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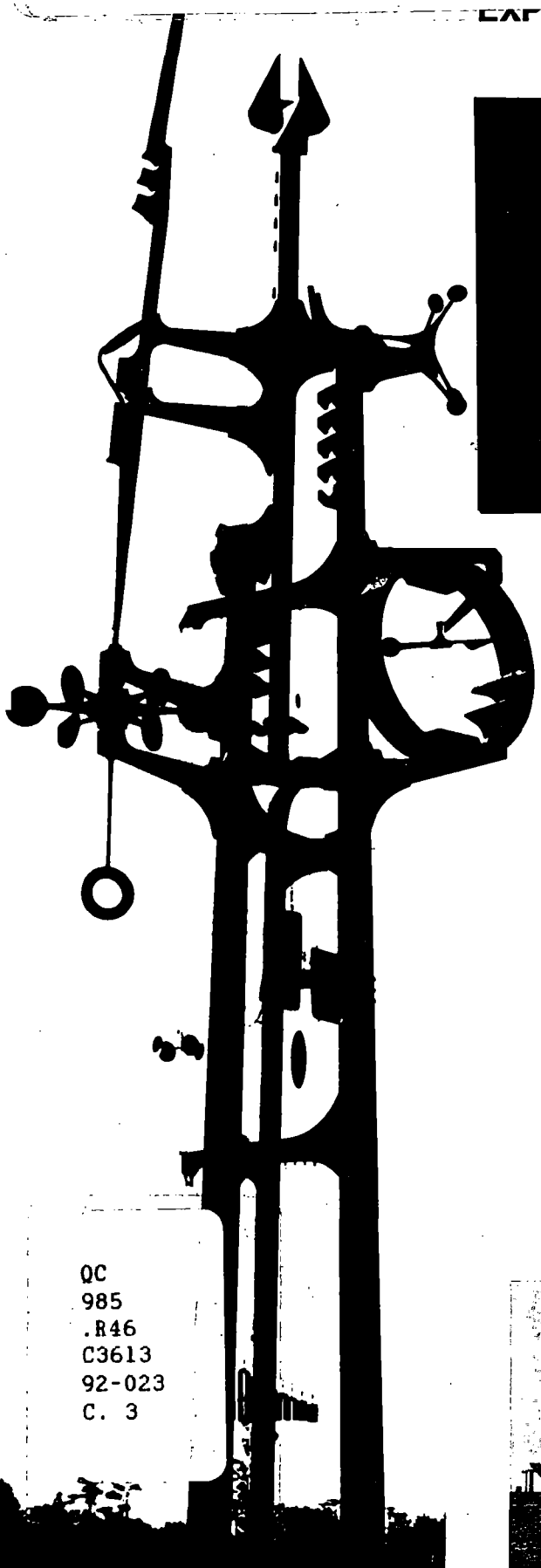

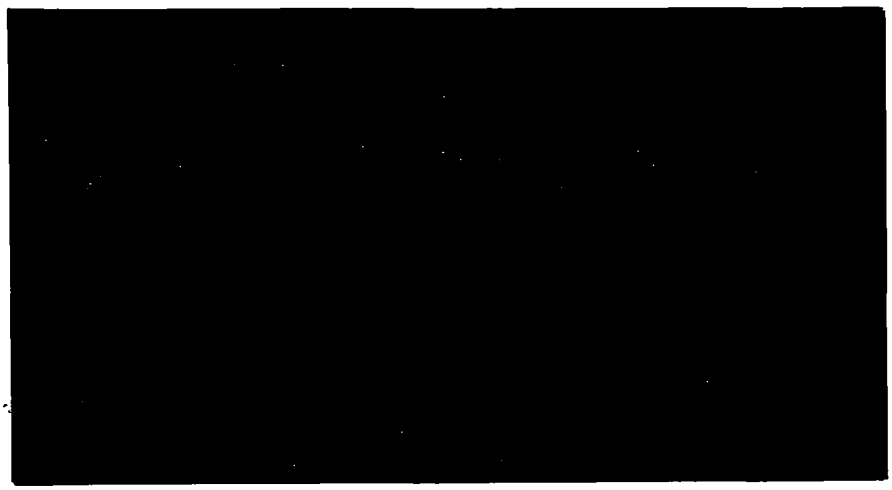

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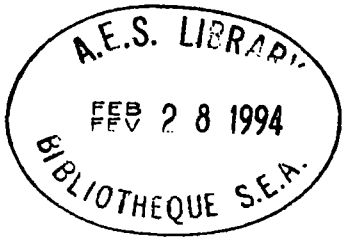
ECSARCH

