILL
16, 0,  15.19,  0,      4  QUP     PYR86002
INDAT7.DO               1541 11/04/86
BASED ON INDAT8.DO OF 5/17/86
```

Table 7.3. Input file for station 8 (E).

```
M N1 N2 N3 N4 N5 N8 GO M7
18, 6,30, 1,30 3, 2, 2,16
LG    HG    HOME REF  O1   O2    RC NCRTD
10.0,199.9,7,  0,264.55,160.40,.49877,9
DELZ  ELEV  CSOIL  DZ    REF    HOME
1.00, 315,  .27,   0.05,  0,  7
CN   RG   GAIN   BIAS   TYPE   DESC.   SER. NO.
1,   2,   39.03,  0,       4   G       86
2,   0,   22.25,  0,       4   Q       Q86022
3,   2,   84.36,  0,       4   Kdn     838771
4,   2,   85.09,  0,       4   Kup     838751
5,   2,   92.49,  0,       4   D       6710
6,   0,   12.66,  0,       4   Qdn     Thr86003
7,   2,    1.00,  0,       6   Home
8,   0,    1.340, 0,       3   DIR     83 GILL
9,   1,  499.65,  0,       2   TAB     81 3/4
10,  1,  499.71,  0,       2   TWB     81 5/6
11,  1,  500.31,  0,       2   TAT     82 3/4
12,  1,  500.23,  0,       2   TWT   82 5/6
13,  3,  302.58,  0,       2   TS      86
14,  0,  100,     0,       2   TQ      THR 86001
15,  0,    0.2473,0.3,     4   U       83 FRIT
16,  0,   12.26,  0,       4   QUP     THR86003
INDAT7.DO                   1550 11/04/86
BASED ON INDAT8.DO OF 5/17/86
```

Table 7.4. Input file for station 9 (N)

```
M N1 N2 N3 N4 N5 N8 GO M7
18, 6,30, 1,30 3, 2, 2,16
LG   HG   HOME REF  O1  O2   RC NCRTD
10.0,200.0,7,  0,264.67,159.96,.49909,9
DELZ  ELEV  CSOIL  DZ   REF   HOME
1.00, 315,   .27,  0.05,  0,   7
CN  RG  GAIN   BIAS  TYPE  DESC.  SER. NO.
1,  2,  30.516, 0,      4  G       96
2,  0,  22.00,  0,      4  Q       Q86023
3,  2,  82.15,  0,      4  Kdn     001
4,  2,  82.55,  0,      4  Kup     60294
5,  2, 167.90,  0,      4  D       1579
6,  0,  12.89,  0,      4  Qdn     Thr6001
7,  2,   1.00,  0,      6  Home
8,  0,   1.10,  0,      3  DIR     93 GILL
9,  1, 500.10,  0,      2  TAB     71 3/4
10, 1, 499.93,  0,      2  TWB     71 5/6
11, 1, 499.88,  0,      2  TAT     72 3/4
12, 1, 500.06,  0,      2  TWT    72 5/6
13, 3, 301.38,  0,      2  TS      96
14, 0, 100,     0,      2  TQ      THR 86001
15, 0,   0.0905, 0.3,   4  U       93 FRIT
16, 0,  12.24,  0,      4  QUP     THR86001
INDAT7.DO               1554 11/04/86
BASED ON INDAT8.DO OF 5/17/86
```

Table 7.5. Description of INDATx.DO control files used in program SAMP.BA.

M   Total number of variables in each data record

N1 Minutes in each averaging period (between Bowen ratio interchanges)

N2 Number of seconds between samples (0 < N2 < 59)

N3 Maximum number of records allowed in memory storage buffer (calculated in program line 9265)

N4 Minutes between data output to cassette tape (Changed in the program into N4/N1, which is the number of data records written to the cassette each access.

N5 Number of times each analog channel is sampled before the value is saved. This allows for a longer settling time for the A/D converter when sampling low level signals using the on board amplifier.

N8 Number of minutes samples are not taken after the Bowen ratio interchange device has operated to allow temperatures to come into equilibrium.

GO Not used

M7 Total number of analog and digital inputs being sampled (M7 = M - 2; 2 variables are used to store date and time).

LG Gain of low range (mv/AD unit)

HG Gain of high range (mv/AD unit). Selected by adding 32 to the channel number.

HOME Channel number of AEM Home signal.

REF Channel thermocouple reference connected to (not currently in use)

O1 Offset #1 (mv). Selected by adding 16 to the channel number.

O2 Offset #2 (mv). Selected by adding 48 to the channel number.

RC(1) Value of constant current through dry and wet bulb resistance temperature elements (ma).

NCRTD Channel number of the first resistance temperature element

CHAN	C(K)	Array of channel numbers	
RANGE	C1(K)	0 = Lo gain	-adding 0 to chan. no.
		1 = Hi gain, offset 1	-adding 16 to chan. no.
		2 = Hi gain, no offset	-adding 32 to chan. no.
		3 = Hi gain, offset 2	-adding 48 to chan. no.
GAIN	G(K)	mv gain (eng. units/mv)	
BIAS	B(K)	bias (eng. units)	
TYPE	N(K)	1 = type K thermocouple	
		2 = resistance temperature element	
		3 = wind direction	
		4 = linear calibration	
		5 = digital input	
		6 = Home signal	
DESC.	X$	Used in data file for description only	

In addition, the following quantities are calculated in connection with the above control parameters.

G2(K) mv gain for each channel

B1(K) offset for each channel (if used, otherwise zero)

C1(K) This is converted to the actual channel number plus the offset for use in the A/D routine

NRTD The number of resistance temperature elements

NWD not used

NDIG number of digital channels

NANLG number of analog channels

7.2 Data transfer (READT2.BA)

The procedure used for reading cassette data tapes in the field used a combination of the ROM-resident communications program called TELCOM, and the BASIC program READT2.BA. TELCOM was used to initially set up the receiving computer, in this case a AT compatible microcomputer using DOS operating system. The NEC computer is configured as a terminal, and connected to the RS 232 port on the AT. Cross Talk software was used on the AT to capture the transmitted files. READT2.BA was then used to transmit the data.

7.3 Test Programs (ADCTST.BA)

A program was developed for use in testing the operation of the data acquisition system, ADCTST.BA. The ADCTST.BA (Appendix 9.8.6) uses the built-in serial port driver. Communication with the ADC-1 from a BASIC program via the standard serial port driver uses INP and OUT statements.

7.4 Post Experimental Data Processing and Data Conversion From Raw to Engineering Units (SAMPE.BAS)

The second series of programs were developed for initial post-experimental data processing, including energy and radiation balance calculations, plots and printed summaries used in this report. They are coded in Microsoft BASIC 5.2, and were intended to be compiled and run using the Microsoft BASIC compiler to reduce execution time. The data conversion (SAMPE.BAS) and energy/radiation balance processing (SAMPP.BAS) programs are based in part on the field sampling and analysis program SAMP.BA (Section 7.1.1). All programs are controlled by an input file named PDS.FIL which contains values of certain control parameters, an identification label, and a list of file names to be processed (Table 7.6). The meaning of the control parameters varies, depending on exact program involved.

Table 7.6. Sample contents of control file PDS.FIL.

```
0,4,0,B:,D:,.MF,P
     Energy balance, 6 minute data (SAMPP
     1/12/85)S10929,S50929,S30929G,S40929,S40929T,S20929,END
```

The ASCII raw data files were edited using a text editor so that each contained one day's data for one data system, starting and ending at 0000 hours. Since an average was stored every 6 minutes during data collection, each file contains a maximum of 241 records. Using this data as input, SAMPE.BAS (Appendix 9.8.8) converts the raw data (in A/D units) to engineering units (e.g. oC, m s-1, etc.). System and time specific data is found in lines 9300 - 9400, lines 6300 - 6400 (analogous to lines 9000 - 9106 and 9110 to 9195 in SAMP.BA) and lines 6200 - 6300. The identical files used in the field analysis (Tables 7.1 to 7.5) are used with this program. The data is stored in a BASIC random file in compressed binary format.

7.5 Energy balance processing (SAMPP.BAS)

SAMPP.BAS (Appendix 9.8.9) uses the output from SAMPE.BAS to compute the radiation and energy balance. The same basic calculational algorithms as those in the field programs are used, with some minor additions. The most significant of these was the inclusion in the soil heat flux term of the energy storage in the layer of soil above the heat flow transducer. Others include the setting to zero of small amounts of spurious negative shortwave radiation which occasionally occurred at night, the shadow band correction for the diffuse radiometer, the processing of the AEM "home" signal, and a diagnostic routine in development to detect a drying wet bulb. These changes should be considered in any reanalyses of the data.

7.6 Data Plotting and 30 Minute Summary Listings

The resulting radiation and energy balance data were then averaged for 30 minute periods, and the results plotted were plotted and/or printed in summary listings. Examples of programs used for this purpose are included in Appendix 9.8.10. SUMMARYE.BAS prints a table of 30 minute averages and totals for a 24 hour period. As input it uses either the 6 minute data created by SAMPP.BAS, in which case the 30 minute averages it creates are stored on a summary disk file, or it uses the 30 minute average created by a prior run of SUMMARYE.BAS to print the table only. This choice is determined from the value of the flag ICFLG (the first parameter in file PDS.FIL; Table 7.7). Sample programs which produce line printer plots of the radiation and energy balance data are reproduced in Appendices 9.8.11 and 9.8.12)

A spreadsheet called SMART was used to create the 30 minute average files and the graphs included in this report.

8. RESULTS

8.1 History of Data Records

During the first week some equipment difficulty was experienced. They included: the data system board shorting against the chassic on system 1; a wire shorting the exchange mechanism on system 7 which burned out the input switch for the home signal; one of the fans stuck some time during the week on system 9; and a tape recorder battery connected in reverse during a battery change. These problems were solved by the end of the first week and all stations were operating properly during the second week. A rodent cut the wind vane wire on the south slope system some time during the second week.

8.2 Energy and Radiation Balance Data Listings

Listings of the 30 minute averages, and various totals or averages of the energy and radiation balance data plus other environmental data are present in Attachment 1 for the first week and in Attachment 2 for the second week. The time represents the preceding 30 minute period. All times are CDST.

8.3 Plots of Energy Balance Data

Plots of the 30 minute average energy balance data are present in Attachment 3 for the first week and in Attachment 4 for the second week. The averages are plotted at the time representing the preceding 30 minute period. All times are CDST.

9. APPENDICES

9.1 Sensor Wiring Diagram

The wiring of all sensors to and through the current housing box located below the data system to the data system is shown on the following page. The wires are color coded as follows:

B, black
Br, brown
Gr, green
Gy, gray
O, orange
R, red
T, tan
W, white
Y, yellow

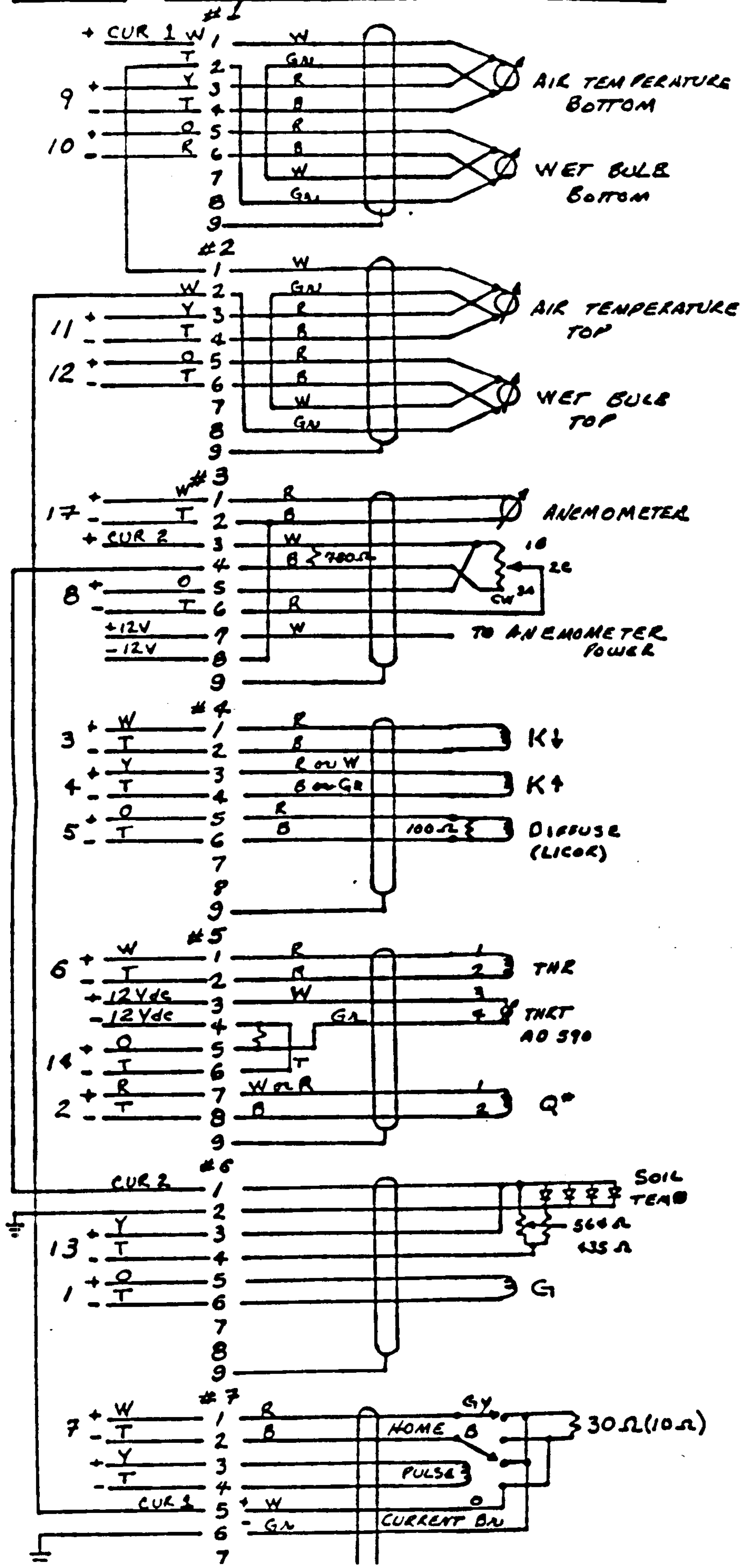
Other codes or symbols are defined as:

Q*, net radiation
THR, total hemispherical radiometer
THRT, temperature sensor of THR
K , global solar radiation
K , reflected solar radiation
cur, current

Figure 9.1. Energy balance station sensor wiring diagram (see following page)

SENSOR INPUT WIRING

CHANNEL CONNECTOR (DE9P) SENSOR



9.2 AEM Wiring Diagram

The wiring for the automatic exchange mechanism is shown on the following page. The wires are color coded as follows:

B, black
Br, brown
Bu, blue
Gr, green
Gy, gray
O, orange
P, pink
R, red
T, tan
W, white
Y, yellow

Other symbols used are defined as:

P#, plug
R#, relay
S#, Switch

Switch 1 is used to turn on the power to the AEM. Relay 2 controls the direction of rotation of the drive motor by controlling the polarity of the applied voltage with S7 and S8. Relay 2 can be accuated automatically from the data system through R1 and S10 or manually with momentary S2. Switches 4 and 5 limit the length of travel by interrupting the power to the drive motor. A line fuse (2 amp) is located in the power line to the drive motor.

Switches 3 and 6, called the home switches, indicate the position of the AEM by reversing the polarity of the voltage drop across a 30 ohm (some AEM's have 10 ohm) resistor. Current 1 is applied to this resistor via pins 5 and 6 while the voltage is sensed via pins 1 and 2 of DE9P #7. The convention used is the signal is + when the right hand psychrometer (looking from the drive motor end) is down, - when it is up and 0 when neither psychrometer is in home position. NOTE: BE SURE TO CONNECT THE 12 VDC PROPERLY. THE RED WIRE IS + AND BLACK WIRE IS -. THE AEM WILL NOT FUNCTION AND THE FAN WILL RUN BACKWARDS IF THE VOLTAGE IS REVERSED.

9.3 Auxiliary Module Description and Operation

9.3.1 Current Source and Offset Voltage Wiring Diagram

The wiring of the current sources and the offset voltages is shown on the following page. The current sources and offset voltages are located on a board in the box under the data system. The wires are color coded as follows:

B, black
Br, brown
Gr, green
Gy, gray
O, orange
R, red
T, tan
W, white
Y, yellow

Three 0.5 mA current sources were utilized with each data system. Current source 1 supplied for the RTD's and the home signal. The output of this source is the brown wire attached to pin 24 which is connected to socket 1 pin 1. The return line is a tan wire attached from socket 7 pin 6 and is attached to pin 23. Pins 1 and 2 are tie points to monitor current 1. Current source 2 supplied the current for the wind vane and the vertical soil temperature probe. Its output (pin 22) is a yellow wire which is attached to socket 3 pin 3. The return line is a tan wire from socket 6 pin 2 and is attached to pin 21.

Pins 3 and 4 are tie points to monitor current 2. Current source 3 supplied the current for the offset voltages. The offset voltages are terminated on pins 16, 17, and 18. Pin 16 (red wire) is the plus side of the small offset voltage, pin 17 is the negative side. Pin 18 (white wire) is the plus side of the large offset voltage and pin 17 is the negative side of this offset voltage. The offset voltages can be monitored via pins 9 and 10 which are attached to channel 15. Voltage for current sources 1 and 2 was supplied by a 12 Vdc battery attached to pins 7 and 8 via a black jacketed cable. Voltage for the offset voltages was supplied through pins 11 and 12 via a orange jacketed cable attached to a 6 Vdc battery. Two voltage regulators are also located on this board. The 5 Vdc regulator supplied the voltage for the data acquisition system via pins 20 and 19. The 6 Vdc regulator supplied voltage to the computer via pins 5 and 6 which have a gray jacketed wire attached to them.

Two additional tie points provided voltage to the anemometer (socket 3 pins 7 and 8) and to the temperature sensor in the total hemispherical radiometer (socket 5 pins 3 and 4).

9.3.2 Current Source and Offset Voltage Adjustment

The current source circuit is described in the National Semiconductor Application note LM- 334 3-Terminal Adjustable Current Source. Each current source as two adjustments, Rset and R1. Rset is initially set using an ohmmeter to 285 ohms. This value is based on minimizing the temperature coefficient of the current source. R1 is then adjusted for each (about 2404 ohms) so that the current is 0.500 ma.

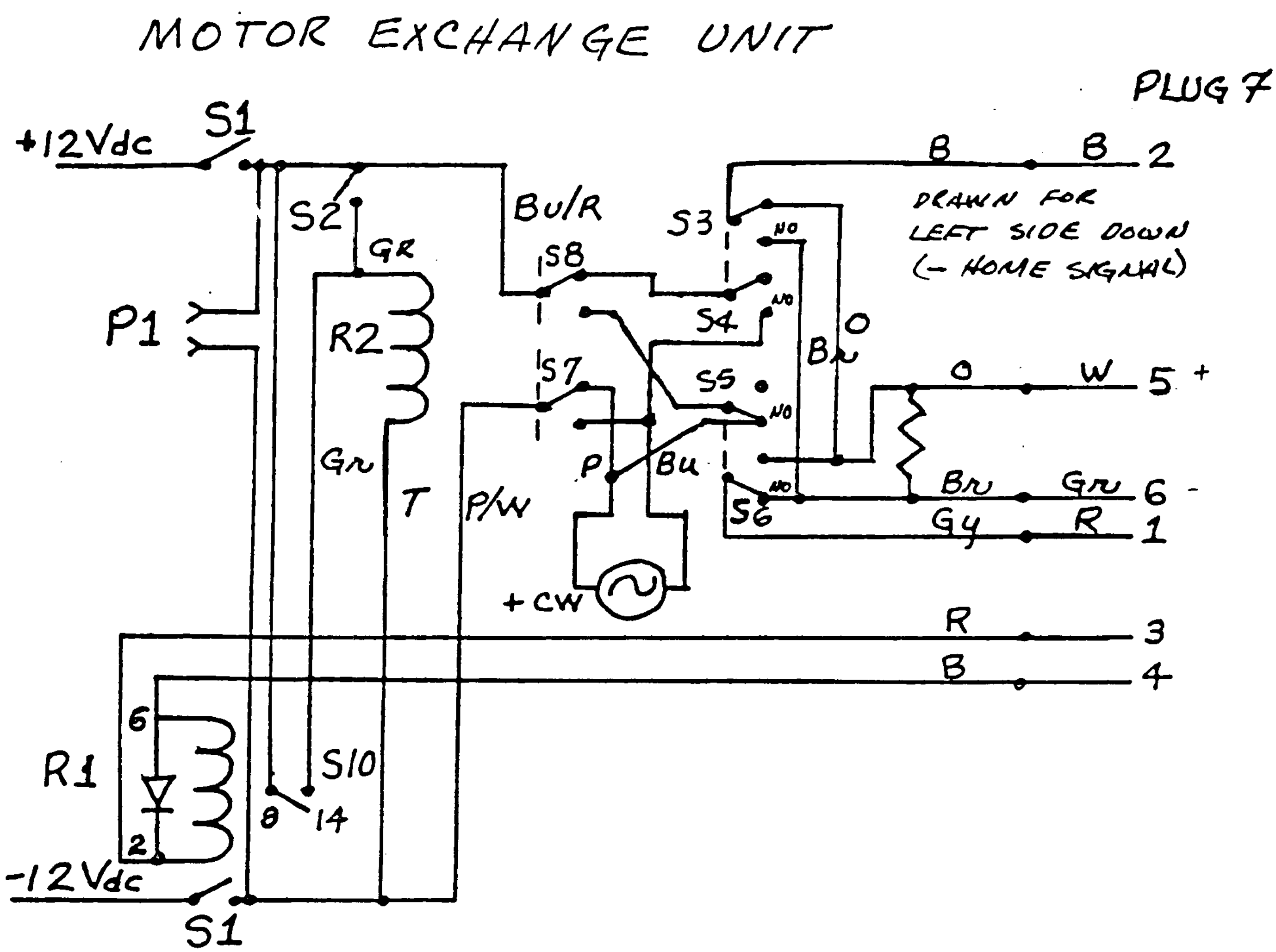


Figure 9.2. Automatic Exhange Mechanism Wiring Diagram.

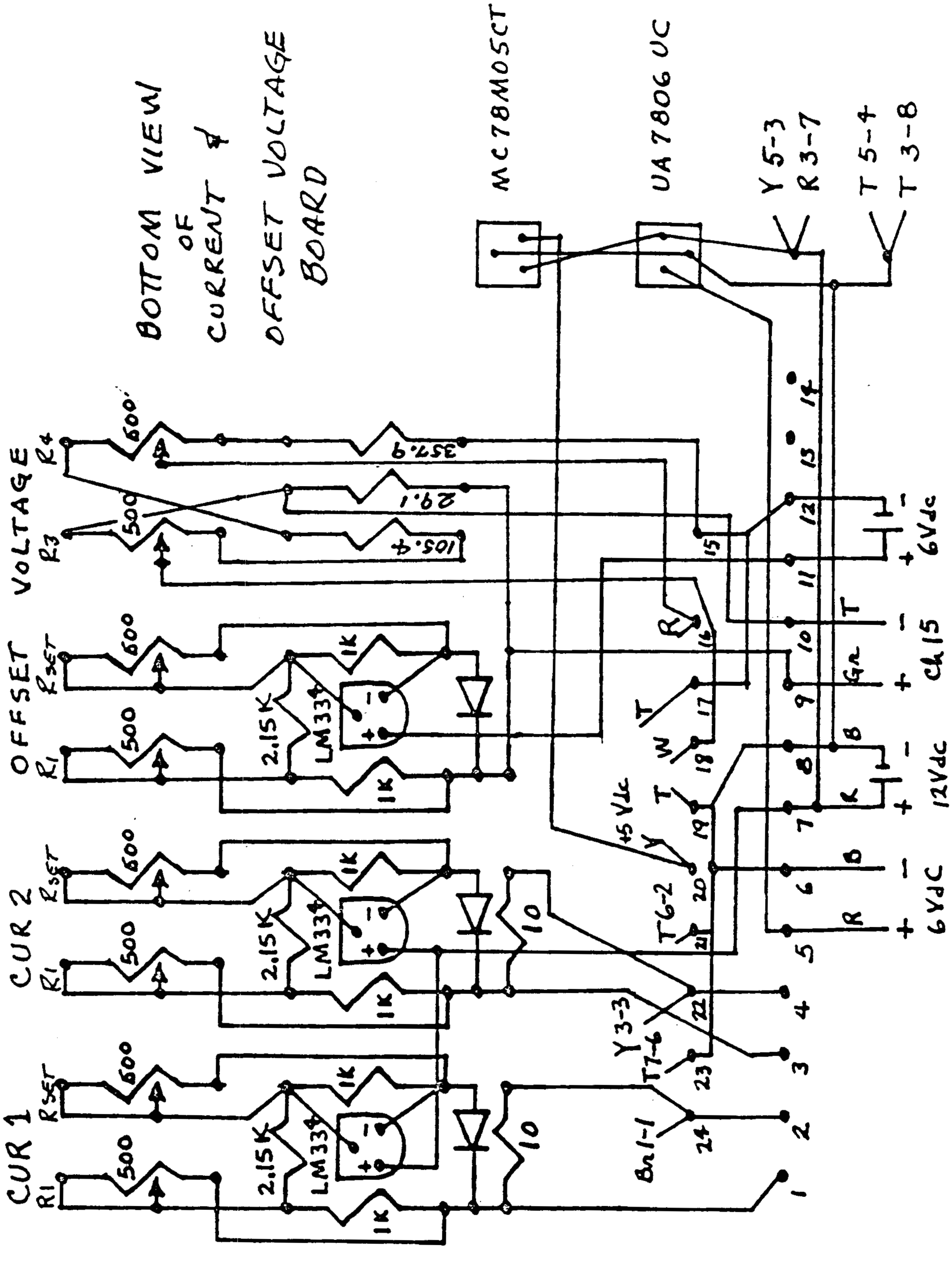


Figure 9.3. Current source and offset voltage wiring diagram.

The nominal magnitude of the offset voltages are set by the precision resistors in series with potentiometers R3 and R4. These voltages can be adjusted +12.5 mV using these potentiometers.

9.4 Operation of the Shadow Band

9.4.1 Mounting the Shadow Band

The procedures for the operation of the shadow band are adapted from Publication 8105-22 from Li-Cor, Lincoln, NE. First one has to mount the base of the shadow band on a horizontal pipe with the clamp supplied. The horizontal pipe must be oriented true north and south. A slight error in orientation will cause the sun to shine on the sensor during the day. Next level the base using the three socket screws in the base. After the base is leveled lock it in place with the three bolts in the base.

The rod attaching the shadow band to the base is now adjusted for the latitude of the site. Latitude marks are scribed on the vertical curved surface attached to the base. The upper portion of the rod should be set at the correct latitude.

The sensor platform is mounted on a gimbal and should be leveled in both directions. After the sensor platform has been leveled, the shadow band should be adjusted for the solar declination (See 9.4.2). The upper surface of the block containing the thumb screw should be set on the proper declination angle which is scribed on the upper surface of the rod. The declinations are marked every 5 degrees and labeled every 10 degrees. After these adjustments have been made, the shadow band should cast a shadow over the sensing element. If this is not the case, check the latitude and declination angles. Also make sure that the horizontal pipe and rod are oriented true north and south. This can be done by observing the shadow cast be the pipe and rod. At solar noon (See 9.4.3) the shadow should be directly below the rod or pipe. A plumb bob attached to a piece of string will help to determine the location of the shadow.

9.4.2 Shadow Band Adjustment

9.4.2.1. Declination angle versus time of year.

The declination angle can be approximated as follows:

$$= \sin[(360^\circ/365 \text{ days})(n-n_{ve})]$$

where D = declination angle, E = obliquity of the ecliptic (=23.45°, n = day of year and n_{ve} = day of vernal equinox = 81. Then

$$= 23.45 \sin [0.9863(n - 81)]$$

or

= 23.45 sin [0.9863(n + 284)]

Example 1:
Date: March 16, 1981 (n = 75)

= 23.45 sin [0.9863(75 + 284)]
= 23.45 sin [0.9863(359)]
= 23.45 sin 354°
= -2.4°

9.4.2.2 Shadow band adjustment versus time of year and latitude

The shadow band projects a shadow of varying widths upon the sensor diffusing eye depending upon the time of year and latitude. In addition, the declination angle of the sum changes at different rates depending on the time of year. Both phenomena need to be considered when determining how ofter to adjust the band.

= Declination angle - 23.45 sin [0.9863 (n +284)]

Rate of declination angle change

d /dn = 23.45 cos [0.9863 (n +284)] (0.9863) 2Prad/360°
= 0.404 cos [0.9863 (n +284)] degrees/day

The maximum rate of change is 0.404 degrees/day and occurs when n = 81 (vernal equinox) and n = 263 (autumnal equinox). The minimum rate of change is 0 degrees/day and occurs when n = 172 (summer solstice) and n = 355 (winter solstice).

The angle subtended by the shadow band on the sensor diffusing eye is

F = 2 tan-1[(w cos D - d cos (F -D)/(2r/cos D)]

for (F - D) < 90°
where D = declination angle, w = width of shadow band, d = sensor diffusing eye diameter, r = band radius and F = latitude.

For a perfectly aligned shadow band, one should change the band as follows:

1. Determine the day of the year (n).
2. Determine the latitude (F).
3. Determine the declination angle (D).
4. Determine the rate of declination angle change dD/dn.
5. Determine the angle subtended by the band (F).
6. Determine the number of days shadowed (Ds) as follows:

Ds = (F - Fs)/(dD/dn)

where Fs = angle subtended by the sun (- 0.5°). However, let Fs = 1° as a safety factor.

Example 2:

Date: March 16, 1981 (n = 75)

2. Q = 41°
3. = 23.45 sin [0.9863(75 + 284)] = -2.42°
4. dD/dn = 0.404 cos [0.9863 (75 +284)] = 0.402 degrees/day
5. F = 2 tan-1 [(0.5 cos (-2.42) - 0.307 cos (41-(2.42)]
   ((2)(3)/cos (-2.42))

   F = 5.27°
6. $Ds = \frac{5.27° - 1°}{0.402 \text{ deg/day}} = 10$ days (for a perfectly aligned band)

A more realistic value for Ds in actual operation would be about 1/2 of Ds or 5 days.

9.4.3 Equation of Time and Time of Solar Noon

Example: Compute the time of solar noon at longitude 81° 38′ West on September 22, 1980.

1. Determine the day of year (n).
   September 22, 1980 is day number 266.

2. Determine West longitude in hours (H).

   $H = 81° 38' \text{ West} = 81.633° \times \frac{24 \text{ hours}}{360°}$

   = 5.4422 hours = 5 hours 27 min

3. Determine time elapsed (t) in days since January 0, 0 hour UT

   t = n + (UT + H)/24

   where UT = universal time = 12 for solar noon

   t = 266 + (12 + 5.4422)/24 = 266.72676

4. Determine equation of time (EQT)

   EQT = -7.64 sin (0.9893t) + 0.56 cos (0.9863t)
   -9.37 sin [2(0.9863t)] - 2.83 cos [2(0.9863t)] min.

   EQT = -7.64 sin (0.9893(266.73)) + 0.56 cos
   (0.9863(266.73))
   -9.37 sin [2(0.9863(266.73))] - 2.83 cos
   [863(266.73))] min.
   = 8.0 min.

The above example uses the EQT for the year 1980. This should provide adequate north-south alignment for any year. The current EQT can be obtained from the Almanac for Computers, 1980, Nautical Almanac for computers, 1980, 34th and Massachusetts Avenue, N. W., Washington, DC 20390.

5. Determine local mean time (LMT)

LMT = 12 h 00 min - 8.0 min = 11 h 52 min

6. Determine universal time (UT)

UT = LMT + H = 11 h 52 min + 5 h 27 min = 17 h 19 min

7. Determine local time (LT)

LT = UT - dT

where dT is the difference in time zones between H and Greenwich, England.

= 17 h 19 min n (Eastern Daylit Time)

The time of solar noon on September 22, 1980, at a longitude of 81° 38′ West is 1:19 pm (EDT).

9.4.4 Data Reduction

Use of a shadow band necessitates applying a correction factor to the data to allow for that part of the total diffuse radiation which is obstructed by the band. In addition, a correction may be necessary if the spectral response of the sensor is not ideal due to the variation of spectral irradiance between blue sky and various cloud conditions (as in the case only of the LI-200SB pyranometer).

The problem of correcting the data should be approached both theoretically and experimentally, although neither approach is entirely satisfactorly in itself because the diffuse radiation varies over the dome of the sky (International Energy Agency, 1980).

Table 9.1 contains theoretically derived correction factors for the band obstruction for isotropic sky conditions on the 16th of each month. An additional 4% additive correction is included in the table values to account for the effects of non-isotropic distribution of the radiance over the sky. It should be realized that these corrections are approximations for general sky conditions and are not a substitute for corrections derived experimentally at a given location. The measured values of diffuse radiation should be multiplied by the appropriate correction factor.

The correction factor for clear sky conditions can be determined experimentally by comparing the diffuse measurement (as measured when the shaddow band is in its normal position), to the diffuse measurement when a shadow disk is used to shadow the sensor instead of the sadow band. The difference between these two measurements is the portion of diffuse radiation that is obstructed by the shadow band (International Energy Agency, 1980).

Table 9.1. Correction factors for solar radiation obstructed by the shadow band.

Lat.°N Lat.°S	Jan Jul	Feb Aug	Mar Sep	Apr Oct	May Nov	Jun Dec	Jul Jan	Aug Feb	Sep Mar	Oct Apr	Nov May	Dec Jun
0	1.12	1.15	1.17	1.15	1.14	1.12	1.12	1.14	1.16	1.15	1.14	1.12
10	1.11	1.14	1.16	1.16	1.14	1.13	1.14	1.15	1.16	1.14	1.12	1.11
20	1.10	1.12	1.15	1.16	1.15	1.14	1.14	1.15	1.15	1.13	1.11	1.09
30	1.09	1.11	1.14	1.15	1.15	1.14	1.15	1.15	1.14	1.11	1.09	1.08
40	1.07	1.09	1.12	1.14	1.15	1.14	1.15	1.15	1.13	1.10	1.08	1.07
50	1.06	1.08	1.11	1.13	1.14	1.14	1.14	1.14	1.11	1.09	1.07	1.05
60	1.05	1.06	1.09	1.11	1.14	1.14	1.14	1.14	1.11	1.09	1.07	1.05
70	----	1.05	1.07	1.10	1.13	1.15	1.14	1.11	1.09	1.05	1.04	----
80	----	----	1.05	1.09	1.14	1.15	1.14	1.11	1.07	1.04	----	----
90	----	----	----	1.09	1.14	1.16	1.15	1.11	1.06	----	----	----

The LI-COR LI-200SB pyranometer sensor does not have an ideal spectral responsivity curve over the spectral irradiance range of blue sky and cloud coverrcf the following were known:

1) Spectral irradiance of the sky ceor calibration;
2) Spectral irradiance of the sky conditions at the time of data collection;
3) LI-200SB pyranometer relative spectral responsivity curve.

In reality, this is not practical because of the difficulty and expense involved in obtaining spectral correction factor experimentally. This can be derived from these measurements:

G: Global solar radiation (total sun plus sky radiation on a horizontal surface) using the LI-200SB pyranometer.

D1: Diffuse solar radiation (sky radiation) using the LI-200SB and 2010S Miniature Shadow band (corrected for band obstruction).

De: Diffuse solar radiation using an Eppley Precision Spectral Pyranometer (PSP) and an Eppley shadow band (corrected for band obstruction).

On Figure 9.5, values of D1/G (%) are plotted on the x-axis and the corresponding values of D1/De (%) are plottedon the y-axis. The following equation is used to make the spectral correction of the LI-200SB pyranometer. All measurements were made in W m^{-2}, although other units can be used since the correction factor is dimensionless.

$$Dc = \frac{D1}{1.17 - \frac{1}{1.2 + 11.8\ (x)}}$$

where Dc is the corrected diffuse radiation and x = D1/G. The curve represented on Figure 9.4 is a plot of the denominator in the above equation.

This equation applies only to solar radiation measured out doors and not greenhouse, growth chamber, artificial lighting conditions or under a plant or tree canopy.

Example: Calculate the corrected diffuse solar radiation at a latitude of 30° N during March, where G = 800 W m-2 and the diffuse component measured by the LI-200SB and 2010SS = 60 W m^{-2} (uncorrected for band obstruction).

1. Correction for band obstruction (Table 9.1): 1.14(60) = 68.4 W m^{-2}.

2. Spectral correction:

$$D_c = \frac{68.4}{1.17 - \frac{1}{1.2 + 11.8(68.4/800)}} = 95.4\ W\ m^{-2}$$

Corrected diffuse radiation (D_c) ≈ 95 W m-2.

A plot of the corrected diffuse radiation determined by the LI-COR pyranometer versus diffuse radiation determined with the Eppley PSP pyranometer is given in Figure 9.5.

IMPORTANT: When using the LI-200SB Quantum Sensor or LI-200SB Photometric Sensor, only the band obstruction correction is needed since these ensors have spectral responsivity curves that match very closely their respective ideal response curves.

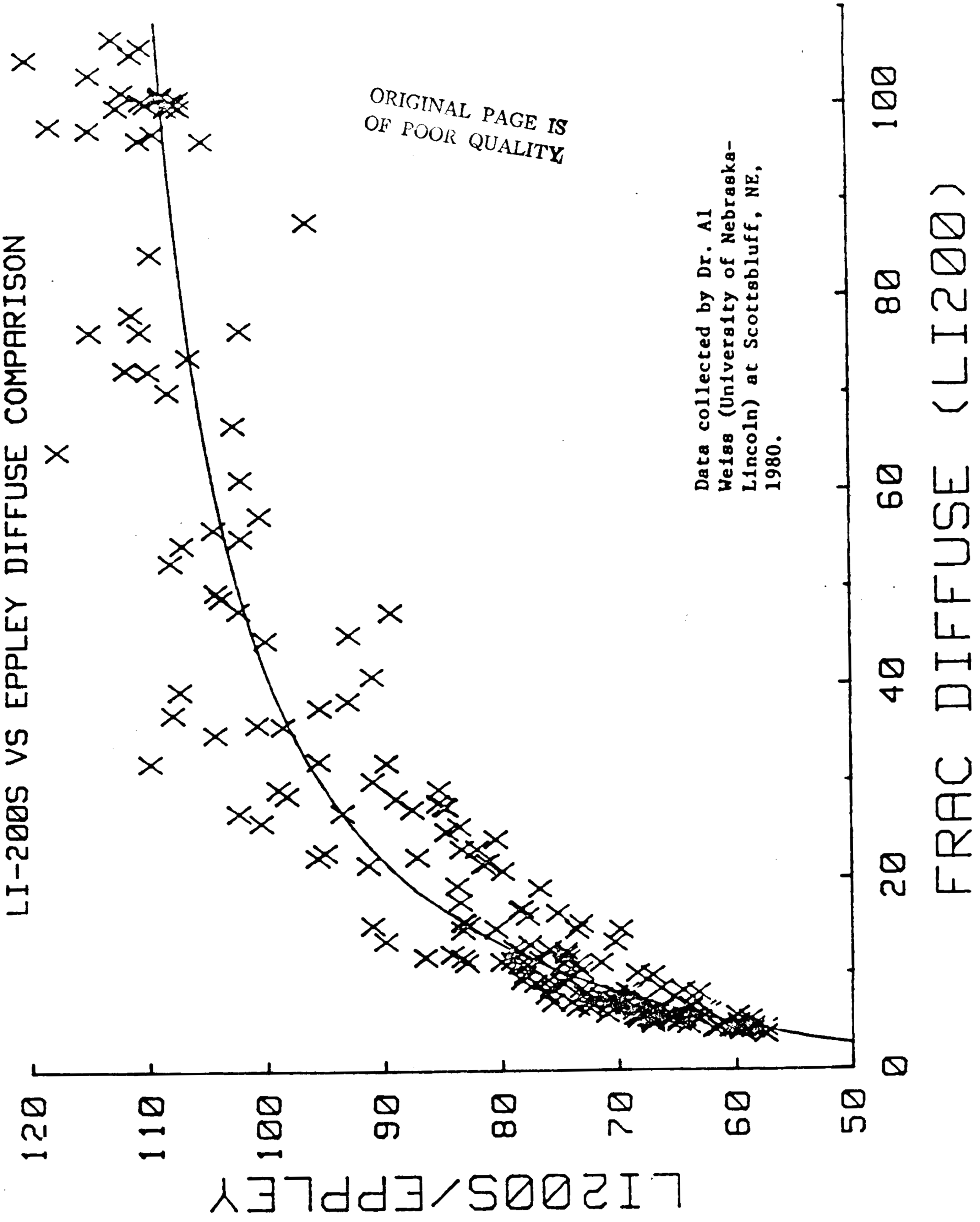


Figure 9.4. Spectral correction for the LI-200SB pyranometer. Values of Dl/G (%) are plotted on the x-axis and the corresponding values of Dl/De (%) are plotted on the y-axis.

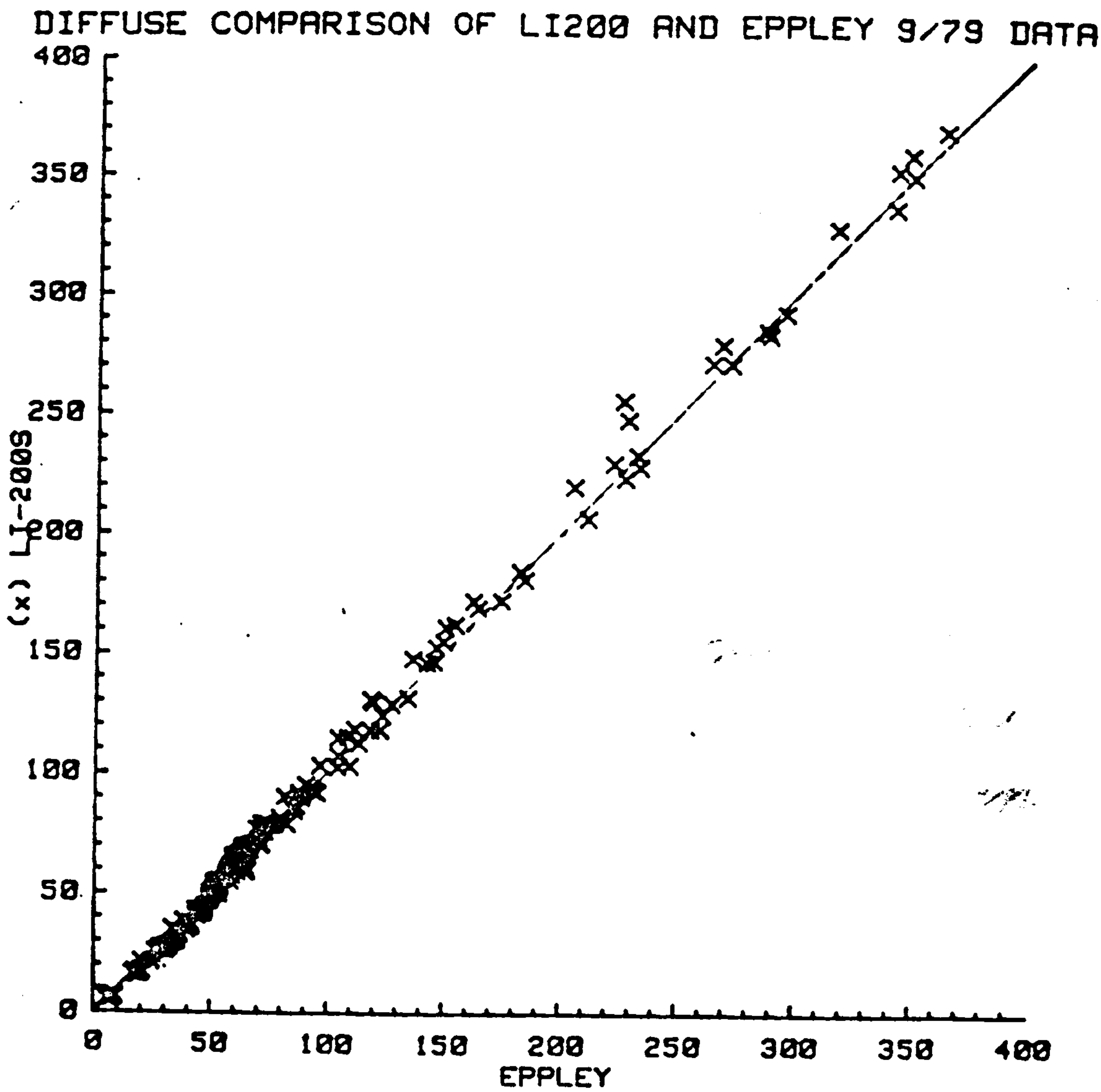


Figure 9.5 Plot of the corrected diffuse radiation determined by the LI-COR pyranometer versus diffuse radiation determined with the Eppley PSP pyranometer.

9.5 ADC-1 Wiring Diagrams

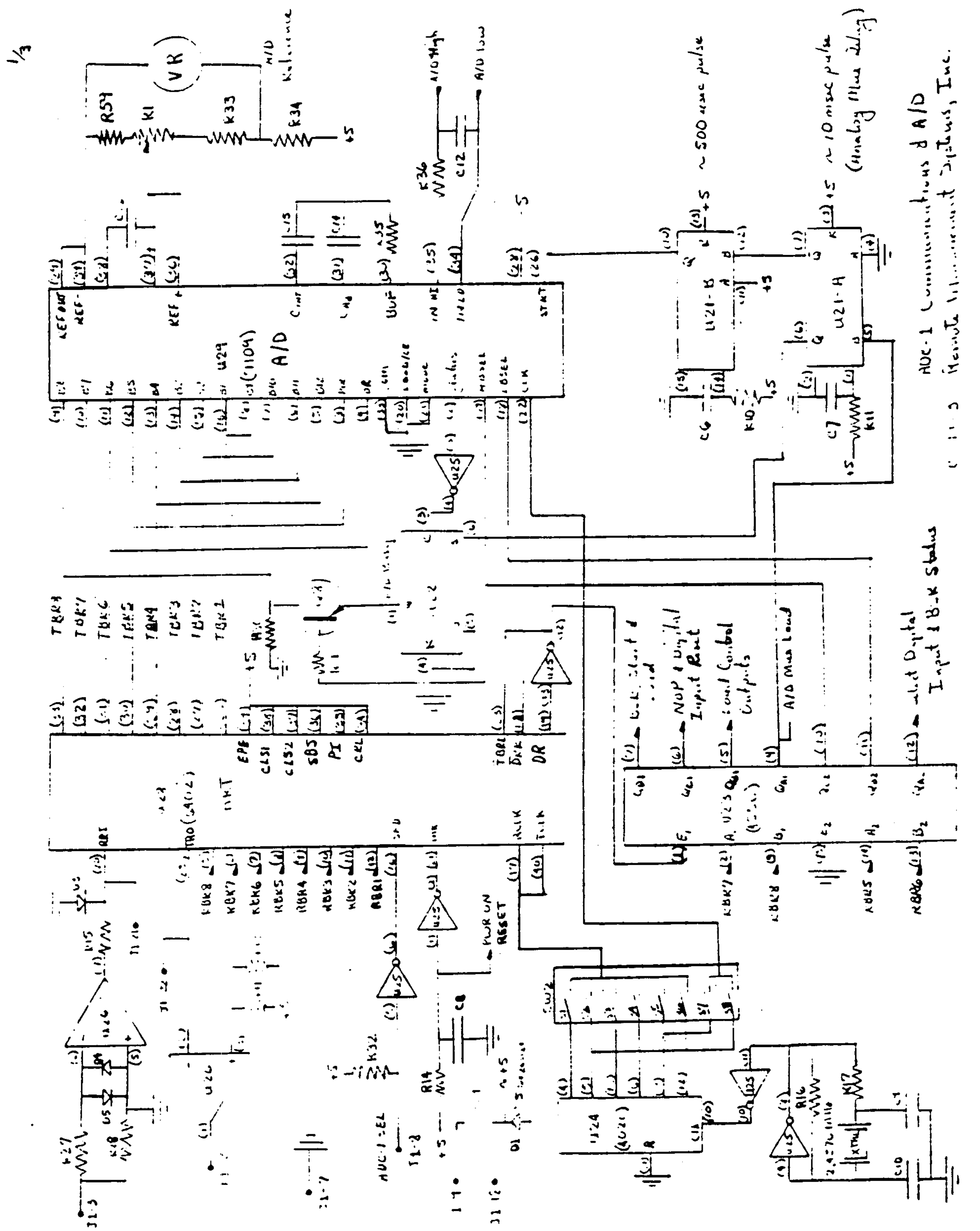


Figure 9.6 ADC-1 communications and analog to digital conversion section.

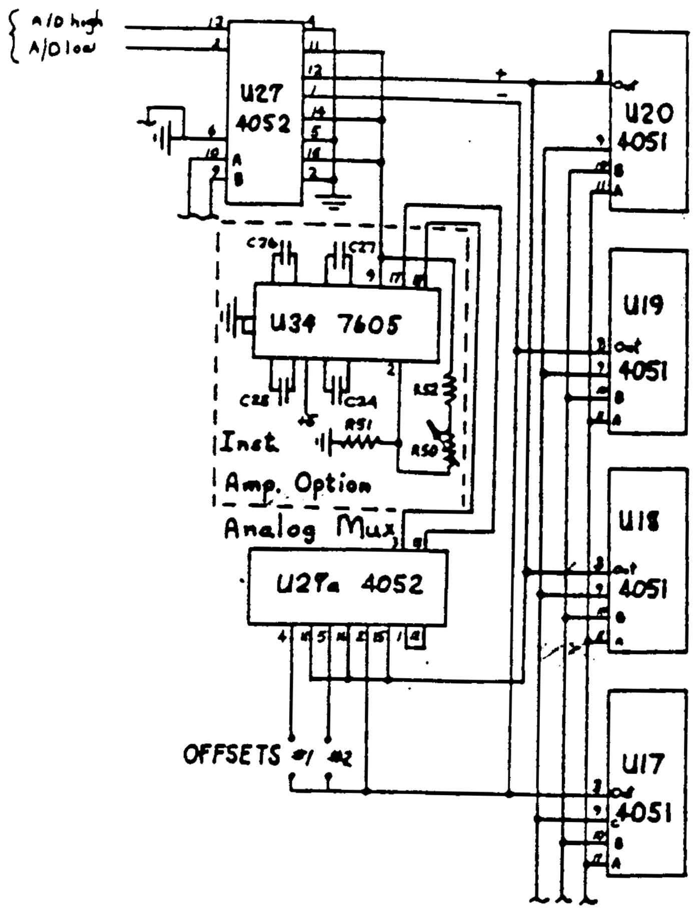


Figure 9.7. Overlay of offset voltage modifications to ADC-1.

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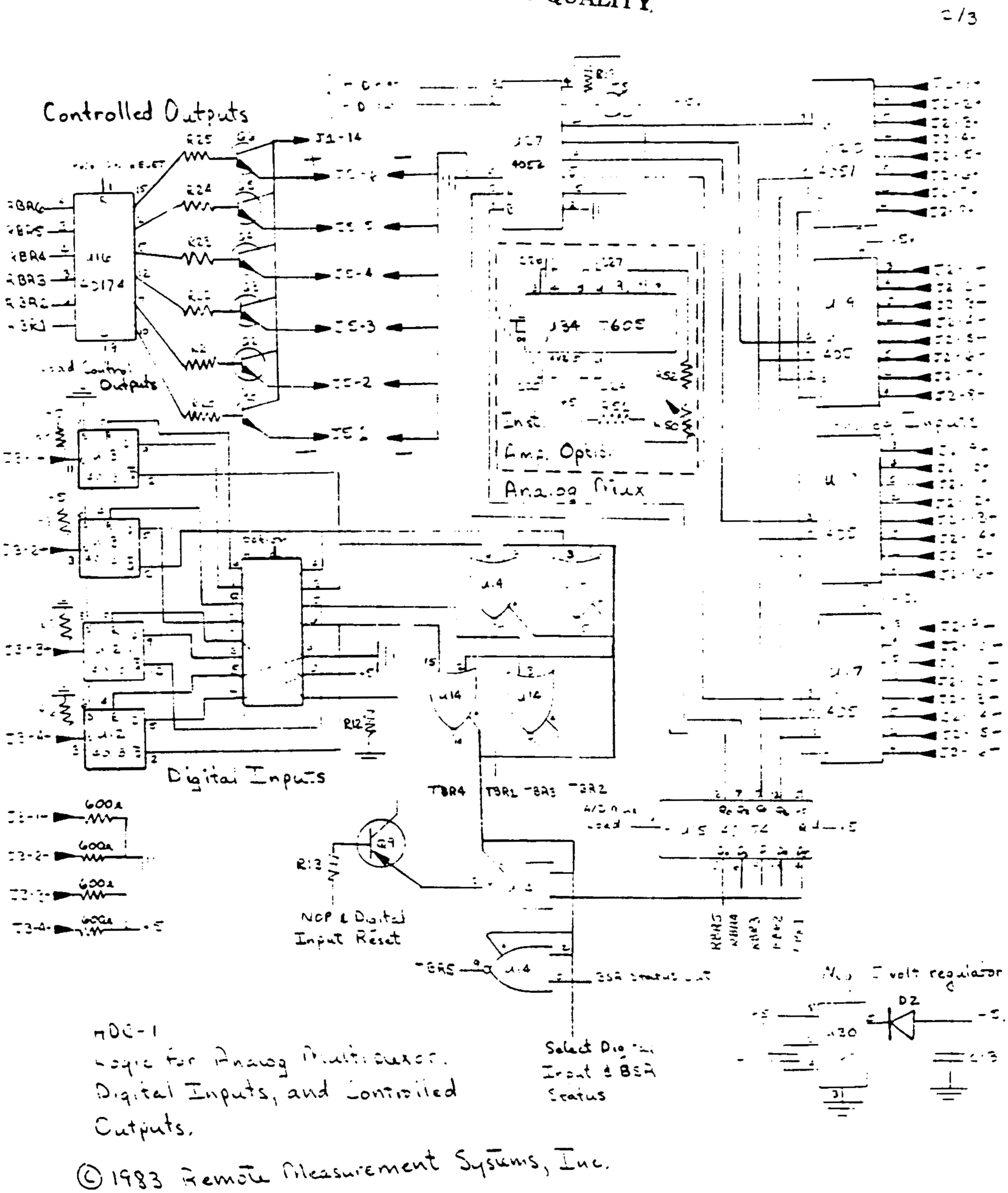

Figure 9.8. ADC-1 analog multiplexer, digital inputs and controlled outputs.

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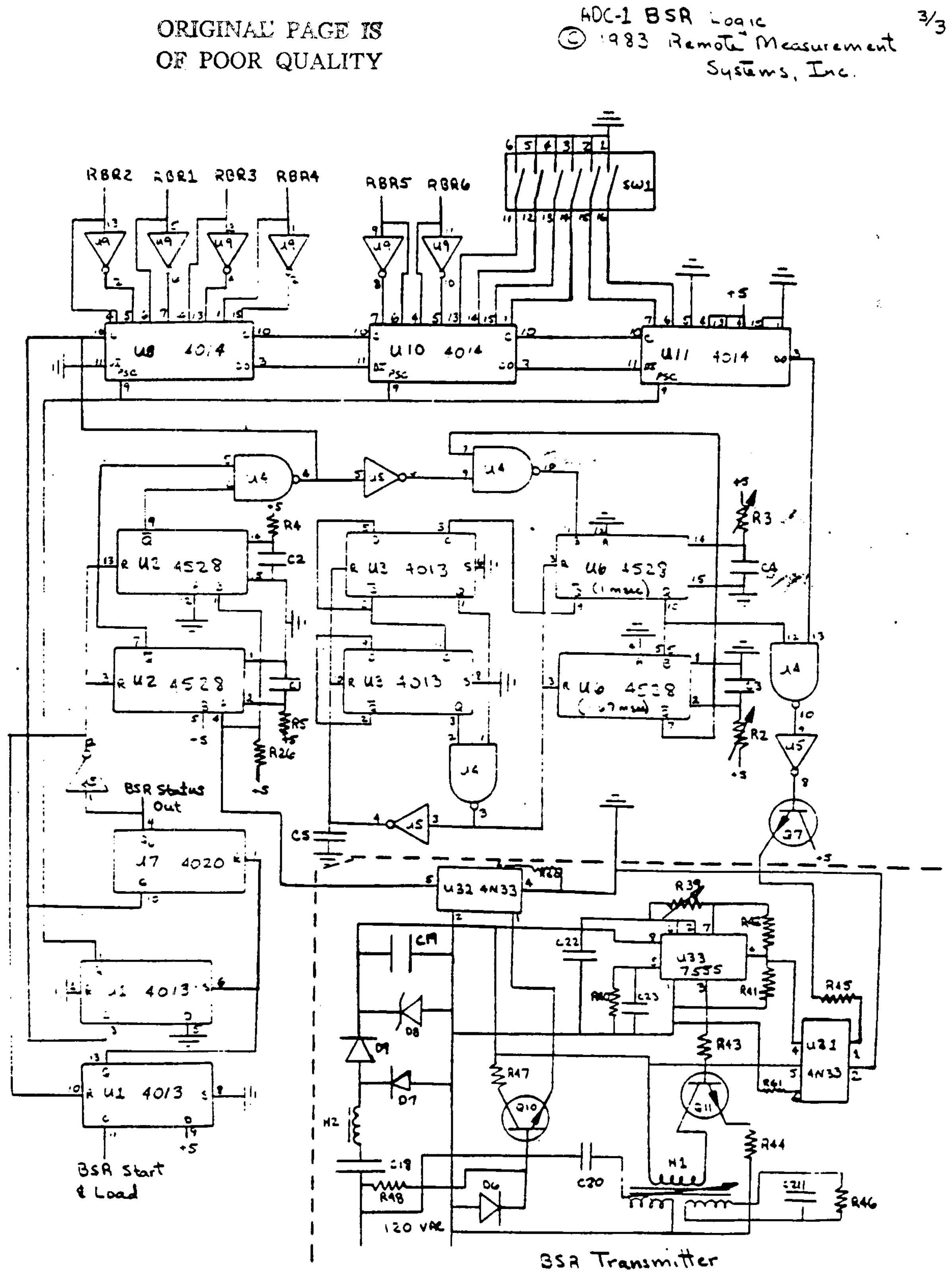

Figure 9.9. ADC-1 line carrier (BSR) control logic.

9.6 Surface Energy Balance Station Operating Instructions

9.6.1 Sample Screen Display with Channel ID's

CHAN	ENG	CHAN	ENG	CHAN	ENG
1	G	2	Q*	3	Kdn
4	Kup	5	D	6	THRt
7	Home	8	Udir	9	Tar
10	Twr	11	Tal	12	Twl
13	Tsoil	14	Tthr	15	U
16	THRb				

Screen Display legend

Chan	Abbr	Description	Units
1	G	= soil heat flux	(W m-2)
2	Q*	= net short and long wave radiation	(W m-2)
3	Kdn	= downward shortwave radiation	(W m-2)
4	Kup	= upward shortwave radiation	(W m-2)
5	D	= downward diffuse (sky) radiation	(W m-2)
6	THRt	= signal from top of total hemispherical radiometer	(W m-2)
7	Home	= AEM home signal	(mv)
8	Udir	= wind direction	(degrees)
9	Tar	= air temperature, right side	(Celsius)
10	Twr	= wet bulb temperature, right side	(Celsius)
11	Tal	= air temperature, left side	(Celsius)
12	Twl	= wet bulb temperature, left side	(Celsius)
13	Tsoil	= soil temperature, average top 5 cm	(Celsius)
14	Tthr	= temperature of THR	(Celsius)
15	U	= wind speed	(m s-1)
16	THRb	= signal from bottom of total hemispherical radiometer	(W m-2)

9.6.2 Energy Balance Station Maintenance Checklist

Daily maintenance and inspection is necessary in order to assure proper operation of the energy balance stations. The following checklist is designed to aid in systematic operation.

1. _____ Observe system operation
   _____ Check computer display
   _____ Check time (set to MST)

2. _____ Water psychrometers
   _____ Note water level in psycrometer reservoir (e.g. 1/2 full, 2/3 full, etc.)

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_____ Left hand psychrometer
_____ Right hand psychrometer
_____ Refill bottles
_____ Before replacing bottle, squeeze it in inverted position until water no longer runs out after squeeze pressure is removed.
_____ Check feed tube position with gauge
_____ Insert feed bottle into psychrometer. If properly seated, bottom of bottle will be below lip of holder

3. _____ Battery check
_____ V Main storage battery. Replace if less than 11.5 V.
(_____ V Offset battery
(_____ V Recorder battery)

4. _____ Automatic exchange system (AEM) operation
_____ Observe AEM operation for at least two cycles
_____ Check belt tension

NOTE: If for any reason the AEM is not operational, note the separation distance and height of the psychrometer pair for use in later analysis.

5. _____ Radiation sensors
_____ Check shadow band; is Licor sensor in shade?
_____ Check dessicant in net (Q) and total hemispherical (THR) radiometers
_____ Clean radiometer domes if they are dirty

6. _____ Record sky/cloudiness conditions

7. _____ Program changes; should only be entered immediately after the system has written to tape to minimize data loss.

9.6.3 Maintenance Equipment Checklist

1. _____ Distilled water

2. _____ Blank cassette tape

3. _____ Voltmeter

4. _____ Psychrometer gauge

5. _____ Paper towels/kleenex

6. _____ Black tape

7. _____ Two-way radio

8. _____ Ruler

9. _____ First aid kit

10. _____ Emergency storm shelter kit

11. _____ Rain gear

12. _____ Record book

(13. _____ RAM cartridge)

(14. _____ NEC battery pack)

15. _____ Tools

    _____ level
    _____ compass
    _____ scotch locks
    _____ straight blade screwdriver
    _____ phillips screwdriver
    _____ wire cutters
    _____ pliers
    _____ 3/8 - 7/16 and 1/2 - 9/16 wrenches
    _____ sandpaper strips
    _____ rubber cement

9.6.4 Operating the data acquisition program SAMP.BA

9.6.4.1 Move the cursor to SAMP.BA on the menu and hit the "RETURN" key to begin program execution. Basic program operation from this point on is automatic and requires no operator intervention.

9.6.4.2 Six single keystroke commanda have been implemented to control various system functions without interruption to data collection. These are activated by simply typing the single key as defined below. Five of the six commands are implemented in the current version of SAMP.BA.

"R" : Shifts the display to raw data units. The display remains in this mode until changed by the operator. Data is from last instantaneous sample.

"E" : Shifts the display to engineering units. The display remains in this mode until changed by the operator. Data is from last instantaneous sample. This is the default display.

"C" : Shifts the display to show the most recently computed energy and radiation balance. The display reverts to the previously selected option after the next sample is completed.

"G" : Shifts the display to show the air and wetbulb temperatures and gradients of the 30-second sample, present 6-minute average, past 6-minute average and the 12-minute average.

"P" : Directs program output to the parallel printer port as well as to the NEC display screen. WARNING: IF THIS OPTION IS SELECTED AND A PRINTER IS EITHER NOT INSTALLED OR NOT ON LINE, THE PROGRAM WILL STOP AND DATA COLLECTION WILL BE TERMINATED.

"O" : Cancels the "P" command, directing program output to NEC display only.

9.6.5 Changing cassette tape

Data is recorded on standard audio tape cassettes. Tapes of longer playing time than C-90 are not recommended.

a. Wait until the system is not writing to the tape, and ensure that adequate time is available before the system is scheduled to write data to the tape. This currently occurs on every hour and half hour.

b. Depress the STOP/EJECT button to release the SAVE/LOAD function keys, and then a second time to eject the old tape cassette.

c. Write the tape counter reading on the sticker on the upper left corner of the cassette, alonq with the date and time the cassette was removed. Ensure that the system number or site name (1 = PNL, 2 = SKIN, 3 = ESIDE, 4 = WSIDE and 5 = WPL) is written on the cassette.

d. After writing the system number or site name, and current date and time on the new cassette, insert it into the recorder and shut the cover.

e. Rewind the new cassette (the full reel should be to the left as you face the recorder).

f. Reset the tape counter by pushing the black button to the right of the counter.

g. Advance the tape past the leader using the FF key. A reading of 2 on the tape counter is sufficient.

h. Simultaneously depress the SAVE and LOAD key, and the recorder is ready to accept data.

i. It is recommented that time be allowed for the operator to observe correct operation of the recorder. The signal from the computer can be heard by use of the MONITOR button in the lower left hand corner of the cassette.

9.6.6 Main battery maintenance

Battery life. Average current consumption of a station can be estimated by summing the current consumption for each component, taking into account the variable duty cycle for the psychrometer blower and tape recorder. The resulting average current drain is about 233 ma (Table 9.2). A 12 V battery with an 125 Ampere-hour capacity could be expected to last a maximum of 536 hours (125 Amp-hours/.585 Amps), or about 23.4 days. It is recommended that the battery be replaced when about 25% of this capacity remains, or in the case of the above example, after 16.8 days.

Table 9.2. Power consumption of the data acquisition system from a 12 Vdc power source. Efficiences of all regulators are included.

Component	Current (ma)	Duty Cycle (%)	Average Current (ma)	Power (mW)
ADC-1	8	100	8	96
Auxiliary module	7	100	7	84
Computer (32k RAM)	75	100	75	900
Cassette recorder	65	5	3	36
Psychrometer blowers	100	100	100	1200
AEM	500	8	40	480
Totals	705		233	2796

BATTERY REPLACEMENT PROCEDURE

a. Remove the battery covers of both the old and replacement battery, and place the batteries side by side.

b. One at a time, remove the insulating cover from the spade lug on extra set of battery cables. Connect the black cable to the negative (-) terminal of the new battery, and then the red cable to the positive (+) terminal.

c. One at a time, remove the battery cables from the old battery, covering the terminating spade lugs with the insulating covers.

d. Remove the old battery, replace the covers.

NOTE: Minimize the time that the two batteries are connected in parallel, since connecting them in such a manner will tend to discharge the new battery.

9.7 Reading Tape Cassettes

Raw data is saved on cassette tape. These tapes can be read and transmitted via NEC computer's serial port to another computer for processing using the program READT2.BA and the following instructions. These instructions assume that the receiving computer is a Sierra Data Sciences model SBC-100 computer (SDS) operation under the CP/M operating system.

On NEC:

1. Connect NEC computer in place of the terminal to the SDS.
2. Put the NEC into terminal mode.
3. Move the cursor to "TELCOM" on the menu and hit "RETURN".
4. Set the serial port protocol to "8N82XN" using the "STAT" command (f.4 key).
5. Select TERM mode (f5 key). NEC is now acting as a terminal.

On SDS (using NEC as terminal):

6. Set the SDS computer to use XON/XOFF protocol using the GENMOD program (item 32 in the menu).
7. Insert proper floppy to store data on.
8. Type control C
9. Type D:
10. Type A:ED fname (invokes CP/M editor on file fname)
11. Type I (insert mode)
12. Type shift f5 twice to return control to NEC menu

On NEC:

13. Move cursor to READT2.BA; type RETURN.

(data is now transmitted).

(When the transmitted data fills the data buffer of the receiving computer, or the date changes, data transmission will cease and the program will stop and issue a buffer full message. If so, return the NEC to the terminal mode in TELCOM, and flush the data buffer or close the file and open a new one to store the data using the following procedure.)

On NEC:

14. Type CONTROL C (STOP key) when "Buffer full message" occurs.
15. Return to menu (shift 5)
16. Run TELCOM and TERM: by repeating steps 3 and 5

On SDS: (To flush buffer and continue data transfer)

17. Type CONTROL Z then RETURN (exits insert mode)
18. Type #W then RETURN (flushes buffer to disk)
19. Type I then RETURN (re-enter insert mode)
20. Return to menu (type shift 5 twice)

On NEC:

21. Move cursor to READT2.BA; type RETURN. (restarts transfer) (Ending cassette reading. Note that at the end of information on the tape, the cassette recorder will continue to run, but no new data will update the screen.)

22. Note time and date of las data record on display.
23. Type SHIFT and STOP simultaneously. (Response: ?IO ERROR
OK
24. Return to menu (type shift f5).
25. Run TELCOM and TERM: by repeating steps 3 and 5
26. Type CONTROL Z then RETURN (exits insert mode)
27. Type E, then RETURN (saves file on disk D:)
28. Type A:PIP C:=D:filename (backs up file on the C: disk.)
29. Repeat process for another tape.

To check for successful operation, enter "TYPE fname" and RETURN to list the data file. Editing may now be accomplished using ED.COM or Wordstar in the (N)ondocument mode.

9.8 Program Listings

The following programs are listed in this Appendix:

9.8.1 SAMP.BAS (with cross reference listing)
9.8.2 READT2.BA
9.8.3 ADCTST.BA
9.8.4 SAMPE.BAS
9.8.5 SAMPP.BAS (with cross reference listing)
9.8.6 SUMMARYE.BAS
9.8.7 PLOT4.BAS
9.8.8 PLOT5.BAS

Cross reference listings, included for some programs, consist of two parts. The first gives line numbers referenced in program statements such as GOSUB's and GOTO's (first column), and the line number(s) in which those references occur in succeeding columns. The second gives an alcal list of all variables used in the program, followed by a list of line number(s) in which those references occur.

The pages of each listing are numbered consecutively starting at page 1, with the name of each program or cross reference listing printed at the top of the page with the page number. Cross reference listings are distinguished by the suffix "CRF" instead of the "BA" or "BAS" used for the program lisings.

10. REFERENCES

Fritschen, L. J. and J. R. Simpson: 1982. An automatic system for measuring Bowen ratio gradients using platinum resistance elements. 739-742. In: Temperature, its Measurement and Control in Science and Industry. Am. Institute of Physics.

Gay, L. W. and L. J. Fritschen: 1979. An energy exchange system for precise measurements of temperature and humidity gradients in air near the ground. In: Proceedings, Hydrology and Water Resources of Arizona and the Southwest. 9:37-42.

International Energy Agency. 1980. Task IV-Development of an insolation instrument package: An introduction to meteorological measurements and data handling for solar energy applications. DOE/ER-0084. pp.4-7 to 4-9.

Appendix 9.8.1 SAMPX.BA, A sampling program for the NEC computer.

