CLIMATE DATA INFORMATION SYSTEM

Version 1.0

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Climate Data Information System

The climate information data system is a data retrieval system based on queries for dates and for climate stations. The system operates using a Paradox relational database engine and is application-driven. Following is description of the system, including an introduction to all related objects.

1. Data capture

This is the origin of the information as obtained by the climate data loggers. These loggers are driven by software developed by Lakewood, the manufacturer of the data loggers. The daily information on temperature and precipitation is stored from the loggers in a binary 'raw' file until such time when the climate technician collects the information.

2. Data collection

The data retrieval from the loggers is performed 3 to 4 times annually. At this time the technician transfers the binary 'raw' files from the logger to a laptop, and proceeds to convert these files to ASCII format. A sample of this information is shown in figure 1. A file for each station and for each month is produced by the logger, with each file approximately 5K in size.

```
"DATALOGGER #:", 2
"DESCRIPTION :","110011      "
"File Type   :","HeadSkipstrblastrec"
"SAMPLE RATE :","00:00:00"
"PRECISION   :","-DOUBLE-Maximum"
"LAST RECORDING:","MM/DD/YY","HH:MM:SS"
"DATE     ","TIME     ","ANALOG 1","ANALOG 2","ANALOG 5",
"MM/DD/YY","HH:MM:SS","LE8397A ","LE8397A ","LE8412  ",
"        ","        ","C       ","C       ","mm      ",
"03/15/92","06:00:00",  17.1811,  17.1811,  36.2285
"03/16/92","06:00:00",  17.7168,  17.7460,  36.5128
"03/17/92","06:00:00",   9.4076,   9.4309,  37.6242
"03/18/92","06:00:00",   7.1377,   7.1599,  37.0785
"03/19/92","06:00:00",   8.4892,   8.5233,  37.0785
"03/20/92","06:00:00",  12.6130,  12.5877,  37.6242
"03/21/92","06:00:00",   4.7460,   4.7460,  37.9071
"03/22/92","06:00:00",  10.5680,  10.5680,  37.6242
"03/23/92","06:00:00",  15.1583,  15.2054,  37.6242
"03/24/92","06:00:00",  14.6402,  14.6599,  39.1942
"03/25/92","06:00:00",   7.2491,   7.2714,  37.9071
"03/26/92","06:00:00",  14.9890,  15.0160,  38.8885
"03/27/92","06:00:00",  18.4025,  18.4323,  37.6242

"DATALOGGER #:", 2
"DESCRIPTION :","110011      "
"File Type   :","HeadSkipstrblastrec"
"SAMPLE RATE :","00:00:00"
"PRECISION   :","-DOUBLE-Minimum"
"LAST RECORDING:","MM/DD/YY","HH:MM:SS"
"DATE     ","TIME     ","ANALOG 1","ANALOG 2","ANALOG 5",
"MM/DD/YY","HH:MM:SS","LE8397A ","LE8397A ","LE8412  ",
"        ","        ","C       ","C       ","mm      ",
"03/14/92","18:00:00",  -3.1171,  -3.1313,  36.0985
"03/15/92","18:00:00",   0.7169,   0.7169,  35.7714
"03/16/92","18:00:00",   0.9146,   0.9296,  35.7714
"03/17/92","18:00:00",  -1.9700,  -1.9700,  35.7714
"03/18/92","18:00:00",  -0.0101,  -0.0101,  36.7300
"03/19/92","18:00:00",  -5.2741,  -5.2835,  36.7300
"03/20/92","18:00:00",   0.3377,   0.3377,  36.7300
"03/21/92","18:00:00",  -6.8132,  -6.8132,  36.8171
"03/22/92","18:00:00",  -4.0369,  -4.0556,  36.9271
"03/23/92","18:00:00",  -4.8383,  -4.8569,  36.0985
"03/24/92","18:00:00",  -2.5309,  -2.5309,  36.7300
"03/25/92","18:00:00",  -5.5008,  -5.5193,  36.4685
"03/26/92","18:00:00",  -2.4408,  -2.4315,  36.8614
"03/27/92","18:00:00",   1.5866,   1.5866,  35.8143
```

Figure 1. Logger file containing maximum temperature information (file 00107092.max) and minimum temperature information (file 00107092.min).

3. Data edits 1

The ASCII files for each station are transferred from the laptop computer to desktop computer at the main office. Each file is loaded into the DOS editor for review. Manual changes are made where necessary, most often to precipitation values at time of station reset, and to temperatures whenever erroneous values are evident.

4. Data edits 2

Following manual adjustments, a file restructuring must be performed to ensure that the appropriate number and sequencing of fields is in order. The removal of the files' header information and the merging of all files into one properly formatted ASCII file called **logger.dat** also occurs at this stage (figure 2). The program that performs these tasks is **logfiles.exe** and it runs under the batch program **climupdt.bat** (appendix 1).

5. Database import

The ASCII file **logger.dat** is converted to a paradox table object within the climate data information system application program. This program is accessed by running the paradox runtime module; **pdoxrun** followed by the application **climate**. From the menu system choose the IMPORT/EXPORT routine, and the IMPORT ASCII DATA submenu. The script **cimport.sc** is enacted to perform the import. The script also proceeds to assign field names to the 8 comma delimited ASCII fields. Records which are problematic are extracted and placed into a temporary table called PROBLEMS. These records must be adjusted and consequently placed into the newly created table called CLIMATE (figure 3). The table CLIMATE is backed up with another table called CLIMNEW; this is the working table.

```
"03/15/92",  17.1811,  -3.1171,,,  36.2285,,001
"03/16/92",  17.7168,   0.7169,,,  36.5128,,001
"03/17/92",   9.4076,   0.9146,,,  37.6242,,001
"03/18/92",   7.1377,  -1.9700,,,  37.0785,,001
"03/19/92",   8.4892,  -0.0101,,,  37.0785,,001
"03/20/92",  12.6130,  -5.2741,,,  37.6242,,001
"03/21/92",   4.7460,   0.3377,,,  37.9071,,001
"03/22/92",  10.5680,  -6.8132,,,  37.6242,,001
"03/23/92",  15.1583,  -4.0369,,,  37.6242,,001
"03/24/92",  14.6402,  -4.8383,,,  39.1942,,001
"03/25/92",   7.2491,  -2.5309,,,  37.9071,,001
"03/26/92",  14.9890,  -5.5008,,,  38.8885,,001
"03/27/92",  18.4025,  -2.4408,,,  37.6242,,001
"03/28/92",  19.7252,   1.5866,,,  38.2342,,001
"03/29/92",   7.7018,  -1.1745,,,  37.6242,,001
"03/30/92",  12.1479,  -5.2741,,,  37.0785,,001
"03/31/92",  12.6445,  -5.6486,,,  37.9514,,001
"04/01/92",  11.8676,  -6.9644,,,  37.4285,,001
"04/02/92",  18.7244,   0.7564,,,  37.6242,,001
"04/03/92",  24.3576,   3.1113,,,  37.0785,,001
"04/04/92",  23.6174,   4.7142,,,  38.8014,,001
```

Figure 2. The ASCII comma delimited structured file (logger.dat) containing merged information from the files 00107092.max and 00107092.min.

6. Climate - Climnew table edit

The table CLIMATE is reviewed for inconsistencies before its incorporation to the master database. This function is performed by accessing the menu choice EDIT and the submenu ORIGINAL DATA. The system is placed into edit mode to accommodate any changes. Pressing F2 saves the changes and returns the system to normal mode.

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Date	Maxtemp	Mintemp	Soil_5	Soil_50	Precip	Comments	Id
15-Mar-92	17	-3		36			1
16-Mar-92	18	1		37			1
17-Mar-92	9	1		38			1
18-Mar-92	7	-2		37			1
19-Mar-92	8	-0		37			1
20-Mar-92	13	-5		38			1
21-Mar-92	5	0		38			1
22-Mar-92	11	-7		38			1
23-Mar-92	15	-4		38			1
24-Mar-92	15	-5		39			1
25-Mar-92	7	-3		38			1
26-Mar-92	15	-6		39			1
27-Mar-92	18	-2		38			1
28-Mar-92	20	2		38			1
29-Mar-92	8	-1		38			1
30-Mar-92	12	-5		37			1
31-Mar-92	13	-6		38			1
1-Apr-92	12	-7		37			1
2-Apr-92	19	1		38			1
3-Apr-92	24	3		37			1
4-Apr-92	24	5		39			1

Figure 3. A sample of the Paradox table CLIMATE. Note that the precipitation values have yet to be adjusted.

7. Precipitation Adjustments

The precipitation field for the table CLIMNEW (figure 4) is modified to address three items: events whereby a negative value for precipitation occurred, adjustment to reflect daily precipitation events rather than accumulating values, and adjustments to precipitation values for those stations equipped with tipping buckets. These tasks are performed by accessing the menu choice PROCESS and the submenu choice PRECIPITATION SMOOTHING FUNCTION, which in turn executes the script **cdiff.sc**.

8. Climnew table edit

The table CLIMNEW, with adjusted precipitation, is reviewed for any inconsistencies. This function is performed by accessing the menu choice EDIT and the submenu PROCESSED DATA. The system is placed into edit mode to accommodate any changes. Pressing F2 will save the changes made and return the system back to normal mode.

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Date	Maxtemp	Mintemp	Soil_5	Soil_50	Precip	Comments	Id
15-Mar-92	17	-3			0		1
16-Mar-92	18	1			1		1
17-Mar-92	9	1			0		1
18-Mar-92	7	-2			0		1
19-Mar-92	8	-0			1		1
20-Mar-92	13	-5			0		1
21-Mar-92	5	0			0		1
22-Mar-92	11	-7			0		1
23-Mar-92	15	-4			2		1
24-Mar-92	15	-5			0		1
25-Mar-92	7	-3			1		1
26-Mar-92	15	-6			0		1
27-Mar-92	18	-2			1		1
28-Mar-92	20	2			0		1
29-Mar-92	8	-1			0		1
30-Mar-92	12	-5			1		1
31-Mar-92	13	-6			0		1
1-Apr-92	12	-7			0		1
2-Apr-92	19	1			0		1
3-Apr-92	24	3			2		1
4-Apr-92	24	5			0		1

Figure 4. A sample of the Paradox table CLIMNEW. Note the adjusted precipitation values.

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Station: SEVEN PERSONS PGR.
Elevation: 779
NTS Map Location: 72E15
Legal Description: SW-03-012-07-W4
Latitude: 49:53
Longitude: 110:53

Date	Maxtemp	Mintemp	Soil_5	Soil_50	Precip	Comments
24.03.92	14.6	-4.8			0.0	
25.03.92	7.2	-2.5			1.0	
26.03.92	15.0	-5.5			0.0	
27.03.92	18.4	-2.4			.6	
28.03.92	19.7	1.6			0.0	
29.03.92	7.7	-1.2			0.0	
30.03.92	12.1	-5.3			.9	
31.03.92	12.6	-5.6			0.0	
1.04.92	11.9	-7.0			.2	
2.04.92	18.7	.8			0.0	
3.04.92	24.3	3.1			1.7	
4.04.92	23.6	4.7			0.0	

Climate Station Summary: SEVEN PERSONS PGR.

Average Maximum Air Temperature: 15.5 Precipitation for the period: 4
Average Minimum Air Temperature: -2.0 Average Soil Temp. at 50 cm.:
Absolute Maximum Air Temperature: 24.3 Average Soil Temp. at 05 cm.:
Absolute Minimum Air Temperature: -7.0 Air Temperature Range: 31.3
Average Air Temperature: 6.7

Figure 5. A sample of a daily event report.

9. New records append

Records from the table CLIMNEW are appended to the master table CLIMARCH. Table CLIMNEW contains processed records from the most recent field outing, while table CLIMARCH contains all records from previous field outings. This function is performed by choosing the menu choice IMPORT/EXPORT and the submenu ADD TO DATABASE. The script executed, **cadd.sc**, not only appends the records but also checks for duplication.

10. Data retrieval 1

Obtaining climate data is performed in two distinct steps. First, the master table CLIMARCH must be queried; this query is performed for two parameters: date and station. Once the query is performed the data can be later obtained in a report format. The menu choice EXTRACT and the submenu choice CLIMATE QUERY enable you to enter the dates and the station id(s). Station ids are available on screen by pressing pageup or pagedown; this information is stored in the table CLIMSTN (figure 7). The results of the query are placed in a temporary table named ANSWER and also copied to two tables named CLIMATE1 and CLIMATE2. From the table ANSWER two types of reports are compiled, a daily and a monthly report (figures 5 and 6). The reports are accessed by the menu choice REPORT and the submenu choices DAILY REPORT and MONTHLY REPORT. An optional choice to send the report to the SCREEN or the PRINTER is also available.

11. Data retrieval 2

Following an EXTRACT and CLIMATE QUERY procedure, the table produced (CLIMATE1) can also be exported to other file formats, namely, Lotus 1-2-3 .wk1, Quattro .wq1, dBase .dbf, and ASCII comma delimited .asc. This procedure is performed by the menu choice IMPORT/EXPORT and submenu EXPORT DATA; the script procedure is named **cexport.sc**. The user is prompted for a file name and asked to choose the export file format. The file produced is stored in the active directory.

12. Data distribution

Data distribution and archiving is performed in three locations: R.I.D. office in Edmonton, the Southern regional office in Lethbridge, and the Northeast regional office in St.Paul. The data is sent to the regional offices in a diskette(s) containing the file **climnew.db**, this file is copied to the directory \pdoxrun. The routine described in part 9 is then executed. Archived information at the Edmonton office includes copies of the individual edited logger station files as depicted in figure 1, and backups of the master climate database table CLIMARCH.

21-Sep-93 Climate Monthly Summaries Page 1

Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip. Monthly	Average Temp.	Station Name	No. of Days
4/92	15.1	.1	19	7.6	SEVEN PERSONS PGR.	30
5/92	19.4	5.4	23	12.4	SEVEN PERSONS PGR.	31
6/92	23.2	10.7	88	17.0	SEVEN PERSONS PGR.	30

Figure 6. A sample of a monthly summary report.

13. Program Execution

The active directory for all the climate information is **\pdoxrun**. This directory will contain ASCII file (*.dat), the database files (*.db), the reporting files (*.r*), form files (*.f*), script files (*.sc), and library files (*.lib). In addition, the directory contains the program files for the Paradox Runtime Module. The runtime programs provide the database engine for the Climate Data Information System. The executable ASCII restructuring program, **logfiles.exe**, is also contained in this directory; it is enacted by the batch file, **climupdt.bat**. The batch file also runs a windowing runtime module, **flrun.exe**, which in turn executes the windows contained in **logger.win**.