ELECTRONIC CLIMATE SYSTEM ARCHIVE

TECHNICAL MANUAL

DAVID P PHILLIPS
CANADIAN CLIMATE CENTRE
ENVIRONMENT CANADA



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ECSARCH

ELECTRONIC CLIMATE SYSTEM ARCHIVE

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1) SYSTEM REQUIREMENTS

386 OR BETTER WITH 4 MEG. OR MORE OF MEMORY RECOMMENDED.
MINIMUM CONFIGURATION IS 286 WITH 1 MEG MEMORY.
DOS 3.3 OR GREATER OR OS 2.0 OR GREATER.
MEMORY MANAGER AND / OR VIRTUAL DISK.
SPACE REQUIREMENTS 3 MEG.

INSTALLATION REQUIREMENTS

CURRENTLY REQUIRES DBASE4 INSTALLED OR FULLY COMPATIBLE SYSTEM

VIRTUAL DISK(IF USED) IDENTIFIED IN AUTOEXEC FOR "VDISK" EQUAL TO THE DRIVE LETTER (SEE DOS MANUALS FOR SETTING ENVIRONMENT PARAMETERS, AND FOR SETTING UP A VIRTUAL DISK)

SPACE ALLOCATED FOR VIRTUAL DISK MUST BE GREATER THAN 1 MEG.

2) STARTING UP THE PROGRAMS

To automate the archive data a communications program must be used to make the communications link to get the data and put it into a file called "C:\ARCHIVE\ALLDATA.TXT" and makes the following batch calls.
"cd\dbase" (any where you have the program dbase.exe)
"DBASE AUTO" ("AUTO" being anywhere you have the programs and archive files)

To access the menu driven archive and display system the user must get into the database and typing "DO AES_SYS" or while in the database directory type "DBASE AES_SYS"

3) TECHNICAL TERMS

B.B.S. -- ELECTRONIC CLIMATE SYSTEM
BULLETIN BOARD SERVICE
OUTPUT DATA FORMAT

DATALOGGER -- DEVICE FOR GATHERING DATA FROM ELECTRONIC SENSORS FOR LATER RETRIEVAL

4) ARCHIVE DATA FORMAT

FIELD	EXAMPLE	DESCRIPTION	USAGE
TIME	199223011	YEAR,JULIAN DAY,HOUR	TIME DATA RECORDED
STA_CODE	"1"	STATION CODE	CODE REPRESENTING THE TOWER LOCATION
ARR_CODE	"3"	ARRAY CODE	ARRAY TYPE I.E. HOURLY
SEN_CODE	"1"	SENSOR CODE	TYPE OF SENSOR I.E. TEMPERATURE
MAKE_CODE	"1"	MAKE CODE	MAKE OF SENSOR I.E. THERMAL COUPLE
OBS_CODE	"5"	OBSERVATION CODE	TYPE OBSERVATION OF THE DATA I.E. MAX VALUE OVER THE HOUR
HT_CODE	"7"	HEIGHT CODE	HEIGHT OF SENSOR I.E. 1.5 METERS
DERIVED	"y"	DERIVED CODE	DERIVED FIELD I.E. TIME OF MAX
DATA_VALUE	-9999.99	RECORDED VALUE	OBSERVED DATA VALUE
ERR_CODE	"1"	ERROR CODE	TYPE OF ERROR IN THE DATA THAT WAS DETECTED I.E. VALUE OUT OF SENSOR RANGE

5) SETTING UP THE SYSTEM

STEP SEQUENCE TO CREATE THE NECESSARY FILES TO ARCHIVE THE DATA.
FROM THE START UP MENU SELECT THE "OPERATOR CONTROL MENU".

1) SET UP SENSOR FILE
2) SET UP STATION FILE
3) SET UP HEIGHT FILE
4) SET UP OBSERVATION FILE
5) SET UP DERIVED FIELD FILE
6) SET UP ARRAY FILE
7) SET UP DATA CONVERSION FILE

FOR ALL FILES EXCEPT THE "DATA CONVERSION FILE" DO NOT MANUALLY CHANGE ANY OF THE CODES UNLESS THE CODES ARE DUPLICATED IN A FILE.

STEP 1

SENSOR FILE SET UP

The Sensor file contains all the information on how the sensor quality control is to take place.
** NOTE ** THE SENSOR CODE AND MAKE CODE UNIQUELY IDENTIFY A SENSOR IN THE ARCHIVE

To modify the sensor file select the "EDIT SENSOR FILE" menu option.

