NOAA Western Region Computer Programs and Problems NWS WRCP No. 61

A SYSTEM OF COLLECTING RAWS DATA FOR DISSEMINATION OVER AFOS

Dennis D. Gettman

WSO Medford

January 1991

U.S. DEPARTMENT OF COMMERCE / National Oceanic and Atmospheric Administration / National Weather Service

PREFACE

This Western Region publication series is a subset of our Technical Memorandum series. This series will be devoted exclusively to the exchange of information on and documentation of computer programs and related subjects. This series was initiated because it did not seem appropriate to publish computer program papers as Technical Memoranda; yet, we wanted to share this type of information with all Western Region forecasters in a systematic way. Another reason was our concern that in the developing AFOS-era there would be unnecessary and wasteful duplication of effort in writing computer programs in National Weather Service (NWS). Documentation and exchange of ideas and programs envisioned in this series hopefully will reduce such duplication. We also believe that by publishing the programming work of our forecasters, we will stimulate others to use these programs or develop their own programs to take advantage of the computing capabilities AFOS makes available.

We solicit computer-oriented papers and computer programs from forecasters for us to publish in this series. Simple and short programs should not be prejudged as unsuitable.

The great potential of the AFOS-era is strongly related to local computer facilities permitting meteorologists to practice in a more scientific environment. It is our hope that this series will help in developing this potential into reality.

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1 Standardized Format for Computer Series. Revised January 1984. (PB85 109668)
2 AFOS Crop and Soil Information Report Programs. Kenneth B. Mielke, July 1979. (PB85 110419)
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36 Soaring Forecast Program. D.S. Toronto and G. R. Lussky, Revised March 1986. (PB86 173523/AS)
37 Program to Work Up Climatic Summary Weather Service Forms (F-6, F-52). Peter G. Mueller, August 1982. (PB85 109866)
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53 DATACOL - AFOSPLOT Program. Donald P. Laurine and Timothy K. Helble, February 1986. (PB86 161866/AS)
54 Hemispheric Spectral Analysis Program. Craig C. Peterson, April 1986. (PB 183662/AS)
55 Convective Cross Section Analysis. Timothy W. Barker, June 1987. (PB87 204566)
56 SWELL Program. Craig C. Peterson, August 1987. (PB87 229795/AS)
57 Watchdog Program. William R. Schneider and Craig C. Peterson, October 1988. (PB89 122535/AS)
58 Daily Climate Summary for MAPSO. Joe L. Johnston, August 1989. (PB89 230841/AS)
59 SEAPLOT. Bob Diaz and Steve Todd, December 1989. (PB90 151333/AS)
60 NWWS Product Retransmission Program. William R. Schneider, March 1990. (PB90 199092/AS)

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A SYSTEM OF COLLECTING RAWS DATA FOR TRANSMISSION OVER AFOS

Dennis D. Gettman
WSO Medford

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UNITED STATES
DEPARTMENT OF COMMERCE
Robert A. Mosbacher, Secretary

National Oceanic and
Atmospheric Administration
John A. Knauss, Under Secretary and Administrator

National Weather Service
Elbert W. Friday, Jr., Assistant Administrator for Weather Services

This publication has been reviewed and is approved for publication by Scientific Services Division, Western Region

Ken Mielke

Kenneth B. Mielke, Chief
Scientific Services Division
Salt Lake City, Utah

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A SYSTEM OF COLLECTING RAWS DATA FOR DISSEMINATION OVER AFOS

Dennis D. Gettman - WSO Medford

I. SUMMARY

Medford recently implemented a new PC-based system of collecting, processing, and storing RAWS data for dissemination to AFOS. RAWS data are accessed via the Forest Service's AFFIRMS computer network. SAO's are accessed via AFOS, and a database of both RAWS and SAO observations is maintained by the PC. Software developed as part of this program is used to create plotfiles and AMOS-type RAWS observations which are transmitted into AFOS.

II. ENVIRONMENT

The system software was written in Microsoft C and compiled to run under DOS on an IBM PC-XT or compatible. The PC must be equipped with a modem and a hard disk is recommended. An AFOS dial-in port must be available to access SAO data.

III. SOFTWARE COMPONENTS

Four programs were written as part of this system. In addition, MIRROR II was chosen to accomplish the communication tasks required. An explanation of the four programs and how they interface with MIRROR II follows.

PLTBATCH.EXE

This program has several responsibilities which include maintaining a database of observations, determining the RAWS and SAO data that needs to be requested, and creating a MIRROR script file that will accomplish the collection, processing, and dissemination of the data.