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Id	Name	Legal	Latitude	Longitude	Elevation	NTS
1	SEVEN PERSONS PGR.	SW-03-012-07-W4	49:53	110:53	779	72E15
2	BOW ISLAND PGR.	SW-19-012-11-W4	50:00	111:13	771	72L04
3	HAYS PGR.	NW-15-013-13-W4	50:05	111:42	774	72L04
4	RED ROCK COULEE	NW-14-008-07-W4	49:34	110.52	968	72E10
5	PINHORN PGR.	SW-29-002-07-W4	49:04	110:55	930	72E02
6	MANY ISLAND LAKE CS.	SE-18-013-01-W4	50:05	110:07	730	72L01
7	SCHULER CS.	NE-16-017-02-W4	50:26	110:13	800	72L08
8	WALDRON GL.	SE-07-010-01-W5	49:48	114:07	1280	82G16
9	GARDINER	NE-32-015-02-W5	50:18	114:14	1285	82J08
10	O.H. RANCH	NE-33-018-03-W5	50:34	114:21	1265	82J09
11	ANTELOPE CREEK	SE-08-019-16-W4	50:36	112:11	770	82J09
12	BLUEFIELD	NW-20-006-02-W4	49:29	110:15	1190	72E08
13	CRESSDAY	SW-05-004-02-W4	49:16	110:15	990	72E08
14	RAINY HILLS	SE-04-018-09-W4	50:29	111:11	770	72L06
15	BAD LAND	SE-23-012-13-W4	50:01	111:41	745	72L04
16	CONRAD	NW-20-003-18-W4	49:14	112:24	1260	82H01
17	LOMOND	SW-18-018-19-W4	50:31	112:37	905	82J10
101	BODO	NE-29-36-1-W4	52:07	110:06	695	73D01
102	CADOGAN SOUTH	SW-6-38-3-W4	52:14	110:26	685	73D01
103	PEEING HORSE LAKE	NE-10-39-2-W4	52:21	110:12	665	73D08
104	RIBSTONE CREEK	SE-29-41-5-W4	52:33	110:41	680	73D10
105	EDGERTON SUOUTH	NW-7-42-3-W4	52:37	110:26	650	73D9
106	RIVERCOURSE SOUTH	NE-11-45-1-W4	52:52	110:02	580	73D16
107	FABYAN/BATTLE	NE-11-45-8-W4	52:52	110:03	685	73D14
108	JARROW	SD13-11-46-10-W4	52:58	111:20	740	73D14
109	GRIZZLY BEAR CREEK	SE29-48-5-W4	53:10	110:42	610	73E2
110	LAC TREMBLE	SD3-29-52-4-W4	53:31	110:34	610	73E10
111	MANNVILLE NORTH	SD12-29-52-9-W4	53:31	110:18	680	73E11
112	TULLIBY LAKE G.A.	SE11-56-1-W4	53:49	110:02	655	73E16
113	BELLEVUE LAKE	SD4-18-56-9-W4	53:50	111:20	665	73E14
114	MOOSE HILLS	SD4-29-58-6-W4	54:02	110:52	625	73L02
115	BANGS LAKE VALLEY	SD4-11-59-7-W4	54:05	110:57	640	73L02
116	SMOKY LAKE G.A.	SD2-15-59-3-W4	54:06	110:22	635	73L01
117	EDWAND CREEK	E35-60-15-W4	54:14	112:08	700	83I01
118	CLEAR HILLS G.A.	SW6-61-11-W4	54:14	112:24	640	83I01
119	BOYNE LAKE	SE29-61-11-W4	54:18	111:37	655	73L05
120	CHERRY GROVE	SD15-27-61-1-W4	54:19	110:04	550	73L08
121	LUCKY LAKE G.A.	NW25-62-18-W4	54:24	112:35	695	83I07
122	RICH LAKE	SD4-1-64-12-W4	54:30	111:42	610	73L12
123	FRENCHMAN LAKE	SD12-8-64-10-W4	54:31	111:29	610	73L11
124	JACKFISH CREEK	SD2-17-64-5-W4	54:32	111:43	570	73L10
125	OLYMPIC LAKE	SE32-64-14-W4	54:39	112:04	595	83I09
126	MARGUERITE LAKE	SD12-35-64-6-W4	54:35	110:49	640	73L10

Figure 7. The Paradox table CLIMSTN contains details on the climate stations.

The two DOS level commands to run the programs are:
\PDOXRUN\CLIMUPDT
and
\PDOXRUN**PDOXRUN CLIMATE**

The first sequence will run the logger ASCII file restructuring program, while the second runs the climate application software.

2. Climate Data Information System - Process Chart

STEPS IN CLIMATE DATA INFORMATION SYSTEM

Process	Description	Tools/Software	Responsibility
1. Data Capture	Loggers record "climate" data, the daily information is stored in a binary data file	Lakewood data loggers and associated software	
2. Data Collection	Performed 3-4 times annually. Technician transfers binary files to laptop PC. Converts to ASCII and reviews data.	Laptop PC/Lakewood software	Ryan Eade/ Back-up Arlo Stade
3. Data Edits 1	From laptop climate files are transferred to desktop (one file per month per station) ASCII files are reviewed and preliminary edits are performed, i.e. removing improbable values of temperature and precipitation.	Laptop PC, Desktop PC/DOS back-up utility Desktop PC/DOS Editor	Ryan Eade Ryan Eade
4. Data Edits 2	All files are merged and restructured into one ASCII file called LOGGER.DAT. LOGGER.DAT file is visually checked for any problems with the data formats.	Desktop PC/in-house developed software, CLIMUPDT.BAT Desktop PC/DOS Editor	Ryan Eade Ryan Eade
5. Database Import	LOGGER.DAT ASCII file is imported to the PARADOX table CLIMATE. The 8 ASCII fields associated with LOGGER.DAT are assigned field names: DATE, MAXTEMP, MINTEMP, SOIL_5, SOIL_50, PRECIP, COMMENTS, ID	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ↓ Ryan Eade
6. Climate Table Edit	Climate table is viewed and adjusted wherever inconsistencies occur.	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ↓ Ryan Eade
7. Precipitation Adjustments	Precipitation data for climate table is smoothed and adjusted to reflect daily values. New table is created to contain adjusted values (CLIMNEW)	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ↓ Ryan Eade

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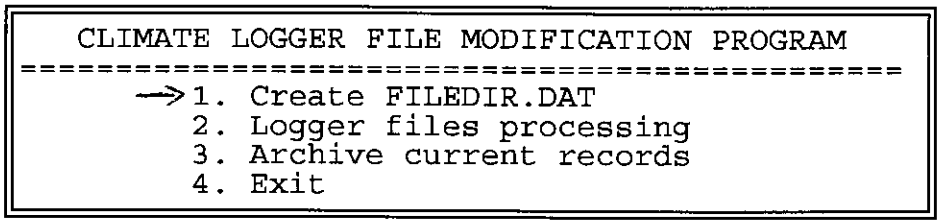
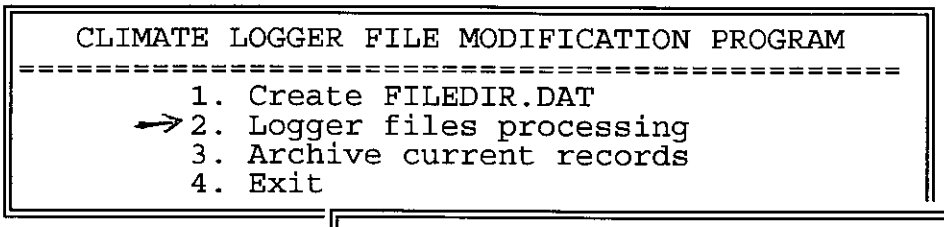
Process	Description	Tools/Software	Responsibility
8. CLIMNEW Table Edit	Table CLIMNEW is reviewed for any precipitation anomalies.	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ⇓ Ryan Eade
9. New Records Append	Records in table CLIMNEW are appended to the master archived climate database, table CLIMARCH.	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ⇓ Ryan Eade
10. Data Retrieval	Queries to the database can be performed by date and station ID. Queries use a relational process between tables CLIMARCH (climate records database) and CLIMSTN (climate station database).	Desktop PC/Paradox runtime module - running developed code (climate data management system)	Livio Fent ⇓ Ryan Eade Northeast Region Southern Region
11. Data Distribution	Table CLIMNEW (current climate records) will be sent to Lethbridge and St. Paul for updating of the local systems. The local systems will facilitate DATA RETRIEVAL (as in #10) and data inclusion from the distributed CLIMNEW tables.	Desktop PC/DOS Utilities/Paradox climate application code Desktop PC/Paradox climate application code	Livio Fent ⇓ Ryan Eade Regions
13. Provincial Data Depository	Climate data is updated and archived within the NRIS program. Data is accessed for special requests or projects.	Unavailable	Unavailable

3. Program code for LOGFILES.BAS



This menu choice produces a file containing a listing of the all the current station files. A typical station number file would be 13003072.MAX and 13003072.MIN. The MIN and MAX extensions are truncated for processing purposes.



This menu choice is the main file processing routine. FILEDIR.DAT is accessed to obtain the names of the files which require modification. The individual files are loaded into memory and each record is modified to conform to a structured format. The DATE, MAXTEMP, SOIL_5, SOIL_50 and PRECIP fields are derived from the .MAX file while the MINTEMP field is derived from the .MIN file. This information for each of the files is then compiled into a master file called LOGGER.DAT.

```
'LOGGER FILE MODIFICATION AND DATABASE CREATION PROGRAM

'**** Main Program ****

DECLARE SUB filedirect (f$(), check$())
DECLARE SUB procloggerfile (recordmax$(), recordmin$(), c$(), cc$(), recordlengt
DECLARE SUB archive ()

DIM f$(200)
DIM check$(10)
DIM recordmax$(500)
DIM recordmin$(500)
DIM c$(300)
DIM cc$(300)
DIM recordlengthmax(300)
DIM recordlengthmin(300)
DIM fileid$(500)
DIM fileidtemp$(500)


initiate:

CLS
OPEN "con" FOR RANDOM AS #1

PRINT #1, "~E=ALL/";
PRINT #1, "~L=logger/";
PRINT #1, "~W=climate/";



LINE INPUT choice$
PRINT #1, "~C=ALL/"

CLOSE #1

SELECT CASE choice$

        CASE "1"
                CALL filedirect(f$(), check$())
        CASE "2"
                CALL procloggerfile(recordmax$(), recordmin$(), c$(), cc$(), rec
        CASE "3"
                CALL archive
        CASE "4"
                CLS : END
END SELECT

GOTO initiate


SUB archive

        CLS
        LOCATE 10, 15
        PRINT "Archiving current climate records in file CLMTARCH.DAT"
        SHELL "copy clmtarch.dat + logger.dat"

END SUB

SUB filedirect (f$(), check$())

CLS
LOCATE 10, 25
PRINT "Erasing old FILEDIR.DAT (if it exists)"
SHELL "erase filedir.dat"
```

```
FOR t = 1 TO 10000
NEXT t

CLS
LOCATE 10, 15
PRINT "Sorting and writing directory listing in filedir.dat"
SHELL "dir /on /a:-d /b *.max > filedir.dat"
FOR t = 1 TO 10000
NEXT t


OPEN "filedir.dat" FOR INPUT AS #1

i = 0

DO WHILE NOT EOF(1)
        i = i + 1
        LINE INPUT #1, f$(i)
LOOP

CLOSE #1

CLS
LOCATE 10, 25
PRINT "Checking for non-valid file number types"

FOR x = 1 TO i
        FOR j = 1 TO 8
                check$(j) = (MID$(f$(x), j, 1))
                IF check$(j) < CHR$(47) OR check$(j) > CHR$(57) THEN f$(x) = CHR
        NEXT j
NEXT x
FOR t = 1 TO 10000
NEXT t

SHELL "erase filedir.dat"

OPEN "filedir.dat" FOR OUTPUT AS #1

CLS
LOCATE 10, 15
PRINT "Rewriting FILEDIR.DAT file with valid file numbers."

FOR u = 1 TO i
        IF f$(u) <> CHR$(0) THEN PRINT #1, f$(u)
NEXT u
FOR t = 1 TO 10000
NEXT t

CLOSE #1

CLS
LOCATE 10, 20
PRINT "File FILEDIR.DAT is now ready for processing"
FOR t = 1 TO 20000
NEXT t


END SUB

SUB procloggerfile (recordmax$(), recordmin$(), c$(), cc$(), recordlengthmax(),


CLS
LOCATE 10, 20
PRINT "Climate Logger file processing routine"
```

```
LOCATE 15, 20
PRINT "Loading file numbers from filedir.dat.."

OPEN "filedir.dat" FOR INPUT AS #1

        ii = 0
        DO WHILE NOT EOF(1)
                ii = ii + 1
                LINE INPUT #1, fileidtemp$(ii)
        LOOP

CLOSE #1

        FOR jj = 1 TO ii
                fileid$(jj) = LEFT$(fileidtemp$(jj), 8)
        NEXT jj

        ERASE fileidtemp$


LOCATE 15, 20
PRINT "File number loading completed. Press ENTER to continue."; vvv$



FOR jj = 1 TO ii
        CLS
        LOCATE 12, 20
        PRINT "Processing file number:"; fileid$(jj)
        fileidmax$ = fileid$(jj) + ".max"
        fileidmin$ = fileid$(jj) + ".min"
        fileid$(jj) = LTRIM$(fileid$(jj))
        stationid$ = LEFT$(fileid$(jj), 3)



        OPEN fileidmax$ FOR INPUT AS #1



        filecount = filecount + 1
        LOCATE 17, 20
        PRINT " Number of files processed = "; filecount * 2
                i = 0
                DO WHILE NOT EOF(1)
                        i = i + 1
                        LINE INPUT #1, recordmax$(i)
                LOOP

        CLOSE #1



        OPEN fileidmin$ FOR INPUT AS #2


                i = 0
                DO WHILE NOT EOF(2)
                        i = i + 1
                        LINE INPUT #2, recordmin$(i)
                LOOP


        CLOSE #2
```

```
'*********************************************************
'The byte length of the first record (10) is determined
'and stored in variable 'y'.  Variables comma and count
'  e initialized.
   *********************************************************

        y = LEN(recordmax$(10))
        yy = LEN(recordmin$(10))
        comma = 0
        ccomma = 0
        count = 0
        ccount = 0

'*********************************************************
'A FOR NEXT loop is used to analyze how many commas
'are contained in the first record of the file.  The
'number of commas in the first record will indicate
'the number of data attributes the file contains.
'Thus, a file class is determined.  The modification
'of the file records will depend on these classes.
'*********************************************************

        FOR j = 1 TO y
                c$(j) = (MID$(recordmax$(10), j, 1))
                cc$(j) = (MID$(recordmin$(10), j, 1))
                IF c$(j) = CHR$(44) THEN comma = comma + 1
                IF cc$(j) = CHR$(44) THEN ccomma = ccomma + 1
        NEXT j

'*********************************************************
'The length of each record is determined and stored in
'  e array 'recordlength(s)'.
   *********************************************************

        FOR s = 10 TO i
                recordlengthmax(s) = LEN(recordmax$(s))
                recordlengthmin(s) = LEN(recordmin$(s))
        NEXT s


        OPEN "logger.dat" FOR APPEND AS #1

'Class 2 files
'Class 3 files.

'These files contain the following record info:
'DATE, TIME, TEMP
'They are processed as CASE 3 in the SELECT CASE.
'CASE 3 adds 4 commas and appends the station id
'value to each record.  The four commas simulate
'fields for TEMP2, S_TEMP50, S_TEMP5, PRECIP.
'*********************************************************

'Class 4 files.

'These files will contain the following record info.
'DATE, TIME, TEMP, TEMP2, PRECIP
'They are processed as CASE 4 in the SELECT CASE
'CASE 4 splits each record string into two strings,
'  e with DATE, TIME, TEMP, and TEMP2, the other with
'  .ECIP. Three commas are inserted between these two
'strings before they recombined.  The three commas add
'two new fields to each record, the fields would be
'equivalent to the missing soil temp. at 50cm. and soil
'temp at 5cm.
```

```
'*********************************************************

'Class 5 files.

'  ese files contain the following record info:
   TE, TIME, TEMP, TEMP2, S_TEMP50, PRCIP.
'They are processed in CASE 5 of SELECT CASE.
'Processing is similar to class 4 files except that
'only tow commas are inserted between strings.  The commas
'allow for the creation of the soil temp. at 5cm. field.
'*********************************************************

'Class 6 files.

'These files contain completed information for all fields.
'DATE, TIME, TEMP, TEMP2, S_TEMP50, S_TEMP5, PRECIP.
'No string processing is invoked in CASE 6 of SELECT CASE
'*********************************************************

'Class > 6 files.

'These files contain extra fields beyond the PRECIP field.
'The extra information is stripped off by the CASE IS > 6
'of the SELECT CASE.
'*********************************************************
'In all cases each record is appended by the file I.D.,
'Therefore, each record will have the following field
'structure:
'DATA, TIME, TEMP, TEMP2, S_TEMP50, S_TEMP5, PRECIP, ID
'*********************************************************

        SELECT CASE comma
        CASE 2
                FOR k = 10 TO i
                                count = 0
                                counter = 0
                                t = recordlengthmax(k)

                        FOR l = 1 TO t
                                fielddate$ = LEFT$(recordmax$(k), 1)
                                fielddatetmp$ = MID$(recordmax$(k), l, 1)
                                IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                        NEXT l

                        FOR l = 1 TO t
                                fieldtempmax$ = MID$(recordmax$(k), 23, 1)
                                fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                                IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                        NEXT l


                        tt = recordlengthmin(k)
                        ccount = 0
                        FOR ll = 1 TO tt
                                 fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                                 fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                                 IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                                 IF ccount = 3 THEN EXIT FOR
                        NEXT ll

                        ttt = LEN(fielddatetempmin$)
                        cccount = 0
                        FOR nn = 0 TO ttt
                                  fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                                  fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                                  IF fieldtempmintmp$ = CHR$(44) THEN EXIT FOR
```

```
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + "," + fieldt
                PRINT #1, recordmerge$
        NEXT k

CASE 3
        FOR k = 10 TO i
                        count = 0
                        counter = 0
                        t = recordlengthmax(k)

                FOR l = 1 TO t
                        fielddate$ = LEFT$(recordmax$(k), l)
                        fielddatetmp$ = MID$(recordmax$(k), l, 1)
                        IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR l = 1 TO t
                        fieldtempmax$ = MID$(recordmax$(k), 23, l)
                        fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                        IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR n = 1 TO t
                        fieldpreciptmp$ = MID$(recordmax$(k), t - n, 1)
                        IF fieldpreciptmp$ = CHR$(44) THEN EXIT FOR
                        fieldprecip$ = RIGHT$(recordmax$(k), n + 1)
                NEXT n

                tt = recordlengthmin(k)
                ccount = 0
                FOR ll = 1 TO tt
                         fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                         fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                         IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                         IF ccount = 3 THEN EXIT FOR
                NEXT ll

                ttt = LEN(fielddatetempmin$)
                cccount = 0
                FOR nn = 0 TO ttt
                          fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                          fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                          IF fieldtempmintmp$ = CHR$(44) THEN cccount =
                          IF cccount = 2 THEN EXIT FOR
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + fieldtempmin
                PRINT #1, recordmerge$
        NEXT k


CASE 4
        FOR k = 10 TO i
                        count = 0
                        counter = 0
                        t = recordlengthmax(k)

                FOR l = 1 TO t
                        fielddate$ = LEFT$(recordmax$(k), l)
                        fielddatetmp$ = MID$(recordmax$(k), l, 1)
                        IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                NEXT l
```

```
                FOR l = 1 TO t
                        fieldtempmax$ = MID$(recordmax$(k), 23, l)
                        fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                        IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR n = 1 TO t
                        fieldpreciptmp$ = MID$(recordmax$(k), t - n, 1)
                        IF fieldpreciptmp$ = CHR$(44) THEN EXIT FOR
                        fieldprecip$ = RIGHT$(recordmax$(k), n + 1)
                NEXT n

                tt = recordlengthmin(k)
                ccount = 0
                FOR ll = 1 TO tt
                         fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                         fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                         IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                         IF ccount = 3 THEN EXIT FOR
                NEXT ll

                ttt = LEN(fielddatetempmin$)
                cccount = 0
                FOR nn = 0 TO ttt
                          fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                          fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                          IF fieldtempmintmp$ = CHR$(44) THEN cccount =
                          IF cccount = 2 THEN EXIT FOR
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + fieldtempmin
                PRINT #1, recordmerge$
        NEXT k
CASE 5
        FOR k = 10 TO i
                        count = 0
                        counter = 0
                        t = recordlengthmax(k)

                FOR l = 1 TO t
                        fielddate$ = LEFT$(recordmax$(k), l)
                        fielddatetmp$ = MID$(recordmax$(k), l, 1)
                        IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR l = 1 TO t
                        fieldtempmax$ = MID$(recordmax$(k), 23, l)
                        fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                        IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR n = 1 TO t
                        fieldpreciptmp$ = MID$(recordmax$(k), t - n, 1)
                        IF fieldpreciptmp$ = CHR$(44) THEN EXIT FOR
                        fieldprecip$ = RIGHT$(recordmax$(k), n + 1)
                NEXT n

                FOR g = 1 TO t
                        fieldsoil50x$ = LEFT$(recordmax$(k), g)
                        fieldsoil50xtmp$ = MID$(recordmax$(k), g, 1)
                        IF fieldsoil50xtmp$ = CHR$(44) THEN counter = co
                        IF counter = 5 THEN EXIT FOR
                NEXT g
```