STEP 2

STATION FILE SET UP

The Station file contains all information on the station location, the identification fields for the datalogger and the B.B.S., and all the information on the environment around the station

To modify the station file select the "EDIT STATION FILE" menu option.

STEP 3

HEIGHT FILE SET UP

The Height file contains all the information on the heights of sensors that are to be used
** NOTE ** CREATE FROM LOWEST TO HIGHEST ALL SENSORS HEIGHTS IN ALPHA NUMERIC SEQUENCE.
CREATE THE FILE WITH ALL CURRENT AND FUTURE HEIGHT CODES UP TO THE HIGHEST HEIGHT OF THE CURRENT TOWER(S).

To modify the height file select the "EDIT SENSOR HEIGHTS FILE" menu option.

STEP 4

OBSERVATION FILE SET UP

The Observation file contains all the information on how the data was observed.

To modify the observation file select the "EDIT OBSERVATION PROGRAM FILE" menu option.

STEP 5

DERIVED FIELD FILE SET UP

The Derived field file contains all the information on the type of derived field was calculated .i.e. Standard Deviations,etc.

To modify the derived field file select the "EDIT DERIVED VALUES FILE" menu option.

STEP 6

ARRAY FILE SET UP

The Array file contains the information on when the data is to be expected for the type of data record from the datalogger or B.B.S. i.e. hourly scientific,hourly aes,daily scientific,etc.

To modify the array file select the "EDIT ARRAY DEFINITIONS FILE" menu option.

STEP 7

DATA CONVERSION FILE SET UP

The Data conversion file contains all the information necessary to convert any datalogger or B.B.S. file into the archive format.
** NOTE ** INFORMATION IN THIS FILE REQUIRES ALL STEPS 1 TO 6 BE MADE BEFORE THIS FILE CAN BE CREATED OR UPDATED.
** NOTE ** CHANGES IN THIS FILE MAY MAKE THE RE-ARCHIVING OF THE OLD DATA IMPOSABLE SO SAVE THE FILES "STA_CONT.DBF" AND "ARY.NDX" WITH THE LAST BACKUP DATA SET BEFORE MAKING ANY CHANGES.

To modify the data conversion file select the "EDIT DATA PROCESS CONTROL FILE" menu option.

6) SETTING UP THE CLIMATE FORM AND GRAPHS

The setting up of the climate form and graphs can only be done when the system has been set up first.

Control files are files that contain all information on what data is to be extracted and where it is to be put.

The setting up of the control files for each of the programs should be done in this order

1) climate form control file
2) graph4 control file
3) wind rose control file
4) vertical profiles control file
5) soil profiles control file

1- SETTING UP CLIMATE FORM CONTROL FILE

The climate form control file is a file that controls the processing of twice daily data into a daily data table.

The climate form control file must be set up if any program that uses the climate form data is to operate properly. The controlled file for the climate form is "STA_FORM.DBF" and has all the data structure for the eventual climate form to be generated. The file controlling the data that "STA_FORM.DBF" gets is "FORFORMS.DBF".

To set up the climate control file select from the main menu the "INVOKE GRAPHING FACILITIES" option, then select "EDIT PROGRAM SET-UP FILES", and finally select "FORMS SETUP".

The "FILE IN USE:" field indicates the name of the control file used.

The "FIELD_NAME" field indicated the field name in the controlled file.

The "ARRAY","SENSOR","MAKE","HEIGHT","OBS_CODE","DERIVED",and "HOURS" are all data selection parameters for the field named in the controlled file.

2- SETTING UP GRAPH4 CONTROL FILE

The graph4 control file is a file that controls the processing of data into a daily graphs of various types of data.

The file controlling the data extraction for the output files is "EXTDAT.DBF".

The field "FILE IN USE:" refers to the controlling file name.

The field "OUTFILE" refers to a file name

The fields "SENSOR","MAKE","HEIGHT","OBSER1","OBSER2","OBSER3", "OBSER4","ARRAY", and "DERIVED" are parameters for data extraction.

The field "DESCRIPT" is a description of the data record in the controlling file for the users.

3- SETTING UP WIND ROSE CONTROL FILE

The wind rose control file is a file that controls the extraction of data for wind rose graphs (directional relations of data).

The file controlling some of the data that is controlling the output files is "ROSESU.DBF".

The field "FILE IN USE:" refers to the controlling file name.

The fields "SENSOR","MAKE","HEIGHT","OBSER","ARRAY", and "DERIVED" are parameters for data extraction.