```
10 ' PROGRAM SAMPX.BA FOR NEC 8201 AND ADC-1                    6/8/84
2100
15 '                        LAST MODIFIED (SAMP2)          101211/19/84
20 '  SYSTEM 1        LOWER VALLEY (PNL)
25 ' USES CUSTOM INTP. SUBR. FOR COUNTERS
40 '
45 MAXFILES=3:CLEAR 100,61999!
50 CLS:SCREEN 0,0
55 DEFINT I-N
60 GOSUB 115:GOSUB 116
98  '
99      GOTO 1000          ' * * *  TO START OF PROGRAM * * *
100 '
105 '                        JUMP TABLE
110 '
115   GOTO 9000  ' INITIALIZE
116   GOTO 2100  ' MISC. CONSTANTS
120   GOTO 500   ' CLOCK
125   GOTO 300   ' SCREEN OUTPUT
130   GOTO 400   ' E/RAD BALANCE OUTPUT
135   GOTO 600   ' TC; MV TO C
140   GOTO 700   ' SAMPLE A/D (3000)
145   GOTO 800   ' GET DIGITAL INPUTS
150   GOTO 900   ' A/D TO MV CONVERSION
155   GOTO 1300  ' VECTOR WIND DIR.
160   GOTO 1500  ' RTD, MV TO C
165   GOTO 1600  ' DIGITAL OUTPUT
170   GOTO 1700  ' BREB
175   GOTO 1900  ' RADIATION BALANCE
180   GOTO 9100  ' CONTROL PARAMETERS
185   GOTO 9200  • CALIBRATION FACTORS
190   GOTO 2000  ' MISC. FUNCTIONS
195   GOTO 950   ' A/D UNITS TO MV
200   GOTO 12000 ' ERROR TRAPPING
205   GOTO 1200  ' AUDIO CASSETTE DUMP
210   GOTO 2500  ' PRINTER OUTPUT
215   GOTO 1400  ' DIGITAL CASS. DUMP
290 ' - - - - - - - - - - - - - - - - - - - - -
300 '
301 '  DISPLAY SUMMARY
302 '
305 CLS:LOCATE 0,1
310 IF DSP THEN MCOL=4 ELSE MCOL=3
315 FOR I=1 TO MCOL
316   IF DSP THEN PRINT "CHAN RAW "; ELSE PRINT"CHAN    ENG  ";
317 NEXT:PRINT
320 FOR I=1 TO M7 STEP MCOL
322   FOR K=I TO MCOL+I-1
323     IF K>M7 THEN 335
325     IF DSP THEN 326 ELSE 328
```

```
326        PRINT USING "## ##### ";C(K);A(K);:GOTO 330
328        PRINT USING "### #####.###";C(K);INT(1000*A1(K))/1000;
330   NEXT:PRINT
335 NEXT
340 IF DSP THEN LOCATE 0,7:PRINT (C-OC)/N2;C-OC;C;
350 RETURN
400 '
401 '      DISPLAY ENERGY, RAD BALANCE
402 '
405 CLS:GOSUB 120
407 LOCATE 0,2
410 PRINT "      H       E       B      Q      G"
415 PRINT USING F1$;H;E;B;Q;G
420 PRINT "     KDN     KUP     LUP    LDN    THR"
430 PRINT USING F2$;KDN;KUP;LUP;LDN;THR
435 PRINT "      TT      TWT      E      DT     DE"
450 PRINT USING F3$;T9;W9;E9;DT;DE;
455 LOCATE 0,0:PRINT "      U       DIR"
460 PRINT USING F1$;A1(17);A1(8);
465 RETURN
470 PRINT "     CP      L       S     GAMMA   RHO HOME"
475 PRINT USING F4$;CP;XL/1E+06;S0*1000;G1*1000;R0;P1;
490 RETURN
499 '
500 '  CLOCK - HOURS/MINUTES/SECONDS  (HR/MIN/SEC)
501 '
502 SEC=VAL(MID$(TIME$,7,2))
505 IF S8=59 AND SEC=0 THEN 570
510 IF S8<>SEC THEN 515 ELSE RETURN
515 LOCATE 23,0
520 PRINT TIME$;" ";DATE$;
522 DSP$=INKEY$:IF DSP$="" THEN 545
525 IF DSP$=CHR$(27) THEN E2=1 ' ESC?
530 IF DSP$="T" THEN TPE=1
533 IF DSP$="R" THEN DSP=1:GOSUB 125
534 IF DSP$="E" THEN DSP=0:GOSUB 125
535 IF DSP$="C" THEN GOSUB 130
540 IF DSP$="P" THEN PRT=1
542 IF DSP$="O" THEN PRT=0
545 S8=SEC
550 HR=VAL(MID$(TIME$,1,2))
555 YR=VAL(MID$(DATE$,1,2)) : MO=VAL(MID$(DATE$,4,2)) :
DA=VAL(MID$(DATE$,7,2))
570 MIN=VAL(MID$(TIME$,4,2)):RETURN
600 '
605 '     THIS SUBROUTINE CONVERTS READINGS FROM A THERMOCOUPLE
AND
610 '     REFERENCE JUNCTION IN A/D UNITS TO DEG. C.
615 '
625   V=A1(IC) + A1(REF)
627   A1(IC)=B1*V+B2*V^2+B3*V^3+B4*V^4
640   RETURN
```

```
700 '
704 '    ***  SAMPLE A/D (ADC-1); CONVERT TO DECIMAL   ***
705 '
710 FOR K2=1 TO NANLG:CN=C1(K2)
715  FOR J1=1 TO N5
725   POKE IOB,CN:POKE ITOB,1:             '     SELECT CHANNEL;
START A/D
730   X=PEEK(IB):'    GARBAGE CHARACTER
735   POKE IOB,161:POKE ITOB,1             '     GET ADC-1 HIGH
BYTE/STATUS
745   HBYTE=PEEK(IB):'   SAVE HIGH BYTE
750   IF(HBYTE AND 128) <> 0 THEN 735     '     CHECK STATUS FOR
A/D FINISHED
755   POKE IOB,145:POKE ITOB,1:            '     GET ADC-1 LOW BYTE
765   LBYTE=PEEK(IB):'    SAVE LOW BYTE
770   HMASK=HBYTE AND 15                   '     MASK 4 HIGH ORDER
BITS FROM A/D
775   Y=LBYTE+256*HMASK                    '     COMBINE ALL 12 BITS
FROM A/D
780   IF (HBYTE AND 16)=0 THEN Y=-Y        '     FIX SIGN IF
NEGATIVE FLAG SET
782   IF J1=N5 THEN 785 ELSE 787
785   A(K2)=Y
787  NEXT
790 NEXT:RETURN
800 '
801 ' ***  SAMPLE & RESET COUNTERS   ***
802 '
805 OC=C
810 C1=PEEK(I1):C2=PEEK(I2):C3=PEEK(I3)
820 C=C1+256*C2+65536!*C3
822 IF C9=1 THEN RETURN
825 A(M7)=C-OC
827 IF A(M7)<-1E+06 THEN A(M7)=A(M7)+1.6843E+07
830 A1(M7)=A(M7)/N2
880 RETURN
900 '
901 '  A/D UNITS TO MV
905 '
910 FOR I=1 TO NANLG
915   A1(I)=A(I)*G2(I)+B1(I)
925 NEXT
940 RETURN
949  '
950  ' MV TO ENG. UNITS, LINEAR
951  '
960  A1(IC)=A1(IC)*G(IC)+B(IC)
970  RETURN
1000 '
1005 ' MAIN SAMPLING LOOP
1010 '
1015 LOCATE 0,0:PRINT "WAIT FOR SECONDS = 0  "
```

```
1020 GOSUB 120:IF SEC>2 THEN 1020
1025 GOSUB 120:IF SEC=0 THEN 1025
1030 LOCATE 0,0:PRINT "SAMPLING INITIATED    ":'ON ERROR GOTO
12000 '       ????
1032 J9=0:POKE I1,0:POKE I2,0:POKE I3,0
1035 J9=J9+1:N6=0:H9=0:LOCATE 18,0:PRINT J9
1040   FOR K1=1 TO M : D(K1)=0 : A2(K1)=0 : NEXT
1045   A1=0:A2=0 ' ZERO VECTOR COMPONENTS OF WIND DIRECTION
1050   GOSUB 120:IF TPE THEN GOSUB 215
1052   IF INT(SEC/N2)<>SEC/N2 THEN 1050  '  UPDATE CLOCK TILL
TIME TO SAMPLE
1055     GOSUB 145 '  SAMPLE COUNTERS
1060     GOSUB 140 '        SAMPLE A/D'S
1065     IF INT((MIN+N1-1-N8)/N1)<>INT((MIN+N1-1)/N1) THEN LOCATE
0,0:PRINT "WAIT FOR EQUILI.      ":GOTO 1050 ' SKIP 1ST N8 POINTS
1068     GOTO 1085 '    SKIP HOME CHECK
1070     IF ABS(A(HOME)) >400 THEN 1085
1075    IF INT(MIN/N1)=MIN/N1 THEN 1085
1080     H9=H9+1:IF H9<=2 THEN 1050
1085     N6=N6+1
1087     GOSUB  150  '  A/D UNITS TO MV
1090     FOR IC=1 TO M7
1093       D(IC)=D(IC)+A(IC)    ' SUM RAW DATA
1095       ON N(IC) GOSUB 135,160,155,195,195
1100       A2(IC)=A2(IC)+A1(IC)   ' SUM ENG UNITS
1110     NEXT
1120     GOSUB  125  '  UPDATE DISPLAY
1125     LOCATE 0,0:PRINT "SAMPLE BELOW SAVED";J9;:LOCATE
35,7:PRINT N6;
1130     GOSUB  120  '   GET TIME
1135     IF E2=1 THEN 1145 ' EXIT IF "ESCAPE" LAST KEY PRESSED
1140     IF INT(MIN/N1)=MIN/N1 AND SEC+N2>59 THEN 1142 ELSE 1050
1142   C9=1:C5=C4:GOSUB 145:C9=0 '  COUNTER
1143   C4=C:DC=C4-C5:IF DC<-1E+06 THEN DC=DC+1.6843E+07
1144   DS%(J9,M7)=DC/N1:A2(M7)=DC*G(M7)/(N1*60)+B(M7)
1145   IF N6<10 THEN I=N6 ELSE I=0
1146   DS%(J9,M-1)=HR*1000!+MIN*10+I   '  HRS/MIN
1150   DS%(J9,M)   = MO *100 + DA
1155   GOSUB  165  '  REVERSE BOWEN RATIO DEVICE
1160   FOR I=1 TO NANLG
1165     A2(I)=A2(I)/N6
1170     IF N(I)<> 3 THEN DS%(J9,I)=D(I)/N6 ELSE DS%(J9,I)=D(I)
1175   NEXT
1180   J=NCRTD:K9=1:IF TPE <>1 THEN GOSUB 170 ' BREB
1182   IF PRT=1 THEN GOSUB 210  '  PRINTER OUTPUT
1185   IF E2=1 THEN STOP
1190   IF MIN MOD N4*N1=0 THEN GOSUB 205
1191   IF J9>=N3 THEN J9=0
1192 GOTO 1035
1195 '
1200 ' SAVE RAW DATA ON CASSETTE TAPE
1205 '
```

```
1210 IS=J9-N4+1:IE=J9:TPE=0:IF IS<1 THEN IS=1
1220 OPEN "CAS:DATA" FOR OUTPUT AS #2
1225 CLS:LOCATE 0,0
1230 PRINT "WRITING TO TAPE       ";
1235 FOR J1=IS TO IE
1240   FOR I=1 TO M
1250     PRINT #2,DS%(J1,I);
1260   NEXT
1265   LOCATE 23,0:PRINT TIME$;" REC= ";J1;
1270 NEXT:CLOSE #2:RETURN
1300 '
1305 '     VECTOR AVG WIND DIRECTION
1315 '
1330 A7=(A1(IC)*G(IC)+B(IC))/DPR
1340 A1=A1+COS(A7):A2=A2+SIN(A7)
1345 IF A1<>0 THEN A3=ATN(A2/A1) ELSE A3=SGN(A2)*PI/2
1350 IF SGN(A1)<0 THEN A3=A3+PI
1360 IF SGN(A1)>0 AND SGN(A2)<0 THEN A3=A3+2*PI
1380 D(IC)=A3*DPR:A1(IC)=D(IC)
1390 RETURN
1400 '          DIG CASSETTE DUMP
1410 IF IO>0 THEN 1440
1420 POKE IP,201 'TURN OFF COUNTER
1425 OPEN "COM:6N82NN" FOR OUTPUT AS #3
1430 PRINT"DISC. ADC-1; CONN. DIG REC."
1432 INPUT"RECORDER ON; PRESS RETURN"
1435 IO=1:J8=0
1440 J8=J8+1
1445 LOCATE 0,0:PRINT "DIG O/P IN PROG. ";J8;
1450 FOR I=1 TO M
1455   PRINT #3,DS%(J8,I);
1460 NEXT
1475 IF J8>=N3 THEN 1480 ELSE 1440
1480 IO=0:TPE=0:CLOSE #3
1481 PRINT"DISC. DIG REC.; CONN. ADC-1"
1482 INPUT"RECORDER OFF; PRESS RETURN"
1500 '
1505 '  CONVERT RTD READINGS TO DEG. C.
1510 '
1545   T=(A1(IC))/RC(1)/B2(IC)
1550   A1(IC)=-245.665+T*(235.476+10.189*T)
1565 RETURN
1600 '
1601 '        PULSE BOWEN RATIO DEVICE
1602 '
1605 ' CHANNEL:   1   2   3   4   5   6  ALL OFF
1607 '
1610 POKE IOB,65:POKE ITOB,1:X=PEEK(IB)
1615 FOR I=1 TO 500:NEXT
1620 POKE IOB,64:POKE ITOB,1:X=PEEK(IB)
1625 RETURN
1700 '
```

```
1705 '               ONLINE CALCULATIONS
1715 ' SUB5,6 = PRESENT VAL., SUB7,8 = PAST VAL., SUB9,0 =
RUNNING AVE.
1720 '
1725 Q5=A2(2):G5=A2(1)
1730 TAV5=(A2(J)+A2(J+2))/2:WAV5=(A2(J+1)+A2(J+3))/2
1735 P1=SGN(A(HOME)):IF P1=-1 THEN IALT=0 ELSE IALT=2
1740 T5=A2(J+IALT):T6=A2(J-IALT+2):W5=A2(J+IALT+1):W6=A2(J-
IALT+3)
1744 '
1745 '   *** FIND RUNNING AVERAGES ***
1746 '
1750 Q=(Q7(K9)+Q5)/2:G=(G7(K9)+G5)/2
1755 T=(TAV5+TAV7(K9))/2:TW=(WAV5+WAV7(K9))/2
1760 T9=(T5+T7(K9))/2:T0=(T6+T8(K9))/2:W9=(W5+W7(K9))/2:
W0=(W6+W8(K9))/2
1764 '
1765 '   *** SAVE PRESENT VALUES ***
1766 '
1770 G7(K9)=G5:Q7(K9)=Q5
1775 TAV7(K9)=TAV5:WAV7(K9)=WAV5
1780 T7(K9)=T5:T8(K9)=T6:W7(K9)=W5:W8(K9)=W6
1784 '
1785 '   *** MISCELLANEOUS PARAMETERS ***
1786 '
1790 TT=T:W=TW:GOSUB 2015:EA=EFN
1792 CP=(239.9+440.9*.622*EA/(P-EA))/.2388
1795 XL=2.5013E+06-2366*TW:GOSUB 2030:S0=S
1800 G1=P*CP/(.622*XL):R0=3.4838*(P-.378*EA)/(T+273.16)
1805 S1=9.81/CP:TT=TW:GOSUB 2030
1810 S2=9.81*(1/CP+3.4857E-03*EA/(273.16+T)/G1)/(1+S/G1)
1815 S7=9.81*3.4857E-03*EA/(273.16+T)
1819 '
1820 '   *** GRADIENTS ***
1821 '
1825 TT=T9:W=W9:GOSUB 2015:E9=EFN
1826 TT=T0:W=W0:GOSUB 2015:E0=EFN
1830 DT=T9-T0+S1*DELZ(K9)
1835 DE=E9-E0+S7*DELZ(K9)
1859 '
1860 '   *** BOWEN RATIO USING T, E ***
1861 '
1865 B=G1*DT/DE
1870 H=(-Q-G)/(1+1/B):E=H/B
1872 '
1873 '   *** RADIATION BALANCE ***
1874 '
1877 KUP=-A2(4):KDN=A2(3)
1880 IF KDN<=0 THEN A=0 ELSE A=-KUP/KDN ' ALBEDO
1890 THR=SIGMA*(A2(14)+273.16)^4+A2(6)
1895 LUP=-THR-KUP:LDN=Q5-KUP-KDN-LUP
1910 RETURN
```

```
1950 '
2000 '   * * *  MISCELLANEOUS FUNCTIONS  * * *
2005 '
2015
ESAT=(E(1)+W*(E(2)+W*(E(3)+W*(E(4)+W*(E(5)+W*(E(6)+W*(E(7)))))))
/10
2020 EFN=ESAT-6.6E-04*(1+1.15E-03*W)*P*(TT-W)
2025 RETURN
2030
S=(S(1)+TT*(S(2)+TT*(S(3)+TT*(S(4)+TT*(S(5)+TT*(S(6)+TT*(S(7)))))
)))/10
2035 RETURN
2050 '
2100 '   * * *  MISCELLANEOUS CONSTANTS  * * *
2105 '
2115 E(1)=6.1078
2116 E(2)=.44365185#
2117 E(3)=.014289458#
2118 E(4)=2.6506485D-04
2120 E(5)=3.031240400000003D-06
2121 E(6)=2.0340809D-08
2125 E(7)=6.136820900000027D-11
2126 '
2130 S(1)=.44381
2131 S(2)=.028570026#
2132 S(3)=7.93805E-04
2133 S(4)=1.2152151D-05
2135 S(5)=1.0365614D-07
2136 S(6)=3.532421800000003D-10
2140 S(7)=-7.090244800000048D-13
2141 '
2145 B1=25.661297#
2146 B2=-.619548690000003#
2147 B3=.022181644#
2148 B4=-3.5509E-04
2150 RETURN
2500 '
2505 '  PRINT SUMMARY
2510 '
2515 LPRINT TIME$;" ";DATE$
2520 MCOL=4
2525 FOR I=1 TO MCOL
2530   LPRINT "CHAN  RAW      ENG ";
2535 NEXT:LPRINT
2540 FOR I=1 TO M7 STEP MCOL
2545   FOR K=I TO MCOL+I-1
2550     IF K>M7 THEN 2575
2565     LPRINT USING "### #####
#####.###";C(K);DS%(J9,K);INT(1000*A2(K))/1000;
2570   NEXT:LPRINT
2575 NEXT:LPRINT
2580 '
```

```
2600 '      DISPLAY ENERGY, RAD BALANCE
2601 '
2605 LPRINT "      H       E       B       Q        G";
2610 LPRINT "      KDN     KUP     LUP     LDN      THR"
2615 LPRINT USING F1$;H;E;B;Q;G;
2620 LPRINT USING F2$;KDN;KUP;LUP;LDN;THR
2625 LPRINT "      TT      TWT     E       DT       DE";
2630 LPRINT "      U       DIR"
2635 LPRINT USING F3$;T9;W9;E9;DT;DE;
2640 LPRINT USING F1$;A2(17);A1(8)
2645 FOR I=1 TO 10:LPRINT "- - - ";:NEXT:LPRINT:RETURN
2650 LPRINT "     CP      L      S     GAMMA   RHO HOME"
2655 LPRINT USING F4$;CP;XL/1E+06;SO*1000;G1*1000;RO;P1
2660 RETURN
9000 '
9005 ' * INITIALIZE CONTROL PARAMS *
9010 '
9020 OPEN "COM:8N82NN" FOR INPUT AS #1
9030   DPR=57.2958   '  DEGREES/RADIAN
9050   DELZ(1)=1!    '  PSYCHROM. SEP.
9055   SIGMA=5.6697E-08' BOLTZMAN CONST
9070   PN=192        '  SERIAL PORT DATA
9080   PI = 3.14159
9095   REF=0         '  TC REF CHANNEL
9100   HOME=7        '  HOME CHANNEL
9105   ELEV=1804      '  ELEVATION, M
9106   P=101.3-.01055*ELEV ' ASSUME STD ATMOSPHERE
9110 OPEN "INDAT1" FOR INPUT AS #2
9112 INPUT #2,X$    ' SKIP LABEL
9115 INPUT #2,M,N1,N2,N3,N4,N5,N8,GO,M7
9120 N4=N4/N1   '  SET N4=# OF RECORDS/DISK UPDATE
9125 DIM D(M),A(M7),A1(M7),A2(M)
9130 DIM C(M),C1(M),G(M7),B(M7),G2(M7)
9132 DIM B2(M7),N(M7),B1(M7)
9135 INPUT #2,X$   ' SKIP LABEL
9136 INPUT #2,LG,HG,HOME,REF,O1,O2,RC(1),NCRTD
9137 INPUT #2,X$   ' SKIP LABEL
9140 FOR K=1 TO M7
9145  INPUT #2,C(K),C1(K),G(K),B(K),N(K),X$
9150  IF C1(K)=0 THEN G2(K)=1/LG ELSE G2(K)=1/HG
9155  IF C1(K)=1 THEN B1(K)=O1
9160  IF C1(K)=3 THEN B1(K)=O2
9165  C1(K)=C1(K)*16+C(K)-1
9168  IF N(K)=2 THEN NRTD=NRTD+1
9170  IF N(K)=3 THEN NWD =K
9175  IF N(K)=5 THEN NDIG=NDIG+1
9180 NEXT
9190 FOR K=NCRTD TO NCRTD+NRTD-1
9192   INPUT#2,B2(K)
9193 NEXT:CLOSE#2
9195 NANLG=M7-NDIG
9235 F1$="#####.# #####.# ###.### #####.# #####.#"
```

```
9240 F2$="#####.# #####.# #####.# #####.# #####.#"
9245 F3$="###.### ###.### ###.### ##.#### ##.####"
9250 F4$="####.# ##.### ###.## ###.## ###.## ##.#"
9260 ' CALC DATA BUFFER SIZE
9265 N3=(FRE(O)-1600)/(2*(M+1))
9270 DIM DS%(N3,M)
9275 LOCATE 0,7:PRINT N3*N1/60;" HOURS OF DATA IN BUFFER";
9300 ' INIT UART INTERRUPT HANDLER
9310 IF PEEK(62000!)=51 AND PEEK(62115!)=201 THEN 9320 ELSE 9315
9315 PRINT "LOAD DIG IN ROUTINE":STOP
9320 I1=-3413:I2=I1+1:I3=I1+2
9325 IB=-3420:IOB=IB+1:ITOB=IB+3
9330 IP=-3188
9335 POKE IP,195:POKE IP+1,48:POKE IP+2,242
9340 OUT PN,129:'  START COUNTERS
9350 POKE IOB,64:POKE ITOB,1:'ALL DIG. O/P'S OFF
9500 RETURN
12000 ON ERROR GOTO 0
12002 IF INKEY$=CHR$(27) THEN E2=1
12005 PRINT "ERROR ";ERR;" IN STATEMENT ";ERL
12020 RESUME 1015
```

Appendix 9.8.5 READT2.BAS, A program for the NEC which reads casette tape data into the editor of the SDS computer.

```
10 'READT2  READS SAMPX DATA FILE AND
15 'WRITES IT TO SERIAL PORT    9/18/84
20 'LAST MODIFIED          1530 9/18/84
25 '
30  MAXFILES=2:CLEAR 100,62335!
35  POKE -3188,201
50  M=19 '                     FIELDS/RECORD
60  DIM DS%(M):SCREEN 0,0
100 OPEN "COM:8N82XN" FOR OUTPUT AS #2
120 CLS:LOCATE 0,0
130 N=0
140 OPEN "CAS:DATA" FOR INPUT AS #1
200 N=N+1
205 DATE=DS%(M):TIME=INT(DS%(M-1)/10)
210 PRINT N;
220 FOR I=1 TO M
225   IF EOF(1) THEN GOTO 400
230   INPUT #1,DS%(I)
250   PRINT USING "#####";DS%(I);
260   PRINT #2,USING "######";DS%(I);
270 '  IF EOF(1) THEN GOTO 400
280 NEXT:PRINT""
285 PRINT #2,""
290 IF DATE<>DS%(M) AND N>1 THEN CLOSE #1:FOR I=1 TO 20:PRINT
CHR$(7);:NEXT:STOP
295 GOTO 200
400 PRINT""
405 PRINT #2,""
410 CLOSE #1
415 IF N>285 THEN FOR I=1 TO 20:PRINT CHR$(7);:NEXT:INPUT "ED
BUFFER FULL; USE #W ";X$
420 IF DATE<>DS%(M) AND N>1 THEN FOR I=1 TO 20:PRINT
CHR$(7);:NEXT:STOP
425 GOTO 140
```

Appendix 9.8.6 ADCTST.BAS, A Test program for the ADC-1 using the NEC computer.

```
10 ' ADCTST:  TEST FOR ADC-1    6/7/84
15 ' LAST MODIFIED             3/ 6/85
20 '
25  CLS: CN=16: POKE -3188,201
30  OPEN "COM:8N82NN" FOR INPUT AS 1
40  DIM C(16),M(16),N(16),A(16),OFST(16),Q(16),S(16)
90    PN=192                      :' SERIAL PORT DATA ADDRESS
105   X=INP(PN)                   :' CLEAR INPUT PORT OF OLD BYTES
107 OS=0:NO=1:N1=10:N3=1:C(1)=1:GOTO 170
110 INPUT "GAIN/OFFSET";OS
120 PRINT "A/D STABILITY AND CALIBRATION TEST"
130 INPUT "NO. OF CHANNELS TO TEST ";NO
140 INPUT "NO. OF CHANNELS TO AVERAGE ";N1
145 INPUT "NO. OF SCANS/SAMPLE ";N3
150 PRINT "SPECIFIY EACH CHANNEL TO TEST "
160 FOR K=1 TO NO:INPUT "?";C(K):NEXT
165 IF C(1)=0 THEN FOR I=1 TO 16:C(I)=I:NEXT
170 Y1=-1E+38:Y2=1E+38
180 PRINT
185 N2=10
190 FOR L=1 TO NO: M(L)=-10000:N(L)=10000:NEXT
200 FOR L=1 TO N1
225   GOSUB 800
228   FOR K=1 TO NO
229     IF L=1 THEN OFST(K)=A(K)
230     S(K)=S(K)+A(K)-OFST(K):Q(K)=Q(K)+(A(K)-OFST(K))^2
240     IF A(K)>M(K) THEN M(K)=A(K)
245     IF A(K)<N(K) THEN N(K)=A(K)
250   NEXT
260 NEXT
270 FOR L=1 TO NO
280   Q(L)=SQR(ABS((Q(L)-S(L)^2/N1)/(N1-1)))
290   S(L)=S(L)/N1+OFST(L)
300 NEXT
305 PRINT "CH NO.     AVE     STD DEV    MAX    MIN"
310 FOR L=1 TO NO
320   PRINT USING "###";C(L),
330   PRINT USING "#######.## #######.##";S(L),Q(L),
335   PRINT USING "####### #######";M(L),N(L)
340   Q(L)=0:S(L)=0
350 NEXT
355 PRINT
360 GOTO 190
800 '
801 '    ***  SAMPLE A/D (ADC-1); CONVERT TO DECIMAL  ***
802 '
805 FOR K2=1 TO NO
810  X$=INKEY$:IF X$<>""THEN C1=ASC(X$)
811  IF X$<>"" THEN IF C1>57 THEN C1=C1-7
```

```
815  IF C1>48 THEN C(1)=C1-48
816  CN=C(K2)+OS-1
818  FOR I1=1 TO N3
820   OUT PN, CN                          :' SELECT CHANNEL; START
A/D
826   Y=INP(PN)                           :' GARBAGE CHARACTER
827   FOR K=1 TO 200:NEXT
830   OUT PN,128+32                       :' GET ADC-1 HIGH
BYTE/STATUS
835 'OUT PN,129
840   HBYTE=INP(PN)                       :' SAVE HIGH BYTE FROM
A/D
845   IF(HBYTE AND 128) <> 0 THEN 830     :' CHECK STATUS FOR A/D
FINISHED
850   OUT PN,129+16                       :' GET ADC-1 LOW BYTE
855 'OUT PN,129
860   LBYTE=INP(PN)                       :' SAVE LOW BYTE FROM A/D
865   HMASK=HBYTE AND 15                  :' MASK 4 HIGH ORDER BITS
FROM A/D
870   Y=LBYTE+256*HMASK                   :' COMBINE ALL 12 BITS
FROM A/D
875   IF (HBYTE AND 16)=0 THEN Y=-Y       :' FIX SIGN IF NEGATIVE
FLAG SET
877   IF I1=N3 THEN 880 ELSE 883
880   A(K2)=Y:PRINT USING "#####";Y;
883  NEXT
885 NEXT:PRINT:' HBYTE;HMASK;LBYTE
890 RETURN
1000 C1=VAL(INKEY$)
1010 IF C1<> OC1 THEN CN=C1
1015 OC1=C1
1020 PRINT CN:GOTO 1000
1050 GOTO 1000
```

Appendix 9.8.8 SAMPEE.BAS, a program for the AT computer which converts the raw data from the NEC computer into engineering units.

```
4    'note changed lines 4470-4485---removed
5     ' SAMPE.BAS modified for AT computer and Epson LQ-1000
printer
6     '
06/25/86  0443
10    ' SAMPB2.BAS  RANDY data analysis program
06/13/85  1130
15    ' Based on PROGRAM SAMPC2.BAS
12/17/84  1143
20    ' For Hanford Site study, Washington
100   ' 3981 for thermal conductivity and 3892 for correct soil
heat flow.
120   '                                          Last modified
5/7/86
140  DEFINT I-N : M=18
150  DIM T(50),IFLGO(30),IFLGO7(30)
155  DIM N(25),D(25),F(17),A$(50),L(50),T$(13),C(50,4),B$(50)
160  DIM A2(20),CH(20),C1(20),G(20),B(20),G2(20)
165  DIM NT(20),B1(20),FL$(120),N$(9)
170  DIM
DELZ(2),Q7(2),G7(2),TAV7(2),WAV7(2),T7(2),T8(2),W7(2),W8(2)
175  DIM RC(2),E(9),S(7)
200  '
1000 GOSUB 9000:F$=""                        ' Microstat init
1010 GOSUB 32000                             ' init clock
2000 '
2005 ' MAIN PROGRAM
2010 '
2030 M3=0:M2=0:M1=0:S4=0:S5=0:S7=0
2040 '
2045 ' read input file name
2050 '
2055 ICOUNT = ICOUNT + 1 : N$=DXI$+FL$(ICOUNT) : N1$=N$+"R"
2056   N9$=N$+".DAT"
2065   Q5=4
2070   GOSUB 6200                             ' set system
specific info
2100   '
2540   L1=M :M1=L1          '  NOUT
2560   '
2565   C=1 : D=1000
2605   N3M=D-C+1
2608   '
2617   N3$=DXO$+FL$(ICOUNT):Z$=N3$+FS$
2700   '
2870   FOR L=1 TO L1
2880     L(L)=L
2890   NEXT
```

```
2900   GOSUB 6300 '                          read data system
parameters
2990   PRINT F$:PRINT"FILE: " N3$ " IS NOW BEING OUTPUT...":J1=0
2995 '
2996 '   open input and output files
2997 '
3000   OPEN "I",#1,N9$   '   OPEN "R",#1,N1$,Q5
3050 '                       FIELD #1,Q5 AS T$
3060   OPEN "R",#2,Z$,Q5
3080   FIELD #2,Q5 AS U$
3100 '
3105 '   main computation loop
3110 '
3150   FOR J=C TO D
3155 '
3160 '   read data into T()
3165 '
3170     FOR K=1 TO L1
3175       INPUT #1,T(K) : IF EOF(1) THEN 3540
3210     NEXT
3427     GOSUB 3600
3440     J1=J1+1:PRINT CHR$(13) J1 INT(T(M-1)/10) T(M) "    ";
3450 '
3455 '   write out full T() array
3456 '
3460     FOR L=1 TO L1
3480       IF Q5=4 THEN LSET U$=MKS$(T(L(L))) ELSE LSET
U$=MKD$(T(L(L)))
3510       PUT #2,L+(L1*(J1-1))
3520     NEXT
3530   NEXT:PRINT F$
3540   PRINT "END OF FILE OUTPUT":N$=N1$
3570   CLOSE #1:CLOSE #2:PRINT
3575   GOSUB 6400                              'create output
file directory
3580   N$=N3$:GOSUB 8300
3590 IF ICOUNT<IFILES GOTO 2000
3595 CHAIN "SAMPP":END
3600 '
3605 ' MAIN SAMPLING LOOP
3610 '
3670 FOR I=1 TO M1
3675   IF NT(I)=3 OR I>M1-2 THEN A2(I)=T(I):GOTO 3689 'No action
Time or Udir
3680   IF NT(I)=3 AND T(M)<VDATE AND INT(T(M-1)/10)<VTIME THEN
A2(I)=T(I)+VANE:GOTO 3689
3685   A2(I)=T(I)*G2(I)+B1(I) ' A/D UNITS TO MV
3689 NEXT
3690 FOR IC=1 TO M7
3695   ON NT(IC) GOSUB 6700,5000,6800,6700,6700
3700 NEXT
3714 '
```

```
3775 TIME = INT(A2(18)/10)
3785 GOSUB 4400 '                                   Home signal
processing
3800 '
3898 FOR I=1 TO L1 : T(I)=A2(I) : NEXT
3982 TK=.64+1.63*CSOIL-(.64-.135)*EXP(-((17*CSOIL)^2)):'TK is
thermal conductivit
3983 PRINT "TK= ",TK
3984 T(1)=T(1)*(1-1.92*.138*(1-(TK/.48)))/(1-1.92*.138*(1-
(.94/.48)))
3986 'Above is heat flow correction-see Fritschen and Gay
4300 '
4305 ' Checks: Tw < 0, dT or dTw < .005, Tw -> T  and 4095 <
signal < -4095
4310 '
4330 IFLGW7=IFLGW:IF W5<0 OR W6<0 THEN IFLGW=1 ELSE IFLGW=0
4335 IF IFLGW<>IFLGW7 THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(13);:PRINT USING "##.##
##.##";W5,W6;:PRINT CHR$(13);
4339 '
4340 IFLGDT7=IFLGDT:IF ABS(T9-T0)<.005 OR ABS(W9-W0)<.005 THEN
IFLGDT=1 ELSE IFLGDT=0
4345 IF IFLGDT<>IFLGDT7 AND J>C THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(39);:PRINT USING "##.#### ##.####";T9-
T0,W9-W0;:PRINT CHR$(13);
4346 '
4347 IFLGD7=IFLGD:IF ABS(T5-T6)<.02 OR ABS(W5-W6)<.02 THEN
IFLGD=1 ELSE IFLGD=0
4348 IF IFLGD<>IFLGD7 AND J>C THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(57);:PRINT USING "##.#### ##.####";T5-
T6,W5-W6;:PRINT CHR$(13);
4349 '
4355 I1=-1:FOR I=1 TO M1-3:IFLGO7(I)=IFLGO(I):IF ABS(T(I))>=4095
THEN IFLGO(I)=I ELSE IFLGO(I)=0
4360   IF IFLGO(I)<>IFLGO7(I) AND J>C THEN IPFLG=1:I1=I1+1:PRINT
USING "#####";TIME;:PRINT TAB(100+I1*10);:PRINT USING "###
#####";I,T(I);:PRINT CHR$(13);
4362 NEXT
4365 TWD7=TWD : TWD=ABS((T5-W5)-(T6-W6)) : FLG=1.5
4370 IF TWD >FLG AND TWD7<=FLG THEN GOTO 4390
4375 IF TWD<=FLG AND TWD7 >FLG THEN GOTO 4390
4380 IF IPFLG=1 THEN PRINT
4385 RETURN
4390 PRINT USING "##### ##.## ##.## ##.## ##.##
##.###";TIME,T5,W5,T6,W6,TWD
4395 RETURN
4400 '
4405 '  Home signal processing: HM2-> t-2, HM1-> t-1, HM-> t
[HM0-> t+1]
4410 '
4415
HM2=HM1:HM1=HM:HMM2=HMM1:HMM1=HMM:JFLGH0=IFLGH0:JFLGH1=IFLGH1:JFL
```

```
GH2=IFLGH2
4420 HM=A2(HOME):HMM=HM
4425 IF ABS(HM)<HMAX1 THEN HMM=0
4430 IF ABS(HM1)>HMAX9 AND HMM=0 THEN HMM=-SGN(HM1)*HMAX
4432 '
4435 IF ABS(HMM)=HMAX AND ABS(HMM2)<>HMAX THEN IFLGH1=1
4437 IF ABS(HMM)<>HMAX AND ABS(HMM2)=HMAX THEN IFLGH1=0
4440 IF HMM=0 THEN IFLGH0=1 ELSE IFLGH0=0
4445 IF ABS(HM-HM1)<HMAX1 AND HM>HMAX9 THEN IFLGH2=1 ELSE
IFLGH2=0
4450 P1=SGN(HMM)
4455 IF J=C THEN PRINT:PRINT "SYSTEM ";ISYS    A2(19);" 1984
",DATE$,TIME$;"   ";N3M;" RECORDS"
4460 IF J=C THEN PRINT "          Tw dryout / Tw < 0
dT or dTw < 0.02            HOME"
4465 IF J=C THEN PRINT " TIME   T5   Tw5    T6   Tw6   dT-dTw
dTavg  dTwavg     dT     dTw    P1   raw"
4470 ' IPFLG=0:I1=0
4475 'IF IFLGH0<>JFLGH0 THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " intermed";CHR$(13);:I1=I1+1
4480 'IF IFLGH1<>JFLGH1 THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " bad sw  ";CHR$(13);:I1=I1+1
4485 'IF IFLGH2<>JFLGH2 THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " Homed   ";CHR$(13);:I1=I1+1
4490 RETURN
5000 '
5005 '  CONVERT RTD READINGS TO DEG. C.
5010 '
5045   T=(A2(IC))/RC(1)/G(CH(IC))
5050   A2(IC)=-245.665+T*(235.476+10.189*T)
5065   RETURN
6200 '
6205 ' read system specific data
6207 '
6210  ISYS=VAL(MID$(N1$,4,1)) : IF ISYS=9 THEN HMAX=3000 ELSE
HMAX=1000
6215  HMAX9=.9*HMAX : HMAX1=.1*HMAX : HMAX=5000
6217  JFLGH0=0:IFLGH0=0:JFLGH1=0:IFLGH1=0:JFLGH2=0:IFLGH2=0
6218
IFLGW7=0:IFLGW=0:IFLGDT7=0:IFLGDT=0:IFLGD7=0:IFLGD=0:TWD7=0:TWD=0
6219  FOR I=1 TO M1:IFLG0(I)=0:IFLG07(I)=0:NEXT
6220  ON ISYS GOSUB 6230,6280,6280,6280,6280,6280,6245,6260,6275
6222  PRES=101.3-.01055*ELEV ' ASSUME STD ATMOSPHERE, ELEV =
ELEVATION (M)
6223  RETURN
6230  VANE =  8.3 : VDATE=919 : VTIME= 600
6235  RETURN
6245  VANE =  5.2 : VDATE=915 : VTIME= 920
6250  RETURN
```

```
6260  VANE = 11.3 : VDATE=915 : VTIME= 1800
6265  RETURN
6275  VANE = 11.5 : VDATE=915 : VTIME= 1250
6280  RETURN
6300 '
6305 INFL$="INDAT"+RIGHT$(STR$(ISYS),1)+".DO"
6310 OPEN "I", #1,INFL$:NDIG=0:NRTD=0
6312 INPUT #1,X9$   ' SKIP LABEL
6315 INPUT #1,M,N1,N2,N3,N4,N5,N8,GO,M7
6320 N4=N4/N1  '  SET N4=# OF RECORDS/DISK UPDATE
6335 INPUT #1,X9$  ' SKIP LABEL
6336 INPUT #1,LG!,HG,HOME,REF,O1,O2,RC(1),NCRTD
6337 INPUT #1,X9$  ' SKIP LABEL
6338 INPUT #1,DELZ(1),ELEV,CSOIL,DZ,REF,HOME
6339 INPUT #1,X9$
6340 FOR K8=1 TO M7
6345  INPUT #1,CH(K8),C1(K8),G(K8),B(K8),NT(K8),X9$
6350  IF C1(K8)=0 THEN G2(K8)=1/LG! ELSE G2(K8)=1/HG
6355  IF C1(K8)=1 THEN B1(K8)=O1
6360  IF C1(K8)=3 THEN B1(K8)=O2
6365  C1(K8)=C1(K8)*16+CH(K8)-1
6368  IF NT(K8)=2 THEN NRTD=NRTD+1
6370  IF NT(K8)=3 THEN NWD =K8
6375  IF NT(K8)=5 THEN NDIG=NDIG+1
6380 NEXT
6395 NANLG=M7-NDIG
6399 CLOSE #1:RETURN
6400 '
6405 ' create output directory file
6408 '
6410 Q5=4 : N=J-1 : M=L1
6425 GOSUB 32100:D$="Manhattan"+TIME$+" "+DATE$
6430 OPEN "O",#1,N3$
6440 PRINT#1,Q5;",";N;",";M;",";D$;",";:FOR L=1 TO L1:PRINT
#1,A$(L(L)):NEXT
6450 PRINT #1,Z$ : CLOSE #1
6460 PRINT F$:N$=N3$:GOSUB 7100:PRINT
6495 RETURN
6700  '
6705  ' MV TO ENG. UNITS, LINEAR
6710  '
6715  A2(IC)=A2(IC)*G(IC)+B(IC)
6800  RETURN
7000 '
7060 IF LEN(G$)=0 THEN G=1:PRINT G:RETURN
7070 G=VAL(G$):PRINT:RETURN
7090 '
7100 PRINT"HEADER DATA FOR: ";N$ TAB(30) "LABEL: " D$
7110 PRINT"NUMBER OF CASES: " N TAB(30) "NUMBER OF VARIABLES: "
M:RETURN
7120 '
7200 ON ERROR GOTO 7250
```

```
7210 OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$
7220 FOR J=1+M1 TO M+M1:INPUT #1,A$(J):RSET
SP$=A$(J):A$(J)=SP$:NEXT J:INPUT #1,Z$
7230 CLOSE #1:ON ERROR GOTO 0:RETURN
7250 PRINT:IF ERR=53 THEN PRINT "FILE NOT FOUND":PRINT J$
7255 IF ERR<>53 THEN PRINT "ERROR # ";ERR;" IN LINE ";ERL
7260 INPUT "NEW FILE NAME:",N$:N$=H$+N$:CLOSE #1
7270 GOSUB 8300
7280 GOTO 7210
7300 '
7400 PRINT:INPUT;"ENTER BEGINNING CASE NUMBER: ",C
7410 INPUT", ENDING CASE NUMBER: ",D
7420 G=C:H1=1:H2=D:GOSUB 8200:IF W<>1 THEN 7440
7430 PRINT J$:GOTO 7400
7440 G=D:H1=C:H2=N:GOSUB 8200:IF W<>1 THEN RETURN ELSE 7430
8000 '
8010 ' *S-R*
8020 '
8030 PRINT
8035 PRINT"ENTER OPTION: ";:G$=INPUT$(1)
8040 IF ASC(G$)=13 THEN G$=MID$(T1$,1,1)
8050 G=ASC(G$)-64:PRINT G$;
8060 H1=ASC(LEFT$(T1$,1))-64:H2=ASC(MID$(T1$,2,1))-64:GOSUB 8200
8080 IF W<>1 THEN RETURN ELSE 8035
8090 '
8200 IF G>=H1 AND G<=H2 THEN W=0:RETURN
8210 PRINT J$;CHR$(13);:W=1:RETURN
8215 '
8300 OPEN "R",#1,"PARMD",38
8310 FIELD #1,19 AS X$,9 AS NN$:GET #1,1:LSET X$=X$:LSET
NN$=N$:PUT #1,1
8320 CLOSE #1:RETURN
8325 '
8400 IF LEFT$(N$,6)="(NONE)" THEN 8430
8410 PRINT:PRINT"OPEN FILE: " CHR$(34) N$ CHR$(34);"    ";
8420 PRINT"(PRESS " CHR$(34) "RETURN" CHR$(34) " TO USE OPEN
FILE)"
8430 PRINT"ENTER FILE NAME: ";:N9$="":FOR J=1 TO 10
8432 XX$=INPUT$(1):IF XX$=CHR$(13) THEN 8438 ELSE PRINT XX$;
8434 N9$=N9$+XX$
8436 NEXT
8438 IF LEN(N9$)=0 THEN PRINT"    " N$:PRINT:RETURN
8439 IF MID$(N9$,2,1)=":" THEN N$=N9$:GOTO 8450
8440 N$=H$+N9$
8450 GOSUB 8300:PRINT"    ";N$:PRINT:RETURN
8455 '
8600 PRINT:PRINT TAB(10) "-----VARIABLE NUMBERS AND NAMES-----
":PRINT
8620 A=A+6:B=B+6:IF B>M THEN B=M
8630 FOR K=A TO B
8640 PRINT USING "###";K;:PRINT". " A$(K) "  ";:NEXT K:PRINT:IF
B<M THEN 8620
```

```
8670 RETURN
8675 '
8900 D9$="NO YES":IF D9=1 THEN D9$="YESNO ":PRINT
8910 PRINT Q1$;:Q$=INPUT$(1)
8920 IF Q$=MID$(D9$,4,1) THEN PRINT RIGHT$(D9$,3):Q=1:RETURN
8930 PRINT LEFT$(D9$,3):Q=0:RETURN
8935 '
8950 PRINT:PRINT "   ";
8960 FOR L=1 TO L1:PRINT "      " A$(L(L));:NEXT
L:PRINT:PRINT:RETURN
8965 '
8970 PRINT:PRINT"PRESS 'RETURN' TO CONTINUE:
";:Q$=INPUT$(1):L3=1:PRINT F$
8980 RETURN
8985 '
8990 IF P=1 THEN RETURN
8992 PRINT:PRINT"PRESS ANY KEY TO CONTINUE: ";:Q$=INPUT$(1)
8994 PRINT CHR$(13);:RETURN
9000 '
9010 '    *INIT*
9020 '
9120 R$=CHR$(13)+"     "
9300 '
9305 ' * INITIALIZE CONTROL PARAMS *
9310 '
9330   DPR=57.2958  '  DEGREES/RADIAN
9355   SIGMA=5.6697E-08' BOLTZMAN CONST
9365   PI=3.14159
9370 OPEN "I",#1,"PDS.FIL"
9380 INPUT #1,PG$:IF PG$<>"SAMPE"THEN 9380
9517 INPUT #1,ICFLG,IS,IE,DXI$,DXO$,FS$,FT$,MSG$
9520 IFILES=0
9525 IFILES=IFILES+1 : INPUT #1,FL$(IFILES):IF EOF (1) THEN 9540
ELSE 9530
9530 IF FL$(IFILES)="END" THEN IFILES=IFILES-1:GOTO 9540
9535 PRINT IFILES;FL$(IFILES),:GOTO 9525
9540 CLOSE #1:PRINT IFILES;FL$(IFILES)
9799 '
9800 ' Field (variable) names
9805 '
9810 FOR I=1 TO M:READ A$(I):NEXT
9820 DATA "G    ","Q    ","KDN  ","KUP  ","D    ","QDN  ","HOME
","UDIR "
9830 DATA "TAR  ","TWR  ","TAL  ","TWL  ","TSOIL","THAT ","U
","QUP  "
9850 DATA "TIMER","DATE "
9890 RETURN
32000 '
32005 ' Time and date routine for SDS MV5.0c
10/15/84 11:40
32007 '                                    last modified 11/
1/84  7:50
```

```
32010 ' init
32015 '
32020 DIM M(12)
32025 FOR I=1 TO 12:READ M(I):NEXT:IF INT(DATE/4)*4 = DATE THEN
M(2)=29
32030 DATA 31,28,31,30,31,30,31,31,30,31,30,31
32035 '
32040 ' main program
32045 '
32100 RETURN:''''DATE=PEEK(&H40):IF DATE=0 THEN GOSUB 32170
32105 DATE$="19"+RIGHT$(STR$(DATE),2)
32120
TIME$=RIGHT$(STR$(PEEK(&H43)),2)+":"+RIGHT$(STR$(PEEK(&H44)),2)+"
:"+RIGHT$(STR$(PEEK(&H45)),2)
32125 DAY=PEEK(&H41)+256*(PEEK(&H42)) : MO=0
32135 FOR I=1 TO 12:MO=MO+M(I):IF MO>=DAY THEN MO=MO-M(I):GOTO
32145
32140 NEXT
32145 DAY=DAY-
MO:MO=I:DATE$=RIGHT$(STR$(MO),2)+"/"+RIGHT$(STR$(DAY),2)+"/"+DATE
$
32150 PRINT DATE$,TIME$
32160 RETURN
32165 '
32170 RETURN:' set time
32175 '
32180 INPUT "MONTH,   DAY,   YEAR ", MO,DAY,YR : MO=MO-1
32185 INPUT "HOUR, MINUTE, SECOND ",HR,MIN,SEC
32190 JDAY=0:FOR I=1 TO MO:JDAY=JDAY+M(I):NEXT
32195 JDAY=JDAY+DAY:JDAYH=INT(JDAY/256):JDAYL=JDAY-JDAYH*256
32200 POKE &H41,JDAYL:POKE &H42,JDAYH
32205 POKE &H43,HR:POKE &H44,MIN:POKE &H45,SEC
32210 PRINT "depress <CR> to start clock ";:XC$=INPUT$(1)
32215 IF XC$<>CHR$(13) THEN GOTO 32185 ELSE POKE &H40,YR
32220 RETURN
```

Appendix 9.8.9 SAMPP.BAS, a program for the AT computer which converts the output of SAMPE.BAS into 6-minute energy and radiation balances.

```
6    '
6/25/86  0445
10   ' SAMPB3.BAS  RANDY data analysis program
6/13/85  1330
20   ' Based on PROGRAM SAMPC3                                    1/
7/85  2230
30   '                                         Last modified
5/5/86
32   ' For Hanford Site study, Washington
35   ' Reduced soil heat capacity ala DeVries (1963)
40   'CONVERT INDAT CSOIL IN %H2O(G/G) TO CSOI=HEAT CAPACITY,
```

```
BATTELLE 4/86
45    'ICFLG = 0 -> include IS point running mean of G in top 10
cm
50    '          1 -> exclude G calculation in top 10 cm
55    'IS      = no. of points in soil heat storage running mean
60    'FS$     = output file name extension (.MF or R)
65    'FT$     = not used
100   S4=0:S5=0:S7=0
140   DEFINT I,J,L-N : NS=19:NST=52:NOUT=34
150   DIM T(54),IFLGO(30),IFLGO7(30)
155   DIM N(25),D(25),F(17),A$(53),L(53),T$(13),C(50,4),B$(51)
160   DIM A2(20),CH(20),C1(20),G(20),B(20),G2(20)
165   DIM NT(20),B1(20),FL$(120),N$(9)
170   DIM
DELZ(2),Q7(2),G7(2),TAV7(2),WAV7(2),T7(2),T8(2),W7(2),W8(2)
175   DIM RC(2),E(9),S(7),GP(10),RCC(250),RC2(100)
180   RC2=0:RCC=0:'record counter for loop and the first three
records
315   GOSUB 6100                                    ' set constants
1000 GOSUB 9000:F$=""                               ' Microstat init
1010 'GOSUB 32000                                    ' init clock
2000 '
2005 ' MAIN PROGRAM
2010 '
2030 M3=0:M2=0:M1=0:S4=0:S5=0:S7=0:FOR I=1 TO IS:GP(I)=0:NEXT
2040 '
2045 ' read input file directory
2055 ICOUNT = ICOUNT + 1 : N$=DXI$+FL$(ICOUNT) :
N1$=N$+".MF":PRINT "N$=",N$
2060 GOSUB 7200:N1M=N:M1=M:PRINT F$:GOSUB 7100:D1$=D$
2070 'GOSUB 6200                                     ' set system
specific info
2100 '
2540 L1=NOUT
2565 '
2570 C=1 : D=N ' IF ICFLG=1 THEN D=N : PRINT "OUTPUT ALL CASES ("
N1M ")"
2575             ' IF ICFLG=0 THEN C=IS : D=IE : PRINT "OUTPUT
SUBSET OF CASES(" IS "TO" IE ")"
2605 N3M=D-C+1
2608 '
2617 N3$=DXO$+FL$(ICOUNT)+"P":Z$=N3$+FS$
2700 '
2870 FOR L=1 TO L1
2880   L(L)=L+M1
2890 NEXT
2895 GOSUB 6300: 'READ INDAT? FILES
2900 GOSUB 6400 '                                 create output
file directory
2990 PRINT F$:PRINT"FILE: " N3$ " IS NOW BEING OUTPUT...":J1=0
2995 '
2996 ' open input and output files
```

```
2997 '
3000 OPEN "R",#1,N1$,Q5
3030 OPEN "R",#2,Z$,Q5
3050 FIELD #1,Q5 AS T$
3080 FIELD #2,Q5 AS U$
3100 '
3105 ' main computation loop
3110 '
3150 FOR J=C TO D:ON ERROR GOTO 3205
3155 '
3160 ' read data into T()
3165 '
3170   FOR I=1 TO M1:GET #1,I+(M1*(J-1))
3190     A2(I)=CVS(T$)
3200     GOTO 3210
3205     PRINT "ERROR #" ERR " OCCURED IN LINE" ERL "
3208     ON ERROR GOTO 0
3210   NEXT
3230   TIME = INT(A2(NS-2)/10)
3427   GOSUB 3600
3440   J1=J1+1:PRINT CHR$(13) J1 TIME A2(NS-1) "    ";
3450 '
3455 ' write out full T() array
3456 '
3460   FOR L=1 TO L1
3480     LSET U$=MKS$(T(L(L)))
3510     PUT #2,L+(L1*(J1-1))
3520   NEXT
3530 NEXT:PRINT F$
3540 PRINT "END OF FILE OUTPUT":N$=N1$
3570 CLOSE #1:CLOSE #2:PRINT
3580 N$=N3$: ' GOSUB 8300
3590 IF ICOUNT<IFILES GOTO 2000
3595 ' IF ISTP=0 THEN CHAIN "SUMMARYE" ELSE CHAIN "SC"
3596 CHAIN "SUMMARYE":END
3600 '
3605 ' MAIN SAMPLING LOOP
3610 '
3785 P1=SGN(A2(HOME)):REM GOSUB 4400 '          Home signal
processing
3890 '
3895 J8=NCRTD : I9 = 1 : GOSUB 4000  '        Energy and
radiation balance
3898 '
3900 T(NS)   =TIME   : T(NS+1) =QSTAR  : T(NS+2) =H      :
T(NS+3)= E
3910 T(NS+4) =GP     : T(NS+5) =KDN    : T(NS+6) =KUP    :
T(NS+7)= A2(5)
3920 T(NS+8) =LDN    : T(NS+9) =LUP    : T(NS+10)=A2(15) :
T(NS+11)=A2(8)
3930 T(NS+12)=T9     : T(NS+13)=W9     : T(NS+14)=TO     :
T(NS+15)=WO
```

```
3940 T(NS+16)=A2(13)  : T(NS+17)=E9      : T(NS+18)=EO      :
T(NS+19)=DT
3950 T(NS+20)=DE      : T(NS+21)=QDN     : T(NS+22)=QUP     :
T(NS+23)=Q9-QN
3960 T(NS+24)=RHB     : T(NS+25)=P1      : T(NS+26)=GS     :
T(NS+27)=A2(HOME)
3970 T(NS+28)=A2(NS-1):T(NS+29)=BR      : T(NS+30)=HALT    :
T(NS+31)=EALT
3972 T(NS+32)=CV#     : T(NS+33)=RB
3980 RETURN
4000 '
4005 '             Bowen ratio energy balance - 2 point running
mean
4010 ' SUB5,6 = PRESENT VAL., SUB7,8 = PAST VAL., SUB9,0 =
RUNNING AVE.
4015 '
4020 Q9=A2(2):G5=A2(1)
4025 S4=S7:S7=S5:S5=A2(13) ' S7=Tsoil at TIME-6 mins; S4 at TIME-
12 mins
4030 TAV5=(A2(J8)+A2(J8+2))/2:WAV5=(A2(J8+1)+A2(J8+3))/2
4035 IF P1=1 THEN IALT=0 ELSE IALT=2
4040 T5=A2(J8+IALT):T6=A2(J8-IALT+2):W5=A2(J8+IALT+1):W6=A2(J8-
IALT+3)
4051 '
4052 '   *** FIND RUNNING AVERAGES ***
4053 '
4054 QSTAR=(Q7(I9)+Q9)/2:GP=(G7(I9)+G5)/2:QN9=(QN7+QN5)/2
4055 T=(TAV5+TAV7(I9))/2:TW=(WAV5+WAV7(I9))/2
4059
T9=(T5+T7(I9))/2:TO=(T6+T8(I9))/2:W9=(W5+W7(I9))/2:WO=(W6+W8(I9))
/2
4060 IF 1 > RCC THEN GOSUB 5670:'STARTUP AVERAGES
4061 IF QSTAR < 0 THEN QSTAR=1.0621*QSTAR
4062 IF ISYS=1 THEN QSTAR=QN9:'THR NET
4063 'GOSUB 4300                            ' wet bulb processing
4064 '
4065 '   *** SAVE PRESENT VALUES ***
4066 '
4070 G7(I9)=G5:Q7(I9)=Q9:QN7=QN5:'THR NET
4075 TAV7(I9)=TAV5:WAV7(I9)=WAV5
4080 T7(I9)=T5:T8(I9)=T6:W7(I9)=W5:W8(I9)=W6
4084 '
4085 '   *** MISCELLANEOUS PARAMETERS ***
4086 '
4090 TT=T:W1=TW:GOSUB 6015:EA=EFN
4092 CP=(239.9+440.9*.622*EA/(PRES-EA))/.2388
4095 XL=2501300!-2366*TW:GOSUB 6030:SO=S
4100 G4=PRES*CP/(.622*XL):RO=3.4838*(PRES-.378*EA)/(T+273.16)
4105 S1=9.810001/CP:TT=TW:GOSUB 6030
4110 S2=9.810001*(1/CP+.0034857*EA/(273.16+T)/G4)/(1+S/G4)
4115 S3=9.810001*.0034857*EA/(273.16+T)
4119 '
```

```
4120 '   *** GRADIENTS ***
4121 '
4125 TT=T9:W1=W9:GOSUB 6015:E9=EFN:W1=T9:GOSUB
6015:RHT=100*E9/ESAT
4126 TT=TO:W1=WO:GOSUB 6015:EO=EFN:W1=TO:GOSUB
6015:RHB=100*EO/ESAT
4130 DT=T9-TO+S1*DELZ(I9)
4135 DE=E9-EO+S3*DELZ(I9)
4159 '
4160 '   *** BOWEN RATIO USING T, E ***
4161 RCC=RCC+1
4162 'Convert %H2O(G/G) to volumetric and calc heat capacity.
4164 GS = -CSOI*DZ*(S5-S4)/(2*N1*60):IF RCC <3 THEN GS=0:'heat
storage.
4166 BR = G4*DT/DE:QAV = QSTAR+GP+GS
4168 H = (-QAV)/(1+1/BR):E = H/BR
4170 GOSUB 5005
4171 IF SGN (E) <> SGN (DE) THEN E=EALT:H=HALT
4172 IF (-.6 > BR) AND (BR > -1.25) THEN E=EALT:H=HALT
4174 '   *** RADIATION BALANCE ***
4175 '
4177 KUP=-A2(4):KDN=A2(3)
4180 IF KDN<=0 THEN A=0 ELSE A=-KUP/KDN ' ALBEDO
4200 '
4205 ' Diffuse correction, per LI-COR 2010S shadow band manual
4210 ' NOTE: Eppley and not LI-COR used for total solar radiation
4215 '
4220 IF KDN<=0 THEN 4245 ELSE A2(5)=A2(5)*1.13 '        Table I
4225 A2(5)=A2(5)/(1.17-(1/(1.2+11.8*(A2(5)/KDN))))'     Spectral
correction
4235 '
4245 IF KDN<0 THEN KDN=0
4250 IF KUP>0 THEN KUP=0
4255 IF A2(5)<0 THEN A2(5)=0
4257 QUP=-SIGMA*(A2(14)+273.16)^4-A2(16)
4260 QDN=SIGMA*(A2(14)+273.16)^4+A2(6)
4261 IF QDN > 3000 THEN QDN=3000:IF QUP < -3000 THEN QUP=-3000
4262 IF KDN = 0 THEN QUP = 1.062*QUP
4263 IF KDN = 0 THEN QDN = 1.062*QDN
4265 LUP=QUP-KUP:LDN=QDN-KDN:QN=QDN+QUP:QN5=QN
4270 IF ISYS=7 THEN GOSUB 5650
4280 RETURN
4300 '
4305 ' Checks: Tw < 0, dT or dTw < .005, Tw -> T  and 4095 <
signal < -4095
4310 '
4330 IFLGW7=IFLGW:IF W5<0 OR W6<0 THEN IFLGW=1 ELSE IFLGW=0
4335 IF IFLGW<>IFLGW7 THEN IPFLG=1:LPRINT USING
"#####";TIME;:LPRINT TAB(13);:LPRINT USING "##.##
##.##";W5,W6;:LPRINT CHR$(13);
4339 '
4340 IFLGDT7=IFLGDT:IF ABS(T9-TO)<.005 OR ABS(W9-WO)<.005 THEN
```

```
IFLGDT=1 ELSE IFLGDT=0
4345 IF IFLGDT<>IFLGDT7 AND J>C THEN IPFLG=1:LPRINT USING
"#####";TIME;:LPRINT TAB(39);:LPRINT USING "##.#### ##.####";T9-
T0,W9-W0;:LPRINT CHR$(13);
4346 '
4347 IFLGD7=IFLGD:IF ABS(T5-T6)<.02 OR ABS(W5-W6)<.02 THEN
IFLGD=1 ELSE IFLGD=0
4348 IF IFLGD<>IFLGD7 AND J>C THEN IPFLG=1:LPRINT USING
"#####";TIME;:LPRINT TAB(57);:LPRINT USING "##.#### ##.####";T5-
T6,W5-W6;:LPRINT CHR$(13);
4349 '
4355 I1=-1:FOR I=1 TO M1-3:IFLGO7(I)=IFLGO(I):IF ABS(A2(I))>=4095
THEN IFLGO(I)=I ELSE IFLGO(I)=0
4360   IF IFLGO(I)<>IFLGO7(I) AND J>C THEN IPFLG=1:I1=I1+1:LPRINT
USING "#####";TIME;:LPRINT TAB(100+I1*10);:LPRINT USING "###
#####";I,A2(I);:LPRINT CHR$(13);
4362 NEXT
4365 TWD7=TWD : TWD=ABS((T5-W5)-(T6-W6)) : FLG=1.5
4370 IF TWD >FLG AND TWD7<=FLG THEN GOTO 4390
4375 IF TWD<=FLG AND TWD7 >FLG THEN GOTO 4390
4380 IF IPFLG=1 THEN LPRINT
4385 RETURN
4390 LPRINT USING "##### ##.## ##.## ##.## ##.##
##.###";TIME,T5,W5,T6,W6,TWD
4395 RETURN
4400 '
4410 '
4415
HM2=HM1:HM1=HM:HMM2=HMM1:HMM1=HMM:JFLGHO=IFLGHO:JFLGH1=IFLGH1:JFL
GH2=IFLGH2
4420 HM=A2(HOME):HMM=HM : GET #1,7+M1*J : HMO=CVS(T$)
4425 IF ABS(HM)<HMAX1 THEN HMM=0
4430 IF ABS(HM1)>HMAX9 AND ABS(HMO)>HMAX9 AND HMM=0 THEN HMM=-
SGN(HM1)*HMAX
4432 '
4435 IF ABS(HMM)=HMAX AND ABS(HMM2)<>HMAX THEN IFLGH1=1
4437 IF ABS(HMM)<>HMAX AND ABS(HMM2)=HMAX THEN IFLGH1=0
4440 IF HMM=0 THEN IFLGHO=1 ELSE IFLGHO=0
4445 IF ABS(HM-HM1)<HMAX1 AND HM>HMAX9 THEN IFLGH2=1 ELSE
IFLGH2=0
4450 P1=SGN(HMM)
4455 IF J=C THEN PRINT:PRINT "SYSTEM ";ISYS    A2(19);" 1984
",DATE$,TIME$;"   ";N3M;" RECORDS"
4460 IF J=C THEN PRINT "         Tw dryout / Tw < 0
dT or dTw < 0.02              HOME"
4465 IF J=C THEN PRINT " TIME    T5    Tw5    T6    Tw6   dT-dTw
dTavg  dTwavg      dT      dTw     P1   raw"
4470 IPFLG=0:I1=0
4475 IF IFLGHO<>JFLGHO THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " intermed";CHR$(13);:I1=I1+1
4480 IF IFLGH1<>JFLGH1 THEN IPFLG=1:PRINT USING
```

```
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " bad sw  ";CHR$(13);:I1=I1+1
4485 IF IFLGH2<>JFLGH2 THEN IPFLG=1:PRINT USING
"#####";TIME;:PRINT TAB(74+I1*9);:PRINT USING "###
#####";P1,HM;:PRINT " Homed   ";CHR$(13);:I1=I1+1
4490 RETURN
5005 'ALTERNATE CALCULATIONS OF H AND E
5006 WS=A2(15):'PRINT "WS=",WS
5008 CV#=-(QAV)/((WS*CP*DT)+(WS*XL*.622*DE/PRES))
5501 RB=9.810001*DT*3.24/((TT+273)*WS^2):'3.24=(Z-ZO)^2
5506 PRINT "CV=",CV#,"RB=",RB
5508 IF RB > .006 THEN GOTO 5515
5510 CVA#=-2.567*RB + .0246:GOTO 5540
5515 CVA#=-.0123*RB + .0246
5540 HALT=CVA#*WS*CP*DT
5550 EALT=CVA#*XL*WS*.622*DE/PRES
5615 PRINT "HALT=",HALT,"EALT=",EALT
5634 RETURN
5650 QUP=A2(16):QDN=A2(6):LUP=0:LDN=0:'QUP AND QDN ARE
PRYANOMETERS
5660 RETURN
5670 'STARTUP AVERAGES
5671 QSTAR=Q9:GP=G5:QN9=QN5:T=TAV5:TW=WAV5
5672 T9=T5:T0=T6:W9=W5:W0=W6:RETURN
6000 '
6005 '  * * *  MISCELLANEOUS FUNCTIONS  * * *
6010 '
6015
ESAT=(E(1)+W1*(E(2)+W1*(E(3)+W1*(E(4)+W1*(E(5)+W1*(E(6)+W1*(E(7))
))))))/10
6020 EFN=ESAT-.00066*(1+.00115*W1)*PRES*(TT-W1)
6025 RETURN
6030
S=(S(1)+TT*(S(2)+TT*(S(3)+TT*(S(4)+TT*(S(5)+TT*(S(6)+TT*(S(7)))))
)))/10
6035 RETURN
6050 '
6100 '  * * *  MISCELLANEOUS CONSTANTS  * * *
6105 '
6115 E(1)=6.1078
6116 E(2)=.44365185#
6117 E(3)=.014289458#
6118 E(4)=.00026506485#
6120 E(5)=3.031240400000003D-06
6121 E(6)=.000000020340809#
6125 E(7)=6.136820900000059D-11
6126 '
6130 S(1)=.44381
6131 S(2)=.028570026#
6132 S(3)=7.93805E-04
6133 S(4)=.000012152151#
6135 S(5)=.00000010365614#
```

```
6136 S(6)=3.532421800000003D-10
6140 S(7)=-7.090244800000164D-13
6150 RETURN
6200 '
6205 ' read system specific data
6207 '
6210 ' ISYS=VAL(MID$(N1$,4,1)) : 'IF ISYS=9 THEN HMAX=15 ELSE
HMAX=5
6215 ' HMAX9=.9*HMAX : HMAX1=.1*HMAX : HMAX=30
6217 ' JFLGH0=0:IFLGH0=0:JFLGH1=0:IFLGH1=0:JFLGH2=0:IFLGH2=0
6218 '
IFLGW7=0:IFLGW=0:IFLGDT7=0:IFLGDT=0:IFLGD7=0:IFLGD=0:TWD7=0:TWD=0
6219 ' FOR I=1 TO M1:IFLGO(I)=0:IFLGO7(I)=0:NEXT
6300 ISYS=VAL(MID$(N1$,4,1))
6305 INFL$="INDAT"+RIGHT$(STR$(ISYS),1)+".DO"
6310 OPEN "I", #1,INFL$:NDIG=0:NRTD=0
6312 INPUT #1,X9$   ' SKIP LABEL
6315 INPUT #1,MA,N1,N2,N3,N4,N5,N8,GO,M7
6320 N4=N4/N1  '  SET N4=# OF RECORDS/DISK UPDATE
6335 INPUT #1,X9$  ' SKIP LABEL
6336 INPUT #1,LG,HG,HOME,REF,O1,O2,RC(1),NCRTD
6337 INPUT #1,X9$  ' SKIP LABEL
6338 INPUT #1,DELZ(1),ELEV,CSOIL,DZ,REF,HOME
6339 INPUT #1,X9$
6340 CLOSE #1
6342 CSOI=(.402*2+4.23*CSOIL)*10^6:'CONVERT %H2O TO HEAT CAPACITY
6344 PRES=101.3-.01055*ELEV:'ASSUME STANDARD ATMOSPHERE
6395 RETURN
6400 '
6405 ' create output directory file
6408 '
6410 Q5=4 : N=N3M : M=L1
6425 GOSUB 32100:D$="Manhattan "+TIME$+" "+DATE$
6430 OPEN "O",#1,N3$
6440 PRINT#1,Q5;",";N;",";M;",";D$;",";:FOR L=1 TO L1:PRINT
#1,A$(L(L)):NEXT
6450 PRINT #1,Z$ : CLOSE #1
6460 PRINT F$:N$=N3$:GOSUB 7100:PRINT
6495 RETURN
7000 '
7060 IF LEN(G$)=0 THEN G=1:PRINT G:RETURN
7070 G=VAL(G$):PRINT:RETURN
7090 '
7100 PRINT"HEADER DATA FOR: ";N$ TAB(30) "LABEL: " D$
7110 PRINT"NUMBER OF CASES: " N TAB(30) "NUMBER OF VARIABLES: "
M:RETURN
7120 '
7200 ON ERROR GOTO 7250
7210 OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$
7220 FOR J=1+M1 TO M+M1:INPUT #1,A$(J):RSET
SP$=A$(J):A$(J)=SP$:NEXT J:INPUT #1,Z$
7230 CLOSE #1:ON ERROR GOTO 0:RETURN
```

```
7250 PRINT:IF ERR=53 THEN PRINT "FILE NOT FOUND":PRINT J$
7255 IF ERR<>53 THEN PRINT "ERROR # ";ERR;" IN LINE ";ERL
7260 INPUT "NEW FILE NAME:",N$:N$=H$+N$:CLOSE #1
7270 'GOSUB 8300
7280 GOTO 7210
7300 '
7400 PRINT:INPUT;"ENTER BEGINNING CASE NUMBER: ",C
7410 INPUT", ENDING CASE NUMBER: ",D
7420 G=C:H1=1:H2=D:GOSUB 8200:IF W<>1 THEN 7440
7430 PRINT J$:GOTO 7400
7440 G=D:H1=C:H2=N:GOSUB 8200:IF W<>1 THEN RETURN ELSE 7430
8000 '
8010 '   *S-R*
8020 '
8030 PRINT
8035 PRINT"ENTER OPTION: ";:G$=INPUT$(1)
8040 IF ASC(G$)=13 THEN G$=MID$(T1$,1,1)
8050 G=ASC(G$)-64:PRINT G$;
8060 H1=ASC(LEFT$(T1$,1))-64:H2=ASC(MID$(T1$,2,1))-64:GOSUB 8200
8080 IF W<>1 THEN RETURN ELSE 8035
8090 '
8200 IF G>=H1 AND G<=H2 THEN W=0:RETURN
8210 PRINT J$;CHR$(13);:W=1:RETURN
8215 '
8300 OPEN "R",#1,"PARMD",38
8310 FIELD #1,19 AS X$,9 AS NN$:GET #1,1:LSET X$=X$:LSET
NN$=N$:PUT #1,1
8320 CLOSE #1:RETURN
8325 '
8400 IF LEFT$(N$,6)="(NONE)" THEN 8430
8410 PRINT:PRINT"OPEN FILE: " CHR$(34) N$ CHR$(34);"     ";
8420 PRINT"(PRESS " CHR$(34) "RETURN" CHR$(34) " TO USE OPEN
FILE)"
8430 PRINT"ENTER FILE NAME: ";:N9$="":FOR J=1 TO 10
8432 XX$=INPUT$(1):IF XX$=CHR$(13) THEN 8438 ELSE PRINT XX$;
8434 N9$=N9$+XX$
8436 NEXT
8438 IF LEN(N9$)=0 THEN PRINT"     " N$:PRINT:RETURN
8439 IF MID$(N9$,2,1)=":" THEN N$=N9$:GOTO 8450
8440 N$=H$+N9$
8450 GOSUB 8300:PRINT"     ";N$:PRINT:RETURN
8455 '
8600 PRINT:PRINT TAB(10) "-----VARIABLE NUMBERS AND NAMES-----
":PRINT
8620 A=A+6:B=B+6:IF B>M THEN B=M
8630 FOR I=A TO B
8640 PRINT USING "###";I;:PRINT". " A$(I) "   ";:NEXT I:PRINT:IF
B<M THEN 8620
8670 RETURN
8675 '
8900 D9$="NO YES":IF D9=1 THEN D9$="YESNO ":PRINT
8910 PRINT Q1$;:Q$=INPUT$(1)
```

```
8920 IF Q$=MID$(D9$,4,1) THEN PRINT RIGHT$(D9$,3):Q=1:RETURN
8930 PRINT LEFT$(D9$,3):Q=0:RETURN
8935 '
8950 PRINT:PRINT "   ";
8960 FOR L=1 TO L1:PRINT "      " A$(L(L));:NEXT
L:PRINT:PRINT:RETURN
8965 '
8970 PRINT:PRINT"PRESS 'RETURN' TO CONTINUE:
";:Q$=INPUT$(1):L3=1:PRINT F$
8980 RETURN
8985 '
8990 IF P=1 THEN RETURN
8992 PRINT:PRINT"PRESS ANY KEY TO CONTINUE: ";:Q$=INPUT$(1)
8994 PRINT CHR$(13);:RETURN
9000 '
9010 '    *INIT*
9020 '
9120 R$=CHR$(13)+"     "
9300 '
9305 ' * INITIALIZE CONTROL PARAMS *
9310 '
9315  ' NCRTD=9            '  Channel number of 1st RTD
9320  ' N1=6               '  Basic data rate (min)
9330    DPR=57.2958       '  DEGREES/RADIAN
9355    SIGMA=5.6697E-08 '  BOLTZMAN CONST
9365    PI=3.14159
9370  ' DZ=.1             '  depth of Ts avg (m)
9380  ' HOME=7            '  HOME CHANNEL
9500 '
9505 ' Initialize
9510 '
9515 OPEN "I",#1,"PDS.FIL"
9516 INPUT #1,PG$:IF PG$<>"SAMPP" THEN 9516
9517 INPUT #1,ICFLG,IS,IE,DXI$,DXO$,FS$,FT$,MSG$
9520 IFILES=0
9525 IFILES=IFILES+1 : INPUT #1,FL$(IFILES):IF EOF (1) THEN 9540
ELSE 9530
9530 IF FL$(IFILES)="END" THEN IFILES=IFILES-1:GOTO 9540
9535 PRINT IFILES;FL$(IFILES),:GOTO 9525
9540 CLOSE #1:PRINT IFILES;FL$(IFILES)
9799 '
9800 ' Additional Field (variable) names
9805 '
9810 FOR I=NS TO NST:READ A$(I):NEXT
9820 DATA "TIME ","Q    ","H    ","E    ","GP   ","KDN  ","KUP
","D    "
9830 DATA "LDN  ","LUP  ","U    ","UDIR
","TATOP","TWTOP","TABOT","TWBOT"
9840 DATA "TSOIL","EATOP","EABOT","DT   ","DE   ","QDN  ","QUP
","QERR "
9850 DATA "RHBOT","M    ","GS   ","HMREC","DATE "," BR  ","HALT
","EALT "
```

```
9860 DATA "CV    ","RB    "
9890 RETURN
32000 '
32005 ' Time and date routine for SDS MV5.0c
10/15/84 11:40
32007 '                                               last modified 11/
1/84  7:50
32010 ' init
32015 '
32020 DIM M(12)
32025 FOR I=1 TO 12:READ M(I):NEXT:IF INT(DATE/4)*4 = DATE THEN
M(2)=29
32030 DATA 31,28,31,30,31,30,31,31,30,31,30,31
32035 '
32040 ' main program
32045 RETURN
32100 DATE=PEEK(&H40):IF DATE=0 THEN GOSUB 32170
32105 RETURN:'DATE$="19"+RIGHT$(STR$(DATE),2)
32120
TIME$=RIGHT$(STR$(PEEK(&H43)),2)+":"+RIGHT$(STR$(PEEK(&H44)),2)+"
:"+RIGHT$(STR$(PEEK(&H45)),2)
32125 DAY=PEEK(&H41)+256*(PEEK(&H42)) : MO=0
32135 FOR I=1 TO 12:MO=MO+M(I):IF MO>=DAY THEN MO=MO-M(I):GOTO
32145
32140 NEXT
32145 DAY=DAY-
MO:MO=I:DATE$=RIGHT$(STR$(MO),2)+"/"+RIGHT$(STR$(DAY),2)+"/"+DATE
$
32150 PRINT DATE$,TIME$
32160 RETURN
32165 '
32170 ' set time
32175 RETURN
32180 INPUT "MONTH,   DAY,   YEAR ", MO,DAY,YR : MO=MO-1
32185 INPUT "HOUR, MINUTE, SECOND ",HR,MIN,SEC
32190 JDAY=0:FOR I=1 TO MO:JDAY=JDAY+M(I):NEXT
32195 JDAY=JDAY+DAY:JDAYH=INT(JDAY/256):JDAYL=JDAY-JDAYH*256
32200 POKE &H41,JDAYL:POKE &H42,JDAYH
32205 POKE &H43,HR:POKE &H44,MIN:POKE &H45,SEC
32210 PRINT "depress <CR> to start clock ";:XC$=INPUT$(1)
32215 IF XC$<>CHR$(13) THEN GOTO 32185 ELSE POKE &H40,YR
32220 RETURN
```

Appendix 9.8.10. SUMMARYE.BAS, a program for the AT computer which summarizes the the output of SAMPP.BAS (6-minute data) into 30-minute averages.

```
5    'SUMMARYE.BAS modified for AT computer and Epson LQ-1000
printer
6    '
06/25/86
10   'Program SUMMARYB.BAS
06/14/85
11   'Based on SUMMARYS.BAS of                              1517
01/08/85
12   'FT$ = "S"    -> output 30 min averages
13   '     = ".MF" -> input 6 min averages
14   'ICFLG = 0    -> list data as is
15   '       = 1   -> recompute EB w/o soil heat storage in top 10
cm
20   '       = 2   -> recompute EB w/ modified Gs term
1/ 8/85
25   'NASA Konza Prairie study
30   '                                          last modified 0919
6/16/85
80    ON ERROR GOTO 30000
90   DEFINT I:WIDTH "LPT1:",255:X$="":G$="":N$=""
100   DIM B%(64),A$(100),A1$(100),D(53),FL$(53),B5%(53)
105   DIM
AVG(34),AVG1(34),AVG2(34),SUM(34):T$=CHR$(27)+"S"+CHR$(0):V$=CHR$
(27)+"T"  '----Superscript on/off
110   DIM IQ(34),NQ(34)
120   GOSUB 31000:GOSUB 32000
150   ICOUNT=0
300   '
500   ICOUNT=ICOUNT+1 : G$=FL$(ICOUNT)+FT$
510   N$=DXI$+G$:GOSUB 7200:B1%=N:B5%=M:GOSUB 7100
540   GOSUB 32100
601 PI=3.1314159#:DPR=57.2958
602 LPRINT CHR$(27);"M";CHR$(27);"2";  '-------12 cpi, 6 lpi
603 LPRINT TAB(5) DATE$ " " TIME$ "   file " N$ "  label:  " D$
604 LPRINT:LPRINT MSG$:LPRINT:LPRINT:LPRINT
605 LPRINT TAB(24) "UNIVERSITY OF WASHINGTON FOREST METEOROLOGY"
606 LPRINT
607 LPRINT TAB(24) "     ENERGY/RADIATION BALANCE SUMMARY "
608 LPRINT TAB(24) "          Konza Prairie - 1986"
609 LPRINT
610 SYS = VAL(MID$(G$,2,1)):ON SYS GOTO
611,618,618,618,618,613,615,616,617
611 LPRINT TAB(24) "      System 1:  North Facing Slope":GOTO
618
613 LPRINT TAB(24) "        System 6:  Tempe Az demo":GOTO 618
615 LPRINT TAB(24) "      System 7: East Facing Slope":GOTO 618
616 LPRINT TAB(24) "      System 8: West Facing Slope":GOTO 618
```

```
617 LPRINT TAB(24) "      System 9: South Facing Slope":GOTO 618
618 LPRINT TAB(43);
619 LPRINT USING "##/##/85";VAL(MID$(G$,3,2));VAL(MID$(G$,5,2))
620 LPRINT
621 LPRINT "        TIME    Q     H     E     G    KDN    KUP    D
LDN   LUP   Ta    U    Udir"
622 LPRINT
623 LPRINT "                    Wm";T$;"-2";V$;"  Wm";T$;"-2";V$;"
Wm";T$;"-2";V$;"  Wm";T$;"-2";V$;"  Wm";T$;"-2";V$;"  Wm";T$;"-
2";V$;"  Wm";T$;"-2";V$;,
624 LPRINT "  Wm";T$;"-2";V$;"  Wm";T$;"-2";V$;T$;" o";V$;"C";"
ms";T$;"-1";V$;" deg.":LPRINT
625 LPRINT CHR$(27);"0"  '---- 8 lpi
626 F1$="############ ###### ###### ###### ##### ###### ######
##### ###### ###### ###.## ###.# ######"
627  IF FT$="S" THEN 720  ' create Mstat directory
628 N1$=DXO$+MID$(G$,1,LEN(G$)-1)+"S" : Q5=4 : N=49 : M=B5% :
ZO$=N1$+"R"
629 D$="KONZA "+TIME$+" "+DATE$
630 OPEN "O",#1,N1$ '    Create directory file
631 PRINT #1,Q5;",";N;",";M;",";D$;",";:FOR J=1 TO M:PRINT
#1,A$(J):NEXT J
632 PRINT #1,ZO$
633 CLOSE #1
634 OPEN "R",#1,N1$+"R",Q5:FIELD #1,Q5 AS T9$
720  OPEN "R",#2,Z$,Q5:FIELD #2,Q5 AS N9$
800  FOR R%=1 TO B1%
802    FOR K%=1 TO M
805      GET #2,K%+M*(R%-1):D(K%)=CVS(N9$)
2000 NEXT:GOSUB 10000
2003 NEXT:CLOSE:FOR I=1 TO 11:PRINT:NEXT
2004 GOSUB 33000
2005 IF ICOUNT<IFILES GOTO 500
2006 CHAIN "PLOTRE":END
2020 GOTO 30020
7090 '
7100 PRINT"HEADER DATA FOR: ";N$ TAB(30) "LABEL:  " D$
7110 PRINT"NUMBER OF CASES: " N TAB(30) "NUMBER OF VARIABLES: "
M:RETURN
7120 '
7200 '
7210 OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$
7220 FOR J=1 TO M:INPUT #1,A$(J):NEXT J:INPUT #1,Z$
7230 CLOSE #1:RETURN
7300 '
10000 '  30 min summary routine                SUMMARY1.CMF
10001 '  9/24/84                               Last modified 0914
10/05/84
10002 '
10003 IF D(1)=0 AND R%=1 THEN RETURN
10004 FOR I=1 TO B5%
10005   AVG(I)=D(I)+AVG(I)
```

```
10006 NEXT : IF FT$="S" THEN 10017
10007 '
10008 '     VECTOR AVG WIND DIRECTION
10009 '
10010 A7=D(12)/DPR
10011 A1=A1+COS(A7):A2=A2+SIN(A7)
10012 IF A1<>0 THEN A3=ATN(A2/A1) ELSE A3=SGN(A2)*PI/2
10013 IF SGN(A1)<0 THEN A3=A3+PI
10014 IF SGN(A1)>0 AND SGN(A2)<0 THEN A3=A3+2*PI
10015 AVG(12)=A3*DPR
10016 IF D(1)=0 THEN D(1)=2400
10017 HR=INT(D( 1)/100)
10018 MIN=D( 1)-HR*100
10019 NR=NR+1
10020 IF MIN MOD 30 = 0 OR R%=B1% THEN GOTO 10023
10021 RETURN
10022 '
10023 X1=X9:X9=HR+MIN/60:XD=(X9-X1)*2 ' XD = # missing records +
1
10024 FOR I=1 TO B5%
10025   IF I<> 12 THEN AVG(I)=AVG(I)/NR
10026 NEXT
10027 IF AVG(6)<0 THEN AVG(6)=0
10028 IF AVG(8)<0 THEN AVG(8)=0
10029 IF AVG(7)>0 THEN AVG(7)=0
10030 FOR I=1 TO XD:XT=X1+.5*I
10031   AVG(1)=40*INT(XT)+60*XT
10032   AVG2(1)=AVG(1)
10033   FOR J=2 TO B5%
10034     AVG2(J)=AVG1(J)+(AVG(J)-AVG1(J))/XD*I
10035 '   IF AVG(1)>1830 AND AVG(1) <2030 THEN PRINT
AVG(J),AVG1(J),AVG2(J),XD
10036   NEXT
10037   IF I<>XD THEN EF$="  *" ELSE EF$=""
10038   IF ICFLG > 1 THEN GOSUB 10100
10039   GOSUB 20000:ISUM=ISUM+1
10040   FOR K=1 TO B5% : IF FT$="S" THEN 10043
10041     IF Q5=4 THEN LSET T9$=MKS$(AVG2(K)) ELSE LSET
T9$=MKD$(AVG2(K))
10042     PUT #1,K+(B5%*(ISUM-1))
10043     IF K<11 OR K=27 THEN SUM(K)=SUM(K)+AVG2(K)*.0018 ELSE
SUM(K)=SUM(K)+AVG2(K)
10044   NEXT
10045 NEXT
10046 FOR K=1 TO B5%
10047   AVG1(K)=AVG(K)                       ' previous averages
10048   AVG(K)=0
10049 NEXT
10050 NR=0:A1=0:A2=0
10051 IF R%<B1% THEN RETURN
10052 FOR K=11 TO B5%:IF K<>27 THEN SUM(K)=SUM(K)/ISUM
10053 NEXT
```

```
10054 GOSUB 20015
10055 GOSUB 20017
10056 GOSUB 20029
10057 GOSUB 20031
10058 GOSUB 20035
10059 GOSUB 20037
10060 ISUM=ISUM+1 : IF FT$="S" THEN 10065
10061 FOR K=1 TO B5%
10062   LSET T9$=MKS$(SUM(K))
10063   PUT #1,K+(B5%*(ISUM-1))
10064 NEXT
10065 FOR K=1 TO B5%:SUM(K)=0:NEXT:ISUM=0:X9=0
10066 CLOSE #1:RETURN
10100 '
10104 IF ICFLG=1 THEN FACTOR=0:GOTO 10115
10105 ON SYS GOTO 10106,10107,10108,10109,10110
10106 FACTOR=.65:GOTO 10115
10107 FACTOR=.76:GOTO 10115
10108 FACTOR= 1 :GOTO 10115
10109 FACTOR= 1 :GOTO 10115
10110 FACTOR=.62
10115 AVG2(27)=FACTOR*AVG2(27)
10120 BETA=AVG2(3)/AVG2(4)
10125 AVG2(4)=-(AVG2(2)+AVG2(5)+AVG2(27))/(1+BETA)
10130 AVG2(3)=BETA*AVG2(4)
10180 RETURN
10190 '
20000 LPRINT USING "############"; AVG(1),
20001 LPRINT USING "######";AVG2(2),
20002 LPRINT USING "######";AVG2(3),
20003 LPRINT USING "######";AVG2(4),
20004 LPRINT USING "#####";AVG2(5)+AVG2(27),
20005 LPRINT USING "######";AVG2(6),
20006 LPRINT USING "######";AVG2(7),
20007 LPRINT USING "#####";AVG2(8),
20008 LPRINT USING "######";AVG2(9),
20009 LPRINT USING "######";AVG2(10),
20010 LPRINT USING "###.##";AVG2(13),
20011 LPRINT USING "###.#";AVG2(11),
20012 LPRINT USING "######";AVG2(12),
20013 LPRINT  EF$                                      ' removed  ;  RW
20014 RETURN
20015 FL%= 14 :LPRINT   "
-----------------------------------------------------------------
--------"   ' removed ;  RW
20016 RETURN
20017 FL%= 14 :LPRINT   "     Totals:";;
20018 FL%= 6 :LPRINT USING "###.##";SUM(2),
20019 FL%= 6 :LPRINT USING "###.##";SUM(3),
20020 FL%= 6 :LPRINT USING "###.##";SUM(4),
20021 FL%= 5 :LPRINT USING "##.##";SUM(5)+SUM(27),
20022 FL%= 6 :LPRINT USING "###.##";SUM(6),
```

```
20023 FL%= 6 :LPRINT USING "###.##";SUM(7),
20024 FL%= 5 :LPRINT USING "##.##";SUM(8),
20025 FL%= 6 :LPRINT USING "###.##";SUM(9),
20026 FL%= 6 :LPRINT USING "###.##";SUM(10),
20027 FL%= 14 :LPRINT "    (MJ m";T$;"-2";V$;")"                ’
removed  ;  -RW
20028 RETURN
20029 FL%= 14 :LPRINT                                   ’ removed  ;  -RW
20030 RETURN
20031 FL%= 14 :LPRINT  "    Averages (units as in column
headings):                 ";;
20032 FL%= 6 :LPRINT USING "###.##";SUM(13),
20033 FL%= 5 :LPRINT USING "###.#";SUM(11) ,
20034 RETURN
20035 FL%= 14 :LPRINT :LPRINT                           ’ removed  ; -RW
20036 RETURN
20037 FL%= 14 :LPRINT  "    (";
20038 FL%= 14 :LPRINT  CHR$(34);
20039 FL%= 14 :LPRINT  "*";;
20040 FL%= 14 :LPRINT  CHR$(34);
20041 FL%= 14 :LPRINT  " indicates interpolated values inserted
for missing data)";
20042
LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LP
RINT
20043 RETURN
30000 ’
30010 IF ERR<>51 THEN 30030
30020 CLOSE
30025 PRINT:PRINT:CHAIN "PLOT4"
30030 ON ERROR GOTO 0
30050 END
31000 ’
31005 ’ Initialize
31010 ’
31015 OPEN "I",#1,"PDS.FIL"
31016 INPUT #1,PG$:IF PG$<>"SUMMARYE" THEN 31016
31017 INPUT #1,ICFLG,IS,IE,DXI$,DXO$,FS$,FT$,MSG$
31020 IFILES=0
31025 IFILES=IFILES+1 : INPUT #1,FL$(IFILES):IF EOF (1) THEN
31040 ELSE 31030
31030 IF FL$(IFILES)="END" THEN IFILES=IFILES-1:GOTO 31040
31035 PRINT IFILES;FL$(IFILES),:GOTO 31025
31040 CLOSE #1:PRINT IFILES;FL$(IFILES)
31050 RETURN
32000 ’
32005 ’ Time and date routine for SDS MV5.0c
10/15/84 11:40
32007 ’                                         last modified
11/30/84 18:02
32010 ’ init
32015 ’
```

```
32020 DIM M(12)
32025 FOR I=1 TO 12:READ M(I):NEXT:IF INT(DATE/4)*4 = DATE THEN
M(2)=29
32030 DATA 31,28,31,30,31,30,31,31,30,31,30,31
32035 '
32040 ' main program
32045 '
32100 RETURN:'DATE=PEEK(&H40):IF DATE=0 THEN GOSUB 32170
32105 DATE$="19"+RIGHT$(STR$(DATE),2)
32120
TIME$=RIGHT$(STR$(PEEK(&H43)),2)+":"+RIGHT$(STR$(PEEK(&H44)),2)+"
:"+RIGHT$(STR$(PEEK(&H45)),2)
32125 DAY=PEEK(&H41)+256*(PEEK(&H42)) : MO=0
32135 FOR I=1 TO 12:MO=MO+M(I):IF MO>=DAY THEN MO=MO-M(I):GOTO
32145
32140 NEXT
32145 DAY=DAY-
MO:MO=I:DATE$=RIGHT$(STR$(MO),2)+"/"+RIGHT$(STR$(DAY),2)+"/"+DATE
$
32150 PRINT DATE$,TIME$
32160 RETURN
32165 '
32170 RETURN:' set time
32175 '
32180 INPUT "MONTH,   DAY,   YEAR ", MO,DAY,YR : MO=MO-1
32185 INPUT "HOUR, MINUTE, SECOND ",HR,MIN,SEC
32190 JDAY=0:FOR I=1 TO MO:JDAY=JDAY+M(I):NEXT
32195 JDAY=JDAY+DAY:JDAYH=INT(JDAY/256):JDAYL=JDAY-JDAYH*256
32200 POKE &H41,JDAYL:POKE &H42,JDAYH
32205 POKE &H43,HR:POKE &H44,MIN:POKE &H45,SEC
32210 PRINT "depress <CR> to start clock ";:XC$=INPUT$(1)
32215 IF XC$<>CHR$(13) THEN GOTO 32185 ELSE POKE &H40,YR
32220 RETURN
33000 PRINT "STARTING TIME = ",TIME$
33010 OPEN "R",#1,DXI$+G$+".MF",4
33020 OPEN "O",#2,DXI$+G$+".TXT"
33030 FIELD #1,4 AS N$
33050 FOR L = 1 TO 241
33060 FOR IQ = 1 TO 34
33070 GET #1
33080 NQ(IQ)= CVS(N$)
33130 NEXT IQ
33135 WRITE #2,
NQ(1),NQ(2),NQ(3),NQ(4),NQ(5),NQ(6),NQ(7),NQ(8),NQ(9),NQ(10),NQ(1
1),NQ(12),NQ(13),NQ(14),NQ(15),NQ(16),NQ(17),NQ(18),NQ(19),NQ(20)
,NQ(21),NQ(22),NQ(23),NQ(24),NQ(25),NQ(26),NQ(27),NQ(28),NQ(29),N
Q(30),NQ(31),NQ(32),NQ(33),NQ(34)
33140 NEXT L
33150 CLOSE #1:CLOSE #2:
33160 OPEN "R",#1,N1$+"R",4
33170 OPEN "O",#2,N1$+".TXT"
33180 FIELD #1,4 AS N$
```

```
33190 FOR L = 1 TO 49
33200 FOR IQ = 1 TO 34
33210 GET #1
33220 NQ(IQ)= CVS(N$)
33230 NEXT IQ
33235 WRITE #2,
NQ(1),NQ(2),NQ(3),NQ(4),NQ(5),NQ(6),NQ(7),NQ(8),NQ(9),NQ(10),NQ(1
1),NQ(12),NQ(13),NQ(14),NQ(15),NQ(16),NQ(17),NQ(18),NQ(19),NQ(20)
,NQ(21),NQ(22),NQ(23),NQ(24),NQ(25),NQ(26),NQ(27),NQ(28),NQ(29),N
Q(30),NQ(31),NQ(32),NQ(33),NQ(34)
33240 NEXT L
33250 CLOSE #1:CLOSE #2:
33255 PRINT "ENDING TIME=",TIME$
33260 RETURN
```

Appendix 9.8.11. PLOTRE.BAS, a program for the AT computer which converts the output of SUMMARYE.BAS into line printer plots of radiation balances.

