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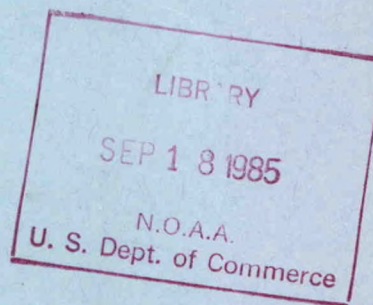
NOAA Eastern Region Computer Programs
and Problems NWS ERCP - No. 24 (Revised)



WXR
(Version 3.00)

Harold Opitz
Ohio River Forecast Center
Cincinnati, Ohio

Scientific Services Division
Eastern Region Headquarters
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The Eastern Region Computer Programs and Problems (ERCP) series is a subset of the Eastern Region Technical Memorandum series. It will serve as the vehicle for the transfer of information about fully documented AFOS application programs. The format ERCP - No. 1 will serve as the model for future issuances in this series.

- 1 An AFOS version of the Flash Flood Checklist. Cynthia M. Scott, March 1981. (PB81 211252).
- 2 An AFOS Applications Program to Compute Three-Hourly Stream Stages. Alan P. Blackburn, September 1981. (PB82 156886).
- 3 PUPPY (AFOS Hydrologic Data Reporting Program). Daniel P. Provost, December 1981. (PB82 199720).
- 4 Special Search Computer Program. Alan P. Blackburn, April 1982. (PB83 175455).
- 5 Conversion of ALEMBIC\$ Workbins. Alan P. Blackburn, October 1982. (PB83 138313).
- 6 Real-Time Quality Control of SAOs. John A. Billet, January 1983. (PB83 166082).
- 7 Automated Hourly Weather Collective from HRR Data Input. Lawrence Cedrone, January 1983. (PB83 167122).
- 8 Decoders for FRH, FTJ and FD Products. Cynthia M. Scott, February 1983. (PB83 176057).
- 9 Stability Analysis Program. Hugh M. Stone, March 1983. (PB83 197947).
- 10 Help for AFOS Message Comp. Alan P. Blackburn, May 1983. (PB83 213561).
- 11 Stability and Other Parameters from the First Transmission RAOB Data. Charles D. Little, May 1983. (PB83 220475).
- 12 TERR, PERR, and BIGC: Three Programs to Compute Verification Statistics. Matthew R. Peroutka, August 1983. (PB84 127521).
- 13 Decoder for Manually Digitized Radar Observations. Matthew R. Peroutka, June 1983. (PB84 127539).
- 14 Slick and Quick Data Entry for AFOS Era Verification (AEV) Program. Alan P. Blackburn, December 1983. (PB84 138726).
- 15 MDR--Processing Manually Digitized Radar Observations. Matthew R. Peroutka, November 1983. (PB84 161462) (Revised June 1985, PB85-220580/A).
- 16 RAMP: Stability Analysis Program. Hugh M. Stone, February 1984. (PB84 1614).
- 17 ZONES. Gerald G. Rigdon, March 1984. (PB84 174325).
- 18 Automated Analysis of Upper Air Soundings to Specify Precipitation Type. Joseph R. Bocchieri and Gerald G. Rigdon, March 1984. (PB84 174333).

(Continued on Inside Rear Cover)

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I. General Information

A. Summary

WXR is a hydrologic weather wire and PLT product software package which manipulates decoded SHEF hydrologic data according to runtime command line options. WXR coordinates execution with various master format parameter files. The master format parameter files contain the actual output format for specific weather wire products and are assembled during an initial setup phase. Multiple master files may be assembled for various output formats. The operator decides, via command line input, which file(s) WXR will use.

WXR will also create, at the operator's option, an intermediate PLT product. The PMOD package can then be used to transform this into a graphic product displayable on an AFOS GDM.

WXR uses two other programs. The initial setup phase is performed by NET.SV, a dictionary/database utility program that will assemble and alphabetize station information into an RDOS disk file. The information contained in this NET.DT file is designed for use by WXR, however, it may be useful for other programs as well. After WXR assembles an RDOS disk file containing any specified AFOS SHEF-coded product(s) it invokes WXRPARSHEF, the S/230 version of the standard SHEF decoder (see Appendix A). Output from the SHEF decoder is a binary file, SHEFOUT, containing the decoded SHEF data. Optionally, a conversion routine is available should it be desirable to examine the contents of the binary file.

Each program has a complex command line with several processing options. Probably the best approach for routine use is to construct a macro.

B. Environment

All of these programs are written in Data General FORTRAN IV for the Eclipse S/230. They will run either in foreground or background (depending on the installation).

C. References

Bonnin, G. M. and R. S. Cox, Jr., 1983: An Explanation of the Standard Hydrologic Exchange Format (SHEF) and its Implementation in the Central Region. NOAA Technical Memorandum NWS CR-67, NOAA, U. S. Department of Commerce.

Bonnin, G. M., 1983: The Posting of SHEF Data to the RFC Gateway Data Base. NOAA Technical Memorandum NWS CR-68, NOAA, U. S. Department of Commerce.

Bonnin, G. M., 1984: The Standard SHEF Decoder 1.1. NOAA Technical Memorandum NWS CR-72, NOAA, U. S. Department of Commerce.

Leader, David C., 1983: DATACOL Rev. 7.20.

MacDonald, A. E., 1981: AFOS Graphics Creation from FORTRAN. NWS Western Region Computer Programs and Problems NWS WRCP No. 18, NOAA, U. S. Department of Commerce.

National Weather Service, 1983: PMOD Plotting Package for AFOS. NOAA AFOS Operating Division Computer Programs NWS AOD CP 83-1, NOAA, U. S. Department of Commerce.

National Weather Service, 1982: Standard Hydrologic Exchange Format (SHEF) Version 1 (Working Draft 1.1). Unpublished manuscript, Northwest River Forecast Center, National Weather Service, NOAA, Department of Commerce.

Opitz, Harold H., 1984: WXR. NWS Eastern Region Computer Programs and Problems NWS ERCP #24, NOAA, U. S. Department of Commerce.

II. Application

A. NET

When initially setting up the WXR package, NET is run first to create a station information file called NET.DT. The file contains the station call letters, the station name, the latitude and longitude

and the zoom setting for the stations whose data WXR will use. Subsequently, NET may be used to add or delete station entries from an existing NET.DT file.

The raw station data may be input to NET either in an AFOS product or an RDOS file created with one of the editors. The operator indicates which to use via a command line switch.

The add and delete options are independent of each other: one may not add and delete simultaneously. The add function will add and alphabetize the specified station information to a currently existent NET.DT file (if one does not exist, NET will create one). The delete function will only work on a current NET.DT file.

NET will always create a NET.DT backup file, NET.BU. The operator may save the backup file in the event of anticipated add/delete/duplication errors (duplicate entries in the input cause NET to terminate). NET also creates various intermediate scratch files. All scratch and backup files may be saved via runtime options. However, by default, NET deletes all scratch and backup files when it is finished.

NET makes use of the following modules:

- INTHVG - interval-halving routine
- ALBT - alphabetizing routine by numeric index
- FPREP - file preparation routine (Used extensively when an AFOS product is to be used as input, checks for parameter consistency. AFOS retrieval routine PLLDATA dumps data to this module.)
- PLLDATA - AFOS database retrieval routine (writes product to an RDOS disk file)
- GAFOS - Front end to PLLDATA
- WRADD - Add routine
- WRDEL - Delete routine

B. WXR

In version 3.00, the program WXR has two main functions. The first is to collect any specified AFOS products into an RDOS file (SHEFIN) and optionally invoke the SHEF decoder (in previous versions

of the package the program NSEEK performed these functions). Current, previous and multiple versions of AFOS products may be accessed, and several different products may be combined into one file. There are no size and structure restrictions on AFOS products. The SHEF decoder, WXRPARSHEF.SV, utilizes SHEFIN as input and returns the decoded data in binary form to file SHEFOUT.

The second function is creating the desired hydrologic weather wire and/or PLT products from the decoded data in SHEFOUT or the WXR database file WXR.TD. WXR 3.0 will utilize these SHEF station/data attributes from SHEFOUT:

- station call letters (maximum 8 characters)
- observation date and time (month, day, year and hour; no minutes or seconds)
- revision code (stations containing duplicate physical element code attributes must have the SHEF revision code set in order for WXR to 're-store' the new data value)
- 5 of the 7 physical element attribute codes (PEDTSEP) as follows:

PE OF PEDTSEP

Two character physical element code. All the recognized two character codes are utilized by WXR, including the additions of:

'NM' for specifying a station name output (20 characters)

'CL' for specifying a station call letter output (8 characters)

'XW/A' for specifying present weather alphanumeric output (12 characters)

D OF PEDTSEP

Duration. All valid duration codes are utilized by WXR 3.0 including exceptions and default values.

T OF PEDTSEP

Type codes. 'R' type data is specifically used by WXR. All other type data may also be utilized but are only differentiated by the fact that they are not 'R' type. That

is to say, SHEF TYPES 'C', 'F', 'H', and 'P' are the same to WXR Version 3.00.

E OF PEDTSEP

Extrema as applied to send codes.

(For further inquiries about SHEF data attributes, defaults and exceptions, reference the SHEF Manual, Version I Working Draft 1.1, NOAA, NWRFC, Portland, Oregon and the SHEF Technical Memos CR-67 and CR-72.)

The following are WXR module descriptions. The main module only opens the overlay file and loads the executive routine, EXCTV.

- EXCTV - WXR executive routine; controls logical program path
- RDCLI - Command line reader and processor

AFOS Product Retrieval/SHEF Decoder Modules

- NSEEK - Command line reader and AFOS product retrieval executive
- NSEK1 - File maintenance module
- NSEK2 - Extracts and processes products from the AFOS database.

WXR Weather Wire Processing Modules

- WXRT - Holds the program revision number.
- DATIM - (main) Date and time processor
- CTIM - (support) Translates system time to "local" time.
- CDATF - (support) Translates the system zulu date forward according to the input reference hour/date and the "+" window range (max 24 hours).

- CDATB - (support) Translates the system zulu date backward according to the input reference hour/date and the "-" window range (max 24 hours).
- CDAY - (support) Computes a numerical day of week.
- RJUL - (support) Computes an absolute Julian date according to date/time.
- FORM1 - Translates the ASCII duration character to a valid duration integer number, will also search inherent program default SHEF duration table, if needed.
- FORM2 - Converts the SHEF two character physical element, duration character, and SHEF type character into a 16-bit integer word.
- IRANG - Checks range of integer variable (D. LEADER, SCRFC)
- LDBS - "Databases" the SHEFOUT file without processing any Weather Wire or plot products.
- INTHV - WXR interval halving routine
- WXSYN - Overlay labeled common module holding the 100 12-character present weather ASCII conversions.
- LTRS - Reads and processes the call letters from a '.STATION COMMAND'.
- WRMSG - Posts 'DATA UNAVAILABLE' message.
- REOCT - Converts single/double precision real numbers to an unpacked, reversed ASCII character stack.
- C24HR - Locates and produces time-change data value computations.
- PILLL - Posts the AFOS product key (CCCNXX), addressee (AAA), and WMO header characters in a '.PIL' command. Optionally, will establish an RDOS file from a given RDOS filename in a '.PIL FILE' command.
- PILL2 - (support) Establishes the RDOS file requested in

PILL module.

- MAOPN - WXR file maintenance module
- TAFOS - Posts the AFOS product ETX and stores file in the AFOS database.
- UPDTE - Updates the WXR database file 'WXR.TD'.
- WRCOM - Processes both '.COMMENT' and '.COMMENT DATE' commands.
- LDSHF - Loads the SHEFOUT file onto WXR's data stacks.
- LDYES - Loads the WXR data stacks from the WXR.TD database file.
- LDDUR - Computes a duration stack pointer from the integer duration values read from the SHEFOUT file.
- WRWXR - Data value output posting routine. Also decides the column sectoring options for data value output (default is one column, maximum is 9).
- LDNET - Opens and loads the NET.DT file.
- FORMT - Processes the '.FORMAT' command.