PLTBATCH begins by reading a command line argument that specifies the name of the last file that will be incorporated into the MIRROR script file it creates. This is necessary to provide some flexibility in the output portion of the system. If no arguments are provided, the filename AUTOFILE.DAT is assumed. This last file will be discussed later.

Next, PLTBATCH obtains the system time. The PC this system runs on must be set to GMT time for the software to work properly. The file SDATA (station data) is then opened. Line 1 of the SDATA file contains the Julian date and time of the last system run, the number of hours of data to be maintained in the system's database, and the number of hours of data that were captured the last time the system ran. This information is used by PLTBATCH to either create a custom database, (if no OBS.DAT file exists) or to update the OBS.DAT database file. Updating is accomplished by purging the observations that fall outside the time limits established by the line 1 entry, thereby creating room for the receipt of new observations. PLTBATCH proceeds to read the remaining lines of the SDATA file. Each additional line contains the name of a station, followed by information pertaining to that station. From the station information, PLTBATCH determines which stations in the SDATA file need to be requested. Only RAWS platform transmit times are examined here, since SAO data are available every hour.

Having done this, the software is ready to compose the MIRROR script file PLOT.XTS that will run the system. The disk file COMMS.INI is copied as the first entry in the script file. COMMS.INI contains the MIRROR commands that will dial AFFIRMS, log on, and reach the "R-COMMAND:" state. PLTBATCH then writes the "DSPW" request lines for the RAWS platforms that need to be updated, to the script file. Next, the COMMS.TFR disk file is copied to PLOT.XTS. COMMS.TFR contains the MIRROR commands to log off AFFIRMS and to log on to AFOS. AFOS SAO data are downloaded to the PC in the form of plotfiles. Thus, after copying COMMS.TFR, PLTBATCH writes the "ZCZC REQ" lines needed to capture plotfiles, to PLOT.XTS. COMMS.END is then copied to the script file. The COMMS.END file contains the commands to log off AFOS.

The user is expected to create the three "COMMS" files, since the communication procedures will differ from station to station.

PLTBATCH then writes to PLOT.XTS, the MIRROR "RUN" commands that initiate the decoding software. PLTBATCH provides the decoder with the type and name of the file to be decoded as runline arguments.

Finally, the PLTBATCH runline argument file (or AUTOFILE.DAT) is copied to PLOT.XTS. This file, as with the "COMMS" files, is created by the user. This file determines how the data will be formatted and sent to AFOS. The user has two formatting choices. He/she can invoke the RAWSOB program and create a file of AMOS-type RAWS observations, or he/she can invoke the PFGEN program and create AFOS compatible plotfiles. The user, using MIRROR commands, makes the choices in this last file and then provides the commands to log on to AFOS, download the processed data, and log off AFOS.

DECOD.EXE

This program has the dual responsibilities of decoding the RAWS and SAO observations, and of storing them in the database file OBS.DAT. Two runline arguments are required by the program, the file type, and the name of the file to be decoded. Currently, the software has two file types defined. Type "S" files are AFOS plotfiles of SAO data. Type "R" files are files containing the 24 hour skid of RAWS data obtained from AFFIRMS using the "DSPW" command. Additional file types may be added, in the future, to make the decoder more versatile.

The second runline argument, the name of the file containing the data, is self-evident. A runline such as DECOD R RAWS.1 would tell the decoder that the RAWS data in the file RAWS.1 was to be decoded and stored in the database.

In the process of decoding, DECOD converts humidity to dew point, (for RAWS data) and dew point to humidity (for SAO data). In this way, both humidity and dew point are available for all station types. If the "R-VALUE" switch is set in the SDATA file for a station, DECOD will attempt to compute a sea-level pressure for the station. All data are stored with reference to GMT time.

PFGEN.EXE

PFGEN is a versatile AFOS plotfile generator. Runline arguments, in a form similar to AFOS command line switches, are used to determine the nature of the output plotfile.

Two switches are used to control the date and time of the plotfile. The "/D" switch is preceded by the Julian date of the plotfile produced. If this number is negative, the number is subtracted from the current Julian date. The "/H" switch is preceded by the hour of the output plotfile. If these two switches are missing, the output plotfile defaults to the current date and time.

The last two switches are used to provide the program with filenames. The "/O" switch is preceded by the AFOS key that the plotfile will be stored under. Only three characters are required here, as NMCPLT is assumed to be the first six characters in the plotfile name. If this switch is missing, NMCPLTSAO is assumed. The "/F" is preceded by the name of the plot model file used to create the plotfile. If this switch is missing, the program will abort.

Any number of switches may be entered on a single runline with the software reading them left to right. Each time the "/F" switch is encountered, a plotfile is produced. In this way, several plotfiles can be produced by running PFGEN just once. This is important because PFGEN's output file, containing one or more plotfiles, is always named PLOTFILE. Every time PFGEN is run, the output file should be shipped to AFOS since it will be overwritten when PFGEN is run again.