```
3  '   PLOTRE.BAS modified for AT computer and Epson LQ-1000
printer
4  '
06/25/86
5  '   PLOT4K Konza Prairie study
6/14/85
6  '   PLOT4C removed refs to MOVE.COM for compilation
10/26/84
7  '   PLOT4  combines EBPLOT.CMF (ASCOT) for multiple files
10/22/84
9  '   PLOT1  1/12/84 minimum fixes to run on SDS
10 '   from Program PLOT 1/13/82 (Northstar)
11 '   Added SUBR 9100 to program Okidata 84 printer 1/12/83
12 '   Added plot vert. height as variable (HP) 11/82
20 '                                          last edited  0946
6/16/85
80 '
90  DEFINT I:WIDTH "LPT1:",255:X$="":G$="":N$=""
100 DIM A$(100),D(50),AVG(35),FL$(35),P$(145)
120 GOSUB 31000:'GOSUB 32000 ' Initialization, Time of Day
routines
150 ICOUNT=0
250   '
275 VRES=5 ' Vert res. in 144ths of an inch
276 MARG=17 ' margin offset
280 WP=5.65:WP=INT(WP*17.1)+1
290 HP=5:HP=INT(HP*144/VRES)+1
305 '
500   ICOUNT=ICOUNT+1 : G$=FL$(ICOUNT)+"P" : A$=G$
505   N$=DXI$+G$:GOSUB 8200:B1%=N:B5%=M:GOSUB 8100
510   OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$:CLOSE #1
515   ' GOSUB 32100
520 XMIN=1.1E+38:YMIN=XMIN:XMAX=XMIN:YMAX=XMIN
525 FOR I=1 TO HP:P$(I)=SPACE$(WP):MID$(P$(I),1,1)="|"
526 MID$(P$(I),WP,1)="|":NEXT
530 FOR I=1 TO WP:MID$(P$(1),I,1)="-":MID$(P$(HP),I,1)="-":NEXT
535 OPEN "R",#2,DXI$+G$+".MF",Q5:FIELD #2,Q5 AS N9$
623 YMAX=1000:YMIN=-
1360:XMAX=24:XMIN=0:T$=CHR$(27)+CHR$(83)+CHR$(0):V$=CHR$(27)+CHR$
(84)
624 LPRINT CHR$(27)CHR$(50);CHR$(27)CHR$(80);CHR$(15);
625 LPRINT TAB(5) DATE$ " " TIME$ "  file " N$ "  label:  " D$
626 LPRINT:LPRINT:LPRINT:LPRINT:LPRINT:LPRINT
627 LPRINT TAB(MARG+27) "UNIVERSITY OF WASHINGTON FOREST
METEOROLOGY"
628 LPRINT TAB(MARG+27) "          RADIATION BALANCE PLOT "
629 LPRINT "
```

```
630 LPRINT TAB(MARG+12) "Konza Prairie" TAB(MARG+62) "o = Net
radiation           [W m";T$;"-2";V$;"]"
631 LPRINT TAB(MARG+62) "* = Shortwave rad. down   [W m";T$;"-
2";V$;"]"
632 LPRINT TAB(MARG+17);:LPRINT USING
"##/##/85";VAL(MID$(A$,3,2));VAL(MID$(A$,5,2));:LPRINT
TAB(MARG+62) "x = Shortwave rad. up     [W m";T$;"-2";V$;"]"
633 LPRINT TAB(MARG+62) "= = Long wave rad. down   [W m";T$;"-
2";V$;"]"
634 SYS = VAL(MID$(A$,2,1)):LPRINT TAB(MARG);:ON SYS GOTO
635,642,642,642,642,636,639,640,641
635 LPRINT "            System 1:  North Facing Slope":GOTO 642
637 LPRINT "              System 6:  Tempe Az demo"  ::GOTO 642
639 LPRINT "            System 7: East Facing Slope"::GOTO 642
640 LPRINT "            System 8: West Facing Slope"::GOTO 642
641 LPRINT "            System 9: South Facing Slope":GOTO 642
642 LPRINT TAB(MARG+62) "+ = Long wave rad. up     [W m";T$;"-
2";V$;"]"
643 LPRINT TAB(MARG+62) "# = Diffuse rad.          [W m";T$;"-
2";V$;"]"
644 LPRINT TAB(MARG+62) "t = Air temperature
[";T$;"o";V$;"C]"
645 LPRINT TAB(MARG+62) "w = Wet bulb temperature
[";T$;"o";V$;"C]"
646 LPRINT
783 SX=(WP-1)/(XMAX-XMIN):SY=(HP-1)/(YMAX-YMIN)
795 LPRINT TAB(MARG) "XMIN=";XMIN;"  XMAX=";XMAX;"  YMIN=";YMIN;"
YMAX=";YMAX
796 GOSUB 9100:LPRINT
798 COUNT=1
800 FOR R%=1 TO B1%
802   FOR K%=1 TO M
804     GET #2,K%+M*(R%-1):D(K%)=CVS(N9$)
806   NEXT:GOSUB 10000
810 NEXT
820 FOR I=HP TO 1 STEP -1
825 LPRINT TAB(MARG) P$(I)
830 NEXT
835 FOR I=1 TO 3:LPRINT:NEXT:GOSUB 9110
840 CLOSE :FOR I=1 TO 10:LPRINT:NEXT
850 IF ICOUNT<IFILES GOTO 500
855 CHAIN "PLOTEE":END
900 '
5000 GOTO 30020
7200 IF SW=1 THEN SW=0:RETURN
7201 IF SX=0 THEN 7250
7202 IX=(X-XMIN)*SX+1:IY=(Y-YMIN)*SY+1
7205 IF (IX<=0 OR IY<=0) THEN RETURN
7210 IF (IX>WP OR IY>HP) THEN RETURN
7215 MID$(P$(IY),IX,1)=PC$:RETURN
7250 IF X>EXMX THEN EXMX=X
7255 IF X<EXMN THEN EXMN=X
```

```
7260 IF Y>EYMX THEN EYMX=Y
7265 IF Y<EYMN THEN EYMN=Y
7270 RETURN
8090 '
8100 PRINT"HEADER DATA FOR: ";N$ TAB(30) "LABEL: " D$
8110 PRINT"NUMBER OF CASES: " N TAB(30) "NUMBER OF VARIABLES: "
M:RETURN
8120 '
8200 '
8210 OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$
8220 FOR J=1+M1 TO M+M1:INPUT #1,A$(J):RSET
SP$=A$(J):A$(J)=SP$:NEXT J:INPUT #1,Z$
8230 CLOSE #1:RETURN
8300 '
9100 '   Epson LQ-1000 printer set up
9105 LPRINT CHR$(15);:LPRINT CHR$(27)CHR$(51)CHR$(7);
9107 RETURN
9110 LPRINT CHR$(27)CHR$(80);CHR$(27)CHR$(50):RETURN
10000 '  Plotting/averaging routine          RADPLOT.CMF
10001 '  9/24/84                             Last modified 1629
10/034/84
10002 '
10003 IF D(1)=0 AND R%=1 THEN RETURN
10005 FOR I=1 TO B5%
10006   AVG(I)=D(I)+AVG(I)
10007 NEXT
10008 HR=INT(D( 1)/100)
10009 IF D(1)=0 THEN D(1)=2400
10010 MIN=D( 1)-HR*100
10011 X=HR+MIN/60
10012 IF MIN=0 OR MIN=12 OR MIN=30 OR MIN=42 THEN Y=0:PC$="-
":GOSUB 7200:Y=-660:GOSUB 7200:Y=-1160:GOSUB 7200
10013 NR=NR+1
10014 IF MIN MOD 30 = 0 THEN GOTO 10017
10015 RETURN
10016 '
10017 FOR I=1 TO B5%
10018   AVG(I)=AVG(I)/NR
10019 NEXT
10020 IF X=0 AND RECORD%>2 THEN X=24
10021 Y=AVG(6):PC$="*":GOSUB 7200
10022 Y=AVG(7):PC$="x":GOSUB 7200
10023 Y=AVG(9):PC$="=":GOSUB 7200
10024 Y=AVG(10):PC$="+":GOSUB 7200
10025 Y=AVG(8):PC$="#":GOSUB 7200
10026 Y=AVG(2):PC$="o":GOSUB 7200
10027 Y=AVG(13)*20-1160:PC$="t":GOSUB 7200
10028 Y=AVG(14)*20-1160:PC$="w":GOSUB 7200
10029 FOR I=1 TO B5%
10030   AVG(I)=0
10031 NEXT
10032 NR=0
```

```
10033 RETURN
30000 '
30020 CLOSE
30030 IF ISTP=0 THEN STOP ELSE CHAIN "SC"
30040 STOP
31000 '
31005 ' Initialize
31010 '
31015 OPEN "I",#1,"PDS.FIL"
31016 INPUT #1,PG$:IF PG$<>"PLOTRE" THEN 31016
31017 INPUT #1,ICFLG,IS,IE,DXI$,DXO$,FS$,FT$,MSG$
31020 IFILES=0
31025 IFILES=IFILES+1 : INPUT #1,FL$(IFILES):IF EOF (1) THEN
31040 ELSE 31030
31030 IF FL$(IFILES)="END" THEN IFILES=IFILES-1:GOTO 31040
31035 PRINT IFILES;FL$(IFILES),:GOTO 31025
31040 CLOSE #1:PRINT IFILES;FL$(IFILES)
31050 RETURN
32000 '
32005 ' Time and date routine for SDS MV5.0c
10/15/84 11:40
32007 '                                          last modified 11/
1/84  7:50
32010 ' init
32015 '
32020 DIM M(12)
32025 FOR I=1 TO 12:READ M(I):NEXT:IF INT(DATE/4)*4 = DATE THEN
M(2)=29
32030 DATA 31,28,31,30,31,30,31,31,30,31,30,31
32035 '
32040 ' main program
32045 '
32100 DATE=PEEK(&H40):IF DATE=0 THEN GOSUB 32170
32105 DATE$="19"+RIGHT$(STR$(DATE),2)
32120
TIME$=RIGHT$(STR$(PEEK(&H43)),2)+":"+RIGHT$(STR$(PEEK(&H44)),2)+"
:"+RIGHT$(STR$(PEEK(&H45)),2)
32125 DAY=PEEK(&H41)+256*(PEEK(&H42)) : MO=0
32135 FOR I=1 TO 12:MO=MO+M(I):IF MO>DAY THEN MO=MO-M(I):GOTO
32145
32140 NEXT
32145 DAY=DAY-
MO:MO=I:DATE$=RIGHT$(STR$(MO),2)+"/"+RIGHT$(STR$(DAY),2)+"/"+DATE
$
32150 PRINT DATE$,TIME$
32160 RETURN
32165 '
32170 ' set time
32175 '
32180 INPUT "MONTH,   DAY,   YEAR ", MO,DAY,YR : MO=MO-1
32185 INPUT "HOUR, MINUTE, SECOND ",HR,MIN,SEC
32190 JDAY=0:FOR I=1 TO MO:JDAY=JDAY+M(I):NEXT
```

```
32195 JDAY=JDAY+DAY:JDAYH=INT(JDAY/256):JDAYL=JDAY-JDAYH*256
32200 POKE &H41,JDAYL:POKE &H42,JDAYH
32205 POKE &H43,HR:POKE &H44,MIN:POKE &H45,SEC
32210 PRINT "depress <CR> to start clock ";:XC$=INPUT$(1)
32215 IF XC$<>CHR$(13) THEN GOTO 32185 ELSE POKE &H40,YR
32220 RETURN
```

Appendix 9.8.12. PLOTEE.BAS, a program for the AT computer which converts the output of SUMMARYE.BAS into line printer plots of energy balances.

```
3  '   PLOTRE.BAS modified for AT computer and Epson LQ-1000
printer
4  '
06/25/86
5  '   PLOT5K Konza Prairie study
6/14/85
6  '   PLOT5SC removes MOVE.COM references for compilation
12/18/84
7  '   PLOT5S combines EBPLOT.CMF (ASCOT) for multiple files
10/22/84
9  '   PLOT1  1/12/84 minimum fixes to run on SDS
10 '   from Program PLOT 1/13/82 (Northstar)
11 '   Added SUBR 9100 to program Okidata 84 printer 1/12/83
12 '   Added plot vert. height as variable (HP) 11/82
13 '   ASCOT: uses already averaged data ("*S" files)
14 '                                          last edited  1012
06/16/85
15 '
20   'FT$ = "S"    -> input 30 min averages
22   '     = ".MF" -> input 6 min averages
24   'ICFLG = 0    -> plot data as is
26   '       1     -> recompute EB w/o soil heat storage in top 10
cm
28    '
80  ON ERROR GOTO 30000
90  DEFINT I:WIDTH "LPT1:",255:X$="":G$="":N$=""
100 DIM B%(64),A$(100),B$(100),D(50),AVG(35),FL$(35),P$(145)
110 ' OPEN "R",#3,"MOVE.COM":GET #3:GT=VARPTR(#3):PT=GT+11:CLOSE
#3
120 GOSUB 31000: GOSUB 32000 ' Initialization, Time of Day
routines
150 ICOUNT=0
272 '
275 VRES=5 ' Vert res. in 144ths of an inch
276 MARG=17 ' margin offset
280 WP=5.65:WP=INT(WP*17.1)+1
290 HP=5:HP=INT(HP*144/VRES)+1
305 '
500   ICOUNT=ICOUNT+1 : G$=FL$(ICOUNT)+"P": A$=G$
505   N$=DXI$+G$:GOSUB 8200:B1%=N:B5%=M:GOSUB 8100
510   OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$:CLOSE #1
515 ' GOSUB 32100
520 XMIN=1.1E+38:YMIN=XMIN:XMAX=XMIN:YMAX=XMIN
525 FOR I=1 TO
HP:P$(I)=SPACE$(WP):MID$(P$(I),1,1)="|":MID$(P$(I),WP,1)="|":NEXT
530 FOR I=1 TO WP:MID$(P$(1),I,1)="-":MID$(P$(HP),I,1)="-":NEXT
610  OPEN "R",#2,DXI$+G$+".MF",Q5:FIELD #2,Q5 AS N9$
```

```
624 YMAX=1000:YMIN=-1360:XMAX=24:XMIN=0:PI=3.14159:DPR=57.2958
625 LPRINT
CHR$(27)CHR$(50);CHR$(27)CHR$(80);CHR$(15);:T$=CHR$(27)+CHR$(83)+
CHR$(0):V$=CHR$(27)+CHR$(84)
626 LPRINT TAB(MARG) DATE$ " " TIME$ "   file " N$ "  label:  "
D$
627 LPRINT:LPRINT:LPRINT:LPRINT
628 LPRINT TAB(MARG+27);"UNIVERSITY OF WASHINGTON FOREST
METEOROLOGY"
629 LPRINT TAB(MARG+27);"           ENERGY BALANCE PLOT " :
LPRINT
630 LPRINT TAB(MARG+12) "Konza Prairie" TAB(MARG+62) "v = Net
radiation        [W m";T$;"-2";V$;"]"
631 LPRINT TAB(MARG+62)          ,"* = Soil Heat Flux       [W
m";T$;"-2";V$;"]"
632 LPRINT TAB(MARG+17);:LPRINT USING
"##/##/84";VAL(MID$(A$,3,2));VAL(MID$(A$,5,2));:LPRINT
TAB(MARG+62) "o = Sensible Heat Flux    [W m";T$;"-2";V$;"]"
633 LPRINT TAB(MARG+62)          "+ = Latent Heat Flux      [W
m";T$;"-2";V$;"]"
634 SYS = VAL(MID$(A$,2,1)):LPRINT TAB(MARG);:ON SYS GOTO
635,642,642,642,642,636,639,640,641
635 LPRINT "       System 1:  North Facing Slope":GOTO 642
636 LPRINT "         System 6:  Tempe Az demo";  :GOTO 642
639 LPRINT "       System 7: East Facing Slope":GOTO 642
640 LPRINT "       System 8: West Facing Slope":GOTO 642
641 LPRINT "       System 9: South Facing Slope":GOTO 642
642 LPRINT TAB(MARG+62) "x = Wind direction       [Degrees]"
643 LPRINT TAB(MARG+62) "# = Wind speed           [m s";T$;"-
1";V$;"]"
644 LPRINT
783 SX=(WP-1)/(XMAX-XMIN):SY=(HP-1)/(YMAX-YMIN)
795 LPRINT TAB(MARG) "XMIN=";XMIN;"  XMAX=";XMAX;"  YMIN=";YMIN;"
YMAX=";YMAX
796 GOSUB 9100:LPRINT
798 COUNT=1
800 FOR R%=1 TO B1%
802   FOR K%=1 TO M
805     GET #2,K%+M*(R%-1):D(K%)=CVS(N9$)
810   NEXT:GOSUB 10000
815 NEXT
820 FOR I=HP TO 1 STEP -1
825 LPRINT TAB(MARG) P$(I)
830 NEXT
835 FOR I=1 TO 3:LPRINT:NEXT:GOSUB 9110
840 CLOSE : FOR I=1 TO 14:LPRINT:NEXT
850 IF ICOUNT<IFILES GOTO 500
900 '
5000 GOTO 30020
7200 IF SW=1 THEN SW=0:RETURN
7201 IF SX=0 THEN 7250
7202 IX=(X-XMIN)*SX+1:IY=(Y-YMIN)*SY+1
```

```
7205 IF (IX<=0 OR IY<=0) THEN RETURN
7210 IF (IX>WP OR IY>HP) THEN RETURN
7211 Q1=Q1+1:S1=S1+X:S2=S2+Y:S3=S3+X*X:S4=S4+X*Y:S5=S5+Y*Y
7215 MID$(P$(IY),IX,1)=PC$:RETURN
7250 IF X>EXMX THEN EXMX=X
7255 IF X<EXMN THEN EXMN=X
7260 IF Y>EYMX THEN EYMX=Y
7265 IF Y<EYMN THEN EYMN=Y
7270 RETURN
8090 '
8100 PRINT"HEADER DATA FOR: ";N$ TAB(30) "LABEL: " D$
8110 PRINT"NUMBER OF CASES: " N TAB(30) "NUMBER OF VARIABLES: "
M:RETURN
8120 '
8200 '
8210 OPEN "I",#1,N$:INPUT #1,Q5,N,M,D$
8220 FOR J=1+M1 TO M+M1:INPUT #1,A$(J):RSET
SP$=A$(J):A$(J)=SP$:NEXT J:INPUT #1,Z$
8230 CLOSE #1:RETURN
8300 '
9100 '   Okidata 84A printer set up
9105 LPRINT CHR$(15);:LPRINT CHR$(27)CHR$(51)CHR$(7)
9107 RETURN
9110 LPRINT CHR$(27)CHR$(80);CHR$(27)CHR$(50):RETURN
10000 '  Plotting/averaging routine          EBPLOT.CMF
10001 '  9/23/84   1536                      Last modified 1525
10/22/84
10002 '
10003 IF D(1)=0 AND R%=1 THEN RETURN
10004 IF FT$ = "S" THEN GOTO 10018
10005 FOR I=1 TO B5%
10006   AVG(I)=D(I)+AVG(I)
10007 NEXT
10008 '
10009 '     VECTOR AVG WIND DIRECTION
10010 '
10011 A7=D(12)/DPR
10012 A1=A1+COS(A7):A2=A2+SIN(A7)
10013 IF A1<>0 THEN A3=ATN(A2/A1) ELSE A3=SGN(A2)*PI/2
10014 IF SGN(A1)<0 THEN A3=A3+PI
10015 IF SGN(A1)>0 AND SGN(A2)<0 THEN A3=A3+2*PI
10016 AVG(12)=A3*DPR
10017 IF D(1)=0 THEN D(1)=24
10018 HR=INT(D( 1)/100)
10019 MIN=D( 1)-HR*100
10020 X=HR+MIN/60 : Y=0
10021 IF MIN MOD 15 = 0 THEN Y=0    :PC$="-":GOSUB 7200
10022 IF MIN MOD 15 = 0 THEN Y=-500:PC$="-":GOSUB 7200
10023 IF MIN MOD 15 = 0 THEN Y=-860:PC$="-":GOSUB 7200
10024 IF FT$ = "S" THEN GOTO 10031
10025 NR=NR+1:IF MIN MOD 30 = 0 THEN GOTO 10027
10026 RETURN
```

```
10027 '
10028 FOR I=1 TO B5%
10029   IF I<> 12 THEN D(I)=AVG(I)/NR
10030 NEXT
10031 IF ICFLG AND 1 THEN GOSUB 10100
10032 Y=D(5)+D(27):PC$="*":GOSUB 7200
10033 Y=D(3):PC$="o":GOSUB 7200
10034 Y=D(4):PC$="+":GOSUB 7200
10035 Y=D(12)-860:PC$="x":GOSUB 7200
10036 Y=D(11)*50-1360:PC$="#":GOSUB 7200
10037 Y=D(2):PC$="v":GOSUB 7200
10038 IF FT$ = "S" THEN RETURN
10039 FOR I=1 TO B5%
10040   AVG(I)=0
10041 NEXT
10042 NR=0:A1=0:A2=0
10043 RETURN
10100 '
10110 BETA=D(3)/D(4)
10120 D(4)=-(D(2)+D(5))/(1+BETA)
10130 D(3)=BETA*D(4)
10140 D(27)=0
10180 RETURN
10190 '
30000 '
30010 IF ERR<>51 THEN 30030
30020 CLOSE
30025 PRINT:PRINT:STOP
30030 ON ERROR GOTO 0
30050 STOP
31000 '
31005 ' Initialize
31010 '
31015 OPEN "I",#1,"PDS.FIL"
31016 INPUT #1,PG$:IF PG$<>"PLOTEE" THEN 31016
31017 INPUT #1,ICFLG,IS,IE,DXI$,DXO$,FS$,FT$,MSG$
31020 IFILES=0
31025 IFILES=IFILES+1 : INPUT #1,FL$(IFILES):IF EOF (1) THEN
31040 ELSE 31030
31030 IF FL$(IFILES)="END" THEN IFILES=IFILES-1:GOTO 31040
31035 PRINT IFILES;FL$(IFILES),:GOTO 31025
31040 CLOSE #1:PRINT IFILES;FL$(IFILES)
31050 RETURN
32000 '
32005 ' Time and date routine for SDS MV5.0c
10/15/84 11:40
32007 '                                          last modified 11/
1/84  7:50
32010 ' init
32015 '
32020 DIM M(12)
32025 FOR I=1 TO 12:READ M(I):NEXT:IF INT(DATE/4)*4 = DATE THEN
```