WXR PLT processing modules

- WXPLT - PLT processing and posting module
- PLACE - (support) Character posting module for WXPLT
- WXFIL - File maintenance module for PLT products
- LLCVT - Latitude/longitude/zoom reader module
- CART - Latitude and longitude pixel convert module

D. Machine Requirements

WXR requires a minimum of 31K words of core. The program files together take up 207 blocks of disk space (NET.SV - 40 blocks - does not have to reside on the disk for routine use). Space requirements

for data files will vary with the application. A NET.DT file for 53 stations took up 4 blocks. The format parameter files and .PM files for the plotfiles are all relatively small.

WXR's run times will also vary with the amount of data it is to process.

WXR uses an overlay file. NET and WXR allow 25 channels to be open.

E. Structure of Software

See Figures 1-2 for flowcharts.

F. Database

Raw input to NET can be stored in any RDOS file (filename up to 18 characters long) or AFOS product as long as the data is in the proper format (see Section III A). One dictionary/database file and three backup/scratch files are used by NET when manipulating station information. They are:

NET.DT - the end result, a database/dictionary station information file. It contains station call letters, alphanumeric station names, station latitude and longitude and a zoom level for plot purposes. Each record is 39 bytes in length terminated by a carriage return (15K). Maximum characters allowed are:

call letters	8 (minimum 1)
alphanumeric name	20 (not contiguous characters)
latitude	4 (whole degrees and minutes)
longitude	5 (" " " ")
zoom	1 (0,1,2,3,4)
<hr/> total	<hr/> 39 (plus carriage return 15K)

NET.BU - Backup file of original NET.DT created during the add or delete process. Deleted unless the global X or global S switch is used.

NET.SC - Scratch file.

NET.TM - Scratch file for CCCNNXXX or FILENAME/F.

```

.MAIN
:
:----> GAFOS
:      :----> PLLDATA
:
:
:
:
:----> WRADD
:      :----> FPREP
:      :----> ALBT
:      :----> INTW
:
:
:----> WRDEL
:      :----> INTW

```

Figure 1. NET Software Structure

```

.MAIN  >OPENS DISK OVERLAY FILE (WXR.OL)
:      >LOADS EXECUTIVE MODULE (EXCTV)
:      >CONTAINS THE UNLABELED STACK ALLOCATIONS
EXCTV
:----> ROCLI
:      :----> DATIN
:      :      :----> CTIM
:      :      :----> CDAT
:      :      :----> CDATB
:
:
:      :----> LDBS
:
:      :----> NET.SV (FCHAN)
:
:
:----> MSEEK
:      :----> WXPARSHEF.SV (SWAP)
:      :----> MSEEK2
:      :----> MSEEK3
:
:
:----> WXPLT
:      :----> LDNET
:      :----> LDSHF
:      :      :----> LDYES
:      :      :----> LDDUR
:      :      :----> FORM2
:
:
:      :----> UPDTE
:      :----> PLACE
:      :----> WXFIL
:      :----> LLCVT
:      :      :----> CART
:
:
:      :----> PLTHB
:
:
:----> PILL
:      :----> PILL2
:
:
:      =
:----> WRCON
:      :----> IRANG
:
:
:----> FORMT
:      :----> FORM1
:      :----> FORM2
:
:
:----> LTRS
:      :----> LDNET
:      :----> LDSHF
:      :      :----> LDYES
:      :      :----> LDDUR
:      :      :----> FORM2
:      :      :----> CDATF
:      :      :      :----> R.JUL
:      :      :      :
:      :      :----> CDATB
:      :      :      :----> R.JUL
:
:
:      :----> WRWXR
:      :----> REDCT
:      :----> C24HR
:      :----> WXSYN
:
:----> MAGPH
:
:----> TAFOS
:
:----> UPDTE

```

Figure 2. WXR Software Structure

Input to the WXR SHEF decoder functions is the AFOS product(s) which may be specified in the run line. The following files are used:

SHEFIN - This ASCII file contains the assembled AFOS products and is the input file for the SHEF decoder.

SHEFOUT - The SHEF decoder, WXRPARSHEF.SV sends decoded SHEF data to this file. SHEFOUT is a binary data file.

SHEF.ER - All data that has passed through the SHEF decoder is passed to this file including all SHEF errors. This is the actual SHEF error file.

SHEFOUT.D - This is a AFOS ADM displayable file (formerly OUT.DT) containing the ASCII output of the binary data in SHEFOUT. Allows the operator to visually scan the contents of SHEFOUT.

SHEFPARM - This is a utility file for the SHEF decoder.

The following is a listing of all the various files (mandatory and optional) utilized by WXR to produce Weather Wire and PLT products:

NET.DT - An alphabetical master database file containing all station information.

SHEFOUT - The binary output file from the SHEF decoder. WXR will read SHEFOUT to obtain all SHEF data for the current run.

WXR.* - The asterisk template represents any single ASCII character, i.e., WXR.A, WXR.1, or WXR.8. This is the format parameter file.

WXR.TD - Used in conjunction with global /C switch. All data values on the data stacks during execution are stored in this file prior to termination for use at a later time. The file holds data pointers, the actual SHEF packed physical element code attributes and their associated data values.

WXR.99 - A temporary intermediate output file for weather wire products stored into the AFOS database via the FSTORE library module. This scratch file is deleted when storage is completed.

WXR.PL - Same as WXR.99 except it holds PLT data for AFOS storage.

III. Procedures

A. NET

1. Initiation of program

NET will not be used routinely, only when a NET.DT file must be created or altered. NET.SV is invoked by the following command line:

```
WXR/N/A/D/S/X CCCNNXXX (or) FILENAME/F
```

Where the global switches imply:

- /N Utilize NET.SV functions (mandatory)
- /A Add the stations found in CCCNNXXX or FILENAME to NET.DT. If NET.DT doesn't exist, build a NET.DT file.
- /D Delete the stations in CCCNNXXX or FILENAME from the current NET.DT file.
- /S Do not delete the NET.BU backup file. (Used with /A or D)
- /X Save all temporary, scratch and backup files utilized by NET.SV (used with /A or /D). This is helpful in determining any errors encountered during NET execution.

CCCNNXXX is the AFOS product containing the raw station data. If an RDOS file is used instead, FILENAME is the name of the RDOS file. FILENAME can be up to 19 characters long.

2. Input Required

The user can enter the information for the stations whose data is to be used in the weather wire or PLT products either via message comp or one of the RDOS file editors. NET can handle up to 500 station entries. The product/file should conform to the following format:

-the first line must begin with .START

-each station entry takes up one line (72 character max).
All character fields must entered. (If a field is not completely filled by the information, pad with blanks.)
Each field entry must be separated by at least one space.

The character fields are as follows:

STATION CALL LETTERS: Maximum 8 characters. No embedded blanks.

ALPHANUMERIC NAME: Maximum 20 characters, blanks may be used. It is recommended that the station's flood stage be entered here since there is no separate entry for flood stage. (i.e., Louisville, KY 23; where 23 is the flood stage and the "3" resides in the last portion of the alphanumeric field (position 20). Refer to Figure 3.)

LATITUDE: Maximum 4 characters. Enter degrees and minutes with no decimal (45 degrees, 24 minutes would be entered 4524).

LONGITUDE: Maximum 5 characters. Enter the same as latitude with no decimals, i.e., 101 degrees, 25 minutes is entered as 10125.

ZOOM: Maximum 1 character that is either 0,1,2,3 or 4. Entries 0-3 display stations at certain zoom settings at the AFOS GDM console. WXR recognizes that certain stations may not need to be plotted, for whatever reason. Therefore, entering a zoom factor greater than 3 will instruct WXR not to post that particular station to the plotfile.

-the last line must be .END.

See Figure 3 for sample input. The same format should be used when adding additional stations to an existing NET.DT file.

When deleting, however, only the station call letters are needed for the station entries. More than one set of call letters can appear on a line, as long as they are separated by a space. ID's more than 8 characters long are ignored, as well as those not matching entries in the current NET.DT. .START and .END must still be used as above. Figure 4 shows sample input for deleting.

CRWRK003
THIS IS A TEST FILE

```

.START
ACR01      ALUM CREEK      FS      0100      85 113      2
ATD01      ATWOOD LAKE    FS      0100      22 246      3
AT401      ATHENS         FS      0000      97 256      1
BCH01      BEACH CITY     FS      0100      48 228      3
BHD01      HARSHA DAM     FS      0100      29 202      2
BOL01      BOLIVAR DAM   FS      0100      98 210      3
BJR01      BURTON        FS      0000      99 199      1
RVL01      BOURNEVILLE FS      0100      91 189      2
CAK        AKRON-CANTON  FS      0100      99 299      3
CCL01      CEASAR CREEK  FS      0100      45 125      2
CCV01      CIRCLEVILLE  FS      0100      92 120      2
CJI01      CAMBRIDGE     FS      0199      92 221      3
CHC01      CHILLOCOTHE   FS      0100      92 179      2
CHM01      CHARLES MILL  FS      0100      93 296      3
CHN01      COSHOCTON     FS      9199      95 253      3
DAY        DAYTON AP     FS      0100      99 199      2
DAY01      JAYTON        FS      0100      25 174      2
FT401      FITCHVILLE   FS      0000      99 199      1
FTJ01      FT JENNINGS   FS      9199      92 110      1
HAM01      HAMILTON      FS      0100      91 184      2
.END

```

Figure 3. Sample input for NET in AFOS product CRWRK003. Comments may be placed after the .END command since the program stops there. This is helpful for future references.

```

.START
CIND1
CAERR5YN
INDI3
EVVI2
.END

```

Figure 4. Sample input for NET to delete station entries from NET.DT.

To change station information, first delete, then re-enter the particular station entry.

3. Output

The output is the file NET.DT. See Figure 5. Error messages from NET appear in Appendix B.

4. Cautions or Restrictions in Program Use

The total number of stations may not exceed 500.

It is mandatory that modifications be performed on a NET.DT itself, not through a link to NET.DT. Link entries will generate a fatal program error.

The add and delete functions (/A and /D) may not be executed simultaneously; this will also produce a fatal program error. The entire station entry must be first deleted and then re-added in order to change station information in a NET.DT database/dictionary file.

Adding duplicate station call letters to the NET.DT file will generate a fatal execution error. If this occurs, the program will re-establish the original contents of the NET.DT file.

B. WXR: AFOS Retrieval and SHEF Decoder Functions (previously NSEEK.SV)

1. Initiation of Functions (see Appendix A)

WXR will collect products from the AFOS database and invoke the SHEF decoder, WXRPARSHEF.SV, to decode them. The WXR command line still requires the global R-switch (/R) to invoke these routines.

```
RUN:WXR/R/A/D/O */V CCCNNXXXX/M */V/T CCCNNXXXX/M CCCNNXXXX/W
```

Global Switches

/R Utilize the AFOS product retrieval and SHEF decoder routines (mandatory switch).