The field "DESCRIPT" is a description of the data record in the controlling file for the users.

4- SETTING UP VERTICAL PROFILES CONTROL FILE

The vertical profiles control file is a file that controls the extraction of data for vertical profile graphs.

The file controlling some of the data that is controlling the output files is "VERTSU.DBF".

The field "FILE IN USE:" refers to the controlling file name.

The fields "SENSOR","MAKE","OBSER","ARRAY",and "DERIVED" are parameters for data extraction.

The field "DESCRIPT" is a description of the data record in the controlling file for the users.

The fields HOUR1,HOUR2,HOUR3,ETC... are times in which data is required.

5- SETTING UP SOIL PROFILES CONTROL FILE

The soil profiles control file is a file that controls the extraction of data for soil profile graphs.

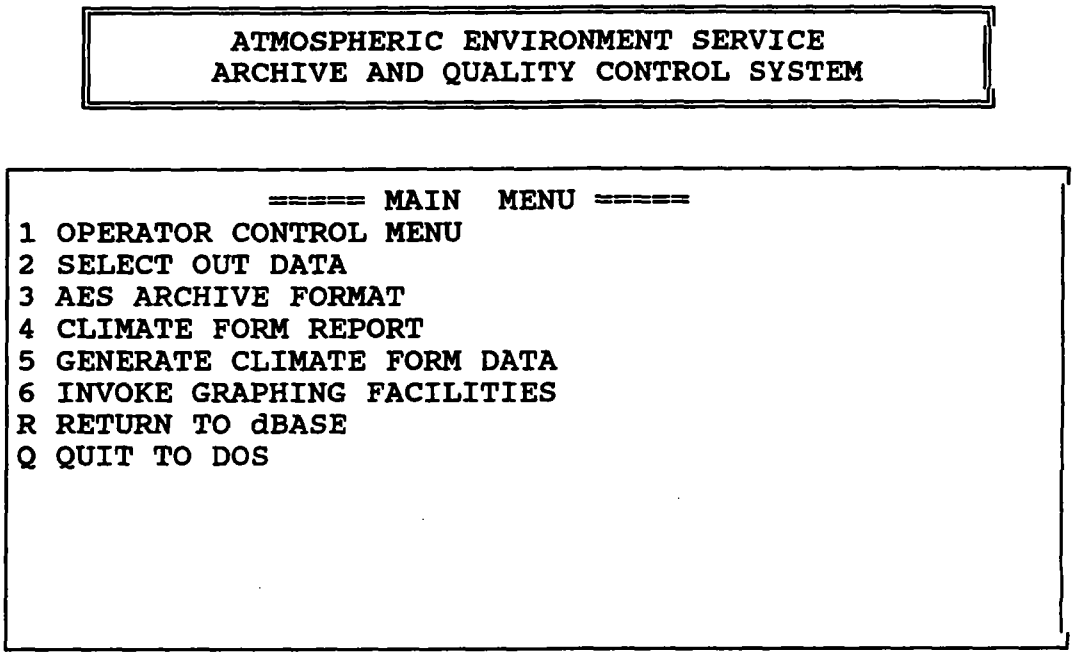
The file controlling some of the data that is controlling the output files is "INTERPSU.DBF".

The field "FILE IN USE:" refers to the controlling file name.

The fields "SENSOR","MAKE", and "DERIVED" are parameters for data extraction.

The field "DESCRIPT" is a description of the data record in the controlling file for the users.

7) MAIN MENU DESCRIPTION



Press first number of menu choice, or highlight and press <Enter>

1) OPERATOR CONTROL- MENU WHICH HAS ALL THE MAINTENANCE PROGRAMS
2) SELECT OUT DATA - MENUS OF FOR THE COPYING OF DATA
3) AES ARCHIVE FORMAT- INACTIVE IN THIS VERSION
4) CLIMATE FORM REPORT - GENERATES A PRINT OUT OF THE A.E.S. DAILY CLIMATE FORM
5) GENERATE CLIMATE FORM DATA - SAME AS 4) EXCEPT THERE IS NO PRINT OUT
6) INVOKE GRAPHING FACILITIES - MENU WHICH HAS ALL THE GRAPHICS PROGRAMS