```
M(2)=29
32030 DATA 31,28,31,30,31,30,31,31,30,31,30,31
32035 RETURN '
32040 ' main program
32045 '
32100 DATE=PEEK(&H40):IF DATE=0 THEN GOSUB 32170
32105 DATE$="19"+RIGHT$(STR$(DATE),2)
```

SYSTEM 1, JULY 16, 1986. DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5																											
1.0																											
1.5																											
2.0																											
2.5																											
3.0																											
3.5																											
4.0																											
4.5																											
5.0																											
5.5																											
6.0																											
6.5																											
7.0																											
7.5																											
8.0																											
8.5																											
9.0																											
9.5																											
10.0																											
10.5	475			-91	739	-170	129	407	-483	3.8	208	32.15	24.38	33.51	24.89	30.29	2.53	2.57	-1.35	-0.04	1147	-653	49.7	0.2	-13	1.00	1.07
11.0	517			-104	803	-184	135	404	-493	3.5	209	32.97	26.30	34.44	26.84	31.42	2.98	3.03	-1.46	-0.05	1206	-676	55.5	-0.2	-13	-1.00	-0.73
11.5	560			-113	855	-194	138	400	-500	3.7	214	33.61	27.19	35.06	28.45	32.50	3.19	3.46	-1.43	-0.26	1255	-695	61.4	0.2	-11	0.99	-0.34
12.0	591	-307	-159	-118	695	-203	144	293	-504	3.6	206	34.34	24.62	35.93	25.26	33.28	2.45	2.51	-1.58	-0.06	1188	-707	42.4	-0.2	-7	-1.00	2.07
12.5	610	-330	-150	-119	921	-208	149	149	-507	3.0	201	34.69	24.90	36.31	25.51	34.12	2.50	2.55	-1.61	-0.05	1070	-715	42.1	0.2	-11	0.99	2.20
13.0	622	-339	-154	-121	932	-212	155	24	-504	2.6	200	35.08	25.18	36.72	25.79	34.97	2.54	2.59	-1.63	-0.05	956	-716	41.9	-0.2	-9	-1.02	2.21
13.5	616	-351	-142	-117	925	-210	151	154	-512	2.6	207	35.43	24.93	36.93	25.48	35.59	2.46	2.50	-1.50	-0.04	1078	-722	39.9	0.2	-6	0.97	2.47
14.0	607	-336	-156	-110	906	-211	155	44	-508	3.5	192	35.65	25.15	37.27	25.76	36.00	2.50	2.55	-1.61	-0.05	950	-719	40.0	-0.2	-5	-1.04	2.16
14.5	580	-311	-169	-100	873	-202	156	172	-518	4.8	196	35.69	24.86	37.19	25.46	36.08	2.42	2.47	-1.49	-0.05	1045	-720	39.0	0.2	0	0.96	1.88
15.0	550	-314	-148	-87	830	-196	167	81	-511	3.3	203	35.91	24.64	37.29	25.17	36.12	2.35	2.39	-1.37	-0.04	912	-706	37.5	-0.2	-1	-1.06	2.14
15.5	499	-272	-148	-79	767	-180	162	217	-522	3.7	194	35.92	24.89	37.25	25.42	36.22	2.41	2.46	-1.32	-0.05	984	-702	38.7	0.2	0	0.95	1.90
16.0	450	-265	-118	-69	699	-167	161	151	-517	2.6	187	35.61	25.17	36.92	25.66	36.06	2.51	2.54	-1.31	-0.04	850	-684	40.7	-0.2	2	-1.06	2.24
16.5	384	-218	-112	-58	622	-149	145	266	-523	3.3	190	35.41	25.09	36.56	25.54	35.81	2.50	2.54	-1.14	-0.04	888	-672	41.4	0.2	4	0.96	1.94
17.0	326	-182	-103	-46	540	-134	136	231	-516	2.7	189	35.17	24.80	36.17	25.21	35.37	2.44	2.48	-0.99	-0.04	772	-650	41.3	-0.2	5	-1.05	1.76
17.5	251	-138	-86	-33	438	-111	116	311	-516	3.2	185	34.91	24.88	35.74	25.23	34.83	2.48	2.51	-0.82	-0.03	748	-627	42.9	0.0	6	-0.04	1.59
18.0	175	-93	-69	-22	327	-87	97	371	-516	3.2	183	34.27	24.86	34.84	25.12	34.12	2.52	2.54	-0.56	-0.03	698	-602	45.6	0.2	8	0.97	1.37
18.5	110	-50	-57	-11	239	-67	84	381	-513	3.0	178	33.69	24.70	34.10	24.93	33.43	2.51	2.54	-0.40	-0.03	620	-580	47.5	-0.2	7	-1.03	0.87
19.0	43	-15	-35	-2	149	-44	62	425	-508	2.7	177	32.87	24.45	33.05	24.62	32.71	2.51	2.54	-0.17	-0.03	574	-552	50.3	0.2	9	0.98	0.39
19.5	-13	2	-14	9	74	-26	46	453	-508	2.1	178	32.00	23.87	31.92	23.96	31.82	2.42	2.45	0.09	-0.03	527	-533	51.7	-0.2	10	-1.02	-0.22
20.0	-34	9	-13	18	20	-7	21	455	-498	2.3	176	30.91	23.44	30.63	23.47	30.95	2.39	2.41	0.28	-0.02	476	-506	54.9	0.2	10	0.98	-0.80
20.5	-42	50	-41	23	5	-4	9	455	-483	2.4	174	29.99	23.79	29.65	23.78	30.18	2.53	2.55	0.34	-0.02	459	-487	61.4	-0.2	8	-1.01	-1.20
21.0	-43	56	-47	27	2	-2	4	450	-480	3.0	171	29.71	23.66	29.37	23.65	29.54	2.52	2.54	0.36	-0.02	451	-482	62.1	0.2	7	0.99	-1.20
21.5	-43	39	-31	28	2	-3	4	430	-466	3.4	174	29.18	23.57	28.85	23.55	28.99	2.53	2.55	0.34	-0.02	432	-468	64.3	-0.2	6	-1.00	-1.27
22.0	-43	37	-30	30	2	-2	5	443	-476	3.1	180	28.93	23.46	28.60	23.44	28.50	2.52	2.54	0.34	-0.02	445	-479	64.9	0.2	5	0.99	-1.25
22.5	-44	34	-26	31	3	-3	6	430	-462	3.7	181	28.52	23.30	28.20	23.28	28.08	2.51	2.53	0.33	-0.02	433	-465	66.2	-0.2	4	-1.00	-1.32
23.0	-43	28	-22	32	1	-2	4	431	-465	3.0	184	28.08	23.12	27.75	23.10	27.69	2.50	2.52	0.34	-0.02	432	-467	67.6	0.2	4	0.99	-1.30
23.5	-43	26	-19	32	2	-2	5	424	-459	3.1	188	27.84	23.01	27.49	22.98	27.44	2.49	2.51	0.36	-0.02	426	-462	68.3	0.0	4	0.00	-1.35
24.0																											

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	26	-12	-8	-3.9	41.5	-9.8	8.4	27.0	-43.1												68.5	-53.0		0.0	0.9	0.00	
DSUM	19	-10	-5	-3.2	29.4	-6.9	5.9	12.6	-23.6												42.1	-30.5		0.0	0.5	0.00	
NSUM	7	-3	-3	-0.7	12.1	-2.9	2.5	14.4	-19.5												26.5	-22.4		0.0	0.3	0.00	
TAVE										3.1	190	33.02	24.60	33.76	24.95	32.73	2.54	2.58	-0.73	-0.04			50.1				0.7
DAVE										3.1	193	33.95	24.86	34.92	25.30	33.67	2.5426	2.59	-0.96	-0.05			46.7				1.2
NAVE										0.5	27	4.33	3.52	4.28	3.52	4.28	0.3796	0.38	0.05	0.00			9.9				-0.2

ORIGINAL PAGE IS
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SYSTEM 1, JULY 17, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-45	38	-28	32	2	-3	5	419	-455	3	188	27.54	22.85	27.19	22.83	27.20	2.47	2.49	0.36	-0.02	421	-458	69.1	-0.2	3	-1.00	-1.35
1.0	-45	37	-28	33	1	-2	4	425	-459	4	190	27.48	22.64	27.12	22.62	26.88	2.43	2.45	0.37	-0.02	426	-460	68.2	0.2	3	0.99	-1.32
1.5	-46	37	-29	34	3	-4	8	443	-459	3	194	27.49	22.28	27.12	22.26	26.56	2.34	2.36	0.38	-0.02	445	-463	65.8	-0.2	3	-1.01	-1.28
2.0	-47	44	-35	35	2	-2	5	421	-458	3.9	195	27.26	21.86	26.88	21.84	26.27	2.26	2.28	0.38	-0.02	423	-461	64.5	0.2	3	0.99	-1.26
2.5	-47	43	-35	36	2	-3	5	414	-450	3.8	198	27.12	21.44	26.73	21.42	25.98	2.18	2.20	0.40	-0.02	416	-453	62.7	-0.2	3	-1.00	-1.25
3.0	-47	34	-26	36	1	-2	4	418	-456	3.2	202	26.80	21.10	26.41	21.08	25.69	2.12	2.14	0.41	-0.02	420	-458	62.3	0.2	3	0.99	-1.28
3.5	-45	29	-24	36	2	-3	5	410	-447	3.4	196	26.37	20.84	25.98	20.82	25.42	2.09	2.12	0.40	-0.02	412	-450	63.1	-0.2	3	-1.00	-1.21
4.0	-45	33	-28	37	1	-2	3	417	-452	3.8	196	26.22	20.61	25.84	20.59	25.17	2.06	2.08	0.39	-0.02	419	-454	62.4	0.2	3	0.99	-1.19
4.5	-43	19	-16	37	2	-3	4	414	-446	4.1	200	26.08	20.49	25.70	20.47	24.95	2.04	2.06	0.39	-0.02	416	-449	62.4	-0.2	2	-1.00	-1.23
5.0	-43	23	-19	36	1	-1	3	418	-453	3.7	199	25.87	20.39	25.51	20.37	24.75	2.03	2.05	0.38	-0.02	419	-454	62.9	0.2	2	1.00	-1.23
5.5	-43	26	-22	36	2	-2	4	411	-444	3.3	201	25.69	20.27	25.32	20.26	24.57	2.02	2.04	0.38	-0.02	413	-446	63.2	-0.2	2	-1.00	-1.22
6.0	-41	22	-18	35	3	-3	3	417	-451	3.0	198	25.54	20.14	25.16	20.13	24.38	2.00	2.02	0.39	-0.02	419	-453	63.2	0.2	2	1.00	-1.21
6.5	-26	-72	64	34	40	-13	26	406	-417	3.2	198	25.10	20.09	24.85	20.11	24.11	2.02	2.04	0.26	-0.02	446	-430	65.0	0.2	1	0.99	-0.80
7.0	-26	-72	64	34	40	-13	26	406	-417	3.2	198	25.10	20.09	24.85	20.11	24.11	2.02	2.04	0.26	-0.02	446	-430	65.0	0.2	1	0.99	-0.80
7.5	14	4	-44	28	118	-31	47	407	-413	3.1	204	25.65	20.37	25.62	20.47	24.20	2.04	2.07	0.04	-0.02	524	-444	62.9	0.0	-2	-0.01	-0.12
8.0	92	-38	-69	19	215	-52	64	395	-429	2.6	201	26.57	20.79	26.78	20.97	24.58	2.07	2.10	-0.20	-0.02	610	-481	59.6	-0.2	-4	-1.01	0.54
8.5	164	-88	-78	8	307	-75	76	397	-430	3.9	203	27.38	21.15	27.78	21.38	25.10	2.10	2.12	-0.39	-0.02	704	-505	56.9	0.2	-6	0.99	1.12
9.0	231	-133	-87	-4	405	-102	96	288	-443	2.6	206	28.28	21.50	28.85	21.77	25.68	2.11	2.14	-0.56	-0.02	693	-545	53.8	-0.2	-7	-1.03	1.53
9.5	295	-178	-88	-17	492	-119	103	310	-448	3.4	213	29.15	22.02	29.91	22.35	26.63	2.17	2.20	-0.76	-0.02	802	-568	52.1	0.2	-12	0.98	2.02
10.0	357	-209	-94	-41	581	-140	116	244	-455	2.8	207	30.03	22.43	31.04	22.85	27.78	2.21	2.24	-1.01	-0.03	825	-597	49.7	-0.2	-13	-1.02	2.23
10.5	436	-253	-99	-70	687	-162	124	222	-470	2.6	213	31.37	23.01	32.56	23.47	29.46	2.26	2.29	-1.18	-0.03	909	-633	46.6	0.2	-13	0.98	2.56
11.0	485	-261	-123	-88	755	-178	133	142	-476	2.4	213	32.40	23.34	33.70	23.87	30.57	2.27	2.31	-1.29	-0.04	896	-655	44.1	-0.2	-12	-1.02	2.13
11.5	529	-296	-118	-100	817	-191	132	183	-486	2.7	214	33.19	23.60	34.58	24.13	31.78	2.28	2.31	-1.38	-0.04	1000	-677	42.1	0.2	-13	0.98	2.52
12.0	563	-307	-134	-110	871	-203	138	49	-490	2.5	209	33.95	23.79	35.49	24.39	32.92	2.27	2.31	-1.53	-0.04	920	-693	40.1	-0.2	-12	-1.03	2.29
12.5	589	-326	-135	-115	898	-207	136	93	-494	2.3	202	34.26	23.94	35.91	24.57	33.56	2.29	2.33	-1.64	-0.05	991	-702	39.5	0.0	-8	-0.02	2.41
13.0	601	-325	-140	-120	929	-213	140	27	-501	2.1	217	35.05	24.32	36.56	24.89	34.75	2.33	2.37	-1.50	-0.04	955	-714	38.7	-0.2	-16	-1.02	2.53
13.5	607	-314	-159	-124	931	-213	138	151	-514	2.9	197	35.61	24.63	37.26	25.28	35.72	2.37	2.42	-1.64	-0.06	1082	-726	38.1	0.2	-9	0.98	1.99
14.0	601	-297	-176	-121	922	-214	146	37	-510	2.6	190	35.81	24.70	37.38	25.35	36.35	2.37	2.43	-1.56	-0.06	959	-723	38.0	-0.2	-6	-1.02	1.72
14.5	584	-249	-216	-115	889	-206	149	177	-521	2.4	193	36.22	24.95	37.48	25.56	36.79	2.41	2.48	-1.26	-0.07	1066	-727	38.5	0.2	-4	0.98	1.17
15.0	558	-271	-176	-109	860	-202	161	73	-517	2.4	190	36.05	25.01	37.46	25.62	36.98	2.43	2.50	-1.41	-0.06	932	-718	38.8	-0.2	-2	-1.02	1.59
15.5	523	-243	-188	-93	810	-190	163	202	-523	3.5	192	36.24	24.51	37.45	25.07	37.03	2.30	2.36	-1.19	-0.06	1012	-713	36.7	0.2	1	0.98	1.32
16.0	477	-258	-137	-82	751	-179	165	130	-521	2.6	187	36.04	24.74	37.40	25.28	36.97	2.37	2.41	-1.35	-0.05	882	-700	37.6	-0.2	0	-1.03	1.88
16.5	429	-242	-118	-71	662	-162	155	248	-525	3.2	189	35.91	24.71	37.17	25.20	36.78	2.37	2.41	-1.24	-0.04	930	-687	38.0	0.2	3	0.98	2.06
17.0	359	-207	-106	-59	604	-147	148	205	-521	2.9	186	35.72	24.79	36.90	25.26	36.44	2.40	2.44	-1.18	-0.04	808	-668	39.1	-0.2	4	-1.02	1.96
17.5	300	-165	-91	-48	505	-125	129	286	-522	2.6	184	35.32	25.04	36.34	25.46	36.03	2.49	2.53	-1.01	-0.04	791	-647	41.8	0.0	5	-0.02	1.82
18.0	230	-118	-89	-32	405	-103	107	344	-519	3.1	184	34.88	24.50	35.65	24.86	35.36	2.39	2.42	-0.76	-0.04	750	-622	41.6	0.2	8	0.98	1.34
18.5	164	-77	-72	-22	312	-84	91	352	-518	2.1	188	34.53	24.52	35.12	24.82	34.62	2.41	2.45	-0.58	-0.04	663	-603	43.2	-0.2	8	-1.01	1.07
19.0	97	-41	-49	-14	217	-60	71	407	-515	2.7	182	33.80	24.78	34.17	25.00	33.93	2.53	2.56	-0.36	-0.03	624	-575	47.6	0.2	8	0.99	0.83
19.5	28	-9	-23	-5	133	-40	57	429	-513	1.7	180	32.76	24.38	32.92	24.54	33.12	2.49	2.52	-0.15	-0.03	562	-553	50.4	-0.2	9	-1.01	0.33
20.0	-22	3	-10	4	59	-18	36	447	-506	1.9	177	31.50	23.89	31.42	23.97	32.24	2.46	2.48	0.09	-0.03	506	-524	54.0	0.2	10	0.99	-0.25
20.5	-38	12	-11	11	15	-6	17	451	-490	2.5	176	30.25	24.05	29.97	24.06	31.40	2.58	2.60	0.29	-0.02	465	-496	61.4	-0.2	9	-1.01	-1.00
21.0	-45	29	-24	19	2	-2	4	432	-472	2.8	175	29.86	23.76	29.50	23.75	30.60	2.54	2.56	0.37	-0.02	433	-474	62.0	0.2	8	0.99	-1.22
21.5	-43	70	-58	24	2	-3	5	428	-465	2.9	177	29.20	23.48	28.84	23.47	29.91	2.51	2.53	0.37	-0.02	430	-468	63.8	-0.2	7	-1.00	-1.22
22.0	-43	56	-47	27	1	-2	4	433	-468	2.6	177	28.76	23.32	28.42	23.30	29.31	2.50	2.52	0.35	-0.02	434	-470	65.1	0.2	6	0.99	-1.21
22.5	-44	92	-83	29	2	-3	5	426	-460	3.2	183	28.46	22.94	28.14	22.93	28.79	2.43	2.45	0.34	-0.02	428	-463	64.3	-0.2	5	-1.00	-1.13
23.0	-44	56	-48	31	1	-2	4	429	-464	2.9	185	28.07	22.62	27.73	22.61	28.31	2.38	2.40	0.34	-0.02	430	-466	64.6	0.2	5	0.99	-1.19
23.5	-44	53	-44	32	2	-3	6	421	-452	4.3	190	28.06	22.57	27.73	22.56	27.97	2.37	2.39	0.34	-0.02	424	-455	64.3	-0.3	4	-1.67	-1.19
24.0	-45	46	-37	32	1	-2	4	430	-464	3.3	188	27.98	22.60	27.66	22.58	27.75	2.38	2.40	0.33	-0.02	432	-465	64.8	0.3	4	1.66	-1.26

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.6	-7.5	-6.1	-1.4	27.4	-6.6	5.7	28.0	-41.0												55.4	-47.6		0.0	0.0	0.00	
DSUM	16.6	-8.6	-5.0	-2.6	26.8	-6.4	5.4	11.3	-22.8												38.1	-29.2		0.0	-0.2	0.00	
NSUM	-1.1	1.1	-1.1	1.2	0.6	-0.2	0.3	16.7	-18.2												17.3	-18.5		0.0	0.1	0.00	
TAVE										3.0	194	30.36	22.82	30.72	23.04	29.88	2.29	2.32	-0.35	-0.03			53.7				0.3
DAVE										2.7	195	33.25	23.90	34.19	24.31	32.94	2.3491	2.39	-0.93	-0.04			45.0				1.5
NAVE										2.2	130	18.09	14.43	17.88	14.42	17.60	1.4790	1.49	0.22	-0.01			42.9				-0.7

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SYSTEM 7, JULY 19, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5																											
1.0																											
1.5																											
2.0																											
2.5																											
3.0																											
3.5																											
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10.0																											
10.5																											
11.0																											
11.5																											
12.0																											
12.5	582	-275	-159	-90	894	-199	271	0	0	4.0	203	34.50	24.32	36.24	25.04	30.07	2.36	2.43	-1.73	-0.07	1008	182	40.4	-1.0	-57	-5.17	1.73
13.0	594	-297	-169	-94	904	-200	274	0	0	4.8	201	34.84	24.43	36.53	25.13	30.46	2.37	2.43	-1.69	-0.06	1020	185	39.8	0.2	-34	1.03	1.77
13.5	593	-295	-175	-97	909	-202	276	0	0	4.7	193	35.38	24.67	37.12	25.40	31.00	2.39	2.46	-1.73	-0.07	1027	190	39.0	-0.2	-26	-1.03	1.69
14.0	583	-260	-191	-100	897	-200	274	0	0	4.1	201	36.14	24.93	37.70	25.63	31.55	2.41	2.48	-1.55	-0.08	1017	181	38.1	0.2	-32	1.03	1.37
14.5	575			-101	876	-196	269	0	0	4.3	194	36.55	25.39	temp.	26.08	32.02	2.50				1012	182		-0.2	-19	-1.03	
15.0	552			-98	841	-190	261	0	0	4.8	195	36.66	25.53	off	26.21	32.25	2.53				985	176		0.2	-9	1.03	
15.5	520			-91	792	-181	249	0	0	4.8	197	36.96	25.63	scale	26.27	32.36	2.53				941	165		-0.2	-4	-1.03	
16.0	482			-85	735	-169	233	0	0	5.3	203	37.13	25.85		26.43	32.35	2.58				894	160		0.2	2	1.03	
16.5	431			-77	666	-154	213	0	0	4.9	207	37.45	25.69		26.43	32.31	2.57				819	142		-0.2	3	-1.03	
17.0	377	-144	-183	-68	586	-137	190	0	0	5.3	196	36.98	25.84	37.87	26.34	32.06	2.59	2.66	-0.88	-0.08	745	134	40.5	0.2	18	1.03	0.85
17.5	309	-150	-124	-55	492	-116	164	0	0	4.9	188	36.62	25.86	37.62	26.32	31.63	2.62	2.67	-0.98	-0.05	644	115	41.2	0.0	20	0.00	1.22
18.0	232	-102	-109	-43	389	-93	132	0	0	4.8	186	36.45	25.65	37.21	26.04	31.22	2.57	2.63	-0.75	-0.05	527	95	41.4	-0.2	22	-1.03	0.93
18.5	168	-75	-93	-32	296	-71	104	0	0	5.1	184	35.65	25.53	36.17	25.83	30.63	2.60	2.64	-0.51	-0.04	412	77	44.0	0.2	31	1.03	0.80
19.0	101	-36	-72	-22	206	-52	79	0	0	4.5	184	34.72	25.51	35.03	25.73	30.11	2.65	2.69	-0.30	-0.04	294	62	47.8	-0.2	29	-1.03	0.50
19.5	30	-3	-44	-13	123	-34	55	0	0	4.4	183	33.69	24.74	33.72	24.89	29.54	2.52	2.56	-0.02	-0.03	180	45	48.9	0.2	30	1.03	0.04
20.0		12	-25	-6	52	-15	30	0	0	3.6	184	32.27	24.23	32.08	24.31	29.00	2.49	2.52	0.19	-0.03	43	23	52.8	-0.2	28	-1.03	-0.43
20.5		32	-33	0	10	-3	14	0	0	4.2	182	31.22	23.60	30.83	23.60	28.46	2.41	2.43	0.40	-0.03	6	4	54.7	0.2	29	1.03	-0.98
21.0		39	-35	6	0	-1	11	0	0	4.5	188	30.65	22.95	30.19	22.94	27.95	2.29	2.32	0.47	-0.03	-7	0	54.0	-0.2	26	-1.03	-1.13
21.5		41	-36	10	0	-1	10	0	0	4.7	188	30.26	22.55	29.82	22.53	27.52	2.22	2.25	0.45	-0.03	-8	-1	53.5	0.2	22	1.03	-1.15
22.0		32	-27	12	0	-1	9	0	0	4.0	198	29.70	22.19	29.25	22.18	27.16	2.18	2.20	0.46	-0.03	-8	0	54.2	-0.2	17	-1.03	-1.19
22.5		24	-21	13	0	0	7	0	0	3.5	208	28.89	21.66	28.45	21.65	26.86	2.11	2.14	0.44	-0.03	-8	0	55.0	0.2	16	1.03	-1.15
23.0	-44	21	-19	14	0	0	6	0	0	3.4	206	28.24	21.11	27.78	21.10	26.55	2.03	2.06	0.47	-0.03	-9	0	55.2	-0.2	16	-1.03	-1.12
23.5	-45	21	-19	16	0	0	6	0	0	3.3	208	28.00	20.75	27.52	20.74	26.30	1.97	2.00	0.49	-0.03	-11	-2	54.4	0.3	17	1.72	-1.13
24.0	-46	28	-23	17	0	0	5	0	0	3.2	206	27.57	20.54	27.07	20.52	26.13	1.95	1.98	0.51	-0.03	-9	1	55.3	-0.3	15	-1.72	-1.20

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	27.8	-7.8	-10.3	-3.6	34.6	-8.0	11.3	0.0	0.0												41.5	7.6		0.0	0.7	0.00	
DSUM	18.0	-6.9	-7.6	-3.1	27.6	-6.3	8.8	0.0	0.0												33.3	6.1		0.0	0.1	0.00	
NSUM	9.9	-0.9	-2.7	-0.5	7.0	-1.6	2.5	0.0	0.0												8.2	1.5		0.0	0.6	0.00	
TAVE										4.4	194	33.81	24.27	34.27	24.61	29.95	2.41	2.47	-0.46	-0.06			46.1				0.2
DAVE										4.6	192	35.37	25.13	36.15	25.57	30.95	2.5122	2.58	-0.76	-0.06			43.3				0.7
NAVE										0.7	35	5.11	3.82	5.03	3.82	4.74	0.3709	0.38	0.08	0.00			9.6				-0.2

SYSTEM 9, JULY 13, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-27	1	1	45	0	0	0	412	-427	0	286	19.80	19.36	19.39	19.12	24.92	2.22	2.20	0.42	0.02	412	-428	97.6	-0.2	20	-3.01	1.64
1.0	-24	2	2	47	0	0	0	413	-426	1	195	19.29	18.99	18.98	18.77	24.63	2.18	2.15	0.32	0.03	413	-427	98.1	0.2	19	3.00	1.02
1.5	-21	1	1	48	0	0	0	418	-423	0	145	19.13	18.82	18.93	18.70	24.36	2.15	2.14	0.21	0.01	418	-423	97.9	-0.2	16	-3.01	0.69
2.0	-14	-5	-27	46	0	-1	0	429	-424	0.8	241	19.35	19.09	19.36	19.13	24.19	2.19	2.20	0.00	-0.01	429	-424	97.9	0.2	9	3.00	0.39
2.5	-14	5	-31	41	0	-1	0	429	-429	0.5	229	19.60	19.24	19.58	19.28	24.09	2.21	2.22	0.03	-0.01	429	-430	97.3	-0.2	6	-3.00	-0.32
3.0	-15	0	0	38	0	0	0	427	-429	0.4	197	19.70	19.41	19.62	19.39	23.98	2.23	2.24	0.09	0.00	427	-430	97.9	0.2	8	3.00	-3.45
3.5	-12	10	-31	38	0	-1	0	434	-430	1.2	196	19.88	19.53	19.81	19.54	23.84	2.25	2.25	0.07	-0.01	434	-431	97.6	0.0	18	0.00	-2.28
4.0	-17	8	-14	37	0	-1	0	428	-430	1.0	134	20.29	19.57	20.10	19.57	23.76	2.23	2.24	0.21	-0.01	427	-431	95.3	0.2	7	3.00	-1.19
4.5	-18	2	-2	37	0	-1	0	431	-428	0.9	233	20.79	19.60	20.51	19.58	23.63	2.20	2.22	0.29	-0.01	431	-429	91.9	-0.2	8	-3.00	-3.28
5.0	-22	11	-19	34	0	-1	0	427	-432	1.0	160	21.23	19.64	20.84	19.72	23.56	2.18	2.22	0.40	-0.04	427	-433	90.3	0.2	3	3.00	-0.67
5.5	-26	6	-4	34	0	-1	0	425	-429	1.6	140	21.36	19.72	20.92	19.67	23.47	2.19	2.21	0.46	-0.02	424	-429	89.3	-0.2	7	-3.00	-1.72
6.0	-27	10	-7	34	0	-1	0	432	-434	2.7	170	22.20	20.81	21.94	20.79	23.40	2.37	2.38	0.26	-0.01	432	-435	90.3	0.2	3	3.00	-1.60
6.5	-17	5	-1	29	19	-4	18	400	-412	1.7	94	21.90	20.92	21.59	20.86	23.33	2.41	2.42	0.32	-0.01	419	-416	93.7	0.2	2	3.00	-0.21
7.0	-17	5	-1	29	19	-4	18	400	-412	1.7	94	21.90	20.92	21.59	20.86	23.33	2.41	2.42	0.32	-0.01	419	-416	93.7	0.2	2	3.00	-0.21
7.5	13	12	-33	25	65	-13	59	396	-409	1.6	105	22.42	21.28	22.26	21.33	23.36	2.45	2.48	0.17	-0.02	461	-422	92.2	0.0	-4	0.00	-0.61
8.0	68	-9	-63	16	103	-19	91	401	-420	1.5	114	22.32	21.49	22.40	21.66	23.51	2.51	2.54	-0.07	-0.03	503	-439	93.8	-0.2	-12	-3.00	0.14
8.5	125	-8	-110	8	148	-28	127	406	-425	3.3	186	22.38	21.28	22.44	21.47	23.72	2.46	2.50	-0.04	-0.04	554	-452	92.0	0.2	-15	2.99	0.08
9.0	90	4	-90	5	122	-24	107	410	-441	4.4	215	22.42	20.93	22.40	21.11	23.88	2.38	2.42	0.03	-0.04	532	-466	89.2	-0.2	-8	-3.00	-0.05
9.5	54	13	-72	7	107	-22	95	403	-435	3.1	218	13.91	11.90	13.83	12.08	23.93	1.30	1.34	0.10	-0.03	515	-457	81.6	1.0	-2	14.48	-0.19
10.0	254	-51	-196	6	413	-84	218	375	-386	4.0	227	22.31	20.09	22.60	20.50	24.02	2.22	2.29	-0.28	-0.07	788	-470	82.9	0.2	-13	2.97	0.23
10.5	407	-157	-201	-20	564	-121	283	388	-441	4.8	257	25.92	21.94	26.62	22.40	24.60	2.37	2.43	-0.68	-0.06	951	-562	69.7	-0.2	-29	-3.01	0.78
11.0	228	-79	-123	-22	288	-60	238	397	-488	3.9	243	25.90	21.68	26.31	21.99	24.79	2.31	2.36	-0.41	-0.04	685	-548	68.8	0.2	-3	3.00	0.62
11.5	366	-160	-171	-17	594	-125	326	408	-387	3.5	238	26.97	21.92	27.80	22.42	24.90	2.30	2.35	-0.83	-0.06	1002	-513	63.1	-0.2	-18	-3.01	0.91
12.0	576	-268	-192	-53	865	-185	158	413	-426	3.1	213	28.90	22.58	30.46	23.33	25.70	2.32	2.39	-1.55	-0.07	1278	-611	55.0	0.2	-63	3.00	1.39
12.5	425	-166	-127	-84	569	-121	379	427	-553	2.4	209	29.65	22.53	31.03	23.23	26.60	2.26	2.33	-1.38	-0.07	996	-673	51.8	-0.2	-49	-3.01	1.24
13.0	425	-181	-152	-71	662	-140	425	424	-457	3.0	216	30.17	22.87	31.47	23.54	26.94	2.30	2.38	-1.28	-0.07	1086	-598	51.5	0.2	-21	3.00	1.17
13.5	590	-254	-225	-79	867	-186	314	412	-462	4.7	239	31.34	23.16	32.75	23.90	27.41	2.29	2.38	-1.40	-0.08	1278	-648	47.9	-0.2	-32	-3.01	1.12
14.0	628	-276	-254	-80	884	-190	167	402	-487	6.0	229	31.03	22.99	32.34	23.69	27.74	2.27	2.35	-1.30	-0.08	1286	-677	48.6	0.2	-17	3.00	1.09
14.5	587	-278	-209	-79	835	-180	180	402	-496	5.1	235	31.14	23.69	32.51	24.34	28.04	2.43	2.50	-1.36	-0.07	1237	-675	51.1	-0.2	-21	-3.01	1.33
15.0	588	-292	-193	-81	845	-124	161	406	-488	4.7	248	31.32	23.96	32.77	24.61	28.37	2.49	2.55	-1.44	-0.06	1251	-672	51.4	0.2	-21	3.00	1.52
15.5	544	-262	-176	-83	788	-172	155	409	-501	4.1	235	31.64	24.19	33.17	24.87	28.70	2.52	2.59	-1.52	-0.07	1198	-674	51.0	-0.2	-23	-3.01	1.49
16.0	515	-253	-153	-86	761	-165	158	407	-506	3.9	239	32.00	24.45	33.55	25.11	29.04	2.56	2.63	-1.54	-0.06	1168	-673	50.6	0.2	-22	3.00	1.65
16.5	446	-222	-141	-80	677	-147	114	401	-512	4.4	247	31.87	24.04	33.12	24.58	29.19	2.47	2.52	-1.24	-0.05	1078	-659	49.8	-0.2	-3	-3.01	1.57
17.0	384	-195	-130	-64	602	-131	108	405	-502	4.1	246	31.76	24.11	32.89	24.61	29.12	2.49	2.54	-1.12	-0.05	1006	-633	50.9	0.2	5	3.00	1.50
17.5	306	-150	-110	-54	495	-103	120	412	-501	3.7	247	31.79	24.29	32.78	24.74	29.01	2.54	2.58	-0.98	-0.05	908	-609	52.0	0.0	8	0.00	1.36
18.0	259	-129	-87	-48	425	-92	129	414	-506	3.2	257	31.72	24.49	32.58	24.88	28.93	2.59	2.63	-0.86	-0.04	839	-598	53.6	-0.2	5	-3.01	1.48
18.5	172	-79	-69	-39	307	-64	87	418	-503	2.3	259	31.42	24.48	32.04	24.79	28.74	2.61	2.64	-0.61	-0.04	724	-566	55.5	0.2	15	3.01	1.15
19.0	107	-44	-56	-28	186	-36	60	423	-522	2.1	224	31.28	24.74	31.75	25.03	28.46	2.68	2.73	-0.46	-0.04	608	-559	58.2	-0.2	21	-3.01	0.75
19.5	2	1	-19	-15	49	-9	45	422	-499	1.7	180	29.25	24.54	29.22	24.66	28.03	2.77	2.80	0.04	-0.03	471	-508	69.0	0.2	30	3.00	-0.09
20.0	-8	4	-17	-5	25	-6	25	427	-470	1.7	165	28.32	24.41	28.21	24.50	27.62	2.80	2.83	0.12	-0.03	452	-476	73.9	-0.2	25	-3.01	-0.25
20.5	-21	7	-13	3	3	-2	6	429	-457	1.6	181	27.62	23.95	27.38	24.01	27.25	2.73	2.76	0.25	-0.03	432	-459	75.8	0.2	24	3.01	-0.52
21.0	-21	12	-22	9	1	-2	3	430	-449	2.5	184	27.14	23.66	26.92	23.71	26.91	2.69	2.72	0.23	-0.03	431	-451	76.7	-0.2	21	-3.01	-0.55
21.5	-20	15	-26	14	1	-1	3	431	-449	3.3	189	26.96	23.45	26.77	23.49	26.59	2.65	2.68	0.21	-0.02	431	-450	76.1	0.2	21	3.00	-0.60
22.0	-19	17	-29	18	1	-2	3	429	-447	3.7	193	26.65	23.30	26.46	23.34	26.31	2.64	2.66	0.20	-0.02	430	-449	77.0	-0.2	18	-3.01	-0.61
22.5	-19	23	-39	22	1	-1	3	426	-446	5.1	192	26.16	22.89	26.00	22.93	26.00	2.57	2.59	0.17	-0.02	427	-447	77.1	0.3	32	5.01	-0.60
23.0	-17	25	-47	25	1	-1	2	427	-444	4.4	209	25.27	22.37	25.14	22.40	25.79	2.51	2.53	0.14	-0.02	427	-446	79.1	0.2	14	2.99	-0.53
23.5	-15	21	-45	25	1	-1	2	427	-443	3.7	227	24.81	22.20	24.68	22.25	25.63	2.50	2.52	0.14	-0.02	428	-445	81.2	0.3	14	5.00	-0.48
24.0	-14	25	-46	25	0	-1	2	434	-449	4.2	226	24.01	21.71	23.82	21.76	25.52	2.44	2.47	0.20	-0.02	435	-451	83.7	1.0	10	14.96	-0.54

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	14.5	-6.2	-6.9	-0.7	23.0	-4.9	8.2	35.8	-39.2												58.9	-44.2		0.0	0.0	0.06	
DSUM	14.5	-6.2	-6.0	-1.8	21.9	-4.7	7.8	18.9	-21.8												40.8	-26.5		0.0	-0.5	0.03	
NSUM	0.0	0.0	-0.9	1.1	1.1	-0.3	0.5	16.9	-17.4												18.0	-17.7		0.0	0.5	0.04	
TAVE										2.8	205	25.58	21.83	25.91	22.07	25.83	2.39	2.43	-0.33	-0.03			74.9				0.2
DAVE										3.5	225	28.37	22.77	29.13	23.21	26.94	2.4260	2.48	-0.76	-0.05			62.6				0.8
NAVE										1.2	113	14.16	13.26	14.04	13.26	15.62	1.5086	1.52	0.13	-0.01			57.9				-0.4

SYSTEM 9, JULY 14, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-15	23	-31	25	1	-2	3	435	-446	4	227	10.32	8.45	10.06	8.50	25.40	0.98	1.01	0.27	-0.02	436	-448	81.7	1.0	-815	14.25	-0.76
1.0	-16	26	-32	25	1	-2	4	424	-435	5	215	11.03	9.35	10.78	9.38	25.23	1.06	1.09	0.26	-0.02	424	-437	83.9	1.0	10	14.30	-0.81
1.5	-16	18	-22	24	2	-2	4	424	-434	4	202	11.26	9.60	11.03	9.63	25.10	1.09	1.11	0.25	-0.02	425	-436	84.1	1.0	7	14.30	-0.84
2.0	-18	14	-16	22	1	-2	4	420	-436	3.6	188	11.14	9.70	10.95	9.71	25.01	1.11	1.12	0.20	-0.01	421	-438	85.9	1.0	6	14.31	-0.90
2.5	-18	20	-22	21	1	-2	4	423	-434	4.0	222	11.30	9.57	11.07	9.59	24.93	1.08	1.10	0.24	-0.02	424	-436	83.2	1.0	6	14.30	-0.88
3.0	-21	35	-38	21	2	-2	3	422	-437	5.2	225	11.75	9.09	11.46	9.11	24.83	0.98	1.00	0.31	-0.02	424	-439	74.2	1.0	7	14.29	-0.91
3.5	-26	42	-45	23	1	-2	3	419	-441	6.1	215	11.83	8.79	11.54	8.80	24.70	0.93	0.95	0.31	-0.02	420	-443	70.1	1.0	9	14.28	-0.94
4.0	-24	33	-36	25	1	-2	3	421	-442	5.4	223	11.67	8.59	11.40	8.60	24.57	0.91	0.93	0.28	-0.02	422	-444	69.3	1.0	8	14.28	-0.93
4.5	-24	35	-38	25	1	-2	3	420	-442	5.6	220	11.68	8.31	11.41	8.33	24.46	0.88	0.90	0.28	-0.02	421	-444	66.4	1.0	7	14.28	-0.91
5.0	-31	31	-30	26	1	-2	3	413	-441	4.7	230	11.68	8.02	11.38	8.02	24.33	0.83	0.85	0.31	-0.02	414	-443	63.5	1.0	9	14.28	-1.03
5.5	-28	32	-33	27	1	-2	3	418	-441	5.0	224	11.69	7.76	11.40	7.77	24.20	0.80	0.82	0.30	-0.02	419	-442	60.8	1.0	8	14.27	-0.99
6.0	-21	30	-31	28	1	-2	3	422	-443	4.8	220	11.63	7.57	11.34	7.58	24.08	0.78	0.80	0.30	-0.02	423	-445	59.3	1.0	7	14.27	-0.95
6.5	-11	20	-22	25	18	-5	17	420	-439	4.0	223	5.25	1.70	5.02	1.72	23.93	0.47	0.49	0.24	-0.02	438	-445	54.5	1.0	4	13.92	-0.87
7.0	-11	20	-22	25	18	-5	17	420	-439	4.0	223	5.25	1.70	5.02	1.72	23.93	0.47	0.49	0.24	-0.02	438	-445	54.5	1.0	4	13.92	-0.87
7.5	13	26	-47	24	73	-17	55	408	-423	3.7	230	3.21	-0.30	3.07	-0.25	23.88	0.37	0.39	0.15	-0.01	481	-441	50.5	1.0	2	13.84	-0.66
8.0	80	-50	0	17	174	-41	106	408	-420	3.1	212	-2.65	-4.82	-2.53	-4.79	23.95	0.29	0.28	-0.11	0.00	582	-461	59.1	1.0	-8	13.12	-1.10
8.5																											
9.0																											
9.5	216	-113	-60	-3	415	-94	208	412	-424	4.3	249	25.04	19.58	25.55	19.81	24.49	2.02	2.04	-0.49	-0.02	826	-518	59.6	-0.2	-41	-3.01	0.85
10.0	282	-154	-81	-19	468	-104	191	399	-453	3.8	239	28.74	22.72	29.46	23.03	24.90	2.36	2.39	-0.71	-0.02	867	-557	58.0	0.2	-28	2.99	1.90
10.5	336	-170	-87	-43	507	-111	310	413	-500	3.3	248	30.01	23.48	30.93	23.87	25.68	2.46	2.49	-0.91	-0.03	920	-612	55.7	-0.2	-36	-3.01	1.88
11.0	311	-152	-95	-44	512	-112	302	410	-461	3.4	247	30.17	23.52	30.96	23.88	26.01	2.46	2.49	-0.78	-0.03	922	-573	55.6	0.2	-21	3.00	1.61
11.5	330	-162	-100	-47	560	-123	345	422	-444	3.3	250	30.61	23.87	31.45	24.24	26.34	2.51	2.55	-0.83	-0.03	982	-567	55.3	-0.2	-21	-3.01	1.61
12.0	636	-365	-149	-66	921	-205	361	435	-440	3.9	246	32.34	24.37	33.84	24.92	27.04	2.52	2.56	-1.49	-0.04	1356	-645	48.6	0.2	-56	2.99	2.47
12.5	528	-280	-126	-86	790	-174	178	409	-497	4.6	234	32.58	24.77	33.87	25.26	27.70	2.60	2.64	-1.28	-0.04	1199	-671	50.1	-0.2	-37	-3.02	2.22
13.0	614	-329	-167	-87	904	-200	127	421	-466	5.8	230	32.94	24.85	34.23	25.35	28.19	2.60	2.64	-1.27	-0.04	1325	-666	49.1	0.2	-31	2.99	1.97
13.5	633	-346	-157	-95	910	-202	134	425	-488	5.6	230	33.73	25.35	35.12	25.87	28.72	2.68	2.72	-1.39	-0.04	1335	-690	48.0	-0.2	-34	-3.01	2.21
14.0	620	-332	-163	-98	884	-196	128	427	-500	5.8	229	34.11	25.52	35.44	26.02	29.17	2.69	2.74	-1.33	-0.04	1311	-696	47.5	0.2	-27	3.00	2.04
14.5	604	-335	-149	-97	872	-193	121	425	-500	5.9	230	34.20	25.65	35.59	26.15	29.53	2.72	2.76	-1.38	-0.04	1297	-693	47.6	-0.2	-23	-3.01	2.26
15.0	580	-321	-147	-95	838	-187	117	424	-506	5.8	232	34.33	25.56	35.65	26.06	29.82	2.69	2.73	-1.32	-0.04	1262	-693	46.9	0.2	-16	3.00	2.18
15.5	543	-303	-144	-88	793	-177	114	424	-511	6.0	231	34.31	25.13	35.55	25.60	29.99	2.58	2.62	-1.23	-0.04	1217	-688	45.2	-0.2	-7	-3.00	2.10
16.0	497	-273	-139	-80	741	-166	104	424	-512	6.1	226	34.62	25.06	35.80	25.52	30.07	2.54	2.58	-1.17	-0.04	1165	-677	43.9	0.2	-5	3.01	1.97
16.5	439	-243	-134	-68	677	-151	99	417	-514	6.2	231	34.36	24.27	35.39	24.70	30.01	2.36	2.40	-1.02	-0.04	1094	-664	41.8	-0.2	6	-3.00	1.81
17.0	375	-199	-125	-57	600	-133	93	420	-513	5.2	227	34.46	23.91	35.42	24.33	29.90	2.27	2.31	-0.95	-0.04	1021	-646	40.1	0.2	7	3.00	1.59
17.5	307	-157	-114	-48	512	-114	84	417	-516	5.6	226	34.33	23.64	35.18	24.04	29.75	2.21	2.25	-0.83	-0.04	929	-629	39.6	0.0	12	0.00	1.39
18.0	239	-123	-100	-34	415	-92	75	418	-510	4.5	229	33.99	23.62	34.68	23.97	29.46	2.23	2.27	-0.68	-0.04	834	-602	41.0	-0.2	18	-3.01	1.23
18.5	178	-83	-84	-28	323	-70	65	419	-512	4.1	214	33.80	24.05	34.43	24.39	29.20	2.34	2.39	-0.62	-0.04	742	-582	43.8	0.2	17	3.01	0.99
19.0	114	-54	-29	-17	222	-47	54	420	-513	3.2	213	33.34	24.38	33.65	24.54	28.81	2.46	2.47	-0.30	-0.02	642	-560	47.4	-0.3	43	-5.01	1.40
19.5	44	-20	-31	-7	136	-29	44	421	-508	3.1	197	32.26	24.63	32.39	24.72	28.44	2.59	2.61	-0.12	-0.02	557	-537	53.6	0.2	25	3.01	0.53
20.0	-11	8	-27	3	59	-14	31	415	-493	3.5	199	30.81	23.80	30.73	23.86	27.99	2.48	2.50	0.09	-0.02	474	-507	56.6	-0.2	32	-3.01	-0.34
20.5	-33	15	-22	14	10	-3	12	414	-475	3.3	192	29.15	23.01	28.94	23.04	27.49	2.40	2.42	0.22	-0.02	424	-477	60.8	0.2	33	3.01	-0.72
21.0	-40	16	-19	23	0	-1	3	430	-477	3.5	188	27.65	22.60	27.40	22.64	27.02	2.41	2.43	0.26	-0.02	430	-478	66.6	-0.2	29	-3.01	-0.91
21.5	-40	15	-25	28	0	-1	2	434	-473	3.9	189	27.29	22.24	27.03	22.31	26.61	2.35	2.38	0.26	-0.03	434	-474	66.6	0.2	25	3.01	-0.62
22.0	-42	25	-32	32	0	-1	2	431	-469	4.5	190	27.11	22.17	26.86	22.19	26.25	2.34	2.36	0.26	-0.02	431	-470	66.9	-0.2	22	-3.01	-0.80
22.5	-42	20	-21	34	0	-1	2	428	-470	3.9	208	26.63	21.95	26.39	21.95	25.94	2.32	2.34	0.25	-0.02	429	-470	68.1	0.2	19	3.00	-0.99
23.0	-41	20	-23	36	0	-1	2	427	-465	3.9	207	26.31	21.28	26.06	21.29	25.64	2.19	2.21	0.26	-0.02	428	-467	65.6	-0.2	19	-3.01	-0.91
23.5	-40	18	-18	38	0	-1	2	427	-462	3.4	210	26.23	20.70	25.94	20.70	25.41	2.07	2.09	0.30	-0.02	427	-463	62.5	0.3	18	5.01	-1.04
24.0	-40	19	-22	39	0	-1	2	426	-463	3.3	205	26.12	20.42	25.78	20.44	25.24	2.02	2.05	0.35	-0.03	426	-464	61.7	-0.3	18	-5.01	-0.86

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	15.3	-7.7	-5.9	-1.2	25.8	-5.8	6.8	36.3	-40.4												62.1	-46.2		0.0	-3.1	0.43	
DSUM	16.8	-8.9	-4.9	-2.3	26.2	-5.8	6.8	19.4	-22.4												45.6	-28.2		0.0	-0.5	0.05	
NSUM	-1.5	1.2	-1.0	1.1	-0.4	0.0	0.0	16.9	-18.0												16.5	-17.9		0.0	-2.6	0.38	
TAVE										4.5	221	23.58	17.69	23.90	17.89	26.60	1.86	1.89	-0.32	-0.03			58.6				0.3
DAVE										4.6	228	32.20	24.06	33.05	24.42	28.13	2.4648	2.50	-0.84	-0.03			49.9				1.5
NAVE										2.9	143	9.56	7.22	9.40	7.24	16.75	0.8104	0.82	0.17	-0.01			45.6				-0.6

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SYSTEM 9, JULY 15, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-39	15	-17	38	0	-1	2	425	-464	3	223	25.83	20.21	25.50	20.22	25.04	1.99	2.02	0.34	-0.03	425	-465	61.9	0.2	-727	3.00	-0.92
1.0	-38	10	-14	38	0	-1	1	423	-462	3	217	25.14	20.09	24.86	20.12	24.84	2.02	2.04	0.29	-0.02	423	-463	65.0	-0.3	14	-5.01	-0.78
1.5	-37	11	-13	38	0	0	1	420	-456	3	223	24.59	20.01	24.28	20.03	24.59	2.03	2.06	0.33	-0.03	420	-456	68.0	0.2	17	3.00	-0.86
2.0	-37	14	-18	38	0	-1	1	420	-452	3.1	228	24.64	19.99	24.37	20.01	24.41	2.03	2.05	0.28	-0.02	420	-453	67.3	-0.2	11	-3.01	-0.86
2.5	-37	10	-11	38	0	-1	1	421	-453	2.6	223	24.34	19.82	24.08	19.84	24.23	2.01	2.03	0.27	-0.02	421	-454	67.8	0.2	10	3.01	-0.87
3.0	-37	19	-26	39	0	-1	1	426	-451	4.0	226	25.14	19.59	24.89	19.64	24.06	1.91	1.94	0.26	-0.02	426	-452	61.7	-0.2	10	-3.01	-0.72
3.5	-38	27	-25	41	0	-1	1	426	-459	4.3	234	25.47	19.44	25.17	19.43	23.88	1.86	1.88	0.31	-0.02	426	-460	58.7	0.2	11	3.00	-1.22
4.0	-38	22	-18	42	0	0	1	422	-462	3.8	241	25.20	19.28	24.90	19.27	23.70	1.84	1.86	0.31	-0.02	422	-462	59.1	-0.2	11	-3.01	-1.24
4.5	-37	15	-16	41	0	0	1	419	-459	3.1	243	24.76	19.15	24.50	19.16	23.53	1.85	1.87	0.27	-0.02	419	-459	60.7	0.2	9	3.00	-0.97
5.0	-37	12	-9	41	0	0	1	417	-456	2.8	241	24.16	19.07	23.91	19.06	23.38	1.87	1.88	0.26	-0.01	417	-457	63.5	-0.2	9	-3.01	-1.27
5.5	-37	11	-12	40	0	-1	1	416	-451	2.7	245	23.93	18.94	23.66	18.95	23.25	1.86	1.88	0.28	-0.02	416	-451	64.2	0.2	8	3.00	-0.95
6.0	-37	14	-15	40	0	-1	1	410	-445	3.1	249	23.75	18.93	23.49	18.94	23.11	1.87	1.89	0.26	-0.02	411	-446	65.2	-0.2	8	-3.01	-1.01
6.5	-19	16	-23	38	45	-12	30	386	-408	2.8	240	23.55	19.17	23.34	19.19	22.92	1.93	1.95	0.22	-0.02	430	-419	67.9	-0.2	3	-3.01	-0.84
7.0	-19	16	-23	38	45	-12	30	386	-408	2.8	240	23.55	19.17	23.34	19.19	22.92	1.93	1.95	0.22	-0.02	430	-419	67.9	-0.2	3	-3.01	-0.84
7.5	16	10	-54	32	124	-30	57	386	-397	2.7	247	24.61	19.77	24.57	19.83	22.95	1.98	2.00	0.05	-0.01	509	-427	64.8	0.0	-4	-0.01	-0.02
8.0	80	-56	-35	23	220	-52	78	382	-403	3.7	245	26.17	20.50	26.32	20.59	23.12	2.04	2.04	-0.15	-0.01	602	-455	59.7	0.2	-12	3.00	-0.55
8.5	146	-93	-55	14	312	-73	94	382	-410	4.2	246	27.12	20.90	27.44	21.05	23.34	2.06	2.07	-0.31	-0.01	693	-483	56.6	-0.2	-13	-3.01	1.79
9.0	211	-148	-44	3	408	-95	107	383	-415	4.1	249	28.14	21.34	28.63	21.53	23.64	2.09	2.10	-0.49	-0.01	791	-510	53.5	0.2	-21	3.00	3.40
9.5	273	-192	-43	-11	495	-116	115	386	-422	4.3	254	28.96	21.54	29.61	21.78	24.09	2.08	2.09	-0.64	-0.01	882	-538	50.3	-0.2	-27	-3.01	7.78
10.0	337	-227	-54	-25	583	-135	123	388	-429	4.0	256	29.65	21.74	30.45	22.03	24.59	2.08	2.09	-0.78	-0.01	971	-564	48.0	0.2	-31	3.00	4.44
10.5	424	-293	-58	-43	697	-160	125	387	-433	5.3	254	30.56	21.83	31.50	22.21	25.31	2.05	2.06	-0.94	-0.01	1084	-599	44.6	-0.2	-29	-3.01	6.93
11.0	478	-325	-71	-52	763	-175	128	393	-445	5.3	257	31.28	21.81	32.29	22.17	25.81	1.98	2.00	-1.00	-0.01	1156	-620	41.3	0.2	-29	3.00	4.80
11.5	524	-400	-34	-61	821	-183	128	395	-450	5.6	254	31.70	21.76	32.77	22.10	26.30	1.95	1.95	-1.07	-0.01	1216	-638	39.3	-0.2	-29	-2.97	5.12
12.0	562	-395	-68	-70	866	-198	129	397	-453	5.7	258	31.11	20.66	32.24	21.07	26.79	1.75	1.77	-1.12	-0.01	1263	-652	36.4	0.2	-29	3.07	-1.63
12.5	591	-390	-95	-77	901	-205	127	397	-461	5.9	252	33.02	22.19	34.23	22.63	27.29	1.96	1.98	-1.21	-0.02	1299	-666	36.7	-0.2	-29	-3.01	4.46
13.0	608	-405	-94	-82	919	-209	127	400	-467	6.6	254	33.46	22.43	34.63	22.85	27.78	1.98	2.00	-1.16	-0.02	1319	-676	36.3	0.2	-28	3.00	5.59
13.5	619	-461	-53	-82	927	-211	124	401	-471	6.8	255	33.75	22.41	34.91	22.79	28.18	1.96	1.97	-1.16	-0.01	1328	-682	35.2	-0.2	-22	-3.01	36.70
14.0	618	-467	-56	-79	919	-210	124	403	-477	6.9	253	33.90	22.45	35.03	22.81	28.50	1.96	1.97	-1.12	-0.01	1322	-686	34.9	0.2	-17	3.00	11.40
14.5	604	-487	138	-77	900	-205	126	406	-479	7.0	235	34.49	23.08	35.67	23.27	28.79	2.06	2.03	-1.17	0.03	1305	-684	34.8	0.0	-22	0.00	13.06
15.0	579	-512	25	-77	869	-199	130	406	-483	7.3	239	34.95	22.99	36.07	23.30	29.06	2.01	2.01	-1.11	0.00	1275	-687	33.7	0.2	-14	3.00	1.05
15.5	533	-503	53	-74	805	-185	147	404	-497	7.1	239	35.05	22.81	36.14	23.09	29.25	1.96	1.96	-1.08	0.01	1209	-683	32.7	-0.2	-9	-3.01	1.92
16.0	422	-448	83	-61	669	-153	153	407	-504	7.2	236	34.82	22.61	35.67	22.82	29.24	1.93	1.93	-0.84	0.01	1075	-657	33.0	0.2	5	3.00	-14.82
16.5	444	-453	63	-53	700	-161	144	410	-488	7.6	238	35.25	22.76	36.16	22.99	29.23	1.94	1.93	-0.90	0.01	1110	-649	32.2	-0.2	-2	-3.01	-1.62
17.0	375	-389	55	-45	612	-141	128	406	-501	7.2	236	35.19	22.59	35.98	22.79	29.17	1.90	1.90	-0.79	0.01	1018	-642	32.0	0.2	5	3.01	13.86
17.5	304	-279	8	-40	514	-119	113	406	-503	6.3	232	35.00	22.68	35.70	22.88	29.07	1.94	1.94	-0.69	0.00	921	-622	33.1	0.0	7	0.00	-5.17
18.0	231	-190	-23	-31	411	-94	101	407	-502	5.1	226	34.47	22.63	35.04	22.82	28.66	1.96	1.97	-0.55	-0.01	818	-596	34.9	-0.2	13	-3.01	-2.22
18.5	165	-138	-25	-22	319	-72	87	407	-502	5.3	226	33.88	22.40	34.26	22.54	28.57	1.95	1.95	-0.37	-0.01	726	-574	36.2	0.2	20	3.01	-4.19
19.0	103	-62	-58	-8	225	-50	72	411	-503	3.6	218	33.09	22.87	33.28	22.97	28.14	2.11	2.12	-0.18	-0.01	636	-553	41.6	-0.2	26	-3.01	1.16
19.5	36	-11	-15	-4	134	-30	55	411	-497	3.4	209	31.73	23.95	31.80	23.98	27.75	2.46	2.46	-0.07	0.00	545	-527	52.4	0.2	22	3.01	0.13
20.0	-19	10	-19	4	46	-10	30	409	-488	3.4	211	30.10	23.20	30.00	23.23	27.34	2.38	2.40	0.11	-0.01	455	-499	56.5	-0.2	26	-3.01	-0.52
20.5	-37	8	-6	14	10	-3	11	406	-466	2.9	204	28.48	22.75	28.24	22.80	26.88	2.39	2.41	0.26	-0.03	416	-469	63.1	0.2	26	3.01	-0.32
21.0	-44	11	-10	20	0	-1	2	422	-471	2.8	206	27.05	22.58	26.73	22.54	26.46	2.44	2.45	0.33	-0.01	422	-472	69.9	-0.2	23	-3.01	0.19
21.5	-44	22	-22	24	0	-1	2	429	-467	3.9	207	26.91	22.44	26.65	22.44	26.12	2.42	2.44	0.27	-0.02	429	-468	69.8	0.2	19	3.01	-1.05
22.0	-44	15	-13	27	0	-1	2	427	-465	4.0	214	26.85	22.18	26.58	22.17	25.82	2.36	2.38	0.27	-0.01	426	-466	68.4	-0.2	17	-3.01	-1.25
22.5	-44	31	-27	29	0	-1	2	429	-465	4.8	218	27.07	21.91	26.77	21.91	25.56	2.29	2.31	0.30	-0.02	429	-466	65.5	0.2	15	3.00	-1.22
23.0	-44	15	-18	31	0	-1	1	430	-463	5.0	221	27.07	21.79	26.83	21.79	25.39	2.26	2.27	0.25	-0.02	430	-469	64.4	0.0	14	-0.01	-1.11
23.5																											
24.0																											

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.3	-13.3	-1.7	-0.6	29.1	-6.7	5.7	35.1	-39.8												64.2	-46.5		0.0	-2.8	0.01	
DSUM	16.5	-13.0	-1.0	-1.8	27.0	-6.2	5.1	18.5	-21.6												45.5	-27.8		0.0	-0.5	0.01	
NSUM	-0.2	-0.4	-0.7	1.1	2.1	-0.5	0.5	16.6	-18.2												18.7	-18.7		0.0	-2.4	0.00	
TAVE										4.5	236	29.15	21.35	29.45	21.49	25.91	2.03	2.04	-0.30	-0.01			51.7				1.6
DAVE										5.4	239	32.17	22.32	32.89	22.56	27.24	2.0451	2.05	-0.71	-0.01			42.0				3.5
NAVE										2.1	142	15.28	12.21	15.14	12.22	14.69	1.2276	1.24	0.15	-0.01			39.5				-0.6

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 9, JULY 16, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-45	18	-13	32	0	-1	2	428	-468	5	205	27.03	21.32	26.78	21.30	24.87	2.16	2.17	0.26	-0.01	428	-469	61.7	0.2	-680	3.00	-1.44
1.0	-47	9	-5	33	0	-1	2	426	-469	6	206	26.98	21.13	26.71	21.09	24.68	2.12	2.13	0.29	-0.01	425	-469	60.8	-0.2	10	-3.01	-1.78
1.5	-50	16	-11	34	0	-1	2	419	-455	6	207	26.71	20.82	26.45	20.79	24.49	2.07	2.08	0.27	-0.01	419	-466	60.3	0.2	11	3.00	-1.95
2.0	-51	16	-10	35	0	-1	2	415	-463	5.3	212	26.33	20.52	26.05	20.48	24.30	2.03	2.04	0.29	-0.01	415	-464	60.5	-0.2	11	-3.01	-2.05
2.5	-50	7	-4	36	0	-1	2	414	-462	4.9	205	25.81	20.26	25.53	20.22	24.11	2.01	2.02	0.29	-0.01	414	-462	61.8	0.2	10	3.00	-1.88
3.0	-48	17	-11	37	0	-1	1	414	-458	5.0	210	25.35	19.97	25.10	19.95	23.93	1.98	1.99	0.26	-0.01	414	-459	62.4	-0.2	10	-3.01	-1.79
3.5	-46	16	-11	37	0	-1	1	415	-456	4.6	208	25.05	19.84	24.77	19.82	23.76	1.97	1.98	0.29	-0.01	415	-456	63.5	0.2	9	3.00	-1.52
4.0	-44	11	-7	37	0	-1	1	417	-455	4.7	211	25.11	19.86	24.84	19.84	23.62	1.97	1.98	0.27	-0.01	417	-455	63.2	-0.2	8	-3.01	-1.53
4.5	-42	22	-14	36	0	-1	1	417	-456	4.7	208	24.92	19.90	24.68	19.88	23.49	1.99	2.00	0.26	-0.01	418	-457	64.5	0.2	7	3.00	-1.57
5.0	-41	15	-12	35	0	0	1	418	-456	4.5	206	24.62	19.91	24.38	19.90	23.38	2.01	2.03	0.25	-0.01	418	-456	66.4	-0.2	6	-3.01	-1.32
5.5	-39	19	-11	34	0	0	1	416	-455	4.1	210	24.28	19.91	24.02	19.89	23.27	2.04	2.05	0.26	-0.01	416	-455	68.5	0.2	6	3.00	-1.68
6.0	-33	20	-17	33	0	0	1	416	-452	4.1	203	23.86	19.85	23.64	19.84	23.17	2.05	2.06	0.23	-0.01	416	-452	70.7	-0.2	6	-3.01	-1.23
6.5	-24	16	-21	31	47	-13	23	388	-406	4.0	207	23.90	20.06	23.72	20.08	23.02	2.09	2.11	0.19	-0.02	435	-418	71.9	-0.2	2	-3.01	-0.81
7.0	-24	16	-21	31	47	-13	23	388	-406	4.0	207	23.90	20.06	23.72	20.08	23.02	2.09	2.11	0.19	-0.02	435	-418	71.9	-0.2	2	-3.01	-0.81
7.5	14	29	-55	26	129	-31	40	385	-399	4.5	205	24.79	20.59	24.70	20.62	23.05	2.15	2.16	0.10	-0.01	514	-431	69.4	0.0	-3	0.00	2.55
8.0	87	-50	-45	18	229	-55	54	383	-400	5.1	214	26.05	21.16	26.18	21.25	23.20	2.19	2.20	-0.12	-0.01	611	-456	64.7	0.2	-10	3.00	2.04
8.5	153	-137	-8	8	325	-79	64	381	-402	5.9	213	27.36	21.69	27.68	21.80	23.45	2.22	2.22	-0.31	0.00	706	-481	59.9	-0.2	-16	-3.01	-12.18
9.0	215	-211	21	-4	416	-99	73	383	-411	5.8	218	28.26	22.11	28.76	22.24	23.80	2.25	2.25	-0.50	0.00	799	-511	57.0	0.2	-21	3.00	-4.65
9.5	279	-263	26	-17	503	-120	81	387	-417	5.7	215	29.04	22.50	29.68	22.67	24.24	2.29	2.29	-0.64	0.00	890	-537	54.9	-0.2	-26	-3.01	12.28
10.0	343	-340	56	-30	591	-139	87	386	-423	6.0	213	29.80	22.91	30.58	23.09	24.76	2.34	2.33	-0.77	0.01	977	-562	53.1	0.2	-30	3.00	-13.32
10.5	426	-359	20	-53	697	-162	93	396	-437	5.6	219	31.02	23.37	32.00	23.63	25.59	2.36	2.36	-0.97	0.00	1093	-599	49.7	-0.2	-35	-3.01	-0.56
11.0	479	-437	60	-67	760	-176	97	400	-446	6.3	214	31.86	23.70	32.96	23.96	26.23	2.39	2.38	-1.09	0.01	1160	-622	47.4	0.2	-35	3.00	-10.07
11.5	524	-487	76	-79	814	-188	100	406	-452	5.9	213	32.72	23.93	33.89	24.21	26.86	2.39	2.38	-1.16	0.01	1221	-640	44.9	-0.2	-35	-3.01	10.61
12.0	564	-499	55	-88	860	-198	101	410	-461	6.3	217	33.42	23.99	34.63	24.29	27.47	2.36	2.35	-1.20	0.01	1270	-659	42.6	0.2	-33	3.00	-3.63
12.5	594	-482	13	-93	894	-205	103	409	-468	6.7	239	33.90	24.06	35.17	24.39	28.05	2.34	2.34	-1.25	0.00	1302	-673	41.2	-0.2	-31	-3.01	-0.53
13.0	611	-430	-53	-97	913	-209	105	411	-469	6.8	202	34.22	24.41	35.48	24.79	28.60	2.40	2.42	-1.26	-0.01	1324	-678	41.8	0.2	-31	3.00	16.28
13.5	618	-481	-6	-103	918	-211	105	413	-476	6.9	206	34.70	24.62	35.98	24.96	29.13	2.43	2.43	-1.27	0.00	1331	-687	40.9	-0.2	-28	-3.01	2.23
14.0	615	-632	138	-100	912	-210	104	413	-480	6.9	209	34.87	24.33	36.05	24.58	29.56	2.34	2.33	-1.17	0.02	1324	-690	39.0	0.2	-21	3.00	-5.59
14.5	600	-634	154	-100	893	-205	102	412	-488	7.1	196	35.13	24.70	36.35	24.95	29.92	2.42	2.40	-1.21	0.02	1304	-692	39.6	-0.2	-20	-3.01	19.56
15.0	575	-422	-52	-91	861	-199	105	411	-490	8.0	199	35.06	24.10	36.26	24.47	30.17	2.27	2.28	-1.19	-0.01	1272	-688	37.9	0.2	-10	3.00	3.37
15.5	535	-487	38	-81	812	-188	106	415	-491	8.0	204	35.37	24.09	36.47	24.38	30.29	2.25	2.25	-1.10	0.00	1227	-679	36.9	-0.2	-6	-3.01	-0.11
16.0	491	-546	136	-77	751	-174	105	414	-502	7.5	197	35.20	24.34	36.21	24.55	30.37	2.32	2.31	-1.00	0.01	1165	-676	38.4	0.2	-4	3.00	1.25
16.5	437	-345	-21	-70	684	-158	101	412	-501	7.2	191	35.00	24.62	35.95	24.90	30.40	2.41	2.41	-0.94	-0.01	1096	-659	40.7	-0.2	-1	-3.01	-1.21
17.0	381	-455	129	-61	610	-141	95	411	-500	7.0	193	34.79	24.49	35.64	24.67	30.34	2.39	2.37	-0.85	0.01	1021	-641	40.8	0.2	5	3.00	*******
17.5	316	-223	-60	-47	519	-121	88	408	-498	7.4	192	34.41	24.06	35.08	24.29	30.12	2.31	2.32	-0.66	-0.01	927	-619	41.1	0.0	14	0.00	-4.69
18.0	244	-319	94	-35	416	-97	81	413	-499	6.8	184	34.00	24.39	34.54	24.51	29.81	2.41	2.41	-0.54	0.01	829	-596	44.0	-0.2	16	-3.01	0.25
18.5	177	-146	-28	-25	320	-74	73	415	-498	6.5	168	33.43	24.22	33.79	24.36	29.45	2.41	2.42	-0.35	-0.01	736	-572	46.0	0.2	22	3.01	1.71
19.0	112	-73	-27	-12	227	-52	61	417	-497	5.5	182	32.85	24.30	33.06	24.41	28.98	2.47	2.48	-0.20	-0.01	644	-549	49.2	-0.2	27	-3.01	0.09
19.5	41	-69	2	-2	137	-33	46	418	-493	5.4	185	31.93	23.85	31.99	23.93	28.47	2.42	2.44	-0.05	-0.02	555	-526	51.3	0.2	28	3.01	-0.18
20.0	-14	15	-18	8	60	-16	30	414	-484	5.3	182	30.93	23.24	30.81	23.26	27.96	2.34	2.35	0.13	-0.01	473	-499	52.9	-0.2	29	-3.01	-1.25
20.5	-36	13	-17	16	11	-3	12	417	-473	4.5	179	29.64	23.05	29.47	23.11	27.45	2.38	2.40	0.18	-0.02	428	-477	58.5	0.2	27	3.00	-0.72
21.0	-42	19	-26	19	0	-1	3	437	-480	4.9	178	28.83	23.40	28.64	23.41	27.03	2.52	2.53	0.20	-0.02	437	-481	64.5	-0.2	21	-3.01	0.19
21.5	-43	14	-12	21	0	-1	2	440	-481	5.3	175	28.55	23.21	28.36	23.19	26.69	2.49	2.50	0.20	-0.01	440	-482	64.7	0.2	18	3.00	0.43
22.0	-43	20	-28	23	0	-1	2	438	-478	5.2	180	28.10	23.08	27.88	23.09	26.38	2.49	2.51	0.23	-0.02	438	-479	66.8	-0.2	16	-3.01	-2.01
22.5	-44	10	-4	24	0	-1	2	436	-475	5.6	182	27.67	22.69	27.69	22.83	26.13	2.46	2.46	0.20	0.00	436	-476	66.3	0.2	14	3.00	0.91
23.0	-44	17	-10	25	0	-1	2	433	-473	5.8	188	27.55	22.71	27.34	22.67	25.89	2.44	2.44	0.22	-0.01	433	-474	67.2	-0.2	13	-3.01	-1.34
23.5	-44	32	-36	25	0	-1	2	432	-473	5.3	190	27.24	22.50	26.98	22.51	25.71	2.41	2.43	0.27	-0.02	432	-473	68.2	0.3	13	5.01	-0.94
24.0	-44	21	-15	25	0	-1	2	429	-469	5.1	192	27.04	22.40	26.81	22.37	25.59	2.40	2.41	0.24	-0.01	429	-470	68.3	-0.3	11	-5.01	1.12