/A Append a CCCNNXXXX to the current SHEFIN disk file.

```

SSSSSSSSAAAAAAAAAAAAAAAAAAAAAAAAAALATILONGIZ
ACR01  ALUM CREEK          FSC100851132
ATD01  ATWOOD LAKE         FSC100222463
ATH01  ATHENS                 FSC000972561
BC401  BEACH CITY             FSC100482283
BH001  HARSHA DAM             FSC100292022
BOLO1  BOLIVAR DAM           FSC100982103
BUR01  BURTON                 FSC000991991
BVL01  BOURNEVILLE         FSC100911992
CAK    AKROY-CANTON          FSC100932993
CCL01  CEASAR CREEK         FSC100431252
CCV01  CIRCLEVILLE         FSC100921202
CDIO1  CAMBRIDGE             FSC919992213
CHCO1  CHILLOCOTHE          FSC100931792
CHM01  CHARLES MILL          FSC100932963
CHV01  CUSHCOTON            FSC919993253
DAY    JAYTON AP             FSC100991992
DAY01  DAYTON                 FSC100251742
FTH01  FITCHVILLE           FSC000991991
FTJ01  FT JENNINGS           FSC9099921101
HAM01  HAMILTON              FSC100911942

```

Figure 5. NET output file NET.DT generated from input in Figure 4 (command line RUN:WXR/N/A CRWWRK003). Notice it is in compressed in order to save disk space. The header line in record 0 specifies field length.

- /D Invoke the SHEF decoder WXRPARSHEF.SV. The SHEF decoder will operate on the current content of file SHEFIN (the input file to the SHEF decoder).
- /O Translate the binary SHEF decoder output file SHEFOUT to an ASCII file, SHEFOUT.D.

All global switches are independent except for the /A switch which should be used in conjunction with a CCCNNNXXX in the command line.

Local Entries and Switches

CCCNXXX (AFOS key entry)

Indicates the AFOS product to retrieve and store in the SHEFIN file (maximum 9 characters).

*/V (specific version entry)

Allows the retrieval of single specific versions of an AFOS product (current versions require no /V entry). The asterisk template denotes a number 1-9 which is the specific AFOS version number: first previous version is 1/V, second previous version is 2/V, and so on, to a maximum 9th previous version.

*/V/T (total versions entry)

Specifies the total number of versions of an AFOS product WXR is to retrieve and place in SHEFIN (always beginning with the current version). The asterisk template denotes a number 2-9: 2/V/T is 2 versions total, the current and first previous version; 4/V/T is 4 versions total, current plus the first, second and third previous versions.

CCCNXXX/M (multiple key delimiter switch)

Primarily used for specifying different multiple AFOS product keys in the command line for WXR retrieval. One may also utilize version requests (/V OR /V/T) for each CCCNNXXX entered. For example, the command line

```
RUN:WXR/R/D 1/V CRWRR1CRW/M 3/V/T NMCRRAOH/M CLERR1CLE
```

tells WXR to retrieve the first previous version of CRWRR1CRW, three total versions of NMCRRAOH beginning with the current version and the current version of CLERR1CLE, assemble all into SHEFIN, and then decode SHEFIN (/D).

/W (program continuation switch)

This special switch is entered only on the last local entry. It specifies that WXR is to continue on to the WXR Weather Wire/Plot Routines after it has completed all the /R (retrieval) functions. The user must therefore place all global and local switches and entries related to the Weather Wire/Plot functions after the /W switch (see section C below for the WXR Weather Wire/Plotfile command line). For example:

```
RUN:WXR/R/D 1/V NMCRRAWV/M 2/V/T SDFRR1SDF/W/P/C DG/F
```

is identical to the following two command lines:

```
RUN:WXR/R/D 1/V NMCRRAWV/M 2/V/T SDFRR1SDF
RUN:WXR/P/C DG/F
```

All local switches are optional to the user.

2. Input Required

WXR will assemble various AFOS products into a file called SHEFIN, which the SHEF decoder (WXRPARSHEF.SV) uses as input. See Figure 6 for an example of the input file SHEFIN.

3. Output

WXRPARSHEF creates a binary file of decoded data called SHEFOUT. Optionally (/O switch) it also produces SHEFOUT.D, an ADM-displayable file used for examining the contents of the SHEFOUT file. See Figure 7 for a sample SHEFOUT.D. Error messages appear in Appendix C.

TTA00 KALB 031244
 HYDROLOGIC OBSERVATIONS
 NATIONAL WEATHER SERVICE ALBANY NY
 DATE: Jul 3 1985 TIME 8:44 AM EDT

```
.B ALB 0703 DH12/PPP/XW/TX/TN/TA/HG/QR/DRH-12/HG/DRH-24/PPP/HG
:IDENT PCPN WX MAX MIN OBS STAGE CFS 7P RVR PYDA RYDA
BOON6 0.00/10/ 74/ 57/ 59/ / / / /
BRIN6 0.00/ 3/ 75/ 62/ 67/ / / / /
ELZN6 0.25/ 3/ 76/ 60/ 63/ / / / /
NWPN6 T / 3/ 75/ 51/ 59/ / / / /
ONTN6 0.00/ 1/ 82/ 58/ 66/ / / / /
ROSN6 0.00/ 5/ / / 70/ / / / /
MORN6 0.07/ 3/ 78/ 61/ 68/ / / / /
STRN6 T / 3/ 74/ 56/ 60/ / / / /
YTNN6 0.09/ 1/ 78/ 60/ 64/ / / / /
EFK 0.05/ 3/ 78/ 61/ 63/ / / / /
COPN6 0.00/ 3/ 78/ 61/ 64/ / / / /
MSS T /60/ 84/ 64/ 66/ / / / /
MSV 0.00/ 3/ 76/ 61/ 61/ / / / /
POU 0.07/10/ 79/ 64/ 66/ / / / /
HPN 0.06/ 2/ / 66/ 69/ / / / /
ISP 0.02/10/ 71/ 64/ 67/ / / / /
ART 0.23/61/ 79/ 64/ 65/ / / / /
HUCV1 0.71/ 2/ / / / / / / 0/
TRYN6 0.00/ 2/ 83/ 68/ 70/ 15.00/ /15.50/ /
```

Figure 6. Example of the SHEFIN file created by WXR.

STA CALL	DATE OF		DATE OF							ATTRIBUTES			PRODUCT		
	DATE OF	OBSERVATION	CREATION	PE	D	TSE	P	QR	SOURCE	I					
BOON6	85 7	312 0	0/ 0 0 0 0 0 0	PP	5004	RZZ	-1.0	0.00	Z0	ALB	0				
BOON6	85 7	312 0	0/ 0 0 0 0 0 0	XW	0	RZZ	-1.0	10.00	Z0	ALB	0				
BOON6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZX	-1.0	74.00	Z0	ALB	0				
BOON6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZN	-1.0	57.00	Z0	ALB	0				
BOON6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZZ	-1.0	59.00	Z0	ALB	0				
BRIN6	85 7	312 0	0/ 0 0 0 0 0 0	PP	5004	RZZ	-1.0	0.00	Z0	ALB	0				
BRIN6	85 7	312 0	0/ 0 0 0 0 0 0	XW	0	RZZ	-1.0	3.00	Z0	ALB	0				
BRIN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZX	-1.0	75.00	Z0	ALB	0				
BRIN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZN	-1.0	62.00	Z0	ALB	0				
BRIN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZZ	-1.0	67.00	Z0	ALB	0				
ELZN6	85 7	312 0	0/ 0 0 0 0 0 0	PP	5004	RZZ	-1.0	0.25	Z0	ALB	0				
ELZN6	85 7	312 0	0/ 0 0 0 0 0 0	XW	0	RZZ	-1.0	3.00	Z0	ALB	0				
ELZN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZX	-1.0	76.00	Z0	ALB	0				
ELZN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZN	-1.0	60.00	Z0	ALB	0				
ELZN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZZ	-1.0	63.00	Z0	ALB	0				
NWPN6	85 7	312 0	0/ 0 0 0 0 0 0	PP	5004	RZZ	-1.0	0.00	Z0	ALB	0				
NWPN6	85 7	312 0	0/ 0 0 0 0 0 0	XW	0	RZZ	-1.0	3.00	Z0	ALB	0				
NWPN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZX	-1.0	75.00	Z0	ALB	0				
NWPN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZN	-1.0	51.00	Z0	ALB	0				
NWPN6	85 7	312 0	0/ 0 0 0 0 0 0	TA	0	RZZ	-1.0	59.00	Z0	ALB	0				

Figure 7. Optional SHEFOUT.D file for ADM display of decoded data.

4. Cautions and Restrictions

The only caution is that WXRPARSHEF.SV and SHEFPARM must be disk resident in order to decode a SHEFIN file. There are no longer any restrictions to input file content, structure or size.

C. WXR: Creating Weather Wire Products/Plotfiles

1. Initiation of Program

Once the collected SHEF data has been decoded, WXR is used to generate the final output products. The WXR 3.0 command line has been expanded to include various new optional entries. There are three types of global switches and seven independent local entries and their associated switches. The globals are data filters, plot instructions and a databasing switch. The data filter switches (A,O,C) may not be used simultaneously since they tell WXR the type of data to load from the decoded SHEFOUT file. The local entries and switches generally change the inherent program defaults and free the user from OEDITing the WXR save file should it be necessary to change the default values. (However, OEDITing is still permitted if the defaults are to be altered semi-permanently. Check the Appendices for program default locations.)

The entire WXR command line is now:

```
RUN:WXR/A/O/C/P/L/B/D [*]/F [*]/C [HH]/O [CCCPLTXXX]/P/F  
[PEDTPEDT]/P/C/S/T/H/D [DIR:PART:FILENAME]/L/N [DIR:PART:FILENAME]/L/D
```

GLOBAL SWITCHES

GLOBAL DATA FILTER SWITCHES

The data filter switches perform the following functions when loading SHEF data onto WXR's data stacks:

- /A WXR will load any data/time/type data. The latest value will be stored if duplicate physical element attributes for a particular station are loaded.
- /O WXR will load any time/type data that has a current observation date equal to the current system date (ZULU).
- /C WXR will load any data value having an observation date/time that is equal to the specified load hour and

current system date or, any data value with an observation date/time that falls within the boundaries of the +/- load hour window relative to the current system date. (See local /O). This switch also instructs WXR to post the runtime data values to a disk database file, WXR.TD, as the last function prior to program termination. This allows WXR to save the current data values for use at any future execution and eliminates the necessity of decoding SHEF encoded products more than once. This is the primary function of the global C-switch. See Appendix H for a further explanation of expanding the use of a database file.

(Technical note: the inherent default load hour is 12 ZULU with a time window of +/- 2 hours. See Appendix G to change any of these values.)

If a global data filter switch is not entered, data values utilized by WXR will be in accordance with the global C-switch without creating/posting to the WXR.TD database file.

GLOBAL PLOT SWITCHES

- /P This switch instructs WXR to create a PLT plotfile after processing all weather wire products.
- /L (used with /P) WXR will create a plotfile only.
- /B (used with /P and /L) WXR will produce a special background plotfile to create a background map. See Appendix F for specific instructions.

'DATABASING' GLOBAL SWITCH

- /D This switch instructs WXR to post the SHEFOUT file to the WXR.TD database file. This switch allows the operator to intermittently post decoded products to the WXR database without producing any Weather Wire or PLT output products. This switch may be used with the local link entries (/L/N and /L/D) and local load time entry (/O).

LOCAL ENTRIES AND SWITCHES

- /F The local F-Switch specifies which format file(s)

to use in creating weather wire products. The character(s) entered in this local entry are the one-character extension(s) of the RDOS format parameter filename(s) WXR.*, where the * is any ASCII character. A maximum of 9 single character arguments are allowed for the local /F switch. (Note: any global entry will be maintained throughout the execution period on all format parameter files.) If the /F switch is not entered, WXR terminates and displays an error message.

For example: If WXR.3 is the resident format parameter file to be used by WXR, the command line would read:

```
RUN:WXR 3/F
```

This instructs WXR to follow the format command found in file WXR.3.

If multiple file processing is necessary, say WXR.3, WXR.4, and WXR.D are all to be used during the same execution of WXR, the command line would read:

```
RUN:WXR 34D/F
```

This would instruct WXR to follow the formats found, in order of entry, in files WXR.3 (first), WXR.4 (second), and WXR.D (third).