The runline PFGEN -1/D 23/H fwo/O mod1/F fwp/O mod2/F informs the software to create two plotfiles. Both plotfiles contain yesterday's 2300Z data. The first file will be stored in AFOS as NMCPLTFWO, and the plot model file mod1.pm will control the selection and arrangement of the data. The second file will be stored in AFOS as NMCPLTFWP. The plot model file mod2.pm will govern the selection and arrangement of data in the plot.

The plot model file deserves some explanation. This is a user-created ASCII file whose filename always has the extension .pm . The file has two sections. Section one contains the station exclusion data. All references made in this section pertain to the station information listed in the SDATA file. Stations can be excluded from the plotfile if the item number and string that follows matches the entry in the SDATA file for that station and item number. For example, if the plot model entry is 5/623, the software is instructed to look at the fifth item in the SDATA file. This is the station's zone number. If the station's zone number is 623, the station is excluded from the plotfile. Up to 50 exclusions are allowed per plot model file. The exclusions may be entered one per line or several, separated by a space on a line. The indicator for the end of the exclusion section is $$. This indicator must be on a line by itself.

The second section of the plot model file contains the information on the type and arrangement of data in the plot file. Several switches are used in this section. The "/D" switch is preceded by the item number of the data to be included in the plot. Each observed weather item has been assigned a number as listed below:

Item Number	Type of Data
1	Station Name
2	Sky Condition
3	Weather
4	Sea-Level Pressure
5	Temperature

6	Dew Point
7	Humidity
8	Wind Direction
9	Wind Speed
10	Fuel Temperature
11	Bias Voltage
12	10-Hour Fuel Moisture
13	Precipitation

An entry of 5/D would instruct the software to include temperature in the plotfile.

The "/H" switch is used to specify the number of hours of observations that will be scanned. The beginning of this time window is the plotfile time given PFGEN as a runline argument (or its default, the current time). If you enter 6/H and the plot file time is 1200Z, then the observations from 0600Z to 1200Z will be scanned. The reason for this switch will become apparent soon.

The "/T" switch is used to specify the type of operation you want done on the data. There are four possible choices here. The entry d/T will cause the software to compute the difference between the value of the data item at the beginning of the time window and the value of the data item at the end of the time window. Thus, with the switches set to 6/H d/T, the software would compute the 6-hour change in the temperature. Another option is to choose h/T. This causes the software to scan the time window and find the highest value of the data item. The l/T option is similar, causing the software to scan the time window for the lowest value of the item. The last option is o/T. This causes the software to find the value of the item at time PLOTFILE TIME minus TIME ENTERED WITH THE /H SWITCH. For a plotfile of the current data, the "/H" switch should be set to zero.

The final switch is "/P". The entry preceding this switch determines the plotfile position of the output data item. The entry 9/P would cause an item to be entered in the ninth position in the plot line. This is the position that SAODEC.SV places the temperature. You can use this switch to arrange the plotted data around the station circle. This switch must be the last one entered for a data item in the plot model file.

The following default settings have been established for the various switches and are in effect if the switch is not used.

Switch	Default Setting
/D	-1
/H	0
/T	0

RAWSOB.EXE

This program reads the database file OBS.DAT and outputs a file of RAWS observations in an AMOS-type format. All the logic necessary to output only new RAWS data are contained in the program. Thus, not every RAWS station is output each time the program is run. Only data for stations that reported since the last system run is output. RAWSOB reads the SDATA file and checks the second character of the MISC entry for each station.

If this character is set to "S" and the station type is set to "R", AMOS-type observations are formatted for the station. The AFOS key is assembled by combining RAWSAO with the station name, as found in the SDATA file. The data file RAWSOBS is used to store the formatted observations. This file is then shipped to AFOS. You must ensure that the various RAWSAOXXX keys have been added to your AFOS database.

IV. SYSTEM SETUP PROCEDURES

The installation of this system is somewhat complicated since it requires coordination between the PC and AFOS. The setup procedures have been divided into two parts, system setup on AFOS and system setup on the PC.

AFOS Setup Procedures

1. Add the following keys to the database:

   NMCPLTFW1
   NMCPLTFW2
   NMCPLTFW3

2. Create the following three macros:

   PF1.MC ---> SAODEC/I/Z 02/B XX/C Q/P
   RENAME NMCPLTSAO NMCPLTFW1
   SAODEC/I/Z 02/B XX/C Q/P

   PF2.MC ---> RENAME NMCPLTSAO NMCPLTFW2

   PF3.MC ---> SAODEC/I/Z 02/B XX/C Q/P
   RENAME NMCPLTSAO NMCPLTFW3

3. Make the following entries in your WATCHDOG time schedule file WDTIME:

   D 0012 03 9 PF1
   D 0112 03 9 PF2
   D 0212 03 9 PF3

4. Add the various RAWSAOXXX, NMCPLTXXX, and NMCGPHXXX keys to your database for receipt of the products generated at the PC.