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.6	-14.9	0.6	-1.2	28.2	-6.6	4.2	35.5	-40.0												63.7	-46.5		0.0	-2.5	-0.01	
DSUM	16.8	-15.1	1.1	-2.3	27.3	-6.3	3.9	18.8	-21.5												46.1	-27.9		0.0	-0.5	0.01	
NSUM	-1.2	0.2	-0.5	1.1	0.9	-0.2	0.2	16.8	-18.4												17.6	-18.7		0.0	-2.1	-0.01	
TAVE										5.7	201	29.59	22.51	29.91	22.61	26.34	2.27	2.27	-0.31	-0.01			55.2				-1.7
DAVE										6.4	201	32.60	23.77	33.36	23.98	27.97	2.3577	2.36	-0.75	0.00			46.6				-2.4
NAVE										3.3	136	17.40	14.07	17.25	14.06	16.36	1.4479	1.46	0.15	-0.01			44.2				-0.6

SYSTEM 8, JULY 12, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-26	31	-34	26	0	0	0	452	-474	5		25.97	22.63	25.66	22.69	24.71	2.53	2.56	0.32	-0.02	452	-474	77.7	-0.2	41	-1.00	-0.93
1.0	-15	28	-37	27	0	0	0	464	-478	5		26.05	22.42	25.60	22.45	24.34	2.47	2.49	0.26	-0.02	464	-478	75.1	-1.0	13	-4.99	-0.76
1.5	-14	32	-43	27	1	-1	0	451	-465	6		26.06	22.35	25.83	22.38	24.28	2.45	2.48	0.25	-0.02	452	-465	74.4	0.0	14	0.00	-0.75
2.0	-13	20	-29	27	3	-1	0	435	-450	4.0		26.03	22.27	25.80	22.30	24.16	2.44	2.46	0.24	-0.02	438	-451	74.1	0.2	11	1.00	-0.70
2.5	-12	10	-14	25	1	0	0	454	-468	2.5		26.04	22.30	25.81	22.33	24.03	2.44	2.47	0.24	-0.02	455	-469	74.2	-0.2	7	-1.00	-0.74
3.0	-11	14	-33	23	4	-2	1	440	-464	3.2		24.91	21.85	24.72	21.92	23.92	2.42	2.44	0.20	-0.03	444	-466	78.5	0.2	10	1.00	-0.50
3.5	-12	22	-50	25	3	-1	0	428	-450	3.0		22.88	21.42	22.71	21.50	23.68	2.45	2.48	0.18	-0.03	431	-451	90.0	-0.2	15	-1.00	-0.43
4.0	-9	29	-56	26	1	-1	0	449	-449	4.3		22.96	21.80	22.78	21.86	23.49	2.53	2.56	0.19	-0.03	450	-450	92.3	0.2	12	1.00	-0.50
4.5	-5	101	-163	34	0	0	0	436	-448	8.1		22.40	19.86	21.94	19.96	22.96	2.15	2.20	0.46	-0.05	437	-448	83.5	-0.2	51	-1.00	-0.64
5.0	-2	73	-138	46	0	0	0	452	-449	5.4		21.31	19.75	21.06	19.82	22.24	2.20	2.23	0.27	-0.03	452	-449	89.4	0.2	39	1.00	-0.54
5.5	-1	42	-65	48	0	-1	0	446	-440	6.2		21.96	20.00	21.68	20.05	21.81	2.21	2.24	0.28	-0.03	447	-441	86.3	-0.2	26	-1.01	-0.66
6.0	-4	42	-85	47	0	0	0	450	-448	4.4		21.91	20.04	21.68	20.12	21.62	2.22	2.25	0.24	-0.03	450	-448	86.9	-0.2	8	-1.02	-0.51
6.5	-5	5	-53	41	3	-3	2	416	-412	3.8		20.49	19.33	20.48	19.40	21.26	2.16	2.18	0.03	-0.02	420	-415	90.6	-1.0	12	-5.08	-0.10
7.0	-5	5	-53	41	3	-3	2	416	-412	3.8		20.49	19.33	20.48	19.40	21.26	2.16	2.18	0.03	-0.02	420	-415	90.6	-1.0	12	-5.08	-0.10
7.5	7	22	-78	39	36	-8	26	400	-408	4.5		20.39	19.07	20.30	19.16	21.10	2.12	2.14	0.10	-0.02	436	-417	90.0	0.0	10	-0.03	-0.28
8.0	36	24	-104	38	90	-17	72	396	-402	4.3		20.63	19.02	20.55	19.13	20.97	2.09	2.12	0.10	-0.03	485	-418	87.7	0.2	6	0.98	-0.23
8.5	157	-8	-165	34	241	-44	215	403	-406	4.6		21.41	19.61	21.45	19.85	21.09	2.16	2.21	-0.04	-0.05	644	-449	86.4	-0.2	-17	-1.03	0.05
9.0	147	-14	-110	21	207	-37	176	415	-450	2.2		22.38	20.43	22.49	20.72	21.66	2.27	2.33	-0.10	-0.05	622	-487	85.4	0.2	-45	0.98	0.12
9.5	113	-12	-76	8	179	-30	141	417	-444	1.4		22.71	21.00	22.86	21.31	22.24	2.37	2.43	-0.14	-0.06	595	-474	87.3	-0.2	-34	-1.02	0.16
10.0	308	-56	-188	-1	454	-78	341	429	-422	1.3		24.11	22.05	24.49	22.54	22.93	2.51	2.60	-0.37	-0.09	883	-499	84.8	0.2	-62	0.98	0.27
10.5	448	-67	-225	-46	619	-108	429	425	-530	2.4		26.81	23.83	27.43	24.56	25.27	2.76	2.89	-0.61	-0.14	1044	-638	79.1	-0.2	-110	-1.01	0.29
11.0	540	-93	-287	-69	705	-123	475	426	-544	2.2		27.64	24.31	28.39	25.11	26.70	2.82	2.97	-0.74	-0.15	1131	-667	76.8	0.2	-92	0.99	0.32
11.5	326	-44	-148	-83	414	-72	294	419	-579	1.9		27.97	24.49	28.43	25.03	27.74	2.84	2.95	-0.45	-0.11	833	-652	76.1	-0.2	-51	-1.00	0.28
12.0	354	-53	-189	-77	465	-81	318	462	-557	2.2		28.85	24.57	29.32	25.14	28.11	2.80	2.92	-0.47	-0.11	927	-638	71.6	0.2	-36	1.00	0.27
12.5	393	-62	-246	-79	557	-97	380	424	-508	1.8		29.09	24.38	29.47	24.87	28.44	2.74	2.84	-0.37	-0.10	981	-605	69.0	0.0	-6	0.00	0.25
13.0	397	-67	-163	-88	542	-96	380	436	-539	2.0		29.34	24.53	29.90	25.06	29.51	2.76	2.86	-0.54	-0.10	978	-684	67.9	0.2	-79	0.99	0.38
13.5	481	-90	-262	-92	660	-117	440	442	-557	2.3		29.37	24.88	30.08	25.62	30.06	2.85	2.99	-0.70	-0.14	1102	-674	70.2	-0.2	-38	-1.00	0.32
14.0	698	-179	-390	-92	955	-175	625	445	-534	3.6		30.16	24.92	31.09	25.69	30.47	2.80	2.94	-0.93	-0.14	1399	-709	65.1	0.2	-37	1.00	0.46
14.5	673	-158	-373	-102	906	-170	583	419	-539	3.6		29.42	25.09	30.37	25.91	31.20	2.90	3.05	-0.94	-0.15	1324	-760	70.3	-0.2	-40	-1.00	0.43
15.0	618	-155	-335	-102	846	-163	559	425	-577	2.9		29.92	24.30	30.92	25.13	31.62	2.66	2.81	-1.00	-0.14	1271	-740	62.8	0.2	-26	1.00	0.46
15.5	578	-131	-327	-98	806	-160	549	423	-568	2.8		30.14	24.07	31.11	24.97	31.95	2.59	2.75	-0.96	-0.16	1229	-728	60.9	-0.2	-21	-1.00	0.40
16.0	525	-131	-288	-93	749	-152	535	425	-569	2.8		30.54	23.67	31.46	24.47	32.23	2.47	2.60	-0.91	-0.14	1175	-721	56.6	0.2	-14	0.99	0.46
16.5	462	-113	-262	-85	677	-139	512	423	-559	2.4		30.50	23.45	31.42	24.29	32.31	2.42	2.56	-0.91	-0.14	1100	-708	55.7	-0.2	-3	-1.00	0.43
17.0	397	-126	-205	-74	602	-126	488	424	-553	3.0		30.42	24.22	31.31	24.85	32.23	2.61	2.71	-0.88	-0.10	1026	-678	59.2	0.2	7	0.99	0.63
17.5	320	-109	-175	-61	508	-108	452	422	-541	3.2		30.13	24.10	30.92	24.65	31.91	2.60	2.69	-0.78	-0.08	930	-649	60.1	0.0	25	0.00	0.62
18.0	244	-79	-163	-43	412	-89	415	420	-525	3.1		29.76	23.33	30.40	23.86	31.33	2.44	2.52	-0.63	-0.09	832	-613	58.1	-0.2	40	-1.00	0.50
18.5	178	-61	-133	-27	318	-68	299	420	-518	2.6		29.42	23.18	29.92	23.63	30.70	2.43	2.50	-0.49	-0.07	739	-586	59.2	0.2	44	0.99	0.45
19.0	111	-37	-108	-15	226	-46	63	419	-517	1.8		28.87	23.22	29.22	23.60	29.99	2.47	2.54	-0.34	-0.07	645	-562	62.6	-0.2	49	-1.00	0.34
19.5	34	-12	-74	-3	141	-28	149	415	-505	1.4		28.15	22.61	28.32	22.93	29.18	2.38	2.44	-0.16	-0.06	556	-533	63.4	0.2	55	1.00	0.16
20.0	-31	1	-26	5	62	-12	184	409	-492	0.6		27.28	22.40	27.20	22.67	28.43	2.38	2.45	0.09	-0.07	470	-503	68.0	-0.2	50	-1.00	-0.07
20.5	-47	11	-27	12	12	0	59	392	-473	0.5		26.49	21.59	25.96	21.81	27.62	2.25	2.34	0.53	-0.08	405	-473	69.7	0.2	55	0.99	-0.46
21.0	-50	13	-23	21	1	0	2	396	-451	0.5		24.54	21.61	23.82	21.73	26.80	2.39	2.46	0.73	-0.07	397	-451	83.5	-0.2	53	-1.00	-0.66
21.5	-46	23	-41	28	0	0	0	413	-449	0.5		23.69	20.98	22.96	21.13	26.07	2.30	2.38	0.74	-0.08	413	-449	85.1	0.2	46	1.00	-0.62
22.0	-48	2	-2	33	0	0	0	405	-440	0.6		22.08	20.93	21.78	20.92	25.47	2.40	2.42	0.31	-0.02	405	-440	92.7	-0.2	39	-1.00	-1.37
22.5	-44	1	0	38	1	-1	2	383	-408	0.3		21.70	20.98	21.23	20.77	24.93	2.44	2.42	0.48	0.01	384	-409	96.0	0.2	35	1.00	2.44
23.0	-37	1	1	42	2	-2	4	384	-436	0.5		20.85	20.33	20.55	20.19	24.41	2.35	2.34	0.31	0.01	386	-408	96.8	-0.2	34	-1.00	1.86
23.5	-33	1	0	44	2	-2	3	385	-424	0.3		20.70	20.06	20.41	19.98	24.03	2.30	2.31	0.30	0.00	388	-405	96.2	0.3	31	1.66	-0.84
24.0	-28	1	1	45	2	-2	3	393	-434	0.3		20.56	20.21	20.21	19.96	23.76	2.35	2.32	0.36	0.03	395	-405	97.8	-0.3	29	-1.67	0.95

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.1	-2.6	-11.2	-0.9	23.2	-4.4	17.2	36.5	-41.9												60	-46		0.0	0.2	-0.02	
DSUM	15.2	-3.2	-9.1	-2.1	22.1	-4.2	16.3	19.6	-24.0												42	-28		0.0	-0.9	0.00	
NSUM	-0.1	0.7	-2.1	1.1	1.1	-0.2	1.0	16.9	-17.9												18	-18		0.0	1.0	-0.02	
TAVE										2.8		25.55	22.15	25.72	22.47	26.22	2.46	2.52	-0.15	-0.07			77.3				0.05
DAVE										2.3		27.86	23.28	28.36	23.83	28.46	2.5611	2.66	-0.48	-0.10			69.6				0.28
NAVE										2.2		14.64	13.41	14.47	13.43	15.13	1.5039	1.52	0.17	-0.02			56.5				-0.1

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 8, JULY 14, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-15	29	-46	32	2	-2	2	428	-440	5		24.67	22.70	24.45	22.75	24.67	2.63	2.65	0.23	-0.02	430	-442	86.6	0.2	20	1.00	-0.63
1.0	-17	25	-36	33	1	-2	2	433	-443	5		24.51	22.78	24.32	22.81	24.40	2.66	2.68	0.20	-0.02	434	-446	88.0	-0.2	17	-1.00	-0.69
1.5	-17	20	-27	32	2	-2	2	428	-437	4		24.69	22.97	24.49	22.99	24.20	2.69	2.71	0.21	-0.02	430	-439	88.1	0.2	10	1.00	-0.76
2.0	-19	16	-21	30	2	-2	2	423	-439	4.0		24.56	23.04	24.39	23.06	24.08	2.71	2.73	0.18	-0.02	425	-441	89.4	-0.2	8	-1.00	-0.76
2.5	-17	20	-24	28	2	-3	3	427	-437	4.3		24.84	23.04	24.65	23.06	23.96	2.70	2.71	0.21	-0.02	429	-440	87.5	0.2	8	1.00	-0.85
3.0	-21	35	-39	28	1	-2	2	427	-440	5.6		25.56	22.76	25.30	22.78	23.81	2.58	2.60	0.27	-0.02	428	-442	80.8	-0.2	10	-1.00	-0.89
3.5	-24	44	-46	29	1	-2	2	424	-445	6.6		25.78	22.60	25.51	22.61	23.64	2.53	2.55	0.28	-0.02	425	-446	78.1	0.2	11	1.00	-0.96
4.0	-23	37	-38	29	1	-1	1	426	-445	6.1		25.65	22.41	25.41	22.42	23.47	2.50	2.51	0.25	-0.02	426	-447	77.4	-0.2	10	-1.00	-0.97
4.5	-23	36	-39	29	1	-1	1	425	-446	6.2		25.74	22.20	25.50	22.21	23.34	2.44	2.46	0.25	-0.02	426	-447	75.4	0.2	9	1.00	-0.93
5.0	-30	34	-32	30	1	-1	1	418	-444	5.4		25.75	21.91	25.47	21.91	23.17	2.37	2.39	0.28	-0.02	419	-446	73.4	-0.2	12	-1.00	-1.06
5.5	-27	35	-35	31	0	-1	1	429	-450	5.5		25.85	21.71	25.58	21.71	23.00	2.32	2.34	0.28	-0.02	429	-451	71.4	0.2	10	0.99	-1.01
6.0	-21	30	-32	31	1	-1	1	427	-447	5.1		25.86	21.58	25.61	21.59	22.88	2.29	2.31	0.26	-0.02	427	-448	70.4	-0.2	7	-1.00	-0.95
6.5	-8	18	-24	29	17	-4	16	426	-444	4.1		25.23	21.42	25.05	21.44	22.71	2.30	2.31	0.20	-0.02	443	-448	72.9	-0.2	4	-1.00	-0.75
7.0	-8	18	-24	29	17	-4	16	426	-444	4.1		25.23	21.42	25.05	21.44	22.71	2.30	2.31	0.20	-0.02	443	-448	72.9	-0.2	4	-1.00	-0.75
7.5	8	29	-61	27	56	-12	45	416	-434	4.2		25.15	21.39	25.03	21.43	22.69	2.30	2.31	0.13	-0.02	472	-446	72.9	0.2	1	1.00	-0.50
8.0	74	-20	-54	21	149	-33	101	423	-440	3.4		25.99	21.68	26.12	21.82	22.92	2.31	2.33	-0.12	-0.02	572	-473	68.8	0.2	-21	1.00	0.34
8.5	113	-44	-68	14	226	-50	96	418	-419	3.3		26.34	21.73	26.57	21.90	23.15	2.29	2.32	-0.22	-0.02	645	-469	66.7	-0.2	-15	-1.00	0.58
9.0	174	-77	-75	6	296	-64	99	420	-451	5.0		27.63	22.06	27.97	22.25	23.57	2.28	2.31	-0.34	-0.02	716	-515	61.1	0.2	-28	1.00	0.99
9.5	247	-121	-78	-3	401	-87	207	433	-447	4.6		28.29	22.25	28.83	22.51	24.12	2.28	2.31	-0.53	-0.02	834	-534	58.2	-0.2	-47	-1.00	1.59
10.0	294	-141	-70	-21	451	-97	188	424	-478	4.0		28.56	22.59	29.33	22.92	25.07	2.34	2.37	-0.76	-0.03	875	-575	58.0	0.2	-61	0.99	1.99
10.5	342	-138	-71	-49	494	-105	307	434	-523	3.7		29.94	23.52	30.79	23.89	27.31	2.47	2.50	-0.84	-0.03	928	-633	56.5	-0.2	-176	-1.00	2.14
11.0	321	-196	-128	-54	506	-107	295	425	-487	3.9		30.05	23.54	30.76	23.88	27.38	2.47	2.51	-0.70	-0.03	931	-594	56.6	0.2	57	0.99	1.57
11.5	339	-164	-83	-57	551	-116	337	439	-471	3.6		30.41	23.72	31.22	24.05	27.96	2.49	2.52	-0.80	-0.03	990	-588	55.3	-0.2	-35	-1.00	1.97
12.0	644	-324	-124	-74	915	-196	353	451	-478	4.4		32.12	24.22	33.68	24.79	29.38	2.50	2.54	-1.55	-0.04	1366	-674	48.6	0.2	-122	0.99	2.63
12.5	530	-251	-106	-98	797	-167	173	410	-534	5.0		32.32	24.61	33.68	25.12	30.80	2.58	2.62	-1.35	-0.04	1207	-701	50.1	-0.2	-74	-1.00	2.39
13.0	611	-315	-134	-103	910	-192	124	422	-503	6.1		32.62	24.67	34.02	25.19	31.73	2.58	2.62	-1.39	-0.04	1332	-695	49.1	0.2	-59	0.99	2.34
13.5	625	-320	-127	-111	919	-194	132	424	-527	5.9		33.38	25.15	34.91	25.70	32.80	2.65	2.69	-1.52	-0.04	1343	-721	48.0	-0.2	-67	-1.00	2.51
14.0	609	-314	-126	-116	893	-189	124	425	-535	6.2		33.73	25.30	35.16	25.82	33.67	2.66	2.70	-1.43	-0.04	1318	-724	47.6	0.2	-52	0.99	2.49
14.5	592	-312	-119	-116	873	-187	118	434	-536	6.3		33.89	25.46	35.38	25.99	34.37	2.69	2.73	-1.48	-0.04	1306	-723	47.6	-0.2	-45	-1.00	2.62
15.0	566	-305	-119	-115	833	-180	114	438	-541	6.4		33.99	25.35	35.44	25.87	34.90	2.66	2.70	-1.44	-0.04	1272	-721	46.8	0.2	-28	0.99	2.56
15.5	530	-296	-116	-108	787	-172	111	440	-541	6.3		33.98	24.93	35.33	25.41	35.16	2.55	2.59	-1.33	-0.03	1227	-713	45.2	-0.2	-11	-1.00	2.56
16.0	487	-273	-109	-98	732	-162	109	443	-540	6.5		34.27	24.86	35.56	25.34	35.29	2.52	2.55	-1.28	-0.03	1176	-702	44.0	0.2	-6	0.99	2.51
16.5	436	-249	-114	-86	663	-149	133	442	-537	6.6		34.05	24.09	35.13	24.51	35.15	2.34	2.37	-1.07	-0.03	1105	-687	41.8	-0.2	13	-1.00	2.19
17.0	376	-211	-109	-73	584	-132	179	447	-535	5.7		34.13	23.73	35.14	24.15	34.91	2.24	2.28	-1.01	-0.03	1031	-666	40.2	0.2	17	0.99	1.93
17.5	308	-171	-106	-60	493	-113	234	445	-533	6.4		33.99	23.46	34.86	23.85	34.51	2.19	2.22	-0.86	-0.04	939	-646	39.9	0.0	29	0.00	1.62
18.0	236	-129	-101	-44	396	-91	268	447	-527	5.1		33.67	23.44	34.35	23.78	33.86	2.21	2.24	-0.67	-0.03	843	-618	41.3	-0.2	39	-1.00	1.27
18.5	169	-92	-81	-34	304	-69	263	448	-526	4.3		33.54	23.88	34.17	24.20	33.30	2.32	2.36	-0.62	-0.04	752	-595	43.9	0.2	38	0.99	1.14
19.0	102	-63	-74	-23	214	-47	215	443	-528	3.7		32.91	23.89	33.37	24.15	32.47	2.36	2.40	-0.45	-0.04	658	-574	46.7	-0.2	58	-1.00	0.84
19.5	34	-28	-56	-11	127	-27	139	440	-520	3.3		31.58	23.93	31.85	24.15	31.55	2.46	2.50	-0.26	-0.04	567	-547	53.0	0.2	61	0.99	0.49
20.0	-16	16	-74	1	55	-13	63	431	-503	3.9		30.38	23.27	30.30	23.38	30.47	2.38	2.42	0.10	-0.03	487	-516	56.0	-0.2	73	-1.00	-0.20
20.5	-34	29	-47	14	12	-2	12	421	-485	3.7		28.94	22.50	28.63	22.56	29.36	2.30	2.33	0.32	-0.03	433	-486	59.5	0.2	71	0.99	-0.64
21.0	-40	22	-29	24	1	0	1	432	-479	3.6		27.57	22.19	27.23	22.22	28.36	2.32	2.35	0.35	-0.03	433	-479	65.0	-0.2	61	-1.00	-0.76
21.5	-40	37	-46	31	0	0	0	442	-479	4.7		27.29	21.90	26.92	21.93	27.52	2.27	2.30	0.38	-0.03	442	-479	64.8	0.2	51	1.00	-0.80
22.0	-41	37	-39	36	0	0	0	440	-477	4.8		27.06	21.90	26.70	21.91	26.82	2.28	2.31	0.36	-0.03	440	-477	66.0	-0.2	42	-1.00	-0.95
22.5	-41	31	-30	39	0	0	0	435	-475	4.2		26.56	21.67	26.17	21.67	26.24	2.27	2.29	0.40	-0.03	435	-475	67.5	0.2	36	1.00	-1.05
23.0	-40	34	-35	40	0	0	0	434	-471	4.2		26.33	21.00	25.90	21.01	25.70	2.13	2.16	0.44	-0.03	433	-471	64.7	-0.2	34	-1.00	-0.95
23.5	-40	27	-29	42	0	0	0	436	-471	3.7		26.23	20.42	25.80	20.43	25.30	2.01	2.04	0.44	-0.03	436	-471	61.6	0.3	32	1.66	-0.93
24.0	-40	24	-26	43	0	0	0	433	-468	3.5		26.09	20.13	25.62	20.14	25.03	1.96	2.00	0.48	-0.03	433	-469	60.7	-0.3	29	-1.67	-0.92

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	15.1	-7.2	-5.9	-1.4	25.3	-5.5	8.5	37.3	-41.6												62.5	-47.1		0.0	0.0	0.00	
DSUM	15.8	-8.2	-4.4	-2.5	24.6	-5.3	8.2	20.1	-23.4												44.7	-28.7		0.0	-0.9	0.00	
NSUM	-0.7	1.0	-1.5	1.1	0.7	-0.2	0.3	17.1	-18.2												17.8	-18.4		0.0	0.9	0.00	
TAVE										4.9		28.96	22.98	29.30	23.19	27.81	2.42	2.44	-0.34	-0.03			61.7				0.53
DAVE										4.9		31.63	23.78	32.47	24.14	30.73	2.4270	2.46	-0.83	-0.03			50.9				1.62
NAVE										3.2		17.16	14.67	16.99	14.68	16.13	1.5993	1.61	0.18	-0.01			49.7				-0.6

PRECEDING PAGE BLANK NOT FILMED

SYSTEM 8, JULY 15, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-38	21	-23	43	0	0	0	432	-469	3		25.89	19.90	25.40	19.92	24.69	1.93	1.96	0.49	-0.04	432	-469	60.5	0.2	19	1.00	-0.92
1.0	-38	16	-17	43	0	0	0	429	-467	3		25.13	19.81	24.66	19.82	24.31	1.96	1.99	0.48	-0.03	429	-467	64.1	-0.2	21	-1.00	-0.94
1.5	-38	15	-15	43	0	0	0	427	-461	3		24.72	19.76	24.25	19.77	23.97	1.98	2.01	0.48	-0.03	427	-461	66.3	0.2	19	1.00	-0.99
2.0	-38	22	-22	43	0	0	0	428	-460	3.4		24.71	19.79	24.27	19.79	23.66	1.98	2.01	0.45	-0.03	428	-460	66.3	-0.2	18	-1.00	-1.01
2.5	-37	14	-15	43	0	0	0	426	-458	2.9		24.43	19.59	23.97	19.60	23.38	1.96	1.99	0.46	-0.03	426	-457	66.8	0.2	16	0.99	-0.99
3.0	-36	36	-38	43	0	0	0	433	-456	4.2		25.29	19.40	24.81	19.41	23.13	1.86	1.90	0.49	-0.03	433	-456	60.6	-0.2	15	-1.00	-0.95
3.5	-38	38	-39	44	0	0	0	431	-464	4.4		25.51	19.19	25.07	19.20	22.90	1.80	1.84	0.45	-0.03	431	-464	57.7	0.2	13	1.00	-0.96
4.0	-38	28	-28	44	0	0	0	429	-466	3.9		25.21	19.04	24.82	19.04	22.69	1.79	1.82	0.39	-0.03	429	-466	58.1	-0.2	12	-1.00	-1.00
4.5	-38	20	-20	43	0	0	0	426	-464	3.4		24.84	18.93	24.48	18.93	22.48	1.80	1.82	0.37	-0.02	426	-464	59.3	0.2	12	1.00	-1.05
5.0	-36	13	-13	43	0	0	0	423	-461	2.8		24.30	18.83	23.90	18.82	22.28	1.81	1.84	0.41	-0.03	423	-461	61.9	-0.2	12	-1.00	-1.07
5.5	-36	15	-14	43	0	0	0	423	-457	3.0		24.05	18.75	23.69	18.75	22.08	1.81	1.84	0.37	-0.02	423	-457	62.7	0.2	12	1.00	-1.05
6.0	-37	19	-18	43	0	0	0	416	-450	3.4		23.82	18.75	23.48	18.75	21.89	1.83	1.85	0.35	-0.02	417	-450	64.0	-0.2	11	-1.00	-1.08
6.5	-18	18	-26	41	40	-10	29	397	-415	2.9		23.58	18.96	23.32	19.00	21.62	1.89	1.91	0.27	-0.02	437	-424	66.7	-0.2	3	-1.00	-0.76
7.0	-18	18	-26	41	40	-10	29	397	-415	2.9		23.58	18.96	23.32	19.00	21.62	1.89	1.91	0.27	-0.02	437	-424	66.7	-0.2	3	-1.00	-0.76
7.5	19	7	-53	36	111	-26	57	406	-409	2.9		24.50	19.51	24.47	19.61	21.73	1.94	1.96	0.04	-0.02	517	-435	63.9	0.0	-9	-0.01	-0.12
8.0	87	-33	-60	28	200	-45	78	411	-421	4.0		25.88	20.14	26.07	20.30	22.06	1.98	2.00	-0.18	-0.02	610	-466	59.3	0.2	-21	0.99	0.54
8.5	156	-76	-66	18	290	-66	95	411	-429	4.4		26.78	20.57	27.18	20.79	22.54	2.01	2.03	-0.38	-0.02	702	-496	56.4	-0.2	-32	-1.00	1.15
9.0	224	-116	-68	5	389	-88	108	410	-436	4.3		27.76	20.97	28.36	21.26	23.24	2.03	2.06	-0.59	-0.02	799	-524	53.3	0.2	-45	0.99	1.69
9.5	289	-150	-68	-10	480	-108	118	410	-449	4.5		28.60	21.21	29.39	21.55	24.18	2.03	2.05	-0.77	-0.02	891	-557	50.1	-0.2	-61	-1.00	2.19
10.0	352	-179	-69	-31	566	-127	126	414	-458	4.3		29.30	21.42	30.20	21.79	25.38	2.03	2.05	-0.89	-0.02	980	-585	47.8	0.2	-73	0.99	2.62
10.5	437	-235	-77	-56	685	-152	130	408	-471	5.6		30.25	21.58	31.31	21.99	27.11	2.00	2.02	-1.05	-0.02	1093	-623	44.3	-0.2	-69	-1.00	3.09
11.0	488	-258	-93	-69	756	-167	130	403	-480	5.9		30.94	21.49	32.05	21.94	28.30	1.94	1.96	-1.10	-0.03	1165	-646	41.2	0.2	-69	0.99	2.79
11.5	533	-294	-96	-80	820	-180	127	406	-487	6.2		31.60	21.68	32.80	22.15	29.39	1.94	1.96	-1.19	-0.03	1226	-667	39.4	-0.2	-63	-1.00	3.07
12.0	568	-303	-107	-91	868	-189	126	403	-493	5.7		32.11	21.62	33.36	22.11	30.55	1.89	1.92	-1.23	-0.03	1271	-682	37.3	0.2	-69	0.99	2.85
12.5	595	-316	-116	-100	907	-197	124	400	-501	6.5		32.63	21.85	33.97	22.38	31.67	1.90	1.94	-1.33	-0.03	1307	-697	36.5	-0.2	-64	-1.00	2.74
13.0	609	-326	-119	-106	927	-201	124	400	-507	6.5		33.00	22.04	34.30	22.55	32.68	1.92	1.95	-1.30	-0.03	1327	-708	36.1	0.2	-57	0.99	2.75
13.5	616	-353	-113	-107	937	-203	121	396	-509	7.4		33.32	22.02	34.59	22.50	33.46	1.90	1.92	-1.26	-0.03	1333	-713	35.0	-0.2	-43	-1.00	3.12
14.0	612	-355	-123	-104	928	-202	120	401	-512	7.8		33.44	22.03	34.69	22.51	34.03	1.89	1.92	-1.24	-0.03	1329	-714	34.7	0.2	-30	0.99	2.90
14.5	595	-358	-105	-101	901	-198	122	413	-514	7.7		34.00	22.47	35.42	22.99	34.56	1.95	1.98	-1.40	-0.03	1314	-712	34.4	-0.2	-30	-1.00	3.43
15.0	568	-344	-100	-98	864	-193	126	419	-519	7.7		34.42	22.44	35.79	22.94	35.01	1.92	1.95	-1.36	-0.03	1282	-711	33.1	0.2	-25	0.99	3.45
15.5	522	-318	-101	-93	798	-180	143	421	-530	7.9		34.50	22.22	35.83	22.72	35.29	1.86	1.89	-1.31	-0.03	1219	-710	32.2	-0.2	-11	-1.00	3.16
16.0	413	-252	-106	-79	658	-150	151	428	-531	7.5		34.36	22.05	35.41	22.48	35.07	1.84	1.86	-1.05	-0.03	1086	-680	32.4	0.2	23	0.99	2.39
16.5	438	-271	-103	-67	684	-158	159	436	-512	8.1		34.75	22.17	35.87	22.61	34.92	1.84	1.86	-1.11	-0.03	1119	-670	31.6	-0.2	3	-1.00	2.64
17.0	370	-233	-93	-58	594	-138	184	435	-525	7.6		34.73	22.02	35.73	22.43	34.72	1.80	1.83	-0.99	-0.03	1029	-663	31.3	0.2	14	0.99	2.50
17.5	296	-176	-91	-49	496	-118	227	435	-522	6.8		34.50	22.04	35.40	22.44	34.41	1.82	1.85	-0.89	-0.03	931	-639	32.3	0.0	20	0.00	1.95
18.0	222	-127	-84	-38	392	-93	255	436	-519	5.7		33.99	22.03	34.76	22.40	33.89	1.86	1.89	-0.76	-0.03	828	-612	34.0	-0.2	28	-1.00	1.51
18.5	156	-86	-86	-29	300	-72	248	434	-516	5.7		33.41	21.79	33.95	22.10	33.25	1.84	1.87	-0.53	-0.03	735	-588	35.3	0.2	45	0.99	1.00
19.0	91	-58	-70	-16	211	-49	203	434	-517	4.3		32.51	22.25	32.91	22.49	32.34	2.00	2.03	-0.39	-0.03	645	-565	40.7	-0.2	52	-1.00	0.85
19.5	27	-24	-48	-8	126	-29	133	429	-508	3.8		31.18	23.24	31.38	23.40	31.50	2.32	2.35	-0.19	-0.03	555	-537	51.2	0.2	52	0.99	0.50
20.0	-23	21	-54	2	44	-9	47	421	-498	4.1		29.76	22.64	29.60	22.72	30.45	2.28	2.30	0.17	-0.03	466	-507	55.6	-0.2	65	-1.00	-0.40
20.5	-39	17	-22	13	11	-1	12	413	-476	3.2		28.35	22.10	28.04	22.13	29.36	2.25	2.27	0.32	-0.03	424	-477	60.1	0.2	62	0.99	-0.79
21.0	-45	15	-13	21	1	0	1	424	-472	2.9		27.10	22.06	26.73	22.05	28.40	2.32	2.34	0.38	-0.02	424	-472	66.8	-0.2	54	-1.00	-1.14
21.5	-45	30	-26	27	0	0	0	435	-472	4.1		26.97	22.11	26.59	22.10	27.61	2.34	2.36	0.39	-0.02	435	-472	67.8	0.2	43	1.00	-1.18
22.0	-45	38	-31	32	0	0	0	434	-471	4.6		26.87	21.90	26.47	21.88	26.94	2.30	2.32	0.40	-0.02	434	-472	67.1	-0.2	37	-1.00	-1.21
22.5	-45	48	-39	35	0	0	0	436	-471	5.5		27.02	21.67	26.63	21.66	26.37	2.24	2.26	0.40	-0.02	436	-471	64.7	0.2	31	1.00	-1.22
23.0	-45	54	-44	37	0	0	0	436	-471	6.1		27.09	21.49	26.70	21.47	25.90	2.19	2.21	0.40	-0.02	435	-471	63.2	-0.2	26	-1.00	-1.24
23.5	-45	55	-43	38	0	0	0	434	-472	6.0		27.14	21.35	26.74	21.33	25.57	2.16	2.18	0.41	-0.02	434	-472	62.0	0.3	23	1.66	-1.27
24.0	-45	60	-48	38	0	0	0	434	-472	6.4		27.12	21.24	26.71	21.22	25.35	2.13	2.16	0.42	-0.02	434	-472	61.5	-0.3	21	-1.67	-1.27

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.5	-8.5	-5.1	-0.9	27.5	-6.2	6.7	36.3	-41.2												63.9	-47.4		0.0	0.0	0.00	
DSUM	16.6	-9.3	-4.0	-2.3	26.7	-6.0	6.4	19.3	-22.8												46.0	-28.8		0.0	-0.9	0.00	
NSUM	-1.0	0.8	-1.1	1.4	0.8	-0.2	0.3	17.0	-18.5												17.8	-18.6		0.0	0.8	0.00	
TAVE										5.0		28.88	21.01	29.19	21.22	27.68	1.97	2.00	-0.29	-0.03			51.3				0.69
DAVE										5.9		31.84	21.91	32.69	22.27	30.92	1.9702	2.00	-0.84	-0.03			41.4				2.05
NAVE										2.6		17.00	13.40	16.76	13.41	15.93	1.3297	1.35	0.25	-0.02			42.7				-0.6

OF POOR QUALITY

SYSTEM 8, JULY 16, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-45	55	-42	38	0	0	0	433	-473	6		27.00	21.09	26.59	21.06	25.07	2.11	2.13	0.42	-0.02	433	-473	61.2	0.2	19	1.00	-1.32
1.0	-46	58	-42	38	0	0	0	431	-473	6		26.95	20.90	26.55	20.87	24.76	2.07	2.09	0.41	-0.02	431	-473	60.2	-0.2	17	-1.00	-1.36
1.5	-48	59	-43	38	0	0	0	427	-472	6		26.71	20.60	26.29	20.57	24.45	2.02	2.04	0.43	-0.02	427	-472	59.7	0.2	18	1.00	-1.35
2.0	-50	52	-38	39	0	0	0	423	-469	5.7		26.33	20.29	25.91	20.26	24.13	1.98	2.00	0.43	-0.02	424	-470	59.8	-0.2	17	-1.00	-1.39
2.5	-48	41	-30	40	0	0	0	418	-464	4.8		25.80	20.02	25.39	19.99	23.70	1.96	1.98	0.42	-0.02	418	-464	61.0	1.0	51	4.99	-1.39
3.0	-47	52	-39	40	0	0	0	420	-463	5.6		25.39	19.75	24.96	19.72	23.53	1.93	1.95	0.43	-0.02	420	-463	61.7	-0.2	23	-1.00	-1.32
3.5	-45	43	-33	40	0	0	0	422	-460	4.9		25.07	19.63	24.64	19.60	23.26	1.92	1.95	0.44	-0.02	421	-460	62.8	0.2	14	1.00	-1.33
4.0	-43	42	-32	40	0	0	0	423	-459	5.1		25.13	19.66	24.73	19.64	23.04	1.93	1.95	0.40	-0.02	423	-459	62.5	-0.2	12	-1.00	-1.31
4.5	-42	42	-32	40	0	0	0	424	-460	5.1		24.94	19.71	24.56	19.68	22.86	1.95	1.97	0.39	-0.02	423	-460	63.8	0.2	10	0.99	-1.32
5.0	-40	42	-31	38	0	0	0	424	-460	5.1		24.64	19.74	24.26	19.71	22.69	1.97	1.99	0.39	-0.02	424	-461	65.8	-0.2	8	-1.00	-1.34
5.5	-39	34	-24	37	0	0	0	422	-458	4.5		24.26	19.72	23.89	19.69	22.53	2.00	2.01	0.38	-0.02	421	-458	68.0	0.2	9	1.00	-1.40
6.0	-38	34	-25	37	0	0	0	422	-456	4.6		23.86	19.67	23.50	19.64	22.38	2.01	2.03	0.36	-0.02	422	-456	70.1	-0.2	8	-1.00	-1.38
6.5	-24	23	-24	35	41	-11	23	400	-413	4.3		23.84	19.90	23.60	19.91	22.14	2.06	2.08	0.25	-0.02	441	-424	71.4	-0.2	3	-1.00	-0.97
7.0	-24	23	-24	35	41	-11	23	400	-413	4.3		23.84	19.90	23.60	19.91	22.14	2.06	2.08	0.25	-0.02	441	-424	71.4	-0.2	3	-1.00	-0.97
7.5	18	-1	-41	31	113	-27	39	408	-413	5.1		24.63	20.35	24.64	20.43	22.22	2.10	2.12	0.00	-0.02	522	-439	68.5	0.0	-7	-0.01	0.02
8.0	94	-50	-50	24	207	-48	54	412	-418	5.5		25.85	20.92	26.09	21.06	22.52	2.15	2.16	-0.23	-0.02	619	-466	64.0	0.2	-19	1.00	0.99
8.5	166	-96	-53	14	301	-71	64	413	-425	6.4		27.06	21.39	27.51	21.60	23.01	2.17	2.19	-0.43	-0.02	714	-496	59.6	-0.2	-31	-1.00	1.81
9.0	232	-140	-51	2	397	-92	75	410	-434	6.3		27.96	21.77	28.60	22.03	23.72	2.20	2.21	-0.63	-0.02	807	-526	56.5	0.2	-42	0.99	2.77
9.5	297	-176	-50	-12	488	-112	68	411	-445	5.9		28.74	22.17	29.57	22.48	24.68	2.23	2.25	-0.82	-0.02	899	-557	54.4	-0.2	-59	-1.00	3.53
10.0	360	-206	-52	-33	573	-130	99	414	-454	6.4		29.46	22.54	30.53	22.92	25.90	2.27	2.29	-1.07	-0.02	987	-584	52.4	0.2	-70	0.99	4.01
10.5	441	-247	-62	-58	686	-154	98	415	-469	6.2		30.55	22.93	31.74	23.35	27.75	2.29	2.31	-1.18	-0.02	1100	-622	49.3	-0.2	-74	-1.00	4.02
11.0	490	-278	-65	-74	755	-168	94	415	-472	7.1		31.37	23.22	32.76	23.70	29.08	2.31	2.33	-1.38	-0.02	1169	-646	46.9	0.2	-73	0.99	4.27
11.5	531	-299	-78	-86	813	-179	97	417	-487	6.4		32.12	23.39	33.62	23.91	30.34	2.29	2.32	-1.49	-0.03	1230	-667	44.6	-0.2	-68	-1.00	3.83
12.0	570	-324	-82	-96	862	-189	98	415	-499	7.0		32.87	23.47	34.34	23.97	31.58	2.26	2.29	-1.47	-0.02	1278	-688	42.2	0.2	-69	0.99	3.95
12.5	596	-346	-87	-103	899	-196	99	410	-507	7.5		33.32	23.54	34.90	24.08	32.73	2.25	2.28	-1.57	-0.03	1309	-703	40.7	-0.2	-61	-1.00	3.99
13.0	610	-353	-91	-108	920	-200	101	410	-508	7.5		33.64	23.89	35.31	24.45	33.76	2.31	2.34	-1.66	-0.03	1331	-709	41.0	0.2	-57	0.99	3.88
13.5	614	-359	-93	-113	928	-202	101	410	-514	7.5		34.03	24.05	35.68	24.61	34.71	2.33	2.36	-1.64	-0.03	1338	-716	40.4	-0.2	-49	-1.00	3.89
14.0	609	-387	-81	-109	921	-202	100	410	-517	8.1		34.26	23.74	35.81	24.25	35.38	2.24	2.26	-1.54	-0.02	1332	-719	38.4	0.2	-32	0.99	4.81
14.5	592	-351	-96	-108	895	-198	98	418	-522	8.1		34.55	24.05	36.18	24.61	36.01	2.30	2.32	-1.62	-0.03	1313	-720	38.7	-0.2	-37	-1.00	3.66
15.0	567	-362	-101	-98	856	-192	101	424	-523	8.6		34.54	23.59	36.02	24.10	36.30	2.18	2.21	-1.47	-0.03	1280	-715	37.1	0.2	-7	0.99	3.58
15.5	529	-346	-95	-83	805	-183	108	433	-522	8.7		34.84	23.53	36.27	24.03	36.38	2.15	2.17	-1.42	-0.03	1238	-705	36.1	-0.2	-5	-1.00	3.67
16.0	484	-327	-80	-77	742	-170	134	434	-530	8.4		34.62	23.70	35.99	24.17	36.43	2.20	2.23	-1.37	-0.02	1176	-700	37.5	0.2	0	0.99	4.08
16.5	431	-291	-79	-69	669	-156	192	437	-524	8.5		34.35	23.96	35.64	24.41	36.33	2.29	2.31	-1.29	-0.02	1106	-680	39.6	-0.2	8	-1.00	3.68
17.0	374	-260	-76	-57	593	-140	249	438	-519	7.8		34.18	23.80	35.33	24.20	36.05	2.26	2.28	-1.13	-0.02	1031	-660	39.8	0.2	19	0.99	3.42
17.5	306	-219	-80	-41	499	-120	308	440	-516	6.9		33.88	23.45	34.81	23.80	35.47	2.19	2.22	-0.92	-0.02	939	-636	39.8	0.0	34	0.00	2.76
18.0	234	-171	-66	-29	396	-96	337	444	-514	0.4		33.50	23.68	34.27	23.97	34.80	2.27	2.29	-0.76	-0.02	840	-611	42.5	-0.2	32	-1.00	2.59
18.5	166	-130	-63	-19	301	-73	292	442	-511	0.4		32.92	23.50	33.49	23.74	34.05	2.27	2.29	-0.56	-0.02	743	-584	44.2	0.2	46	0.99	2.09
19.0	99	-79	-62	-9	211	-51	219	442	-510	0.2		32.36	23.46	32.76	23.66	33.13	2.30	2.32	-0.39	-0.02	653	-561	46.7	-0.2	51	-1.00	1.25
19.5	31	-29	-61	1	126	-32	137	438	-504	0.3		31.50	23.09	31.66	23.23	32.14	2.27	2.29	-0.15	-0.02	564	-535	49.0	0.2	58	1.00	0.48
20.0	-20	25	-79	12	55	-15	63	432	-493	0.3		30.62	22.52	30.54	22.59	31.04	2.19	2.21	0.09	-0.02	487	-508	50.6	-0.2	61	-1.00	-0.30
20.5	-36	1	-1	19	11	-2	12	424	-493	0.3		29.52	22.24	29.26	22.25	30.01	2.20	2.22	0.27	-0.02	435	-485	54.6	0.2	55	0.99	-0.87
21.0	-42	1	-1	22	0	0	0	445	-488	0.3		28.86	22.66	28.57	22.65	29.15	2.34	2.36	0.31	-0.02	445	-487	60.4	-0.2	44	-1.00	-1.19
21.5	-43	1	-1	27	0	0	0	448	-487	0.3		28.59	22.51	28.27	22.50	28.42	2.32	2.34	0.33	-0.02	448	-487	61.0	0.2	38	0.99	-1.18
22.0	-43	1	-1	30	0	0	0	445	-484	0.3		28.12	22.49	27.82	22.48	27.82	2.35	2.37	0.31	-0.02	445	-484	63.3	-0.2	32	-1.00	-1.23
22.5	-43	1	-1	32	0	0	0	443	-481	0.3		27.91	22.40	27.60	22.39	27.28	2.34	2.36	0.31	-0.02	443	-482	63.9	0.2	28	1.00	-1.29
23.0	-43	1	0	34	0	0	0	441	-480	0.3		27.53	22.29	27.23	22.27	26.81	2.34	2.36	0.31	-0.01	441	-480	65.2	-0.2	25	-1.00	-1.36
23.5	-43	1	-1	34	0	0	0	436	-477	0.3		27.24	22.19	26.92	22.17	26.56	2.34	2.35	0.33	-0.02	436	-477	66.3	1.0	24	4.99	-1.35
24.0	-43	1	-1	34	0	0	0	438	-477	0.4		27.00	22.08	26.71	22.08	26.20	2.33	2.35	0.31	-0.02	438	-476	67.0	0.0	55	0.00	-1.19
TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.3	-9.9	-4.4	-1.2	28.5	-6.5	6.6	36.7	-41.4												65.2	-47.9		0.0	-0.1	0.00	
DSUM	16.9	-10.4	-3.3	-2.3	26.9	-6.1	6.2	19.6	-22.7												46.5	-28.8		0.0	-0.8	0.00	
NSUM	-0.6	0.5	-1.1	1.2	1.7	-0.4	0.4	17.1	-18.7												18.7	-19.1		0.0	0.8	0.00	
TAVE										4.9		29.42	22.10	29.84	22.30	28.55	2.18	2.20	-0.42	-0.02			53.7				1.1
DAVE										5.5		32.13	23.19	33.13	23.56	31.85	2.2502	2.27	-0.99	-0.02			45.4				2.9
NAVE										2.5		16.23	12.96	16.03	12.95	15.21	1.3121	1.32	0.20	-0.01			40.6				-0.7

SYSTEM 8, JULY 17, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-45	1	-1	34	0	0	0	434	-474	0		26.71	21.94	26.37	21.91	25.93	2.32	2.33	0.35	-0.02	434	-473	67.9	0.2	20	1.00	-1.47
1.0	-45	1	-1	35	0	0	0	433	-471	0		26.60	21.76	26.26	21.73	25.57	2.28	2.30	0.36	-0.02	433	-471	67.4	-0.2	19	-1.00	-1.47
1.5	-46	10	-7	38	0	0	0	433	-471	1		26.72	21.43	26.37	21.40	25.24	2.20	2.22	0.36	-0.02	434	-471	64.6	0.2	18	1.00	-1.43
2.0	-47	0	0	39	0	0	0	429	-470	0.2		26.50	21.04	26.14	21.01	24.91	2.13	2.15	0.37	-0.02	429	-470	63.4	-0.2	18	-1.00	-1.41
2.5	-47	13	-9	41	0	0	0	428	-469	1.9		26.35	20.63	25.98	20.60	24.58	2.05	2.07	0.38	-0.02	428	-468	61.6	0.2	18	1.00	-1.43
3.0	-47	10	-7	41	0	0	0	427	-469	1.5		26.06	20.31	25.68	20.28	24.28	2.00	2.02	0.39	-0.02	427	-469	61.3	-0.2	16	-1.00	-1.41
3.5	-45	1	-1	40	0	0	0	425	-466	0.3		25.64	20.07	25.25	20.04	24.01	1.98	2.00	0.40	-0.02	425	-466	62.2	0.2	14	1.00	-1.37
4.0	-45	1	-1	41	0	0	0	424	-462	0.3		25.56	19.87	25.18	19.84	23.75	1.94	1.96	0.39	-0.02	424	-462	61.2	-0.2	14	-1.00	-1.35
4.5	-43	5	-4	41	0	0	0	426	-461	1.0		25.41	19.76	25.05	19.74	23.52	1.93	1.95	0.37	-0.02	426	-462	61.3	0.2	12	1.00	-1.31
5.0	-43	1	-1	40	0	0	0	426	-464	0.3		25.24	19.68	24.88	19.66	23.32	1.92	1.94	0.36	-0.02	426	-464	61.8	-0.2	10	-1.00	-1.35
5.5	-43	1	-1	40	0	0	0	426	-462	0.3		25.03	19.58	24.69	19.56	23.12	1.92	1.93	0.36	-0.02	426	-463	62.2	0.2	11	1.00	-1.32
6.0	-41	1	-1	39	0	0	0	424	-461	0.3		24.93	19.46	24.56	19.44	22.95	1.90	1.92	0.38	-0.02	424	-461	62.2	-0.2	9	-1.00	-1.32
6.5	-26	1	-1	37	40	-11	21	404	-418	0.3		24.50	19.43	24.26	19.44	22.67	1.92	1.94	0.25	-0.02	444	-429	64.0	-0.2	4	-1.00	-0.93
7.0	-26	1	-1	37	40	-11	21	404	-418	0.3		24.50	19.43	24.26	19.44	22.67	1.92	1.94	0.25	-0.02	444	-429	64.0	-0.2	4	-1.00	-0.93
7.5	14	0	-42	32	112	-28	36	409	-413	3.7		25.03	19.73	25.03	19.81	22.70	1.95	1.96	0.01	-0.02	522	-441	61.9	0.0	-5	0.00	-0.03
8.0	92	-42	-60	26	207	-49	49	411	-420	3.7		25.93	20.14	26.15	20.31	22.96	1.97	2.00	-0.21	-0.02	619	-469	58.9	0.2	-16	1.00	0.69
8.5	164	-100	-57	19	300	-71	57	410	-426	6.8		26.75	20.51	27.20	20.73	23.38	2.00	2.02	-0.44	-0.02	710	-497	55.9	-0.2	-26	-1.00	1.76
9.0	231	-148	-56	9	397	-93	65	408	-429	6.7		27.65	20.85	28.28	21.11	23.99	2.01	2.03	-0.62	-0.02	804	-522	52.8	0.2	-36	0.99	2.66
9.5	295	-179	-54	-4	487	-113	71	409	-436	6.0		28.57	21.38	29.41	21.70	24.91	2.07	2.08	-0.82	-0.02	896	-549	50.8	-0.2	-57	-1.00	3.35
10.0	357	-209	-59	-24	571	-131	77	413	-451	6.9		29.33	21.70	30.36	22.10	26.11	2.09	2.11	-1.03	-0.02	984	-583	48.7	0.2	-65	0.99	3.52
10.5	436	-250	-63	-49	683	-155	83	412	-464	6.8		30.67	22.24	31.92	22.69	27.98	2.12	2.14	-1.24	-0.02	1096	-619	45.3	-0.2	-74	-1.00	3.99
11.0	485	-269	-76	-64	751	-169	86	415	-473	6.3		31.58	22.47	32.92	22.96	29.36	2.12	2.14	-1.33	-0.02	1167	-642	42.8	0.2	-76	0.99	3.56
11.5	528	-307	-72	-77	813	-182	86	415	-483	6.2		32.38	22.71	33.82	23.21	30.71	2.12	2.14	-1.42	-0.02	1228	-665	40.7	-0.2	-71	-1.00	4.26
12.0	563	-314	-89	-88	863	-192	85	413	-495	7.1		33.16	22.90	34.70	23.46	32.03	2.11	2.14	-1.53	-0.03	1277	-687	38.7	0.2	-72	0.99	3.58
12.5	589	-337	-94	-94	900	-199	85	409	-499	6.8		33.60	23.02	35.23	23.60	33.27	2.11	2.14	-1.62	-0.03	1309	-698	37.6	-0.2	-63	-1.00	3.59
13.0	601	-342	-97	-100	921	-204	86	411	-504	5.9		34.20	23.33	35.79	23.89	34.43	2.14	2.17	-1.58	-0.03	1333	-708	37.0	0.2	-62	0.99	3.53
13.5	607	-351	-98	-106	929	-206	88	408	-514	7.3		34.49	23.50	36.18	24.09	35.47	2.16	2.20	-1.68	-0.03	1336	-719	36.6	-0.2	-52	-1.00	3.57
14.0	601	-351	-102	-106	919	-204	89	414	-518	6.9		34.73	23.59	36.42	24.18	36.28	2.17	2.20	-1.69	-0.03	1333	-722	36.2	0.2	-42	0.99	3.49
14.5	584	-338	-114	-101	888	-199	93	423	-519	6.9		35.05	23.80	36.68	24.39	36.88	2.20	2.24	-1.62	-0.04	1311	-718	36.3	-0.2	-31	-1.00	3.01
15.0	558	-343	-97	-99	849	-193	94	429	-526	6.9		34.96	23.85	36.55	24.40	37.36	2.22	2.25	-1.58	-0.03	1278	-719	36.7	0.2	-19	0.99	3.68
15.5	523	-344	-111	-77	801	-184	100	430	-526	8.7		35.01	23.29	36.41	23.80	37.31	2.08	2.11	-1.39	-0.03	1230	-710	34.7	-0.2	10	-1.00	3.11
16.0	477	-308	-93	-72	740	-172	126	434	-524	7.6		34.84	23.48	36.28	24.00	37.30	2.14	2.17	-1.43	-0.03	1174	-696	35.9	0.2	-4	0.99	3.33
16.5	428	-297	-88	-59	671	-159	167	436	-522	8.4		34.66	23.43	35.95	23.89	37.11	2.14	2.16	-1.28	-0.03	1107	-681	36.5	-0.2	16	-1.00	3.39
17.0	369	-254	-79	-50	590	-141	230	440	-519	7.2		34.51	23.54	35.71	23.97	36.83	2.17	2.20	-1.19	-0.02	1030	-661	37.6	0.2	15	0.99	3.22
17.5	300	-213	-70	-42	494	-120	298	442	-517	7.4		34.12	23.79	35.19	24.18	36.41	2.26	2.28	-1.05	-0.02	936	-639	40.2	0.0	25	0.00	3.06
18.0	230	-174	-77	-23	396	-97	310	441	-513	7.1		33.63	23.22	34.43	23.54	35.61	2.16	2.18	-0.79	-0.02	837	-610	40.0	-0.2	44	-1.00	2.27
18.5	164	-122	-73	-13	302	-74	278	443	-512	6.3		33.28	23.25	33.89	23.52	34.82	2.19	2.21	-0.61	-0.02	745	-586	41.8	0.2	43	0.99	1.67
19.0	97	-85	-64	-4	210	-51	218	441	-513	6.4		32.59	23.51	32.99	23.70	33.84	2.29	2.31	-0.39	-0.02	652	-564	46.0	-0.2	57	-1.00	1.32
19.5	28	-33	-55	4	126	-31	138	438	-503	5.2		31.55	23.13	31.75	23.27	32.80	2.27	2.29	-0.18	-0.02	563	-535	48.9	0.2	56	0.99	0.59
20.0	-22	10	-55	10	54	-14	64	428	-495	4.0		30.35	22.64	30.31	22.72	31.74	2.24	2.26	0.05	-0.02	482	-509	52.3	-0.2	58	-1.00	-0.17
20.5	-38	22	-24	14	10	-1	12	421	-479	4.1		29.10	22.84	28.87	22.85	30.73	2.37	2.38	0.24	-0.02	432	-481	60.0	0.2	53	0.99	-0.91
21.0	-45	33	-28	21	0	0	0	437	-480	4.6		28.73	22.60	28.40	22.59	29.74	2.34	2.35	0.34	-0.02	438	-480	60.9	-0.3	82	-1.67	-1.19
21.5	-43	32	-27	27	0	0	0	444	-485	4.5		28.12	22.36	27.79	22.35	28.98	2.32	2.34	0.34	-0.02	444	-485	62.6	0.2	41	0.99	-1.17
22.0	-43	35	-30	30	0	0	0	442	-480	5.1		27.72	22.24	27.41	22.23	28.31	2.32	2.34	0.32	-0.02	442	-480	64.0	-0.2	34	-1.00	-1.19
22.5	-44	43	-36	35	0	0	0	441	-478	5.9		27.50	21.91	27.18	21.90	27.70	2.26	2.28	0.32	-0.02	441	-478	63.2	0.2	32	0.99	-1.18
23.0	-44	38	-31	36	0	0	0	438	-477	5.3		27.12	21.64	26.81	21.62	27.16	2.22	2.24	0.32	-0.02	438	-476	63.5	-0.2	28	-1.00	-1.22
23.5	-44	49	-38	39	0	0	0	439	-474	6.4		27.14	21.61	26.81	21.60	26.78	2.22	2.23	0.33	-0.02	440	-474	63.3	0.3	25	1.66	-1.29
24.0	-45	52	-39	40	0	0	0	439	-475	6.6		27.11	21.67	26.78	21.64	26.52	2.23	2.25	0.34	-0.02	439	-475	63.8	-0.3	23	-1.67	-1.33

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.6	-10.0	-4.1	-0.8	27.8	-6.4	6.0	36.7	-41.4												64.6	-47.8		0.0	0.0	0.00	
DSUM	16.6	-10.2	-3.5	-2.0	26.8	-6.1	5.7	19.6	-22.7												46.4	-28.8		0.0	-0.8	0.00	
NSUM	-1.1	0.2	-0.6	1.3	1.1	-0.2	0.3	17.1	-18.7												18.2	-18.9		0.0	0.8	0.00	
TAVE										4.5		29.52	21.88	29.95	22.09	29.06	2.13	2.15	-0.42	-0.02			52.2				0.9
DAVE										6.6		32.33	22.85	33.38	23.25	32.52	2.1582	2.18	-1.03	-0.02			43.1				2.7
NAVE										1.4		17.58	13.88	17.37	13.67	16.71	1.3919	1.40	0.21	-0.01			42.2				-0.8

SYSTEM 8, JULY 18, 1986, DATA FROM ASHLAND EXPERIMENTAL FARM

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-45	48	-33	40	0	0	0	434	-474	6		26.80	21.63	26.48	21.60	26.21	2.24	2.26	0.33	-0.02	434	-474	65.3	0.2	20	1.00	-1.45
1.0	-45	45	-30	39	0	0	0	431	-470	6		26.42	21.53	26.09	21.50	25.86	2.24	2.26	0.34	-0.01	431	-470	66.8	-0.2	18	-1.00	-1.53
1.5	-45	48	-31	40	0	0	0	430	-469	6		26.25	21.43	25.90	21.40	25.51	2.23	2.25	0.35	-0.02	430	-469	67.3	0.2	19	1.00	-1.55
2.0	-46	41	-25	39	0	0	0	426	-467	5.1		25.81	21.20	25.43	21.16	25.18	2.21	2.23	0.38	-0.02	426	-467	68.5	-0.2	18	-1.00	-1.65
2.5	-47	49	-32	40	0	0	0	426	-464	5.5		25.76	20.82	25.36	20.78	24.85	2.13	2.15	0.41	-0.02	426	-465	66.4	0.2	18	1.00	-1.54
3.0	-45	41	-29	40	0	0	0	426	-464	4.9		25.70	20.45	25.29	20.41	24.54	2.06	2.07	0.42	-0.02	426	-464	64.4	-0.2	16	-1.00	-1.43
3.5	-44	41	-29	39	0	0	0	429	-465	4.8		25.84	20.11	25.41	20.07	24.27	1.97	1.99	0.44	-0.02	429	-465	61.4	0.2	13	1.00	-1.44
4.0	-44	42	-29	39	0	0	0	425	-464	4.8		25.54	19.96	25.13	19.92	24.03	1.96	1.98	0.43	-0.02	425	-464	62.1	-0.2	13	-1.00	-1.44
4.5	-43	45	-32	40	0	0	0	424	-463	5.3		25.28	19.82	24.89	19.78	23.79	1.95	1.97	0.40	-0.02	425	-463	62.6	0.2	12	1.00	-1.44
5.0	-43	40	-28	41	0	0	0	423	-462	5.1		24.90	19.69	24.54	19.65	23.57	1.95	1.96	0.38	-0.02	423	-462	63.8	-0.2	12	-1.00	-1.47
5.5	-42	40	-29	40	0	0	0	424	-459	4.8		24.72	19.49	24.33	19.46	23.36	1.92	1.94	0.40	-0.02	424	-460	63.7	0.2	11	1.00	-1.36
6.0	-40	33	-24	38	0	0	0	422	-458	4.2		24.49	19.26	24.08	19.23	23.16	1.89	1.91	0.42	-0.02	422	-458	63.6	-0.2	10	-1.00	-1.36
6.5	-29	31	-32	36	38	-11	19	402	-416	4.8		24.58	19.15	24.29	19.15	22.86	1.86	1.88	0.30	-0.02	441	-426	61.9	-0.2	4	-1.00	-0.95
7.0	-29	31	-32	36	38	-11	19	402	-416	4.8		24.58	19.15	24.29	19.15	22.86	1.86	1.88	0.30	-0.02	441	-426	61.9	-0.2	4	-1.00	-0.95
7.5	10	2	-37	32	112	-28	34	409	-411	4.6		25.18	19.44	25.17	19.54	22.91	1.88	1.90	0.02	-0.02	521	-439	59.3	0.0	-6	0.00	-0.07
8.0	89	-47	-51	26	206	-48	46	412	-418	4.8		26.06	19.97	26.34	20.15	23.19	1.93	1.95	-0.27	-0.02	618	-466	56.9	0.2	-17	1.00	0.90
8.5	162	-94	-55	17	297	-71	56	409	-426	5.4		27.03	20.42	27.55	20.67	23.66	1.96	1.98	-0.51	-0.02	706	-497	53.8	-0.2	-30	-1.00	1.70
9.0	227	-130	-61	5	394	-93	63	407	-428	5.8		28.20	20.85	28.91	21.17	24.38	1.98	2.00	-0.71	-0.02	801	-522	50.2	0.2	-41	0.99	2.14
9.5	291	-161	-62	-8	485	-114	70	410	-441	5.5		29.31	21.20	30.18	21.56	25.36	1.98	2.00	-0.85	-0.02	895	-554	46.7	-0.2	-60	-1.00	2.59
10.0	350	-181	-65	-29	568	-132	75	413	-451	5.0		30.25	21.76	31.34	22.19	26.72	2.04	2.07	-1.08	-0.03	982	-584	45.1	0.2	-75	0.99	2.78
10.5	428	-230	-65	-55	679	-156	81	413	-466	5.4		31.28	22.29	32.60	22.78	28.73	2.09	2.12	-1.30	-0.02	1093	-622	43.1	-0.2	-79	-1.00	3.53
11.0	475	-242	-77	-72	746	-170	85	418	-477	5.3		32.23	22.67	33.73	23.23	30.31	2.12	2.15	-1.49	-0.03	1164	-647	41.0	0.2	-84	0.99	3.20
11.5	521	-282	-89	-81	808	-183	87	416	-489	5.9		32.75	22.74	34.34	23.33	31.65	2.10	2.13	-1.57	-0.03	1224	-672	39.4	-0.2	-68	-1.00	3.19
12.0	550	-286	-85	-96	851	-191	90	421	-495	4.8		33.39	23.22	35.10	23.83	33.11	2.17	2.20	-1.70	-0.03	1271	-686	39.0	0.2	-83	0.99	3.35
12.5	573	-308	-83	-110	886	-198	92	418	-505	5.1		33.75	23.67	35.64	24.32	34.57	2.26	2.29	-1.87	-0.03	1304	-703	39.3	-0.2	-73	-1.00	3.73
13.0	588	-315	-91	-116	907	-203	94	420	-510	5.3		34.37	24.01	36.19	24.64	35.83	2.30	2.33	-1.81	-0.03	1327	-712	38.8	0.2	-66	0.99	3.46
13.5	592	-301	-112	-120	913	-204	95	420	-517	5.4		34.70	24.16	36.54	24.83	36.96	2.31	2.36	-1.82	-0.05	1333	-721	38.5	-0.2	-58	-1.00	2.68
14.0	581	-266	-149	-123	900	-203	95	432	-519	4.7		35.51	24.41	36.64	25.06	38.02	2.32	2.39	-1.63	-0.06	1333	-722	38.7	0.2	-58	0.99	1.79
14.5	568			-124	877	-199	94	440	-535	4.8		35.98	24.90	0.00	25.54	38.88	2.41				1317	-734	40.6	-0.2	-41	-1.00	
15.0	544			-117	838	-192	93	445	-538	5.6		36.07	25.02	0.00	25.64	39.38	2.44				1283	-730	41.1	0.2	-18	0.99	
15.5	509			-105	790	-184	93	453	-538	5.5		36.42	25.15	0.00	25.76	39.60	2.45				1242	-722	41.5	-0.2	-9	-1.00	
16.0	468			-91	733	-172	103	456	-543	5.9		36.56	25.41	0.00	25.96	39.64	2.50				1189	-715	42.4	0.2	2	0.99	
16.5	417			-81	661	-157	134	464	-542	5.4		36.69	25.43	0.00	25.96	39.57	2.50				1125	-699	42.4	-0.2	5	-1.00	
17.0	362			-70	583	-140	190	463	-547	6.1		36.41	25.39	0.00	25.85	39.26	2.51				1045	-687	41.9	0.2	20	0.99	
17.5	295			-53	490	-119	269	464	-537	5.8		36.15	25.40	0.00	25.81	38.72	2.53				954	-657	41.7	0.0	28	0.00	
18.0	222	-117	-90	-45	387	-95	295	465	-538	5.4		35.96	25.19	36.64	25.57	38.06	2.49	2.51	-0.79	-0.04	851	-632	41.1	-0.2	36	-1.00	1.20
18.5	158	-117	-78	-30	289	-71	269	464	-535	5.8		35.11	25.07	35.79	25.37	37.11	2.51	2.54	-0.67	-0.03	753	-606	43.3	0.5	67	2.48	1.52
19.0	95	-74	-64	-18	205	-50	211	459	-531	4.7		34.23	25.05	34.69	25.27	36.05	2.57	2.59	-0.44	-0.03	664	-581	46.9	-0.2	61	-1.00	1.16
19.5	28	-29	-65	-3	122	-31	135	454	-520	4.6		33.23	24.30	33.41	24.45	34.81	2.44	2.47	-0.17	-0.03	576	-550	48.0	0.2	68	1.00	0.44
20.0	-22	11	-56	4	52	-13	62	441	-509	3.9		31.85	23.80	31.79	23.89	33.61	2.41	2.44	0.07	-0.02	493	-522	51.9	-0.2	62	-1.00	-0.18
20.5	-37	35	-47	12	10	-2	12	432	-490	4.4		30.81	23.18	30.54	23.20	32.45	2.33	2.36	0.28	-0.02	443	-491	53.9	0.2	62	0.99	-0.78
21.0	-43	35	-36	22	0	0	0	453	-498	4.8		30.28	22.54	29.94	22.55	31.35	2.22	2.24	0.35	-0.02	454	-498	53.1	-0.2	57	-1.00	-0.97
21.5	-43	40	-39	30	0	0	0	456	-496	5.1		29.86	22.13	29.50	22.14	30.41	2.15	2.18	0.37	-0.02	456	-496	52.8	0.2	47	0.99	-1.02
22.0	-44	35	-31	34	0	0	0	450	-493	4.4		29.27	21.78	28.87	21.77	29.63	2.11	2.13	0.41	-0.02	450	-493	53.7	-0.2	41	-1.00	-1.13
22.5	-43	28	-23	35	0	0	0	444	-488	3.7		28.41	21.24	27.96	21.22	28.91	2.05	2.07	0.46	-0.03	444	-488	55.0	0.2	37	0.99	-1.21
23.0	-45	27	-22	36	0	0	0	440	-482	3.6		27.80	20.70	27.31	20.68	28.26	1.97	2.00	0.50	-0.03	440	-482	55.0	-0.2	34	-1.00	-1.18
23.5	-45	29	-26	37	0	0	0	438	-476	3.8		27.60	20.35	27.09	20.33	27.79	1.91	1.94	0.52	-0.03	438	-476	54.1	0.3	31	1.66	-1.15
24.0	-45	22	-18	37	0	0	0	433	-478	3.3		27.15	20.13	26.64	20.10	27.46	1.89	1.92	0.52	-0.03	433	-478	55.0	-0.3	29	-1.67	-1.23

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	15.0	-4.7	-4.2	-1.3	27.3	-6.3	5.6	37.3	-41.9												65	-48		0.0	-0.1	0.00	
DSUM	16.3	-7.7	-3.3	-2.6	26.5	-6.1	5.4	20.1	-23.1												47	-29		0.0	-1.0	0.00	
NSUM	-1.3	3.0	-0.9	1.3	0.7	-0.2	0.2	17.2	-18.8												18	-19		0.0	0.9	0.00	
TAVE										5.1		30.15	22.24	29.09	22.47	30.12	2.17	2.14	-0.22	-0.02			51.7				0.3
DAVE										5.2		33.37	23.71	32.95	24.14	34.02	2.3001	2.25	-0.93	-0.03			43.9				2.0
NAVE										3.2		17.65	13.73	17.42	13.72	17.05	1.3548	1.37	0.24	-0.01			41.1				-0.8

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SYSTEM 1, JULY 20, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	4	-14	-2	10	3	-3	5	406	-431	2	45	25.07	21.80	24.64	21.73	26.22	2.39	2.41	0.44	-0.01	409	-434	77.6	-0.2	1	-1.00	-2.65
1.0	-3	-8	-2	11	2	-2	5	401	-427	1	30	24.51	21.60	23.98	21.48	26.00	2.39	2.39	0.54	-0.01	403	-429	80.4	0.2	2	0.99	-3.80
1.5	-30	21	-5	12	3	-3	6	398	-421	1	91	24.09	21.45	23.57	21.33	25.79	2.38	2.39	0.53	-0.01	401	-424	82.2	-0.2	2	-1.00	-4.76
2.0	-14	1	-1	12	2	-3	5	409	-420	1.6	147	23.68	21.31	23.27	21.23	25.60	2.38	2.39	0.42	-0.01	410	-422	83.6	0.2	1	1.00	-3.51
2.5	15	-29	2	11	2	-3	5	409	-421	1.5	18	24.02	21.18	23.67	21.14	25.45	2.33	2.34	0.36	-0.02	411	-424	80.1	0.6	1	2.99	-1.66
3.0	10	-21	-2	11	1	-2	4	396	-422	1.5	30	23.57	20.67	23.06	20.59	25.29	2.24	2.26	0.52	-0.02	397	-424	80.2	1.0	2	4.99	-2.26
3.5	-34	30	-10	12	1	-1	4	388	-418	1.4	34	22.85	20.33	22.24	20.19	25.09	2.22	2.23	0.63	-0.01	389	-419	83.2	1.0	2	4.99	-3.81
4.0	-17	5	-2	13	1	-2	4	381	-410	1.3	31	22.13	19.98	21.49	19.82	24.88	2.19	2.20	0.65	-0.01	382	-411	85.9	1.0	2	4.99	-4.68
4.5	-15	0	-1	14	1	-1	3	376	-406	1.1	56	21.56	19.59	20.82	19.38	24.66	2.15	2.15	0.75	-0.01	377	-407	87.6	1.0	2	4.99	-1.96
5.0	-28	8	2	16	1	-1	3	372	-401	0.7	110	20.71	19.15	19.76	18.76	24.38	2.11	2.10	0.96	0.02	373	-402	91.0	1.0	3	4.99	3.54
5.5	-13	-7	0	17	1	-1	2	371	-397	0.7	198	20.11	18.83	19.41	18.54	24.10	2.09	2.08	0.70	0.01	372	-398	92.1	1.0	2	4.99	4.18
6.0	-38	15	2	19	0	-1	1	387	-405	0.7	120	19.78	18.63	18.78	18.10	23.84	2.07	2.03	1.02	0.04	387	-405	93.8	1.0	2	4.99	1.91
6.5	13	3	-37	20	34	-12	26	388	-373	0.7	88	19.24	18.11	18.66	17.96	23.44	2.00	2.01	0.59	-0.01	422	-385	93.5	1.0	1	4.99	0.13