/C Column Sectoring: This mode instructs WXR to duplicate a format input the amount of times entered in the /C switch. In other words, WXR will columnize the weather wire product (while adhering to the maximum 72 character positions per line). If the local /C is not used, the default is one sector.

See Figure 8 for one-sector output. The format used in the figure is NM 10 PP 6 HG 6, for a total line length of 22. Figure 9 shows 3-sector output produced using the same format, but with 3/C in the command line. Note that a default of two spaces will always appear between sectors. This must be added into the total field count when computing total line length. For Figure 9, for instance, the line length total is $3*(10+6+6) + (3*2) = 66$ (3 formats) + 6 (3 two-space separators) = 72. Total field width positions, again, must not exceed 72 characters. The maximum number of sectors allowed for output is 9 (when not using the


```

ST. LOUIS      0.00    4.53
MOROCCO       M     0.07
ANDERSON      M     1.24
ANYTOWN US    0.01     M
BUDDLING     0.23   12.23
DOWNTOWN     0.35    6.78
MT. VERNON   0.34     M
LITTLE WAB   1.05    1.00
ENDTOWN MO   M     2.50
-----
THIS IS 1 SECTOR

```

Figure 8. Default (1 sector) output (format) was NM 10 PP6 HG6 for line total of 10+6+6=22).

```

ST. LOUIS      0.00    4.53  ANYTOWN US    0.01     M  MT. VERNON   0.34     M
MOROCCO       M     0.07  BUDDLING I    0.23   12.23  LITTLE WAB   1.05    1.00
ANDERSON      M     1.24  DOWNTOWN     0.35    6.78  ENDTOWN MO   M     2.50
-----XX-----XX-----
          1 SECTOR                    1 SECTOR                    1 SECTOR

```

Figure 9. Three-sector output obtained with same format, but with 3/C in command line. A default of 2 spaces will always appear between sectors; this must be included in the total count for the line.

default). The same rules for valid data output, missing data output and field width/data value truncations apply to column sectoring.

The local /C switch also applies to all output if multiple format parameter files are specified in the command line.

HH/O Change the default ZULU load hour. The inherent default ZULU load hour is 12Z. You must enter two characters including the leading zero if there is one. (For example, 06/O.) Caution must be exercised with this local entry particularly when utilizing a WXR database file so as not to inadvertently mix or override different data values with different observation times (see global C-switch explanation).

CCCNXX/P/F

This allows the operator to change the output AFOS plotfile key via the command line (for example, SDFPLT001/P/F).

PEDT/P/D/T/H/C/S

This set of switches changes the default SHEF physical elements to be posted to the plotfile via the command line. The first four SHEF physical element attributes (PEDT of PEDTSEP) must be entered for each data value with a maximum five plotable values. Also by default, WXR will post the station's call letters, plot symbol, and all data values to the hundredths position to the PLT product. These defaults may also be changed by the inclusion of the following switches:

/P/C do not post the station call letters
/P/S do not post the station plot symbol
/P/H post all data values to the hundredths position
/P/T post all data values to the tenths position
/P/D post all data values to the digits position

For example, PPPRSWIRTAIR/P/C/T would post precipitation, water equivalent of snow and air temperature to the tenths position, but the station call letters would be omitted.

DIR:PART:FILENAME/L/N

This switch will establish a "NET.DT" filename link entry to the specified resolution filename entry. For example, DPØF:NET3.DT/L/N will link NET.DT to NET3.DT on DPØF. Useful for utilizing multiple NET.DT files. WXR will re-establish a new link filename if the NET.DT filename is already a link entry. A program error will result if the NET.DT filename is the current resolution file or if any/all directories (DIR) and/or partitions (PART) are not initialized prior to program execution.

DIR:PART:FILENAME/L/D (See Appendix H)

This switch will perform the same functions as above except it will establish a "WXR.TD" link entry to a specified WXR database file. For example, DPØF:WXR18.TD/L/D would link WXR.TD to WXR18.TD on DPØF. Useful with multiple NET.DT files and their associated databases or in establishing different WXR.TD files containing their own unique load-hour data values (see the global C-switch explanation).

2. Input Required

Besides the actual decoded data in the file SHEFOUT, WXR requires at least one format parameter file to indicate how you want the weather wire products formatted. These files may be created either on the ADM (M:F/) or any of the RDOS text editors. The names of the files must be WXR.*, where * is any single ASCII character (for example, WXR.A). Thus a number of different parameter files can be created to accomodate different weather wire products.

There are now six formatting commands used in these format parameter files: .PIL, .COMMENT, .FORMAT, .STATION, .END and .KILL (first line only). All formatting commands must begin with a period (56K) in column 1 followed by the appropriate command. Subsequent line(s) are information lines which contain the information to be processed. Each line in a format parameter file is allowed a maximum of 72 characters; anything beyond position 72 is ignored. Following is an explanation of each command and its associated information line(s). Refer to Figure 1Ø for a sample format file.

```

.PIL
CLERVACLE CLE RWRA RWUS
.COMMENT DATE
NATIONAL WEATHER SERVICE CLEVELAND OHIO
PRECIPITATION AND GAUGE HEIGHT
12Z DATA FOR MO/DO/YO
STATION      PREC  STAGE
.FORMAT
NM 10 PP 7 HG 8
.STATION
NVL13 STR01 FTJ01
FDY DEF01 OFC01 WTV01 TOL WDV01 UPS01
TF01 FT01 H0001
COL01 CCV01 WAS01
CHC01 BVL01 PKT01 MLF01 BHD01
.COMMENT

```

THIS IS ANOTHER COMMENT LINE USING THE SAME HEADER

```

STATION      PCPN  STAGE
.STATION
CJB01 SPR01
DAY
EAT01
HAM01
CCLO1 MAS01 CNG01 MSRC1 MFD  MFD01
.END
ANYTHING AFTER THE .END COMMAND MAY BE A COMMENT OR REFERENCE

```

Figure 10. Sample format parameter file.

```

.COMMENT DATE
NATIONAL WEATHER SERVICE CINCINNATI OH
STAGE DATA FOR D3, THE 01RD OF M3
12Z DATA FOR M1/D1/YO
.FORMAT (NEXT SUBSEQUENT COMMAND)
:
ETC.

```

WOULD OUTPUT THE FOLLOWING:

```

(BLANK LINE)
NATIONAL WEATHER SERVICE CINCINNATI OH
STAGE DATA FOR FRIDAY, THE 3RD OF FEBRUARY
(BLANK LINE)
12Z DATA FOR 2/ 3/84

```

Figure 11. Example of .COMMENT DATE command and its results. All the two-character letter combinations have been converted to data representations. (BLANK LINE for illustrative purposes only.)

.PIL

.PIL
CCCNNNXXX AAA WMOHEADING (DDHHMM)

The .PIL line determines where the completed weather wire product should be stored (CCCNNNXXX) and the proper addressee (AAA). These two parameters are mandatory. Optional character sets following the CCCNNNXXX and AAA are considered WMO headings. After reading the last set of characters, WXR will append a date/time group (DDHHMM) to the end of the header line. A date/time group will not be appended if only CCCNNNXXX and AAA are entered. In Figure 10, the output product is CLERVACLE and the addressee is CLE. The RWRA RWUS will be used as the WMO heading with a date/time group appended.

.PIL FILE

.PIL FILE
DIR:PART:FILENAME.EX

This alternate command indicates that the completed product will be stored in an RDOS file (FILENAME.EX) and not the AFOS database. The directory (DIR) and partition (PART) entries are optional. The maximum characters allowed is 19.

.COMMENT

The .COMMENT command will perform a literal read and write of the subsequent information lines to the output file until it encounters another format command. The .COMMENT command is intended to allow headings and/or comments to be printed as is to the output. Hence, a blank line will be printed as a blank line, etc.

.COMMENT DATE

This command will perform exactly as the .COMMENT command, but the following word DATE will initiate a date routine. WXR will substitute for the listed character combinations in the information line(s) the appropriate form of the date or time. See Figure 11.

In these examples, the reference date/time is Friday, August 5, 1985, 12:34 ZULU (Eastern Standard Time) and the runtime load hour is 23 ZULU.

M0...08	D0...05	Y0...85	T0....12 (ZULU HOUR)
M1... 8	D1... 5	Y1...1985	T1....23 (REF LOAD HOUR)
M2...AUG	D2...MON		T2.... 7 (LOCAL HOUR)
M3...AUGUST	D3...MONDAY		T3....34 (MINUTES)
			T4....AM/PM/Z ACCORDINGLY

The "T4" will post the appropriate single character "Z" for ZULU or two character ante- or post-meridian specifier depending on the previously listed two character hour (T0 or T1). For example:

```

T0T4 WILL POST 12Z
T1T4 WILL POST 23Z
T0:T3 T4 WILL POST 12:34 Z
T2:T3 T4 WILL POST 7:34 AM

```

.FORMAT

.FORMAT

```

NM 15 PPR 5 PP 4 HG 6 HG/C 4
HPIRRZZ 6
HPIRRZZ/C/T 4
TAIR/D 5 TAIRZX/D 5 TAIRZNX 5 XW/A 5 CL 5

```

The .FORMAT command specifies the placement of data values to the output file or AFOS product. The .FORMAT command may contain multiple information lines.

This command will support the full 7 character SHEF code (PEDTSEP) and default values according to the manual of "Standard Hydrologic Exchange Format (SHEF), Version I Working Draft 1.1, NOAA, National Weather Service, Northwest River Forecast Center, Portland Oregon and "The Standard SHEF Decoder Version 1.1", NOAA, National Weather Service, Geoffrey M. Bonnin, MBRFC, Kansas City, MO. One should pay particular attention to the following tables listed in the aforementioned manuals -

- TABLE 2 (SHEF SEND CODE TRANSLATIONS)
- TABLE 3 (SHEF ALPHA-CHARACTER DURATION CODES)
- TABLE 4 (STANDARD DEFAULT PARAMETER CODE KEY AND EXCEPTIONS TO STANDARD DURATION DEFAULT KEY)
- TABLE 11A (DURATION CODE VARIABLE SPECIFIER)
- TABLE 11B (DURATION CODE VARIABLE SPECIFIER UNITS)

The format entries have been expanded to a maximum of 20 7-character entries plus their associated switches and field widths. Maximum character total per line is 72. There are three reserved

two-character parameters and five parameter switch-posting options explicitly used by WXR Version 3.0. They are:

"NM" to be used with station name output. This parameter is no longer mandatory and, if used, does not need to be the first entry of an information line. Maximum characters available for station name is 20 characters. Field width is left-justified and unlimited to the extent of the maximum 72 character line length.

"CL" to be used for station call letter output. Maximum characters available is 8. Field width is left-justified and unlimited to the extent of the maximum 72 character line length.

"XW/A" ASCII character posting of the present weather SHEF code as defined in Appendix A of the previously mentioned SHEF Working Draft manual. Maximum characters available is 12. Field width is left-justified and unlimited to the extent of the maximum 72 character line length.

The switches have the following functions:

- /C This switch instructs WXR to perform a time change computation for the corresponding SHEF element. Must be used with the global /C.
- /D Instructs WXR to perform a data value truncation to the digits position. A value of 24.45 will be written as 24.
- /T Instructs WXR to perform a data value truncation to the tenths position. A value of 24.45 will be written as 24.4.
- /H Instructs WXR to post a data value to the hundredths position and is also the data value posting default.

Missing data values are posted as single character "M" and trace data values are written as single character "T" by WXR Version 3.0. These values and characters are not affected by the format switch posting options. Data values greater than the specified field widths are flagged to the operator via the output console. Program execution will continue while WXR will attempt to place as many characters as possible into the allotted field width. Unintentional character truncation due to a field width that is too small may be avoided by specifying a width large enough for the largest anticipated data

value. The previously mentioned special two-character reserved parameters will not generate any console operator errors or warnings.