5. At your discretion, create the macros that convert the plotfiles received from the PC to graphics and add the macros to your WATCHDOG product receipt schedule file WDSCHD.

PC Setup Procedures

1. Create the ASCII file COMMS.INI using the EDLIN editor. This MIRROR script file contains the commands needed to log-on to AFFIRMS and reach the point where AFFIRMS displays "R-COMMAND:". A sample of the COMMS.INI file used in Medford follows.

```
wait timeout 300
fk c1 1
nu 773-7601
```

```
do svcs
fk c9 LON_RAWS
do logon
wa string 'R-COMMAND:'
```

2. Create the ASCII file COMMS.TFR using the EDLIN editor. This MIRROR script file contains the commands needed to log-off AFFIRMS and to log-on to AFOS. A sample of the COMMS.TFR file used in Medford follows.

```
fk c9 LOF_RAWS
do logoff
fk c1 9
do svcs
do logon
```

3. Create the ASCII file COMMS.END using the EDLIN editor. This MIRROR script file contains the commands needed to log-off AFOS. A sample of the COMMS.END file used in Medford follows.

```
wa delay 10
fk c9 LOF_AFOS
do logoff
```

4. Create the ASCII file AUTOPLT.DAT using the EDLIN editor. This MIRROR script file is the default file used to output data to AFOS if no runline argument is specified with PLTBATCH.EXE. A sample of the file used in Medford follows. This sample causes three plotfiles to be generated and sent to AFOS.

```
run pfgen SA1/o mod1/f SA2/o mod2/f SA3/o mod3/f
fk c1 9
do svcs
do logon
fk c1 plot
fk c3 plotfile
do send
fk c9 LOF_AFOS
do logoff
quit
```

Create other files like AUTOPLT.DAT as need to customize the processing and downloading of data to AFOS.

5. Create the various ASCII plot model files using the EDLIN editor. These are the files that control the data items included in the plotfile as well as the arrangement of the data items around the station circle. A sample of one of Medford's .pm (plot model) files follows. This sample contains no exclusions.

```
$$
4/p 1/d 7/p 24/h l/t 5/d 8/p 24/h h/t 5/d 9/p 24/h h/t 7/d
12/p 24/h l/t 12/d 15/p 24/h l/t 7/d
```

6. Create the ASCII station directory file (SDATA) using the EDLIN editor. Line 1 of this file contains the information needed to create a custom database. Each of the four entries on line 1 is separated from the next by a space, and the end of line 1 is denoted by a comma at column 23. Entry 1 is the current Julian date. Entry 2 is the current hour GMT. Entry 3 is the number of hours of data that will be stored in the OBS.DAT file. Entry 4 is the number of hours since the system was last run. Initially, this entry should be set equal to entry 3.

   33 20 36 12

   An example of a line 1 entry is listed above. This entry shows that the Julian date is 33 and the hour (GMT) is 20. The database will contain 36 hours of observations for each of the stations listed in the SDATA file. The system was last run 12 hours ago.

   The remaining lines of the SDATA file contain information on each of the stations for which data will be collected. One line of information is given for each station. Each line is organized as follows:

Data	Position	Remarks
Station Name	Col 1 - 3	Entries must be listed in alphabetical order
I.D. Number	Col 5 - 12	RAWS platform ID or any entry for NWS stations
X-Location	Col 14 - 17	X-Pixel location of the station on AFOS MBG
Y-Location	Col 19 - 22	Y-Pixel location of the station on AFOS MBG
Zone Number	Col 24 - 26	Fire Weather Zone the station is located in Station elevation (feet)
Elevation	Col 28 - 31	
Station Type	Col 33	R = RAWS, S = SAO
Time Zone	Col 35 - 37	Conversion for observation time to GMT (RAWS obs are in LST unlike SAO's)
R-Value	Col 39	Have R-values been computed for station? Y=yes N=no
Aspect	Col 41	Topographical location: V=valley M=midslope R=ridge
Zoom	Col 43	Zoom setting for station: 0=1:1 1=4:1 and so on

Xmit Time	Col 45	Always 0 for NWS stations For RAWS stations... 1 = xmit time 23Z - 00Z 2 = xmit time 00Z - 01Z 3 = xmit time 01Z - 02Z
Miscellaneous	Col 47 - 50	Generally = MMMM - If first character of this group is set to S and stn type = R, formatted RAWS obs will be sent to AFOS