7.0	13	3	-37	20	34	-12	26	388	-373	0.7	88	19.24	18.11	18.66	17.96	23.44	2.00	2.01	0.59	-0.01	422	-385	93.5	1.0	1	4.99	0.13
7.5	140	-45	-109	16	172	-53	106	397	-339	0.8	215	20.76	18.81	20.88	19.12	23.57	2.04	2.10	-0.11	-0.06	569	-392	85.1	1.0	-2	4.99	0.11
8.0	163	-80	-91	10	216	-58	132	398	-423	1.6	10	22.15	18.61	22.59	18.96	23.86	1.91	1.95	-0.44	-0.04	614	-480	71.2	0.2	-2	1.00	0.77
8.5	60	-14	-52	8	148	-29	140	396	-456	1.7	30	22.39	18.87	22.59	19.09	24.00	1.95	1.98	-0.19	-0.03	544	-485	72.2	-0.2	-1	-1.00	0.40
9.0	95	-30	-69	5	170	-33	157	399	-448	1.6	34	22.88	19.03	23.17	19.32	24.17	1.95	1.99	-0.28	-0.04	569	-482	70.0	0.2	-1	1.00	0.46
9.5	189	-94	-97	4	318	-62	203	389	-409	1.3	23	23.32	19.49	23.87	19.88	24.33	2.01	2.06	-0.54	-0.05	707	-470	69.5	-0.2	-2	-1.00	0.77
10.0	457	-252	-200	0	638	-123	245	402	-446	1.4	65	25.31	20.33	26.66	21.09	24.83	2.06	2.13	-1.34	-0.07	1040	-568	61.1	0.2	-5	1.00	1.18
10.5	475	-240	-219	-12	679	-123	122	397	-561	1.9	40	27.01	20.26	28.21	20.95	25.61	1.93	2.00	-1.18	-0.07	1076	-684	52.2	-0.2	-4	-1.00	1.13
11.0	524	-252	-250	-18	743	-130	125	402	-569	3.0	50	27.59	20.13	28.80	20.87	26.08	1.86	1.94	-1.19	-0.08	1145	-699	49.0	0.2	-4	1.00	1.10
11.5	553	-383	-146	-21	797	-136	126	389	-578	3.2	50	27.93	20.39	29.10	21.21	26.37	1.90	2.00	-1.15	-0.10	1185	-714	49.5	0.0	-4	0.00	-2.77
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TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	9	-5	-5	0.8	14.0	-2.8	5.4	33.9	-37.2												47.9	-40.1		0.0	0.0	0.21	
DSUM	13	-7	-6	0.0	19.1	-3.7	7.1	18.4	-21.5												37.6	-25.2		0.0	-0.1	0.04	
NSUM	-4	2	2	0.7	-5.1	0.9	-1.7	15.5	-15.8												10.4	-14.8		0.0	0.1	0.17	
TAVE										1.4	76	22.96	19.86	22.84	19.92	24.80	2.12	2.14	0.13	-0.02			78.1				-0.6
DAVE										1.9	41	24.97	19.75	25.82	20.29	24.92	1.9569	2.02	-0.83	-0.06			61.4				0.7
NAVE										0.6	46	10.88	9.83	10.61	9.76	12.25	1.0797	1.08	0.27	0.00			42.6				-0.5

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SYSTEM 1, JULY 21, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5																											
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7.5	70	-52	-125	23	177	-52	65	304	-393	1.2	137	18.28	17.21	18.61	16.90	21.07	1.89	1.81	-0.32	0.08	481	-445	84.5	-1.0	0	-5.01	-0.26
8.0	112	-154	-65	20	211	-52	112	333	-397	1.1	266	18.43	17.03	18.84	17.37	21.28	1.85	1.89	-0.40	-0.04	544	-450	86.7	0.2	-2	0.98	1.48
8.5	120	-160	-59	15	259	-57	177	302	-419	1.3	148	19.23	17.54	19.72	17.87	21.60	1.89	1.92	-0.48	-0.03	560	-476	83.8	-0.2	-3	-1.02	1.08
9.0	126	-157	-58	9	246	-51	157	350	-440	1.1	65	20.28	17.98	20.76	18.26	21.99	1.91	1.93	-0.47	-0.02	596	-491	78.9	0.2	-3	0.99	1.32
9.5	279	-233	-121	6	437	-88	238	244	-433	1.2	131	22.02	18.49	22.94	19.02	22.39	1.90	1.94	-0.91	-0.05	680	-521	69.4	-0.2	-4	-1.02	1.30
10.0	209	-171	-103	-1	319	-60	292	328	-499	1.1	109	23.68	18.70	23.77	19.15	22.88	1.86	1.91	-0.68	-0.05	647	-559	65.0	0.2	-4	0.99	1.00
10.5	415	-301	-163	-9	614	-109	384	241	-495	1.2	49	24.42	19.13	25.70	19.82	23.73	1.87	1.92	-1.27	-0.06	855	-605	58.3	-0.2	-6	-1.01	1.44
11.0	445	-300	-182	-15	652	-112	470	397	-541	1.3	91	25.16	18.84	26.43	19.57	24.34	1.76	1.82	-1.26	-0.06	1049	-653	52.9	0.2	-5	1.00	1.40
11.5	509	-350	-189	-21	693	-118	470	399	-614	1.4	100	25.87	19.17	27.42	19.99	24.99	1.78	1.85	-1.54	-0.07	1092	-732	50.5	-0.2	-5	-0.99	1.51
12.0	500	-356	-174	-21	759	-123	385	398	-555	1.3	314	26.09	19.49	27.48	20.19	25.43	1.83	1.83	-1.38	-0.05	1156	-678	51.3	0.2	-5	1.00	1.65
12.5	664	-465	-213	-33	945	-147	231	383	-622	1.8	135	26.86	19.80	28.71	20.67	26.27	1.84	1.90	-1.83	-0.06	1327	-769	48.4	-0.2	-7	-0.99	1.89
13.0	641	-422	-226	-40	906	-143	407	390	-630	2.0	182	27.28	19.72	29.04	20.60	26.91	1.80	1.87	-1.75	-0.07	1295	-773	46.5	0.2	-5	1.00	1.64
13.5	647	-423	-226	-42	916	-140	258	393	-657	1.7	113	27.64	19.67	29.43	20.57	27.54	1.76	1.84	-1.78	-0.07	1309	-796	44.7	-0.2	-5	-1.00	1.67
14.0	529	-319	-215	-41	770	-120	311	383	-626	1.5	60	27.57	19.51	29.13	20.39	27.87	1.73	1.82	-1.55	-0.08	1153	-746	45.0	0.2	-3	1.00	1.22
14.5	657	-415	-246	-39	951	-145	198	388	-641	1.9	72	28.40	19.97	30.20	20.89	28.36	1.77	1.85	-1.78	-0.08	1338	-786	43.2	-0.2	-4	-1.00	1.50
15.0	601	-376	-241	-27	891	-137	180	385	-657	2.1	81	28.75	20.24	30.34	21.09	28.54	1.81	1.89	-1.58	-0.08	1276	-794	43.6	0.2	-1	1.00	1.39
15.5	398	-240	-181	-24	606	-97	325	383	-625	1.9	59	28.41	20.61	29.58	21.30	28.50	1.91	1.98	-1.15	-0.07	989	-723	47.9	-0.2	1	-1.00	1.05
16.0	307	-180	-153	-23	433	-72	309	414	-604	2.3	81	28.21	20.48	29.11	21.09	28.44	1.90	1.97	-0.89	-0.07	847	-676	48.9	0.2	1	1.00	0.79
16.5	158	-96	-97	-17	244	-45	237	410	-531	2.2	79	27.44	20.36	27.86	20.77	28.08	1.92	1.98	-0.42	-0.06	654	-576	52.9	-0.2	3	-1.00	0.46
17.0	120	-83	-82	-12	217	-42	214	415	-482	2.1	78	27.03	20.65	27.33	20.99	27.73	2.01	2.06	-0.29	-0.05	632	-523	56.8	0.2	3	1.00	0.36
17.5	224	-133	-135	-9	412	-77	240	405	-470	2.4	85	27.78	20.65	28.35	21.11	27.66	1.96	2.02	-0.56	-0.06	817	-547	52.4	0.0	0	0.00	0.60
18.0	197	-154	-105	-8	392	-78	99	391	-491	2.2	64	27.96	20.43	28.56	20.84	27.51	1.90	1.95	-0.59	-0.05	784	-569	49.9	-0.2	1	-1.00	0.83
18.5	132	-105	-73	-6	311	-66	79	392	-501	2.5	57	27.59	20.52	28.07	20.87	27.27	1.95	1.99	-0.47	-0.04	703	-567	52.4	0.2	2	1.00	0.74
19.0	54	-72	-34	-4	219	-51	65	392	-469	1.6	73	27.06	20.61	27.37	20.89	26.99	2.00	2.04	-0.30	-0.04	611	-539	56.0	-0.2	3	-1.00	0.50
19.5	-19	-59	18	-2	128	-33	49	364	-475	1.4	75	26.22	20.69	26.29	20.89	26.69	2.07	2.11	-0.07	-0.04	492	-507	61.8	0.2	3	1.00	0.11
20.0	-21	-52	4	0	47	-12	29	360	-446	1.4	98	24.79	20.30	24.43	20.34	26.28	2.08	2.12	0.37	-0.03	407	-458	69.2	-0.3	6	-1.67	-0.82
20.5	-29	-30	-20	3	12	-3	13	377	-435	1.6	125	22.81	19.40	22.25	19.30	25.88	2.03	2.04	0.56	-0.02	388	-437	76.2	0.2	4	1.00	-2.34
21.0	-40	-31	-14	6	4	-3	8	376	-414	1.9	129	21.60	18.84	21.08	18.73	25.43	1.99	2.00	0.52	-0.01	379	-418	80.2	-0.2	4	-1.00	-3.20
21.5	-43	-46	-5	8	3	-3	6	374	-403	1.6	134	20.43	18.40	19.92	18.26	25.02	1.98	1.99	0.51	0.00	377	-406	85.4	0.2	3	1.00	-7.68
22.0	-27	-62	-6	10	4	-5	8	377	-398	1.4	143	20.58	18.43	20.12	18.32	24.68	1.98	1.99	0.47	-0.01	381	-402	84.4	-0.2	3	-1.00	-3.43
22.5	-35	-48	-12	11	3	-3	6	378	-399	1.4	135	20.24	18.07	19.77	17.97	24.38	1.93	1.94	0.48	-0.01	382	-402	84.2	0.2	3	1.00	-2.89
23.0	-33	-52	-8	11	4	-4	8	378	-395	1.4	147	20.76	18.22	20.26	18.11	24.12	1.92	1.94	0.51	-0.01	382	-399	81.5	-0.2	2	-1.00	-3.30
23.5	-40	-49	-8	12	3	-3	5	375	-402	1.2	136	20.07	17.96	19.54	17.83	23.91	1.92	1.93	0.54	-0.01	377	-405	84.9	0.3	2	1.66	-4.37
24.0	-21	-70	-4	12	4	-4	8	378	-394	1.5	148	20.34	17.90	19.86	17.79	23.77	1.89	1.90	0.48	-0.01	381	-398	81.9	-0.3	2	-1.67	-3.21

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	21	-16	-9	-0.7	34.1	-6.0	16.3	32.0	-43.6												66.1	-49.5		0.0	-0.1	0.00	
DSUM	15	-11	-6	-0.6	23.7	-4.1	11.2	17.1	-24.8												40.8	-28.9		0.0	-0.1	0.00	
NSUM	6	-6	-3	-0.1	10.5	-1.9	5.1	14.9	-18.8												25.3	-20.7		0.0	0.0	0.00	
TAVE										1.6	113	24.63	19.34	25.25	19.75	25.64	1.90	1.94	-0.61	-0.05			62.4				0.0
DAVE										1.7	103	25.77	19.66	26.64	20.19	26.07	1.8882	1.94	-0.86	-0.05			56.8				0.8
NAVE										0.3	32	4.18	3.75	4.11	3.73	4.97	0.4007	0.40	0.07	0.00			17.4				-0.7

SYSTEM 1, JULY 22, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-17	4	-2	12	3	-3	6	398	-399	1	143	20.42	17.95	20.06	17.91	23.64	1.89	1.91	0.37	-0.02	401	-402	81.4	0.2	1	0.99	-1.73
1.0	2	2	-2	11	4	-4	7	403	-408	1	198	20.56	18.16	20.34	18.16	23.55	1.93	1.94	0.23	-0.02	407	-412	81.5	-0.2	1	-1.00	-0.86
1.5	9	3	-3	10	3	-3	6	402	-410	1	237	20.38	18.21	19.98	18.24	23.44	1.95	1.98	0.41	-0.03	405	-413	84.8	0.2	1	0.99	-0.86
2.0	-10	4	-4	10	4	-4	7	401	-408	1.1	152	20.38	18.21	20.02	18.22	23.35	1.95	1.97	0.37	-0.03	405	-412	84.3	-0.2	1	-1.00	-0.96
2.5	-2	5	-4	10	3	-3	6	405	-408	1.8	107	20.72	18.32	20.50	18.32	23.28	1.95	1.96	0.23	-0.01	408	-412	81.3	0.2	1	1.00	-1.15
3.0	4	4	-3	9	5	-5	9	401	-410	1.9	107	20.71	18.34	20.51	18.33	23.20	1.95	1.96	0.20	-0.01	406	-415	81.3	-0.2	1	-1.00	-1.25
3.5	-10	6	-4	9	4	-4	7	402	-411	2.1	108	20.79	18.37	20.60	18.36	23.12	1.95	1.96	0.20	-0.01	406	-415	80.9	0.2	1	0.99	-1.29
4.0	-2	4	-3	9	4	-4	8	400	-411	1.8	111	20.73	18.37	20.55	18.36	23.04	1.96	1.97	0.20	-0.01	405	-415	81.3	-0.2	1	-1.00	-1.31
4.5	-15	3	-2	9	3	-3	6	401	-411	1.6	144	20.66	18.35	20.47	18.33	22.96	1.96	1.97	0.20	-0.01	405	-415	81.7	0.2	1	0.99	-1.44
5.0	-7	3	-2	9	4	-4	8	398	-411	1.4	142	20.36	18.35	20.17	18.32	22.88	1.98	1.98	0.20	-0.01	402	-415	84.0	-0.2	1	-1.00	-1.73
5.5	-18	3	-2	9	3	-3	6	397	-409	1.4	132	20.00	18.31	19.81	18.28	22.80	1.99	2.00	0.20	-0.01	400	-413	86.5	0.2	1	0.99	-1.71
6.0	-17	3	-2	10	4	-4	8	399	-406	1.5	133	20.00	18.26	19.82	18.25	22.72	1.98	1.99	0.19	-0.01	403	-411	86.2	-0.2	1	-1.00	-1.51
6.5	-6	2	-2	9	15	-6	18	398	-404	1.4	135	20.02	18.27	19.85	18.27	22.60	1.98	1.99	0.18	-0.01	413	-411	86.1	-0.2	0	-1.00	-1.09
7.0	-6	2	-2	9	15	-6	18	398	-404	1.4	135	20.02	18.27	19.85	18.27	22.60	1.98	1.99	0.18	-0.01	413	-411	86.1	-0.2	0	-1.00	-1.09
7.5	8	16	-33	9	40	-11	40	399	-403	1.6	135	20.48	18.48	20.38	18.51	22.59	1.99	2.01	0.10	-0.01	439	-414	83.8	0.0	0	0.00	-0.56
8.0	36	4	-46	7	85	-20	81	400	-406	2.1	138	21.31	18.69	21.30	18.77	22.67	1.98	2.00	0.02	-0.02	486	-426	78.9	0.2	-1	1.00	-0.08
8.5	83	-24	-62	5	161	-34	143	394	-409	1.7	129	22.12	19.04	22.26	19.20	22.80	2.00	2.02	-0.13	-0.02	555	-442	75.2	-0.2	-1	-1.00	0.38
9.0	237	-116	-120	1	372	-83	159	332	-382	1.7	121	23.67	19.63	24.23	19.99	23.10	2.02	2.06	-0.56	-0.04	753	-466	68.0	0.2	-3	1.00	0.95
9.5	296	-145	-146	-2	445	-92	137	375	-447	2.7	118	24.88	19.93	25.60	20.38	23.46	2.00	2.05	-0.70	-0.05	820	-540	62.4	-0.2	-3	-1.00	0.99
10.0	414	-215	-189	-6	600	-116	148	380	-471	2.4	129	25.95	20.46	26.90	21.00	23.88	2.04	2.10	-0.94	-0.05	980	-587	59.1	0.2	-4	1.00	1.14
10.5	472	-245	-208	-14	670	-119	131	389	-534	2.3	130	27.04	20.87	28.10	21.46	24.63	2.06	2.12	-1.05	-0.06	1059	-653	55.7	-0.2	-5	-1.00	1.18
11.0	529	-265	-238	-21	747	-127	138	393	-557	2.4	128	27.80	21.10	29.00	21.78	25.21	2.06	2.13	-1.19	-0.07	1140	-683	53.2	0.2	-5	1.00	1.11
11.5	576	-270	-273	-27	809	-133	145	393	-583	2.3	127	28.53	21.46	29.86	22.24	25.87	2.09	2.18	-1.31	-0.09	1201	-716	51.7	-0.2	-6	-1.00	0.99
12.0	605	-285	-276	-36	859	-135	148	391	-608	1.8	135	29.30	21.71	30.53	22.41	26.86	2.09	2.17	-1.22	-0.08	1250	-743	49.7	0.2	-9	1.00	1.03
12.5	625	-293	-282	-44	891	-136	143	395	-632	2.0	130	29.64	21.90	31.12	22.73	27.68	2.11	2.21	-1.46	-0.09	1285	-767	48.8	-0.2	-6	-1.00	1.04
13.0	646	-293	-301	-47	916	-138	143	396	-644	2.3	141	30.29	21.83	31.72	22.66	28.29	2.05	2.15	-1.42	-0.10	1312	-782	46.0	0.2	-5	1.00	0.98
13.5	646	-299	-294	-48	924	-137	156	401	-650	1.8	126	30.74	22.22	32.14	23.01	28.85	2.11	2.20	-1.40	-0.09	1325	-787	46.0	-0.2	-5	-1.00	1.02
14.0	630	-239	-287	-50	900	-133	166	400	-656	2.7	117	30.93	22.50	32.34	23.29	29.35	2.17	2.26	-1.39	-0.09	1300	-789	46.6	0.2	-4	1.00	1.01
14.5	612	-275	-290	-45	889	-134	184	402	-633	2.5	122	31.18	22.44	32.41	23.15	29.68	2.13	2.22	-1.23	-0.09	1291	-767	45.6	-0.2	-2	-1.00	0.95
15.0	548	-240	-277	-32	770	-118	207	413	-664	2.7	123	31.35	22.89	32.46	23.55	29.78	2.23	2.31	-1.10	-0.08	1182	-782	47.4	0.2	0	1.00	0.86
15.5	537	-238	-270	-28	819	-129	193	417	-610	2.3	120	31.31	23.11	32.47	23.80	29.79	2.28	2.37	-1.15	-0.09	1236	-739	48.6	-0.2	-1	-1.00	0.88
16.0	502	-222	-250	-29	722	-114	195	404	-640	2.9	119	31.43	23.26	32.41	23.83	29.89	2.31	2.38	-0.97	-0.07	1126	-755	49.0	0.2	0	1.00	0.88
16.5	427	-161	-240	-26	691	-111	175	411	-593	2.5	124	31.45	23.25	32.31	23.84	29.89	2.31	2.39	-0.85	-0.08	1102	-704	49.4	-0.2	0	-1.00	0.67
17.0	342	-137	-182	-24	575	-96	172	405	-571	2.9	123	31.11	23.16	31.82	23.62	29.84	2.31	2.37	-0.70	-0.06	980	-686	50.4	0.2	1	1.00	0.75
17.5	249	-79	-152	-20	437	-76	165	413	-573	2.6	125	30.82	23.14	31.29	23.52	29.64	2.32	2.38	-0.46	-0.06	850	-649	52.2	0.0	2	0.00	0.51
18.0	172	-39	-119	-18	311	-57	152	413	-546	2.3	125	30.24	23.08	30.50	23.37	29.31	2.35	2.40	-0.25	-0.05	724	-603	55.0	-0.2	3	-1.00	0.31
18.5	111	-18	-83	-13	251	-51	121	417	-502	2.8	120	29.76	23.05	29.91	23.26	28.91	2.37	2.41	-0.14	-0.04	668	-554	57.1	0.2	3	1.00	0.21
19.0	43	4	-41	-10	152	-34	87	411	-494	2.4	125	28.97	22.84	28.94	22.96	28.50	2.37	2.41	0.05	-0.03	563	-528	60.3	-0.2	4	-1.00	-0.11
19.5	8	5	-13	-7	76	-15	61	409	-486	2.1	120	28.10	22.79	27.94	22.85	28.08	2.42	2.45	0.17	-0.02	485	-501	64.9	0.2	4	0.99	-0.52
20.0	-13	5	-7	-4	50	-13	42	407	-453	1.9	121	27.17	22.57	26.98	22.59	27.68	2.43	2.45	0.21	-0.02	457	-467	68.8	-0.2	3	-1.00	-0.81
20.5	-25	48	-29	-2	13	-3	14	412	-452	2.0	118	26.13	22.23	25.84	22.20	27.28	2.42	2.43	0.30	-0.01	425	-456	73.2	0.2	3	0.99	-1.72
21.0	-32	43	-15	0	3	-2	5	407	-439	1.6	121	25.03	21.86	24.67	21.79	26.87	2.41	2.42	0.37	-0.01	409	-441	77.9	-0.2	4	-1.00	-2.98
21.5	-40	59	-24	2	2	-2	4	418	-434	2.1	122	25.15	21.81	24.84	21.76	26.52	2.39	2.40	0.32	-0.01	419	-436	76.5	0.2	3	0.99	-2.49
22.0	-38	43	-22	3	2	-3	5	420	-433	2.7	127	25.43	21.70	25.19	21.67	26.23	2.35	2.36	0.25	-0.01	423	-436	73.6	-0.2	2	-1.00	-2.04
22.5	-37	42	-19	3	1	-2	4	409	-432	2.2	141	25.18	21.56	24.94	21.56	25.95	2.33	2.35	0.24	-0.01	410	-434	74.4	0.5	3	2.49	-1.97
23.0	-36	50	-20	4	2	-3	6	406	-430	2.1	161	24.77	21.64	24.57	21.60	25.72	2.38	2.38	0.22	-0.01	409	-433	77.2	-0.2	2	-1.00	-2.55
23.5	-36	43	-13	4	2	-2	4	402	-428	1.8	158	24.05	21.40	23.84	21.36	25.53	2.37	2.38	0.21	0.00	404	-431	80.5	0.3	2	1.66	-3.42
24.0	-34	41	-14	5	3	-3	7	400	-425	1.8	153	23.61	21.24	23.43	21.20	25.40	2.37	2.37	0.19	0.00	404	-429	82.2	-0.3	2	-1.67	-3.01

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	17	-7	-9	-0.7	26.3	-4.5	7.0	34.7	-42.1												61.0	-46.6		0.0	0.0	0.00	
DSUM	17	-7	-8	-0.9	25.3	-4.2	6.5	18.6	-25.3												43.9	-29.5		0.0	-0.1	0.00	
NSUM	0	0	-1	0.2	1.0	-0.3	0.5	16.1	-16.9												17.1	-17.1		0.0	0.1	0.00	
TAVE										2.0	132	25.45	20.70	25.75	20.95	25.80	2.14	2.18	-0.30	-0.04			67.6				-0.4
DAVE										2.3	125	28.64	21.98	29.37	22.46	27.45	2.2049	2.27	-0.73	-0.06			56.1				0.5
NAVE										1.1	92	14.38	12.77	14.23	12.77	15.84	1.3782	1.39	0.15	-0.01			54.5				-1.0

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SYSTEM 1, JULY 23, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-25	-33	39	-11	5	2	-2	5	398	-422	2	155	22.98	21.02	22.79	20.98	25.22	2.36	2.36	0.19	0.00	400	-425	85.2	0.2	1	1.00	-3.84
1.0	-26	-36	36	-6	6	3	-3	7	391	-417	1	145	22.25	20.64	22.02	20.59	25.00	2.33	2.33	0.23	0.00	394	-421	88.0	-0.2	2	-1.00	-6.84
1.5	-20	-32	25	0	6	2	-3	5	394	-412	2	145	21.70	20.47	21.46	20.40	24.77	2.33	2.33	0.24	0.00	396	-414	90.9	0.2	2	1.00	-3.43
2.0	-12	-28	31	-9	7	4	-4	8	396	-410	1.7	146	21.81	20.57	21.64	20.53	24.61	2.34	2.34	0.18	0.00	400	-414	90.6	-0.2	1	-1.00	-4.46
2.5	-23	-40	47	-12	7	3	-3	6	386	-409	2.0	146	21.76	20.37	21.57	20.32	24.44	2.30	2.30	0.20	0.00	389	-412	89.4	0.2	2	1.00	-4.17
3.0	-26	-42	35	-3	8	4	-4	9	381	-406	2.1	149	21.31	20.19	21.10	20.13	24.25	2.29	2.29	0.21	0.00	385	-411	91.6	-0.2	2	-1.00	-21.67
3.5	-19	-39	33	-9	8	3	-4	7	386	-404	2.4	140	21.33	20.02	21.12	19.98	24.08	2.25	2.26	0.21	0.00	389	-408	90.2	0.2	1	0.99	-3.52
4.0	-25	-38	29	-2	9	4	-5	9	380	-405	1.3	140	20.76	19.70	20.53	19.64	23.91	2.22	2.23	0.23	0.00	385	-410	92.1	-0.2	1	-1.00	#######
4.5	-19	-37	26	0	9	3	-4	7	384	-401	1.8	149	20.58	19.64	20.38	19.58	23.76	2.22	2.22	0.21	0.00	387	-405	92.9	0.2	1	1.00	-26.48
5.0	-7	-28	20	-5	9	5	-6	11	394	-400	1.9	140	20.74	19.86	20.58	19.82	23.65	2.26	2.26	0.17	0.00	400	-406	93.4	-0.2	1	-1.00	-1.37
5.5	-10	-28	7	-3	9	5	-6	10	394	-405	2.1	144	21.31	20.09	21.15	20.06	23.57	2.27	2.27	0.17	-0.01	399	-410	90.7	0.2	1	1.00	-2.21
6.0	-12	-27	31	-13	8	5	-6	11	397	-408	2.4	145	21.41	20.15	21.25	20.12	23.49	2.28	2.28	0.17	0.00	402	-414	90.3	-0.2	1	-1.00	-2.41
6.5	-5	-22	20	-11	8	23	-9	25	388	-407	2.2	149	21.69	20.15	21.56	20.13	23.37	2.26	2.26	0.14	-0.01	412	-416	87.9	-0.2	1	-1.00	-1.86
7.0	-5	-22	20	-11	8	23	-9	25	388	-407	2.2	149	21.69	20.15	21.56	20.13	23.37	2.26	2.26	0.14	-0.01	412	-416	87.9	-0.2	1	-1.00	-1.86
7.5	75	29	-33	-46	7	98	-36	53	392	-370	2.3	152	22.43	20.51	22.47	20.57	23.36	2.28	2.29	-0.03	-0.01	490	-405	84.4	0.0	0	0.00	0.07
8.0	142	90	-70	-59	5	193	-57	72	397	-385	2.3	163	23.94	21.20	24.18	21.33	23.52	2.33	2.35	-0.23	-0.01	589	-442	77.9	0.2	-2	1.00	1.19
8.5	197	160	-105	-80	2	265	-72	90	400	-411	2.3	162	25.32	21.93	25.71	22.13	23.78	2.41	2.43	-0.38	-0.02	686	-484	73.5	-0.2	-2	-1.00	1.34
9.0	249	230	-124	-116	0	374	-84	110	406	-441	1.9	181	26.73	22.74	27.22	22.99	24.12	2.50	2.53	-0.48	-0.03	780	-525	70.0	0.2	-3	1.00	1.23
9.5	292	307	-154	-147	-4	461	-94	130	409	-481	2.2	196	27.73	23.20	28.33	23.53	24.53	2.54	2.58	-0.59	-0.04	870	-575	67.0	-0.2	-4	-1.00	1.05
10.0	339	379	-179	-180	-8	550	-104	148	412	-514	1.8	203	28.81	23.64	29.44	23.99	24.98	2.58	2.62	-0.62	-0.04	962	-618	63.7	0.2	-4	1.00	0.99
10.5	402	473	-209	-221	-15	657	-115	162	425	-562	1.9	221	30.36	24.19	31.08	24.59	25.75	2.61	2.66	-0.71	-0.05	1083	-677	58.9	-0.2	-5	-1.00	0.95
11.0	433	530	-212	-258	-21	721	-121	173	432	-595	1.9	216	31.34	24.51	32.08	24.94	26.31	2.62	2.68	-0.73	-0.06	1153	-716	56.1	0.2	-5	1.00	0.82
11.5	465	582	-233	-277	-27	785	-127	176	432	-621	2.3	230	32.29	24.65	33.06	25.10	26.97	2.59	2.66	-0.77	-0.06	1216	-748	52.6	-0.2	-6	-1.00	0.84
12.0	492	622	-242	-296	-36	835	-132	176	433	-641	1.9	221	33.17	25.00	33.99	25.47	27.76	2.62	2.69	-0.81	-0.07	1268	-773	50.6	0.2	-7	1.00	0.82
12.5	504	645	-230	-313	-42	871	-135	182	431	-660	2.1	200	33.65	25.13	34.42	25.59	28.54	2.62	2.69	-0.76	-0.07	1301	-795	49.5	-0.2	-7	-1.00	0.74
13.0	518	671	-232	-330	-46	897	-138	221	434	-667	2.2	191	34.17	25.14	34.87	25.58	29.19	2.59	2.66	-0.70	-0.07	1331	-805	47.6	0.2	-5	1.00	0.70
13.5	297	457	-134	-250	-43	647	-102	253	428	-667	2.3	201	33.67	24.89	34.13	25.24	29.53	2.56	2.62	-0.45	-0.06	1074	-768	48.9	-0.2	-2	-1.00	0.53
14.0	572	633	-205	-322	-40	870	-136	269	451	-638	2.3	187	34.70	25.03	35.36	25.48	29.96	2.53	2.60	-0.65	-0.07	1320	-773	45.3	0.2	-5	1.00	0.63
14.5	458	625	-215	-304	-41	830	-130	236	429	-662	2.7	167	34.66	25.14	35.30	25.54	30.32	2.56	2.62	-0.64	-0.06	1259	-792	45.8	-0.2	-2	-1.00	0.70
15.0	369	578	-193	-293	-31	712	-111	223	435	-674	2.9	178	34.50	25.16	35.06	25.52	30.41	2.58	2.63	-0.55	-0.06	1147	-785	46.7	0.2	0	0.99	0.66
15.5	436	481	-165	-256	-29	748	-122	243	448	-632	2.5	178	34.67	25.32	35.27	25.71	30.45	2.60	2.67	-0.59	-0.06	1196	-754	46.7	-0.2	-1	-1.00	0.65
16.0	397	400	-150	-239	-28	703	-115	197	433	-635	2.3	175	34.51	24.99	35.00	25.32	30.50	2.53	2.58	-0.49	-0.05	1136	-750	46.0	0.2	0	0.99	0.63
16.5	340	433	-123	-229	-26	644	-107	180	426	-631	2.7	170	34.44	25.04	34.89	25.38	30.50	2.55	2.61	-0.44	-0.06	1070	-738	46.6	-0.2	0	-1.00	0.54
17.0	320	396	-108	-209	-24	591	-101	158	434	-607	2.2	175	34.30	24.73	34.72	25.05	30.53	2.48	2.53	-0.41	-0.05	1025	-708	45.8	0.2	0	0.99	0.52
17.5	184	268	-62	-147	-21	402	-71	180	435	-588	2.4	172	33.49	24.65	33.71	24.85	30.31	2.52	2.55	-0.21	-0.03	837	-658	48.7	0.0	2	0.00	0.42
18.0	178	208	-42	-117	-17	361	-71	132	437	-559	2.6	162	33.10	24.61	33.32	24.83	30.05	2.53	2.57	-0.22	-0.04	797	-631	50.2	-0.2	2	-1.00	0.35
18.5	122	148	-18	-88	-14	278	-60	102	432	-536	2.6	165	32.62	24.49	32.72	24.64	29.71	2.53	2.56	-0.09	-0.03	710	-596	51.8	0.2	3	0.99	0.19
19.0	74	75	-1	-41	-11	199	-49	75	428	-506	2.2	163	31.80	24.33	31.81	24.43	29.33	2.55	2.57	0.00	-0.02	627	-555	54.6	-0.2	3	-1.00	0.01
19.5	16	17	-3	8	-8	121	-32	63	414	-494	2.5	158	31.18	24.17	31.12	24.23	28.95	2.55	2.57	0.08	-0.02	535	-526	56.8	0.2	3	1.00	-0.28
20.0	-30	-26	-10	35	-6	49	-15	34	408	-475	2.4	162	30.25	24.34	30.10	24.35	28.58	2.65	2.66	0.16	-0.01	457	-489	62.4	-0.2	3	-1.00	-1.02
20.5	-37	-39	68	-35	-4	9	-3	11	423	-466	2.4	162	29.33	24.03	29.11	24.00	28.18	2.64	2.64	0.23	-0.01	432	-469	65.6	0.2	3	0.99	-1.99
21.0	-38	-41	53	-15	-2	2	-2	4	423	-461	2.1	155	28.26	23.75	28.00	23.70	27.79	2.64	2.64	0.27	-0.01	425	-463	70.0	-0.2	3	-1.00	-3.62
21.5	-27	-40	81	-26	0	1	-2	3	436	-461	2.3	160	27.99	23.67	27.74	23.62	27.45	2.64	2.64	0.25	-0.01	438	-463	71.0	0.2	3	0.99	-3.05
22.0	-27	-40	36	-12	0	2	-3	5	427	-454	2.3	157	27.57	23.65	27.34	23.61	27.16	2.66	2.67	0.25	-0.01	430	-457	73.3	-0.2	2	-1.00	-2.92
22.5	-28	-40	69	-20	1	2	-2	4	431	-459	2.2	155	27.11	23.55	26.89	23.51	26.91	2.67	2.67	0.23	0.00	433	-461	75.5	0.2	2	0.99	-3.27
23.0	-28	-40	68	-27	2	3	-3	6	422	-449	1.8	154	26.70	23.02	26.48	22.98	26.66	2.57	2.57	0.23	-0.01	425	-452	74.4	-0.2	2	-1.00	-2.97
23.5	-26	-39	82	-38	2	2	-2	4	421	-447	2.0	153	26.38	22.64	26.15	22.61	26.46	2.50	2.51	0.23	-0.01	423	-449	74.0	0.3	2	1.66	-2.22
24.0	-25	-38	51	-22	3	3	-4	7	420	-443	1.9	151	26.14	22.46	25.92	22.42	26.32	2.47	2.48	0.23	-0.01	422	-447	74.1	-0.3	2	-1.67	-2.31

TIME	Q	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	13.6	16	-5	-9	-0.8	25.7	-4.6	7.7	35.8	-43.3												61.5	-47.9		0.0	0.0	0.00	
DSUM	14.1	18	-6	-9	-0.9	24.8	-4.4	7.2	19.7	-26.1												44.5	-30.5		0.0	-0.1	0.00	
NSUM	-0.5	-1	2	0	0.2	0.9	-0.3	0.5	16.1	-17.2												17.0	-17.4		0.0	0.1	0.00	
TAVE											2.2	168	27.91	22.89	28.07	23.04	26.71	2.47	2.50	-0.15	-0.03			68.4				-5.8
DAVE											2.3	183	31.87	24.40	32.29	24.69	28.29	2.5621	2.61	-0.42	-0.04			54.6				0.4
NAVE											1.4	100	15.51	14.15	15.39	14.13	16.64	1.5916	1.59	0.12	0.00			57.4				-10.4

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 1, JULY 24, 1986, DATA FROM ...

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-54	89	-39	3	2	-2	5	429	-452	3	153	26.04	22.33	25.83	22.29	26.15	2.45	2.46	0.22	-0.01	431	-454	73.8	0.2	1	0.99	-2.30
1.0	-40	59	-25	3	2	-3	6	426	-445	3	157	26.01	22.31	25.81	22.28	25.95	2.45	2.45	0.20	-0.01	428	-448	73.8	-0.2	2	-1.00	-2.44
1.5	-49	70	-26	4	2	-2	4	432	-453	3	159	25.86	22.43	25.70	22.41	25.79	2.49	2.49	0.17	0.00	434	-455	75.5	0.2	1	0.99	-2.68
2.0	-39	57	-22	4	3	-4	7	417	-438	2.5	160	25.70	22.42	25.51	22.39	25.64	2.49	2.50	0.20	-0.01	420	-441	76.5	-0.2	1	-1.00	-2.58
2.5	-31	42	-16	4	2	-3	6	411	-432	2.6	159	25.64	22.39	25.46	22.36	25.50	2.49	2.50	0.19	0.00	413	-435	76.7	0.2	1	0.99	-2.63
3.0	-23	37	-18	4	4	-5	9	419	-430	2.7	161	25.93	22.45	25.76	22.42	25.38	2.48	2.49	0.18	-0.01	423	-435	75.2	-0.2	1	-1.00	-2.26
3.5	-29	49	-24	4	3	-4	7	418	-434	2.5	165	26.11	22.49	25.94	22.46	25.29	2.48	2.49	0.18	-0.01	421	-438	74.3	0.2	1	0.99	-2.10
4.0	-34	58	-28	4	4	-5	8	416	-435	2.7	174	26.58	22.49	26.40	22.46	25.20	2.45	2.46	0.20	-0.01	419	-439	71.4	-0.2	1	-1.00	-2.12
4.5	-31	45	-18	4	2	-3	5	415	-438	2.4	183	26.54	22.48	26.34	22.45	25.11	2.45	2.46	0.20	-0.01	418	-441	71.7	0.2	1	0.99	-2.48
5.0	-34	47	-17	4	3	-3	6	412	-437	1.8	182	26.19	22.35	25.99	22.31	25.01	2.44	2.45	0.22	-0.01	416	-441	73.0	-0.2	1	-1.00	-2.56
5.5	-31	43	-17	4	2	-3	5	411	-435	1.9	188	26.14	22.18	25.91	22.14	24.91	2.41	2.42	0.24	-0.01	413	-438	72.3	0.2	1	0.99	-2.50
6.0	-22	26	-10	4	3	-4	7	411	-433	2.0	190	26.06	22.06	25.82	22.02	24.81	2.39	2.39	0.25	-0.01	414	-437	72.0	-0.2	1	-1.00	-2.84
6.5	-25	42	-22	4	20	-7	20	405	-430	1.6	176	25.66	21.88	25.44	21.85	24.63	2.37	2.38	0.23	-0.01	425	-436	73.2	-0.2	1	-1.00	-1.89
7.0	-25	42	-22	4	20	-7	20	405	-430	1.6	176	25.66	21.88	25.44	21.85	24.63	2.37	2.38	0.23	-0.01	425	-436	73.2	-0.2	1	-1.00	-1.89
7.5	21	35	-61	4	69	-22	42	406	-410	1.9	183	26.06	21.88	25.91	21.90	24.59	2.35	2.36	0.16	-0.01	475	-432	70.6	0.0	0	0.00	-0.89
8.0	117	-14	-105	3	180	-52	64	416	-399	2.1	189	27.41	22.22	27.46	22.33	24.70	2.34	2.36	-0.04	-0.02	596	-451	64.4	0.2	-1	0.99	0.12
8.5	187	-30	-149	1	281	-68	82	418	-437	1.8	198	28.38	22.72	28.60	23.19	24.92	2.39	2.48	-0.20	-0.10	699	-505	63.4	-0.2	-2	-1.00	-0.01
9.0	246	-85	-157	-2	374	-81	98	420	-471	2.2	209	29.36	22.99	29.65	23.22	25.21	2.38	2.42	-0.28	-0.04	794	-553	58.2	0.2	-3	0.99	0.54
9.5	314	-118	-189	-4	467	-94	117	422	-499	2.1	199	30.36	23.39	30.71	23.64	25.54	2.41	2.45	-0.34	-0.04	888	-593	55.5	-0.2	-3	-1.00	0.62
10.0	373	-132	-230	-8	553	-103	133	426	-533	2.3	201	31.48	23.80	31.90	24.11	25.94	2.44	2.49	-0.41	-0.05	980	-635	52.6	0.2	-4	0.99	0.58
10.5	454	-170	-265	-15	657	-114	156	436	-576	2.5	195	32.94	24.34	33.47	24.70	26.65	2.47	2.53	-0.52	-0.05	1093	-690	49.0	-0.2	-5	-1.00	0.64
11.0	510	-189	-295	-20	726	-121	159	441	-602	2.7	188	33.98	24.69	34.56	25.07	27.21	2.49	2.55	-0.57	-0.06	1167	-723	46.5	0.2	-5	1.00	0.64
11.5	551	-196	-323	-27	794	-130	161	436	-628	2.6	186	34.79	24.85	35.39	25.27	27.86	2.48	2.54	-0.59	-0.07	1230	-758	44.3	-0.2	-6	-1.00	0.61
12.0	586	-214	-331	-35	845	-133	155	434	-647	3.0	191	35.53	25.16	36.14	25.56	28.59	2.51	2.57	-0.61	-0.06	1279	-781	42.9	0.2	-6	0.99	0.65
12.5	609	-217	-344	-41	879	-137	153	435	-664	3.3	180	36.17	25.45	36.74	25.83	29.32	2.54	2.60	-0.57	-0.06	1314	-800	42.0	-0.2	-6	-1.00	0.63
13.0	625	-204	-370	-45	901	-138	144	438	-674	2.9	194	36.81	25.65	37.31	26.01	29.96	2.55	2.61	-0.50	-0.06	1339	-812	40.9	0.2	-5	0.99	0.56
13.5	622	-79	-493	-45	908	-138	140	441	-684	2.7	191	37.27	25.73	37.47	26.10	30.52	2.54	2.62	-0.20	-0.08	1348	-822	40.7	-0.2	-5	-1.00	0.17
14.0	609	-7	-551	-47	901	-137	136	444	-687	3.1	193	37.46	25.90	37.49	26.26	31.06	2.57	2.66	-0.02	-0.09	1345	-825	41.3	0.2	-4	0.99	0.01
14.5	585	4	-543	-44	878	-135	135	445	-690	2.9	182	37.49	26.05	37.49	26.38	31.42	2.61	2.70	0.01	-0.09	1323	-825	41.9	-0.2	-2	-1.00	-0.01
15.0	555	4	-528	-32	846	-133	131	446	-685	2.8	180	37.49	26.03	37.49	26.34	31.47	2.60	2.69	0.01	-0.08	1292	--818	41.7	0.2	0	0.99	-0.01
15.5	514	4	-487	-31	799	-129	129	446	-678	3.3	180	37.49	25.98	37.49	26.29	31.50	2.59	2.67	0.01	-0.08	1245	-806	41.5	-0.2	0	-1.00	-0.01
16.0	456	3	-429	-30	735	-119	136	454	-670	2.6	183	37.49	26.17	37.49	26.47	31.57	2.64	2.72	0.01	-0.08	1189	-789	42.2	0.2	0	0.99	-0.01
16.5	276	-7	-244	-27	457	-77	183	467	-668	2.5	171	37.16	26.03	37.20	26.27	31.44	2.62	2.69	-0.03	-0.06	934	-745	42.3	-0.2	2	-1.00	0.04
17.0	213	-4	-188	-23	367	-62	192	450	-617	2.7	175	36.70	25.76	36.72	25.94	31.21	2.58	2.63	-0.01	-0.05	816	-679	42.5	0.2	2	0.99	0.01
17.5	247	-34	-194	-19	459	-85	156	473	-559	2.5	174	37.04	25.84	37.17	26.04	31.04	2.58	2.63	-0.12	-0.04	932	-644	41.5	0.0	1	0.00	0.18
18.0	197	-25	-157	-17	389	-78	96	455	-574	3.4	174	36.69	25.66	36.77	25.80	30.81	2.56	2.59	-0.07	-0.03	843	-653	41.8	-0.2	2	-1.00	0.15
18.5	122	-1	-109	-15	295	-63	80	452	-559	2.6	169	36.07	25.51	36.08	25.64	30.50	2.56	2.60	0.00	-0.03	747	-622	43.5	0.2	3	0.99	0.00
19.0	49	9	-49	-12	207	-49	64	448	-539	2.5	166	35.34	25.28	35.27	25.38	30.15	2.55	2.58	0.09	-0.03	655	-588	45.2	-0.2	3	-1.00	-0.21
19.5	-22	8	-8	-9	47	-9	29	434	-545	2.3	168	33.83	24.85	33.58	24.85	29.73	2.54	2.56	0.26	-0.02	481	-554	49.2	0.2	4	0.99	-1.08
20.0	-43	12	-9	-6	43	-16	29	420	-473	2.8	163	33.25	24.30	33.00	24.29	29.29	2.44	2.46	0.26	-0.01	463	-488	48.8	-0.2	4	-1.00	-1.37
20.5	-39	9	-4	-4	7	-2	8	438	-482	2.4	160	32.31	23.90	32.02	23.87	28.87	2.41	2.42	0.30	-0.01	445	-485	50.8	0.2	4	0.99	-1.97
21.0	-22	14	-8	-2	1	-2	3	460	-486	3.0	161	32.10	23.56	31.83	23.53	28.51	2.34	2.35	0.28	-0.01	462	-487	49.9	-0.2	3	-1.00	-1.80
21.5	-8	10	-5	-1	1	-1	2	452	-480	2.6	163	31.36	23.63	31.14	23.60	28.21	2.40	2.41	0.23	-0.01	454	-482	53.3	0.2	2	0.99	-2.22
22.0	-27	5	-2	-1	1	-1	3	452	-482	1.9	194	30.64	23.81	30.40	23.78	27.95	2.50	2.50	0.25	-0.01	453	-484	57.7	-0.2	2	-1.00	-2.51
22.5	-23	7	-3	-1	1	-1	3	452	-478	2.3	196	30.31	23.43	30.05	23.39	27.71	2.42	2.43	0.26	-0.01	453	-480	57.2	0.2	2	0.99	-3.71
23.0	-16	8	-4	0	1	-2	3	452	-472	2.2	235	30.08	22.99	29.83	22.95	27.46	2.34	2.34	0.26	-0.01	453	-474	55.8	-0.2	2	-1.00	-0.78
23.5	-15	7	-3	1	2	-2	3	446	-467	2.6	264	28.83	23.50	28.70	23.48	27.32	2.54	2.55	0.14	0.00	448	-468	64.6	0.3	1	1.66	-1.59
24.0	-19	8	-8	0	4	-3	6	421	-466	2.4	298	27.15	22.34	26.84	22.35	27.14	2.38	2.40	0.32	-0.02	425	-469	68.1	-0.3	3	-1.67	-0.93

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	16	-2	-13	-0.9	26.0	-4.6	6.0	37.4	-45.2												63.4	-49.8		0.0	0.0	0.00	
DSUM	16	-3	-12	-1.0	25.2	-4.3	5.6	20.4	-27.0												45.5	-31.4		0.0	-0.1	0.00	
NSUM	0	1	-1	0.1	0.8	-0.2	0.4	17.1	-18.2												17.9	-18.4		0.0	0.1	0.00	
TAVE										2.5	183	31.32	23.88	31.32	24.01	27.69	2.48	2.51	0.01	-0.03			56.6				-0.9
DAVE										2.7	183	34.77	24.98	34.94	25.23	29.19	2.5165	2.57	-0.16	-0.05			46.3				0.0
NAVE										1.6	124	18.27	15.18	18.14	15.17	17.38	1.6357	1.64	0.14	-0.01			46.5				-1.4

SYSTEM 7, JULY 20, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2	
0.5	-33	43	-23	9	0	0	5	0	0	2		24.52	21.25	24.09	21.19	25.72	2.31	2.32	0.44	-0.02	1	-5	77.5	0	4.43	1.03
1.0	-35	29	-10	9	0	0	4	0	0	2		23.88	21.04	23.34	20.93	25.57	2.30	2.32	0.55	-0.01	1	-7	80.8	0	6.19	-1.03
1.5	-35	31	-11	10	0	0	4	0	0	2		23.45	20.92	22.94	20.83	25.43	2.31	2.32	0.52	-0.01	1	-7	82.9	0	5.66	1.03
2.0	-28	25	-12	10	0	0	3	0	0	2.6		23.29	20.86	22.93	20.80	25.30	2.30	2.32	0.37	-0.01	-1	-7	82.8	0	4.60	-1.03
2.5	-28	36	-22	10	0	0	3	0	0	2.8		23.55	20.74	23.27	20.71	25.20	2.26	2.27	0.29	-0.01	0	-5	79.6	0	4.07	1.03
3.0	-36	35	-15	10	0	0	3	0	0	2.1		22.84	20.20	22.44	20.13	25.07	2.19	2.20	0.41	-0.01	2	-6	81.2	0	5.66	-1.03
3.5	-39	31	-9	11	0	0	2	0	0	1.7		22.23	19.87	21.69	19.75	24.91	2.16	2.17	0.55	-0.01	2	-8	83.8	0	6.37	1.03
4.0	-43	35	-10	12	0	0	2	0	0	2.2		21.66	19.58	21.17	19.47	24.76	2.14	2.15	0.49	-0.01	0	-8	85.5	0	6.19	-1.03
4.5		-38	19	13	0	0	2	0	0	1.5		21.25	19.24	20.72	19.10	24.59	2.10	2.10	0.54	-0.01	2	-9	86.1	0	6.72	1.03
5.0		-23	17	14	0	0	1	0	0	1.1		20.49	18.86	19.83	18.63	24.41	2.07	2.07	0.67	0.00	2	-9	89.4	0	7.43	-1.03
5.5		4	12	16	0	0	0	0	0	0.7		19.86	18.55	19.12	18.23	24.21	2.05	2.03	0.75	0.02	2	-8	91.9	0	8.32	1.03
6.0		2	18	17	0	0	0	0	0	0.7		19.26	18.15	18.11	17.56	24.01	2.01	1.97	1.16	0.04	1	-8	94.8	0	7.61	-1.03
6.5	-12	1	6	17	34	-12	13	0	0	0.7		18.78	17.80	18.43	17.75	23.70	1.97	1.99	0.37	-0.01	15	34	93.8	0	2.65	-1.03
7.0	-12	6	-2	17	34	-12	13	0	0	0.7		18.78	17.80	18.43	17.75	23.70	1.97	1.99	0.37	-0.01	15	34	93.8	0	2.65	-1.03
7.5	38	-15	-27	12	180	-59	74	0	0	1.1		20.67	18.80	21.00	19.16	23.82	2.05	2.10	-0.33	-0.05	64	197	84.5	0	-7.22	0.00
8.0	109	-50	-55	4	214	-60	78	0	0	2.7		22.15	18.64	22.69	19.01	24.10	1.92	1.95	-0.53	-0.04	71	269	70.9	0	-9.02	1.03
8.5	76	-20	-59	3	144	-25	37	0	0	2.3		22.13	18.73	22.30	18.94	24.17	1.93	1.97	-0.16	-0.03	22	161	73.1	0	-1.24	-1.03
9.0	100	-28	-73	3	166	-31	44	0	0	2.3		22.59	18.77	22.82	19.04	24.23	1.91	1.95	-0.22	-0.04	23	187	70.3	0	-2.48	1.03
9.5	170	-74	-92	2	322	-62	87	0	0	1.6		23.08	19.29	23.58	19.67	24.32	1.99	2.03	-0.49	-0.05	36	351	69.9	0	-6.02	-1.03
10.0	423	-204	-192	-5	641	-126	172	0	0	2.0		25.16	20.16	26.41	20.90	24.75	2.03	2.11	-1.24	-0.08	76	738	61.2	0	******	1.03
10.5	490	-244	-218	-14	710	-125	176	0	0	3.6		26.64	19.83	27.80	20.51	25.37	1.86	1.93	-1.14	-0.07	97	822	51.7	0	******	-1.03
11.0	552	-272	-251	-17	778	-131	186	0	0	4.0		27.11	19.48	28.23	20.16	25.68	1.76	1.83	-1.11	-0.07	92	882	47.7	0	******	1.03
11.5	608	-299	-278	-20	836	-135	194	0	0	4.6		27.61	19.02	28.68	19.68	25.97	1.63	1.70	-1.06	-0.07	95	938	43.2	0	******	-1.03
12.0	653	-312	-306	-21	879	-136	198	0	0	3.9		28.14	19.51	29.36	20.27	26.30	1.70	1.78	-1.21	-0.08	86	968	43.4	0	******	1.03
12.5	688	-325	-323	-26	913	-136	200	0	0	4.1		28.56	19.50	29.83	20.30	26.63	1.67	1.75	-1.27	-0.03	88	996	41.7	0	******	-1.03
13.0	712	-324	-350	-26	942	-137	202	0	0	4.7		28.87	18.77	29.96	19.50	26.95	1.50	1.58	-1.08	-0.08	91	1018	37.2	0	******	1.03
13.5	721	-347	-344	-24	950	-136	202	0	0	4.6		29.08	18.64	30.18	19.35	27.15	1.46	1.53	-1.09	-0.07	89	1023	35.7	0	-6.73	-1.03
14.0	630	-288	-317	-20	802	-114	171	0	0	4.4		29.04	18.88	30.00	19.53	27.27	1.51	1.58	-0.95	-0.07	74	888	37.2	0	-4.25	1.03
14.5	618	-257	-341	-17	793	-116	172	0	0	4.1		29.12	19.04	30.04	19.72	27.37	1.53	1.62	-0.91	-0.08	74	887	38.0	0	-2.66	-1.03
15.0	635	-269	-349	-14	858	-128	189	0	0	4.3		29.21	19.06	30.09	19.71	27.40	1.53	1.61	-0.87	-0.08	78	941	37.7	0	-1.95	1.03
15.5	591	-252	-325	-13	780	-117	173	0	0	4.2		29.30	19.32	30.21	19.97	27.43	1.58	1.66	-0.89	-0.08	74	828	38.6	0	-0.18	-1.03
16.0	501	-174	-319	-9	654	-103	151	0	0	4.3		29.29	19.44	29.91	19.99	27.38	1.61	1.68	-0.61	-0.07	69	753	39.8	0	1.77	1.03
16.5	445	-161	-279	-8	553	-87	129	0	0	4.5		29.18	19.30	29.77	19.80	27.34	1.58	1.65	-0.58	-0.07	67	669	39.4	0	3.72	-1.03
17.0	295	-70	-229	-5	440	-72	106	0	0	4.4		28.48	18.86	28.74	19.21	27.14	1.54	1.60	-0.25	-0.06	58	511	40.5	0	9.03	1.03
17.5	324	-83	-241	-2	429	-72	106	0	0	4.2		28.52	18.70	28.82	19.06	26.92	1.51	1.56	-0.29	-0.05	58	525	39.4	0	7.67	0.00
18.0	250	-56	-200	-1	344	-59	88	0	0	4.1		28.21	18.93	28.43	19.26	26.73	1.57	1.63	-0.21	-0.05	49	434	42.0	0	6.73	-1.03
18.5	76	25	-55	0	167	-27	43	0	0	3.7		27.00	18.64	26.89	18.67	26.48	1.59	1.61	0.12	-0.01	27	195	45.4	0	18.15	0.00
19.0	90	0	-3	2	159	-28	41	0	0	3.1		26.67	19.02	26.71	18.83	26.31	1.69	1.65	-0.04	0.04	24	190	47.1	0	9.03	1.03
19.5	0	-1	-61	3	48	-6	13	0	0	1.8		24.85	18.69	25.28	18.63	26.06	1.75	1.71	-0.42	0.04	9	53	53.1	0	11.51	-1.03
20.0	-13	-1	-81	6	47	-6	13	0	0	1.1		24.03	18.56	24.55	18.52	25.79	1.77	1.73	-0.51	0.04	8	50	56.2	0	9.20	1.03
20.5				8	5	0	4	0	0	2.4		23.06	18.09	23.66	18.17	25.54	1.75	1.72	-0.59	0.02	4	0	58.9	0	11.33	-1.03
21.0				11	0	0	3	0	0	1.4		21.53	17.41	22.33	17.56	25.24	1.72	1.69	-0.79	0.02	2	-9	62.7	0	12.04	1.03
21.5				12	0	0	3	0	0	1.4		21.34	17.23	21.88	17.26	25.00	1.69	1.66	-0.54	0.03	0	-7	63.4	0	7.79	-1.03
22.0	-28			12	0	-1	3	0	0	2.5		21.91	17.17	22.29	17.19	24.85	1.65	1.62	-0.37	0.02	0	-6	60.4	0	6.37	1.03
22.5	-47			13	0	0	2	0	0	1.5		20.75	16.72	21.41	16.85	24.63	1.64	1.62	-0.65	0.02	2	-9	63.5	0	9.91	-1.03
23.0	-53			16	0	0	0	0	0	0.9		19.20	16.12	20.11	16.36	24.34	1.63	1.61	-0.89	0.02	2	-12	68.6	0	11.68	1.03
23.5	-51			18	0	0	0	0	0	0.7		18.36	15.76	19.20	16.03	24.11	1.62	1.61	-0.82	0.01	3	-14	72.5	0	11.50	-1.72
24.0	-50			19	0	0	0	0	0	0.7		17.94	15.67	18.65	15.89	23.95	1.63	1.62	-0.71	0.01	2	-12	75.5	0	10.61	1.72

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2		mJ/m2		
TSUM	-2.5	0.0	-7.8	0.1	25.6	-4.2	6.2	0.0	0.0												3.1	28.6	5.4	0.0	0.14	
DSUM	17.9	-7.8	-9.1	-0.4	25.1	-4.1	5.9	0.0	0.0												2.9	28.4	2.3	0.0	-0.15	
NSUM	-20.4	7.7	1.4	0.5	0.5	-0.1	0.2	0.0	0.0												0.1	0.3	3.1	0.0	0.28	
TAVE										2.6		24.32	18.93	24.63	19.15	25.50	1.84	1.86	-0.31	-0.02						0.0
DAVE										3.5		26.84	19.04	27.56	19.49	26.21	1.6864	1.73	-0.71	-0.05						0.0
NAVE										1.0		14.26	12.59	14.15	12.55	16.56	1.3472	1.35	0.11	0.00						0.0

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 7, JULY 21, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg
0.5	-48	22	-2	20	0	0	1	0	0	1	
1.0	-50	20	-1	21	0	0	2	0	0	1	
1.5	-51	27	-5	22	0	0	3	0	0	1	
2.0	-48	18	0	22	0	0	0	0	0	0.7	
2.5	-46	13	1	23	0	0	0	0	0	0.8	
3.0	-45	11	2	24	0	0	0	0	0	0.9	
3.5	-38	5	1	24	0	0	0	0	0	0.7	
4.0	-36	6	2	23	0	0	0	0	0	0.7	
4.5	-40	8	3	23	0	0	0	0	0	0.7	
5.0	-38	5	2	24	0	0	0	0	0	0.7	
5.5	-37	5	1	24	0	0	0	0	0	0.7	
6.0	-36	5	1	24	0	0	0	0	0	0.7	
6.5	-36	5	-8	22	40	-23	25	0	0	0.8	
7.0	-36	5	-8	22	40	-23	25	0	0	0.8	
7.5	-13	-18	-51	16	114	-44	53	0	0	0.7	
8.0	70	-65	21	9	200	-50	63	0	0	1.2	
8.5	134	-69	-60	5	248	-50	66	0	0	1.2	
9.0	125	-63	-54	1	234	-44	60	0	0	0.9	
9.5	269	-137	-115	-2	424	-81	110	0	0	1.3	
10.0	214	-89	-107	-7	311	-53	74	0	0	1.1	
10.5	419	-204	-184	-13	593	-102	143	0	0	1.3	
11.0	464	-225	-205	-17	645	-108	152	0	0	1.6	
11.5	543	-268	-236	-22	685	-113	160	0	0	1.6	
12.0	528	-251	-239	-21	761	-120	172	0	0	1.9	
12.5	714	-362	-300	-30	940	-141	205	0	0	2.5	
13.0	689	-344	-302	-31	908	-138	201	0	0	2.7	
13.5	721	-372	-308	-28	924	-135	199	0	0	2.5	
14.0	586	-284	-272	-24	762	-114	168	0	0	2.3	
14.5	734	-383	-323	-22	947	-138	204	0	0	2.6	
15.0	688	-338	-324	-21	879	-129	192	0	0	2.8	
15.5	446	-201	-228	-18	583	-88	132	0	0	2.8	
16.0	350	-137	-203	-14	428	-67	102	0	0	3.0	
16.5	170	-46	-121	-10	238	-40	62	0	0	2.5	
17.0	132	-27	-105	-7	212	-37	58	0	0	2.6	
17.5	271	-83	-185	-6	397	-66	99	0	0	3.2	
18.0	256	-84	-177	-3	378	-64	95	0	0	3.6	
18.5	196	-49	-153	-1	297	-50	75	0	0	3.3	
19.0	118	-5	-121	0	204	-33	51	0	0	2.9	
19.5	19	20	-57	2	115	-14	27	0	0	1.9	
20.0	-28	30	-21	3	40	0	5	0	0	1.3	
20.5	-37	39	-16	5	7	0	3	0	0	1.8	
21.0	-43	31	-11	7	0	0	2	0	0	1.8	
21.5	-42	31	-7	9	0	0	3	0	0	1.8	
22.0	-40	33	-11	10	0	0	3	0	0	1.9	
22.5	-37	34	-14	10	0	0	3	0	0	1.7	
23.0	-39	45	-22	10	0	0	2	0	0	2.5	
23.5	-40	42	-19	10	0	0	2	0	0	2.0	
24.0	-39	44	-21	11	0	0	1	0	0	2.8	

TIME	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	17.66	15.50	16.80	15.21	23.75	1.62	1.62	0.87	0.00	2	-11	84.9	0	8	1.03	4.3
1.0	17.29	15.25	16.61	15.01	23.50	1.60	1.60	0.69	0.00	2	-12	84.8	0	10	-1.03	-12.4
1.5	18.12	15.47	17.29	15.22	23.29	1.58	1.59	0.83	-0.01	1	-14	80.7	0	8	1.03	-9.8
2.0	17.21	15.03	15.93	14.53	23.09	1.56	1.56	1.28	0.00	2	-13	86.3	0	9	-1.03	147.8
2.5	17.45	15.10	15.26	14.20	22.87	1.56	1.55	2.20	0.01	0	-13	89.4	0	9	1.03	14.6
3.0	16.63	14.74	14.63	13.85	22.64	1.55	1.53	2.01	0.02	0	-12	92.0	0	9	-1.03	7.1
3.5	15.97	14.50	14.69	13.88	22.44	1.55	1.53	1.29	0.02	0	-11	91.7	0	7	1.03	5.5
4.0	16.18	14.82	14.83	14.18	22.31	1.59	1.57	1.36	0.02	1	-9	93.4	0	5	-1.03	4.8
4.5	16.58	14.98	14.58	13.93	22.15	1.60	1.55	2.01	0.05	1	-9	93.3	0	7	1.03	2.7
5.0	16.07	14.66	14.53	13.85	21.97	1.57	1.54	1.55	0.04	1	-9	93.0	0	7	-1.03	2.9
5.5	15.87	14.22	13.97	13.35	21.81	1.51	1.49	1.89	0.02	0	-12	93.3	0	6	1.03	5.5
6.0	15.32	14.08	14.13	13.51	21.67	1.52	1.51	1.19	0.02	1	-10	93.5	0	5	-1.03	4.3
6.5	15.50	14.53	15.24	14.53	21.48	1.59	1.61	0.26	-0.02	31	55	92.8	0	0	-1.03	-0.2
7.0	15.50	14.53	15.24	14.53	21.48	1.59	1.61	0.26	-0.02	31	55	92.8	0	0	-1.03	-0.2
7.5	16.83	15.79	17.10	16.15	21.61	1.73	1.77	-0.26	-0.05	57	152	91.0	0	-6	0.00	0.4
8.0	18.98	17.40	19.54	17.77	21.88	1.90	1.92	-0.55	-0.02	51	233	84.4	0	-11	1.03	-0.2
8.5	19.49	17.64	20.13	18.05	22.12	1.89	1.93	-0.63	-0.04	36	280	82.1	0	-10	-1.03	1.1
9.0	20.37	18.00	20.96	18.37	22.37	1.91	1.94	-0.58	-0.03	28	259	78.2	0	-8	1.03	1.2
9.5	22.00	18.45	22.91	19.00	22.68	1.89	1.94	-0.90	-0.05	46	477	69.4	0	-15	-1.03	1.2
10.0	23.08	18.68	23.68	19.11	23.00	1.86	1.91	-0.59	-0.05	26	345	65.3	0	-11	1.03	0.8
10.5	24.27	18.91	25.37	19.58	23.53	1.83	1.90	-1.09	-0.06	50	669	58.6	0	-18	-1.03	1.1
11.0	24.79	18.45	25.98	19.19	23.94	1.70	1.77	-1.18	-0.07	55	720	52.9	0	-17	1.03	1.1
11.5	25.57	18.91	27.00	19.78	24.39	1.74	1.83	-1.42	-0.08	55	783	51.3	0	-16	-1.03	1.1
12.0	25.88	19.29	27.16	20.09	24.68	1.80	1.88	-1.27	-0.08	58	826	52.3	0	-16	1.03	1.0
12.5	26.79	19.59	28.44	20.53	25.26	1.80	1.89	-1.64	-0.09	68	1023	48.8	0	-22	-1.03	1.2
13.0	26.99	19.38	28.64	20.35	25.67	1.75	1.84	-1.64	-0.09	78	996	46.9	0	-13	1.03	1.1
13.5	27.24	19.24	28.82	20.16	25.99	1.70	1.79	-1.57	-0.09	65	1004	45.1	0	-13	-1.03	1.2
14.0	27.27	19.06	28.52	19.85	26.14	1.66	1.74	-1.23	-0.08	55	831	44.7	0	-6	1.03	1.0
14.5	27.89	19.39	29.32	20.21	26.33	1.69	1.77	-1.42	-0.08	67	1035	43.3	0	-7	-1.03	1.2
15.0	28.29	19.58	29.62	20.39	26.47	1.70	1.78	-1.32	-0.08	57	972	43.0	0	-5	1.03	1.0
15.5	27.80	19.84	28.69	20.44	26.48	1.79	1.85	-0.89	-0.07	52	669	47.2	0	2	-1.03	0.9
16.0	27.60	19.75	28.29	20.30	26.43	1.78	1.85	-0.68	-0.07	41	510	48.2	0	4	1.03	0.6
16.5	26.98	19.81	27.31	20.18	26.25	1.84	1.89	-0.32	-0.06	29	277	52.1	0	7	-1.03	0.4
17.0	26.59	19.92	26.77	20.21	26.05	1.89	1.93	-0.18	-0.05	27	237	54.9	0	8	1.03	0.3
17.5	27.36	20.09	27.76	20.48	25.96	1.87	1.93	-0.39	-0.06	42	462	51.7	0	3	0.00	0.4
18.0	27.32	19.60	27.64	19.91	25.77	1.77	1.81	-0.31	-0.04	49	462	49.0	0	8	-1.03	0.5
18.5	27.03	19.84	27.23	20.09	25.57	1.84	1.88	-0.19	-0.04	43	381	52.0	0	8	1.03	0.3
19.0	26.49	19.91	26.52	20.06	25.38	1.89	1.92	-0.02	-0.03	34	268	55.4	0	8	-1.03	0.0
19.5	25.65	20.07	25.46	20.14	25.18	1.98	2.01	0.19	-0.03	24	153	61.7	0	8	1.03	-0.4
20.0	24.40	19.89	23.93	19.86	24.97	2.02	2.05	0.48	-0.02	10	49	68.9	0	9	-1.03	-1.4
20.5	22.88	19.01	22.45	18.93	24.74	1.94	1.95	0.44	-0.01	3	2	71.9	0	9	1.03	-2.4
21.0	21.66	18.53	21.25	18.44	24.50	1.93	1.94	0.42	-0.01	2	-7	76.7	0	15	-1.72	-2.9
21.5	20.89	18.29	20.44	18.18	24.28	1.93	1.94	0.45	-0.01	1	-9	80.6	0	9	1.03	-4.4
22.0	20.76	18.20	20.26	18.08	24.08	1.92	1.93	0.51	-0.01	0	-9	81.3	0	7	-1.03	-3.5
22.5	20.99	18.03	20.52	17.94	23.91	1.87	1.88	0.48	-0.01	0	-9	78.1	0	7	1.03	-2.4
23.0	20.96	18.05	20.45	17.97	23.77	1.83	1.89	0.52	-0.02	0	-8	78.9	0	5	-1.03	-2.1
23.5	20.66	17.90	20.19	17.82	23.65	1.87	1.88	0.48	-0.01	0	-8	79.6	0	6	1.72	-2.2
24.0	20.60	17.79	20.10	17.70	23.57	1.85	1.87	0.51	-0.02	0	-8	79.3	0	5	-1.72	-2.1

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2
TSUM	14.7	-6.7	-8.4	0.2	23.1	-3.8	5.5	0.0	0.0
DSUM	15.7	-7.2	-7.9	-0.5	22.2	-3.6	5.2	0.0	0.0
NSUM	-1.0	0.5	-0.5	0.7	0.9	-0.2	0.3	0.0	0.0

TIME	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM												2.3	25.8	6.1	0.0	0		0.3
DSUM												2.2	25.1	2.7	0.0	0		0.0
NSUM												0.2	0.7	3.4	0.0	0		0.3
TAVE	1.7		21.97	17.69	21.94	17.79	23.97	1.75	1.78	0.05	-0.03						0.0	
DAVE	2.2		25.51	19.27	26.23	19.78	24.97	1.8225	1.88	-0.72	-0.06						0.0	
NAVE	0.7		11.93	10.62	11.26	10.35	15.29	1.1252	1.12	0.68	0.00						0.0	

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SYSTEM 7, JULY 22, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-23	21	-16	11	0	0	2	0	0	3		20.85	17.88	20.52	17.85	23.48	1.85	1.87	0.34	-0.02	-1	-6	77.4	0	4	1.03	-1
1.0	-14	9	-9	10	0	0	1	0	0	2		20.84	18.00	20.57	18.00	23.41	1.87	1.89	0.28	-0.02	0	-4	78.3	0	2	-1.03	-1
1.5	-14	9	-10	9	0	0	1	0	0	1		20.70	18.08	20.22	18.09	23.35	1.90	1.93	0.49	-0.03	0	-4	81.7	0	2	1.03	-1
2.0	-15	13	-14	9	0	0	1	0	0	1.4		20.63	18.10	20.26	18.12	23.29	1.91	1.94	0.38	-0.03	-1	-4	81.6	0	2	-1.03	-1
2.5	-15	10	-8	8	0	0	1	0	0	1.0		20.65	18.20	20.46	18.19	23.23	1.93	1.94	0.19	-0.01	0	-3	80.6	0	2	1.03	-1
3.0	-15	16	-13	8	0	0	1	0	0	1.4		20.63	18.24	20.44	18.23	23.18	1.94	1.95	0.20	-0.01	0	-3	81.1	0	2	-1.03	-1
3.5	-16	22	-16	8	0	0	1	0	0	1.5		20.78	18.29	20.61	18.28	23.13	1.94	1.94	0.19	-0.01	0	-4	80.2	0	2	1.03	-1
4.0	-17	26	-20	8	0	0	0	0	0	1.7		20.73	18.30	20.55	18.29	23.07	1.94	1.95	0.19	-0.01	0	-3	80.6	0	2	-1.03	-1
4.5	-17	11	-8	8	0	0	0	0	0	2.2		20.82	18.31	20.60	18.30	23.01	1.94	1.95	0.24	-0.01	0	-4	80.4	0	2	1.03	-1
5.0	-17	26	-19	8	0	0	0	0	0	2.1		20.50	18.32	20.26	18.30	22.94	1.96	1.97	0.25	-0.01	0	-3	83.1	0	3	-1.03	-1
5.5	-18	25	-18	8	0	0	0	0	0	2.4		20.21	18.30	20.01	18.29	22.87	1.98	1.99	0.21	-0.01	0	-3	85.0	0	3	1.03	-1
6.0	-17	20	-14	8	0	0	0	0	0	2.0		20.07	18.25	19.89	18.23	22.80	1.97	1.98	0.20	-0.01	0	-3	85.5	0	3	-1.03	-1
6.5	-9	5	-5	8	10	-2	2	0	0	2.1		20.36	18.27	20.16	18.28	22.71	1.96	1.97	0.20	-0.01	0	6	83.6	0	1	-1.03	-1
7.0	-9	5	-5	8	10	-2	2	0	0	2.1		20.36	18.27	20.16	18.28	22.71	1.96	1.97	0.20	-0.01	0	6	83.6	0	1	-1.03	-1
7.5	6	11	-23	7	36	-6	9	0	0	2.5		20.68	18.44	20.56	18.49	22.69	1.97	1.99	0.13	-0.02	3	35	82.3	0	0	0.00	-1
8.0	37	5	-44	5	80	-14	20	0	0	2.9		21.37	18.67	21.34	18.76	22.74	1.97	1.99	0.03	-0.02	9	84	78.5	0	-3	1.03	0
8.5	82	-17	-64	3	155	-29	41	0	0	2.5		22.20	19.01	22.32	19.19	22.83	1.99	2.02	-0.11	-0.03	18	167	74.8	0	-4	-1.03	0
9.0	193	-77	-100	-2	368	-83	112	0	0	2.7		23.78	19.58	24.33	19.98	23.09	2.00	2.05	-0.54	-0.05	65	428	67.3	0	-13	1.03	1
9.5	261	-113	-126	-7	443	-93	126	0	0	3.3		25.08	19.92	25.81	20.40	23.45	1.98	2.04	-0.72	-0.05	79	529	61.3	0	-14	-1.03	1
10.0	387	-178	-180	-12	602	-118	163	0	0	3.5		26.14	20.50	27.18	21.13	23.86	2.04	2.11	-1.03	-0.07	94	707	58.5	0	-17	1.03	1