8) OPERATOR MENU DESCRIPTION

```
ATMOSPHERIC ENVIRONMENT SERVICE
ARCHIVE AND QUALITY CONTROL SYSTEM

              ====OPERATOR MENU=====
1 RUN APPEND AND QUALITY CONTROL BBS DATA
2 RUN APPEND AND QUALITY CONTROL DATA LOGGER DATA
3 RUN QUALITY CONTROL
4 MAKE CHANGES TO THE ARCHIVE
5 EDIT SENSOR FILE
6 EDIT OBSERVATION PROGRAM FILE
7 EDIT STATION FILE
8 EDIT SENSOR HEIGHTS FILE
9 EDIT DERIVED VALUES FILE
A EDIT ARRAY DEFINITIONS FILE
B EDIT DATA PROCESS CONTROL FILE
C BACK UP/RESTORE DATA
D ELIMINATE ALL DUPLICATE DATA
```

Press first number of menu choice, or highlight and press <Enter>

1) APPEND + QUALITY CONTROL BBS DATA - ADDING QUALITY CONTROLLED DATA TO THE ARCHIVE
2) APPEND + QUALITY CONTROL DATA LOGGER DATA - SEE 1)
3) QUALITY CONTROL - RECALCULATING THE QUALITY CONTROL ON THE ARCHIVE DATA
4) MAKE CHANGES TO THE ARCHIVE - MENU OF PROGRAMS THAT ARE EXECUTED IN A BATCH MODE
5) TO B) SEE DETAILS ON SETTING UP SYSTEM
C) BACK UP/RESTORE DATA - BACKING UP OR RESTORING THE ARCHIVE ON TO FLOPPY DISKS
D) ELIMINATE ALL DUPLICATE DATA - PROGRAM DESIGNED TO FIND ANY DUPLICATION OF DATA THAT MIGHT GET INTO THE ARCHIVE

9) GRAPHICS MENU DESCRIPTION

CLIMATE DATA
PROCESSING AND GRAPHING

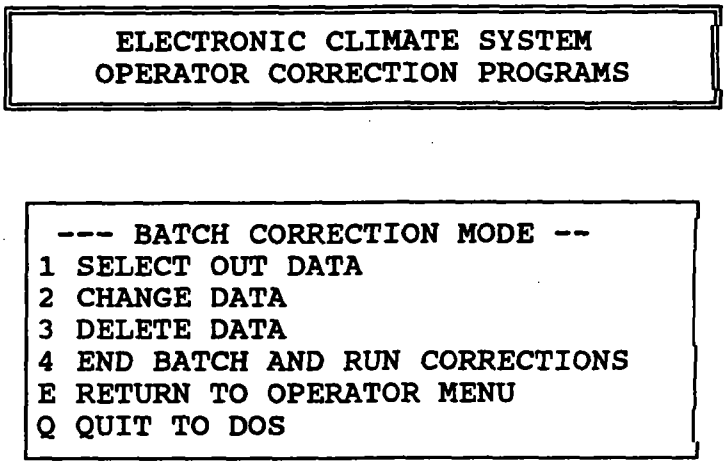
```
          ===== GRAPHICS MENU =====
1 FOREST NURSERY DEGREE DAYS
2 CALCULATE HEATING/COOLING DAYS
3 CALCULATE CORN HEAT UNITS
4 CALCULATE DEGREE DAYS
5 24 HOUR QUALITY CONTROL GRAPHS
6 EXECUTE PC WINDROSE
7 WINDCHILL & HUMIDEX CONVERSIONS
8 SELECT DATA & INVOKE GRAPHING/STATISTICAL PRG
9 SOIL TEMPERATURE PROFILES
0 VERTICAL PROFILES
E EDIT PROGRAM SET-UP FILES
R RETURN TO ARCHIVE MAIN MENU
Q QUIT TO DOS
```

Press first number of menu choice, or highlight and press <Enter>

1) FOREST NURSERY DEGREE DAYS - GROWING DEGREE DAY CALCULATION WITH START UP CONDITIONS (ASCII TEXT FILE OUTPUT ONLY)
2) CALCULATE HEATING/COOLING DAYS - HEATING AND COOLING DEGREE DAYS (ASCII TEXT FILE OUTPUT ONLY)
3) CALCULATE CORN HEAT UNITS - (ASCII TEXT FILE OUTPUT ONLY)
4) CALCULATE DEGREE DAYS - (ASCII TEXT FILE OUTPUT ONLY)
5) 24 HOUR QUALITY CONTROL GRAPHS - GRAPHS OF THE LAST 24 HOURS OF DATA
6) PC WINDROSE - PROGRAM TO DISPLAY DATA RELATED TO WIND DIRECTION SEE USER MANUAL OF PC WINDROSE FOR FURTHER DETAILS
7) WINDCHILL & HUMIDEX CONVERSIONS - CALCULATIONS OF WINDCHILL AND HUMIDEX (ASCII TEXT FILE OUTPUT)
8) SELECT DATA AND INVOKE PROGRAM - SELECT OUT YOUR OWN DATA AND THEN RUN YOUR OWN ANALYSIS PROGRAM
9) SOIL TEMPERATURE PROFILES - CREATES A FILE CONTAINING
0) VERTICAL PROFILES - DISPLAYS HOURLY DATA BY TIME,HEIGHT,AND VALUE