.STATION

.STATION

```
ALBR3 NMRF5 INDI3 EVVI3 YU199 EVVMO OHI34 I88 CVG IND  
SSS67 CAERR56 STLI4 CAEPR123 ...
```

The .STATION command determines the order of station output for the weather wire product according to the last .FORMAT command. Only the station call letters corresponding to the appropriate station in the NET.DT file need be entered. Station sequence is determined sequentially from left to right, then top to bottom. This type of sequencing allows for changes/additions/deletions to station order rather easily. A minimum of 1 character and a maximum of 8 are allowed for the station call letters.

Call letters entered under a .STATION command not identified in the NET.DT file are ignored. Character sets over 8 characters in length are also ignored and flagged to the operator at the console while execution continues. A total of 500 sets of call letters may be entered per .STATION command.

Entering all possible stations under a .STATION command does not imply output for every station. WXR will only write the wanted station information and data values under the following conditions:

- the station call letters are in the current NET.DT file
- there is at least 1 valid decoded data value for the station in SHEFOUT that matches at least one valid element in the last encountered .FORMAT line (Subsequent allocated data fields which are unmatched are left blank. There is no padding of unmatched data fields and unnecessary characters in the output data line are eliminated.)

The words "DATA UNAVAILABLE" are printed to the output file if WXR cannot match at least one valid station with at least one valid element (from the last .FORMAT line) in any .STATION listing.

.END

The .END command terminates data processing for a particular format parameter file and initiates AFOS storage. This command must

be coordinated with the standard .PIL command (AFOS product key and optional WMO headings).

.END KILL

This command terminates data processing for a particular format parameter file. This command will not initiate AFOS database storage and may be used with either the .PIL or .PIL FILE commands.

.KILL

This command terminates data processing for a particular format parameter file. This command will not initiate AFOS database storage and is intended to be used with the .PIL FILE command pertaining to RDOS data file posting.

Points on constructing a format parameter file:

-Format files must be named WXR.*, where * is any single ASCII character.

-WXR will ignore any lines in any format parameter file until it encounters the first format command line (a period in the first column followed by one of the five commands previously mentioned).

-The first format command should be either .PIL or .PIL FILE. The last format command is determined by the first:

first command	last command
.PIL	.END or .END KILL
.PIL FILE	.KILL or .END KILL

-At least one .FORMAT command must be entered before encountering the first .STATION command. When processing multiple format parameter files, each file must contain at least one .FORMAT command. Otherwise, WXR will not know how to place the data values to the output file.

-Multiple .FORMAT commands may be entered into any format parameter file. WXR will use and maintain the latest specified .FORMAT line throughout the entire execution process unless changed in the file by another .FORMAT command.

-The two-character "NM", "CL" or "XW/A" and their associated field widths may be entered anywhere in a format information line. Field

width is unlimited to the extent of the maximum 72 character line length.

-A maximum of 20 7-character SHEF parameters and their associated field widths are allowed in a .FORMAT command.

3. Output

Figure 12 shows a sample weather wire product produced according to the format parameter file in Figure 10.

If the user directs WXR to create a plotfile (with the /P and/or /L switch), a plotfile is produced according to the following default parameters (these will have to be tailored to individual sites, see Appendix E for instructions):

-default key and address: NMCPLTCIN, 000

-default SHEF elements to be plotted (in order)

1. PPPP (REAL)
2. HGIR (REAL)
3. SDIR (INTEGER) 10 IS THE MAXIMUM ALLOWED
4. SWIR (INTEGER)
5. TAIR (INTEGER)

-default call letters: written as they appear in NET.DT.

-default station symbol: overcast symbol

A sample plotfile appears in Figure 13 along with an explanation of each entry. The PMOD plotting package (see References, I C) can be used to convert the WXR plotfile to graphic form. A plot model offset file, WXP.PM, is supplied with the WXR Version 3.00 package. Figures 14 and 15 show graphics created using WXP.PM. Note that the graphic title contains a sample station model indicating the positions of whatever data elements are being plotted. (WXP.PM only accomodates the 5 default SHEF elements. If others are added, a new .PM file will have to be generated.)

4. Cautions and Restrictions

Extensive error checking facilities have been incorporated into WXR. Processing errors are corrected during execution unless proven

CLERVACLE
RWRA RWJS 031900

NATIONAL WEATHER SERVICE CLEVELAND OHIO

12Z DATA FOR 2/ 3/84

STATION	PREC	STAGE
NEWVILLE	M	9.45
STRYKER O	0.01	4.53
FINDLAY	0.02	2.38
TIFFIN OH	0.23	0.90
PIKETON	0.45	12.45
MILFORD	1.03	

THIS IS ANOTHER COMMENT LINE USING THE SAME INFORMATION AS BEFORE

STATION	PREC	STAGE
CJ BROWN	0.00	888.45
DAYTON OH	0.01	54.32
MASJN OHIO	M	M

Figure 12. Sample weather wire output after executing WXR using the format parameter file in Figure 11. All stations from the parameter file were not included, probably due to unreported data (check SHEFOUT.D). Many variations of format parameter files may be constructed for different users.

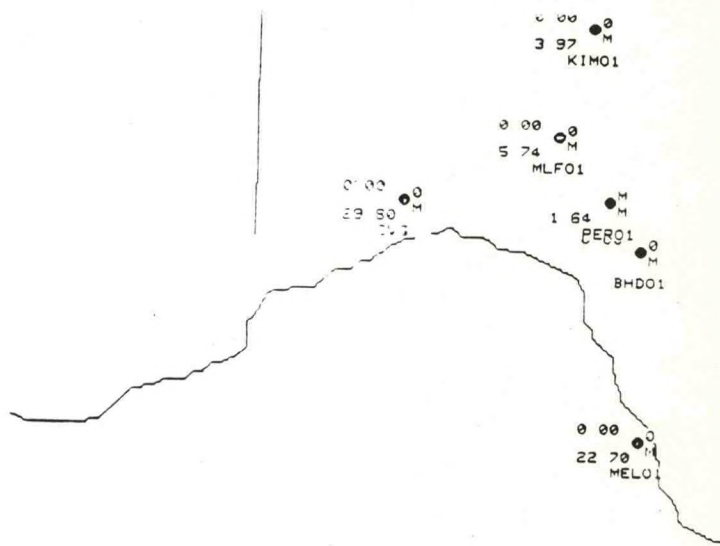
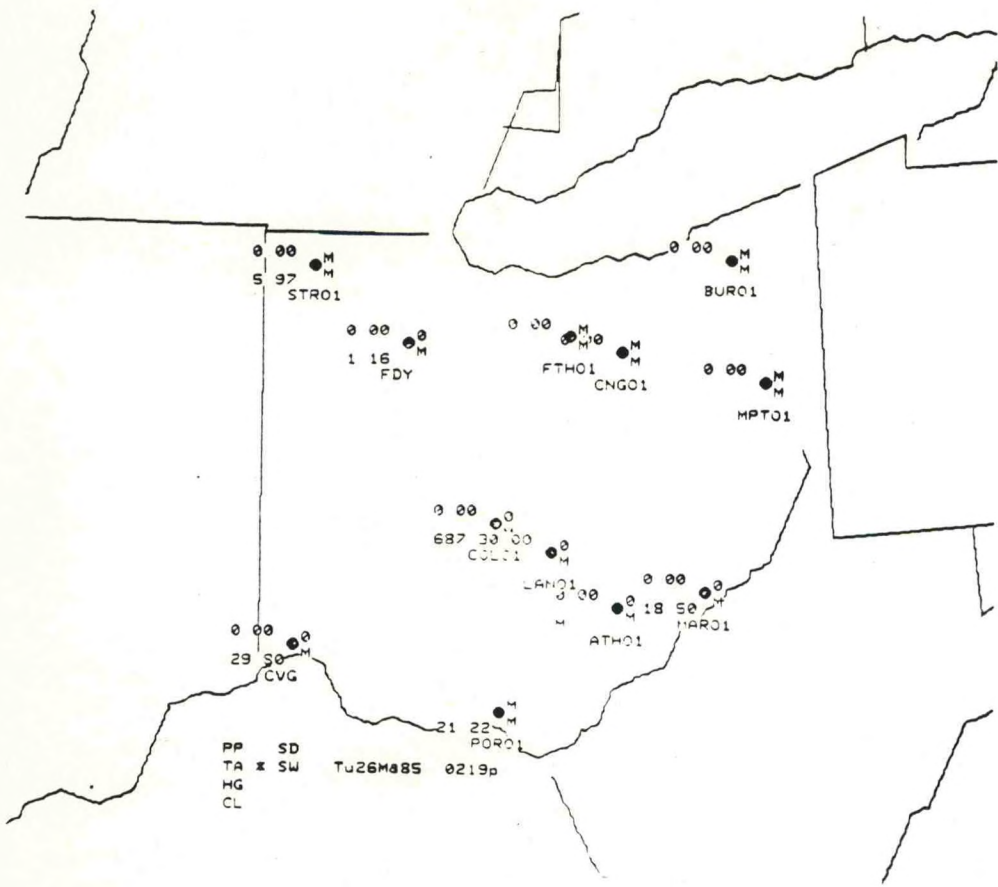
1508.760.100006..BENJ .8.0.03.0.64...73;

: : : :.....5 DATA FIELDS (PP,HG,SD,SW,TA)
: : :.....STATION CALL LETTERS/PLOT SYMBOL
: : :.....TIME FIELD (NOT USED)
: : :.....CONTROL FIELDS

NMCPLTWXR

NMCPLTWXR0010200020481536285014250097501688191408851901
1292.0539.00000Z,PP SDTA * SW We14Au85 0201pHG CL;
1499.764.000006..PTB .8.0.00;
1528.740.100006..ATSN4.8.0.15...73;
1520.758.100006..BBKN4.8.2.20.17.42;
1508.760.000006..BENJ .8.0.03.0.64...73;
1506.752.000006..BETP1.8.0.03.1.28;
1521.757.100006..BKWN4.8.0.33.1.53;
1519.768.100006..BOON4.8.0.00.1.60...75;
1520.756.300006..BRBN4.8.0.50.2.47;
1516.770.100006..CHAN4.8.0.10;
1512.734.200006..CHDP1.8..1.37;
1521.764.200006..CHTN4.8..3.34;
1497.780.200006..CLCN6.8.0.22.2.42;
1513.758.100006..CLIN4.8.0.60;
1506.761.100006..CMEN4.8.0.10;
1503.787.300006..CRYN6.8.M;

Figure 13. WXR plotfile format and sample plotfile (the second line of the plotfile contains the sample station model, and will change if different data elements are selected for plotting).



PP SD
TA x SW Tu26M885 0219p
HG
CL

Figure 14. Sample graphic generated from WXR PLT output by PMOD. The graphic title will reflect exactly what is being plotted and in which position. (The title appears at all zooms.)