10.5	471	-217	-217	-20	680	-121	170	0	0	3.5		26.76	20.55	27.93	21.26	24.45	2.01	2.08	-1.16	-0.08	86	779	55.3	0	-17	-1.03	1
11.0	534	-242	-249	-25	760	-129	183	0	0	3.2		27.51	20.69	28.78	21.47	24.88	1.99	2.07	-1.26	-0.09	81	852	52.4	0	-18	1.03	1
11.5	594	-270	-273	-31	817	-133	191	0	0	3.3		28.10	20.94	29.36	21.70	25.36	2.00	2.09	-1.24	-0.08	77	904	51.0	0	-20	-1.03	1
12.0	638	-280	-306	-33	864	-136	197	0	0	3.4		28.87	21.23	30.15	22.03	25.86	2.02	2.11	-1.28	-0.09	79	951	49.3	0	-19	1.03	1
12.5	671	-298	-319	-35	896	-136	199	0	0	2.7		29.19	21.26	30.58	22.11	26.33	2.00	2.10	-1.38	-0.10	67	963	47.8	0	-19	-1.03	1
13.0	696	-292	-359	-33	924	-137	203	0	0	3.2		29.62	21.09	30.94	21.97	26.69	1.94	2.04	-1.31	-0.11	80	997	45.6	0	-13	1.03	1
13.5	708	-305	-361	-31	931	-137	203	0	0	3.0		29.97	21.37	31.27	22.21	26.97	1.97	2.07	-1.29	-0.10	74	1000	45.5	0	-11	-1.03	1
14.0	696	-307	-352	-29	905	-133	198	0	0	3.7		30.29	21.62	31.46	22.35	27.23	2.01	2.10	-1.16	-0.09	77	983	45.4	0	-9	1.03	1
14.5	681	-283	-368	-25	890	-133	197	0	0	3.5		30.57	21.64	31.56	22.30	27.37	1.99	2.08	-0.98	-0.08	72	969	44.8	0	-5	-1.03	1
15.0	622	-246	-348	-24	781	-118	176	0	0	3.5		30.72	22.10	31.66	22.75	27.50	2.09	2.18	-0.92	-0.09	69	882	46.7	0	-4	1.03	1
15.5	602	-237	-341	-21	803	-123	183	0	0	3.3		30.79	22.40	31.73	23.05	27.57	2.15	2.24	-0.93	-0.09	66	900	47.8	0	-4	-1.03	1
16.0	579	-218	-340	-19	730	-113	169	0	0	3.5		30.80	22.43	31.61	23.01	27.66	2.16	2.24	-0.79	-0.08	67	832	48.2	0	-2	1.03	1
16.5	500	-169	-316	-17	678	-107	159	0	0	3.4		30.70	22.36	31.32	22.86	27.63	2.15	2.22	-0.61	-0.08	65	772	48.6	0	2	-1.03	1
17.0	438	-154	-274	-14	562	-90	134	0	0	2.7		30.59	22.43	31.15	22.87	27.56	2.17	2.24	-0.54	-0.06	61	678	49.4	0	4	1.03	1
17.5	317	-70	-242	-11	430	-70	106	0	0	3.5		30.34	22.46	30.61	22.80	27.39	2.19	2.26	-0.27	-0.06	49	525	51.4	0	6	0.00	0
18.0	217	-25	-191	-9	302	-49	77	0	0	3.5		29.71	22.36	29.81	22.60	27.20	2.21	2.26	-0.09	-0.05	40	375	53.9	0	8	-1.03	0
18.5	154	4	-160	-7	241	-42	66	0	0	3.5		29.25	22.34	29.25	22.51	26.97	2.24	2.28	0.01	-0.04	34	300	56.1	0	9	1.03	0
19.0	74	37	-116	-5	144	-24	41	0	0	2.8		28.49	22.16	28.36	22.25	26.74	2.25	2.28	0.14	-0.03	24	177	59.0	0	10	-1.03	0
19.5	19	20	-39	-3	72	-10	23	0	0	2.5		27.57	22.18	27.38	22.22	26.51	2.32	2.34	0.20	-0.02	13	84	64.1	0	9	1.03	-1
20.0	-3	12	-13	-1	45	-7	17	0	0	1.9		26.61	21.96	26.38	21.97	26.29	2.33	2.35	0.25	-0.02	9	48	68.3	0	9	-1.03	-1
20.5	-23	35	-23	0	11	-2	9	0	0	2.0		25.72	21.67	25.45	21.64	26.07	2.32	2.33	0.28	-0.01	3	8	71.8	0	9	1.03	-2
21.0	-31	33	-13	2	0	0	6	0	0	1.9		24.79	21.38	24.47	21.32	25.83	2.32	2.33	0.33	-0.01	1	-5	75.8	0	9	-1.03	-3
21.5	-32	40	-19	3	0	0	7	0	0	2.4		24.72	21.31	24.44	21.27	25.61	2.31	2.32	0.28	-0.01	0	-6	75.6	0	8	1.03	-2
22.0	-30	45	-25	4	0	-1	6	0	0	3.5		24.96	21.23	24.73	21.20	25.44	2.27	2.28	0.24	-0.01	-1	-7	73.3	0	7	-1.03	-2
22.5	-35	49	-25	4	0	0	6	0	0	3.8		24.80	21.14	24.55	21.11	25.27	2.27	2.27	0.25	-0.01	0	-5	73.8	0	7	1.03	-2
23.0	-34	43	-19	4	0	0	5	0	0	3.5		24.47	21.25	24.22	21.22	25.11	2.31	2.32	0.26	-0.01	1	-5	76.8	0	6	-1.03	-2
23.5	-34	39	-17	4	0	0	5	0	0	2.8		23.82	21.07	23.67	21.05	24.99	2.32	2.32	0.15	0.00	1	-5	79.3	0	8	0.00	-2
24.0	-32	-21	8	5	0	0	4	0	0	2.8		23.04	20.84	23.27	20.89	24.91	2.32	2.31	-0.22	0.01	2	-5	80.9	0	7	1.72	-2

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	M	RHbot	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2		%	mJ/m2		
TSUM	17.9	-6.3	-11.1	-0.5	26.1	-4.2	6.3	0.0	0.0												2.7	29.3	5.7	0.0	0		0.0
DSUM	18.2	-7.0	-10.2	-0.7	25.3	-4.1	6.0	0.0	0.0												2.6	28.5	2.6	0.0	0		0.0
NSUM	-0.2	0.7	-0.9	0.2	0.8	-0.1	0.3	0.0	0.0												0.1	0.8	3.1	0.0	0		-0.1
TAVE										2.7		25.24	20.32	25.50	20.58	24.97	2.07	2.11	-0.25	-0.04						0.0	
DAVE										3.1		28.23	21.43	28.89	21.91	26.09	2.1047	2.17	-0.65	-0.06						0.0	
NAVE										1.4		14.39	12.67	14.24	12.67	15.73	1.3555	1.36	0.15	-0.01						0.0	

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SYSTEM 7, JULY 23, 1986, DATA FROM KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-30	28	-10	5	0	0	3	432	-427	2	163	22.60	20.68	22.83	20.73	24.79	2.31	2.31	-0.22	0.01	433	-427	82.9	-0.2	6	-1.03	-2.91
1.0	-32	23	-5	5	0	0	2	429	-423	2	159	21.95	20.35	22.24	20.42	24.63	2.28	2.28	-0.28	0.00	429	-423	85.0	0.2	8	1.03	-5.25
1.5	-29	20	-4	6	0	0	0	425	-419	3	161	21.43	20.22	21.69	20.29	24.48	2.29	2.29	-0.25	0.00	425	-419	88.2	-0.2	8	-1.03	-4.99
2.0	-26	24	-10	6	0	0	0	424	-419	2.9	156	21.54	20.31	21.75	20.35	24.36	2.30	2.30	-0.20	0.01	424	-419	88.2	0.2	6	1.03	-2.55
2.5	-37	40	-17	6	0	0	0	424	-418	3.9	163	21.49	20.13	21.73	20.17	24.24	2.27	2.26	-0.23	0.01	424	-418	86.9	-0.2	7	-1.03	-2.44
3.0	-39	34	-9	7	0	0	0	423	-417	3.4	162	21.00	19.95	21.24	20.01	24.11	2.26	2.26	-0.23	0.00	424	-417	89.5	0.2	7	1.03	-4.19
3.5	-36	38	-16	7	0	0	0	422	-416	3.7	157	21.11	19.85	21.36	19.90	23.98	2.23	2.23	-0.23	0.01	423	-416	87.6	-0.2	6	-1.03	-2.45
4.0	-34	29	-8	7	0	0	0	422	-415	2.8	155	20.82	19.62	21.08	19.68	23.86	2.20	2.20	-0.26	0.00	422	-416	88.0	0.2	7	1.03	-3.46
4.5	-34	27	-6	8	0	0	0	420	-413	2.7	159	20.59	19.57	20.84	19.64	23.75	2.21	2.21	-0.24	0.00	420	-414	89.6	-0.2	6	-1.03	-6.02
5.0	-25	23	-10	7	0	0	0	419	-414	3.2	153	20.65	19.77	20.83	19.81	23.66	2.25	2.24	-0.17	0.00	419	-414	91.1	0.2	4	1.03	-5.58
5.5	-26	39	-23	7	0	0	0	423	-419	3.8	162	21.20	20.00	21.38	20.03	23.59	2.26	2.25	-0.17	0.01	423	-419	88.5	-0.2	3	-1.03	-1.75
6.0	-25	32	-18	7	0	0	0	424	-420	3.9	158	21.29	20.07	21.47	20.09	23.53	2.27	2.26	-0.17	0.01	424	-420	88.3	0.2	3	1.03	-1.87
6.5	-22	57	-44	6	17	-4	3	414	-440	4.2	160	21.60	20.09	21.76	20.11	23.42	2.25	2.24	-0.15	0.01	431	-444	86.2	0.2	3	1.03	-1.31
7.0	-22	57	-44	6	17	-4	3	414	-440	4.2	160	21.60	20.09	21.76	20.11	23.42	2.25	2.24	-0.15	0.01	431	-444	86.2	0.2	3	1.03	-1.31
7.5	-4	22	-19	5	94	-36	45	390	-514	3.7	158	22.43	20.48	22.32	20.39	23.43	2.28	2.27	0.11	0.01	484	-551	84.1	0.0	-3	0.00	0.36
8.0	59	-27	-23	1	190	-59	77	335	-635	3.8	169	24.07	21.24	23.66	21.01	23.60	2.33	2.31	0.41	0.02	526	-694	79.1	-0.2	-10	-1.03	1.19
8.5	138	-67	-54	-3	284	-74	98	263	-752	3.9	172	25.59	22.04	25.02	21.74	23.83	2.41	2.38	0.58	0.03	547	-826	75.2	0.2	-13	1.03	1.24
9.0	212	-96	-94	-7	372	-87	119	195	-858	3.4	187	27.31	23.01	26.66	22.64	24.09	2.53	2.48	0.66	0.04	567	-944	71.1	-0.2	-15	-1.03	1.03
9.5	290	-123	-139	-10	461	-97	136	127	-967	3.3	196	28.57	23.64	27.84	23.21	24.41	2.59	2,54	0.74	0.06	589	-1065	67.7	0.2	-18	1.03	0.89
10.0	368	-148	-186	-14	553	-108	154	51	-1054	3.3	196	29.62	24.05	28.84	23.57	24.78	2.62	2.56	0.78	0.07	604	-1172	64.4	-0.2	-21	-1.03	0.80
10.5	470	-160	-247	-20	667	-119	172	-46	-1187	2.8	199	31.39	24.77	30.55	24.24	25.36	2.68	2.61	0.85	0.08	621	-1306	59.6	0.2	-24	1.03	0.73
11.0	533	-197	-287	-24	733	-124	183	-103	-1257	2.6	202	32.25	25.01	31.40	24.46	25.82	2.69	2.60	0.86	0.08	630	-1381	56.7	-0.2	-25	-1.03	0.69
11.5	588	-206	-327	-28	792	-130	192	-148	-1325	2.9	210	33.09	25.08	32.33	24.57	26.31	2.65	2.57	0.76	0.08	644	-1455	53.0	0.2	-27	1.03	0.63
12.0	632	-219	-357	-31	840	-133	198	-186	-1374	3.1	206	33.70	25.21	32.87	24.64	26.79	2.64	2.55	0.84	0.09	653	-1507	51.1	-0.2	-25	-1.03	0.61
12.5	666	-218	-391	-33	878	-136	204	-218	-1404	3.6	195	34.07	25.28	33.26	24.68	27.23	2.63	2.54	0.82	0.10	660	-1540	49.7	0.2	-24	1.03	0.56
13.0	676	-211	-416	-31	885	-135	205	-222	-1418	3.6	195	34.52	25.29	33.77	24.70	27.60	2.61	2.51	0.76	0.10	663	-1554	47.8	-0.2	-18	-1.03	0.51
13.5	488	-126	-329	-29	658	-103	158	-28	-1189	3.3	190	33.56	24.74	33.11	24.29	27.75	2.53	2.45	0.47	0.08	629	-1292	48.4	0.2	-4	1.03	0.37
14.0	680	-196	-445	-26	875	-136	205	-217	-1382	4.3	185	34.52	24.80	33.93	24.28	27.92	2.48	2.39	0.60	0.09	658	-1518	45.1	-0.2	-12	-1.03	0.44
14.5	625	-194	-399	-24	831	-129	194	-176	-1355	4.6	172	34.43	24.83	33.86	24.36	28.08	2.50	2.42	0.58	0.08	655	-1484	45.8	0.2	-7	1.03	0.48
15.0	547	-159	-361	-23	704	-111	168	-66	-1266	4.6	183	34.10	24.69	33.62	24.27	28.17	2.48	2.41	0.48	0.07	638	-1377	46.3	-0.2	-3	-1.03	0.44
15.5	596	-176	-395	-21	766	-123	184	-121	-1318	4.8	177	34.31	24.80	33.81	24.37	28.24	2.50	2.42	0.51	0.08	644	-1440	46.0	0.2	-4	1.03	0.44
16.0	545	-139	-385	-19	709	-115	173	-69	-1262	4.6	180	34.13	24.52	33.75	24.13	28.28	2.44	2.37	0.39	0.07	639	-1377	45.1	-0.2	-2	-1.03	0.36
16.5	495	-118	-361	-17	643	-104	157	-12	-1213	4.6	174	34.11	24.59	33.76	24.20	28.28	2.46	2.39	0.36	0.07	631	-1317	45.5	0.2	1	1.03	0.33
17.0	443	-86	-349	-14	578	-95	144	41	-1149	4.7	175	33.72	24.12	33.50	23.80	28.20	2.37	2.30	0.23	0.06	619	-1245	44.5	-0.2	6	-1.03	0.25
17.5	290	-31	-258	-11	392	-66	103	188	-944	4.1	171	32.79	23.91	32.71	23.68	27.99	2.38	2.33	0.09	0.05	580	-1009	47.0	0.0	10	0.00	0.12
18.0	264	-9	-257	-10	356	-63	98	225	-921	4.8	166	32.51	23.99	32.50	23.79	27.80	2.41	2.37	0.02	0.05	582	-984	48.4	0.2	11	1.03	0.03
18.5	184	37	-226	-8	269	-49	78	293	-816	4.5	173	31.91	23.80	32.00	23.68	27.58	2.41	2.37	-0.09	0.04	562	-865	49.9	-0.2	12	-1.03	-0.17
19.0	109	71	-187	-6	188	-34	57	353	-716	4.0	172	31.02	23.66	31.19	23.59	27.34	2.43	2.41	-0.17	0.03	541	-751	53.0	0.2	13	1.03	-0.38
19.5	33	70	-110	-4	113	-19	36	411	-627	4.2	169	30.34	23.49	30.59	23.46	27.12	2.44	2.41	-0.24	0.02	524	-646	55.0	-0.2	11	-1.03	-0.68
20.0	-15	36	-30	-3	41	-6	17	452	-528	3.7	168	29.44	23.65	29.72	23.66	26.91	2.54	2.52	-0.27	0.02	493	-534	60.4	0.2	11	1.03	-1.20
20.5	-34	54	-31	-1	7	-2	12	465	-471	4.0	167	28.52	23.33	28.83	23.37	26.69	2.52	2.51	-0.29	0.01	472	-473	63.3	-0.2	12	-1.03	-1.76
21.0	-39	50	-23	0	0	-1	10	464	-457	3.5	164	27.59	23.10	27.91	23.15	26.48	2.53	2.52	-0.31	0.01	464	-458	67.0	0.2	11	1.03	-2.29
21.5	-39	52	-24	1	0	-1	10	461	-453	3.9	166	27.34	23.07	27.65	23.12	26.29	2.54	2.53	-0.30	0.01	461	-455	68.3	-0.2	10	-1.03	-2.17
22.0	-38	50	-22	1	0	-1	9	459	-452	4.1	167	27.01	23.10	27.29	23.15	26.12	2.57	2.56	-0.27	0.01	459	-453	70.6	0.2	9	1.03	-2.29
22.5	-37	46	-18	1	0	-1	9	456	-450	4.0	160	26.49	23.02	26.77	23.07	25.97	2.58	2.57	-0.27	0.01	456	-450	73.2	-0.2	8	-1.03	-2.49
23.0	-36	50	-24	2	0	-1	8	453	-446	4.3	159	26.11	22.49	26.40	22.54	25.81	2.48	2.48	-0.28	0.01	453	-447	72.0	0.2	8	1.03	-2.17
23.5	-36	53	-28	2	0	-1	8	452	-445	4.4	164	25.88	22.17	26.16	22.21	25.69	2.43	2.42	-0.27	0.01	452	-446	71.2	-0.3	9	-1.72	-1.89
24.0	-36	53	-28	3	0	-1	7	451	-444	4.3	161	25.65	21.99	25.92	22.03	25.60	2.40	2.39	-0.26	0.01	451	-445	71.5	0.3	8	1.72	-1.91

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.9	-3.5	-12.8	-0.6	25.5	-4.4	6.7	20.0	-67.1												45.5	-71.5		0.0	-0.1	0.00	
DSUM	17.7	-4.8	-11.8	-0.7	24.8	-4.3	6.4	3.0	-49.0												27.8	-53.3		0.0	-0.3	0.00	
NSUM	-0.8	1.4	-1.0	0.2	0.7	-0.1	0.3	16.9	-18.0												17.7	-18.2		0.0	0.3	0.00	
TAVE										3.7	173	27.71	22.63	27.59	22.45	25.77	2.43	2.39	0.14	0.04			67.1				-1.1
DAVE										3.9	183	31.81	24.21	31.42	23.86	26.85	2.5179	2.46	0.40	0.06			54.1				0.2
NAVE										2.4	108	15.34	13.99	15.47	14.01	16.44	1.5663	1.56	-0.13	0.00			55.9				-1.7

SYSTEM 7, JULY 24, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-36	37	-17	3	0	-1	7	0	0	4		25.81	21.92	25.55	21.88	25.48	2.37	2.38	0.27	-0.01	0	-6	72.8	0.2	6	1.03	-2.22
1.0		24	-10	3	0	-1	7	0	0	5		25.80	21.94	25.56	21.90	25.34	2.38	2.38	0.24	-0.01	0	-5	72.8	-0.2	5	-1.03	-2.44
1.5		23	-10	3	0	-1	7	0	0	5		25.64	22.09	25.44	22.06	25.24	2.42	2.43	0.20	-0.01	0	-5	74.6	0.2	4	1.03	-2.24
2.0		22	-10	3	0	-1	7	0	0	4.5		25.55	22.11	25.33	22.08	25.13	2.43	2.44	0.23	-0.01	0	-6	75.6	-0.2	4	-1.03	-2.18
2.5		23	-11	3	0	-1	7	0	0	4.5		25.46	22.09	25.24	22.06	25.03	2.44	2.44	0.23	-0.01	0	-5	76.1	0.2	4	1.03	-2.18
3.0		22	-11	3	0	-1	6	0	0	4.7		25.80	22.18	25.60	22.15	24.94	2.43	2.44	0.21	-0.01	-2	-6	74.3	-0.2	3	-1.03	-2.02
3.5		21	-10	3	0	-1	6	0	0	4.3		25.96	22.22	25.76	22.19	24.88	2.43	2.44	0.22	-0.01	-1	-5	73.6	0.2	2	1.03	-2.03
4.0		22	-11	2	0	-1	7	0	0	4.2		26.42	22.23	26.18	22.19	24.81	2.40	2.41	0.25	-0.01	-1	-7	70.9	-0.2	3	-1.03	-1.98
4.5		18	-9	2	0	-1	6	0	0	3.6		26.30	22.21	26.06	22.18	24.75	2.41	2.41	0.25	-0.01	0	-6	71.6	0.2	3	1.03	-2.04
5.0		16	-8	2	0	0	6	0	0	3.3		25.95	22.08	25.70	22.05	24.68	2.40	2.41	0.27	-0.01	0	-6	73.0	-0.2	3	-1.03	-2.14
5.5		16	-8	3	0	-1	6	0	0	3.2		25.99	21.93	25.71	21.90	24.60	2.36	2.37	0.29	-0.01	-1	-8	71.8	0.2	3	1.03	-1.96
6.0		13	-6	3	0	-1	6	0	0	2.8		25.90	21.82	25.61	21.77	24.52	2.34	2.35	0.30	-0.01	0	-7	71.7	-0.2	3	-1.03	-2.04
6.5		12	-7	3	16	-3	10	0	0	2.8		25.48	21.66	25.21	21.63	24.38	2.34	2.35	0.29	-0.01	2	11	73.2	-0.2	3	-1.03	-1.72
7.0		12	-7	3	16	-3	10	0	0	2.8		25.48	21.66	25.21	21.63	24.38	2.34	2.35	0.29	-0.01	2	11	73.2	-0.2	3	-1.03	-1.72
7.5		9	-18	2	68	-23	33	0	0	2.8		25.94	21.67	25.77	21.72	24.36	2.31	2.33	0.18	-0.02	25	74	70.3	0.0	-1	0.00	-0.63
8.0		-9	-53	0	180	-56	76	0	0	3.3		27.44	22.06	27.53	22.26	24.49	2.30	2.34	-0.09	-0.04	66	225	63.5	0.2	-7	1.03	0.14
8.5	129	-25	-85	-3	282	-73	99	0	0	3.2		28.54	22.49	28.80	22.82	24.71	2.32	2.38	-0.25	-0.06	76	354	60.2	-0.2	-9	-1.03	0.32
9.0	213	-55	-142	-7	374	-87	120	0	0	3.7		29.46	22.80	29.78	23.15	24.92	2.33	2.39	-0.32	-0.06	84	467	57.2	0.2	-9	1.03	0.39
9.5	294	-87	-185	-9	468	-99	139	0	0	3.6		30.46	23.23	30.89	23.59	25.19	2.37	2.43	-0.42	-0.06	88	571	54.3	-0.2	-12	-1.03	0.47
10.0	374	-111	-237	-12	557	-109	155	0	0	4.1		31.50	23.54	31.99	23.96	25.53	2.37	2.44	-0.48	-0.07	91	667	51.4	0.2	-14	1.03	0.47
10.5	473	-140	-299	-18	669	-120	173	0	0	3.8		32.84	23.95	33.40	24.41	26.06	2.38	2.46	-0.54	-0.08	91	776	47.8	-0.2	-17	-1.03	0.47
11.0	539	-169	-332	-21	743	-128	186	0	0	4.8		33.62	24.01	34.25	24.51	26.49	2.35	2.43	-0.62	-0.08	98	854	45.0	0.2	-17	1.03	0.51
11.5	596	-185	-368	-26	806	-135	196	0	0	5.4		34.31	24.09	34.91	24.56	26.92	2.32	2.40	-0.59	-0.08	103	917	42.9	-0.2	-17	-1.03	0.50
12.0	638	-196	-396	-28	852	-138	199	0	0	4.8		35.09	24.38	35.68	24.85	27.36	2.34	2.42	-0.58	-0.08	98	955	41.4	0.2	-18	1.03	0.50
12.5	669	-203	-418	-31	886	-139	202	0	0	4.9		35.79	24.70	36.40	25.19	27.81	2.37	2.46	-0.60	-0.08	102	983	40.4	-0.2	-18	-1.03	0.49
13.0	692	-190	-460	-29	911	-140	205	0	0	4.7		36.29	24.72	36.78	25.15	28.16	2.34	2.42	-0.48	-0.08	100	998	39.1	0.2	-12	1.03	0.42
13.5	700	-189	-473	-29	916	-139	205	0	0	5.1		36.71	24.74	37.20	25.19	28.41	2.32	2.40	-0.48	-0.08	101	1004	37.9	-0.2	-10	-1.03	0.40
14.0	698	-169	-490	-29	907	-138	204	0	0	4.4		37.08	24.86	37.49	25.27	28.67	2.33	2.40	-0.40	-0.08	96	996	37.3	0.2	-10	1.03	0.35
14.5	683	-168	-482	-26	880	-135	202	0	0	5.3		37.29	24.86	37.69	25.26	28.86	2.31	2.39	-0.39	-0.07	99	986	36.7	-0.2	-6	-1.03	0.35
15.0	657	-137	-492	-25	846	-131	196	0	0	5.5		37.46	24.71	37.79	25.10	28.96	2.27	2.34	-0.32	-0.08	92	956	35.8	0.2	-3	1.03	0.28
15.5	621	-130	-466	-22	797	-125	187	0	0	6.1		37.41	24.63	37.71	24.98	29.02	2.25	2.32	-0.29	-0.07	93	917	35.5	-0.2	-2	-1.03	0.28
16.0	569	-102	-444	-20	731	-117	174	0	0	4.5		37.45	24.86	37.71	25.20	29.07	2.30	2.37	-0.24	-0.07	81	853	36.4	0.2	-2	1.03	0.23
16.5	357	-3	-341	-18	447	-72	111	0	0	4.9		36.69	24.63	36.70	24.89	29.00	2.30	2.36	0.00	-0.06	61	574	38.3	-0.2	5	-1.03	-0.01
17.0	280	48	-322	-14	351	-59	92	0	0	4.7		36.00	24.43	35.88	24.62	28.81	2.29	2.35	0.13	-0.06	50	418	39.8	0.2	8	1.03	-0.16
17.5	322	37	-350	-13	463	-81	121	0	0	4.3		36.26	24.62	36.18	24.84	28.70	2.32	2.38	0.09	-0.06	58	555	39.7	0.0	4	0.00	-0.10
18.0																											
18.5																											
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TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	41.7	-4.7	-17.1	-0.8	32.3	-5.6	8.3	0.0	0.0												4.3	37.0		0.0	-0.3	0.00	
DSUM	23.4	-4.8	-15.0	-0.8	28.9	-4.9	7.2	0.0	0.0												3.9	33.2		0.0	-0.4	0.00	
NSUM	18.3	0.1	-2.1	0.0	3.5	-0.6	1.1	0.0	0.0												0.5	3.8		0.0	0.1	0.00	
TAVE										4.2		30.65	23.19	30.75	23.39	26.24	2.35	2.39	-0.09	-0.04			56.6				-0.7
DAVE										4.6		34.61	24.19	34.98	24.57	27.43	2.3265	2.40	-0.36	-0.07			43.4				0.3
NAVE										1.9		12.88	10.94	12.77	10.93	12.31	1.1851	1.19	0.11	-0.01			36.1				-0.9

ORIGINAL PAGE IS
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SYSTEM 8, JULY 20, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-32	15	-6	14	1	0	1	420	-449	1		23.89	20.88	23.31	20.78	26.35	2.27	2.28	0.58	-0.02	421	-450	79.8	0.2	9	1.00	-2.38
1.0	-33	10	-2	15	1	0	1	413	-442	1		23.06	20.60	22.26	20.41	26.05	2.26	2.28	0.80	-0.01	414	-442	84.7	-0.2	11	-1.00	-4.05
1.5	-34	11	-3	16	2	-1	3	402	-423	2		22.77	20.51	22.11	20.36	25.78	2.26	2.27	0.67	-0.01	404	-424	85.5	0.2	9	1.00	-3.80
2.0	-28	8	-4	17	1	-1	2	419	-427	2.2		22.87	20.53	22.42	20.45	25.57	2.26	2.27	0.46	-0.01	420	-428	83.9	-0.2	6	-1.00	-2.40
2.5	-28	18	-11	15	1	-1	1	428	-442	2.5		23.18	20.43	22.81	20.38	25.43	2.22	2.23	0.38	-0.01	428	-443	80.4	0.2	5	1.00	-1.76
3.0	-35	20	-9	15	1	0	1	412	-445	1.8		22.43	19.87	21.93	19.78	25.22	2.15	2.16	0.51	-0.01	413	-445	82.2	-0.2	8	-1.00	-2.47
3.5	-39	15	-3	18	2	-1	4	386	-420	1.0		21.55	19.46	20.83	19.27	24.95	2.12	2.13	0.73	-0.01	388	-421	86.7	0.2	10	1.00	-6.11
4.0	-30	7	0	20	2	-1	5	384	-417	0.7		20.57	19.01	19.93	18.80	24.63	2.09	2.09	0.65	0.00	386	-418	90.0	-0.2	11	-1.00	11.34
4.5	-33	4	1	20	2	-1	4	383	-415	0.5		19.85	18.58	19.11	18.27	24.31	2.06	2.04	0.75	0.01	385	-416	92.4	0.2	12	1.00	308.33
5.0	-25	6	3	23	2	-2	6	372	-400	0.7		19.35	18.21	18.05	17.57	23.96	2.01	1.98	1.31	0.04	375	-401	95.5	-0.2	12	-1.00	2.35
5.5	-23	2	2	24	3	-2	6	375	-402	0.4		17.99	17.32	16.96	16.69	23.62	1.93	1.88	1.04	0.05	378	-404	97.5	0.2	12	1.00	1.40
6.0	-18	2	2	26	4	-2	7	375	-395	0.4		17.58	17.08	16.84	16.60	23.32	1.91	1.87	0.75	0.04	378	-397	97.6	-0.2	10	-1.00	1.22
6.5	0	4	-8	26	28	-7	28	386	-380	0.5		17.13	16.68	16.77	16.51	22.79	1.87	1.86	0.36	0.01	415	-387	97.4	-0.2	3	-1.00	0.72
7.0	0	4	-8	26	28	-7	28	386	-380	0.5		17.13	16.68	16.77	16.51	22.79	1.87	1.86	0.36	0.01	415	-387	97.4	-0.2	3	-1.00	0.72
7.5	77	20	-106	20	163	-29	99	407	-371	0.9		19.50	18.20	19.41	18.44	22.98	2.00	2.06	0.10	-0.05	570	-400	91.4	0.0	-10	0.00	-0.18
8.0	136	-14	-121	12	221	-39	140	400	-436	2.4		21.57	18.35	21.66	18.64	23.40	1.90	1.95	-0.08	-0.05	621	-475	75.3	0.2	-13	1.00	0.13
8.5	75	-9	-63	8	143	-25	128	399	-449	2.3		21.93	18.48	22.04	18.73	23.69	1.90	1.94	-0.10	-0.04	542	-474	73.3	-0.2	-9	-1.00	0.14
9.0	99	-21	-72	3	166	-28	146	402	-446	2.0		22.41	18.56	22.63	18.88	23.99	1.83	1.93	-0.21	-0.05	568	-475	70.3	0.2	-10	1.00	0.29
9.5	167	-53	-106	1	303	-52	223	396	-420	1.4		22.82	19.02	23.30	19.49	24.20	1.95	2.01	-0.47	-0.06	704	-471	70.5	-0.2	-9	-1.00	0.44
10.0	429	-196	-201	-5	636	-109	426	413	-460	2.2		24.71	19.67	26.22	20.64	24.83	1.96	2.06	-1.51	-0.10	1046	-568	60.6	0.2	-27	1.00	0.96
10.5	485	-221	-232	-19	698	-114	422	386	-556	3.5		26.59	19.56	28.11	20.53	25.60	1.81	1.91	-1.51	-0.10	1084	-670	50.3	-0.2	-13	-1.00	0.95
11.0	542	-238	-261	-25	764	-122	463	387	-560	4.7		26.96	19.14	28.41	20.10	26.06	1.70	1.80	-1.44	-0.10	1151	-682	46.6	0.2	-18	1.00	0.92
11.5	592	-258	-280	-30	822	-129	488	389	-570	5.1		27.56	18.75	29.13	19.80	26.67	1.58	1.69	-1.56	-0.11	1211	-699	41.9	-0.2	-23	-1.00	0.92
12.0	630	-281	-281	-40	868	-134	495	388	-579	5.0		28.01	19.15	29.99	20.40	27.44	1.63	1.76	-1.97	-0.13	1256	-714	41.5	0.2	-29	1.00	1.00
12.5	658	-286	-289	-48	901	-137	478	388	-595	4.5		28.43	19.21	30.38	20.44	28.36	1.62	1.74	-1.94	-0.13	1289	-731	40.2	-0.2	-34	-1.00	0.99
13.0	677	-267	-307	-58	927	-139	439	386	-600	5.0		28.80	18.72	30.42	19.82	29.57	1.49	1.61	-1.60	-0.12	1313	-739	37.1	0.2	-45	1.00	0.87
13.5	684	-280	-297	-66	938	-142	386	382	-602	5.7		29.06	18.30	30.77	19.45	30.77	1.39	1.51	-1.70	-0.12	1320	-743	34.0	-0.2	-40	-1.00	0.94
14.0	649	-267	-279	-69	872	-133	356	400	-605	4.5		29.12	18.56	30.98	19.79	31.77	1.44	1.57	-1.86	-0.13	1272	-739	34.9	0.2	-34	0.99	0.96
14.5	588	-232	-266	-67	804	-130	380	393	-595	4.2		29.20	18.86	30.93	20.05	32.60	1.49	1.62	-1.72	-0.13	1198	-724	36.3	-0.2	-23	-1.00	0.86
15.0	543	-208	-264	-60	806	-132	376	395	-562	5.7		29.01	18.56	30.52	19.67	32.81	1.45	1.57	-1.50	-0.12	1201	-694	36.0	0.3	-11	1.66	0.78
15.5	543	-228	-244	-55	779	-134	280	405	-584	4.3		29.44	19.18	30.97	20.18	33.40	1.54	1.65	-1.51	-0.11	1183	-717	36.8	-0.2	-16	-1.00	0.93
16.0	433	-168	-227	-51	620	-111	355	422	-559	3.7		28.99	19.08	30.11	19.92	33.09	1.55	1.65	-1.11	-0.10	1041	-670	38.7	0.2	12	1.00	0.74
16.5	411	-149	-220	-48	558	-101	307	428	-572	4.9		29.09	19.11	30.15	19.94	32.97	1.55	1.65	-1.05	-0.10	986	-673	38.6	-0.2	6	-1.00	0.68
17.0	259	-75	-170	-41	434	-82	253	399	-525	4.7		28.23	18.45	28.78	19.03	32.38	1.48	1.56	-0.54	-0.08	833	-603	39.4	0.2	27	1.00	0.43
17.5	232	-101	-166	-33	428	-88	192	406	-513	4.5		28.45	18.54	29.23	19.22	31.78	1.48	1.57	-0.77	-0.09	835	-602	38.6	0.0	16	0.00	0.57
18.0	215	-73	-129	-27	347	-75	155	419	-512	4.2		28.17	18.85	28.88	19.49	31.31	1.56	1.64	-0.71	-0.09	766	-587	41.4	-0.2	14	-1.00	0.53
18.5	85	-8	-66	-19	182	-36	148	408	-492	3.6		26.57	18.35	26.65	18.65	30.57	1.56	1.62	-0.06	-0.06	590	-528	46.4	0.2	27	1.00	0.07
19.0	75	-7	-77	-12	157	-34	119	414	-467	3.1		26.36	18.49	26.45	18.80	29.94	1.61	1.66	-0.08	-0.06	571	-501	48.2	-0.2	21	-1.00	0.10
19.5	-8	11	-25	-6	50	-6	41	386	-481	1.6		24.67	18.27	24.27	18.38	29.19	1.68	1.72	0.41	-0.05	437	-487	57.0	0.2	30	1.00	-0.55
20.0	-18	5	-12	1	49	-15	36	400	-427	1.1		23.80	18.23	23.47	18.41	28.43	1.73	1.78	0.34	-0.06	449	-442	61.7	-0.2	23	-1.00	-0.40
20.5	-47	31	-19	6	7	-1	7	376	-437	2.1		22.84	17.76	22.14	17.67	27.75	1.70	1.72	0.71	-0.03	383	-438	64.7	0.2	26	1.00	-1.67
21.0	-44	12	-5	12	1	0	2	375	-418	0.9		21.14	17.06	19.93	16.82	26.99	1.68	1.71	1.22	-0.03	376	-418	73.6	-0.2	26	-1.00	-2.34
21.5	-24	4	-4	15	1	0	2	404	-410	0.8		20.53	16.80	19.88	16.83	26.43	1.67	1.71	0.66	-0.05	405	-411	74.0	0.2	17	1.00	-0.93
22.0	-30	18	-15	14	0	-1	1	415	-422	2.0		21.84	16.80	21.28	16.79	26.06	1.58	1.62	0.57	-0.03	415	-423	63.9	-0.2	12	-1.00	-1.08
22.5	-45	19	-9	16	1	0	2	362	-415	0.5		20.14	16.28	19.20	16.07	25.59	1.60	1.62	0.96	-0.02	363	-415	73.0	0.2	19	1.00	-2.74
23.0	-47	4	0	20	1	0	2	352	-402	0.4		18.42	15.59	16.85	15.05	24.94	1.58	1.59	1.58	-0.01	353	-402	83.0	-0.2	23	-1.00	-43.15
23.5	-46	0	0	24	2	0	3	346	-384	0.2		18.16	15.42	16.25	14.77	24.42	1.57	1.58	1.92	-0.01	348	-384	85.7	0.3	22	1.66	-18.84
24.0	-45	5	0	26	1	0	2	358	-387	0.5		17.87	15.36	15.67	14.48	24.08	1.58	1.57	2.21	0.01	359	-387	88.2	-0.3	20	-1.67	15.29
TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	15.7	-6.2	-8.9	-0.6	24.9	-4.2	13.6	34.1	-40.9												59.0	-45.1		0.0	0.2	0.00	
DSUM	16.6	-6.4	-8.5	-1.3	24.3	-4.1	13.1	18.6	-24.1												42.9	-28.2		0.0	-0.3	0.00	
NSUM	-0.9	0.3	-0.3	0.7	0.6	-0.1	0.4	15.6	-16.7												16.2	-16.9		0.0	0.5	0.00	
TAVE										2.5		23.80	18.49	23.94	18.77	27.05	1.78	1.83	-0.13	-0.05			65.4				5.5
DAVE										3.6		26.65	18.73	27.54	19.45	28.98	1.6371	1.73	-0.88	-0.09			48.4				0.4
NAVE										0.7		13.66	12.20	13.15	12.04	16.59	1.3097	1.31	0.52	0.00			57.8				8.0

ORIGINAL PAGE IS
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SYSTEM 8, JULY 21, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Gup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-45	5	0	27	1	-1	3	355	-383	1	115	17.37	15.17	15.61	14.52	23.68	1.58	1.58	1.78	0.00	356	-383	89.2	0.2	17	1.00	17.65
1.0	-45	1	0	29	1	-1	3	349	-379	0	103	17.35	15.05	15.49	14.33	23.23	1.56	1.56	1.87	0.00	351	-379	88.5	-0.2	16	-1.00	18.85
1.5	-44	1	0	30	1	-1	4	343	-375	0	119	16.61	14.64	15.15	14.08	22.81	1.54	1.53	1.46	0.00	345	-376	89.2	0.2	14	1.00	57.40
2.0	-41	0	0	29	1	0	1	358	-389	0.3	85	15.67	14.14	13.96	13.32	22.43	1.51	1.49	1.72	0.02	359	-389	93.3	-0.2	14	-1.00	5.12
2.5	-39	1	0	32	2	-1	6	337	-368	0.3	147	14.60	13.55	13.21	12.80	22.06	1.48	1.45	1.39	0.03	339	-369	95.6	0.2	13	1.00	3.03
3.0	-32	1	1	33	2	-1	5	348	-368	0.4	88	13.94	13.09	12.46	12.22	21.71	1.45	1.41	1.49	0.04	349	-370	97.4	-0.2	12	-1.00	2.18
3.5	-27	4	2	34	2	-2	5	359	-366	0.6	148	14.08	13.31	13.10	12.75	21.43	1.48	1.45	0.98	0.03	361	-368	96.2	0.2	8	1.00	2.99
4.0	-22	1	0	31	2	-2	4	365	-377	0.3	118	14.50	13.70	13.34	13.05	21.29	1.51	1.48	1.17	0.03	368	-378	96.8	-0.2	5	-1.00	2.71
4.5	-20	1	0	32	2	-1	5	359	-375	0.3	97	14.17	13.49	13.02	12.81	21.04	1.50	1.46	1.16	0.04	361	-376	97.7	0.2	10	1.00	2.11
5.0	-17	1	0	33	2	-1	5	361	-373	0.3	78	13.68	13.06	12.46	12.29	20.75	1.46	1.42	1.23	0.04	363	-374	98.1	-0.2	10	-1.00	1.79
5.5	-16	2	1	34	2	-1	5	364	-372	0.4	97	13.86	12.96	12.39	12.11	20.50	1.43	1.39	1.48	0.04	366	-373	96.9	0.2	8	1.00	2.48
6.0	-14	2	1	32	0	0	0	385	-392	0.4	160	13.68	12.90	12.46	12.19	20.29	1.44	1.40	1.23	0.03	385	-392	97.1	-0.2	7	-1.00	2.40
6.5	-2	6	2	32	28	-4	19	365	-366	0.9	139	14.48	13.75	13.71	13.34	20.03	1.52	1.51	0.77	0.02	392	-370	96.0	-0.2	1	-1.00	3.51
7.0	-2	6	2	32	28	-4	19	365	-366	0.9	139	14.48	13.75	13.71	13.34	20.03	1.52	1.51	0.77	0.02	392	-370	96.0	-0.2	1	-1.00	3.51
7.5	54	15	-59	28	115	-14	47	381	-374	0.6	116	15.25	14.43	14.90	14.38	20.10	1.59	1.60	0.36	-0.02	496	-388	94.7	0.0	-4	0.00	1.04
8.0	115	-17	-105	22	179	-30	110	410	-394	0.5	259	17.49	16.43	17.58	16.68	20.46	1.80	1.84	-0.08	-0.04	589	-425	91.6	0.2	-15	1.00	0.15
8.5	141	-20	-71	14	245	-41	180	385	-398	0.9	142	18.93	17.62	19.09	17.86	21.00	1.93	1.96	-0.15	-0.03	630	-439	88.9	-0.2	-22	-1.00	0.05
9.0	126	-36	-77	5	234	-37	164	372	-440	0.5	242	19.79	17.88	20.09	18.21	21.60	1.92	1.97	-0.30	-0.04	606	-477	83.7	0.2	-18	1.00	0.47
9.5	276	-134	-118	-1	418	-71	284	398	-436	0.8	136	21.68	18.17	22.44	18.64	22.15	1.85	1.90	-0.76	-0.04	816	-506	69.9	-0.2	-23	-1.00	1.16
10.0	206	-81	-95	-9	311	-52	268	400	-502	0.7	156	22.81	18.38	23.43	18.84	22.83	1.82	1.87	-0.62	-0.05	711	-554	64.9	0.2	-22	1.00	0.86
10.5	409	-175	-187	-19	597	-98	458	417	-501	1.1	114	23.97	18.68	25.32	19.58	23.81	1.80	1.90	-1.34	-0.10	1014	-600	58.8	-0.2	-27	-1.00	0.94
11.0	446	-191	-197	-29	630	-103	513	411	-540	1.3	88	24.58	18.36	25.92	19.25	24.64	1.70	1.79	-1.32	-0.09	1041	-643	53.5	0.2	-29	1.00	0.97
11.5	526	-236	-221	-38	695	-114	552	410	-596	1.5	108	25.15	18.48	26.94	19.61	25.55	1.68	1.80	-1.78	-0.11	1106	-710	50.6	-0.2	-32	-1.00	1.06
12.0	507	-221	-221	-41	746	-117	546	413	-548	1.6	227	25.41	18.83	26.94	19.83	26.20	1.74	1.84	-1.53	-0.10	1158	-664	51.8	0.2	-25	0.99	0.95
12.5	686	-323	-263	-54	929	-143	575	411	-598	1.9	178	26.29	19.37	28.24	20.48	27.24	1.79	1.89	-1.94	-0.10	1340	-741	49.4	0.0	-47	0.00	1.23
13.0	661	-300	-254	-68	893	-140	581	403	-610	2.3	111	26.68	18.84	28.99	20.21	28.38	1.66	1.79	-2.30	-0.13	1297	-750	44.6	0.2	-40	0.99	1.18
13.5	677	-312	-244	-73	907	-140	481	403	-627	2.2	56	27.11	19.00	29.38	20.28	29.69	1.66	1.78	-2.26	-0.12	1315	-767	43.4	-0.2	-47	-1.00	1.28
14.0	546	-246	-203	-73	748	-117	414	409	-610	2.0	54	27.16	18.74	29.27	19.97	30.44	1.60	1.72	-2.10	-0.12	1157	-726	42.3	0.2	-24	0.99	1.19
14.5	688	-316	-248	-74	936	-148	363	409	-610	2.6	102	28.01	19.17	30.66	20.66	31.75	1.64	1.77	-2.64	-0.14	1345	-758	40.2	-0.2	-51	-1.00	1.27
15.0	638	-309	-213	-78	876	-144	296	407	-619	2.3	82	28.51	19.50	30.74	20.68	32.91	1.67	1.77	-2.23	-0.10	1283	-763	40.0	0.2	-37	1.00	1.46
15.5	412	-193	-165	-69	584	-98	334	407	-611	2.6	52	28.14	19.84	29.84	20.82	33.03	1.76	1.86	-1.68	-0.10	991	-710	44.4	-0.2	16	-1.00	1.16
16.0	326	-145	-146	-57	450	-77	303	417	-586	2.5	72	27.77	19.62	29.23	20.54	32.45	1.74	1.84	-1.45	-0.10	867	-662	45.5	0.2	23	1.00	0.92
16.5	157	-51	-102	-43	238	-41	220	420	-532	2.3	63	26.88	19.48	27.53	20.10	31.35	1.77	1.86	-0.64	-0.09	658	-572	50.6	-0.2	39	-1.00	0.49
17.0	121	-32	-91	-29	210	-39	199	424	-481	1.9	71	26.45	19.77	25.88	20.28	30.35	1.86	1.94	-0.41	-0.08	634	-520	54.8	0.2	31	1.00	0.35
17.5	241	-96	-125	-25	399	-80	217	425	-453	2.7	74	27.39	19.88	28.36	20.57	29.99	1.82	1.91	-0.97	-0.08	824	-533	49.4	0.0	5	0.00	0.77
18.0	217	-93	-104	-25	375	-85	75	406	-471	3.1	63	27.70	19.67	28.93	20.48	29.81	1.76	1.85	-1.22	-0.09	782	-556	46.4	-0.2	5	-1.00	0.89
18.5	154	-64	-77	-22	295	-75	61	405	-480	3.2	55	27.34	19.77	28.50	20.57	29.61	1.80	1.90	-1.15	-0.09	700	-554	48.8	0.2	10	1.00	0.82
19.0	78	-32	-46	-17	207	-60	51	402	-464	2.6	52	26.81	19.88	27.66	20.54	29.17	1.86	1.94	-0.84	-0.08	609	-524	52.5	-0.2	18	-1.00	0.67
19.5	1	-17	-48	-12	120	-40	41	395	-455	1.6	56	25.86	19.88	26.29	20.33	28.60	1.92	1.99	-0.42	-0.07	517	-495	58.2	0.2	21	1.00	0.42
20.0	-45	-3	-23	-6	46	-15	25	395	-462	0.5	98	24.25	19.76	24.21	19.91	27.98	2.01	2.04	0.05	-0.03	432	-477	67.6	-0.2	23	-1.00	-0.18
20.5	-44	17	-9	1	10	-1	10	374	-449	1.4	134	21.87	18.52	21.35	18.46	27.23	1.91	1.93	0.53	-0.02	383	-450	76.1	0.2	27	1.00	-1.79
21.0	-43	14	-3	7	1	0	4	374	-417	1.7	135	20.48	17.92	19.88	17.76	26.50	1.88	1.89	0.60	-0.01	376	-417	81.6	-0.2	25	-1.00	-4.76
21.5	-42	14	-3	11	1	-1	3	375	-402	1.9	130	20.14	17.82	19.54	17.66	25.89	1.89	1.89	0.61	-0.01	377	-403	83.5	0.2	20	1.00	-5.10
22.0	-40	16	-4	12	1	-1	2	389	-411	1.7	130	20.26	17.87	19.75	17.75	25.40	1.89	1.90	0.52	-0.01	390	-411	82.5	-0.2	16	-1.00	-3.68
22.5	-37	17	-7	14	1	-1	3	382	-400	1.8	122	20.34	17.62	19.86	17.53	25.01	1.84	1.85	0.49	-0.01	383	-402	79.8	0.2	13	1.00	-2.53
23.0	-39	21	-7	15	1	-1	3	380	-401	1.9	109	20.35	17.66	19.86	17.55	24.69	1.84	1.85	0.50	-0.01	381	-402	80.0	-0.2	11	-1.00	-2.86
23.5	-40	21	-7	15	1	-1	3	377	-402	1.8	120	20.26	17.60	19.80	17.49	24.44	1.84	1.85	0.47	-0.01	379	-403	80.0	0.3	11	1.66	-3.12
24.0	-38	18	-5	15	1	-1	2	387	-411	1.1	114	20.30	17.45	19.63	17.29	24.25	1.80	1.82	0.68	-0.01	388	-412	79.6	-0.3	11	-1.67	-3.31

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Gup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	13.9	-6.2	-6.8	-0.5	22.6	-3.9	13.5	33.5	-39.5												56.0	-43.4		0.0	0.0	0.00	
DSUM	14.8	-6.4	-6.6	-1.4	21.9	-3.8	13.1	18.8	-23.8												40.7	-27.6		0.0	-0.5	0.00	
NSUM	-0.9	0.1	-0.2	0.9	0.6	-0.1	0.5	14.7	-15.7												15.3	-15.8		0.0	0.5	0.00	
TAVE										1.3	112	21.24	17.16	21.38	17.35	25.31	1.71	1.75	-0.13	-0.04			72.0				2.6
DAVE										1.8	106	25.27	19.04	26.40	19.79	27.78	1.7915	1.87	-1.11	-0.08			56.0				0.6
NAVE										0.5	81	10.92	9.96	10.25	9.64	14.97	1.0767	1.07	0.68	0.01			61.6				2.8

SYSTEM 8, JULY 22, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-22	6	-3	16	1	-1	3	398	-405	1	119	20.28	17.48	19.56	17.37	24.06	1.81	1.84	0.72	-0.03	400	-405	80.8	0.2	7	1.00	-1.89
1.0	-14	3	-4	13	1	0	1	422	-424	1	113	20.62	17.75	20.06	17.78	23.94	1.84	1.88	0.57	-0.04	423	-425	80.3	-0.2	3	-1.00	-0.89
1.5	-14	1	-2	11	0	0	1	423	-433	0	169	20.09	17.74	19.69	17.83	23.83	1.88	1.92	0.41	-0.04	423	-434	83.7	0.2	4	1.00	-0.67
2.0	-15	4	-5	12	1	-1	2	410	-414	1.3	123	20.20	17.74	19.86	17.79	23.72	1.87	1.90	0.35	-0.03	411	-414	82.0	-0.2	4	-1.00	-0.88
2.5	-16	7	-6	11	1	-1	2	416	-422	1.5	111	20.56	17.85	20.35	17.84	23.63	1.86	1.88	0.22	-0.01	416	-423	78.6	0.2	3	1.00	-1.19
3.0	-17	8	-6	10	1	-1	1	419	-430	1.1	105	20.36	17.86	20.14	17.85	23.53	1.88	1.89	0.23	-0.01	420	-430	80.3	-0.2	4	-1.00	-1.29
3.5	-17	7	-6	11	1	-1	2	408	-417	1.5	112	20.18	17.87	20.00	17.86	23.42	1.89	1.90	0.19	-0.01	409	-418	81.5	0.2	3	1.00	-1.26
4.0	-17	9	-7	10	1	-1	1	417	-426	1.3	106	20.23	17.90	20.03	17.88	23.32	1.90	1.91	0.22	-0.01	417	-427	81.4	-0.2	4	-1.00	-1.29
4.5	-18	12	-8	11	1	-1	2	407	-414	1.2	127	20.40	17.96	20.20	17.94	23.22	1.90	1.91	0.21	-0.01	408	-415	80.6	0.2	4	1.00	-1.38
5.0	-19	12	-8	11	1	-1	2	411	-423	1.6	106	20.22	17.97	20.00	17.94	23.12	1.91	1.92	0.22	-0.01	411	-424	82.1	-0.2	3	-1.00	-1.65
5.5	-19	10	-6	12	1	-1	3	398	-410	2.2	107	19.76	17.90	19.60	17.88	23.02	1.93	1.93	0.17	-0.01	400	-412	84.8	0.2	4	1.00	-1.59
6.0	-19	12	-8	12	1	-1	3	401	-409	1.4	123	20.01	17.93	19.84	17.92	22.92	1.92	1.92	0.18	-0.01	402	-410	83.2	-0.2	3	-1.00	-1.45
6.5	-11	2	-2	11	12	-3	12	402	-409	1.3	143	20.33	17.94	20.20	17.94	22.77	1.90	1.91	0.14	-0.01	414	-412	80.6	-0.2	2	-1.00	-1.07
7.0	-11	2	-2	11	12	-3	12	402	-409	1.3	143	20.33	17.94	20.20	17.94	22.77	1.90	1.91	0.14	-0.01	414	-412	80.6	-0.2	2	-1.00	-1.07
7.5	4	7	-18	11	37	-8	34	401	-408	1.6	151	20.47	18.09	20.40	18.12	22.77	1.92	1.93	0.08	-0.01	438	-416	80.5	0.0	-1	0.00	-0.49
8.0	34	-3	-33	8	81	-16	73	403	-409	2.4	157	21.10	18.32	21.13	18.39	22.88	1.92	1.93	-0.02	-0.01	484	-425	77.2	0.2	-5	1.00	0.09
8.5	79	-25	-48	4	155	-28	131	399	-413	2.1	152	21.90	18.66	22.06	18.81	23.12	1.94	1.96	-0.15	-0.02	554	-441	73.7	-0.2	-10	-1.00	0.51
9.0	205	-98	-93	-1	362	-63	230	391	-414	2.1	142	23.26	19.16	23.71	19.43	23.45	1.95	1.97	-0.43	-0.03	753	-477	67.4	0.2	-13	1.00	1.03
9.5	270	-131	-118	-6	434	-73	278	387	-474	2.2	142	24.51	19.60	25.09	19.95	23.87	1.96	1.99	-0.56	-0.03	821	-546	62.5	-0.2	-15	-1.00	1.11
10.0	394	-218	-143	-11	593	-100	399	390	-490	2.9	152	25.48	19.99	26.35	20.44	24.43	1.97	2.01	-0.86	-0.04	984	-590	58.6	0.2	-22	1.00	1.53
10.5	470	-259	-170	-23	675	-110	463	397	-536	2.5	157	26.56	20.29	27.73	20.88	25.19	1.96	2.01	-1.16	-0.05	1072	-647	54.1	-0.2	-17	-1.00	1.54
11.0	528	-279	-191	-32	749	-119	519	401	-558	2.4	149	27.30	20.39	28.48	21.00	25.84	1.94	1.99	-1.18	-0.05	1150	-677	51.2	0.2	-25	1.00	1.46
11.5	580	-313	-194	-40	805	-127	553	405	-580	2.7	135	28.09	20.79	29.46	21.46	26.69	1.97	2.03	-1.36	-0.06	1210	-707	49.3	-0.2	-32	-1.00	1.61
12.0	622	-324	-211	-52	851	-133	569	408	-592	2.9	170	28.73	20.86	30.15	21.56	27.66	1.94	2.00	-1.41	-0.06	1259	-725	46.8	0.2	-34	0.99	1.53
12.5	654	-339	-219	-62	885	-137	560	415	-603	2.2	155	29.11	21.00	30.62	21.74	28.62	1.95	2.01	-1.50	-0.06	1300	-740	45.8	-0.2	-34	-1.00	1.56
13.0	669	-303	-250	-72	909	-139	525	409	-621	2.6	176	29.63	20.79	31.15	21.62	29.78	1.87	1.95	-1.51	-0.08	1318	-760	43.1	0.2	-44	0.99	1.21
13.5	676	-328	-219	-81	919	-142	478	413	-620	2.8	159	30.08	21.13	31.66	21.91	31.15	1.91	1.98	-1.57	-0.07	1332	-762	42.5	-0.2	-49	-1.00	1.52
14.0	661	-329	-201	-85	891	-139	421	418	-625	3.4	127	30.51	21.61	32.10	22.35	32.48	1.99	2.05	-1.57	-0.06	1309	-764	43.0	0.2	-46	1.00	1.64
14.5	641	-325	-197	-83	880	-140	382	419	-604	3.0	143	30.95	21.66	32.37	22.32	33.53	1.97	2.03	-1.41	-0.06	1299	-744	41.8	-0.2	-36	-1.00	1.65
15.0	583	-304	-169	-84	769	-126	327	431	-630	3.1	153	31.00	21.95	32.39	22.58	34.50	2.03	2.09	-1.38	-0.05	1200	-756	42.9	0.2	-26	1.00	1.80
15.5	564	-296	-184	-74	801	-136	282	445	-584	3.0	147	31.12	22.27	32.50	22.91	34.82	2.10	2.16	-1.37	-0.06	1246	-720	44.1	-0.2	-10	-1.00	1.62
16.0	534	-276	-180	-73	731	-127	234	421	-608	2.9	141	31.27	22.40	32.61	23.03	35.00	2.12	2.18	-1.34	-0.06	1152	-736	44.2	0.2	-4	1.00	1.54
16.5	454	-235	-152	-71	686	-124	175	430	-565	2.9	150	31.29	22.42	32.44	22.96	35.01	2.12	2.17	-1.14	-0.05	1115	-689	44.6	-0.2	4	-1.00	1.55
17.0	363	-184	-129	-65	521	-98	148	445	-569	3.2	129	30.80	22.30	31.81	22.78	34.66	2.13	2.17	-0.99	-0.05	966	-667	46.2	0.2	15	1.00	1.43
17.5	275	-128	-112	-56	429	-85	147	426	-547	3.0	139	30.51	22.20	31.26	22.60	34.00	2.12	2.17	-0.73	-0.04	855	-632	47.6	0.0	22	0.00	1.14
18.0	187	-78	-87	-45	305	-63	138	426	-532	2.7	139	29.84	22.20	30.35	22.51	33.31	2.17	2.21	-0.50	-0.04	731	-595	51.0	-0.2	23	-1.00	0.88
18.5	126	-48	-68	-35	243	-58	110	427	-487	2.6	140	29.35	22.19	29.71	22.44	32.58	2.20	2.23	-0.35	-0.03	669	-545	53.5	0.2	25	1.00	0.71
19.0	52	-15	-40	-27	146	-37	80	415	-486	2.5	134	28.40	21.84	28.54	21.98	31.82	2.18	2.21	-0.13	-0.02	561	-523	56.6	-0.2	29	-1.00	0.36
19.5	8	1	-20	-19	73	-15	57	415	-486	2.1	124	27.30	21.78	27.29	21.86	30.98	2.24	2.26	0.02	-0.02	487	-501	62.4	0.2	30	1.00	-0.10
20.0	-13	2	-6	-12	48	-14	39	417	-453	1.6	110	26.18	21.59	26.11	21.64	30.20	2.27	2.29	0.08	-0.02	464	-467	67.7	-0.2	26	-1.00	-0.33
20.5	-27	16	-10	-7	12	-2	13	412	-455	1.7	108	25.22	21.25	25.00	21.24	29.47	2.26	2.27	0.23	-0.01	424	-457	71.8	0.2	26	1.00	-1.37
21.0	-34	18	-7	-2	1	0	3	409	-441	1.5	102	24.25	20.94	23.92	20.88	28.76	2.26	2.27	0.34	-0.01	410	-441	76.4	-0.2	24	-1.00	-2.55
21.5	-33	19	-8	2	1	-1	3	411	-428	2.1	116	24.18	20.87	23.92	20.82	28.15	2.25	2.25	0.26	-0.01	412	-429	75.9	0.2	20	1.00	-2.55
22.0	-32	28	-14	4	1	-1	4	417	-428	3.0	136	24.99	20.85	24.82	20.83	27.69	2.19	2.20	0.18	-0.01	418	-429	70.1	-0.2	15	-1.00	-2.00
22.5	-38	30	-12	5	1	-1	4	408	-433	3.9	153	24.52	20.76	24.34	20.73	27.29	2.20	2.20	0.19	0.00	409	-433	72.4	0.2	14	1.00	-2.60
23.0	-36	28	-11	6	1	-1	4	404	-430	3.0	183	23.97	20.82	23.74	20.78	26.92	2.25	2.26	0.24	-0.01	405	-432	76.8	-0.2	13	-1.00	-2.66
23.5	-35	23	-7	7	1	-1	3	400	-428	2.6	195	23.14	20.58	22.91	20.53	26.63	2.25	2.26	0.24	0.00	401	-428	80.8	0.3	13	1.66	-3.28
24.0	-33	18	-4	7	1	-1	4	398	-425	2.5	195	22.63	20.41	22.42	20.36	26.42	2.25	2.25	0.22	0.00	399	-426	83.1	-0.3	12	-1.67	-4.30

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.8	-8.4	-6.6	-1.7	25.7	-4.4	13.7	35.5	-41.8												61.3	-46.2		0.0	-0.1	0.00	
DSUM	17.2	-8.6	-6.2	-1.9	25.0	-4.2	13.2	19.2	-24.8												44.2	-29.0		0.0	-0.5	0.00	
NSUM	-0.4	0.2	-0.4	0.3	0.8	-0.2	0.5	16.3	-17.1												17.1	-17.2		0.0	0.3	0.00	
TAVE										2.2	138	25.05	20.03	25.42	20.27	27.43	2.02	2.05	-0.36	-0.03			65.3				-0.2
DAVE										2.6	142	28.17	21.18	29.04	21.63	29.96	2.0546	2.10	-0.86	-0.04			53.2				1.0
NAVE										1.2	89	14.32	12.55	14.17	12.55	16.38	1.3336	1.34	0.15	-0.01			53.8				-1.0

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 8, JULY 23, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-33	15	-3	8	2	-1	4	396	-421	2	191	22.03	20.20	21.82	20.15	26.16	2.24	2.25	0.22	0.00	397	-422	86.0	0.2	11	1.00	-5.15
1.0	-35	17	-2	9	2	-1	4	390	-415	2	182	21.53	19.92	21.30	19.86	25.83	2.22	2.22	0.24	0.00	392	-416	87.7	-0.2	12	-1.00	-1.19
1.5	-32	8	2	11	2	-1	5	389	-411	1	168	20.65	19.61	20.45	19.53	25.49	2.21	2.21	0.21	0.00	391	-412	91.9	0.2	11	1.00	3.89
2.0	-28	11	-2	11	1	-2	4	396	-407	1.6	180	20.86	19.77	20.67	19.72	25.24	2.23	2.23	0.19	0.00	397	-408	91.7	-0.2	8	-1.00	1.74
2.5	-40	30	-9	11	1	-2	4	385	-405	3.4	171	21.28	19.77	21.07	19.72	25.02	2.20	2.21	0.22	0.00	386	-406	88.4	0.2	8	1.00	-3.60
3.0	-42	24	-3	12	1	-1	4	381	-407	2.9	169	20.90	19.68	20.69	19.62	24.78	2.21	2.21	0.22	0.00	382	-409	90.7	-0.2	9	-1.00	-15.91
3.5	-39	24	-5	12	1	-1	3	388	-409	2.7	174	20.74	19.43	20.51	19.37	24.55	2.17	2.17	0.24	0.00	389	-410	90.1	0.2	8	1.00	-4.87
4.0	-38	20	-3	13	1	-1	4	381	-405	2.1	175	20.36	19.25	20.14	19.19	24.33	2.16	2.16	0.22	0.00	382	-407	91.6	-0.2	8	-1.00	-33.16
4.5	-37	16	0	13	1	-1	4	381	-401	2.3	173	20.04	19.14	19.83	19.07	24.12	2.16	2.16	0.21	0.00	383	-402	93.2	0.2	7	1.00	15.57
5.0	-28	15	-4	13	1	-2	4	397	-403	2.6	166	20.60	19.50	20.44	19.47	23.98	2.19	2.20	0.17	0.00	398	-405	91.5	-0.2	4	-1.00	-4.06
5.5	-28	21	-8	11	1	-1	2	405	-419	2.8	178	20.86	19.60	20.69	19.57	23.89	2.20	2.20	0.17	0.00	405	-420	90.3	0.2	3	1.00	-2.83
6.0	-27	20	-7	12	2	-2	4	397	-409	3.0	180	20.99	19.69	20.82	19.65	23.79	2.21	2.21	0.18	0.00	399	-411	90.0	-0.2	3	-1.00	-2.85
6.5	-22	15	-6	10	19	-4	17	391	-411	3.6	175	21.35	19.73	21.20	19.70	23.64	2.19	2.19	0.17	0.00	410	-415	87.2	-0.2	3	-1.00	-2.31
7.0	-22	15	-6	10	19	-4	17	391	-411	3.6	175	21.35	19.73	21.20	19.70	23.64	2.19	2.19	0.17	0.00	410	-415	87.2	-0.2	3	-1.00	-2.31
7.5	29	13	-53	10	130	-21	68	395	-412	3.6	180	21.84	19.98	21.84	20.01	23.60	2.21	2.22	0.01	-0.01	525	-433	84.8	0.0	2	-0.01	-0.20
8.0	90	-41	-52	7	190	-32	104	396	-421	4.1	188	22.85	20.42	22.98	20.51	23.66	2.24	2.25	-0.12	-0.01	586	-452	80.2	0.2	-3	1.00	0.77
8.5	160	-88	-68	5	274	-48	159	400	-434	4.3	197	24.10	21.07	24.39	21.22	23.83	2.30	2.31	-0.28	-0.01	673	-482	75.6	0.0	-8	0.00	1.28
9.0	230	-92	-95	1	409	-73	90	409	-468	5.1	209	25.33	21.70	25.75	21.95	24.34	2.35	2.38	-0.41	-0.03	818	-541	71.9	1.0	-44	4.99	0.97
9.5	307	-150	-129	-6	458	-79	96	412	-482	5.1	215	26.45	22.24	26.90	22.48	24.62	2.40	2.43	-0.44	-0.03	870	-562	68.5	-0.2	-23	-1.00	1.16
10.0	379	-181	-166	-12	548	-93	105	417	-505	4.9	212	27.55	22.67	28.16	23.00	25.16	2.43	2.47	-0.59	-0.04	966	-598	64.6	0.2	-20	1.00	1.09
10.5	473	-215	-216	-24	662	-109	110	425	-539	4.4	224	29.03	23.16	29.76	23.57	25.90	2.45	2.50	-0.72	-0.05	1087	-648	59.7	-0.2	-18	-1.00	1.00
11.0	530	-237	-235	-33	728	-117	119	431	-562	4.5	218	30.02	23.44	30.85	23.89	26.54	2.45	2.50	-0.82	-0.05	1159	-680	56.1	0.2	-25	0.99	1.01
11.5	582	-261	-249	-41	787	-125	122	435	-583	4.7	223	31.01	23.63	31.91	24.10	27.36	2.43	2.48	-0.89	-0.06	1222	-707	52.5	-0.2	-30	-1.00	1.05
12.0	622	-286	-251	-53	835	-131	125	437	-599	5.4	215	31.69	23.70	32.74	24.24	28.28	2.40	2.46	-1.04	-0.06	1272	-730	49.6	0.2	-33	0.99	1.14
12.5	645	-316	-234	-63	862	-135	134	436	-608	5.5	208	32.18	23.68	33.29	24.20	29.20	2.36	2.42	-1.10	-0.05	1298	-743	47.2	-0.2	-32	-1.00	1.35
13.0	671	-308	-252	-72	903	-143	172	444	-609	5.5	209	32.93	23.85	34.06	24.40	30.23	2.35	2.41	-1.12	-0.06	1347	-752	45.2	0.2	-39	0.99	1.22
13.5	457	-200	-167	-73	590	-96	216	456	-639	5.6	209	32.50	23.53	33.36	23.96	30.94	2.30	2.35	-0.85	-0.05	1046	-735	45.9	-0.2	-16	-1.00	1.18
14.0	633	-300	-224	-68	871	-143	224	451	-576	5.7	204	33.48	23.53	34.62	24.07	31.79	2.24	2.30	-1.13	-0.06	1323	-720	41.7	0.2	-42	0.99	1.34
14.5	625	-317	-202	-72	848	-141	191	446	-599	5.3	196	33.75	23.74	34.95	24.27	32.88	2.27	2.32	-1.20	-0.05	1294	-740	41.4	-0.2	-34	-1.00	1.57
15.0	578	-291	-186	-73	778	-133	189	460	-613	5.8	198	33.77	23.75	34.94	24.27	33.77	2.27	2.32	-1.16	-0.05	1239	-746	41.4	0.2	-27	0.99	1.56
15.5	481	-249	-164	-67	671	-119	200	464	-602	5.5	197	33.74	23.82	34.84	24.31	34.05	2.29	2.34	-1.08	-0.05	1135	-720	42.0	-0.2	-1	-1.00	1.52
16.0	480	-239	-175	-62	670	-122	161	457	-572	5.9	201	33.87	23.70	34.88	24.18	34.01	2.25	2.30	-1.01	-0.05	1127	-694	41.2	0.2	-4	0.99	1.36
16.5	433	-216	-154	-61	626	-118	150	439	-576	5.6	188	33.73	23.66	34.75	24.13	34.14	2.25	2.30	-1.01	-0.05	1064	-695	41.5	-0.2	-2	-1.00	1.40
17.0	396	-201	-147	-58	584	-117	149	447	-552	5.6	192	33.65	23.29	34.63	23.76	33.94	2.17	2.22	-0.97	-0.05	1031	-669	40.2	0.2	9	0.99	1.37
17.5	268	-121	-113	-50	410	-85	203	451	-548	5.3	194	33.00	23.33	33.67	23.69	33.46	2.22	2.27	-0.67	-0.04	860	-633	43.4	0.0	16	0.00	1.06
18.0	208	-96	-87	-42	340	-79	187	448	-525	4.7	188	32.71	23.37	33.30	23.68	32.97	2.25	2.29	-0.59	-0.04	788	-604	44.7	-0.2	17	-1.00	1.11
18.5	148	-64	-68	-34	267	-70	173	444	-505	5.0	195	32.26	23.40	32.70	23.64	32.48	2.29	2.32	-0.43	-0.03	711	-574	46.9	0.2	19	0.99	0.93
19.0	75	-29	-42	-27	189	-57	162	436	-481	4.5	193	31.32	23.27	31.59	23.46	31.85	2.32	2.35	-0.26	-0.03	625	-538	50.5	-0.2	23	-1.00	0.68
19.5	17	-5	-14	-21	116	-40	116	438	-476	4.0	186	30.62	23.13	30.74	23.27	31.19	2.33	2.36	-0.11	-0.02	555	-516	53.3	0.2	23	1.00	0.27
20.0	-26	6	-17	-16	45	-18	50	428	-479	3.9	184	29.56	23.28	29.49	23.32	30.56	2.44	2.45	0.08	-0.01	474	-497	59.6	-0.2	23	-1.00	-0.46
20.5	-39	54	-29	-11	8	-2	10	423	-472	3.8	188	28.41	22.93	28.18	22.90	29.88	2.43	2.44	0.24	-0.01	431	-474	63.9	0.2	24	0.99	-2.00
21.0	-41	38	-12	-6	1	-1	3	423	-463	2.8	176	27.35	22.67	27.05	22.61	29.24	2.44	2.45	0.31	-0.01	424	-464	68.5	-0.2	22	-1.00	-3.14
21.5	-40	37	-13	-2	1	-1	3	419	-445	3.4	180	26.99	22.60	26.70	22.55	28.69	2.45	2.46	0.30	-0.01	420	-446	70.2	0.2	18	0.99	-2.87
22.0	-40	39	-12	-1	0	0	1	438	-467	3.5	179	26.69	22.65	26.42	22.60	28.26	2.48	2.49	0.28	-0.01	438	-468	72.2	-0.2	15	-1.00	-3.27
22.5	-40	39	-13	1	1	-1	3	420	-447	3.4	169	26.25	22.60	25.99	22.55	27.88	2.50	2.51	0.27	-0.01	421	-448	74.6	0.2	13	1.00	-3.14
23.0	-40	43	-17	2	1	-1	3	418	-444	3.8	171	25.89	22.14	25.62	22.10	27.53	2.42	2.42	0.28	-0.01	418	-445	73.8	-0.2	12	-1.00	-2.58
23.5	-39	39	-15	3	1	-1	4	410	-438	3.6	178	25.53	21.77	25.27	21.73	27.26	2.36	2.37	0.26	-0.01	411	-439	73.5	0.3	12	1.66	-2.53
24.0	-38	43	-19	3	0	-1	2	426	-450	3.8	183	25.43	21.63	25.19	21.60	27.11	2.33	2.34	0.25	-0.01	426	-450	73.0	0.0	11	0.00	-2.30