A portion of the SDATA file from Medford is shown below:

```
33 20 36 12
3S2 00000001 0579 1109 604 0195 S 000 Y V 0 0 MMMM
4BK 00000002 0201 0133 618 0080 S 000 N V 0 0 MMMM
4LW 00000003 1114 0158 625 4728 S 000 N V 0 0 MMMM
AGE 326202DC 0248 0286 619 0150 R 008 N V 0 1 SMMM
ALD 3245E2F4 1744 1428 633 4500 R 008 N V 0 2 MMMM
```

7. Create the MIRROR .XTK files to run the system with a single command, using the EDLIN editor. A sample of the PLOT12.XTK file used in Medford is shown below. The filename argument supplied to PLTBATCH is one of the files created in step 4.

```
run PLTBATCH autoplt.12
do PLOT.XTS
```

8. Copy the files PLTBATCH.EXE, DECOD.EXE, PFGEN.EXE, RAWSOB.EXE, and COMMS.STP into the directory where the MIRROR files reside. The files you created above should reside in this directory as well.

V. GENERAL COMMENTS AND CAUTIONS

This software is designed to run in conjunction with the SCHD "autoscheduler" software. Running in this mode, RAWS and SAO data can be requested, processed, and downloaded, at specified times without any operator intervention. This can result in higher AFFIRMS charges though, and the user should be aware of this.

When downloading RAWS formatted observations into AFOS, you must allow some time to elapse between products. AFOS is brought to its knees when it has to store more than 3 or 4 products in a few seconds. The problem is alleviated by using the "line wait" option of MIRROR. Set the line wait to 3 tenths of a second with the following command:

```
lw 3
```

This solution has worked satisfactorily in Medford.

PLTBATCH.EXE

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: PLTBATCH.EXE

PURPOSE: This program maintains the database of observations and creates the MIRROR script file that requests, processes, and downloads the data.

PROGRAM INFORMATION:

Development Programmer:
Dennis D. Gettman
Location: WSO Medford
Phone: FTS 424-4303
System: IBM PC-XT or compatible
Language: Microsoft C
Program Creation Date: 12/07/89
Running Time: About 2 minutes for 150 stations
Disk Space: 32536 bytes

Maintenance:
Dennis D. Gettman
WSO Medford
FTS 424-4303

PROGRAM REQUIREMENTS:

Program Files	Location	Use	Comments
PLTBATCH.EXE	Directory on Hard Disk	EXE	Main Program
AUTOFILE.DAT	"		MIRROR Script file containing data formatting and downloading commands
SDATA	"	R/W	Station Directory file
COMMS.STP	"	R	MIRROR Script file that terminates communication if system has already run that hour
COMMS.INI	"	R	MIRROR Script file that initiates communication with AFFIRMS
COMMS.TFR	"	R	MIRROR Script file that transfers communication from AFFIRMS to AFOS
COMMS.END	"	R	MIRROR Script file that ends communication with AFOS
OBS.DAT	"	R/W	Database file. If missing, the program will create this file.
PLOT.XTS	"	W	MIRROR Script file created by PLTBATCH

Note: AUTOFILE.DAT is the default formatting and downloading file. You may provide PLTBATCH with another filename as a runline argument and that file will control the formatting and downloading of the data.

PROGRAM INSTALLATION:

It is assumed that the user has installed the MIRROR communication software in a directory on the hard disk.

1. Copy PLTBATCH.EXE and COMMS.STP into the directory containing the MIRROR software on the hard disk.

2. Using the EDLIN editor, create SDATA, COMMS.INI, COMMS.TFR, and COMMS.END. These files should reside in the directory containing the MIRROR software on the hard disk.

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: PLTBATCH.EXE

PROGRAM EXECUTION:

From the directory containing the MIRROR software and these program files type:

PLTBATCH FILENAME.EXT <return>

FILENAME.EXT represents the MIRROR script file containing processing and downloading instructions. It may be any valid filename. If no filename is given, the filename AUTOFILE.DAT is assumed.

ERROR CONDITIONS:

The following errors are defined by the program:

ERROR MESSAGE	MEANING
SDATA file is missing	The SDATA file was not found by the software. The user must create this file.
Format Error - Header Line	Line 1 in the SDATA file was formatted improperly. Check the number of entries on this line. Ensure that the entries are separated by one space.
Plotfiles already run	Attempt was made to run the program twice in the same hour. Program can only be run once. New hour begins at HH+15.
DB Error - Too many stations	Software will accept no more than 200 stations in the SDATA file.
DB Error - no stations	No stations were found in the SDATA file.
COMMS.INI file missing	The COMMS.INI file was not found by the software. The user must create this file.
COMMS.TFR file missing	The COMMS.TFR file was not found by the software. The user must create this file.
COMMS.END file missing	The COMMS.END file was not found by the software. The user must create this file.