E) EDIT PROGRAM SET-UP FILES - EDITS THE FILES CONTAINING THE INFORMATION ON THE DATA TO BE EXTRACTED IN THE ABOVE PROGRAMS AND IN THE CLIMATE FORM

10) BATCH CORRECTION MODE DESCRIPTION



Press first number of menu choice, or highlight and press <Enter>

1) SELECT OUT DATA - COPYING DATA TO ANOTHER FILE
2) CHANGE DATA - MAKING ANY NECESSARY CHANGES TO THE DATA VALUES AND/OR ERROR CODES
3) DELETE DATA - REMOVING DATA BASED ON THE CONTENTS OF ANY FIELDS IN THE ARCHIVE
4) END BATCH AND RUN CORRECTIONS - RUNNING THE BATCH OF PROGRAMS

11) ERROR CODE DEFINED

ERROR CODE "0" NO KNOWN ERROR PRESENT

ERROR CODE "1" SEVERE ERROR DATA UNKNOWN
POSSIBLE SENSOR ERROR OR FAILURE
CHECK SENSOR FOR FAILURE

ERROR CODE "2" DATA OUT OF OPERATIONAL RANGE
SENSOR RANGE CHECK ERROR
CHECK FOR SENSOR FAILURE OR INCORRECTLY IDENTIFIED
SENSOR IN DATA PROCESS CONTROL FILE (SEE OPERATOR
MENU)

ERROR CODE "3" SEASONAL RANGE EXCEEDED
SEASONAL RANGE CHECK ERROR
CHECK FOR RANGES BEING TOO NARROW, SENSOR FAILURE,
OR INCORRECTLY IDENTIFIED (SENSOR,OBSERVATION
CODE,OR DERIVED FIELD) IN DATA PROCESS CONTROL FILE

ERROR CODE "4" VERTICAL DIFFERENCE TO GREAT
VERTICAL RANGE CHECK ERROR
CHECK FOR RANGES BEING TOO NARROW, INCORRECTLY
IDENTIFIED HEIGHTS IN DATA PROCESS CONTROL FILE OR
HEIGHTS FILE, OR SENSOR FAILURE

ERROR CODE "5" HORIZONTAL DIFFERENCE TO GREAT
HORIZONTAL RANGE CHECK ERROR
CHECK FOR RANGES BEING TOO NARROW, INCORRECTLY
IDENTIFIED LOCATION IN STATION FILE,
OR SENSOR FAILURE