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.4	-7.4	-7.3	-1.7	25.6	-4.6	7.1	36.3	-42.2												62.0	-46.8		0.0	0.0	0.00	
DSUM	17.8	-8.4	-7.0	-1.9	25.6	-4.5	6.9	20.3	-25.2												45.8	-29.8		0.0	-0.5	0.00	
NSUM	-1.4	1.0	-0.3	0.3	0.1	-0.1	0.2	16.1	-17.0												16.1	-17.0		0.0	0.4	0.00	
TAVE										4.0	150	27.23	21.97	27.52	22.15	28.09	2.30	2.33	-0.28	-0.02			66.5				-1.1
DAVE										5.0	201	31.13	23.26	31.83	23.62	30.25	2.3327	2.37	-0.69	-0.04			51.4				0.9
NAVE										1.8	112	14.36	13.06	14.24	13.04	16.27	1.4516	1.45	0.13	0.00			54.7				-2.3

SYSTEM 8, JULY 24, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-37	35	-15	5	1	-1	4	413	-435	4	177	25.33	21.51	25.08	21.46	26.84	2.31	2.32	0.26	-0.01	414	-436	72.8	0.2	10	1.00	-2.40
1.0	-36	37	-15	5	1	-1	3	420	-441	4	178	25.37	21.51	25.15	21.47	26.59	2.31	2.32	0.24	-0.01	421	-442	72.5	-0.2	8	-1.00	-2.55
1.5	-33	36	-15	6	1	-1	4	416	-437	4	180	25.21	21.65	25.03	21.62	26.39	2.35	2.36	0.20	-0.01	417	-439	74.3	0.2	6	1.00	-2.44
2.0	-35	38	-15	5	1	-1	4	412	-434	4.7	184	25.11	21.68	24.90	21.64	26.20	2.36	2.37	0.22	-0.01	413	-435	75.3	-0.2	7	-1.00	-2.58
2.5	-37	42	-17	5	1	-1	3	415	-439	4.2	190	25.05	21.66	24.84	21.62	26.03	2.36	2.37	0.22	-0.01	416	-440	75.6	0.2	6	0.99	-2.54
3.0	-32	40	-19	6	1	-1	3	426	-439	5.1	188	25.43	21.75	25.22	21.72	25.87	2.36	2.37	0.22	-0.01	426	-440	73.7	-0.2	5	-1.00	-2.15
3.5	-31	39	-17	5	1	-1	4	418	-436	4.4	190	25.56	21.80	25.35	21.77	25.77	2.36	2.37	0.21	-0.01	419	-438	73.2	0.2	4	0.99	-2.30
4.0	-37	48	-20	5	1	-1	3	417	-438	5.5	198	26.10	21.82	25.86	21.78	25.66	2.33	2.34	0.26	-0.01	418	-439	70.2	-0.2	4	-1.00	-2.42
4.5	-38	49	-19	5	1	-1	2	421	-445	6.2	199	26.11	21.83	25.87	21.79	25.55	2.33	2.34	0.25	-0.01	421	-446	70.1	0.2	4	1.00	-2.53
5.0	-38	34	-30	5	1	-1	3	414	-440	4.8	195	25.80	21.66	25.53	21.66	25.41	2.32	2.33	0.28	-0.02	414	-441	71.4	0.0	10	-0.01	-1.54
5.5	-40	53	-22	5	0	-1	2	418	-444	4.9	191	25.88	21.57	25.57	21.52	25.32	2.29	2.30	0.31	-0.01	419	-445	70.1	0.2	4	1.00	-2.39
6.0	-39	52	-21	5	0	-1	2	425	-450	5.4	187	25.91	21.48	25.63	21.43	25.20	2.27	2.27	0.30	-0.01	425	-451	69.2	-0.2	4	-1.00	-2.42
6.5	-31	40	-19	6	16	-3	14	406	-435	4.5	164	25.33	21.28	25.04	21.24	24.99	2.26	2.27	0.29	-0.01	423	-438	71.5	-0.2	4	-1.00	-2.14
7.0	-31	40	-19	6	16	-3	14	406	-435	4.5	164	25.33	21.28	25.04	21.24	24.99	2.26	2.27	0.29	-0.01	423	-438	71.5	-0.2	4	-1.00	-2.14
7.5	-1	20	-16	6	66	-10	35	407	-432	4.4	165	25.55	21.20	25.29	21.18	24.90	2.23	2.24	0.27	-0.01	474	-442	69.6	0.0	2	0.00	-1.37
8.0	78	51	-114	4	179	-30	52	417	-438	5.3	169	26.66	21.40	26.53	21.44	24.93	2.20	2.22	0.14	-0.02	596	-468	63.9	0.2	-2	1.00	-0.56
8.5	165	2	-163	2	279	-48	63	417	-459	5.9	153	27.52	21.65	27.52	21.75	25.06	2.20	2.22	0.00	-0.02	697	-507	60.4	-0.2	-6	-1.00	-0.01
9.0	237	-54	-172	-2	372	-64	73	421	-480	6.1	142	28.36	22.00	28.49	22.15	25.31	2.22	2.25	-0.12	-0.03	792	-544	57.8	0.2	-10	0.99	0.31
9.5	312	-85	-208	-6	424	-79	79	426	-501	7.1	126	29.25	22.22	29.47	22.59	25.68	2.21	2.28	-0.21	-0.07	890	-579	55.5	-0.2	-14	-1.00	0.45
10.0	384	-117	-239	-12	552	-92	84	431	-522	6.0	106	30.32	22.62	30.65	23.06	26.15	2.23	2.31	-0.32	-0.08	984	-614	52.6	0.2	-17	0.99	0.53
10.5	475	-199	-235	-23	661	-108	93	441	-556	6.5	82	31.75	23.00	32.29	23.33	26.82	2.23	2.27	-0.52	-0.04	1102	-664	47.0	-0.2	-17	-1.00	0.85
11.0	534	-248	-230	-32	734	-118	92	444	-578	6.0	70	32.81	23.18	33.51	23.55	27.46	2.20	2.24	-0.69	-0.04	1178	-695	43.3	0.2	-25	0.99	1.08
11.5	586	-290	-230	-40	796	-126	92	444	-593	6.6	64	33.60	23.22	34.37	23.60	23.19	2.16	2.20	-0.76	-0.04	1241	-720	40.5	-0.2	-27	-1.00	1.26
12.0	627	-316	-228	-51	843	-134	92	448	-607	7.1	64	34.32	23.48	35.18	23.89	29.04	2.17	2.21	-0.86	-0.04	1290	-741	39.0	0.2	-31	0.99	1.39
12.5	655	-330	-229	-63	877	-139	95	449	-618	6.7	65	35.09	23.75	36.03	24.18	30.00	2.19	2.23	-0.93	-0.04	1326	-757	37.5	-0.2	-33	-1.00	1.44
13.0	672	-318	-247	-72	901	-142	94	449	-627	6.8	73	35.64	23.92	36.52	24.34	31.00	2.19	2.23	-0.87	-0.04	1349	-769	36.5	0.2	-36	0.99	1.31
13.5	676	-267	-297	-76	908	-145	96	448	-631	6.4	60	36.04	23.91	36.76	24.32	32.01	2.16	2.21	-0.71	-0.05	1356	-776	35.7	-0.2	-36	-1.00	0.93
14.0	665	-59	-488	-79	899	-146	93	455	-631	6.0	67	36.61	24.16	36.79	24.59	33.10	2.18	2.28	-0.17	-0.09	1354	-777	36.7	0.2	-40	0.99	0.12
14.5	645	-21	-513	-78	873	-146	93	459	-630	6.6	65	36.73	24.14	36.80	24.57	34.10	2.17	2.27	-0.06	-0.10	1332	-776	36.6	-0.2	-34	-1.00	0.04
15.0	613	3	-509	-77	839	-144	90	463	-627	6.5	67	36.80	24.14	36.80	24.60	34.99	2.17	2.28	0.01	-0.11	1302	-772	36.8	0.2	-29	0.99	-0.01
15.5	572	3	-499	-71	790	-140	90	464	-620	6.6	58	36.80	23.93	36.80	24.34	35.37	2.12	2.22	0.01	-0.10	1254	-760	35.7	-0.2	-5	-1.00	-0.01
16.0	516	2	-444	-69	725	-133	99	468	-610	7.0	68	36.79	24.21	36.80	24.63	35.43	2.18	2.29	0.01	-0.10	1194	-744	36.9	0.2	-4	0.99	0.00
16.5	328	-42	-234	-66	470	-89	157	488	-616	6.5	62	36.44	24.04	36.63	24.35	35.28	2.17	2.23	-0.18	-0.06	957	-705	36.2	-0.2	14	-1.00	0.25
17.0	243	-44	-165	-56	341	-66	172	478	-587	6.6	68	35.93	23.85	36.14	24.11	34.67	2.15	2.20	-0.20	-0.05	819	-653	36.8	0.2	23	0.99	0.31
17.5	291	-92	-170	-46	458	-99	144	478	-515	6.3	65	36.31	23.85	36.66	24.12	34.03	2.13	2.17	-0.35	-0.04	936	-613	35.2	0.0	16	0.00	0.54
18.0	237	-97	-111	-41	379	-90	119	468	-535	6.2	64	36.05	23.83	36.49	24.14	33.65	2.15	2.19	-0.43	-0.03	847	-625	35.8	-0.2	12	-1.00	0.89
18.5	158	-61	-75	-36	264	-76	138	466	-523	6.0	62	35.51	23.72	35.85	23.93	33.27	2.15	2.18	-0.34	-0.03	749	-599	36.9	0.2	15	0.99	0.81
19.0	82	-24	-48	-30	199	-61	143	458	-507	5.9	63	34.84	23.59	35.03	23.75	32.76	2.16	2.19	-0.18	-0.03	656	-568	38.8	-0.2	19	-1.00	0.47
19.5	-16	50	-48	-24	45	-10	38	438	-539	4.6	59	33.06	23.22	32.87	23.25	32.07	2.19	2.21	0.19	-0.02	483	-549	44.3	0.2	28	0.99	-0.80
20.0	-40	63	-54	-17	39	-19	45	443	-470	4.2	65	32.33	22.66	32.09	22.66	31.30	2.11	2.13	0.25	-0.02	482	-489	44.5	-0.2	25	-1.00	-1.03
20.5	-42	76	-45	-12	6	-2	7	437	-486	4.0	73	31.34	22.27	30.97	22.23	30.63	2.09	2.10	0.38	-0.01	443	-487	46.8	0.2	23	0.99	-1.73
21.0	-37	56	-30	-8	0	0	1	473	-500	4.4	65	31.16	21.96	30.84	21.92	30.06	2.03	2.04	0.33	-0.01	473	-500	45.8	-0.2	19	-1.00	-1.90
21.5	-32	43	-19	-6	0	0	1	477	-504	4.6	74	30.49	22.13	30.23	22.09	29.62	2.11	2.12	0.27	-0.01	476	-504	49.3	0.2	15	0.99	-2.28
22.0	-34	47	-20	-5	0	0	1	459	-487	4.7	93	29.91	22.45	29.63	22.42	29.25	2.22	2.23	0.28	-0.01	459	-489	53.8	-0.2	13	-1.00	-2.32
22.5	-38	50	-21	-4	0	0	1	464	-493	5.7	88	29.57	22.13	29.28	22.08	28.90	2.17	2.18	0.30	-0.01	464	-493	53.6	0.2	12	1.00	-2.42
23.0	-33	44	-20	-2	0	0	1	464	-489	5.0	106	29.31	21.61	29.01	21.56	28.55	2.07	2.08	0.31	-0.01	464	-489	51.9	-0.2	11	-1.00	-2.30
23.5	-19	19	-13	-2	1	0	2	447	-471	4.2	136	27.92	22.29	27.78	22.28	28.37	2.32	2.33	0.15	-0.01	448	-471	62.3	0.3	7	1.66	-1.53
24.0	-22	8	-10	-2	3	0	3	422	-469	2.1	161	26.31	21.15	25.94	21.17	28.18	2.17	2.20	0.38	-0.03	425	-469	65.7	-0.3	13	-1.66	-0.85

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	16.8	-3.0	-11.8	-1.9	26.1	-4.6	4.7	38.1	-44.2												64.1	-48.8		0.0	-0.1	0.00	
DSUM	17.3	-4.5	-10.6	-1.9	25.0	-4.4	4.4	20.8	-25.8												45.8	-30.2		0.0	-0.4	0.00	
NSUM	-0.6	1.5	-1.2	0.0	1.1	-0.2	0.3	17.3	-18.4												18.3	-18.7		0.0	0.3	0.00	
TAVE										5.5	114	30.65	22.60	30.69	22.75	29.01	2.21	2.25	-0.03	-0.03			53.1				-0.8
DAVE										6.1	77	33.87	23.34	34.14	23.62	30.99	2.1694	2.22	-0.27	-0.05			42.1				0.3
NAVE										3.1	105	17.41	14.19	17.24	14.17	17.34	1.4839	1.49	0.17	-0.01			43.8				-1.4

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SYSTEM 9, JULY 20, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-28	11	-4	5	0	0	0	425	-453	1	57	23.46	20.94	23.00	20.88	24.93	2.31	2.33	0.47	-0.02	425	-453	82.9	0.2	7	3.00	-2.66
1.0	-29	33	-17	5	0	0	0	420	-448	1	36	22.87	20.67	22.30	20.57	24.74	2.29	2.31	0.59	-0.02	420	-448	85.7	-0.2	8	-3.01	-2.99
1.5	-29	29	-12	6	0	0	0	418	-442	1	27	22.63	20.58	22.08	20.47	24.57	2.29	2.30	0.56	-0.01	418	-442	86.6	0.2	7	3.00	-1.12
2.0	-22	16	-5	6	0	0	0	428	-440	0.6	63	22.17	20.50	21.70	20.39	24.42	2.30	2.31	0.48	-0.01	427	-440	88.9	-0.2	5	-3.01	10.86
2.5	-24	31	-19	6	0	0	0	428	-440	1.2	36	22.65	20.47	22.29	20.42	24.36	2.26	2.28	0.37	-0.01	428	-440	84.6	0.2	3	3.00	-2.72
3.0	-31	38	-26	6	0	0	0	412	-444	1.0	50	22.06	19.93	21.62	19.90	24.24	2.19	2.21	0.45	-0.02	412	-444	85.5	-0.2	6	-3.01	-1.50
3.5	-34	23	-7	6	0	0	0	403	-437	0.9	52	21.20	19.47	20.71	19.37	24.05	2.15	2.16	0.50	-0.01	403	-437	88.5	0.2	8	3.00	-0.18
4.0	-36	25	-4	7	0	0	0	396	-429	1.1	47	20.29	19.03	19.74	18.87	23.83	2.12	2.12	0.56	0.00	397	-429	92.2	-0.2	8	-3.01	16.38
4.5	-38	26	-4	8	0	0	0	390	-424	0.9	94	19.95	18.67	19.35	18.49	23.65	2.07	2.07	0.61	0.00	390	-424	92.3	0.2	8	3.00	-2.24
5.0	-36	15	3	9	0	0	0	389	-420	0.7	99	19.51	18.33	18.53	17.93	23.41	2.03	2.01	0.98	0.01	389	-419	94.4	-0.2	9	-3.01	9.33
5.5	-33	11	2	10	0	0	0	390	-416	0.6	217	18.78	17.85	17.85	17.47	23.19	1.98	1.97	0.94	0.01	390	-417	96.4	0.2	9	3.01	6.47
6.0	-29	10	1	11	0	0	0	390	-415	0.9	56	17.65	17.24	17.19	17.01	23.00	1.94	1.93	0.47	0.01	390	-415	98.3	-0.2	7	-3.01	1.40
6.5	0	6	-15	12	36	-6	22	378	-379	0.4	85	17.12	16.62	17.01	16.67	22.74	1.86	1.87	0.12	-0.02	414	-384	96.7	-0.2	1	-3.01	-0.54
7.0	0	6	-15	12	36	-6	22	378	-379	0.4	85	17.12	16.62	17.01	16.67	22.74	1.86	1.87	0.12	-0.02	414	-384	96.7	-0.2	1	-3.01	-0.54
7.5	63	-9	-56	10	190	-37	92	373	-357	0.5	135	19.19	18.19	19.27	18.38	22.90	2.02	2.06	-0.07	-0.03	563	-394	92.2	0.0	-9	0.00	0.13
8.0	132	-7	-120	6	240	-48	117	388	-420	1.3	37	22.26	19.01	22.44	19.38	23.21	1.98	2.05	-0.18	-0.06	628	-469	75.4	0.2	-11	3.00	0.13
8.5	76	-5	-68	4	144	-24	124	393	-453	1.3	42	22.19	18.83	22.27	19.04	23.38	1.95	1.99	-0.07	-0.04	538	-477	74.0	-0.2	-6	-3.01	0.08
9.0	101	-17	-79	2	170	-30	142	394	-442	1.3	47	22.68	18.93	22.84	19.21	23.57	1.94	1.98	-0.15	-0.05	564	-471	71.3	0.2	-6	3.00	0.22
9.5	160	-96	-59	1	315	-55	178	379	-408	1.0	59	23.16	19.52	23.32	19.76	23.69	2.03	2.07	-0.15	-0.04	694	-463	72.2	-0.2	-7	-3.01	-0.28
10.0	398	-120	-256	-1	633	-117	208	392	-429	1.6	76	25.80	20.86	26.46	21.44	24.12	2.14	2.22	-0.65	-0.08	1025	-546	64.5	0.2	-21	3.00	0.45
10.5	467	-200	-250	-5	706	-126	115	375	-518	2.5	53	27.57	20.63	28.50	21.30	24.66	1.97	2.06	-0.92	-0.08	1082	-644	52.8	-0.2	-12	-3.01	0.86
11.0	526	-218	-287	-7	769	-135	197	381	-529	3.2	57	27.96	20.24	29.01	20.99	24.99	1.86	1.95	-1.04	-0.09	1150	-664	48.8	0.2	-14	3.01	0.78
11.5	581	-228	-327	-10	824	-142	289	384	-535	3.7	59	28.49	19.83	29.43	20.54	25.38	1.74	1.83	-0.93	-0.09	1209	-677	44.5	-0.2	-16	-3.01	0.71
12.0	623	-266	-319	-14	866	-145	365	393	-550	3.2	57	29.00	20.31	30.19	21.14	25.92	1.81	1.91	-1.18	-0.10	1259	-695	44.5	0.2	-24	3.01	0.88
12.5	656	-250	-358	-17	897	-145	422	392	-567	3.1	54	29.43	20.36	30.59	21.23	26.73	1.79	1.90	-1.15	-0.11	1289	-712	43.3	-0.2	-31	-3.01	0.72
13.0	680	-262	-372	-19	919	-145	461	395	-586	2.8	44	30.00	20.06	31.08	20.90	27.34	1.69	1.80	-1.07	-0.11	1314	-731	39.8	0.2	-27	3.00	0.74
13.5	689	-220	-413	-21	927	-145	474	393	-594	2.6	51	30.13	19.56	31.14	20.47	27.92	1.57	1.70	-1.00	-0.12	1320	-739	37.5	0.0	-35	0.00	0.53
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TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	14.4	-5.0	-9.3	0.2	23.5	-4.0	9.5	34.1	-39.3												57.6	-43.3		0.0	-0.4	0.00	
DSUM	17.6	-6.6	-10.1	-0.2	26.3	-4.5	10.6	17.9	-22.5												44.2	-27.0		0.0	-0.7	0.01	
NSUM	-3.2	1.6	0.8	0.4	-2.8	0.5	-1.1	16.2	-16.8												13.4	-16.3		0.0	0.4	-0.01	
TAVE										1.5	66	23.03	19.40	23.05	19.58	24.28	2.02	2.06	-0.01	-0.04			76.0				1.4
DAVE										2.3	55	26.70	19.96	27.45	20.57	25.04	1.8878	1.97	-0.74	-0.08			55.3				0.5
NAVE										0.4	37	10.14	9.41	9.91	9.36	11.77	1.0425	1.05	0.23	0.00			45.0				1.3

SYSTEM 9, JULY 21, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-41	13	0	14	0	0	0	361	-392	1	85	15.46	14.59	14.85	14.32	22.90	1.60	1.60	0.62	0.01	361	-392	94.5	0.2	11	3.00	1.86
1.0	-37	10	0	15	0	0	0	361	-390	0	110	14.68	14.13	14.06	13.84	22.61	1.57	1.57	0.63	0.01	361	-390	97.6	-0.2	12	-3.01	3.30
1.5	-30	3	0	16	0	0	0	367	-385	0	144	14.40	13.74	13.88	13.49	22.34	1.53	1.52	0.53	0.01	367	-385	95.9	0.2	11	3.00	-19.85
2.0	-33	8	-2	17	0	0	0	369	-385	0.5	105	15.52	14.13	14.53	13.82	22.11	1.52	1.53	1.00	-0.01	369	-385	92.6	-0.2	9	-3.01	-5.25
2.5	-33	8	1	17	0	0	0	367	-390	1.1	61	14.71	13.76	13.80	13.35	21.91	1.51	1.50	0.92	0.01	367	-390	95.2	0.2	7	3.01	21.02
3.0	-32	6	2	17	0	0	0	366	-389	1.3	59	13.88	13.27	13.18	12.89	21.75	1.48	1.47	0.70	0.02	366	-389	96.8	-0.2	7	-3.01	3.52
3.5	-27	6	0	17	0	0	0	373	-388	1.2	53	14.01	13.32	13.36	13.04	21.62	1.48	1.48	0.65	0.00	373	-388	96.5	0.2	4	3.00	-22.89
4.0	-23	4	0	16	0	0	0	379	-390	0.9	67	14.59	13.85	13.91	13.59	21.53	1.53	1.53	0.69	0.00	379	-390	96.6	-0.2	4	-3.01	-74.52
4.5	-28	5	1	16	0	0	0	371	-392	1.3	55	14.47	13.75	13.63	13.39	21.40	1.52	1.52	0.85	0.01	370	-392	97.4	0.2	5	3.00	11.02
5.0	-27	5	1	16	0	0	0	369	-392	1.2	57	13.87	13.26	13.18	12.94	21.26	1.48	1.48	0.70	0.01	369	-392	97.4	-0.2	6	-3.01	9.53
5.5	-26	3	0	17	0	0	0	369	-391	0.8	94	13.58	12.95	12.88	12.60	21.11	1.45	1.44	0.71	0.01	369	-391	97.0	0.2	6	3.00	3.02
6.0	-24	2	0	17	0	0	0	371	-386	0.9	99	13.42	12.80	12.78	12.47	20.95	1.44	1.42	0.64	0.01	371	-386	96.6	-0.2	5	-3.01	0.31
6.5	-7	2	-3	17	47	-5	16	343	-357	0.6	195	13.37	12.93	13.02	12.84	20.77	1.46	1.47	0.35	-0.01	390	-362	98.1	-0.2	2	-3.01	0.13
7.0	-7	2	-3	17	47	-5	16	343	-357	0.6	195	13.37	12.93	13.02	12.84	20.77	1.46	1.47	0.35	-0.01	390	-362	98.1	-0.2	2	-3.01	0.13
7.5	25	1	-4	16	146	-23	31	336	-352	0.5	264	15.39	14.58	15.07	14.48	20.83	1.61	1.61	0.33	0.00	481	-375	94.0	0.0	-5	-0.01	158.05
8.0	104	-19	-36	13	229	-39	88	351	-379	0.9	245	17.72	16.69	17.91	16.84	21.12	1.83	1.85	-0.18	-0.01	580	-418	90.1	0.2	-13	3.00	-0.04
8.5	142	-26	-111	10	266	-48	147	368	-391	1.4	121	19.07	17.46	19.31	17.86	21.45	1.89	1.95	-0.23	-0.06	634	-439	87.0	-0.2	-15	-3.01	0.18
9.0	126	-23	-99	6	235	-39	130	365	-435	0.8	140	20.48	18.58	20.77	18.91	21.77	2.01	2.06	-0.28	-0.05	600	-474	84.1	0.2	-10	3.00	0.55
9.5	241	-94	-134	4	444	-82	175	372	-398	1.0	118	21.89	19.05	22.55	19.53	22.08	2.02	2.07	-0.64	-0.06	816	-480	75.9	0.0	-16	0.00	0.70
10.0	278	-79	-149	0	336	-56	280	392	-481	0.9	169	23.61	19.66	24.51	20.48	22.66	2.03	2.14'	-0.90	-0.11	728	-537	69.6	0.0	-50	0.00	0.51
10.5	392	-164	-205	-4	591	-102	349	400	-477	1.2	196	25.16	20.08	25.89	20.75	23.16	2.01	2.11	-0.72	-0.10	991	-579	63.1	-0.2	-19	-3.01	2.36
11.0	435	-150	-261	-7	631	-107	450	394	-517	1.4	94	25.19	19.06	26.17	19.91	23.60	1.80	1.91	-0.96	-0.11	1025	-624	56.3	0.2	-18	3.01	0.57
11.5	512	-192	-290	-11	677	-116	470	403	-573	1.5	134	26.27	19.54	27.29	20.40	24.11	1.83	1.94	-1.01	-0.11	1080	-689	53.6	-0.2	-19	-3.01	0.69
12.0	499	-159	-244	-12	732	-121	455	412	-516	1.5	221	26.45	20.06	27.24	20.79	24.46	1.92	2.03	-0.79	-0.10	1144	-637	56.1	0.2	-22	3.00	0.40
12.5	683	-201	-436	-15	925	-149	458	409	-582	1.6	323	27.63	20.38	28.63	21.36	25.34	1.91	2.06	-1.00	-0.15	1334	-731	52.5	-0.2	-31	-3.01	0.47
13.0	655	-283	-334	-20	883	-142	559	394	-599	1.8	169	27.53	19.92	28.81	20.82	25.83	1.82	1.93	-1.28	-0.11	1277	-741	49.7	0.2	-18	3.01	0.92
13.5	704	-495	-150	-22	926	-146	498	408	-605	1.8	178	28.78	20.85	29.57	21.27	26.71	1.94	1.98	-0.78	-0.04	1334	-750	47.8	-0.2	-37	-3.01	-2.27
14.0	554	-279	-242	-24	746	-117	446	401	-593	1.8	68	28.18	20.29	28.95	20.81	26.96	1.86	1.92	-0.76	-0.06	1147	-710	48.1	0.2	-9	3.01	1.80
14.5	703	-271	-364	-23	942	-150	452	402	-595	2.2	75	28.62	20.11	30.06	21.25	27.94	1.79	1.94	-1.43	-0.15	1344	-745	45.6	-0.2	-45	-3.01	0.92
15.0	655	-304	-322	-24	879	-142	388	395	-609	2.6	86	29.26	20.87	30.31	21.58	28.53	1.91	2.00	-1.04	-0.09	1273	-751	46.2	0.2	-5	3.01	1.35
15.5	405	-158	-249	-22	554	-91	348	390	-595	2.2	69	28.53	20.76	29.35	21.47	27.92	1.94	2.04	-0.80	-0.10	945	-686	49.9	-0.2	24	-3.00	0.67
16.0	346	-161	-178	-16	463	-78	315	410	-561	2.7	80	28.21	20.84	28.84	21.29	27.75	1.97	2.03	-0.62	-0.06	872	-639	51.3	0.2	9	3.01	1.11
16.5	165	-58	-115	-12	242	-42	218	411	-514	2.5	75	27.19	20.63	27.39	20.89	27.20	2.00	2.04	-0.19	-0.04	653	-556	55.9	-0.2	21	-3.01	0.90
17.0	129	-15	-120	-9	216	-39	197	415	-472	2.1	80	26.57	20.65	26.67	20.97	26.74	2.04	2.10	-0.10	-0.06	631	-511	60.1	0.2	15	3.00	0.14
17.5	266	-64	-200	-6	418	-74	215	404	-462	2.4	79	27.66	21.09	27.89	21.36	26.60	2.07	2.11	-0.22	-0.04	822	-536	56.2	0.0	5	0.00	0.59
18.0	252	-210	-48	-5	395	-73	71	386	-484	3.0	69	27.57	20.34	28.03	20.68	26.28	1.91	1.95	-0.45	-0.04	781	-557	51.6	-0.2	12	-3.01	0.12
18.5	191	-53	-147	-4	312	-59	55	383	-494	2.6	58	27.13	20.17	27.49	20.60	25.99	1.90	1.97	-0.35	-0.07	695	-553	53.7	0.2	12	3.01	0.38
19.0	121	-24	-107	-2	221	-41	45	385	-489	2.4	64	26.47	20.17	26.62	20.44	25.69	1.94	1.99	-0.14	-0.05	606	-530	57.2	-0.2	12	-3.00	0.22
19.5	42	4	-48	-1	125	-20	34	384	-481	1.6	57	25.37	20.09	25.30	20.24	25.35	2.00	2.04	0.08	-0.04	509	-502	63.2	0.2	14	3.01	-0.22
20.0	-12	3	-2	1	44	-3	19	381	-472	1.3	67	23.57	20.05	23.19	19.98	24.96	2.11	2.12	0.39	-0.01	425	-475	74.8	-0.2	17	-3.01	-1.60
20.5	-31	19	-10	3	3	0	5	384	-446	1.4	83	21.24	19.10	20.79	19.06	24.52	2.07	2.09	0.45	-0.02	387	-446	85.2	0.2	17	3.01	0.48
21.0	-39	21	-3	5	0	0	0	393	-436	1.8	79	20.17	18.34	19.78	18.20	24.21	1.99	1.98	0.40	0.00	393	-436	86.1	-0.2	11	-3.01	-0.34
21.5	-38	18	4	6	0	0	0	393	-423	2.0	75	19.43	17.92	18.99	17.71	23.92	1.95	1.94	0.45	0.01	393	-423	88.5	0.2	11	3.00	8.96
22.0	-37	21	-2	6	0	0	0	396	-423	2.0	68	19.74	17.93	19.36	17.82	23.73	1.93	1.94	0.39	0.00	396	-423	86.3	-0.2	8	-3.01	8.79
22.5	-32	20	-6	7	0	0	0	399	-423	2.0	73	19.44	17.62	19.03	17.52	23.55	1.89	1.90	0.42	-0.01	399	-423	86.5	0.2	7	3.01	-2.55
23.0	-34	10	-6	7	0	0	0	395	-420	2.2	67	19.49	17.51	19.04	17.46	23.40	1.87	1.89	0.46	-0.02	395	-420	85.8	-0.2	6	-3.01	-0.25
23.5	-36	35	-13	7	0	0	0	393	-420	2.1	63	19.50	17.45	18.98	17.34	23.27	1.86	1.87	0.52	-0.01	393	-420	85.2	0.3	7	5.01	-3.42
24.0	-34	14	-3	7	0	0	0	394	-423	2.1	72	18.97	17.27	18.55	17.18	23.17	1.86	1.87	0.43	-0.01	394	-422	87.6	-0.3	7	-5.01	-19.76

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HHrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	14.4	-5.9	-8.4	0.2	23.0	-3.8	12.5	33.1	-39.5												56.2	-43.3		0.0	0.0	-0.01	
DSUM	15.4	-6.2	-8.2	-0.3	22.6	-3.8	12.3	18.1	-23.4												40.8	-27.2		0.0	-0.3	0.01	
NSUM	-1.0	0.3	-0.2	0.5	0.4	-0.1	0.2	15.0	-16.1												15.4	-16.1		0.0	0.3	-0.01	
TAVE										1.5	108	21.21	17.58	21.22	17.74	23.85	1.80	1.84	-0.01	-0.04			75.6				2.8
DAVE										1.8	113	25.79	19.96	26.31	20.45	25.35	1.9492	2.02	-0.51	-0.07			60.3				0.5
NAVE										0.8	68	10.61	9.92	10.22	9.76	14.82	1.0899	1.09	0.40	0.00			62.9				3.2

ORIGINAL PAGE IS
OF POOR QUALITY

SYSTEM 9, JULY 22, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-18	5	-1	8	0	0	0	419	-421	2	77	19.14	17.35	18.92	17.32	23.10	1.86	1.87	0.23	-0.01	419	-421	85.6	0.2	2	3.00	17.72
1.0	-12	5	-4	7	0	0	0	429	-431	1	101	20.26	17.97	19.85	17.94	23.07	1.91	1.93	0.42	-0.02	429	-431	83.3	-0.2	1	-3.01	-1.40
1.5	-12	1	-1	7	0	0	1	419	-432	1	171	19.93	18.00	19.68	18.00	22.99	1.94	1.95	0.26	-0.02	419	-432	85.2	0.2	4	3.00	1.23
2.0	-12	2	-3	7	0	0	1	418	-427	1.0	92	19.51	18.04	19.24	18.03	22.90	1.97	1.99	0.28	-0.01	419	-428	89.1	-0.2	3	-3.01	0.33
2.5	-13	13	-11	7	0	0	1	421	-428	1.8	98	19.85	18.15	19.62	18.15	22.87	1.97	1.98	0.24	-0.01	420	-428	87.0	0.2	1	3.01	-1.13
3.0	-14	4	-6	6	0	0	1	419	-430	1.7	99	19.96	18.19	19.71	18.22	22.84	1.97	1.99	0.26	-0.02	419	-431	86.8	-0.2	2	-3.01	-0.81
3.5	-13	8	-7	6	0	0	0	426	-434	2.1	99	19.98	18.21	19.78	18.21	22.81	1.97	1.99	0.20	-0.01	426	-434	86.2	0.2	1	3.00	-1.08
4.0	-14	10	-9	6	0	0	0	423	-435	2.0	94	20.12	18.27	19.94	18.27	22.77	1.97	1.99	0.20	-0.01	423	-435	85.4	-0.2	2	-3.01	-1.02
4.5	-15	7	-9	6	0	0	0	424	-433	2.5	95	20.07	18.25	19.94	18.27	22.74	1.97	1.99	0.14	-0.01	424	-433	85.3	0.2	1	3.00	-0.77
5.0	-16	10	-4	6	0	0	1	416	-430	2.5	89	20.13	18.26	19.94	18.23	22.70	1.97	1.98	0.20	-0.01	416	-430	85.1	-0.2	2	-3.01	-1.34
5.5	-16	9	-67	5	0	0	0	420	-435	3.1	96	19.68	18.03	19.56	18.32	22.65	1.96	2.02	0.13	-0.06	419	-434	88.9	0.0	4	0.00	-0.56
6.0	-16	9	-6	6	0	0	0	422	-432	2.8	91	19.76	18.19	19.63	18.18	22.61	1.98	1.97	0.14	-0.01	422	-432	87.2	-0.2	2	-3.01	-2.15
6.5	-7	8	-10	5	10	-1	7	402	-409	2.6	103	20.33	18.26	20.18	18.28	22.55	1.96	1.97	0.17	-0.01	412	-410	83.6	-0.2	0	-3.01	-0.85
7.0	-7	8	-10	5	10	-1	7	402	-409	2.6	103	20.33	18.26	20.18	18.28	22.55	1.96	1.97	0.17	-0.01	412	-410	83.6	-0.2	0	-3.01	-0.85
7.5	6	9	-19	5	36	-6	29	400	-409	2.9	109	20.69	18.39	20.58	18.44	22.57	1.96	1.98	0.12	-0.02	435	-415	81.7	0.0	-1	0.00	-0.50
8.0	35	18	-54	4	83	-16	69	397	-408	3.1	113	21.16	18.62	21.08	18.69	22.65	1.98	2.00	0.08	-0.02	479	-423	79.9	0.2	-4	3.00	-0.32
8.5	81	-3	-74	3	158	-28	123	391	-410	2.7	118	21.92	19.00	21.95	19.14	22.80	2.00	2.03	-0.02	-0.03	549	-437	77.0	-0.2	-7	-3.01	0.04
9.0	192	-46	-138	1	381	-75	130	366	-384	2.8	113	23.61	19.81	23.89	20.13	23.00	2.06	2.11	-0.27	-0.05	747	-458	71.2	0.2	-9	3.00	0.37
9.5	254	-70	-174	-1	454	-89	103	360	-428	3.4	117	25.13	20.37	25.43	20.69	23.22	2.08	2.12	-0.29	-0.05	814	-517	65.4	-0.2	-9	-3.01	0.43
10.0	374	-111	-246	-3	614	-119	107	363	-438	3.7	121	26.34	20.88	26.92	21.43	23.53	2.11	2.19	-0.57	-0.08	976	-557	61.7	0.2	-13	3.00	0.45
10.5	456	-135	-299	-6	691	-124	104	373	-486	3.1	129	27.49	21.35	28.21	22.03	24.03	2.13	2.24	-0.71	-0.10	1064	-610	58.5	-0.2	-15	-3.01	0.45
11.0	517	-165	-325	-9	760	-133	161	383	-508	3.2	119	28.23	21.54	29.03	22.23	24.48	2.13	2.23	-0.79	-0.10	1142	-641	55.6	0.2	-18	3.01	0.52
11.5	573	-203	-333	-13	814	-140	234	388	-526	3.5	115	28.83	21.86	29.69	22.51	25.03	2.16	2.25	-0.85	-0.09	1202	-666	54.0	-0.2	-23	-3.01	0.61
12.0	616	-249	-323	-17	857	-144	306	392	-544	3.4	135	29.53	22.12	30.47	22.75	25.67	2.17	2.25	-0.93	-0.08	1249	-688	51.7	0.2	-27	3.01	0.79
12.5	653	-188	-417	-19	889	-145	357	403	-564	2.5	130	30.27	22.50	31.11	23.26	26.43	2.21	2.33	-0.83	-0.12	1292	-709	51.5	-0.2	-29	-3.01	0.45
13.0	675	-272	-346	-22	909	-145	385	403	-586	2.8	153	30.44	22.36	31.46	23.03	27.16	2.17	2.25	-1.02	-0.09	1312	-731	48.9	0.2	-35	3.01	0.79
13.5	687	-228	-398	-24	920	-145	405	408	-587	3.1	134	30.98	22.69	31.89	23.39	28.12	2.21	2.31	-0.90	-0.10	1328	-732	48.9	-0.2	-37	-3.01	0.58
14.0	674	-204	-436	-26	902	-143	399	409	-590	3.7	106	31.09	22.71	31.78	23.33	28.53	2.20	2.30	-0.69	-0.10	1311	-733	49.0	0.2	-8	3.01	0.47
14.5	654	-209	-389	-27	888	-143	388	406	-575	4.0	122	31.14	22.62	32.06	23.36	29.05	2.18	2.29	-0.91	-0.11	1294	-717	48.0	-0.2	-30	-3.01	0.54
15.0	611	-183	-402	-25	809	-132	349	405	-594	3.6	123	31.59	23.11	32.31	23.75	29.57	2.26	2.37	-0.71	-0.10	1214	-726	49.0	0.2	0	3.01	0.47
15.5	600	-191	-396	-21	827	-137	307	424	-565	3.5	115	31.59	23.38	32.38	24.04	29.13	2.33	2.44	-0.78	-0.11	1251	-701	50.1	-0.2	8	-3.01	0.48
16.0	539	-186	-337	-17	716	-120	248	402	-593	4.1	111	31.51	23.40	32.34	24.04	29.22	2.34	2.44	-0.82	-0.10	1118	-710	50.3	0.2	1	3.01	0.57
16.5	475	-82	-387	-15	701	-120	183	401	-541	3.8	117	31.43	23.27	31.74	23.72	28.97	2.31	2.40	-0.30	-0.09	1102	-661	51.2	-0.2	12	-3.01	0.23
17.0	389	-83	-307	-12	547	-96	149	411	-544	4.0	115	31.04	23.26	31.52	23.74	28.62	2.34	2.42	-0.47	-0.03	958	-640	52.3	0.2	14	3.01	0.35
17.5	299	-35	-268	-9	439	-79	144	407	-536	4.1	113	30.78	23.13	30.98	23.52	28.24	2.32	2.40	-0.18	-0.03	845	-616	53.6	0.0	13	0.00	0.15
18.0	212	-13	-208	-7	319	-59	137	406	-521	4.0	111	30.02	22.95	30.11	23.25	27.83	2.33	2.39	-0.08	-0.06	725	-580	56.1	-0.2	16	-3.01	0.07
18.5	150	10	-170	-5	256	-51	109	407	-485	3.8	111	29.35	22.81	29.32	23.01	27.43	2.34	2.39	0.04	-0.05	664	-537	58.6	0.2	15	3.01	-0.04
19.0	73	15	-100	-4	152	-29	75	406	-485	3.8	107	28.52	22.60	28.44	22.75	27.04	2.35	2.39	0.07	-0.04	558	-515	61.6	-0.2	16	-3.01	-0.15
19.5	20	15	-46	-3	72	-12	52	409	-478	3.1	100	27.46	22.62	27.32	22.72	26.68	2.42	2.46	0.14	-0.03	481	-490	67.6	0.2	14	3.01	-0.30
20.0	0	10	-18	-1	47	-8	34	411	-456	2.6	95	26.30	22.38	26.13	22.44	26.36	2.44	2.47	0.18	-0.02	459	-464	72.9	-0.2	13	-3.01	-0.56
20.5	-21	10	-10	0	8	-1	8	412	-450	2.6	94	25.37	21.99	25.17	22.00	26.05	2.42	2.43	0.21	-0.02	420	-451	76.0	0.2	13	3.01	-1.54
21.0	-30	16	-11	1	0	0	0	431	-464	2.8	90	24.58	21.62	24.37	21.62	25.74	2.39	2.40	0.22	-0.01	431	-464	78.6	-0.2	12	-3.01	-2.99
21.5	-29	21	-14	1	0	0	0	431	-456	3.2	99	24.14	21.37	23.93	21.36	25.48	2.36	2.37	0.22	-0.01	431	-456	79.9	0.2	10	3.00	-1.50
22.0	-30	29	-33	2	0	0	1	433	-447	4.5	107	24.75	21.27	24.56	21.29	25.28	2.30	2.31	0.19	-0.02	433	-447	75.0	-0.2	7	-3.01	-0.79
22.5	-35	30	-28	3	0	0	1	424	-453	4.5	116	24.77	21.23	24.56	21.24	25.11	2.29	2.30	0.22	-0.02	424	-454	74.7	0.2	7	3.00	-1.01
23.0	-33	14	-12	3	0	0	0	425	-457	2.3	142	24.17	21.32	23.92	21.34	24.92	2.35	2.37	0.26	-0.02	425	-457	79.8	-0.2	8	-3.01	-1.07
23.5	-33	26	-20	3	0	0	0	422	-452	2.4	169	23.41	21.16	23.25	21.17	24.77	2.36	2.38	0.17	-0.01	422	-452	83.3	0.3	8	5.01	-0.99
24.0	-32	10	-3	3	0	0	0	421	-450	1.8	171	22.97	20.95	22.78	20.94	24.66	2.34	2.36	0.21	-0.01	421	-450	85.0	-0.3	7	-5.01	-4.78

TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	17.5	-4.7	-12.7	-0.3	26.5	-4.5	9.4	35.2	-41.2												61.7	-45.8		0.0	-0.1	-0.01	
DSUM	17.5	-5.0	-11.8	-0.5	25.5	-4.4	9.0	18.4	-23.6												43.9	-28.0		0.0	-0.3	0.01	
NSUM	0.0	0.2	-0.9	0.2	1.1	-0.2	0.4	16.8	-17.6												17.8	-17.8		0.0	0.2	-0.02	
TAVE										3.0	113	25.29	20.73	25.45	20.99	25.16	2.16	2.21	-0.15	-0.05			69.6				0.0
DAVE										3.4	117	28.63	22.14	29.08	22.59	26.57	2.2410	2.32	-0.44	-0.07			58.3				0.2
NAVE										1.6	71	13.84	12.44	13.72	12.45	15.30	1.3510	1.36	0.13	-0.01			54.8				-0.6

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SYSTEM 9, JULY 23, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q W/m2	H W/m2	E W/m2	Gp W/m2	Kdn W/m2	Kup W/m2	D W/m2	Ldn W/m2	Lup W/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn W/m2	Qup W/m2	RHbot %	M	Gs W/m2	HMrec	BR
0.5	-31	23	-7	3	0	0	0	418	-447		156	22.36	20.76	22.13	20.70	24.52	2.34	2.35	0.24	0.00	418	-447	88.1	0.2	7	3.00	-46.34
1.0	-32	36	-20	4	0	0	0	412	-439		118	21.68	20.40	21.43	20.36	24.32	2.31	2.32	0.26	-0.01	412	-440	90.9	-0.2	8	-3.01	*******
1.5	-30	23	-13	4	0	0	0	412	-435		107	21.13	20.13	20.93	20.11	24.18	2.29	2.30	0.21	-0.01	412	-434	92.8	0.2	4	3.00	-8.99
2.0	-25	27	-11	4	0	0	0	417	-433		114	21.16	20.17	20.97	20.13	24.07	2.30	2.30	0.20	0.00	417	-433	92.7	-0.2	4	-3.01	-26.71
2.5	-38	28	-19	5	0	0	1	401	-425		130	21.51	20.09	21.29	20.08	23.95	2.26	2.27	0.23	-0.01	401	-426	89.6	0.2	5	3.00	-1.32
3.0	-40	41	-17	5	0	0	0	401	-432		122	21.20	20.00	20.99	19.97	23.84	2.26	2.27	0.22	-0.01	401	-432	91.2	-0.2	5	-3.01	-15.75
3.5	-36	28	-13	5	0	0	0	405	-430		129	20.92	19.75	20.73	19.72	23.71	2.22	2.23	0.20	-0.01	405	-430	91.2	0.2	5	3.00	-3.84
4.0	-35	43	-23	5	0	0	0	403	-429		128	20.64	19.61	20.47	19.59	23.59	2.21	2.22	0.18	-0.01	402	-429	92.3	-0.2	5	-3.01	-3.11
4.5	-27	28	-15	6	0	0	1	416	-427		112	20.64	19.66	20.46	19.64	23.42	2.22	2.23	0.19	-0.01	416	-427	92.9	0.2	6	3.00	-2.12
5.0	-25	27	-16	5	0	0	0	418	-434		131	21.03	19.85	20.87	19.84	23.38	2.24	2.25	0.17	-0.01	418	-433	91.1	-0.2	2	-3.01	-1.70
5.5	-26	46	-27	5	0	0	0	418	-433		134	21.06	19.92	20.85	19.90	23.32	2.25	2.26	0.22	-0.01	418	-433	91.7	0.2	2	3.00	-1.88
6.0	-21	35	-23	5	1	0	0	415	-427		137	21.30	20.03	21.08	20.01	23.29	2.26	2.27	0.23	-0.01	415	-427	90.8	-0.2	1	-3.01	-1.55
6.5	-3	0	-3	4	70	-14	29	382	-395		139	21.72	20.09	21.54	20.11	23.22	2.24	2.26	0.19	-0.02	453	-409	87.9	-0.2	0	-3.01	-0.83
7.0	-3	0	-3	4	70	-14	29	382	-395		139	21.72	20.09	21.54	20.11	23.22	2.24	2.26	0.19	-0.02	453	-409	87.9	-0.2	0	-3.01	-0.83
7.5	55	8	-60	4	174	-37	48	377	-393		158	22.91	20.71	22.85	20.77	23.27	2.30	2.31	0.06	-0.02	551	-430	83.2	0.0	-3	0.00	-0.27
8.0	133	-34	-95	2	280	-58	62	376	-405		167	24.44	21.53	24.58	21.68	23.41	2.38	2.40	-0.13	-0.02	657	-463	77.8	0.2	-6	3.00	0.36
8.5	265	-87	-117	-1	460	-90	92	385	-444		203	26.58	22.64	26.88	22.75	23.89	2.49	2.49	-0.29	0.00	846	-534	70.4	0.2	-21	3.00	0.60
9.0	345	-133	-196	-3	547	-104	103	391	-461		209	27.59	22.97	28.14	23.35	24.22	2.50	2.55	-0.54	-0.05	938	-565	66.9	-0.2	-14	-3.01	0.68
9.5	418	-241	-156	-5	630	-115	107	398	-487		206	28.88	23.61	29.52	23.90	24.62	2.56	2.59	-0.62	-0.03	1028	-602	62.8	0.2	-16	3.00	1.68
10.0	484	-188	-268	-7	700	-123	135	408	-510		218	29.94	23.77	30.68	24.26	25.10	2.53	2.60	-0.73	-0.07	1108	-634	59.0	-0.2	-21	-3.01	0.72
10.5	564	-226	-302	-12	782	-132	213	420	-541		225	31.35	24.17	32.21	24.72	25.88	2.54	2.62	-0.85	-0.08	1202	-674	54.4	0.2	-24	3.00	0.77
11.0	610	-215	-351	-15	830	-139	273	427	-560		216	32.08	24.27	32.95	24.90	26.53	2.51	2.61	-0.86	-0.10	1257	-698	52.1	-0.2	-29	-3.01	0.63
11.5	645	-256	-350	-17	865	-142	323	430	-574		203	32.64	24.49	33.59	25.09	27.18	2.53	2.62	-0.94	-0.09	1295	-717	50.3	0.2	-22	3.01	0.74
12.0	662	-266	-349	-20	865	-144	370	430	-586		207	33.12	24.51	34.03	25.08	27.79	2.50	2.59	-0.90	-0.03	1315	-731	48.5	-0.2	-27	-3.01	0.78
12.5	499	-162	-204	-22	651	-109	346	428	-608		204	33.24	24.66	33.68	24.89	28.30	2.53	2.56	-0.44	-0.03	1079	-717	49.0	0.2	-14	3.01	0.63
13.0	646	-244	-367	-20	903	-150	428	437	-539		189	33.45	24.41	34.28	24.92	28.58	2.46	2.53	-0.82	-0.07	1341	-689	46.9	-0.2	-15	-3.01	0.87
13.5	622	-281	-297	-21	835	-139	373	440	-594		176	33.74	24.48	34.66	24.99	29.11	2.45	2.52	-0.91	-0.07	1274	-733	45.7	0.2	-23	3.01	1.00
14.0	605	-403	-168	-21	789	-133	325	426	-600		186	33.88	24.71	34.67	25.02	29.63	2.50	2.53	-0.78	-0.03	1215	-733	45.8	-0.2	-13	-3.01	-6.31
14.5	543	-320	-220	-19	726	-126	300	453	-576		178	33.86	24.71	34.55	25.04	29.29	2.50	2.54	-0.68	-0.04	1179	-702	46.4	0.2	16	3.01	3.26
15.0	496	-208	-275	-15	702	-123	230	441	-563		184	33.69	24.58	34.35	24.99	29.20	2.48	2.54	-0.65	-0.06	1142	-686	46.9	-0.2	2	-3.01	0.84
15.5	462	-253	-202	-13	645	-115	179	427	-576		178	33.85	24.60	34.51	24.99	29.12	2.48	2.53	-0.65	-0.06	1072	-690	46.3	0.2	5	3.01	-97.20
16.0	431	-438	9	-11	612	-112	129	425	-555		174	33.66	24.34	34.12	24.54	28.89	2.43	2.45	-0.45	-0.02	1037	-666	45.7	-0.2	9	-3.01	-0.54
16.5	303	-141	-164	-9	443	-82	168	422	-548		179	32.98	24.09	33.37	24.34	28.58	2.41	2.44	-0.38	-0.03	865	-629	47.6	0.2	12	3.01	2.98
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TIME	Q mJ/m2	H mJ/m2	E mJ/m2	Gp mJ/m2	Kdn mJ/m2	Kup mJ/m2	D mJ/m2	Ldn mJ/m2	Lup mJ/m2	U m/s	UDIR deg	Tatop C	Twtop C	Tabot C	Twbot C	Tsoil C	Eatop kPa	Eabot kPa	dT C	dE kPa	Qdn mJ/m2	Qup mJ/m2	RHbot %	M	Gs mJ/m2	HMrec	BR
TSUM	22.0	-9.5	-11.5	-0.4	32.9	-5.8	11.1	35.7	-42.2												68.6	-47.9		0.0	-0.4	0.01	
DSUM	21.3	-9.8	-10.1	-0.5	30.3	-5.3	10.1	19.4	-24.7												49.7	-30.0		0.0	-0.5	0.01	
NSUM	0.7	0.3	-1.4	0.1	2.6	-0.5	0.9	16.3	-17.5												18.9	-18.0		0.0	0.1	-0.01	
TAVE											166	26.96	22.24	27.23	22.44	25.57	2.39	2.42	-0.26	-0.03			70.2				-10.6
DAVE											196	31.92	24.14	32.60	24.54	27.32	2.4940	2.55	-0.67	-0.05			52.4				-5.0
NAVE											65	10.67	9.99	10.58	9.98	11.73	1.1237	1.13	0.09	-0.01			44.6				-8.7

SYSTEM 9, JULY 24, 1986, DATA FROM THE KONZA PRAIRIE, KANSAS

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	W/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	W/m2	W/m2	%		W/m2		
0.5	-35	0	0	2	0	0	1	434	-459		150	25.36	22.08	25.11	22.07	25.22	2.44	2.45	0.25	-0.01	433	-459	76.9	0.2	5	3.00	-1.30
1.0	-35	48	-26	2	0	0	0	436	-460		157	25.38	22.02	25.16	22.00	25.10	2.42	2.43	0.23	-0.01	436	-460	76.1	-0.2	5	-3.01	-2.33
1.5	-32	27	-6	3	0	0	1	433	-456		168	25.33	22.12	25.13	22.08	25.00	2.45	2.45	0.22	0.00	433	-456	76.9	0.2	4	3.00	0.39
2.0	-34	39	-16	2	0	0	0	433	-459		163	25.18	22.14	25.00	22.12	24.90	2.46	2.47	0.19	-0.01	433	-459	78.0	-0.2	4	-3.01	1.68
2.5	-36	47	-17	3	0	-1	3	416	-441		177	25.12	22.12	24.92	22.08	24.80	2.46	2.47	0.21	0.00	416	-442	78.2	0.2	4	3.00	-3.28
3.0	-32	40	-19	3	0	0	1	436	-453		176	25.38	22.14	25.22	22.11	24.73	2.45	2.46	0.17	-0.01	437	-454	76.5	-0.2	2	-3.01	10.43
3.5	-29	11	14	2	0	0	1	435	-456		172	25.57	22.30	25.39	22.16	24.68	2.47	2.45	0.20	0.02	435	-456	75.7	0.2	2	3.00	0.99
4.0	-37	23	10	2	0	0	1	438	-462		194	26.06	22.24	25.86	22.11	24.62	2.43	2.41	0.21	0.02	438	-462	72.4	-0.2	2	-3.01	0.28
4.5	-37	24	9	2	0	0	0	436	-465		196	26.06	22.17	25.88	22.08	24.56	2.41	2.40	0.19	0.01	436	-464	72.0	0.2	2	3.00	0.24
5.0	-37	43	-10	2	0	0	0	434	-465		200	25.80	22.02	25.58	21.97	24.50	2.40	2.40	0.23	0.00	435	-465	73.2	-0.2	3	-3.01	0.03
5.5	-39	23	12	2	0	0	0	432	-461		205	25.85	21.87	25.60	21.75	24.42	2.36	2.35	0.26	0.01	432	-461	71.6	0.2	3	3.00	2.16
6.0	-39	54	-26	2	0	0	1	434	-462		210	25.91	21.70	25.65	21.66	24.35	2.32	2.33	0.27	-0.01	434	-462	70.6	-0.2	3	-3.01	2.31
6.5	-29	17	0	2	15	-2	10	403	-433		199	25.25	21.64	25.01	21.57	24.22	2.35	2.35	0.25	0.00	418	-435	74.1	-0.2	3	-3.01	-0.45
7.0	-29	17	0	2	15	-2	10	403	-433		199	25.25	21.64	25.01	21.57	24.22	2.35	2.35	0.25	0.00	418	-435	74.1	-0.2	3	-3.01	-0.45
7.5	-5	11	-7	2	68	-13	32	398	-422		206	25.58	21.55	25.37	21.51	24.18	2.30	2.31	0.22	0.00	467	-435	71.3	0.0	1	0.00	7.95
8.0	64	21	-56	2	192	-41	50	397	-411		212	26.79	21.60	26.69	21.80	24.23	2.28	2.29	0.11	-0.01	589	-453	65.4	0.2	-3	3.00	-8.34
8.5	142	-3	-135	1	296	-61	60	393	-429		206	27.78	22.17	27.79	22.27	24.36	2.30	2.32	0.00	-0.02	689	-490	62.2	-0.2	-6	-3.01	0.02
9.0	215	-31	-129	0	389	-77	70	396	-448		214	28.63	22.37	28.74	22.49	24.54	2.29	2.31	-0.10	-0.02	785	-525	58.5	0.2	-8	3.00	0.17
9.5	289	-65	-212	-2	482	-93	76	400	-464		210	29.52	22.39	29.79	22.72	24.77	2.23	2.29	-0.26	-0.06	882	-557	54.7	-0.2	-10	-3.01	0.31
10.0	364	-92	-255	-3	568	-106	82	408	-484		212	30.67	22.77	31.06	23.18	25.09	2.25	2.32	-0.39	-0.07	976	-590	51.4	0.2	-14	3.00	0.36
10.5	461	-133	-304	-6	674	-119	96	418	-518		214	31.95	23.01	32.50	23.50	25.66	2.22	2.30	-0.54	-0.08	1092	-637	47.0	-0.2	-18	-3.01	0.44
11.0	524	-172	-324	-9	742	-128	124	427	-541		200	32.89	23.21	33.66	23.81	26.14	2.20	2.30	-0.76	-0.09	1169	-669	44.0	0.2	-19	3.01	0.53
11.5	580	-207	-338	-13	800	-135	173	432	-561		194	33.68	23.33	34.59	23.98	26.65	2.18	2.28	-0.89	-0.10	1232	-697	41.4	-0.2	-21	-3.01	0.61
12.0	623	-221	-362	-16	846	-140	227	437	-576		196	34.40	23.55	35.33	24.21	27.25	2.18	2.28	-0.92	-0.10	1283	-716	39.8	0.2	-24	3.01	0.61
12.5	655	-240	-371	-18	876	-143	270	442	-591		196	35.05	23.77	36.07	24.47	27.84	2.19	2.30	-1.01	-0.10	1318	-734	38.5	-0.2	-26	-3.01	0.65
13.0	675	-203	-416	-20	898	-144	297	448	-601		201	35.78	23.99	36.60	24.65	28.72	2.20	2.31	-0.81	-0.11	1346	-745	37.6	0.2	-36	3.01	0.49
13.5	682	-152	-490	-21	905	-145	306	447	-608		195	36.16	24.01	36.71	24.62	29.41	2.18	2.29	-0.54	-0.12	1352	-753	37.1	-0.2	-20	-3.01	0.32
14.0	676	-49	-595	-21	899	-145	297	451	-612		204	36.52	24.07	36.71	24.73	29.64	2.17	2.32	-0.18	-0.15	1351	-757	37.5	0.2	-11	3.01	0.08
14.5	659	-9	-612	-22	877	-143	273	451	-615		196	36.67	24.08	36.71	24.69	30.05	2.16	2.31	-0.03	-0.15	1328	-758	37.4	-0.2	-16	-3.01	0.01
15.0	629	3	-610	-21	846	-142	238	452	-613		196	36.71	24.13	36.71	24.74	30.27	2.17	2.32	0.01	-0.15	1298	-754	37.6	0.2	-1	3.01	0.00
15.5	591	3	-583	-18	799	-137	189	451	-609		186	36.71	23.93	36.71	24.53	30.01	2.12	2.27	0.01	-0.15	1250	-745	36.7	-0.2	8	-3.01	0.00
16.0	539	2	-525	-16	738	-129	147	452	-603		194	36.71	24.11	36.71	24.66	30.02	2.17	2.30	0.01	-0.14	1191	-732	37.2	0.2	-1	3.01	0.00
16.5	353	-11	-341	-14	493	-88	165	462	-603		185	36.44	24.07	36.50	24.49	29.79	2.17	2.27	-0.05	-0.10	956	-691	37.2	-0.2	13	-3.01	0.05
17.0	250	-3	-251	-11	322	-57	169	470	-586		188	35.97	23.85	35.98	24.17	29.43	2.15	2.23	-0.01	-0.08	792	-643	37.5	0.2	15	3.00	0.01
17.5	314	-40	-275	-9	466	-88	131	466	-525		185	36.27	23.91	36.45	24.26	29.11	2.14	2.22	-0.17	-0.07	932	-613	36.4	0.0	10	0.00	0.15
18.0	266	-12	-260	-7	396	-78	74	445	-545		187	35.98	23.80	36.03	24.06	28.78	2.14	2.20	-0.04	-0.06	841	-623	36.9	-0.2	14	-3.01	0.04
18.5	189	39	-234	-6	302	-61	62	442	-537		181	35.48	23.67	35.36	23.86	28.46	2.14	2.19	0.13	-0.05	744	-598	38.2	0.2	13	3.01	-0.17
19.0	114	111	-241	-5	205	-42	51	441	-528		178	34.91	23.55	34.61	23.66	28.13	2.15	2.19	0.31	-0.05	646	-569	39.9	-0.3	21	-5.01	-0.46
19.5	-3	12	-5	-4	43	-5	22	433	-531		166	33.41	23.34	32.91	23.33	27.80	2.20	2.23	0.51	-0.03	476	-536	44.6	0.2	15	3.01	-1.17
20.0	-24	42	-27	-2	39	-6	21	437	-488		174	32.74	22.80	32.16	22.75	27.48	2.12	2.14	0.60	-0.03	476	-494	44.6	-0.2	12	-3.01	-1.54
20.5	-39	68	-39	-1	3	0	5	445	-494		188	31.85	22.47	31.29	22.40	27.19	2.10	2.12	0.57	-0.02	449	-494	46.4	0.2	12	3.01	-1.74
21.0	-36	67	-40	-1	0	0	0	470	-501		165	31.57	22.14	31.06	22.08	26.94	2.04	2.06	0.52	-0.02	470	-501	45.7	-0.2	9	-3.01	-1.69
21.5	-32	56	-31	0	0	0	1	469	-499		173	30.81	22.28	30.41	22.23	26.75	2.12	2.14	0.42	-0.02	469	-499	49.2	0.2	7	3.01	-1.81
22.0	-34	51	-24	0	0	0	0	463	-496		210	30.26	22.61	29.88	22.56	26.58	2.24	2.25	0.39	-0.01	463	-496	53.4	-0.2	7	-3.01	-2.11
22.5	-36	64	-35	0	0	0	1	458	-488		205	29.85	22.25	29.43	22.20	26.41	2.18	2.20	0.42	-0.02	458	-489	53.5	0.2	7	3.00	-1.84
23.0	-31	49	-25	0	0	0	0	464	-491		233	29.53	21.74	29.15	21.69	26.23	2.09	2.10	0.39	-0.01	464	-491	52.0	-0.2	7	-3.01	-2.01
23.5	-16	22	-13	1	0	0	0	467	-495		257	27.95	22.40	27.74	22.39	26.14	2.34	2.35	0.22	-0.01	467	-495	63.2	0.3	4	5.01	-1.39
24.0	-17	-9	11	0	0	0	0	443	-492		267	26.22	21.26	25.72	21.29	25.99	2.20	2.24	0.51	-0.04	443	-492	67.8	-0.3	12	-5.01	-0.81

TIME	Q	H	E	Gp	Kdn	Kup	D	Ldn	Lup	U	UDIR	Tatop	Twtop	Tabot	Twbot	Tsoil	Eatop	Eabot	dT	dE	Qdn	Qup	RHbot	M	Gs	HMrec	BR
	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	mJ/m2	m/s	deg	C	C	C	C	C	kPa	kPa	C	kPa	mJ/m2	mJ/m2	%		mJ/m2		
TSUM	16.8	-1.3	-15.0	-0.4	26.1	-4.6	6.8	37.7	-43.8												63.9	-48.4		0.0	0.0	-0.01	
DSUM	17.7	-2.7	-14.2	-0.5	25.6	-4.5	6.6	20.2	-25.0												45.7	-29.5		0.0	-0.2	0.01	
NSUM	-1.0	1.4	-0.8	0.0	0.5	-0.1	0.2	17.6	-18.8												18.1	-18.9		0.0	0.2	-0.01	
TAVE											194	30.62	22.77	30.60	22.96	26.55	2.25	2.30	0.03	-0.05			54.7				0.1
DAVE											194	33.97	23.41	34.15	23.79	27.78	2.1788	2.26	-0.18	-0.08			42.8				0.0
NAVE											131	17.94	14.82	17.77	14.78	16.86	1.5741	1.58	0.18	0.00			46.3				0.2

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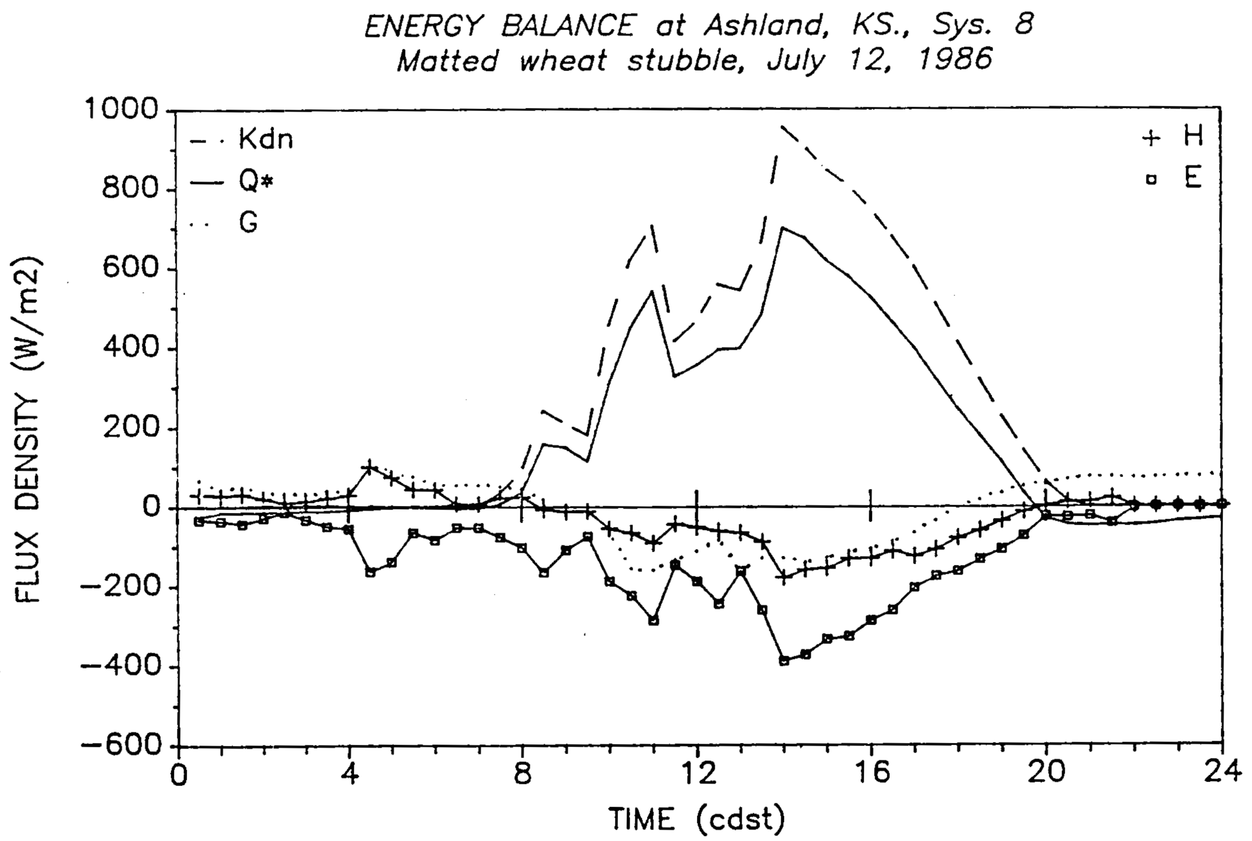
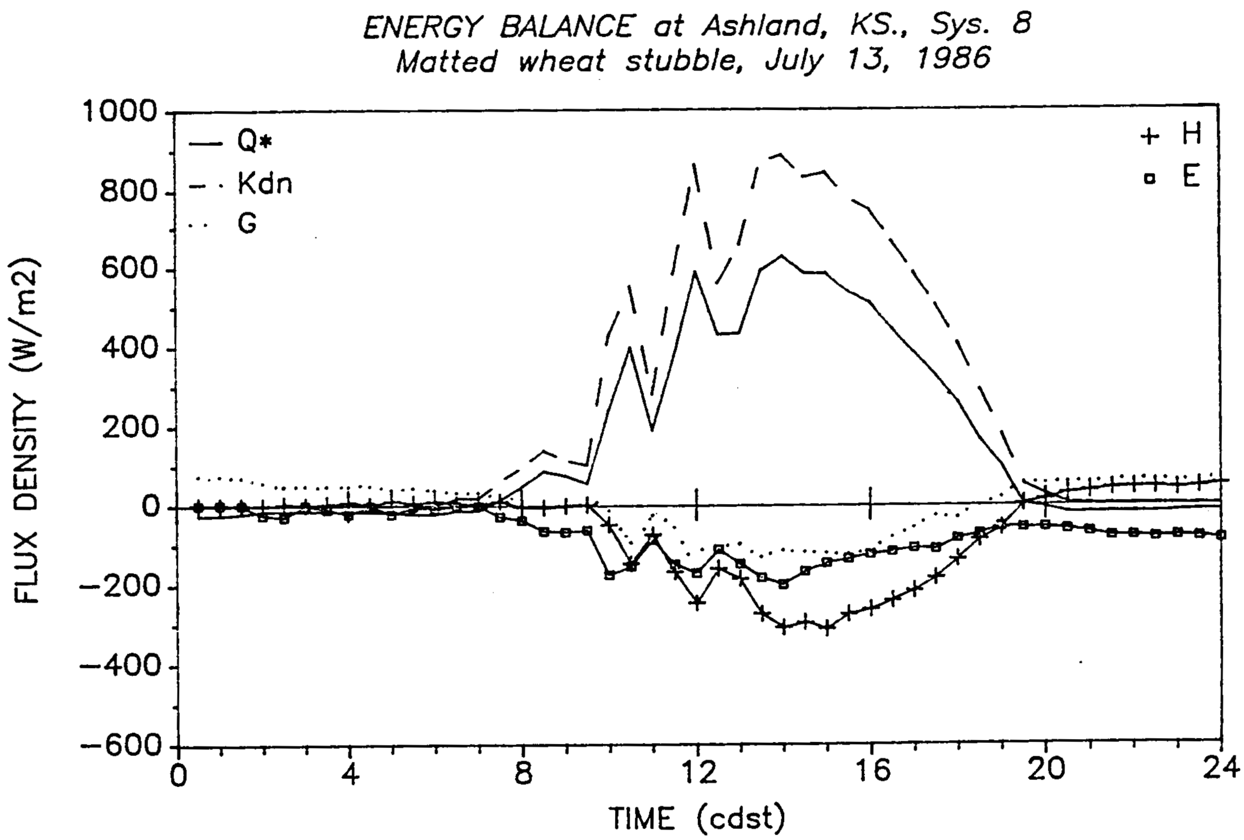
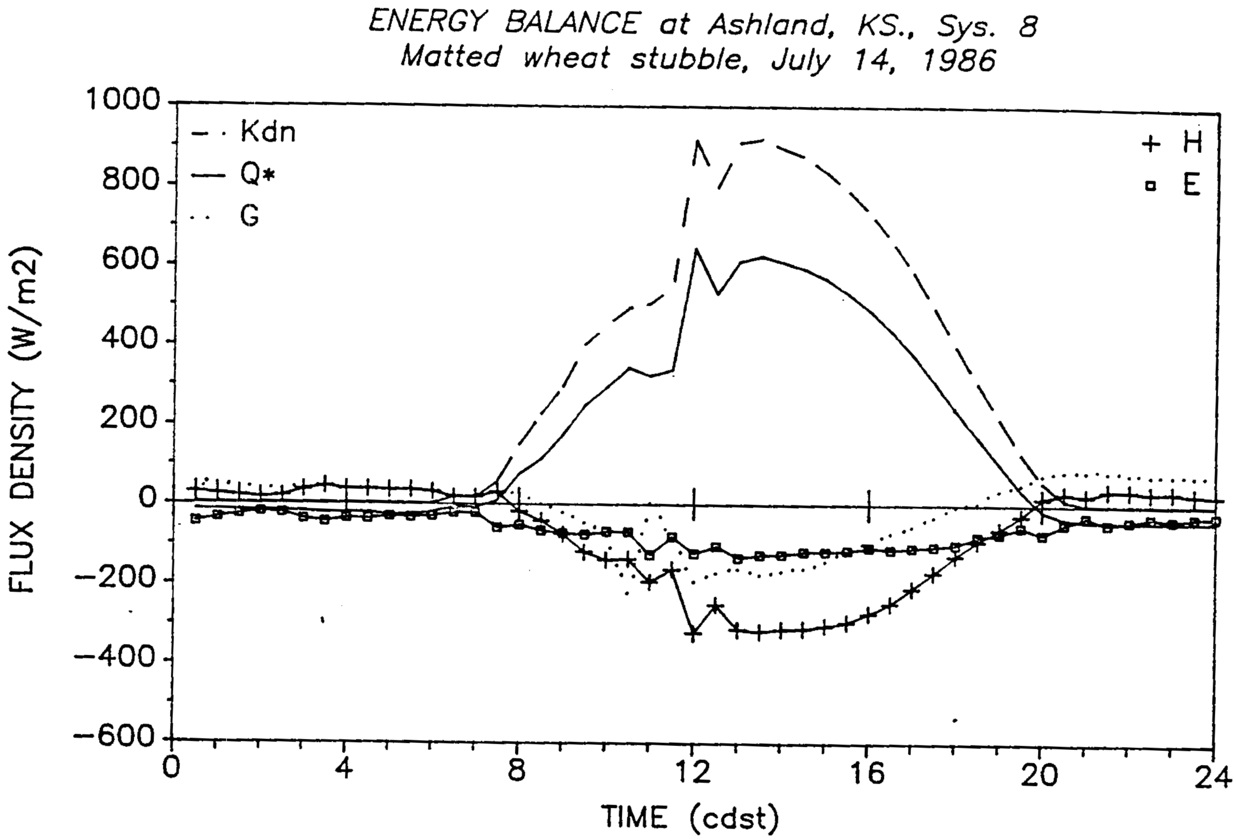
OF POOR QUALITY


ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 12, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)
1000
800
600
400
200
0
−200
−400
−600
0
4
8
12
16
20
24


ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 13, 1986
Q*
Kdn
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)
1000
800
600
400
200
0
−200
−400
−600
0
4
8
12
16
20
24


ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 14, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)
1000
800
600
400
200
0
−200
−400
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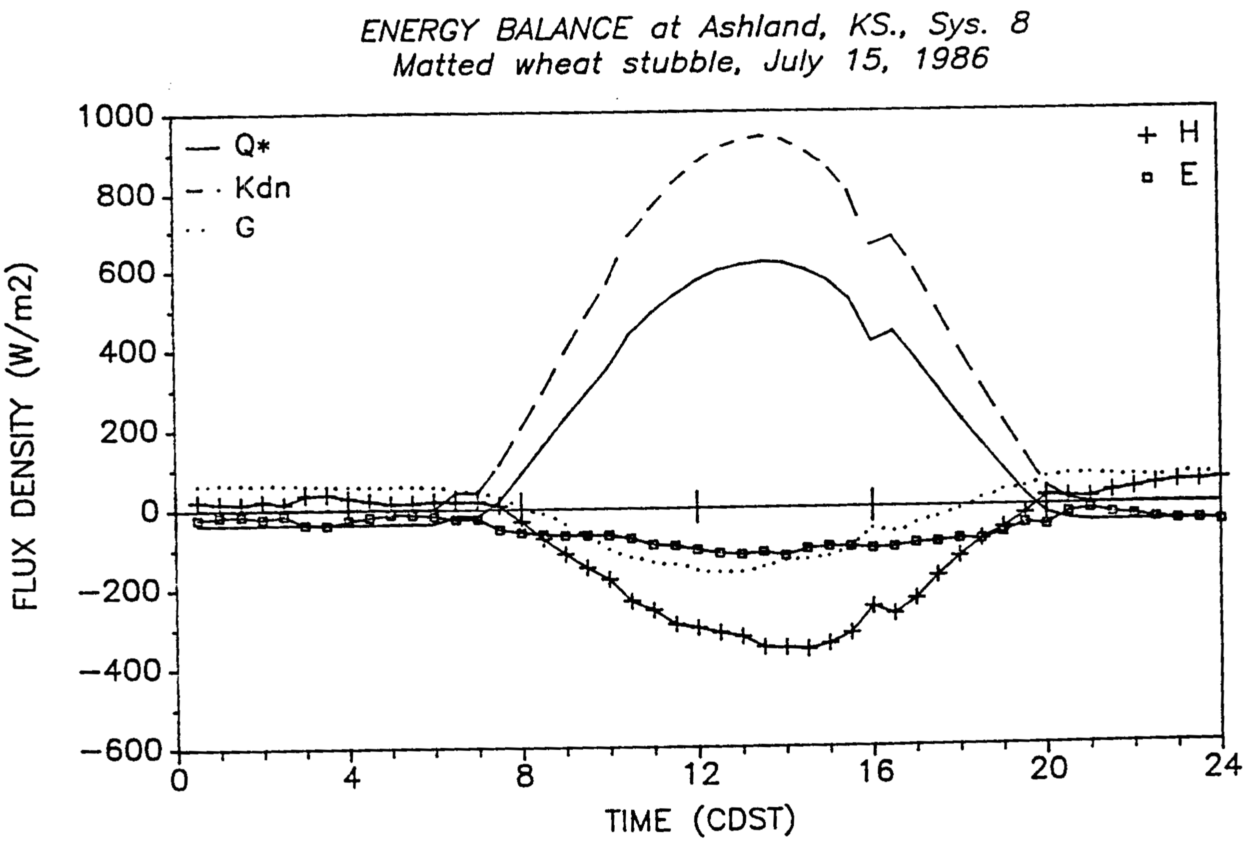
ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 15, 1986
Q*
Kdn
G
H
E
FLUX DENSITY (W/m2)
TIME (CDST)
1000
800
600
400
200
0
−200
−400
−600
0
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8
12
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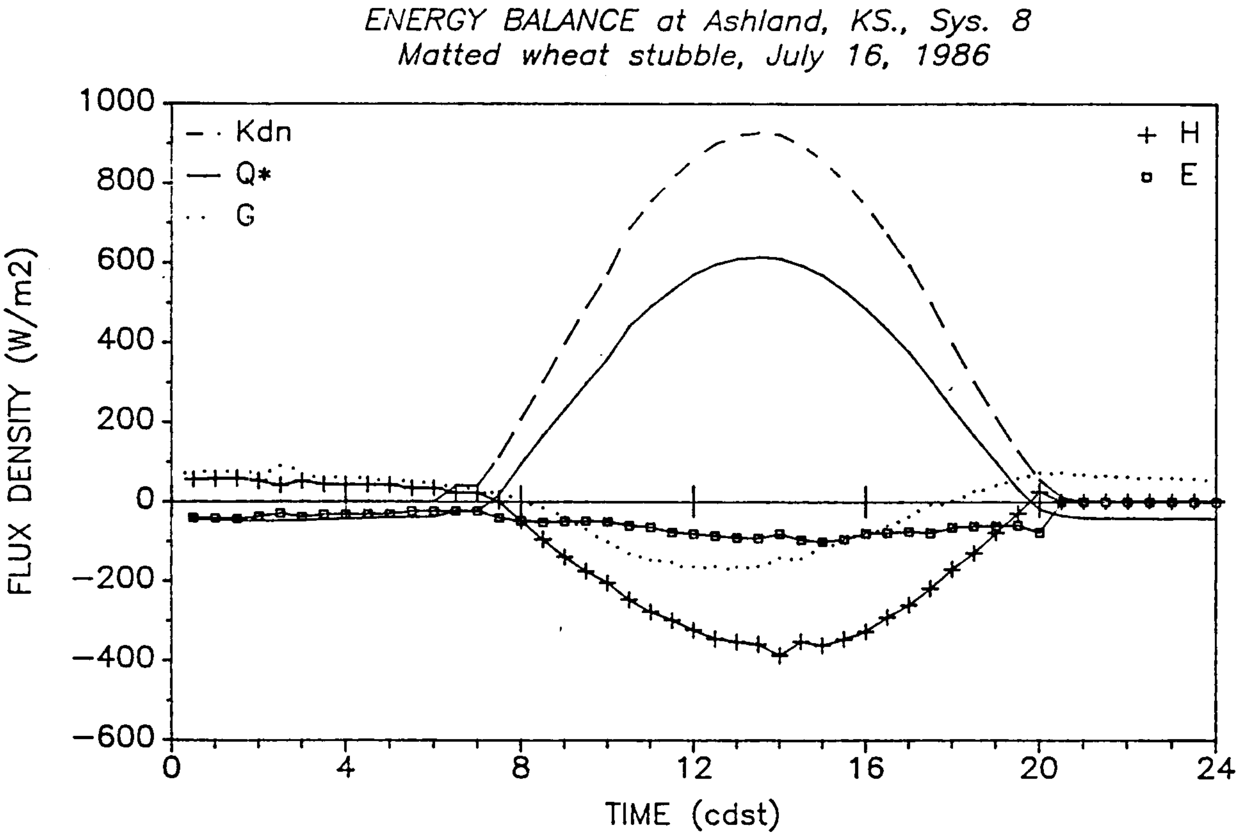
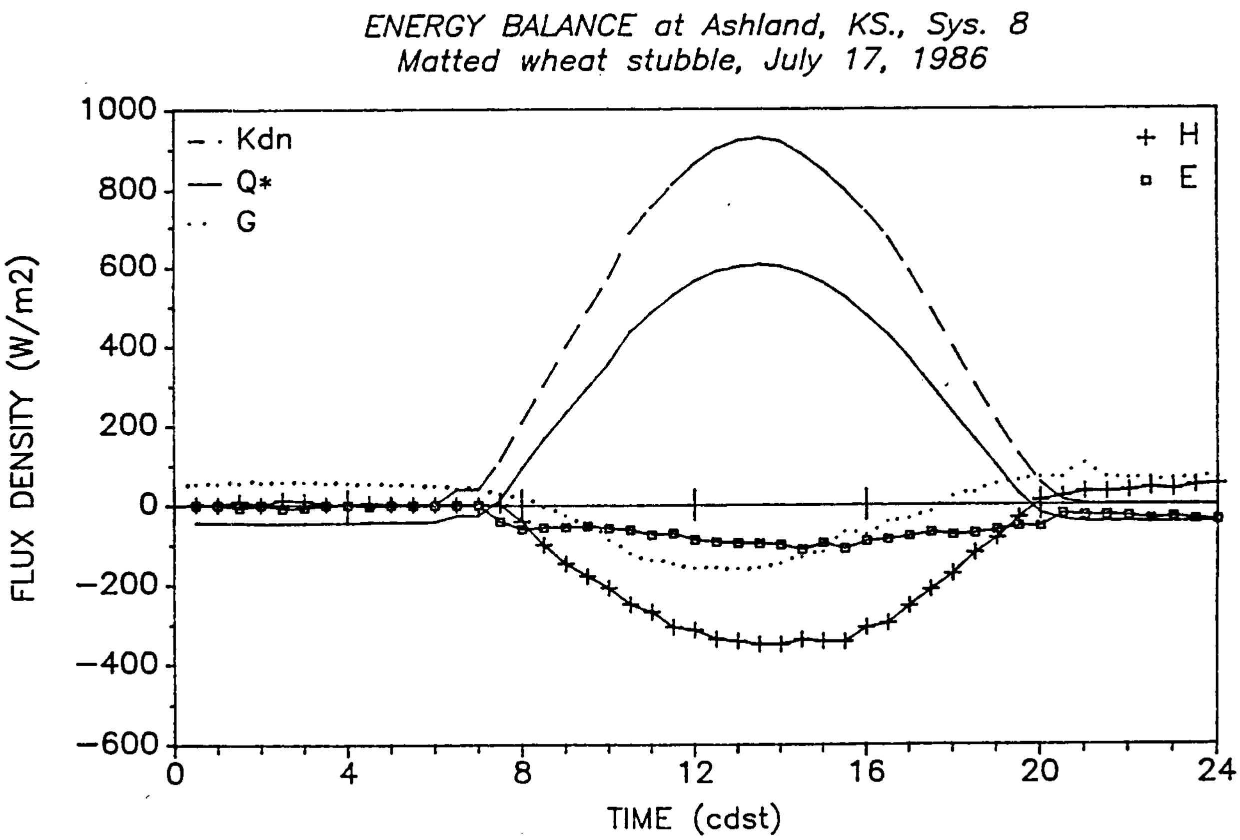
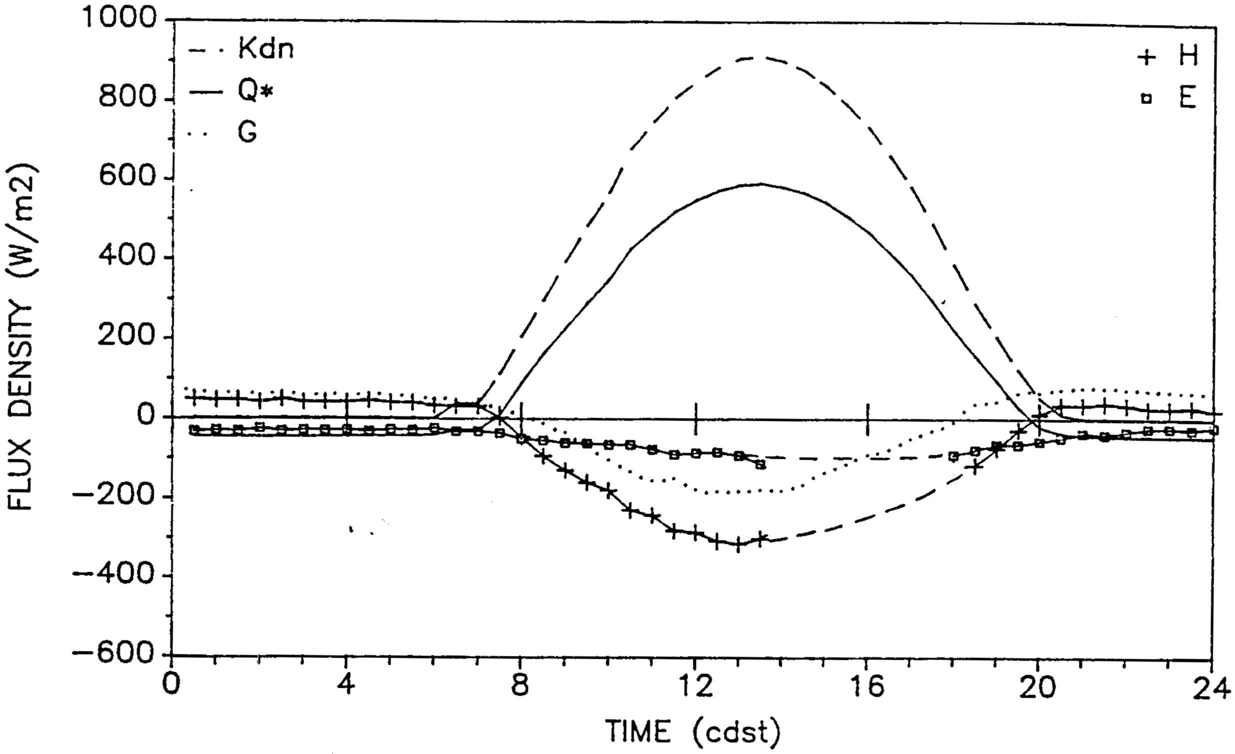
24


ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 16, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)


ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 17, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)

ENERGY BALANCE at Ashland, KS., Sys. 8
Matted wheat stubble, July 18, 1986



ENERGY BALANCE at Ashland, KS., Sys. 7
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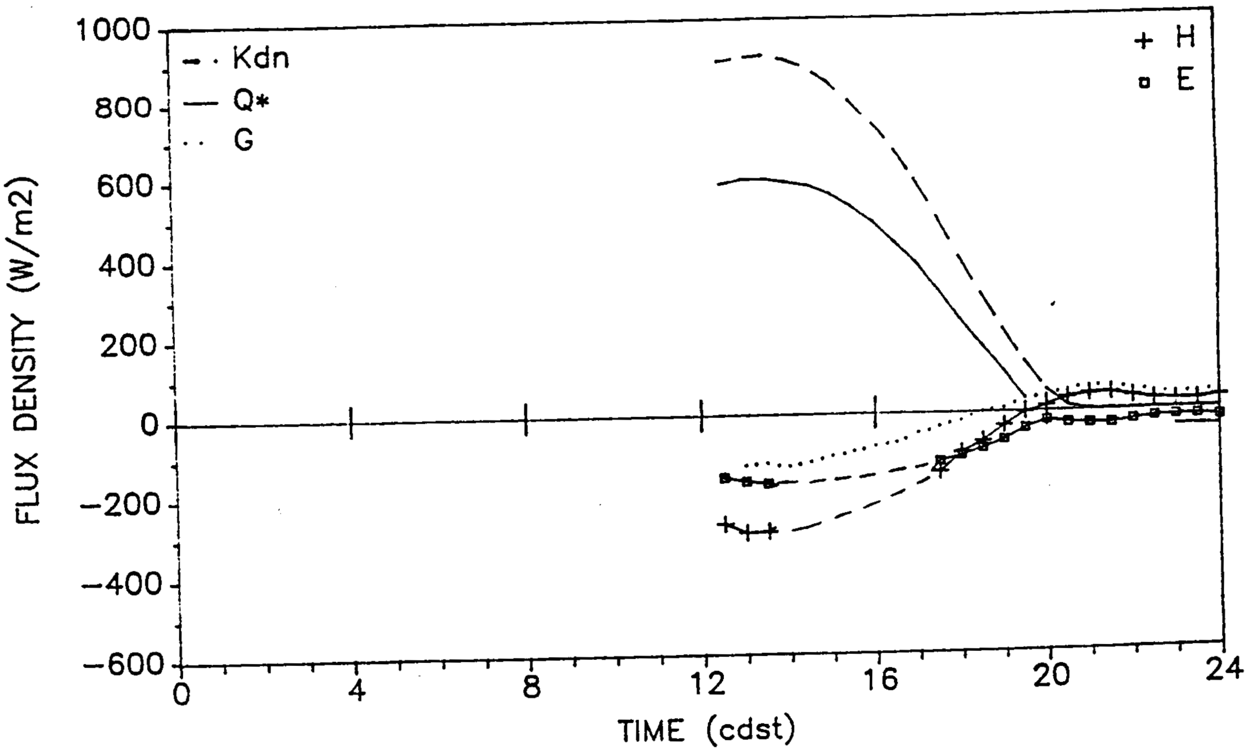
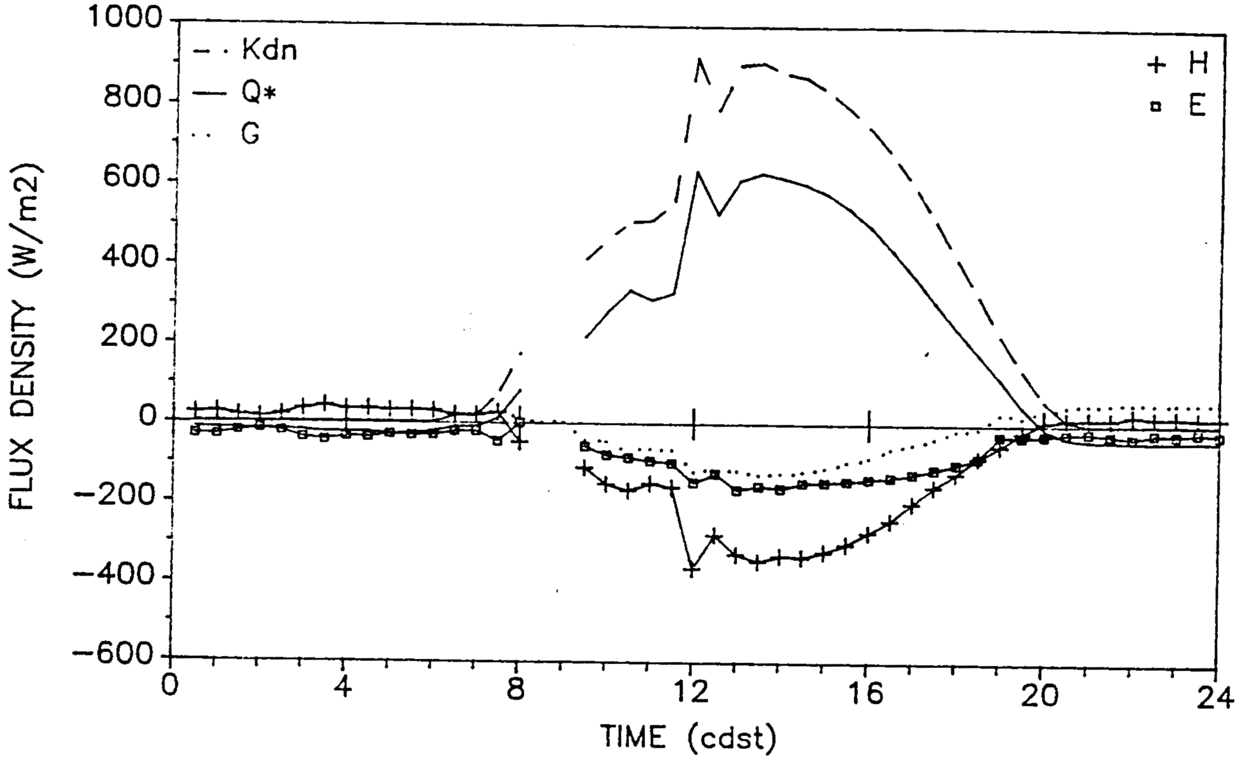
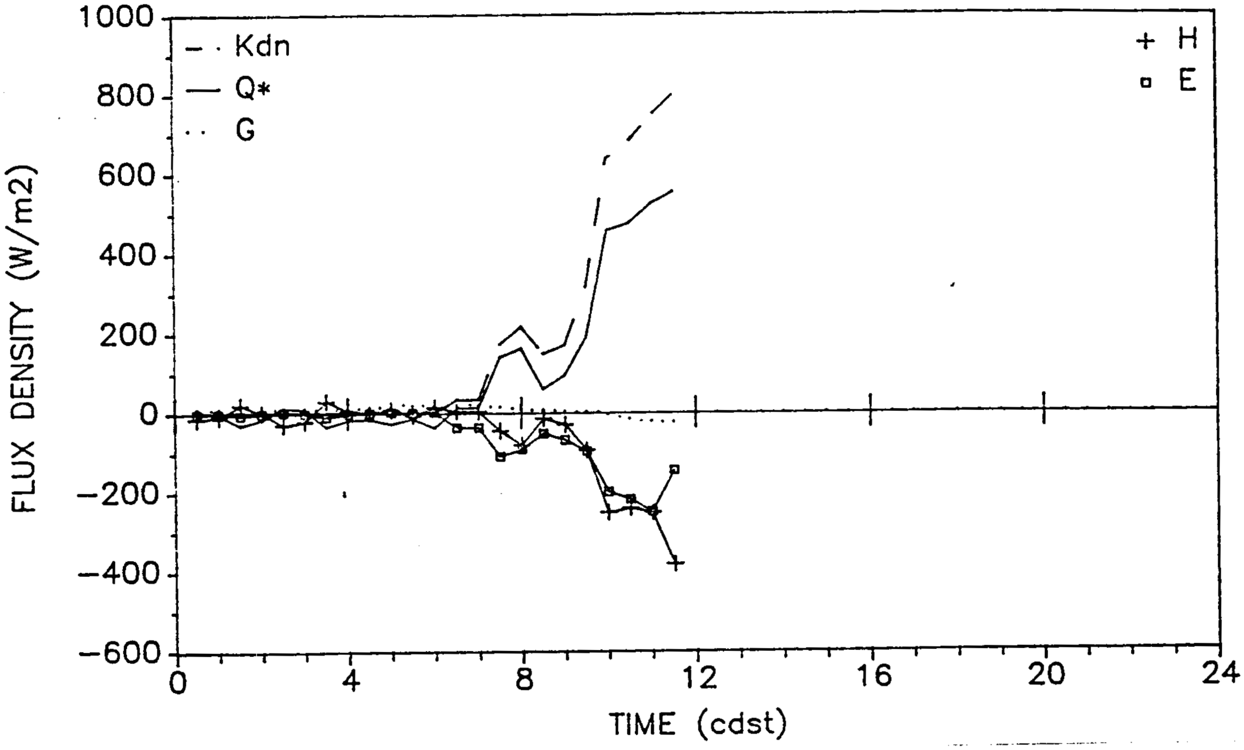


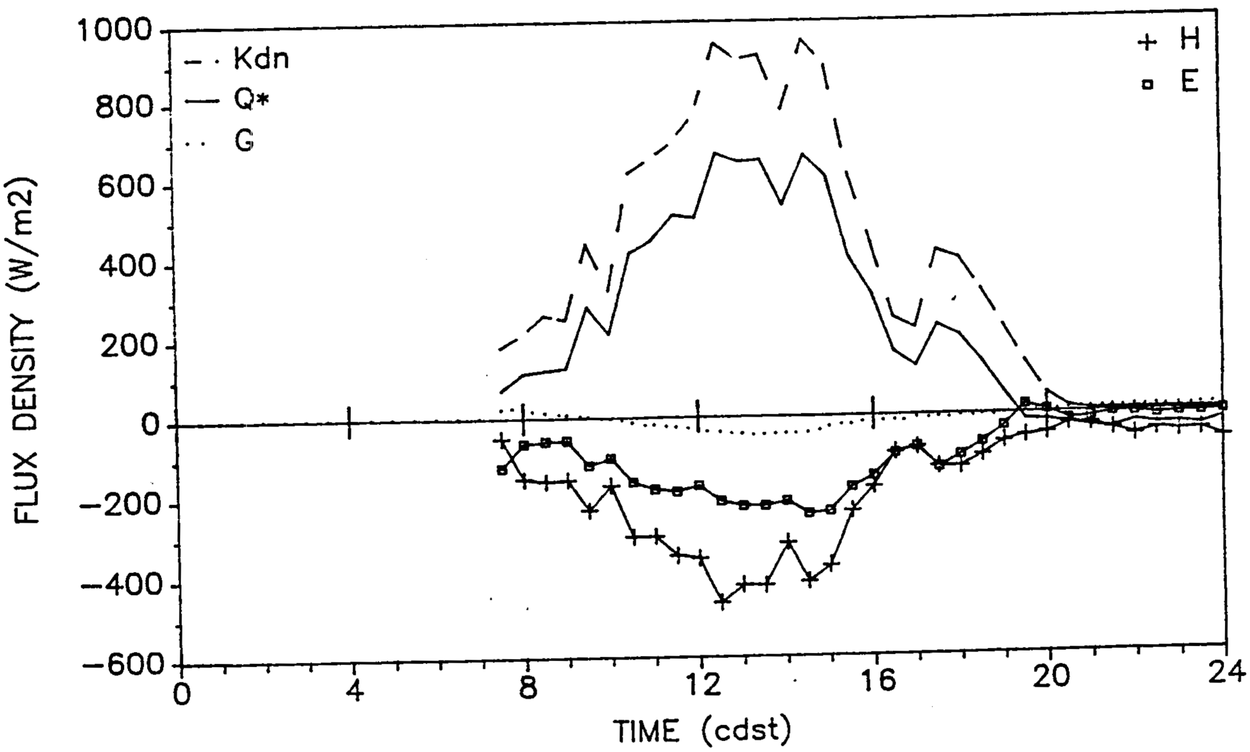
ENERGY BALANCE at Ashland, KS., Sys. 9
Matted wheat stubble, July 14, 1986

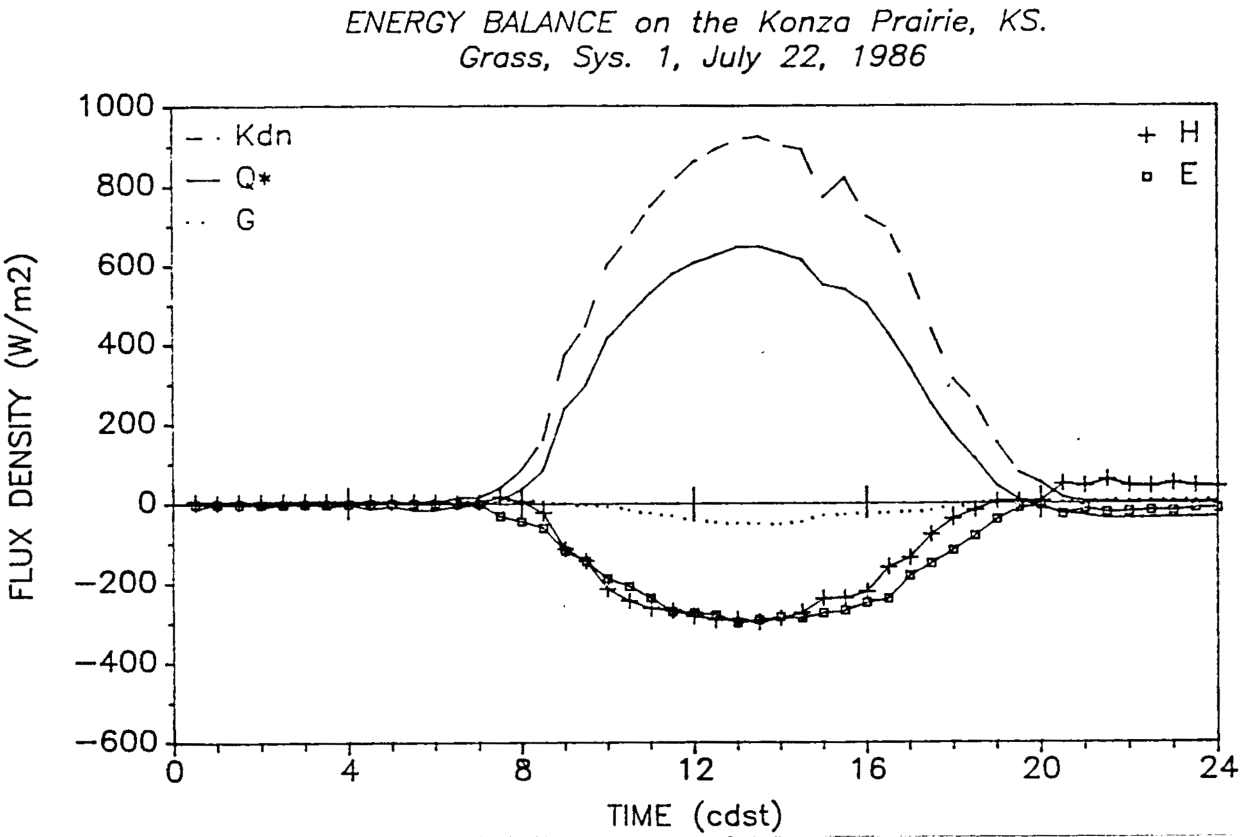


ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 1, July 20, 1986



ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 1, July 21, 1986





ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 1, July 22, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
TIME (cdst)
1000
800
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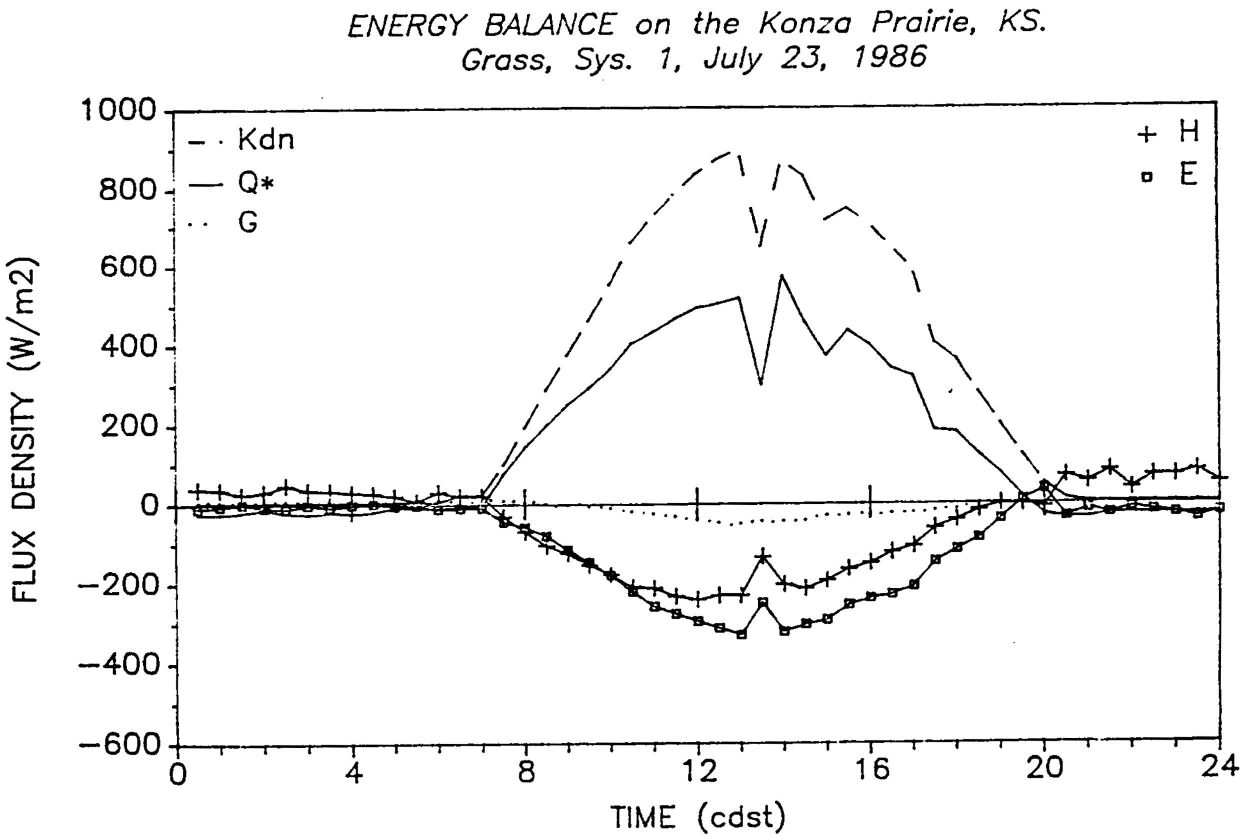

ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 1, July 23, 1986
Kdn
Q*
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FLUX DENSITY (W/m2)
TIME (cdst)
1000
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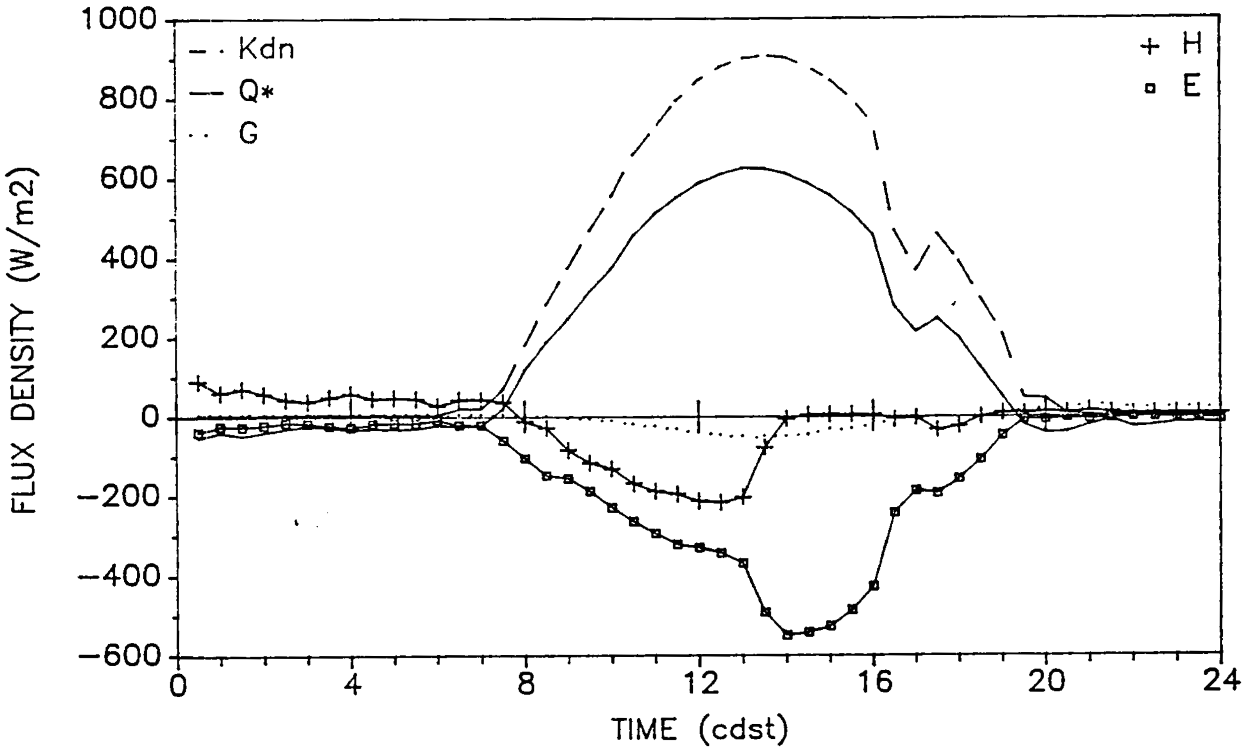
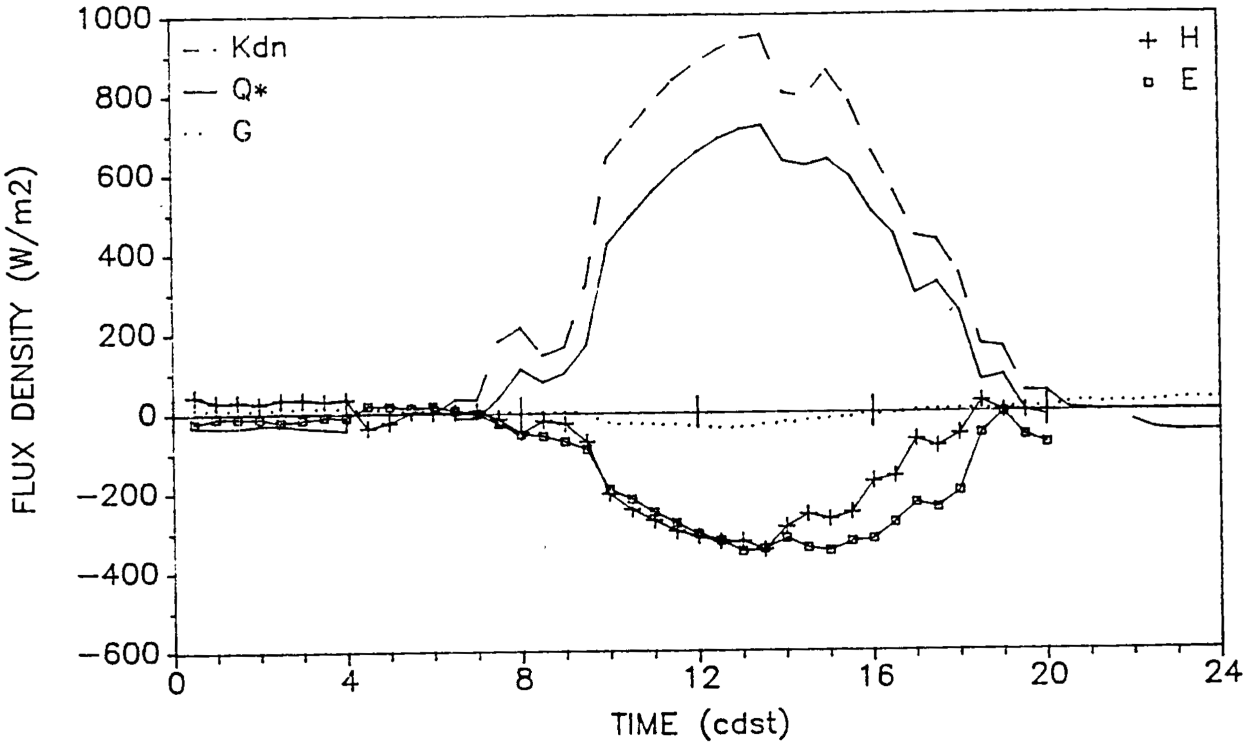
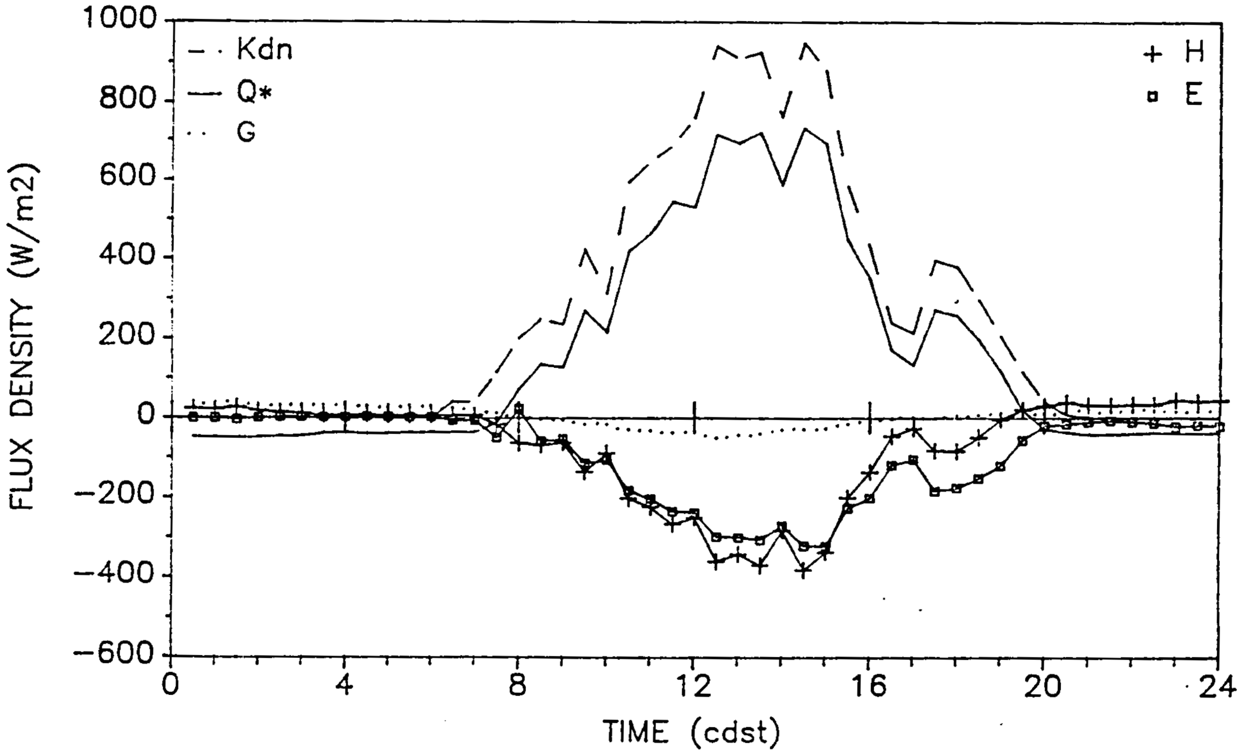
ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 1, July 24, 1986



ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 7, July 20, 1986



ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 7, July 21, 1986



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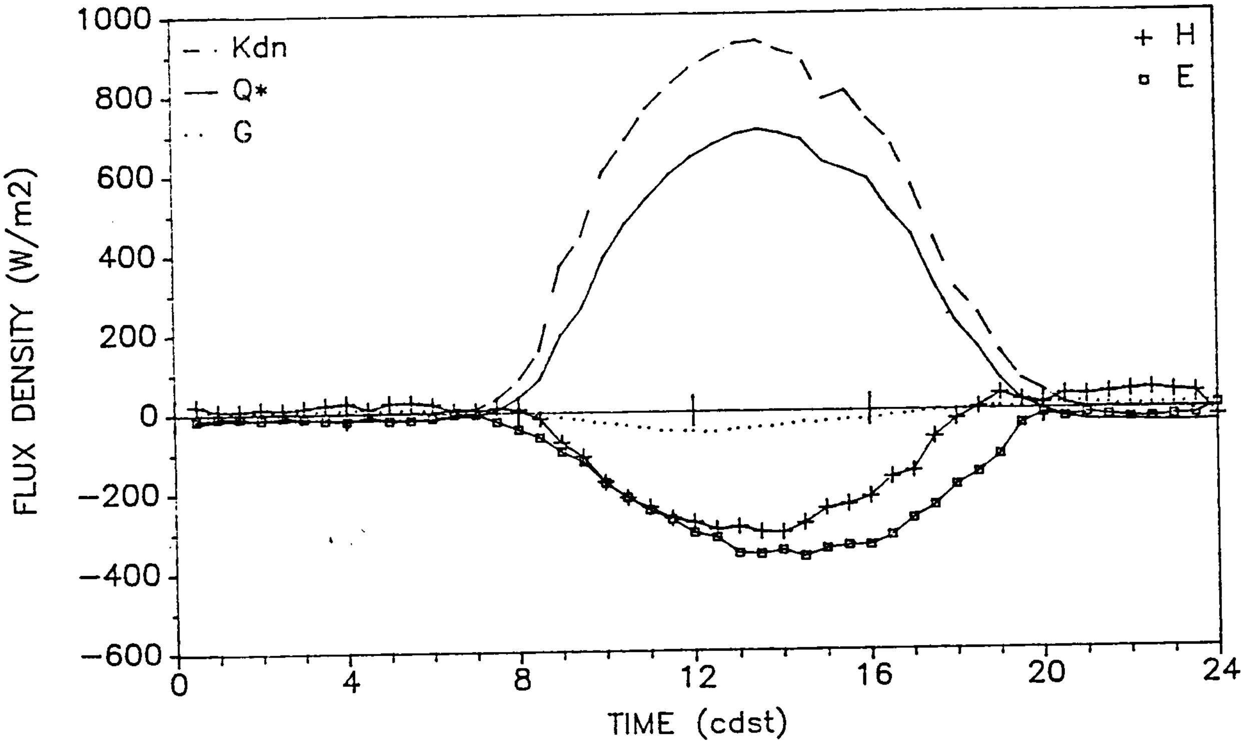
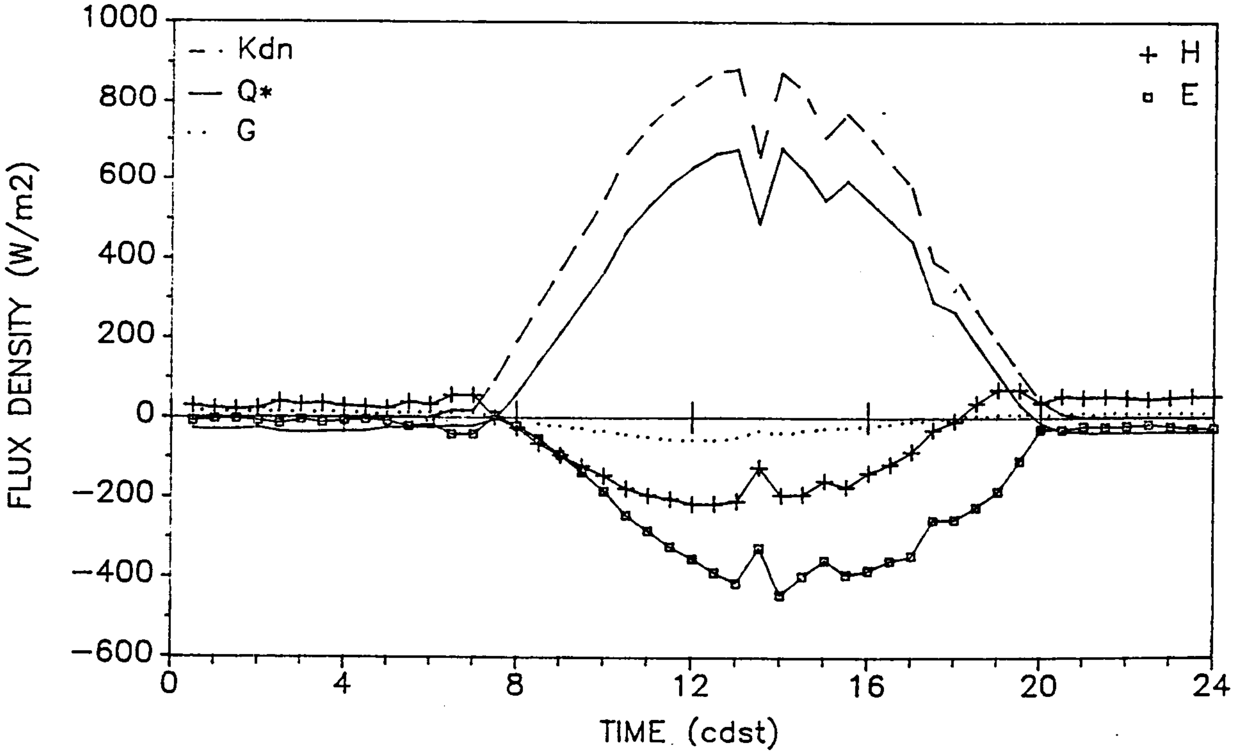
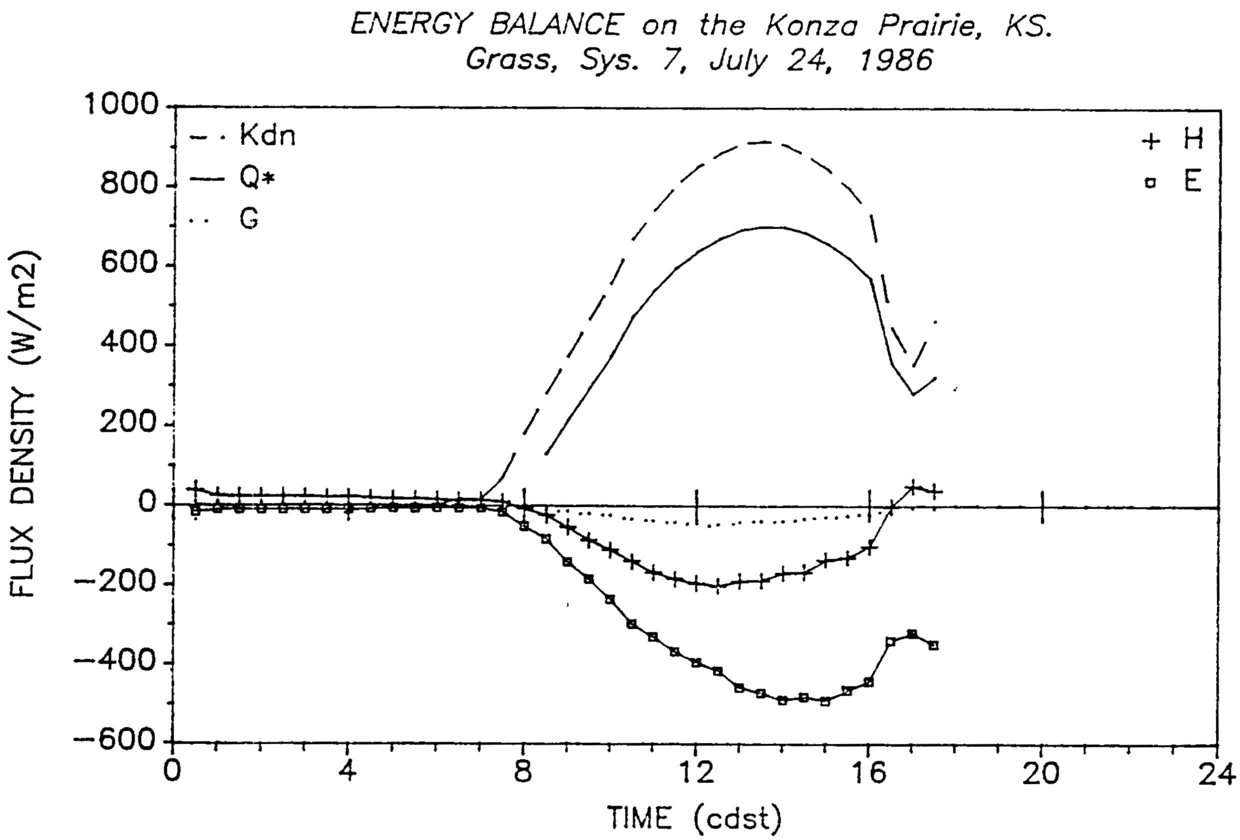


ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 7, July 23, 1986




ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 7, July 24, 1986
Kdn
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FLUX DENSITY (W/m2)
1000
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8
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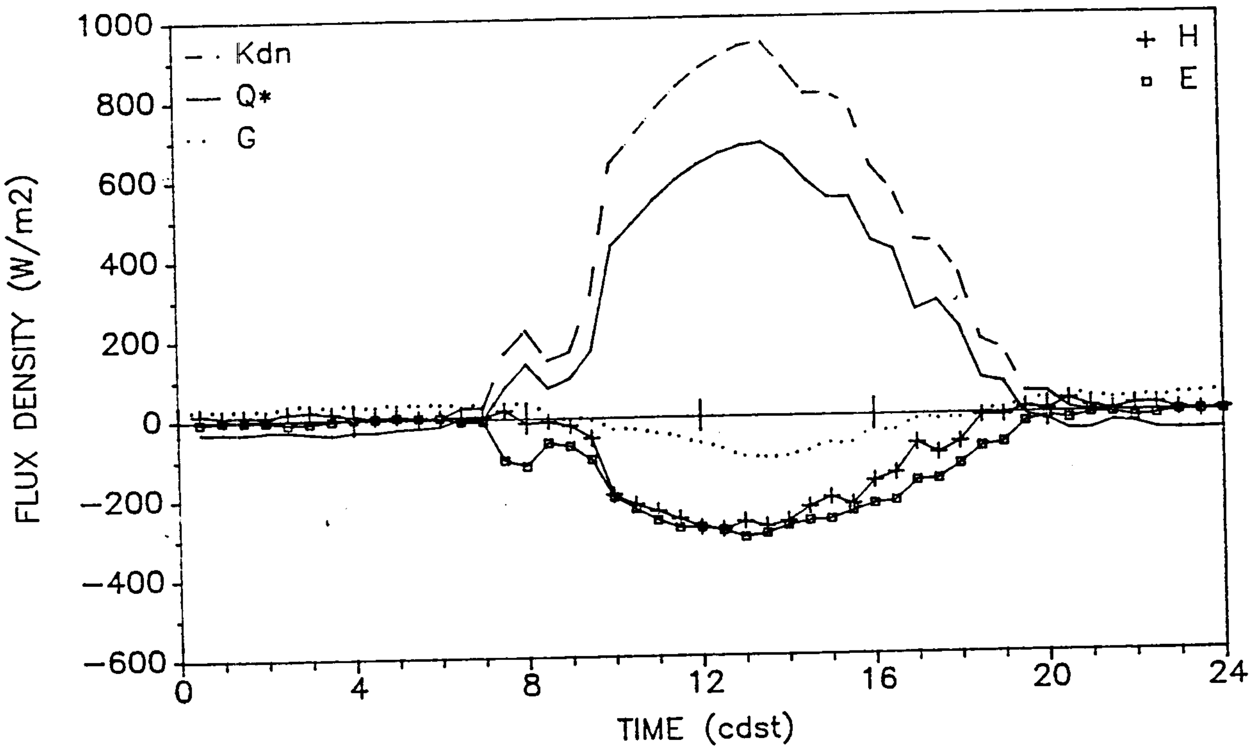
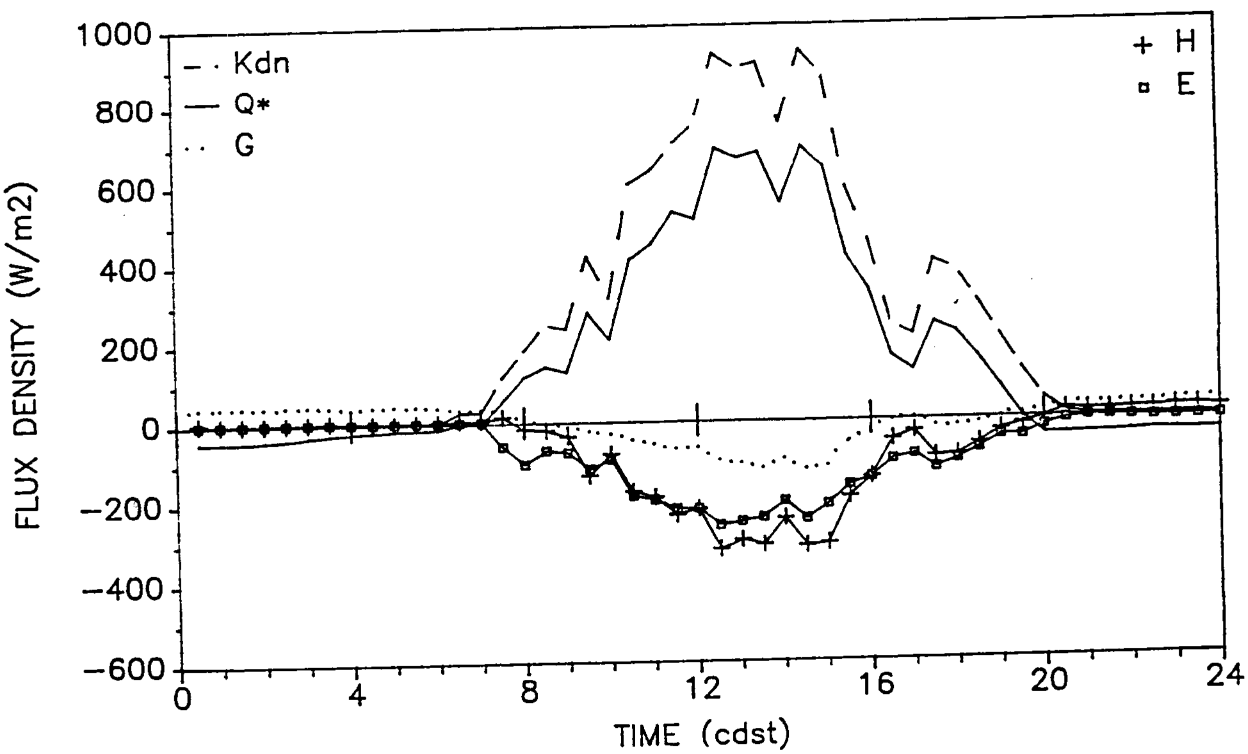
24
TIME (cdst)

ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 8, July 20, 1986



ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 8, July 21, 1986



ENERGY BALANCE on the Konza Prairie, KS.
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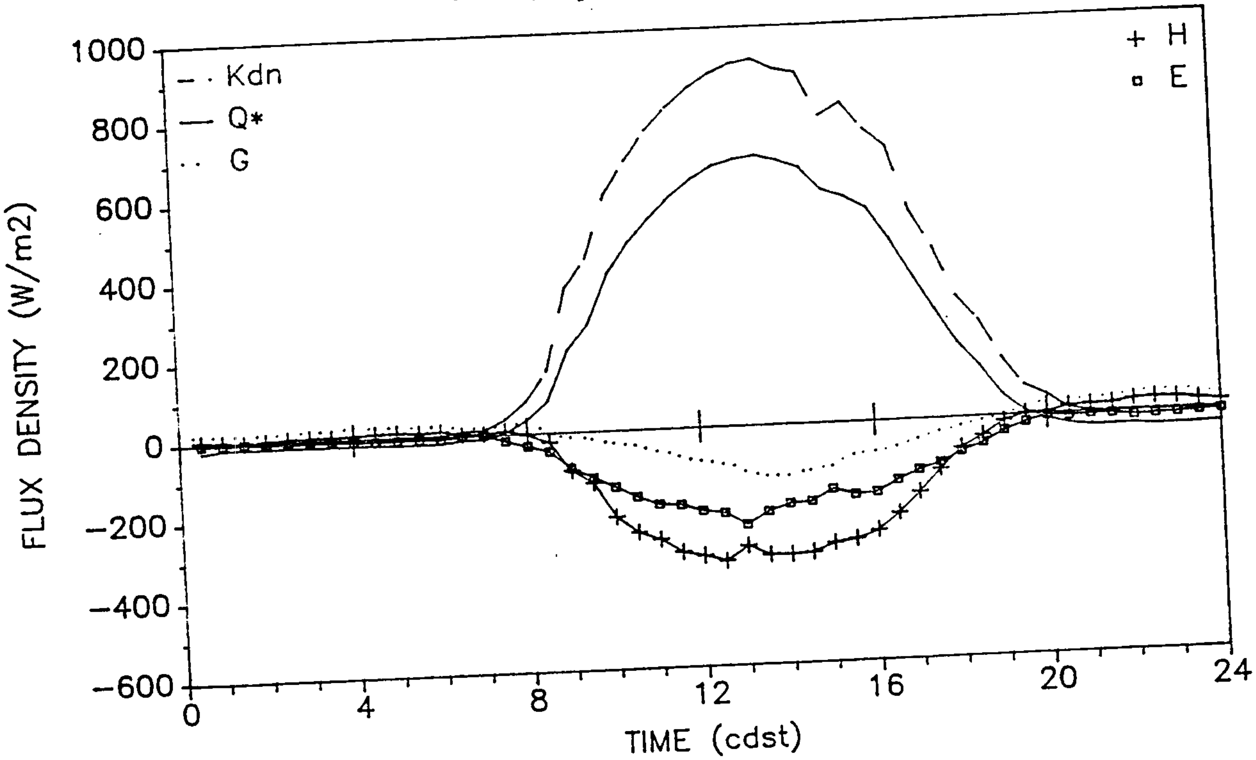

ENERGY BALANCE on the Konza Prairie, KS.
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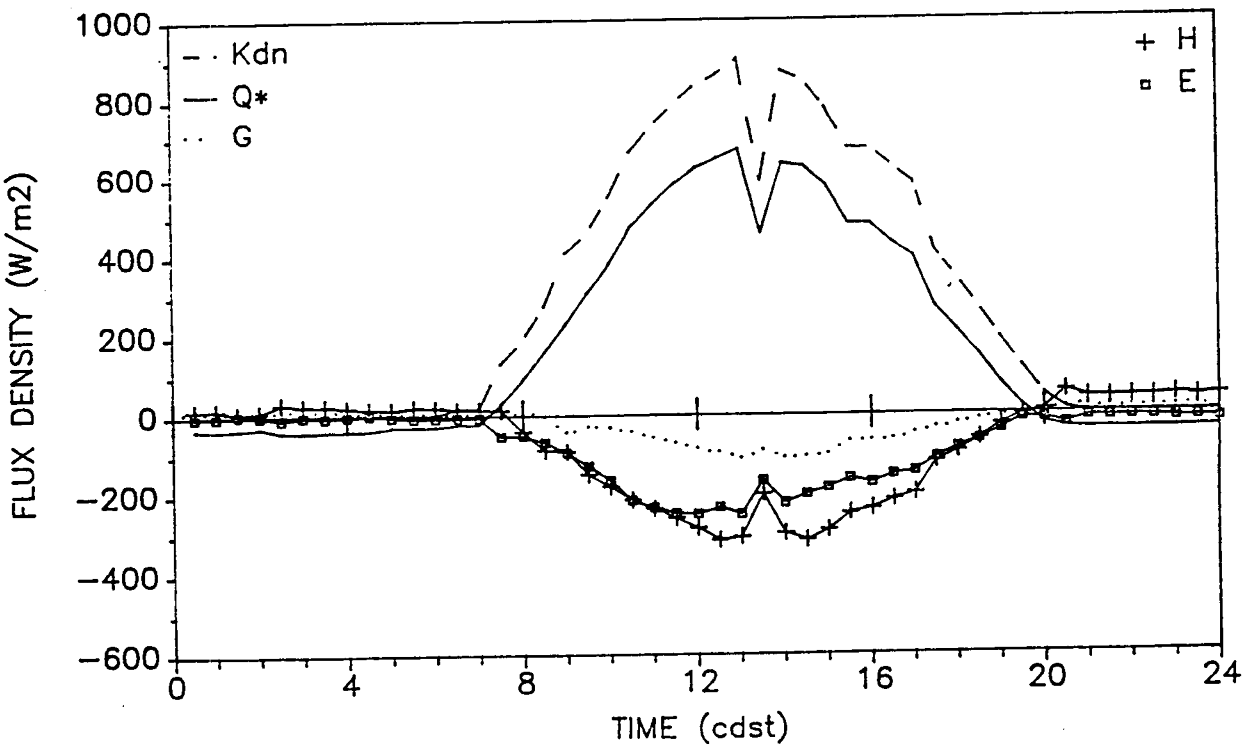

ENERGY BALANCE on the Konza Prairie, KS.
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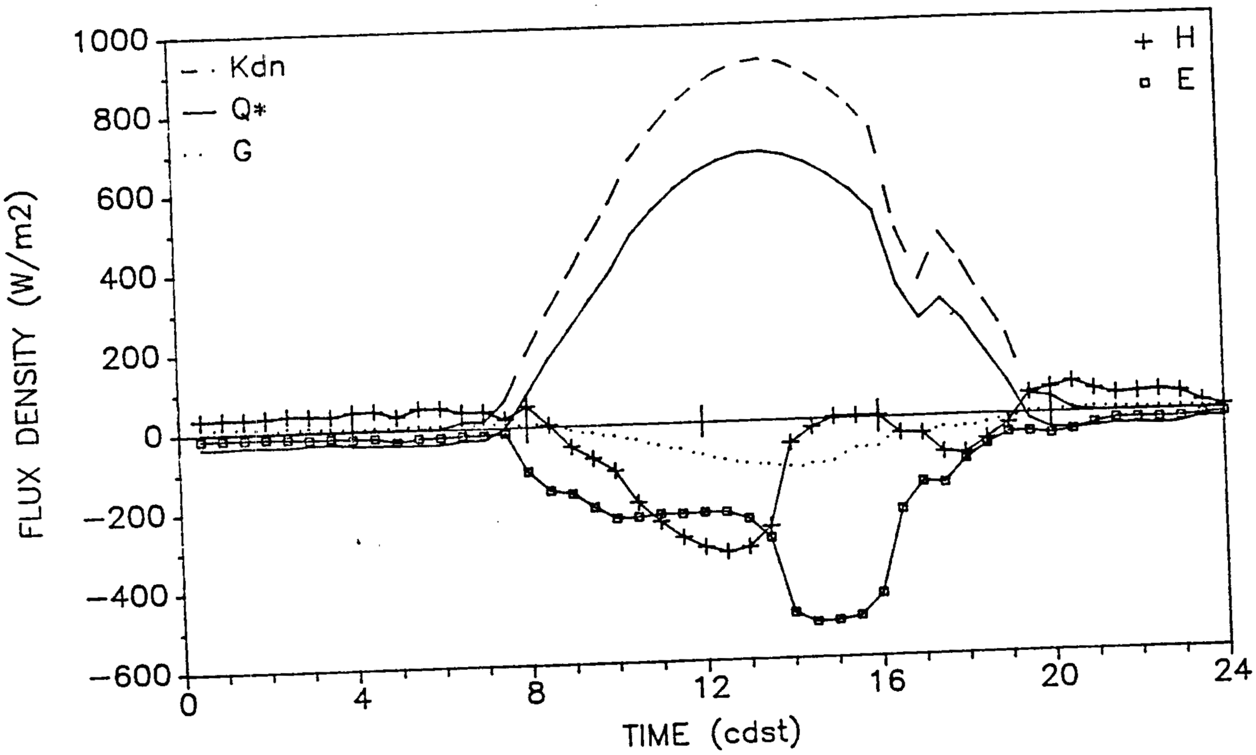

ENERGY BALANCE on the Konza Prairie, KS.
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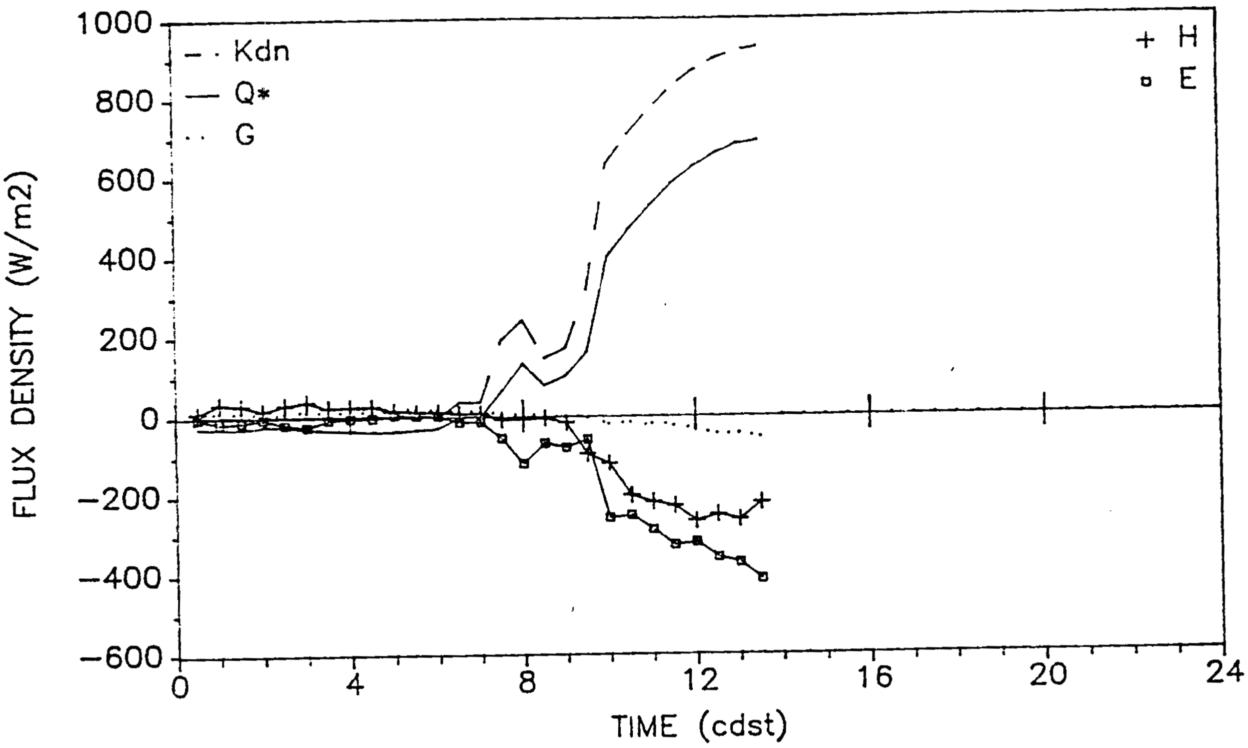
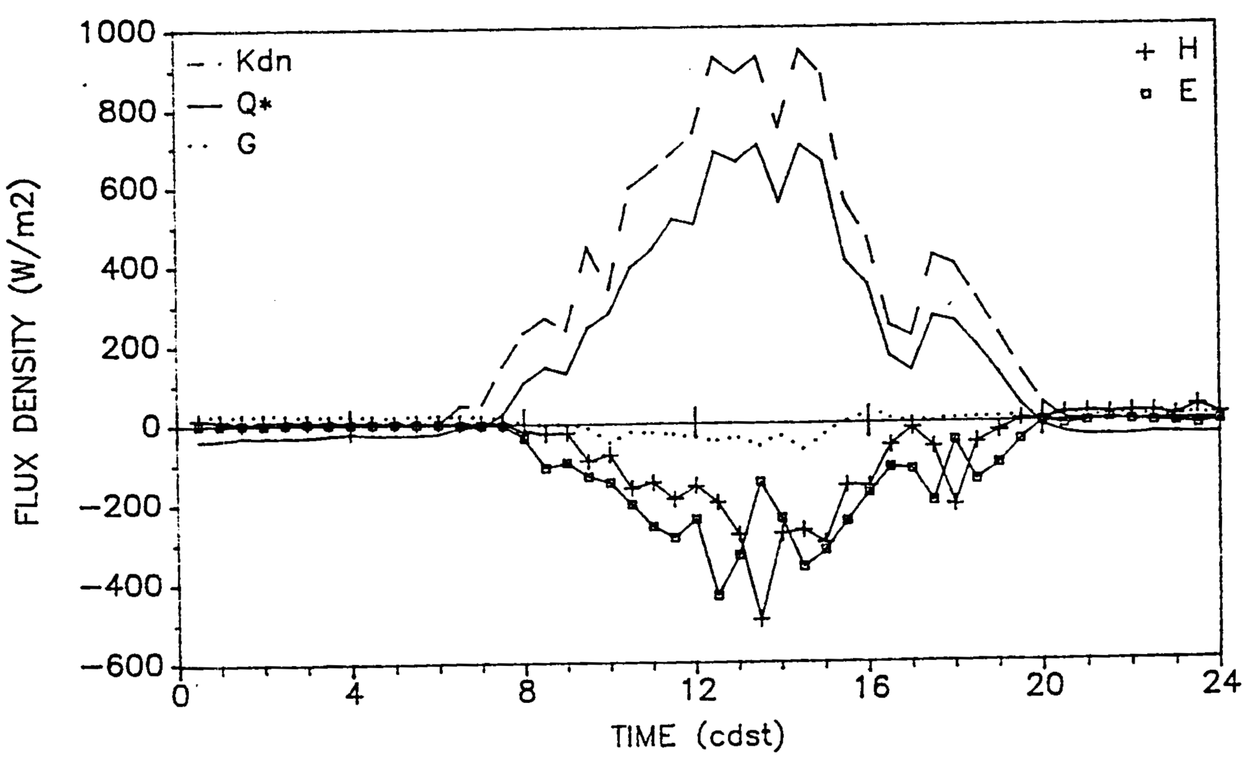
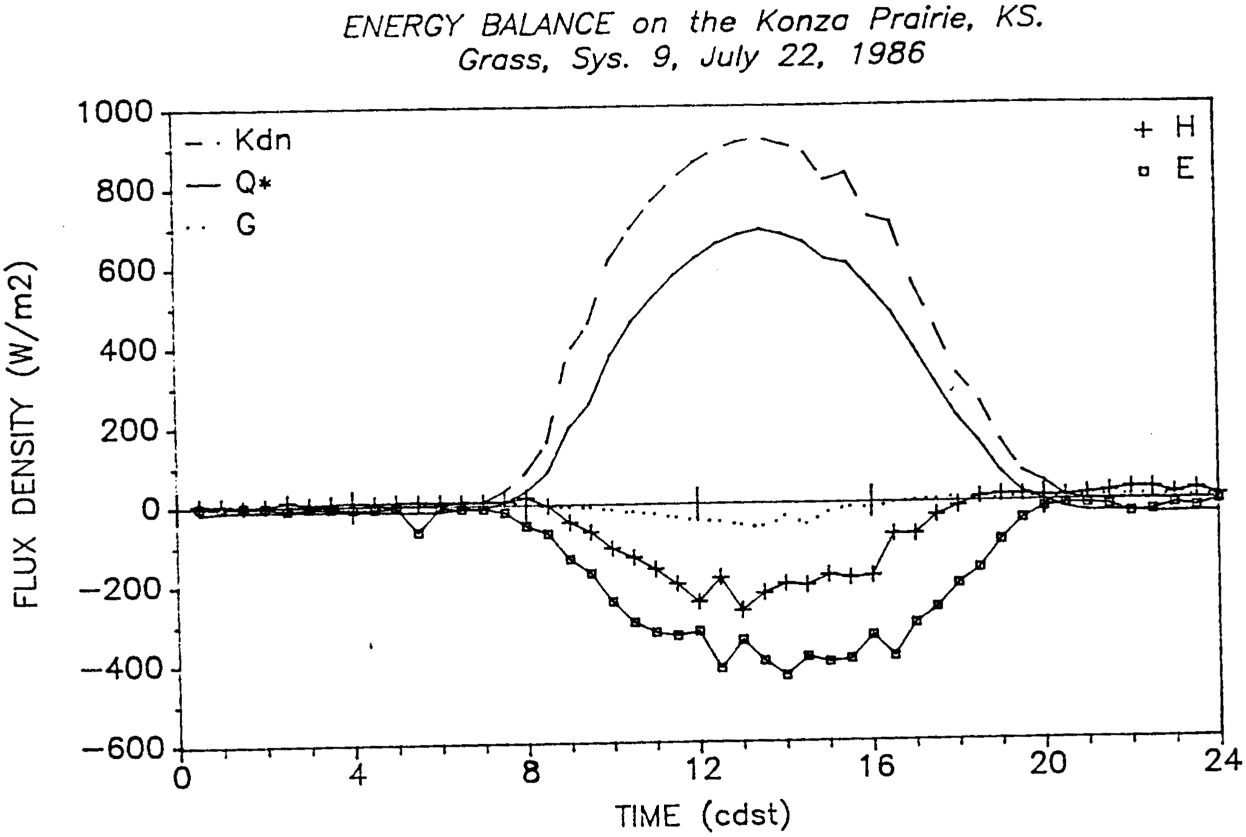


ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 9, July 21, 1968




ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 9, July 22, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
1000
800
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-200
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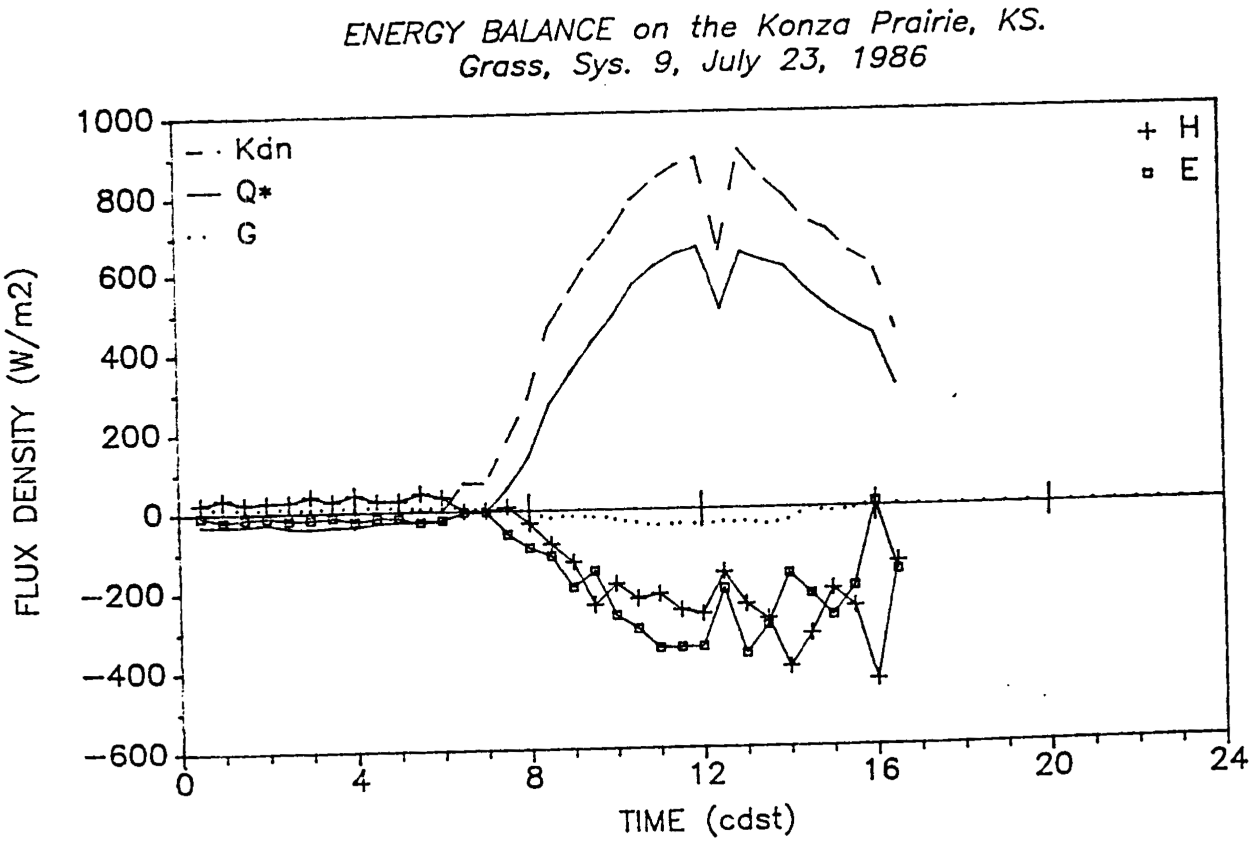
16
20
24
TIME (cdst)


ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 9, July 23, 1986
Kdn
Q*
G
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E
FLUX DENSITY (W/m2)
1000
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-600
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4
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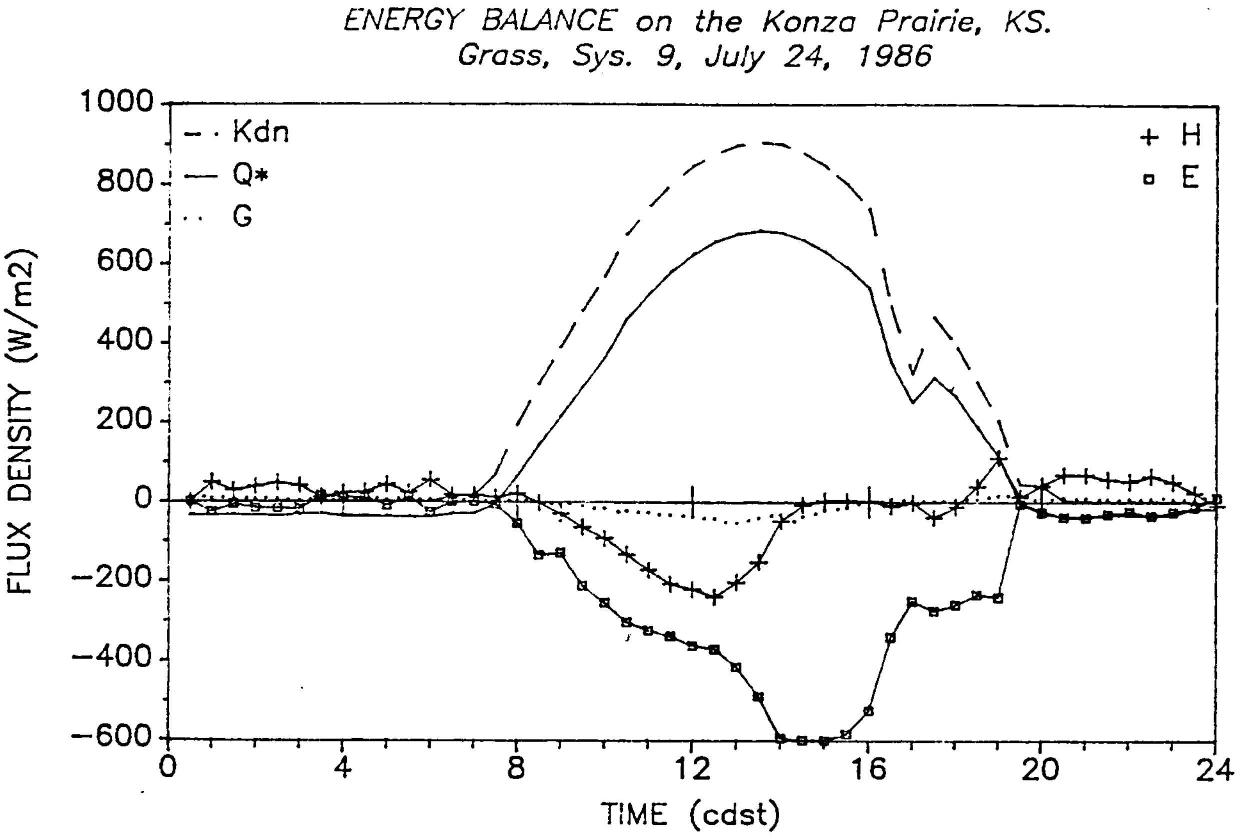
16
20
24
TIME (cdst)



ENERGY BALANCE on the Konza Prairie, KS.
Grass, Sys. 9, July 24, 1986
Kdn
Q*
G
H
E
FLUX DENSITY (W/m2)
1000
800
600
400
200
0
−200
−400
−600
0
4
8
12
16
20
24
TIME (cdst)