DECOD.EXE

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: DECOD.EXE

PURPOSE: This program decodes RAWS data receive from AFFIRMS using the DSPW request form, and SAO plotfile data received from AFOS. The decoded data are databased in the OBS.DAT file.

PROGRAM INFORMATION:

Development Programmer:
Dennis D. Gettman
Location: WSO Medford
Phone: FTS 424-4303

Maintenance:
Dennis D. Gettman
WSO Medford
FTS 424-4303

System: IBM PC-XT or compatible
Language: Microsoft C
Program Creation Date: 2/02/90
Running Time: About 1 second for each 1500 bytes of data.
Disk Space: 45680 bytes

PROGRAM REQUIREMENTS:

Program Files	Location	Use	Comments
DECOD.EXE	Directory on Hard Disk	EXE	Main Program
SDATA	"	R/W	Station Directory file
OBS.DAT	"	R/W	Observation database file

PROGRAM INSTALLATION:

It is assumed that the user has installed the MIRROR communication software in a directory on the hard disk.

1. Copy DECOD.EXE into the directory containing the MIRROR software on the hard disk.

2. Using the EDLIN editor, create the SDATA file. This file should reside in the directory containing the MIRROR software on the hard disk.

3. Ensure that the program PLTBATCH.EXE resides in this directory.

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: DECOD.EXE

PROGRAM EXECUTION:

From the directory containing the MIRROR software and this program file, type:

DECOD X FILENAME.EXT <return>

X represents the type of data that will be decoded, either "R" for RAWS data, or "S" for SAO plotfile data. FILENAME.EXT is the name of the file containing the data.

ERROR CONDITIONS:

The following errors are defined by the program:

ERROR MESSAGE	MEANING
SDATA file is missing	The SDATA file was not found by the software. The user must create this file.
Format Error - Header Line	Line 1 in the SDATA file was formatted improperly. Check the number of entries on this line. Ensure that the entries are separated by one space.
Insufficient runline arguments	The must be 2 runline arguments supplied to the program, data type and data filename.
RAWS OB file missing	No file was found by the software having the name given on the runline.
AFOS plotfile missing	No file was found by the software having the name given on the runline.
Unknown observation type	The data type given on the runline was not "R" or "S".

PFGEN.EXE

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: PFGEN.EXE

PURPOSE: This program reads the database of observations and creates customized AFOS plotfiles.

PROGRAM INFORMATION:

Development Programmer:
Dennis D. Gettman
Location: WSO Medford
Phone: FTS 424-4303

Maintenance:
Dennis D. Gettman
WSO Medford
FTS 424-4303

System: IBM PC-XT or compatible
Language: Microsoft C
Program Creation Date: 12/07/89
Running Time: About 10 seconds for a plotfile of 100 stations.
Disk Space: 42586 bytes

PROGRAM REQUIREMENTS:

Program Files	Location	Use	Comments
PFGEN.EXE	Directory on Hard Disk	EXE	Main Program
SDATA	"	R/W	Station Directory file
OBS.DAT	"	R/W	Observation database file
XXXX.PM	"	R	Plot Model files used by PFGEN to create custom plotfiles
PLOTFILE	"	W	Output file containing AFOS plotfile(s)

PROGRAM INSTALLATION:

It is assumed that the user has installed the MIRROR communication software in a directory on the hard disk.

1. Copy PFGEN.EXE into the directory containing the MIRROR software on the hard disk.

2. Using the EDLIN editor, create the SDATA file. This file should reside in the directory containing the MIRROR software on the hard disk.

3. Ensure that the programs PLTBATCH.EXE and DECOD.EXE reside in this directory.

4. Using the EDLIN editor, create one or more plot model files. The files must be named with .pm as their extension.

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: PFGEN.EXE

PROGRAM EXECUTION:

From the directory containing the MIRROR software and this program file, type:

PFGEN [JD/D] [HR/H] [XXX/O] MODEL/F <return>

Optional switches are shown in brackets and may appear in any order on the runline. The /F switch must be entered and be the last switch in the group. Additional groups may be entered on a single runline to produce a file a two or more AFOS plotfiles. Switch definitions and their defaults are given below.