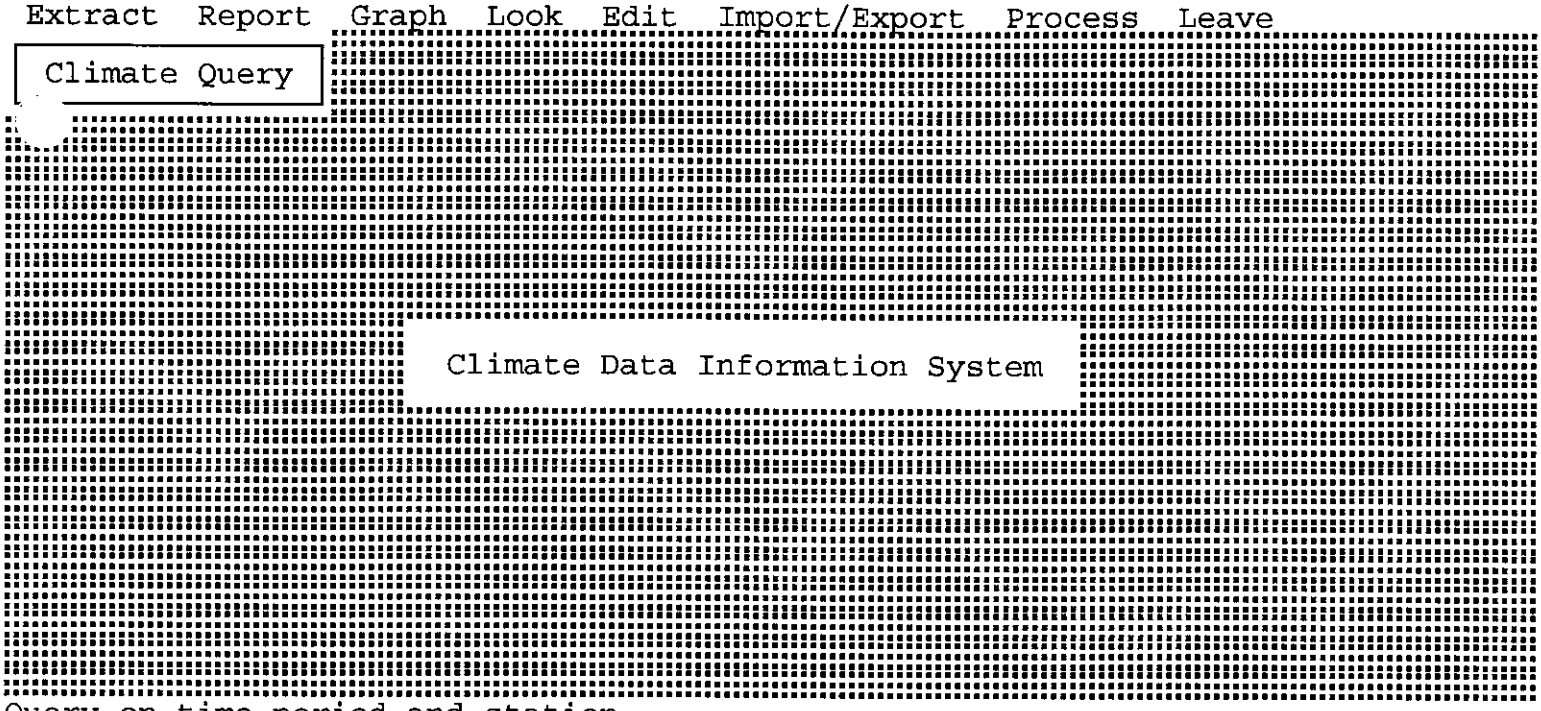
```
                gg = LEN(fieldsoil50x$)
                FOR r = 1 TO gg
                        fieldsoil50$ = RIGHT$(fieldsoil50x$, r)
                        fieldsoil50tmp$ = MID$(fieldsoil50x$, gg - r, 1)
                        IF fieldsoil50tmp$ = CHR$(44) THEN EXIT FOR
                NEXT r

                tt = recordlengthmin(k)
                ccount = 0
                FOR ll = 1 TO tt
                         fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                         fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                         IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                         IF ccount = 3 THEN EXIT FOR
                NEXT ll

                ttt = LEN(fielddatetempmin$)
                cccount = 0
                FOR nn = 0 TO ttt
                          fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                          fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                          IF fieldtempmintmp$ = CHR$(44) THEN cccount =
                          IF cccount = 2 THEN EXIT FOR
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + fieldtempmin
                PRINT #1, recordmerge$
        NEXT k

CASE 6
        FOR k = 10 TO i
                        count = 0
                        counter = 0
                        t = recordlengthmax(k)

                FOR l = 1 TO t
                        fielddate$ = LEFT$(recordmax$(k), l)
                        fielddatetmp$ = MID$(recordmax$(k), l, 1)
                        IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR l = 1 TO t
                        fieldtempmax$ = MID$(recordmax$(k), 23, l)
                        fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                        IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR n = 1 TO t
                        fieldpreciptmp$ = MID$(recordmax$(k), t - n, 1)
                        IF fieldpreciptmp$ = CHR$(44) THEN EXIT FOR
                        fieldprecip$ = RIGHT$(recordmax$(k), n + 1)
                NEXT n

                FOR g = 1 TO t
                        fieldsoil50x$ = LEFT$(recordmax$(k), g)
                        fieldsoil50xtmp$ = MID$(recordmax$(k), g, 1)
                        IF fieldsoil50xtmp$ = CHR$(44) THEN counter = co
                        IF counter = 5 THEN EXIT FOR
                NEXT g

                gg = LEN(fieldsoil50x$)
                FOR r = 1 TO gg
                        fieldsoil50$ = RIGHT$(fieldsoil50x$, r)
                        fieldsoil50tmp$ = MID$(fieldsoil50x$, gg - r, 1)
                        IF fieldsoil50tmp$ = CHR$(44) THEN EXIT FOR
```

```
                NEXT r

                counter = 0
                FOR a = 1 TO t
                        fieldsoil5x$ = LEFT$(recordmax$(k), a)
                        fieldsoil5xtmp$ = MID$(recordmax$(k), a, 1)
                        IF fieldsoil5xtmp$ = CHR$(44) THEN counter = cou
                        IF counter = 6 THEN EXIT FOR
                NEXT a

                b = LEN(fieldsoil5x$)
                FOR rr = 1 TO b
                        fieldsoil5$ = RIGHT$(fieldsoil5x$, rr)
                        fieldsoil5tmp$ = MID$(fieldsoil5x$, b - rr, 1)
                        IF fieldsoil5tmp$ = CHR$(44) THEN EXIT FOR
                NEXT rr


                tt = recordlengthmin(k)
                ccount = 0
                FOR ll = 1 TO tt
                         fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                         fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                         IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                         IF ccount = 3 THEN EXIT FOR
                NEXT ll

                ttt = LEN(fielddatetempmin$)
                cccount = 0
                FOR nn = 0 TO ttt
                          fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                          fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                          IF fieldtempmintmp$ = CHR$(44) THEN cccount =
                          IF cccount = 2 THEN EXIT FOR
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + fieldtempmin
                PRINT #1, recordmerge$
        NEXT k

CASE IS > 6

        FOR k = 10 TO i
                        count = 0
                        counter = 0
                        t = recordlengthmax(k)

                FOR l = 1 TO t
                        fielddate$ = LEFT$(recordmax$(k), l)
                        fielddatetmp$ = MID$(recordmax$(k), l, 1)
                        IF fielddatetmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                FOR l = 1 TO t
                        fieldtempmax$ = MID$(recordmax$(k), 23, l)
                        fieldtempmaxtmp$ = MID$(recordmax$(k), l, 1)
                        IF fieldtempmaxtmp$ = CHR$(44) THEN EXIT FOR
                NEXT l

                number = 0
                FOR c = 1 TO t
                        fieldprecipx$ = LEFT$(recordmax$(k), c)
                        fieldprecipxtmp$ = MID$(recordmax$(k), c, 1)
                        IF fieldprecipxtmp$ = CHR$(44) THEN number = num
                        IF number = 7 THEN EXIT FOR
```

```
                NEXT c

                ww = LEN(fieldprecipx$)
                FOR w = 1 TO ww
                        fieldprecip$ = RIGHT$(fieldprecipx$, w)
                        fieldpreciptmp$ = MID$(fieldprecipx$, ww - w, 1)
                        IF fieldpreciptmp$ = CHR$(44) THEN EXIT FOR
                NEXT w

                FOR g = 1 TO t
                        fieldsoil50x$ = LEFT$(recordmax$(k), g)
                        fieldsoil50xtmp$ = MID$(recordmax$(k), g, 1)
                        IF fieldsoil50xtmp$ = CHR$(44) THEN counter = co
                        IF counter = 5 THEN EXIT FOR
                NEXT g

                gg = LEN(fieldsoil50x$)
                FOR r = 1 TO gg
                        fieldsoil50$ = RIGHT$(fieldsoil50x$, r)
                        fieldsoil50tmp$ = MID$(fieldsoil50x$, gg - r, 1)
                        IF fieldsoil50tmp$ = CHR$(44) THEN EXIT FOR
                NEXT r

                counter = 0
                FOR a = 1 TO t
                        fieldsoil5x$ = LEFT$(recordmax$(k), a)
                        fieldsoil5xtmp$ = MID$(recordmax$(k), a, 1)
                        IF fieldsoil5xtmp$ = CHR$(44) THEN counter = cou
                        IF counter = 6 THEN EXIT FOR
                NEXT a

                b = LEN(fieldsoil5x$)
                FOR rr = 1 TO b
                        fieldsoil5$ = RIGHT$(fieldsoil5x$, rr)
                        fieldsoil5tmp$ = MID$(fieldsoil5x$, b - rr, 1)
                        IF fieldsoil5tmp$ = CHR$(44) THEN EXIT FOR
                NEXT rr


                tt = recordlengthmin(k)
                ccount = 0
                FOR ll = 1 TO tt
                          fielddatetempmin$ = LEFT$(recordmin$(k), ll)
                          fielddatetempmintmp$ = MID$(recordmin$(k), ll,
                          IF fielddatetempmintmp$ = CHR$(44) THEN ccount
                          IF ccount = 3 THEN EXIT FOR
                NEXT ll

                ttt = LEN(fielddatetempmin$)
                cccount = 0
                FOR nn = 0 TO ttt
                           fieldtempmin$ = RIGHT$(fielddatetempmin$, nn)
                           fieldtempmintmp$ = MID$(fielddatetempmin$, ttt
                           IF fieldtempmintmp$ = CHR$(44) THEN cccount =
                           IF cccount = 2 THEN EXIT FOR
                NEXT nn


                recordmerge$ = fielddate$ + fieldtempmax$ + fieldtempmin
                PRINT #1, recordmerge$
        NEXT k

END SELECT
```

```
        CLOSE #1

        ERASE recordmax$
        ERASE recordmin$
        ERASE c$
        ERASE cc$
        ERASE recordlengthmax
        ERASE recordlengthmin


NEXT jj

CLS
LOCATE 15, 20
PRINT "Processing Completed"

END SUB
```

EXTRACT



CLIMATE QUERY SCREEN: Allows for queries to be made by date and station This choice is followed by two more screens, one requesting the time period and the second requesting the station.

The EXTRACT/CLIMATE QUERY choice forms the basis for extracting information from the climate database and proceeding with creating reports, graphs, and exporting to other file formats.

The climate query is performed on the Paradox table named CLIMARCH. A relational link is also set up with the table CLIMSTN, this table contains information on the climate stations.