ERROR CODE "6" TO GREAT A CHANGE OVER TIME
TIME RANGE CHECK ERROR
CHECK FOR RANGES BEING TOO NARROW, OR
SENSOR FAILURE

ERROR CODE "E" ESTIMATED VALUE REPLACED BAD DATA

12)ESSENTIAL FILES LIST

ILE NAME	PURPOSE
..ES_OPS.PRG	menu for operator control set-up and corrections
AES_OUT.PRG	graphics main menu
ES_SYS.DBF	contains a list of files in aes_sys
ES_SYS.PRG	main menu
ARCHIVE.DBF	contains the permanent archive climate data
RR.NDX	indexed on time code
RR_DEF.DBF	contains the array code definitions
ARR_DEF.FMT	form for editing the file
ARR_DEF.MDX	main index for arr_def.dbf
RY.NDX	indexed on station id and array code
UTO.PRG	automatic archive program for use in a batch file execution
BACK_RES.PRG	back up and restore archive
CANOPY.PRG	canopy effect calculation
CHANGE.PRG	menu for changing data
CLOCK.PRG	advances time 1 hour
CORNHEAT.DBF	structured output file for cornheat.prg
CORNHEAT.PRG	calculates corn heat units
CORRECT.DBF	automatic archive data correction control parameters file
DATE_ENT.PRG	menu for the start and end dates wanted
DEGDAYS.DBF	structured output file for degdays.prg
DEGDAYS.PRG	calculates degree days
DELETE.PRG	menu for deleting data
DERIVED.DBF	contains the derived code definitions
DERIVED.FMT	form for editing the file
DERIVED.MDX	main index for derived.dbf
DISTANCE.PRG	calculates the distance and bearing between 2 points
DTOJ.PRG	date to julian conversion
ERRFORM.FRG	error data report form
ERRFORM.PRF	error data report form printer commands
ERRPGM.DBF	contains error code definitions
ERRPGM.MDX	main index for errpgm.dbf
ERR_COR.PRG	batch operator corrections menu
ERR_ENT.PRG	gets the error code value to be changed to
ERR_RPT.PRG	error data report
EXTDAT.DBF	set-up file
EXTPLOT.PRG	extracts data into a text file with time conversion optional
EXTPLOT1.PRG	extracts data into a text file with time conversion
EXTRACT1.PRG	extracts data for GRAPH4 **input necessary**
EXTROSE.PRG	extracts data for windrose.exe
FILEPROC.PRG	performs all I/O on the archive format files
FILE_EN1.PRG	file entry screen for entering bbs path
FILE_EN2.PRG	file entry screen for entering data logger path and file
FILE_EN3.PRG	file entry screen for a path and file name
FILE_ENT.PRG	menu for the output file name
FNDSTRT.PRG	finds the starting record position for a given time
FORFORMS.DBF	set-up file
FORM1.FRG	print form file
FORM1.PRF	print form file
FORSURF.DBF	file containing interpolated point data

FORSURF1.DBF file containing extracted data
GDEG.PRG calculates growing degree days
GETCHANG.PRG gets the change to archive required
GETFILE.PRG gets the allowable file names not protected in aes_sys.dbf
GRAFSU.TXT set-up for graph4
GRAPH4.EXE fortran program to graph temps,rh,precip,rad,batt,wind
GROWING.DBF structured output file for gdeg
HEATCOOL.PRG calculates heating/cooling degrees
HEATING.DBF structured output file for heatcool
HEIGHT.DBF contains the height code definitions
HEIGHT.FMT form for editing file
HEIGHT.MDX main index for height.dbf
HORZDIFA.PRG horizontal quality control for temporary archive
HORZDIFB.PRG horizontal quality control for permanent archive
HOR_ARC.DBF sorted file for horizontal comparisons
HOR_COMP.PRG compares the stations to one station
HOR_WT.PRG computes the weights of each station from one station
INTERC.DBF intermediate file used for processing data
INTERMIT.DBF intermediate file used for processing data
INTERPOL.PRG prg to interpolate between soil temp gauges and output data
INTERPSU.DBF set_up for interpol
LAST24.DBF contains the last 24 hours of data necessary for graph4.exe
MISSFILE.DBF stored contents of identified missing arrays
MISSFORM.FRG missing data form
MISSFORM.PRF printer control data
MISSING.DBF stores what data arrays where found
MISSING.PRG finds missing arrays of data in the archive
NODUP.PRG eliminates duplicate data in the input file before processing
OBSPGM.DBF contains the observation code definition
OBSPGM.FMT form for editing file
OBSPGM.MDX main index for obspgm.dbf
OPER_CON.DBF storage file containing control data
OUTFORM1.PRG creates file form1.dbf giving daily max,min for desired days
PERIOD.NDX indexed on period observed
PROD1AA.PRG generates data for the aes climate form
PROD1AB.PRG break up climate form data into monthly blocks and prints it
PROD1C.PRG determines max. and min for climate day (uses form1)
PUBCOLOR.PRG colour of display parameters defined
PUBCONT.PRG process control parameters defined
PUBFILE.PRG file control parameters defined
PUBINIT.PRG loop control parameters defined
PUBPOPUP.PRG menu popup parameters defined
QUAL1A.PRG takes the input data and puts it into the archive format
QUAL1AA.PRG takes the input data and puts it into the archive format
QUAL1B.PRG quality control with a user named file (data logger format)
QUAL2A.PRG sets the relations between files and the temporary archive
QUAL2B.PRG same as qual2a except using a sorted archive file
QUAL2C.PRG same as qual2a except using the archive file
QUAL3A.PRG quality control programs on a temporary data file
QUAL3B.PRG quality control programs on the archive file
RD_COR.PRG reads control parameters
RESTVAL.PRG automatic archive data correction
ROSESU.DBF set-up for extrose