Switch	Definition	Default
/D	Julian Date (if a negative value is entered, the value is subtracted from the current date)	Current Date
/H	Hour	Current Hour
/O	AFOS plotfile name (only the XXX)	NMCPLTSAO
/F	Plot Model filename (without the .pm extension)	No default

ERROR CONDITIONS:

The following errors are defined by the program:

ERROR MESSAGE	MEANING
SDATA file is missing	The SDATA file was not found by the software. The user must create this file.
Format Error - Header Line	Line 1 in the SDATA file was formatted improperly. Check the number of entries on this line. Ensure that the entries are separated by one space.
OBS.DAT file missing	The database file OBS.DAT was not found by the software.

RAWSOB.EXE

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: RAWSOB.EXE

PURPOSE: This program reads the database of observations and outputs formatted RAWS observations for entry into AFOS.

PROGRAM INFORMATION:

Development Programmer:
Dennis D. Gettman
Location: WSO Medford
Phone: FTS 424-4303

Maintenance:
Dennis D. Gettman
WSO Medford
FTS 424-4303

System: IBM PC-XT or compatible
Language: Microsoft C
Program Creation Date: 2/02/90
Running Time: About 5 seconds for 120 observations
Disk Space: 36596 bytes

PROGRAM REQUIREMENTS:

Program Files	Location	Use	Comments
RAWSOB.EXE	Directory on Hard Disk	EXE	Main Program
SDATA	"	R/W	Station Directory file
OBS.DAT	"	R/W	Observation database file
RAWSOBS	"	W	Output file of formatted RAWS observations

PROGRAM INSTALLATION:

It is assumed that the user has installed the MIRROR communication software in a directory on the hard disk.

1. Copy RAWSOB.EXE into the directory containing the MIRROR software on the hard disk.

2. Using the EDLIN editor, create the SDATA file. This file should reside in the directory containing the MIRROR software on the hard disk. Edit the SDATA file placing an "S" in column 47 of each RAWS station entry for which you want formatted observations.

3. Ensure that the programs PLTBATCH.EXE and DECOD.EXE reside on this directory.

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: RAWSOB.EXE

PROGRAM EXECUTION:

From the directory containing the MIRROR software and this program file, type:

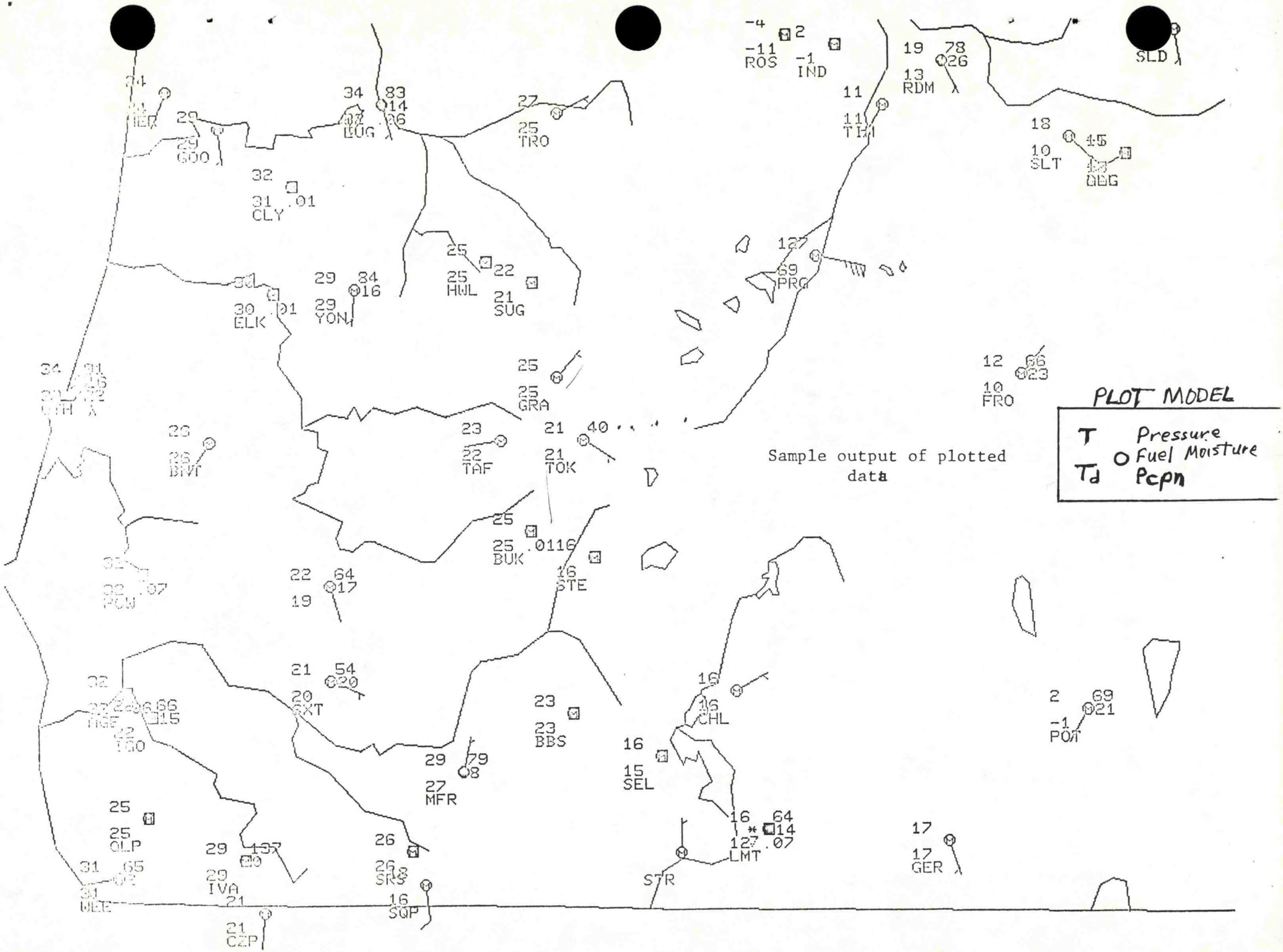
RAWSOB <return>

The software will look at each station in the SDATA file. If the first character of the "Miscellaneous Data" group is set to "S" and the station type is "R", formatted obs will be produced.

ERROR CONDITIONS:

The following errors are defined by the program:

ERROR MESSAGE	MEANING
SDATA file is missing	The SDATA file was not found by the software. The user must create this file.
Format Error - Header Line	Line 1 in the SDATA file was formatted improperly. Check the number of entries on this line. Ensure that the entries are separated by one space.
OBS.DAT file missing	The database file OBS.DAT was not found by the software.


-4
2
-11
ROS
-1
IND
19
78
26
13
RDM
SLD
11
11
TIM
18
10
SLT
45
GGG
34
34
HEN
29
29
GOO
34
83
14
26
LOG
27
25
TRO
32
31
.01
CLY
25
25
22
HWL
21
SUG
29
84
16
29
YON
34
30
.01
ELK
12
69
PRG
25
25
GRA
12
66
23
10
FRO
34
34
16
32
GTH
26
26
DVT
23
22
TAF
21
40
21
TOK
PLOT MODEL
T Pressure
O Fuel Moisture
Td Pcpn
Sample output of plotted data
25
25
.01
16
BUK
16
STE
22
64
17
19
32
32
.07
PDX
21
54
20
20
SXT
32
32
26
66
15
TGE
42
TGO
23
23
BBS
16
16
CHL
2
69
21
-1
POT
29
79
8
27
MFR
16
15
SEL
25
25
OLP
29
137
00
29
IVA
21
26
26
8
SRS
16
SQP
16
64
14
127
.07
LMT
17
17
GER
31
65
31
MEE
21
21
CZP
STR

```
ETTAA00 KMFR 180011
SQP 1500 RAWS 18/16/1711/MMM  RH 92 FM 27 VOLT 13.2 PCPN  7.38
SQP 1400 RAWS 18/16/1712/MMM  RH 93 FM 27 VOLT 13.2 PCPN  7.38
SQP 1300 RAWS 18/17/1911/MMM  RH 96 FM 26 VOLT 13.2 PCPN  7.38
RAWSAOAGE
TTAA00 KMFR 171529
AGE 1500 RAWS 32/32/0800/MMM  RH 100 FM 36 VOLT 12.8 PCPN  5.86
AGE 1400 RAWS 32/32/0400/MMM  RH 100 FM 36 VOLT 12.8 PCPN  5.86
AGE 1300 RAWS 32/32/1401/MMM  RH 100 FM 35 VOLT 12.8 PCPN  5.86
RAWSAOIVA
TTAA00 KMFR 171529
IVA 1500 RAWS 149/29/29/2500/MMM  RH 100 FM 40 VOLT 12.8 PCPN  8.20
IVA 1400 RAWS 137/29/29/0500/MMM  RH 100 FM 40 VOLT 12.8 PCPN  8.20
IVA 1300 RAWS 136/30/30/0600/MMM  RH 100 FM 39 VOLT 12.8 PCPN  8.20
RAWSAOCAL
TTAA00 KMFR 170150
CAL 0000 RAWS 20/18/0911/MMM  RH 90 FM 26 VOLT 14.0 PCPN  2.02
CAL 2300 RAWS 22/20/1108/MMM  RH 91 FM 27 VOLT 13.9 PCPN  2.02
CAL 2200 RAWS 22/21/1305/MMM  RH 96 FM 29 VOLT 14.1 PCPN  2.02
```

Sample output from the RAWSOB program

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