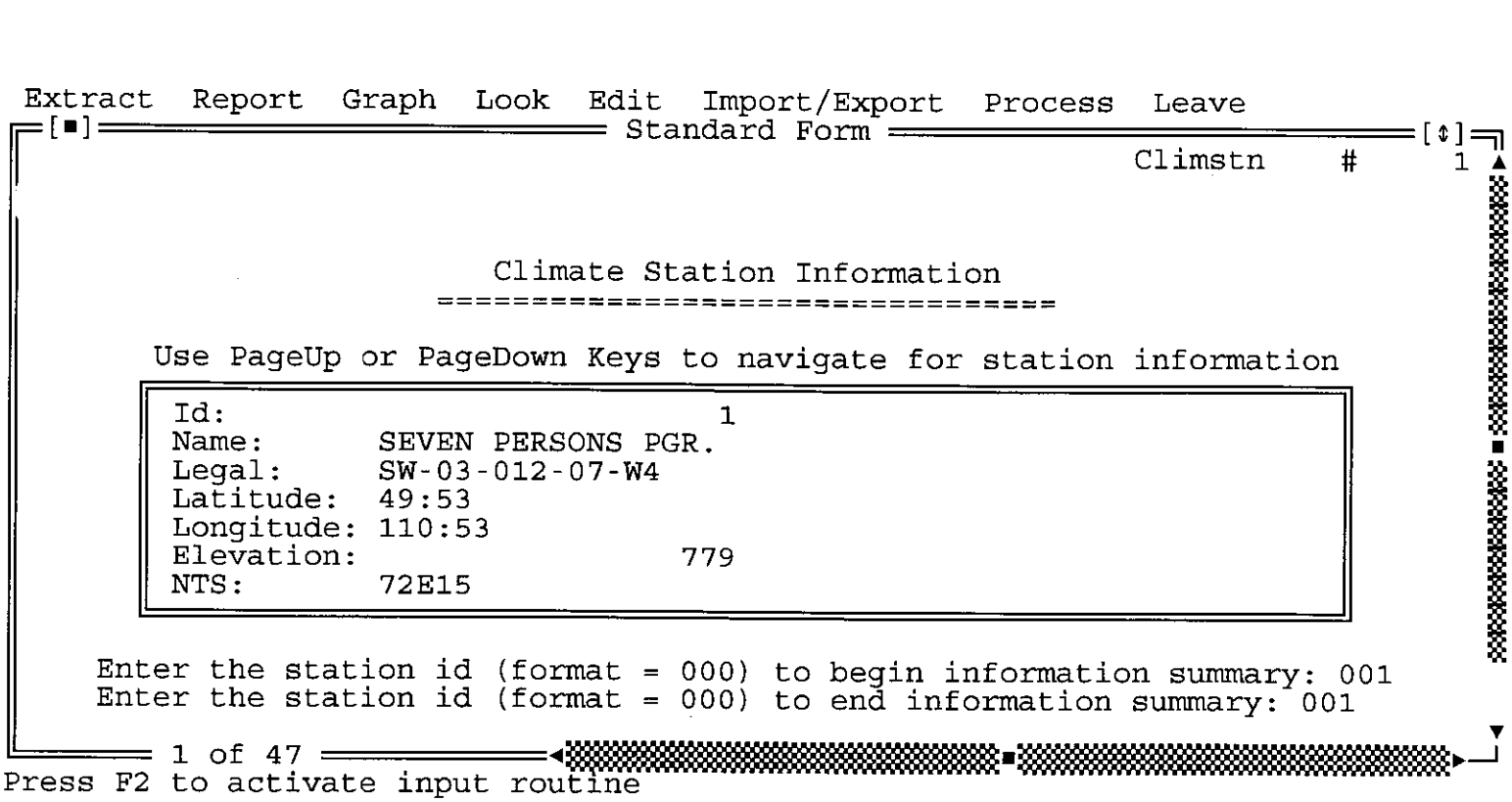
Extract Report Graph Look Edit Import/Export Process Leave

CLIMATE STATION SUMMARIES

Enter the starting date (dd.mm.yy) for climate information: 01.04.92

Enter the last date (dd.mm.yy) for climate information: 30.04.92

EXTRACT/CLIMATE QUERY: This is the second screen of the climate query routine. It requests the time period for the query.



EXTRACT/CLIMATE QUERY: This is the third screen for the climate query. It requests a station number(s) for the query. The screen is associated with the the station information database which the user navigate through and obtain the station numbers (id's) associated with the names.

```
Extract  Report  Graph  Look  Edit  Import/Export  Process  Leave
                      CLIMATE DATA SUMMARY
                   Station: SEVEN PERSONS PGR.
    Time period from: April  1, 1992      to:  April 30, 1992

    ================================================================

                   Average Maximum Temperature is: +15.1

                   Average Minimum Temperature is:   +.1

                   Average Temperature is: +15.0

                   Minimum Temperature is: -12.9

                   Maximum Temperature is: +27.4

                   Total number of records:    30

    ================================================================

    Proceeding to create report structure: Enter Daily (D) or Monthly (M).
```