SELEC.PRG	menu for selecting out data
~ENSOR.DBF	contains the sensor code definitions
ENSOR.FMT	form for editing
ENSOR.MDX	main index for sensor.dbf
SEN_DATA.PRG	gets the information in the sensor.dbf file
EN_MAKE.NDX	indexed on sensor code and make code
TA_CONT.DBF	contains structure info for archive gen
STA_FORM.DBF	used for climate form generation
TA_ID.DBF	contains the station code definitions
TA_ID.FMT	form for editing file
STA_ID.MDX	main index for sta_id.dbf
STORFIL.DBF	contains names of output files
EMP24.DBF	contains all of the last 24 hours of data
EMPDA.DBF	intermediate file for data conversion of logger data
TEMPDATA.DBF	intermediate file for data conversion of bbs data
EMPROSE.DBF	contains output data
EST0001.DBF	test file for path validity
TIME_ENT.PRG	input menu for the start and end times
TMP00001.DBF	temporary sort file on year,day,time,table id, and file name
TOEDIT.PRG	editor used for editing set-up files
TOEDITSC.PRG	editor used for editing sta_cont file
TOEDSU.DBF	set-up for toedit (cannot edit using toedit!)
VALU_ENT.PRG	input menu for the range of data values
VAL_ENT.PRG	gets the value to be changed to
VERTDIFA.PRG	vertical quality control of the temporary archive
VERTDIFB.PRG	vertical quality control of the archive
VERTEMP.DBF	storage of processing error check data
VERTGRAF.EXE	vertical display of data over time
VERTIC.DBF	data file with vertical data
VERTPROF.PRG	extracts and sorts data vertically
VERTSU.DBF	data file with the data parameters to use in program
VSORT.DBF	storage of data sorted vertically
WINDROSE.EXE	creates a wind rose with directional data
WRT_COR.PRG	writes the control parameters for the processing of data

13) EXAMPLE OF INPUT DATA RECORD FORMAT FROM THE DATALOGGER AND POSITION OF FIELDS IN THE DATA CONTROL FILE

CCAD BASE CLIMATE STATION NOV 24,1992

168 - AES CLIMATE DATA 0800 AND 1600 EST

ORIG_POS IN DATA CONTROL FILE	ORIGINAL POSITION IN DATA	FIELD NAME
0	01:	TABLE ID - 0168
0	02:	Station ID(2222) = LOGGER_ID IN CONTROL FILE
0	03:	Array ID(168) = TABLE_ID IN CONTROL FILE
1	04:	Year
2	05:	Julian Day
3	06:	Time(HH:MM)
4	07:	2-Min. Sample air temp. 1.5m
5	08:	Max. Temp. 1.5m
6	09:	Min. Temp. 1.5m
7	10:	2-Min. Sample Soil Temp. 5 cm
8	11:	" Sample Soil Temp. 10cm
9	12:	" Sample Soil Temp. 20cm
10	13:	" Sample Soil Temp. 50cm
11	14:	" Sample Soil Temp. 100cm
12	15:	Precipitation mm

14) EXAMPLE OF INPUT DATA RECORD FORMAT FROM BBS
AND POSITION OF FIELDS IN THE DATA CONTROL FILE

CCAD BASE CLIMATE STATION NOV 24,1992

BA = FILE_NAME IN CONTROL FILE
168= TABLE_ID IN CONTROL FILE

ORIGINAL POSITION IN DATALOGGER FILE	FLD_POS IN DATA CONTROL AND BBS FILES	FIELD NAME	
4	1	Year	
5	2	Julian Day	
6	3	Time	
8	4	Max Air Temp	1.5m
9	5	Min Air Temp	1.5m
7	6	2-min. Sample Air Temp	1.5m
10	7	" Sample Soil Temp	5cm
11	8	" Sample Soil Temp	10cm
12	9	" Sample Soil Temp	20cm
13	10	" Sample Soil Temp	50cm
14	11	" Sample Soil Temp	100cm
15	12	Precipitation mm	

15) HOW TO IDENTIFY THE DATA USING EXAMPLES IN SECTION 13 AND 14

To Identify the observation codes one only has to look at the data structure to see that the data is observed as a maximum, minimum, 2-minute, and total(precipitation) for the time periods of 0800 and 1600. i.e. twice daily observations.

The identification of the sensor codes can be seen from the example that there is the following sensors, air temperature, soil temperature, and precipitation. The instrument make of these sensors is not shown so no make code can be assigned at present.

The identification of the array codes is assigned by you to this data record and the period of observation must match the period of observation in the observation codes. The TABLE_ID is directly linked to the array code in the data control file.

The identification of the height codes easily identified from the data as being at the heights 100cm, 50cm, 20cm, 10cm, 5cm, and 1.5m.

The station code is assigned by you and the related information of file_name and logger_id is linked to this code in the data control file.