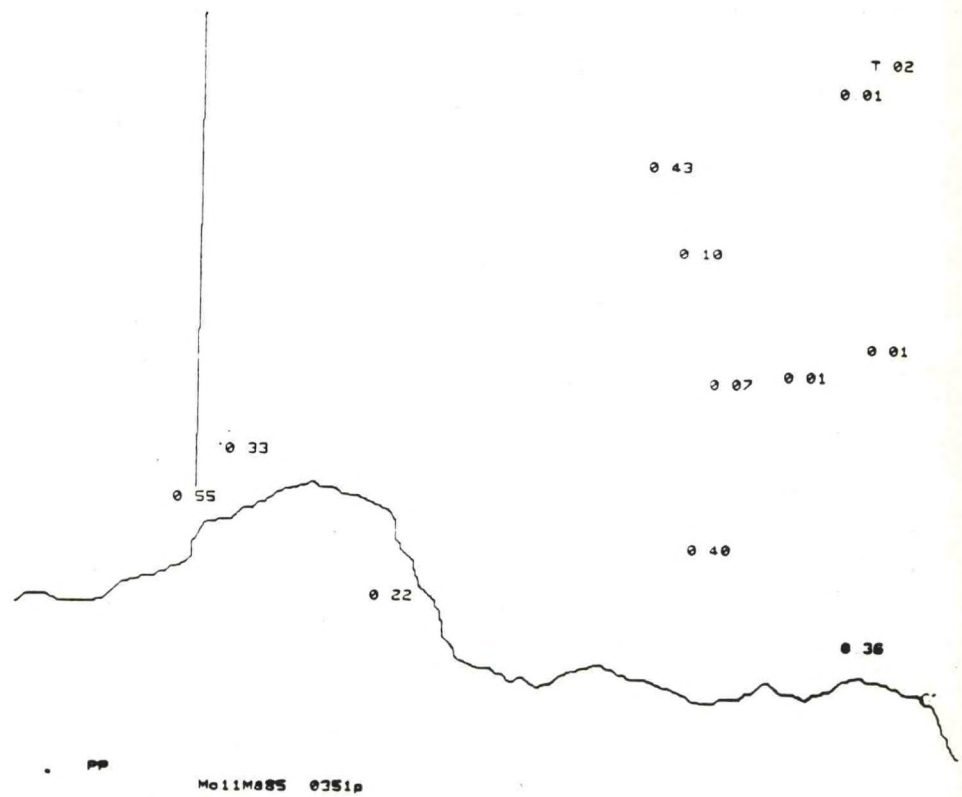
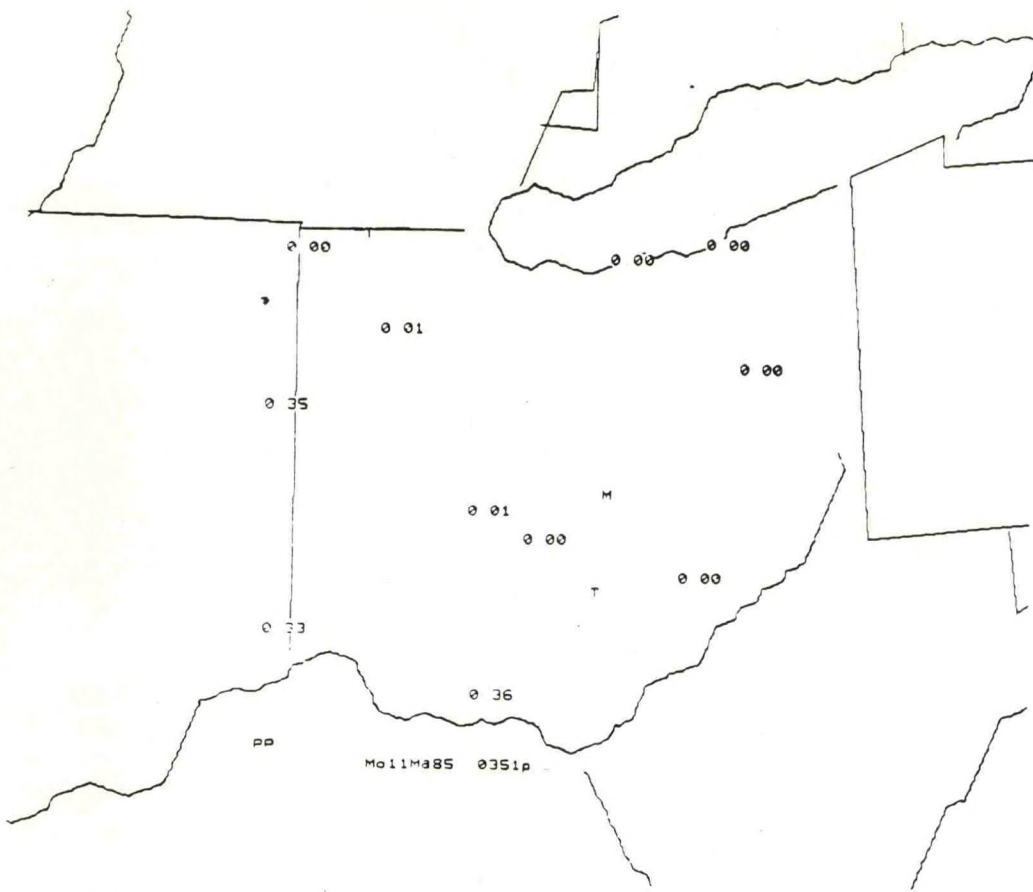


Figure 15. Same as Figure 14, except that only precipitation is plotted.

to be fatal. Non-fatal errors will pass an operator warning message to the output console (Dasher) while data processing continues.

If the FSTORE routine returns an unsuccessful storage flag, WXR will invoke a 15 second wait period (warning to output console) and then try again. A total of four attempts will be executed (1+ minute) before proceeding to the next file (if specified).

D. Source Listings

Because of the volume of documentation, source file listings will not be included in this CP. Source files are available from Eastern Region SSD and from the AFOS Applications Library maintained by TDL.

APPENDIX A

WXRPARSHF3.SV/THE SHEF DECODER DRIVER ROUTINE

All questions on SHEF and the SHEF decoder parsing software should be referred to NOAA Technical Memorandum NWS CR-67 by Geoffrey M. Bonnin and Robert S. Cox and NOAA Technical Memorandum NWS CR-72 by Geoffrey M. Bonnin. The modified driver WXRPARSHF3.FR module of the SHEF decoder contains changes to the FORTRAN IV PARSHEF.FR source driver routine for use by WXR 3.0 software.

File maintenance changes have also been incorporated into the FORTRAN IV SHEF decoder for WXR applications to facilitate file input/output. Some file names have also been changed from WXR 2.5.

<u>FILENAME</u>	<u>WXR APPLICATION FILENAME</u>	<u>PURPOSE</u>
PARSHEF.FR	WXRPARSHF3.FR (WXR 3.0)	PARSING SOFTWARE DRIVER ROUTINE
TESTFILE	SHEFIN	INPUT FILE TO SHEF DECODER
SHEFOUT	-<NO CHANGE>-	BINARY OUTPUT FROM DECODER
DOTBTEMP	-<NO CHANGE>-	TEMP. INTERMEDIATE FILE
\$LPT.DU	SHEF.ER	FILE ERROR LISTING
OUT.DT (WXR 2.5)	SHEFOUT.D (WXR 3.0)	ASCII DEBUG FILE OF SHEFOUT

WXR 3.0 software requires the following file link entries when operating the SHEF decoder:

LINK WXRPARSHEF.SV ---> WXRPARSHF3.SV

LINK SHEFPARM ---> SHEFPARM3

APPENDIX B

NET Error Messages

Errors in NET execution generally occur with the add/delete functions. There are other program errors that may occur. System errors will output a five-character number and terminate program execution. System errors are related to software or hardware failures.

NET Operator Error Messages:

ERR: YOU CANT DO THAT	You can't add and delete simultaneously
ERR: FILNAM/CCCNXX	No input filename or product key given in command line
ERR: CCCNXX	Invalid AFOS product key
ERR: /F	Invalid RDOS filename
ERR: /F STAT	Specified RDOS file does not exist
ERR: /F RENAM	Error renaming RDOS file
FPREP: .START/A	No .START statement in input <u>file</u>
FPREP: DATA LINE/.END	Invalid data line entry or no .END
FPREP: FIELD LENGTH EXCE	Field width exceeded or data field missing
ADD: DUPLICATION	Call letters duplicated in input (recheck data)
DEL: .START/D	No .START statement in input file
AFOS: KSRCF	Specified product key not in database
AFOS: RDBKF	Can't get first AFOS data block
AFOS: SOF/56	No .START statement in input <u>product</u>
AFOS: EOF203	No AFOS end-of-text

AFOS: NXBKF

Subsequent AFOS data blocks unavailable

LINK

Attempt to modify a NET.DT file that is a link entry. NET.SV requires the NET.DT database/dictionary file to be the resolution file and not a link entry.

ADD:BU DT

(ADD:DUPLICATION) Program was unable to re-establish the original NET.DT. NET.DT is now NET.BU.

APPENDIX C

AFOS Retrieval/SHEF Decoder Error Messages

Errors in program execution will generally occur due to missing and/or invalid AFOS product key entries and/or unavailable products in the AFOS database. System errors will generate a five-character numeric output and may be due to software or hardware failures. Errors are non-fatal unless specified.

KEY1	CCCNNNXXX unavailable in AFOS system file (DATAKEYØ)
KEY2	(FATAL) Invalid CCCNNNXXX in command line
ERR/V	Invalid version entry in command line
VER	Requested version of CCCNNNXXX unavailable.
NCFIL	(FATAL) Unable to establish a 'SHEFIN' file.
PBLK	AFOS primary datablock unavailable (AFOS)
NBLK	AFOS subsequent datablock(s) unavailable (AFOS)
EOF	AFOS ETX missing
SWAP	(FATAL) Unable to invoke the SHEF decoder.

APPENDIX D

WXR ERROR MESSAGES

Extensive error checking facilities have been incorporated into WXR. Process errors are returned to the output console in a deliberately short message form. System errors will generate a five character numeric output and may be due to software or hardware failures. Errors are fatal unless otherwise specified.

Command Line Errors (all fatal)

YOU CANT DO THAT	Only one data global data filter switch is permitted. You may not mix globals /A, /C OR /O in the same command.
COM	Unknown local switch entry.
/F	Unspecified format parameter file or incorrectly specified format parameter file.
/O	Invalid specified offtime hour.
/P	Invalid AFOS product key (PLT) in command line or, maximum character exceeded for product key.
/C	Invalid column sector value or character.
/L	Maximum character exceeded in link filename entry.
FIL/L	Unspecified link option.
RES/L	Desired link entry is a current resolution file.
ULK/L	Unable to unlink current link entry (check file attributes).
LNK/L	Unable to link current link entry (check file attributes).
NET.SV	File maintenance program, NET.SV, not disk resident.
NET.DT	Database/dictionary file, NET.DT, not disk resident.

Data Processing Errors

WX TERM	Abnormal WXR termination/end of parameter file?
KEY/ADR	Invalid AFOS product key and/or invalid AFOS product addressee.
RPFIL	Unable to create specified RDOS file via '.PIL FILE' command.
OVRFLO	(non-fatal) Command line exceeding 72 character maximum.
F/CHR	Invalid character in specified field width (.FORMAT).
F/LEN	Total line length exceeded (.FORMAT).
STK1	(non-fatal) Runtime data stack at capacity (LOAD).
STK2	(non-fatal) Runtime data stack at capacity (POST LOAD).
SHEF INPUT	No load of data due to (1) no match of stations with NET.DT or (2) invalid SHEF data date/time runtime requests.
FORMAT	Entered .STATION COMMAND without an initial .FORMAT command.
VAL>FW	(non-fatal) Data value larger than specified field width.

PLT Processing Errors

LLM	(non-fatal) Invalid latitude/longitude/map constant value(s).
-----	---------------------------------------------------------------

File Maintenance Errors

CPFIL	Unable to establish intermediate storage file ('FILE IN USE').
CMFIL	Unable to establish intermediate storage file ('FILE IN USE').
PMFIL	Specified format parameter file not disk resident.
AFOS	AFOS product storage unsuccessful (AFOS down?)

APPENDIX E

Changing the PLT Default Parameters

WXR may be tailored to suit local plot output needs. This requires using OEDIT.SV, the RDOS octal editor, to change any areas in WXR.SV. This is not difficult, but should be left to a person who is experienced in using the octal editor. Caution should be exercised throughout the whole procedure. Make your changes to a copy of the original file.

1. Changing the output PLT product key and the addressee

Locations 1015 through 1022 contain the AFOS keyname for the plotfile and the addressee in the form of "CCNNNXXXXAAA". The original defaults are "NMCLPTCIN0000".