EXTRACT/CLIMATE QUERY: This screen represents a screen dump of some basic information performed by the query. The user is requested to enter a letter corresponding to the type of report required. A 'd' will produce a report with daily events recorded, while an 'm' will produce a monthly summary report for the station(s).

```
;**** Routine for deriving queried climate data and producing reports*****
;******** Routine produces table CLIMATE1 for report information *********

c  ar
@3,25
??"CLIMATE STATION SUMMARIES"


@10,5
??"Enter the starting date (dd.mm.yy) for climate information: "
accept "D"
     picture "##.##.##"
     to begindate
@12,5
??"Enter the last date (dd.mm.yy) for climate information: "
accept "D"
     picture "##.##.##"
     to enddate
@15,5
??"Enter the network and station number to begin information summary: "
accept "N"
     picture "###"
     to beginid
@17,5
??"Enter the network and station number to end information summary: "
accept "N"
     picture "###"
     to endid
play "cqery"
do_it!

w  t table
     prompt "Press F2 for summaries"
until "F2"
clear

edit "answer"
copytoarray s
name = s["name"]
do_it!


view "answer"
n = nrecords("answer")
array xn[15000]


for value from 1 to n
          moveto record value
          xn[value] = [date]
endfor
```

```
¢  25
??"CLIMATE DATA SUMMARY"
@2,20
??"Station: ",name
@3,5
??"Time period from: ", format("D2", xn[1])
@3,43
??"to:  ", format("D2", xn[n])
@6,5
??"=============================================================================="
@20,5
??"=============================================================================="


avgmaxtemp = caverage("answer","maxtemp")
@8,20
?? "Average Maximum Temperature is: ", format ("w5.1,s+",avgmaxtemp)

avgmintemp = caverage("answer","mintemp")
@10,20
?? "Average Minimum Temperature is: ", format ("w5.1,s+",avgmintemp)

avgtemp = avgmaxtemp - avgmintemp
@12,20
?? "Average Temperature is: ",  format ("w5.1,s+",avgtemp)

mintemp = cmin("answer","mintemp")
@14,20
?  "Minimum Temperature is: ", format ("w5.1,s+",mintemp)

maxtemp = cmax("answer","maxtemp")
@16,20
?? "Maximum Temperature is: ", format ("w5.1,s+",maxtemp)

recordno = ccount("answer","maxtemp")
@18,20
?? "Total number of records: ", format ("w5",recordno)

@22,5
?? "Proceeding to create report structure: Enter Daily (D) or Monthly (M)."
@22,76
accept "A1"  to rprtype

clear

@10,30
?? "Creating reports"

switch
```

```
        case rprtype = "d" or rprtype = "D":
                copyreport "ctemp" "1"
                "answer"  "R"
        case rprtype = "m" or rprtype = "M":
                copyreport "ctemp" "2"
                "answer"  "R"
endswitch

switch
        case rprtype = "d" or rprtype = "D":
                copyreport "ctemp" "1"
                "answer"  "1"
        case rprtype = "m" or rprtype = "M":
                copyreport "ctemp" "2"
                "answer"  "1"
endswitch


clear

copy "answer" "climate1"
copy "answer" "climate2"

@10,30
?? "Sorting file"
sort "climate1" on "name","date"
sort "climate2" on "name","date"

clear

@ ?,30
.  Press ENTER to continue"
accept "a1" to finishsum
```

```
;********** Paradox query routine for deriving climate data **************
;******* Relational also link between tables CLIMARCH and CLIMSTN ********


Query

 Climarch |              Date                  | Maxtemp | Mintemp | Soil_5 |
          | Check >=~begindate,<=~enddate      | Check   | Check   | Check  |

 Climarch | Soil_50 | Precip | Comments |            Id                |
          | Check   | Check  | Check    | _link,>=~beginid,<=~endid    |

 Climstn |  Id   |  Name  | Legal  | Latitude | Longitude | Elevation |
         | _link | Check  | Check  | Check    | Check     | Check     |

 Climstn |  Nts  |
         | Check |

Endquery
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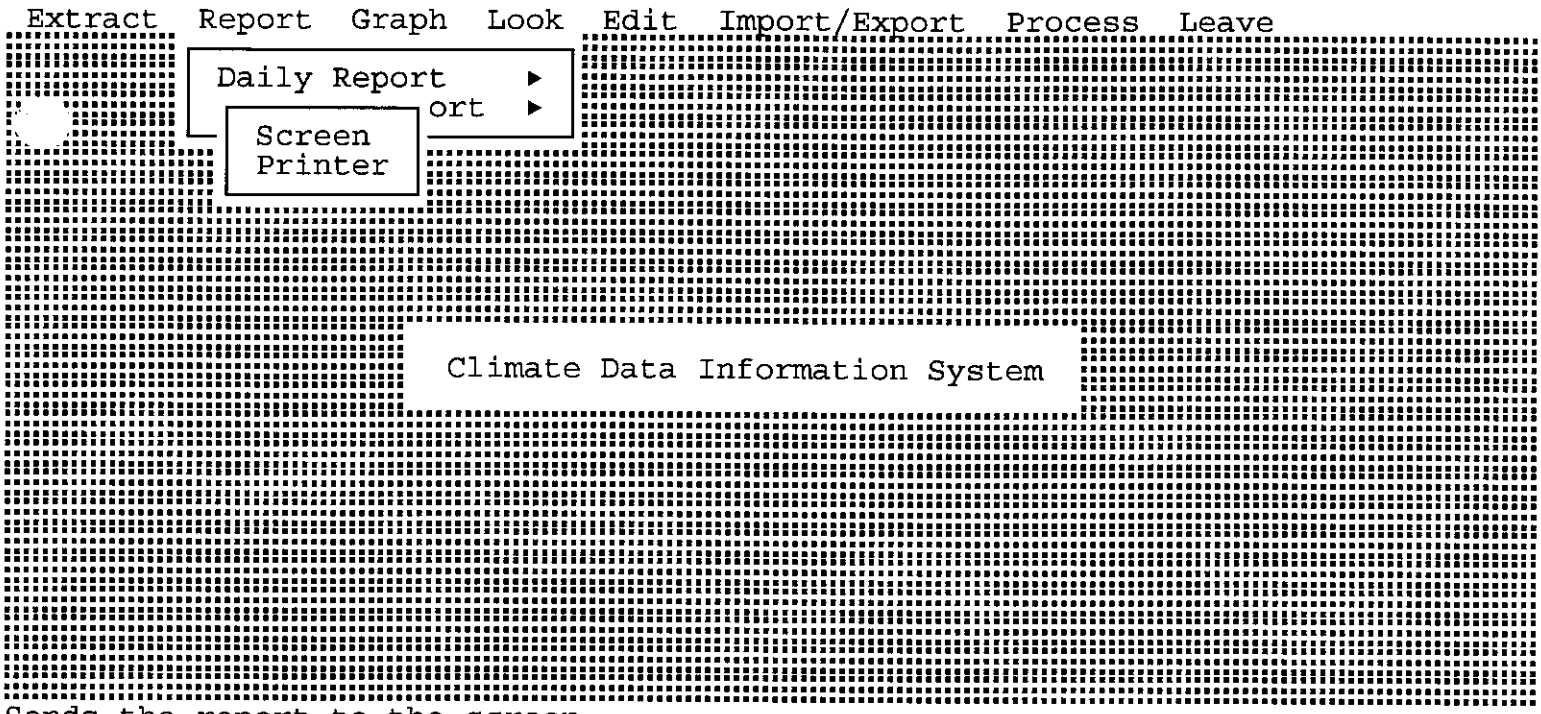
REPORT



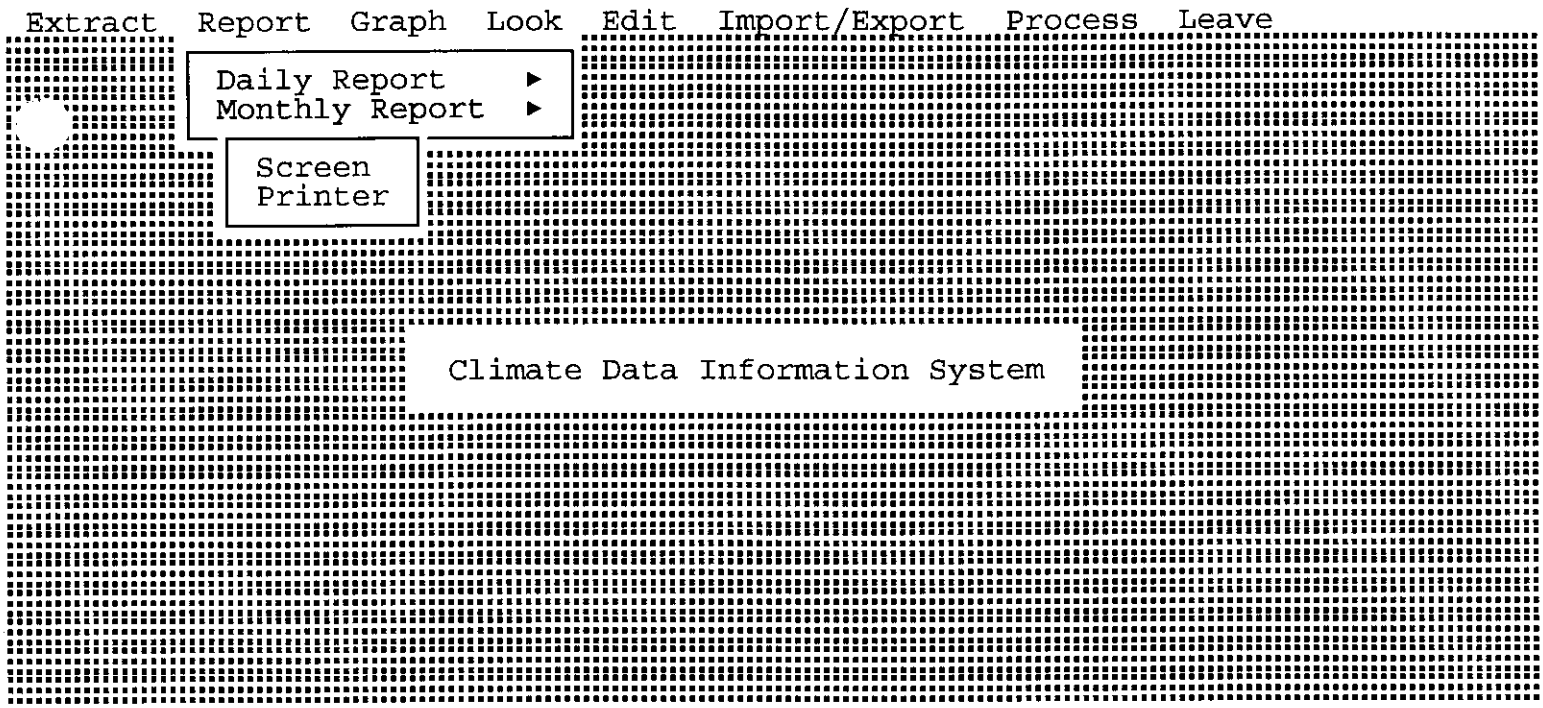
Sends the report to the screen

Station: ANTELOPE CREEK
Elevation: 770
NTS Map Location: 82I09
Legal Description: SE-08-019-16-W4
Latitude: 50:36
Longitude: 112:11

Date	Maxtemp	Mintemp	Soil_5	Soil_50	Precip	Comments
1.06.92	19.5	4.0			.7	
2.06.92	27.7	8.4			3.2	
3.06.92	20.6	11.7			1.7	
4.06.92	18.9	5.7			0.0	
5.06.92	17.3	6.3			0.0	
6.06.92	14.9	5.0			.9	
7.06.92	19.6	4.2			.5	
8.06.92	25.9	4.7			.2	
9.06.92	27.9	7.2			.9	
10.06.92	32.6	11.4			0.0	
11.06.92	28.6	10.2			.6	
12.06.92	24.8	12.1			3.5	
13.06.92	18.4	10.9			17.7	
14.06.92	15.6	9.6			16.1	
15.06.92	12.9	10.2			0.0	
16.06.92	13.8	9.4			1.4	
? 06.92	22.8	10.5			.8	
1..06.92	23.0	13.5			0.0	
19.06.92	22.2	11.8			.2	
20.06.92	26.6	9.5			.1	
21.06.92	26.7	13.9			1.0	
22.06.92	27.7	15.8			.1	
23.06.92	26.9	15.5			1.5	
24.06.92	27.0	13.3			.2	
25.06.92	22.8	15.2			.9	
26.06.92	26.8	8.6			0.0	
27.06.92	32.6	9.9			1.3	
28.06.92	29.5	13.5			.1	
29.06.92	19.3	13.5			11.3	
30.06.92	16.7	11.4			6.5	

Climate Station Summary: ANTELOPE CREEK

Average Maximum Air Temperature:	23.0	Precipitation for the period:	72
Average Minimum Air Temperature:	10.2	Average Soil Temp. at 50 cm.:	
Absolute Maximum Air Temperature:	32.6	Average Soil Temp. at 05 cm.:	
Absolute Minimum Air Temperature:	4.0	Air Temperature Range:	28.7
Average Air Temperature:	14.1		



Sends the report to the screen

Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip.	Average Monthly Temp.	Station Name	No. of Days
3/92	12.1	-4.8	7	3.7	ANTELOPE CREEK	18
3/92	13.1	-4.9	0	4.1	BAD LAND	18
3/92	9.5	-3.4	0	3.0	BLUEFIELD	16
3/92	12.9	-4.0	6	4.5	BOW ISLAND PGR.	18
3/92	10.2	-2.7	12	3.8	CONRAD	19
3/92	11.3	-4.6	0	3.4	CRESSDAY	16
3/92	11.0	-5.7	18	2.7	GARDINER	20
3/92	12.6	-3.2	3	4.7	HAYS PGR.	18
3/92	11.5	-2.7	3	4.4	LOMOND	18
3/92	12.4	-6.0	0	3.2	MANY ISLAND LAKE CS.	16
3/92	10.2	-6.3	17	1.9	O.H. RANCH	20
3/92	11.9	-3.3	5	4.3	PINHORN PGR.	16
3/92	11.2	-5.0	0	3.1	RAINY HILLS	15
3/92	11.1	-.8	3	5.1	RED ROCK COULEE	17
3/92	11.0	-4.9	0	3.1	SCHULER CS.	16
3/92	12.4	-2.7	6	4.9	SEVEN PERSONS PGR.	17
3/92	11.7	-5.7	0	3.0	WALDRON GL.	20
4/92	15.4	-.2	19	7.6	ANTELOPE CREEK	30
4/92	14.6	-2.3	0	6.1	BAD LAND	23
4/92	10.3	-3.0	0	3.7	BLUEFIELD	24
4/92	15.9	.1	16	8.0	BOW ISLAND PGR.	30
4/92	13.2	-1.0	54	6.1	CONRAD	30
'92	12.3	-2.7	0	4.8	CRESSDAY	24
.92	13.1	-2.6	15	5.2	GARDINER	30
4/92	15.8	.2	16	8.0	HAYS PGR.	30
4/92	14.8	-.1	19	7.3	LOMOND	30
4/92	15.4	-.4	0	7.5	MANY ISLAND LAKE CS.	30
4/92	12.4	-3.7	23	4.3	O.H. RANCH	30
4/92	15.5	1.0	26	8.2	PINHORN PGR.	30
4/92	13.4	-3.3	0	5.0	RAINY HILLS	23
4/92	13.6	1.2	23	7.4	RED ROCK COULEE	30
4/92	14.4	-.6	0	6.9	SCHULER CS.	30
4/92	15.1	.1	19	7.6	SEVEN PERSONS PGR.	30
4/92	13.5	-3.7	0	4.9	WALDRON GL.	30
5/92	18.6	4.4	57	11.5	ANTELOPE CREEK	31
5/92	20.2	4.8	24	12.5	BOW ISLAND PGR.	31
5/92	17.2	2.4	32	9.8	CONRAD	31
5/92	16.1	.4	31	8.3	GARDINER	31
5/92	19.7	5.1	23	12.4	HAYS PGR.	31
5/92	18.0	3.9	43	11.0	LOMOND	31
5/92	20.0	5.2	0	12.6	MANY ISLAND LAKE CS.	31
5/92	15.5	-.3	40	7.6	O.H. RANCH	31
5/92	21.0	5.6	12	13.3	PINHORN PGR.	31
5/92	18.8	5.4	15	12.1	RED ROCK COULEE	31
5/92	18.5	4.3	0	11.4	SCHULER CS.	31
5/92	19.4	5.4	23	12.4	SEVEN PERSONS PGR.	31
5/92	17.1	.6	0	8.9	WALDRON GL.	31
6/92	23.0	10.2	72	16.6	ANTELOPE CREEK	30
92	24.3	10.7	86	17.5	BOW ISLAND PGR.	30
6/92	21.3	8.5	162	14.9	CONRAD	31
6/92	20.4	6.0	171	13.2	GARDINER	30
6/92	23.8	11.0	77	17.4	HAYS PGR.	30
6/92	22.2	9.8	84	16.0	LOMOND	30

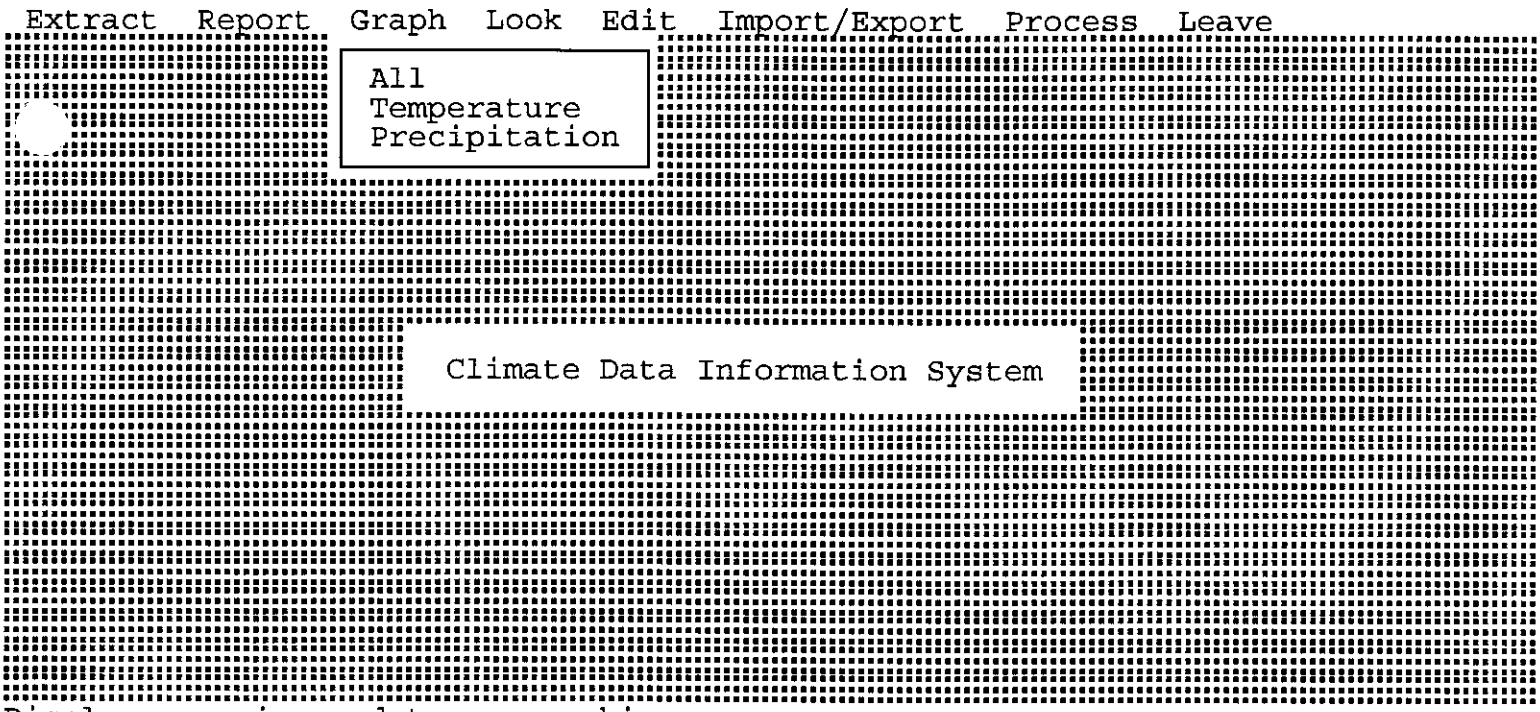
Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip.	Average Monthly Temp.	Station Name	No. of Days
6/92	23.7	10.9	0	17.3	MANY ISLAND LAKE CS.	30
6/92	19.8	6.0	204	12.9	O.H. RANCH	30
6/92	25.0	11.2	82	18.1	PINHORN PGR.	30
6/92	23.2	11.1	87	17.2	RED ROCK COULEE	30
6/92	22.8	9.9	0	16.4	SCHULER CS.	30