2. Changing the plotted SHEF elements

Locations 771-1002 determine which SHEF elements are to be included in the plotfile and their order in the PLT entries (this in turn affects how they are plotted around the station model by PMOD). A maximum of 10 elements can be entered. Both physical element and duration /type must be entered (PEDT or PEDTSEP). The original defaults are

LOCATION	SHEF ELEMENT	LOCATION/TYPE	DURATION/TYPE
771	PP	1003	PR
772	HG	1004	IR
773	SD	1005	IR
774	SW	1006	IR
775	TA	1007	IR
776	0	1010	0
777	0	1011	0
1000	0	1012	0
1001	0	1013	0
1002	0	1014	0

Elements currently in these locations can be deleted by changing the location to 0. For example, SD and SW can be omitted by changing locations 773 and 774 to 0. PP, HG and TA will still be plotted in their same locations.

The (octal) number of SHEF elements to be plotted is in location 746. For example, currently there are five SHEF elements listed in

locations 771-1002, so location 746 should hold the number five (octal).

3. Changing the data value type (real or integer)

One must decide whether the data value output for each SHEF element entered in locations 771-1002 is a real or integer number. Each SHEF element has a corresponding data type flag which appears in locations 757-770. Enter a "1" to store the value to the hundredths position, a "2" for the tenths position and "4" for the digits position. The current data flags (corresponding to the current SHEF elements given in 2. above are:

LOCATION	DATA TYPE
757	1 (real, hundredths position)
760	1 (real, hundredths position)
761	4 (integer, digits position)
762	4 (integer, digits position)
763	4 (integer, digits position)
764	1 (real, hundredths position)
765	1 (real, hundredths position)
766	1 (real, hundredths position)
767	1 (real, hundredths position)
770	1 (hundredths position)

4. Changing the product storage flag

The WXR plotfile is initially written to the dummy disk file WXR.PL. A flag in location 743 indicates what WXR should do with the dummy file.

VALUE	RESULT
-1	Do nothing. Plotfile output is left in file WXR.PL.
1	Store the file into the AFOS database as CCCNNNXXX (the AFOS keyname as specified in section 1 of this Appendix)

5. Changing the station call letter output

This value (location 744) determines what WXR will do with the station call letter in the plotfile.

VALUE	RESULT
-1	WXR determines how many call letters there are per station ID and writes those letters (no padding) to the plotfile (maximum 8, minimum 1)
0	WXR will not write any call letters to the plotfile; this field will be skipped
1	WXR writes a specified number of call letters. The octal number must appear in location 745. Maximum is still 8 and minimum is 1.

6. Changing the plot symbol and symbol type

A value in location 747 determines whether WXR will write a station plot symbol to the plotfile. Subsequently the value in location 750 determines the type of plot symbol to be used.

VALUE	RESULT
1	WXR will write the value in location 750 to the plotfile (location 750 currently holds the value for a cloudy symbol - 70 octal).
0	WXR will skip the station plot symbol field and continue onto the next field. No station symbol will be plotted.

APPENDIX F

WXR PLT Background Option

WXR can produce a separate station name/station symbol plotfile that can be used for constructing a station overlay map. The operator can overlay this station call letter and/or station symbol plot on another graphic containing the data values in order to identify and locate stations. This is useful in reducing CLS memory overflow problems that occur when graphics become larger than the allowable CLS memory partition.

The PLT options for station call letters and station symbols are applicable to the background option (see Appendix E, options 5 and 6 for specific instructions on these two options). A station call letter background does not necessarily need station symbols and vice versa.

The first step is to produce a plotfile with the following WXR command:

```
RUN:WXR/P/L/B
```

this command line will produce a plotfile and store it into the AFOS database (under the CCCNNXXX in locations 1015-1022, see Appendix E). The plotfile will contain station call letters and/or station plot symbols according to the options previously selected.

The second step is to produce the overlay graphic using the PMOD plotting software (see I C, References) with an appropriate plot model offset file. It is important to remember to store the graphic in the AFOS database under a separate AFOS key. Do not store the station call letter/station symbol map under the identical AFOS key for regularly plotted data; this will defeat the purpose of an overlay graphic. It is only necessary to produce the overlay map once, when a station network has been established (unless changes are needed later). Figure F-1 shows such an overlay map.

The last step is to modify WXR.SV to eliminate station call letters and/or station symbols from routinely produced plotfiles (again see Appendix E, options 5 and 6). There is no reason to include these fields if an overlay graphic with them already exists. However, it is not mandatory that they be removed.

APPENDIX G

WXR Special Data Value/Special Character Options

This Appendix addresses locations in WXR.SV that contain special values and characters for certain aspects of data handling and processing. WXR is initially loaded with default values. If necessary, these special values and characters may be changed to suit local needs. Changes to WXR.SV must be done with the octal editor OEDIT.

1. Sector spacing

Location 1475 contains the octal number of spaces between sectors used when columnizing weather wire products (local /C). Default is 2.

2. Reference load hour

Location 1476 holds the local Zulu reference hour (octal) for data collection (used with global /C or no global switches). The default is 12Z.

3. Local Z-time window

Locations 1477 and 1500 contain the positive/negative time windows in (octal) hours for the Z time given in location 1476. These are used only when the global /C is used or if no global switches are used. The time window allows a flexible range (may differ in either direction) for data filtering. The default values are 2 and 2, that is, +/- 2 hours from the default Z time (if default Z-time of 12Z is used, this window runs from 10Z to 14Z).

4. Tendency characters

Locations 1501 and 1502 contain the positive and negative time-change computation characters (octal ASCII equivalents). They are only used when WXR computes and time change value (such as a 24 hour change computation). The default characters are a plus and a minus sign.

5. Local time

Location 1545 contains the (octal) value it takes to translate

Zulu time to local 24-hour clock time. For Eastern Standard Time, the value is 5; for Eastern Daylight Time, the value is 4.

<u>TIME ZONE</u>	<u>VALUE</u>
ATLANTIC STANDARD, AST	4
ATLANTIC DAYLIGHT, ADT	3
EASTERN STANDARD, EST	5
EASTERN DAYLIGHT, EDT	4
CENTRAL STANDARD, CST	6
CENTRAL DAYLIGHT, CDT	5
MOUNTAIN STANDARD, MST	7
MOUNTAIN DAYLIGHT, MDT	6
PACIFIC STANDARD, PST	8
PACIFIC DAYLIGHT, PDT	7

6. Negative Value Indicator

Location 1514 contains the character (octal ASCII equivalent) for negative (non-time-change) data values only (for example, below zero temperatures). This will not affect positive or 0 numbers. Default is ASCII character "B" (102K).

APPENDIX H

WXR Databasing with Multiple WXR.TD Files

The use of the global C-switch allows the user to store data values to the WXR.TD database file. This file is automatically established by WXR 3.0. The data values stored in this file are determined by the SHEF observation default hour (usually 12Z). It is also possible to save (and compute time-change values for) offtime data by utilizing different database files via the local /O and /L/D options. This is done by specifying a unique load hour (HH/O) and a unique file link entry (FILENAME/L/D) via the command line. For example:

```
RUN:WXR/C .... 18/O WXR18.TD/L/D
```

would store 18Z data in the WXR18.TD file (the local /O tells WXR to stack only 18Z data and the local /L/D sets up a link entry to the WXR18.TD file (i. e., WXR.DT is linked to WXR18.TD). If necessary, 24-hour changes could also be computed for Weather Wire output or data values could be saved to specific plots. The same thing could be done for other load hours.

The operator must remember to link the default filename to a unique RDOS file if this option is used because WXR will always look for file "WXR.TD". This is accomplished by simply adding the link entry option into the command line as follows:

```
RUN:WXR/C . . . WXR12.TD/L/D
```

Being the default load hour is 12Z, this will save 12Z data in file WXR12.TD with a runtime link filename of WXR.TD (WXR.TD will be linked to WXR12.TD).

This is an expansion of the use of the global C-switch enabling the user to store data values with the need to continuously decode various SHEF products.

AUGUST 1985

WXR -- WEATHER WIRE REFORMATTING PACKAGE (VER 3.0)
(NET)

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDUREPROGRAM NAME: NETAAL ID: DBC041REVISION NO.: 3.00

PURPOSE: NET is a dictionary/database utility program that will assemble and alphabetize station information into an RDOS disk file, NET.DT. The information contained in the NET.DT file is primarily utilized by WXR, but may have other uses. Version 3.00 prevents the operator from modifying a NET.DT file via a link, and also recovers the original NET.DT if a fatal error occurs.

PROGRAM INFORMATION

DEVELOPMENT PROGRAMMER(S):

H. OPITZ

LOCATION: RFC CIN

PHONE: FTS 684-2371

LANGUAGE: DG FORTRAN IV/5.20

DATE: 03/08/84

MAINTENANCE PROGRAMMER(S):

H. OPITZ

LOCATION: RFC CIN

PHONE: FTS 684-2371

TYPE: STANDARD (CHAINED TO BY WXR)

REVISION DATE: 08/06/84

03/25/85

RUNNING TIME: VARIES WITH NUMBER OF STATIONS PROCESSED

DISK SPACE: PROGRAM FILES
DATA FILES40 RDOS BLOCKS (NET ONLY)
VARIABLEPROGRAM REQUIREMENTS

PROGRAM FILES:

NAME

NET.SV

WXR.SV,.OL

COMMENTS

NET is run via WXR

DATA FILES:

NAME

NET.DT

DP LOCAT.

DP0*

READ/WRITE

WRITE

COMMENTS

Output file of station

			information
NET.BU	DPØ*	WRITE	NET.DT backup file, deleted by default
NET.SC	DPØ	WRITE/READ	Scratch file, deleted by default
NET.TM	DPØ	WRITE/READ	Scratch file for input product or file, deleted by default

* These files may be placed in other directories for normal use, but when NET is being used to add/delete stations, make sure they are on DPØ.

AFOS PRODUCTS:

<u>ID</u>	<u>ACTION</u>	<u>COMMENTS</u>
NONE		

LOAD LINE

RLDR/P NET.SV/S NET<MAIN IT IH 1 2 3 4 5 6> <UTIL BG FORT>.LB 25/C

PROGRAM INSTALLATION

1- Put WXR.SV and .OL and NET.SV on DPØF, link from DPØ.

WXR -- WEATHER WIRE REFORMATTING PACKAGE (VER 3.00)
(WXR)

PART A: PROGRAM INFORMATION AND INSTALLATION PROCEDURE

PROGRAM NAME: WXR.SV

AAL ID: DBC041

REVISION NO.: 3.00

PURPOSE: WXR Version 3.00 has two major functions:

1. It will assemble an RDOS disk file containing any specified AFOS SHEF product(s) and invoke the SHEF decoder package. Optionally it will also run a translation routine that will convert the SHEF binary output file (SHEFOUT) for display on an AFOS console. This translation routine allows the operator to examine the actual contents of SHEFOUT. (Formerly functions of NSEEK.)
2. After the SHEF data has been assembled and decoded, WXR will manipulate it according to specified output formats and command line runtime options to create products for the Weather Wire and/or plotfiles for PMOD plotting. WXR uses various master format files (assembled during the initial setup) that contain the actual output formats for specific weather wire products. Multiple master files may be assembled for various output formats. The operator indicates which file(s) WXR will use via the command line. WXR can also create a database file of previous data in order to compute time changes.