6/92	23.2	10.7	88	17.0	SEVEN PERSONS PGR.	30
6/92	21.7	6.4	0	14.1	WALDRON GL.	30
7/92	21.2	9.6	84	15.4	ANTELOPE CREEK	31
7/92	24.7	9.1	71	16.9	BAD LAND	20
7/92	20.7	8.8	94	14.7	BLUEFIELD	21
7/92	22.2	9.8	60	16.0	BOW ISLAND PGR.	29
7/92	18.9	7.9	91	13.4	CONRAD	31
7/92	22.5	9.2	117	15.9	CRESSDAY	21
7/92	18.3	6.0	154	12.2	GARDINER	31
7/92	21.7	9.9	52	15.8	HAYS PGR.	31
7/92	20.2	9.5	81	14.9	LOMOND	31
7/92	22.0	10.1	99	16.0	MANY ISLAND LAKE CS.	31
7/92	18.1	5.7	124	11.9	O.H. RANCH	31
7/92	22.0	10.5	70	16.2	PINHORN PGR.	30
7/92	23.6	9.3	98	16.5	RAINY HILLS	21
7/92	20.3	10.5	86	15.4	RED ROCK COULEE	31
7/92	21.9	9.4	83	15.6	SCHULER CS.	31
7/92	21.2	10.0	107	15.6	SEVEN PERSONS PGR.	31
[illegible]92	19.5	6.4	122	13.0	WALDRON GL.	30
[illegible]92	23.9	9.0	29	16.5	ANTELOPE CREEK	31
8/92	25.0	8.9	68	17.0	BAD LAND	31
8/92	21.5	9.1	164	15.3	BLUEFIELD	30
8/92	24.6	9.6	53	17.1	BOW ISLAND PGR.	31
8/92	20.7	7.8	37	14.2	CONRAD	31
8/92	23.2	9.3	260	16.2	CRESSDAY	31
8/92	20.4	5.6	133	13.0	GARDINER	31
8/92	23.9	9.6	42	16.8	HAYS PGR.	30
8/92	23.1	9.1	33	16.1	LOMOND	31
8/92	24.6	9.1	150	16.8	MANY ISLAND LAKE CS.	31
8/92	19.9	4.6	89	12.2	O.H. RANCH	31
8/92	24.5	9.6	52	17.1	PINHORN PGR.	31
8/92	24.3	9.1	81	16.7	RAINY HILLS	31
8/92	22.4	10.6	44	16.5	RED ROCK COULEE	30
8/92	24.2	9.3	96	16.7	SCHULER CS.	31
8/92	23.4	10.0	41	16.7	SEVEN PERSONS PGR.	31
8/92	21.1	5.3	63	13.2	WALDRON GL.	31
9/92	17.9	3.5	27	10.7	ANTELOPE CREEK	30
9/92	18.7	3.9	131	11.3	BAD LAND	30
9/92	16.2	3.0	89	9.6	BLUEFIELD	30
9/92	18.3	4.3	53	11.3	BOW ISLAND PGR.	30
9/92	16.2	2.8	42	9.5	CONRAD	30
9/92	18.2	3.4	203	10.8	CRESSDAY	30
9/92	15.9	2.7	68	9.3	GARDINER	28
9/92	18.0	4.4	43	11.2	HAYS PGR.	30
[illegible]92	17.3	3.7	63	10.5	LOMOND	29
[illegible]/92	18.7	4.6	82	11.6	MANY ISLAND LAKE CS.	29
9/92	15.1	1.0	60	8.1	O.H. RANCH	30
9/92	19.6	5.2	46	12.4	PINHORN PGR.	30
9/92	17.7	3.2	64	10.4	RAINY HILLS	30

Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip.	Average Monthly Temp.	Station Name	No. of Days
9/92	17.5	5.3	51	11.4	RED ROCK COULEE	30
9/92	17.3	3.8	93	10.5	SCHULER CS.	30
9/92	17.8	4.6	44	11.2	SEVEN PERSONS PGR.	30
9/92	16.5	1.2	63	8.8	WALDRON GL.	30
10/92	14.1	-.7	44	6.7	ANTELOPE CREEK	30
10/92	14.3	.3	51	7.3	BAD LAND	30
10/92	11.3	.3	19	5.8	BLUEFIELD	31
10/92	14.1	.7	19	7.4	BOW ISLAND PGR.	31
10/92	12.2	.6	34	6.4	CONRAD	30
10/92	13.3	-.0	143	6.6	CRESSDAY	31
10/92	11.9	-.7	13	5.6	GARDINER	31
10/92	13.8	1.1	16	7.4	HAYS PGR.	31
10/92	13.3	.9	13	7.1	LOMOND	30
10/92	15.1	1.0	83	8.0	MANY ISLAND LAKE CS.	29
10/92	11.2	-1.6	0	4.8	O.H. RANCH	31
10/92	14.3	1.8	31	8.0	PINHORN PGR.	31
10/92	14.0	-.2	39	6.9	RAINY HILLS	30
10/92	12.5	3.2	31	7.8	RED ROCK COULEE	31
10/92	13.2	.2	53	6.7	SCHULER CS.	31
10/92	13.4	1.3	33	7.3	SEVEN PERSONS PGR.	31
10/92	12.9	-.7	41	6.1	WALDRON GL.	30
11/92	2.6	-7.1	18	-2.2	ANTELOPE CREEK	30
11/92	4.7	-5.0	53	-.2	BAD LAND	30
1 '92	-.1	-5.7	67	-2.9	BLUEFIELD	30
1 ,92	4.4	-4.4	17	.0	BOW ISLAND PGR.	30
11/92	2.3	-5.4	29	-1.6	CONRAD	29
11/92	1.1	-5.5	38	-2.2	CRESSDAY	30
11/92	4.7	-6.4	25	-.8	GARDINER	30
11/92	4.0	-4.5	12	-.2	HAYS PGR.	30
11/92	3.5	-5.8	14	-1.1	LOMOND	29
11/92	4.2	-5.8	56	-.8	MANY ISLAND LAKE CS.	30
11/92	7.2	-5.9	0	.6	O.H. RANCH	3
11/92	3.8	-4.5	26	-.4	PINHORN PGR.	29
11/92	2.8	-5.8	46	-1.5	RAINY HILLS	28
11/92	2.9	-3.3	18	-.2	RED ROCK COULEE	28
11/92	2.7	-5.2	5	-1.2	SCHULER CS.	30
11/92	3.8	-4.2	12	-.2	SEVEN PERSONS PGR.	30
11/92	3.6	-3.9	0	-.2	WALDRON GL.	30
12/92	-6.4	-18.3	8	-12.4	ANTELOPE CREEK	31
12/92	-5.1	-16.6	68	-10.8	BAD LAND	31
12/92	-7.3	-16.6	64	-11.9	BLUEFIELD	31
12/92	-5.1	-15.7	4	-10.4	BOW ISLAND PGR.	31
12/92	-6.2	-15.8	14	-11.0	CONRAD	31
12/92	-7.3	-17.5	65	-12.4	CRESSDAY	31
12/92	-4.4	-16.8	13	-10.6	GARDINER	31
12/92	-5.6	-15.5	6	-10.5	HAYS PGR.	31
12/92	-6.2	-16.4	6	-11.3	LOMOND	31
12/92	-4.9	-17.2	61	-11.1	MANY ISLAND LAKE CS.	31
12/92	-3.9	-15.1	6	-9.5	PINHORN PGR.	31
: 92	-7.4	-17.7	63	-12.6	RAINY HILLS	31
12/92	-5.6	-14.9	12	-10.2	RED ROCK COULEE	31
12/92	-7.0	-17.5	0	-12.2	SCHULER CS.	31
12/92	-5.5	-15.4	7	-10.5	SEVEN PERSONS PGR.	31
12/92	-5.0	-10.0	0	-7.5	WALDRON GL.	31

Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip.	Average Monthly Temp.	Station Name	No. of Days
1/93	-10.3	-21.2	5	-15.7	ANTELOPE CREEK	31
1/93	-8.5	-21.7	104	-15.1	BAD LAND	31
1/93	-7.4	-17.4	79	-12.4	BLUEFIELD	31
1/93	-8.6	-20.1	4	-14.3	BOW ISLAND PGR.	31
1/93	-7.1	-16.9	11	-12.0	CONRAD	31
1/93	-10.2	-20.5	90	-15.4	CRESSDAY	31
1/93	-3.7	-18.1	8	-10.9	GARDINER	31
1/93	-9.1	-19.7	3	-14.4	HAYS PGR.	31
1/93	-7.9	-19.7	4	-13.8	LOMOND	31
1/93	-8.7	-21.7	104	-15.2	MANY ISLAND LAKE CS.	31
1/93	-8.1	-18.6	8	-13.4	PINHORN PGR.	31
1/93	-10.6	-22.3	95	-16.4	RAINY HILLS	31
1/93	-6.6	-16.4	13	-11.5	RED ROCK COULEE	31
1/93	-10.3	-21.7	0	-16.0	SCHULER CS.	31
1/93	-8.8	-19.1	11	-14.0	SEVEN PERSONS PGR.	31
1/93	-5.4	-15.0	0	-10.2	WALDRON GL.	31
2/93	-5.3	-17.3	6	-11.3	ANTELOPE CREEK	27
2/93	-2.6	-15.8	55	-9.2	BAD LAND	28
2/93	-5.7	-14.2	53	-9.9	BLUEFIELD	28
2/93	-3.0	-14.7	10	-8.9	BOW ISLAND PGR.	28
2/93	-4.7	-13.3	7	-9.0	CONRAD	28
2/93	-6.8	-18.2	57	-12.5	CRESSDAY	28
2/93	12.1	-3.8	1	4.2	GARDINER	8
'93	-3.4	-14.0	6	-8.7	HAYS PGR.	28
,93	-3.8	-14.2	4	-9.0	LOMOND	28
2/93	-2.9	-15.7	48	-9.3	MANY ISLAND LAKE CS.	28
2/93	-4.4	-14.8	8	-9.6	PINHORN PGR.	28
2/93	-4.5	-16.3	50	-10.4	RAINY HILLS	28
2/93	-4.2	-12.1	255	-8.1	RED ROCK COULEE	28
2/93	-4.7	-15.4	33	-10.1	SCHULER CS.	28
2/93	-3.0	-13.8	8	-8.4	SEVEN PERSONS PGR.	28
2/93	-1.8	-19.0	46	-10.4	WALDRON GL.	28
3/93	6.2	-4.5	15	.9	ANTELOPE CREEK	31
3/93	7.8	-3.8	59	2.0	BAD LAND	31
3/93	2.8	-5.5	63	-1.3	BLUEFIELD	31
3/93	7.4	-3.4	24	2.0	BOW ISLAND PGR.	31
3/93	3.8	-4.8	13	-.5	CONRAD	31
3/93	3.7	-7.1	58	-1.7	CRESSDAY	31
3/93	7.1	-3.1	31	2.0	HAYS PGR.	31
3/93	6.3	-4.1	10	1.1	LOMOND	31
3/93	6.9	-3.3	68	1.8	MANY ISLAND LAKE CS.	31
3/93	6.9	-3.2	34	1.9	PINHORN PGR.	31
3/93	5.7	-4.6	62	.6	RAINY HILLS	31
3/93	5.2	-2.9	34	1.2	RED ROCK COULEE	31
3/93	5.3	-4.3	68	.5	SCHULER CS.	31
3/93	6.4	-3.2	36	1.6	SEVEN PERSONS PGR.	31
3/93	5.6	-5.7	64	-.0	WALDRON GL.	31
4/93	13.1	-1.1	25	6.0	ANTELOPE CREEK	30
4/93	14.7	-1.0	53	6.8	BAD LAND	30
93	10.5	-1.2	48	4.7	BLUEFIELD	30
4/93	14.2	-.1	38	7.1	BOW ISLAND PGR.	30
4/93	10.5	-1.2	30	4.7	CONRAD	30
4/93	12.2	-.5	48	5.8	CRESSDAY	30
4/93	14.0	-.3	24	6.8	HAYS PGR.	30

Month	Average Maximum Temp.	Average Minimum Temp.	Total Precip.	Average Monthly Temp.	Station Name	No. of Days
4/93	12.4	-.9	25	5.7	LOMOND	30
4/93	14.0	-.3	50	6.8	MANY ISLAND LAKE CS.	30
4/93	13.5	.8	50	7.1	PINHORN PGR.	30
4/93	13.3	-.8	46	6.2	RAINY HILLS	30
4/93	12.2	1.1	50	6.7	RED ROCK COULEE	30
4/93	12.7	-.5	52	6.1	SCHULER CS.	30
4/93	13.8	.3	34	7.0	SEVEN PERSONS PGR.	30
4/93	11.5	-2.7	43	4.4	WALDRON GL.	30
5/93	16.8	1.1	1	9.0	ANTELOPE CREEK	5
5/93	19.7	.1	12	9.9	BAD LAND	6
5/93	16.5	3.3	12	9.9	BLUEFIELD	7
5/93	19.1	.7	1	9.9	BOW ISLAND PGR.	6
5/93	13.3	-.1	1	6.6	CONRAD	4
5/93	17.9	4.1	11	11.0	CRESSDAY	7
5/93	17.6	1.1	1	9.4	HAYS PGR.	5
5/93	15.9	1.1	3	8.5	LOMOND	5
5/93	19.4	3.3	12	11.4	MANY ISLAND LAKE CS.	6
5/93	18.7	5.6	5	12.1	PINHORN PGR.	7
5/93	17.1	.8	8	9.0	RAINY HILLS	5
5/93	17.1	3.9	15	10.5	RED ROCK COULEE	6
5/93	17.3	1.1	3	9.2	SCHULER CS.	5
5/93	18.7	1.7	2	10.2	SEVEN PERSONS PGR.	6
5/93	12.5	-3.5	4	4.5	WALDRON GL.	3

GRAPH



Displays precip. and temp. graphic

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style attribute 146
@ 12,55
??"...."


Menu {Image} {Graph} {Reset} {OK}


Right Right Menu {Image} {Graph} {Modify} Menu {Overall} {Titles}
 "Climate Tre" Backspace Backspace Backspace  "Data Trends"
Enter Enter Enter Enter Enter  "Date" Enter  "Temperature/Pr"
 "ecipitation" Menu {ViewGraph} {Screen}
clear
quit
```
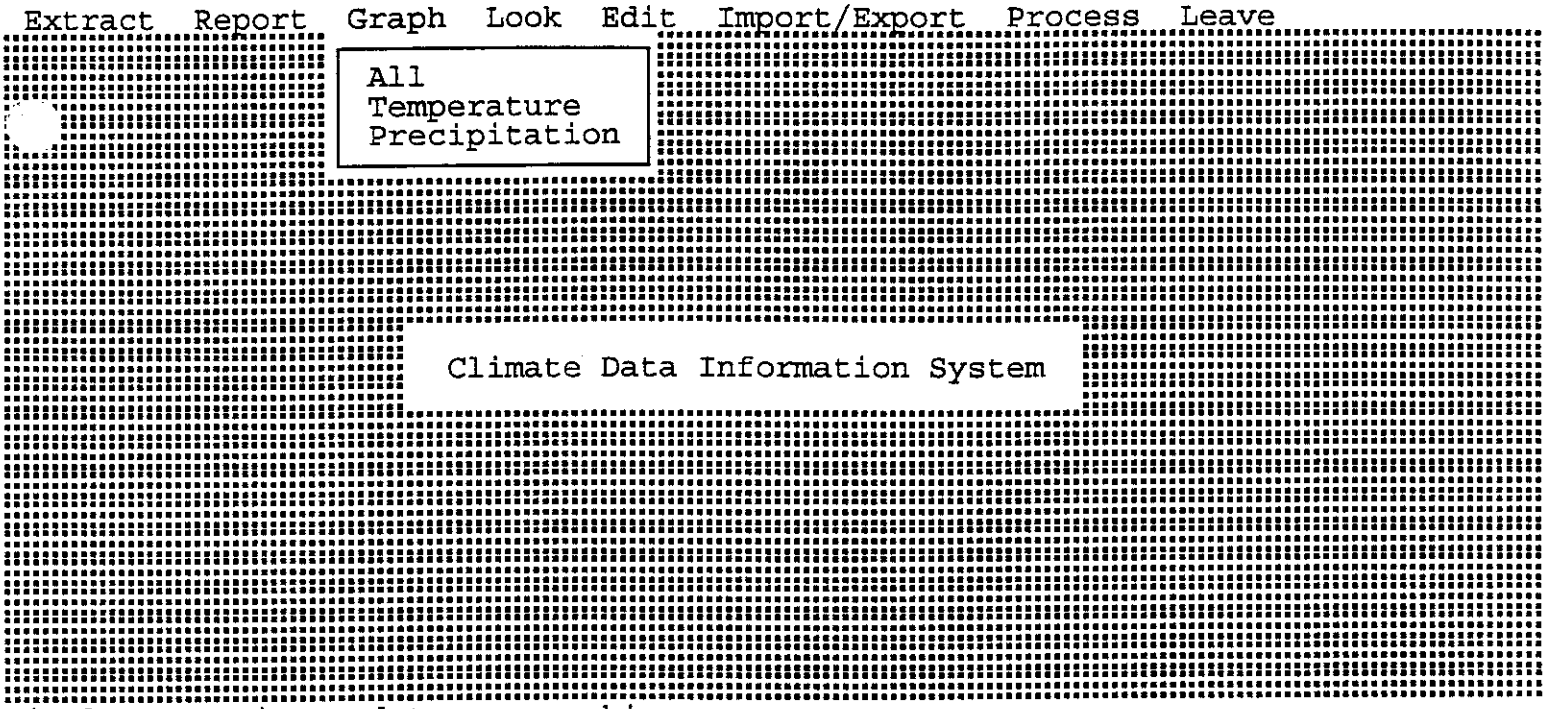
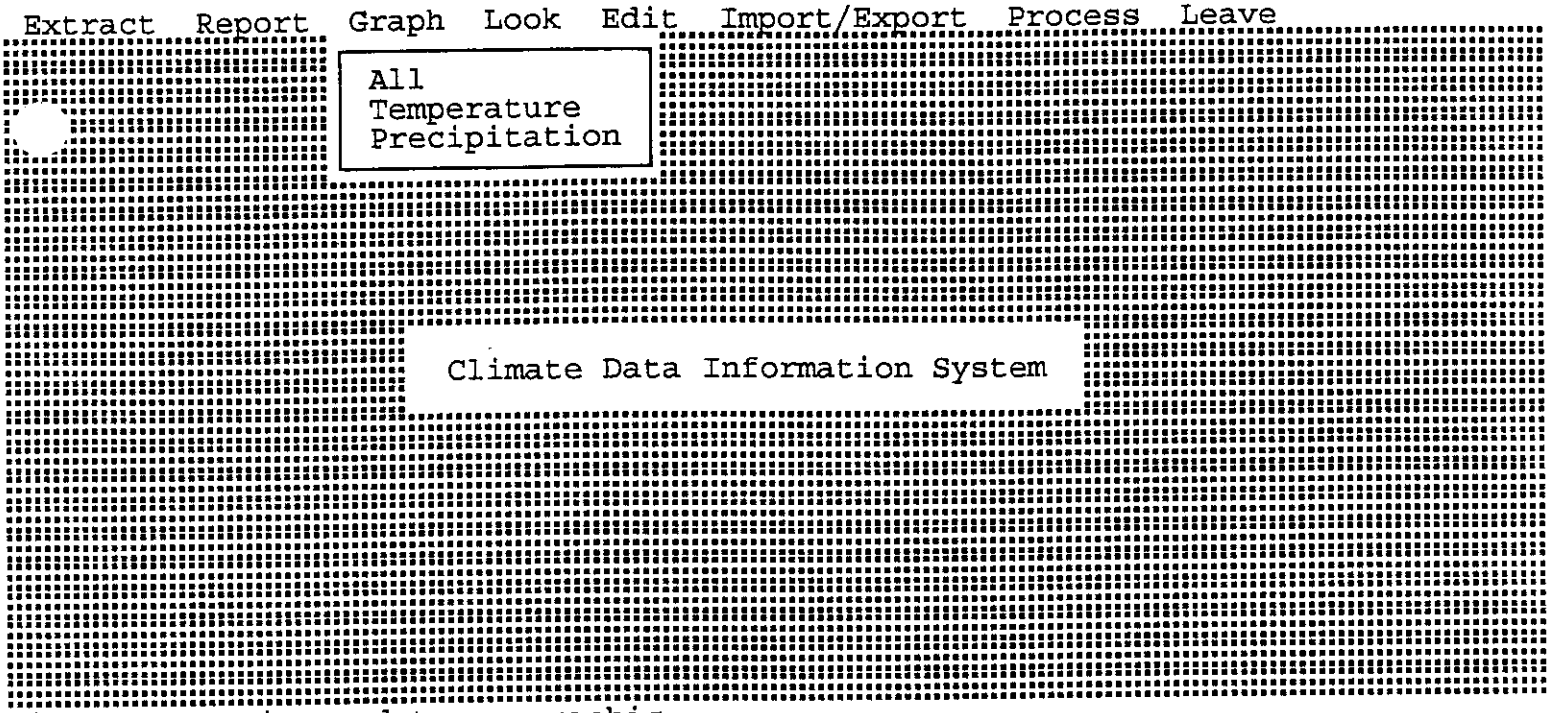



Displays precip. and temp. graphic

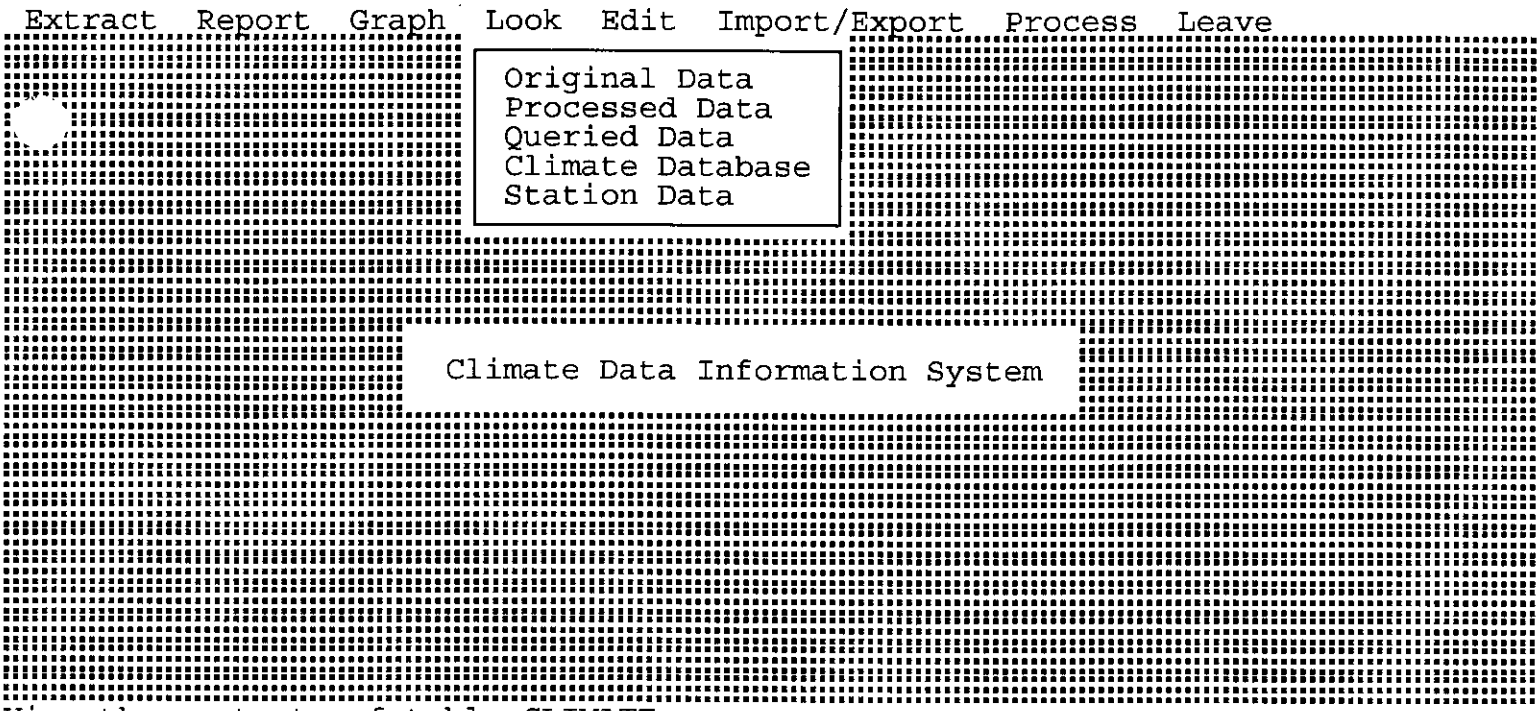
```
view "answer"


c  ar
style attribute 18
@ 12,30
??"Compiling temperature graphic"
style attribute 146
@ 12,59
??"...."


Menu {Image} {Graph} {Reset} {OK}


Menu {Modify} {Restructure} {Answer} Down Down Down Down Down
Del Menu {DO-IT!} {Delete} Right Right Menu {Image} {Graph}
{Reset} {OK} Menu {Image} {Graph} {Modify} Menu {Overall} {Titles}
 "Temperature Data Trends" Enter Enter Enter Enter Enter  "D"
 "ate" Enter  "Temperature" Menu {ViewGraph} {Screen}

 clear
 quit
```



Displays precip. and temp. graphic

```
view "answer"


c  ar
style attribute 18
@ 12,30
??"Compiling precipitation graphic"
style attribute 146
@ 12,61
??"...."


Menu {Image} {Graph} {Reset} {OK}


Menu {Modify} {Restructure} {Answer} Down Del Del Del Del Down
Down Down Del Del Del Menu {DO-IT!} {Delete} {Delete} {Delete}
{Delete} {Delete} {Delete} {Delete} Right Right Menu {Image}
{Graph} {Reset} {OK} Menu {Image} {Graph} {Modify} "b" Menu {Overall}
{Titles}  "Precipitation Data Trend" Enter Enter Enter Enter
Enter  "Date" Enter  "Precipitation (mm)" Menu {ViewGraph} {Screen}

clear

quit
```

LOOK

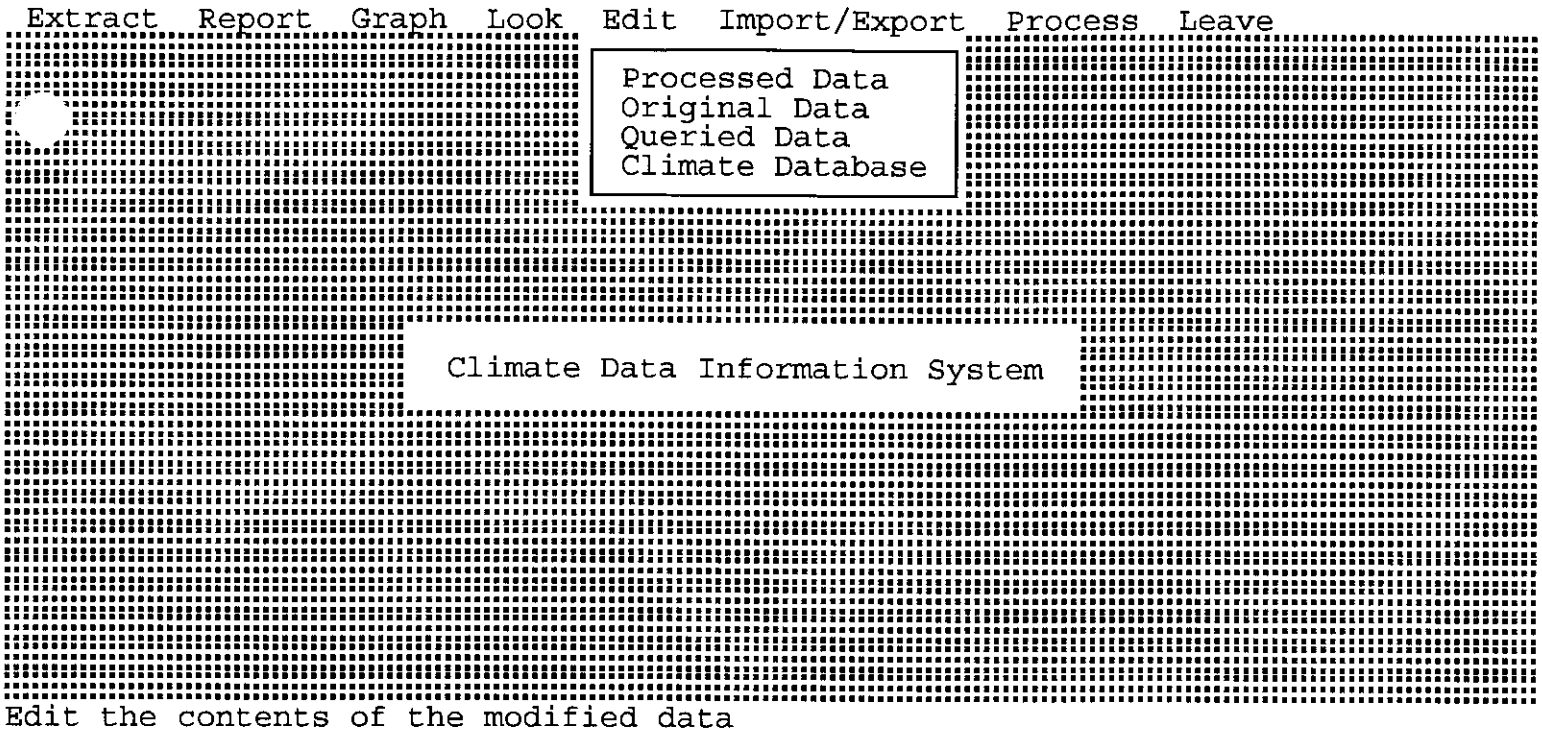


View the contents of table CLIMATE

This screen provides the user with access to a variety of Paradox tables each produced with specific functions.

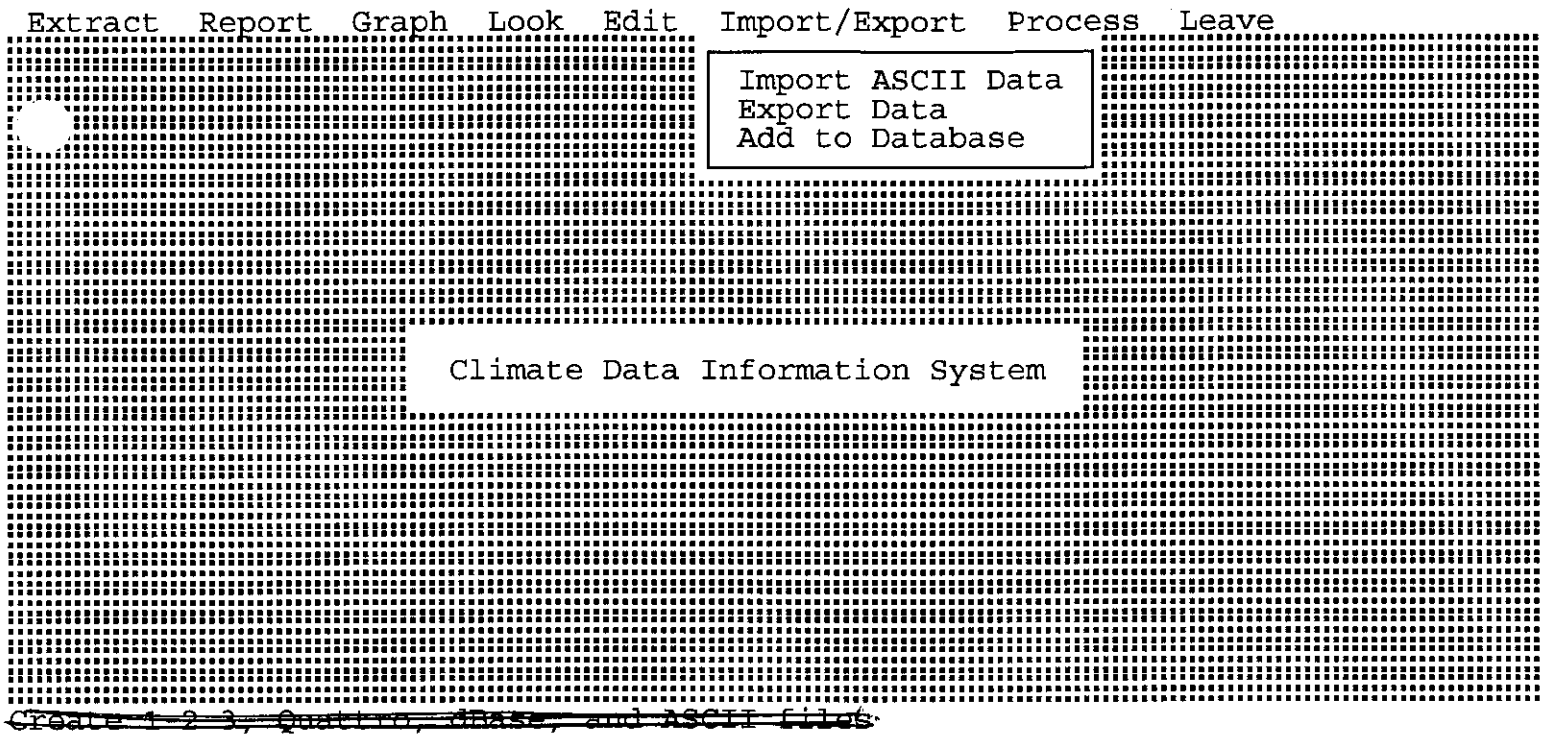
ORIGINAL DATA: Data as obtained from the data loggers (precip.).
PROCESSED DATA: Data that has been modified for precip.
QUERIED DATA: Data that was derived from the EXTRACT function.
CLIMATE DATABASE: The main data repository.
STATION DATA: Data concerning the climate stations

EDIT



Edit the contents of the modified data

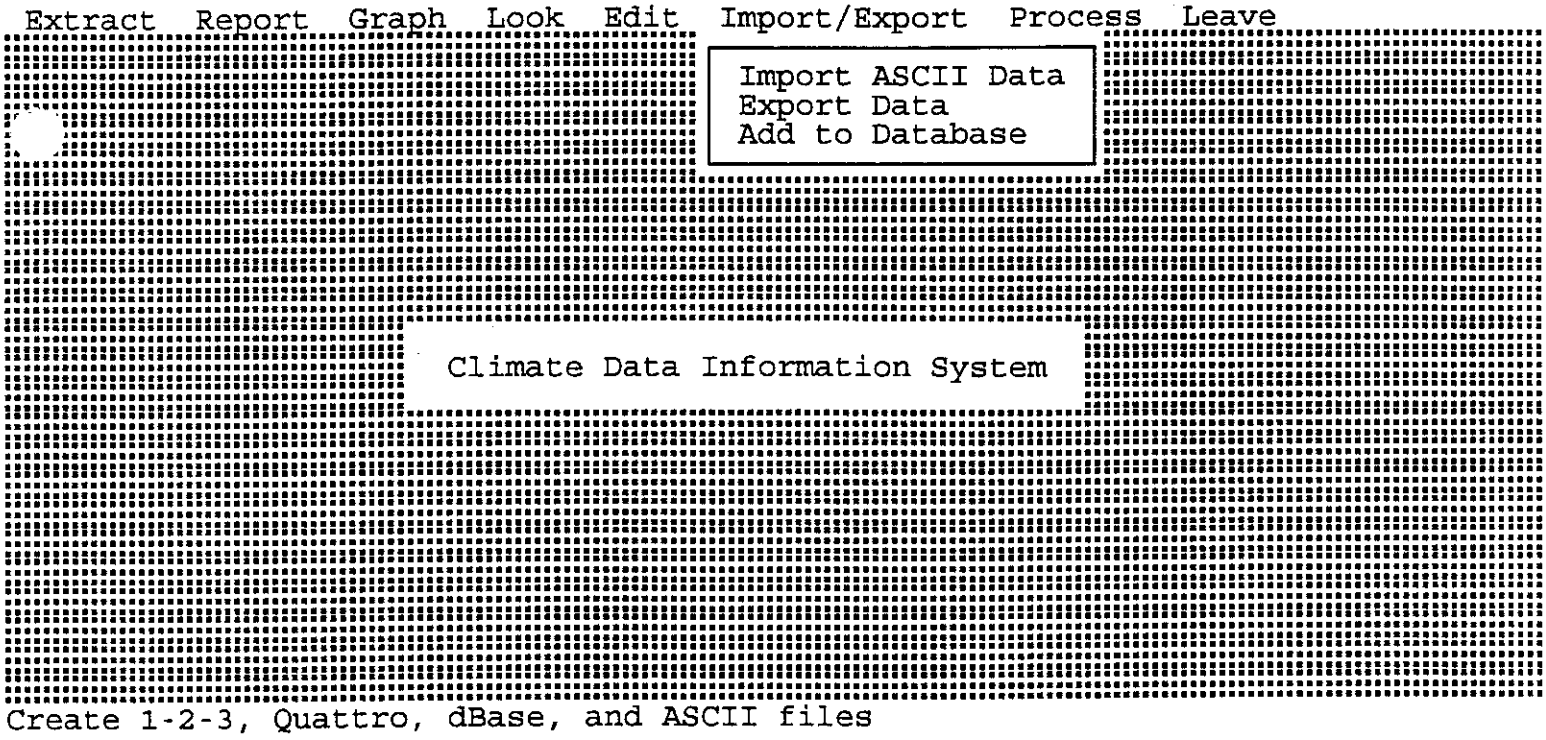
IMPORT/EXPORT



This menu choice allows the ASCII file produced by the BASIC program climupdt to be converted to a Paradox table. The ASCII file is LOGGER.DAT and the resulting Paradox table is CLIMNEW.

```
        {DO-IT!}
        rename "problems" "temp"

        Menu {Modify} {Restructure} {temp} Right Right Backspace Backspace
        Backspace Backspace Backspace Backspace  "d" Down Backspace
        Backspace Backspace Backspace Backspace Backspace  "n" Down
        Backspace Backspace Backspace Backspace Backspace Backspace
         "n" Down Backspace Backspace Backspace Backspace Backspace
         "n" Down Backspace Backspace Backspace Backspace Backspace
        Backspace  "n" Down Backspace Backspace Backspace Backspace
        Backspace Backspace  "n" Down Backspace Backspace Backspace
        Backspace Backspace  "n" Backspace  "a25" Down Backspace Backspace
        Backspace Backspace  "n" Menu {DO-IT!} Menu {Scripts} {End-Record}


        clear

        @10,10
        style attribute 18
        ??"Proceeding to copy revised records into CLIMATE table"
        @10,63
        style attribute 146
        ??"...."
        @0,0

        add "temp" "climate"

endif

clear

@ ,10
style attribute 18
??"Proceeding to sort CLIMATE table by station id and by date"
@10,68
style attribute 146
??"...."
@0,0
sort "climate" on "id", "date"

clear

@10,10
style attribute 18
??"Proceeding to copy climate data into working table (CLIMNEW)"
@10,70
style attribute 146
??"...."
@0,0


copy "climate" "climnew"
```

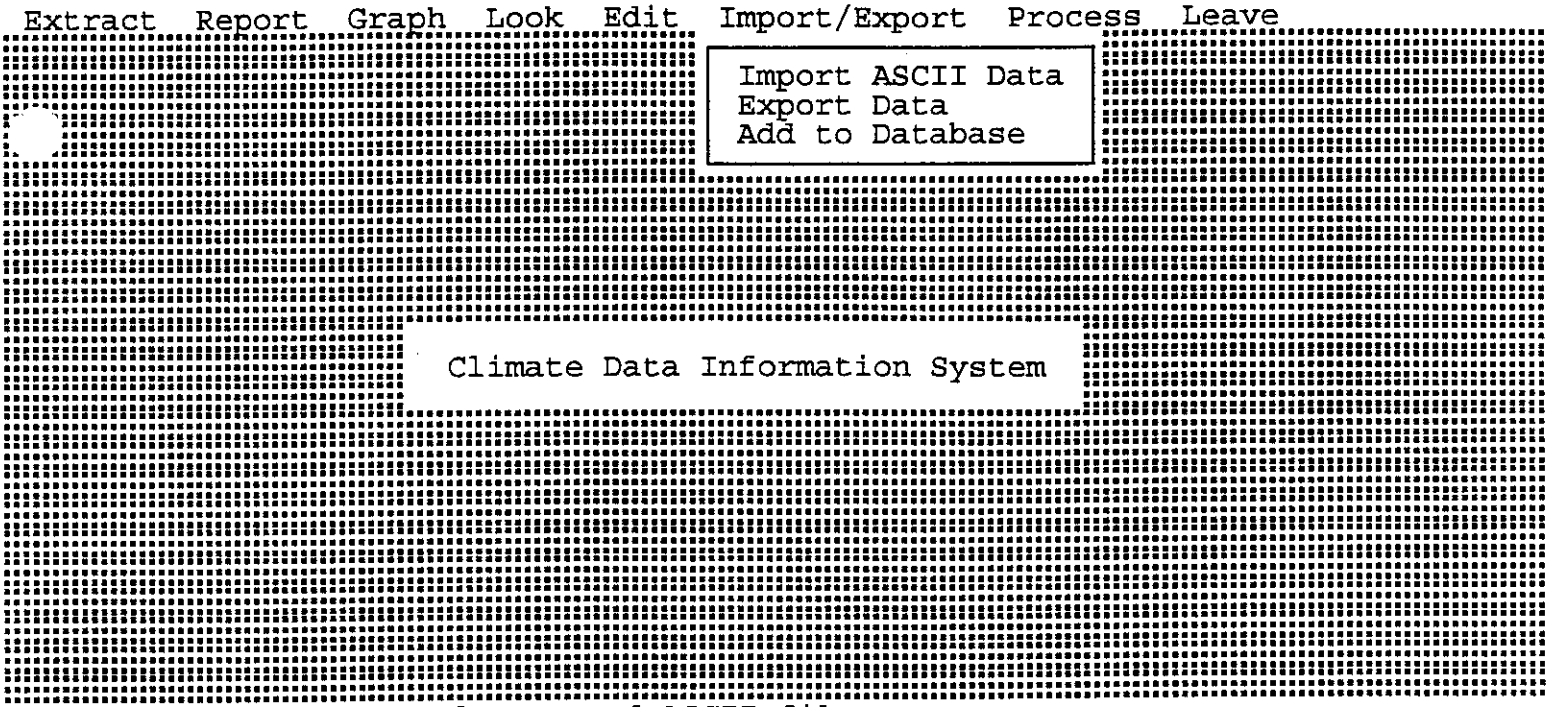
```
;********* Routine for importing ASCII data from logger.dat file *********
;****** This routine also creates the fields for the table CLIMATE *******


clear

@10,10
style attribute 18
??"Proceeding with import of LOGGER.DAT file data"
@10,56
style attribute 146
??"...."
@0,0
debug
{Tools} {ExportImport} {Import} {Ascii} {Delimited} {logger.dat}
{climate} {Replace}

clear

@10,10
style attribute 18
??"Proceeding to assign field labels to CLIMATE table"
@10,60
style attribute 146
??"...."
@0,0



Menu {Modify} {Restructure} {climate} Right Backspace Backspace
P  kspace Backspace Backspace Backspace Backspace  "Date" Right
L  kspace Backspace Backspace  "d" Down Backspace Backspace Backspace  "n" Left
Backspace Backspace Backspace Backspace Backspace Backspace
Backspace  "Maxtemp" Down Backspace Backspace Backspace Backspace
Backspace Backspace Backspace  "Mintemp" Right Backspace Backspace
Backspace  "n" Down Backspace Backspace Backspace  "n" Left
Backspace Backspace Backspace Backspace Backspace Backspace
Backspace  "Soil_5" Right Backspace Backspace Backspace  "n" Down Backspace Back
Left Backspace Backspace Backspace Backspace Backspace Backspace
Backspace  "Soil_50" Right Backspace Backspace Backspace  "n" Down Backspace Bac
Left Backspace Backspace Backspace Backspace Backspace Backspace
Backspace  "Precip" Right Backspace Backspace Backspace  "n" Down Backspace Back
 "A25" Left Backspace Backspace Backspace Backspace Backspace
Backspace Backspace  "Comments" Down Backspace Backspace Backspace
Backspace Backspace Backspace Backspace  "Id" Right Backspace Backspace Backspac
 "n" Menu {DO-IT!}

if ISTABLE("problems") then
        edit "problems"
        wait table
                prompt"Imported records with problems.","Edit (ALT F5) and press
        until "F2"
```



This routine allows newly acquired climate data stored in the table CLIMNEW to inserted into the the main climate database table CLIMARCH.

The file must have been copied onto the active directory since no path definition exists for this option

```
;********* Routine for appending new records to main database ************


tab1 = "climarch"
tab2 = "climnew"
view tab2

x = 1
while not atlast()
        @10,30
        ?? "Processing record ",x
        moveto tab2
        moveto record x
        copytoarray A
        coedit tab1
        moveto record x
        copyfromarray A
        appendarray A
        do_it!
        y = [date]
        z = [id]
        x = x + 1
        moveto tab2
        moveto record x
        y1 = [date]
        z1 = [id]

        while y = y1 and z = z1
                        x = x + 1
                        moveto record x
                        y1 = [date]
                        z1 = [id]
                        loop
        endwhile

endwhile
```



Create 1-2-3, Quattro, dBase, and ASCII files

This menu option will produce the desired file types (1-2-3,Quattro, dBase, and ASCII) from the queried table CLIMATE1. Only results from the last query will be exported.

Extract Report Graph Look Edit Import/Export Process Leave

FILE EXPORT ROUTINE

Note: File will contain the records derived from the last query

Enter the file name to which the data will be exported
(Do not enter the extension) filename

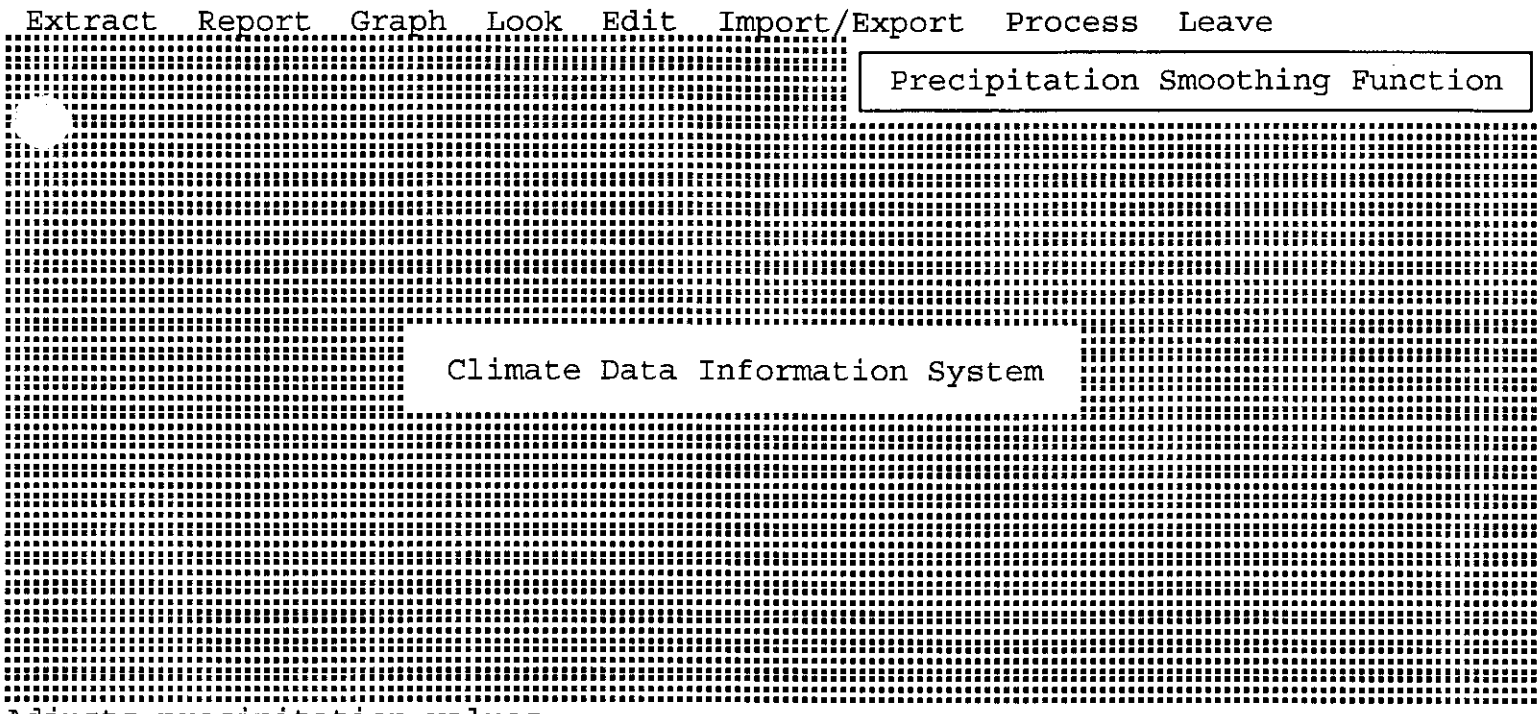
Enter the type of file you want to create
Your choices are as follows: 1-2-3, Quattro, dBase, or ASCII:
(Type the choice EXACTLY as shown) Quattro

This screen displays the export information required to produce an exported file. The file which is created will be saved on the active directory

```
;******* Routine for creating 1-2-3, dBase, Quattro and ASCII files ******

clear
clear
@1,30
?? "FILE EXPORT ROUTINE"
@3,5
?? "Note: File will contain the records derived from the last query"

@6,5
?? "Enter a file name to which the data will be exported"
@7,5
?? "(Do not enter the extension) "

Accept "A8"  to newfile



showmenu
        "1-2-3": "Exports to Lotus .wk1 file",
        "dBase":"Exports to dBase .dbf file",
        "Quattro":"Exports to Quattro .wq1 file",
        "ASCII": "Exports to ascii flat file"
        default "Quattro"
to filetype



@16,25
?? "Proceeding with the export..."

publish table = "climate1"
exportfile = newfile

{Tools} {ExportImport} {Export}
SELECT  filetype


switch
        case filetype = "Quattro":
                newfile = newfile + ".wq1"
                {2) Quattro Pro}
        case filetype = "1-2-3":
                newfile = newfile + ".wk1"
                {2) 1-2-3 Release 2}
        case filetype = "dBase":
                newfile = newfile + ".dbf"
                {2) dBase III}
        case filetype = "ASCII":
                newfile = newfile + ".asc"
                {Delimited}
endswitch
```

```
if isfile(newfile) then
        clear
        @10,10
        ??"File name already exists, Replace(R) or Cancel operation(C)? "
        Accept "A1" to canned
        if canned = "R" or canned = "r" then
                run "erase " + newfile
        else
                @12,10
                quit "Export terminated"
        endif
endif


SELECT pdxtable
SELECT newfile




clear

@10,30
??"Export completed"
```

PROCESS



This menu choice runs the program which determines the differences between the accumulating precipitation values, and eliminates all negative values.

The function also adjusts the precipitation values for those stations served by tipping buckets.

```
;****** Routine for adjusting and deriving the daily precip. values ******


view "climnew"
x = 1
y = nrecords("climnew")

while not atlast()

           ratio = x/y
           percent = (x/y)*100
           location = int((ratio * 50) + 10)

           @18,location
           ??"",chr(219)

           percent = (x/y)*100

           @15,20
           ??"Percent of processing completed is: ",format ("w10.1",percent)
           style
                @0,0
                @19,10
                ??"++++++++++++++++++++++++++++++++++++++++++++++++++"
                @20,10
                ??"0%        20%       40%       60%       80%       100%"



      edit "climnew"
      @10,20
      ?? "Adjusting precipitation record ", x

      moveto record x
              precip1 = [precip]
              id1 = [id]
      moveto record x+1
              precip2 = [precip]
              id2 = [id]

      if isblank(precip1) or isblank(precip2) then
              moveto record x
              [precip] = 0
              x = x + 1
              do_it!
              loop
      endif

      if precip2 - precip1 <= -30 then
              moveto record x
              [precip] = 0
```

```
                do_it!
                x = x + 1
                loop
        endif

        if id2 - id1 = 0 then
                precipf = precip2 - precip1
        else
                precipf = 0
        endif

        moveto record x

        if precipf < 0 then
                precipf = 0
        endif

        [precip] = precipf

        do_it!
        x = x + 1

endwhile

x = 1

while not atlast()
        @10,5
        ?? "Adjusting tipping bucket precip., checking record ", x
        moveto record x
        precipx = [precip]

        if isblank(precipx) then
                x = x + 1
        else
            if ([id] = 6 or [id] = 7 or [id] = 8 or [id] = 12 or [id] = 13
               or [id] = 14 or [id] = 15) then
               [precip] = [precip] * 0.2
               x = x + 1
            else
               x = x + 1
            endif
        endif
endwhile
do_it!
```