PROGRAM INFORMATION

DEVELOPMENT PROGRAMMER(S):

H. OPITZ

LOCATION: RFC CIN

PHONE: FTS 684-2371

LANGUAGE: DG FORTRAN IV/5.20

DATE: 03/05/84

MAINTENANCE PROGRAMMER(S):

H. OPITZ

LOCATION: RFC CIN

PHONE: FTS 684-2371

TYPE: OVERLAY, CHAIN

REVISION DATE: 08/06/84

07/17/85

RUNNING TIME: VARIES WITH AMOUNT OF DATA, NUMBER OF PRODUCTS,
PLOTFILE OPTION

DISK SPACE: PROGRAM FILES
DATA FILES

207 RDOS BLOCKS TOTAL
35 (SHEFPARM3), VARIES WITH
AMOUNT OF DATA, NUMBER OF
PARAMETER FILES

PROGRAM REQUIREMENTS

PROGRAM FILES:

<u>NAME</u>	<u>COMMENTS</u>
WXR.SV	
WXR.OL	
WXRPARSHF3.SV	WXR version of SHEF decoder (must have linkname WXRPARSHEF.SV)

DATA FILES:

<u>NAME</u>	<u>DP LOCAT.</u>	<u>READ/WRITE</u> <u>WRITE/READ</u>	<u>COMMENTS</u>
SHEFIN	DP0		The assembled AFOS products; input for SHEF decoder.
SHEFOUT	DP0	WRITE	Decoded SHEF data; binary file.
SHEFPARM3	DP0	READ	SHEF parameter file (linkname SHEFPARM)
SHEF.ER	DP0	WRITE	SHEF error file
SHEFOUT.D	DP0	WRITE	An ADM-displayable version of SHEFOUT; allows operator to easily check data.
NET.DT	DP0	READ	Generated by NET; contains station information.
WXR.#	DP0	READ	Output format files; # is any single character.
WXR.TD	DP0	WRITE/READ	If global /C is used, current run's data will be stored in this file

for later use. ("data-
base" file)

WXR.99	DPØ	WRITE	Temporary Weather Wire output file, deleted after AFOS storage.
WXR.PL	DPØ	WRITE	Temporary output file for plotfile output, deleted after storage.

AFOS PRODUCTS:

<u>ID</u>	<u>ACTION</u>	<u>COMMENTS</u>
VARIOUS SHEF PRODUCTS	READ, DECODE	A variety of products and product versions is possible.
VARIOUS WW AND PLOT PRODUCTS	WRITE, STORE	Output can also be di- rected to RDOS files.

LOAD LINE

```
RLDR/P WXR.SV/S WXR<MAIN COM T> C<TIM DATB DATF DAY> RJUL FORM<1 2>  
LDBS [EXCTV WXR IH,WXSYN,PLTHDR] [LTRS WRMSG,REOCT C24HR,LLCVT  
CART WXFIL,PILL,MAOPN TAFOS UPDTE] [WRCOM WRANG PILL2,LDSHF LDYES  
LDDUR,WRWXR,WXPLT PLACE,NSEEK NSEEK1 NSEEK2 LDNET,FORMAT,RDCLI  
DATIM] <UTIL BG FORT>.LB 25/C
```

PROGRAM INSTALLATION

- 1- WXR.SV and .OL should be installed on on DPØF, linked to DPØ.
WXRPARSHF3.SV and SHEFPARM3 should also be on DPØF, linked to
WXRPARSHEF.SV and SHEFPARM on DPØ.
- 2- WXR.#, SHEFOUT, SHEFOUT.D and SHEF.ER may also be placed on
DPØF and linked to DPØ. NET.DT and WXR.TD may reside in other
directories, use command line switches to access. Don't link
any of the other files!

WXR -- WEATHER WIRE REFORMATTING PACKAGE (VER 3.0)
(NET)

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: NET

AAL ID: DBC041

REVISION NO.: 3.00

PROGRAM EXECUTION

1. The station information NET will add to or delete from NET.DT must exist either in an AFOS product created with message comp or an RDOS file created with a text editor (filename may be up to 18 characters long). Up to 500 station entries are allowed. Information on the formats required appears in ERCP #24, Section III A 2.

2. After the information has been stored in the product or file, run NET:

RUN:WXR/N/A/D/S/X cccnnnxxx (or) filename/F

where cccnnnxxx or filename contains the raw station data and the global switches imply:

- /N Utilize NET.SV functions (mandatory)
- /A Add the input station information to NET.DT. If no NET.DT exists, it will create one.
- /D Delete the input stations from NET.DT.
- /S Do not delete NET.BU (use with /A or /D)
- /X Save all temporary, scratch and backup files (used with /A or /D). This is useful in determining any errors encountered during execution.

(NOTE: /A and /D cannot be used in the same run.)

ERROR CONDITIONS

ADM MESSAGES	MEANING
NONE	
DASHER MESSAGES	
ERR: YOU CANT DO THAT	You can't add and delete simultaneously
ERR: FILNAM/CCCNNNXXX	No input filename or product key given in command line
ERR: CCCNNNXXX	Invalid AFOS product key
ERR: /F	Invalid RDOS filename
ERR: /F STAT	Specified RDOS file does not exist
ERR: /F RENAM	Error renaming RDOS file
FPREP: .START/A	No .START statement in input <u>file</u>
FPREP: DATA LINE/.END	Invalid data line entry or no .END
FPREP: FIELD LENGTH EXCE	Field width exceeded or data field missing
ADD: DUPLICATION	Call letters duplicated in input (recheck data)
DEL: .START/D	No .START statement in input file
AFOS: KSRCF	Specified product key not in database
AFOS: RDBKF	Can't get first AFOS data block
AFOS: SOF/56	No .START statement in input <u>product</u>
AFOS: EOF2Ø3	No AFOS end-of-text
AFOS: NXBKF	Subsequent AFOS data blocks unavailable
LINK	Attempt to modify a NET.DT file that is a link entry. NET.SV requires the NET.DT database/dictionary file to be the resolution file and not a link entry.
ADD:BU DT	(ADD:DUPLICATION) Program was unable to re-establish the original NET.DT. NET.DT is now NET.BU.

WXR -- WEATHER WIRE REFORMATTING PACKAGE (VER 3.00)
(WXR)

PART B: PROGRAM EXECUTION AND ERROR CONDITIONS

PROGRAM NAME: WXR

AAL ID: DBC041

REVISION NO.: 3.00

PROGRAM EXECUTION

1. AFOS Retrieval and SHEF Decoder phase:

RUN:WXR/R/A/D/O cccnnnxxx */V cccnnnxxx/M */V/T cccnnnxxx/W

The global switches have the following functions:

- | | |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| /R | Use AFOS product retrieval and SHEF decoder functions (mandatory) |
| /A | Append the AFOS product(s) to the current SHEFIN file. If /A is not used, the current file is deleted and a new one containing the product is created. |
| /D | Invoke the SHEF decoder, which will act on the current SHEFIN file. |
| /O | Convert the current SHEFOUT file for display on an ADM (produces ASCII file SHEFOUT.DT). |

The cccnnnxxx's are the AFOS SHEF products to be assembled and/or decoded. If /A is used, a cccnnnxxx must appear in the command line.

The local /V switch can be used to extract previous versions of cccnnnxxx: 1/V for the first previous version, 2/V for the next, and so on up to 9 versions.

The /V/T allows the user to collect several versions of a product compactly: 2/V/T indicates that the current and the first previous versions are to be retrieved, for a total of 2.

The local /M is a delimiter switch indicating multiple keys in the command line, while the /W is a continuation switch. Placed after the last cccnnnxxx, it indicates that WXR should continue on to the

product generation phase. If used, it should be followed by all the information the product generation phase command line would contain.

2. Product generation phase:

```
RUN:WXR/C/O/A/P/L/B/D */F X/C HH/O cccPLTxxx/P/F PEDT/P/L/S/T/H/D
DIR:PART:FILENAME/L/N DIR:PART:FILENAME/L/D
```

The global switches have the following functions:

- /C Load type R data for the specified load hour (default=12Z), current date and/or do change computation.
- /O Load any hour's type R data for the current date. No change computation or file update.
- /A Load any type data for any hour and/or day. Operator becomes data filter.
- /P After producing weather wire products, create a plotfile. Default output is NMCPLTCIN.
- /L Produce plotfile only (used with /P, e. g. /P/L)
- /B Produce a special background plot (used with /P/L, e. g. /P/L/B. See ERCP #24, Appendix F)
- /D Post the data in SHEFOUT to the WXR.TD database file without producing Weather Wire or PLT products. Allows intermittent decoding of SHEF products, may used with /L/N, /L/D and /O.

(NOTE: /C, /O and /A are independent and cannot be used in the same run.)

The local /F indicates the parameter format files to be used. The single-character extension(s) of the file(s) replaces the asterisk. Up to three files can be specified; for example if one wanted to use the format files WXR.1, WXR.3, and WXR.D, 13D/F should appear in the command line. This switch is mandatory.

The /C is optional and indicates how many columns should appear in the weather wire products.

HH/O is used to specify a non-default load hour for the data.

cccPLTxxx/P/F allows the operator to specify a non-default AFOS plotfile product in the command line.

PEDT/P/L/S/T/H/D controls what elements are posted to the pltofile output and their appearance:

PEDT	the SHEF physical element to be plotted (max. 5)
/P/C	don't post station call letters
/P/S	don't post the station plot symbol
/P/H	post all data values to hundreths position
/P/T	post all data values to tenths position
/P/D	post all data values to digits position

DIR:PART:FILENAME/L/N and DIR:PART:FILENAME/L/D allow WXR to access NET.DT and WXR.TD files, respectively, in other directories/partitions. This allows the easy maintenance of several database files for different data sets.

(Several of the above may be altered permanently via the octal editor; see the Appendices in ERCP #24.)

ERROR CONDITIONS

ADM MESSAGES	MEANING
NONE	

DASHER MESSAGES	MEANING
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AFOS Product Retrieval/SHEF Decoding

KEY1	CCCNNNXXX unavailable in AFOS system file (DATAKEYØ)
KEY2	(FATAL) Invalid CCCNNNXXX in command line
ERR/V	Invalid version entry in command line
VER	Requested version of CCCNNNXXX unavailable.
NCFIL	(FATAL) Unable to establish a 'SHEFIN' file.
PBLK	AFOS product datablock unavailable (AFOS)
NBLK	AFOS product datablock unavailable (AFOS)
EOF	AFOS ETX missing
SWAP	(FATAL) Unable to properly invoke the SHEF decoder.

Product Generation

Command Line Errors (all fatal)

YOU CANT DO THAT	Only one global data filter switch is permitted. You may not mix globals /A, /C or /O in the same command.
COM	Unknown local switch entry.
/F	Unspecified format parameter file or incorrectly specified format parameter file.
/O	Invalid offtime hour specifier.
/P	Invalid AFOS product key (PLT) in command line or, maximum character entry exceeded for product key.
/C	Invalid column sector value or character.
/L	Maximum character exceeded in link filename entry.
FIL/L	Unspecified link option.
RES/L	Desired link entry is a current resolution file.
ULK/L	Unable to unlink current link entry (check file attributes).
LNK/L	Unable to link current link entry (check file attributes).
NET.SV	File maintenance program, NET.SV, not disk resident.
NET.DT	Database/dictionary file, NET.DT, not disk resident.

Data Processing Errors

WX TERM	Abnormal WXR termination/end of parameter file?
KEY/ADR	Invalid AFOS product key and/or invalid AFOS product addressee.
RPFIL	Unable to create specified RDOS file via '.PIL FILE' command.
OVRFLO	(non-fatal) Command line exceeding 72 character maximum.
F/CHR	Invalid character in specified field width (.FORMAT)
F/LEN	Total line length exceeded (.FORMAT).
STK1	(non-fatal) Runtime data stack at capacity (LOAD).

STK2 (non-fatal) Runtime data stack at capacity (POST
LOAD).

SHEF INPUT No load of data due to (1) no match of stations with
NET.DT or (2) invalid SHEF data date/time runtime
requests.

FORMAT Entered .STATION COMMAND without an initial .FORMAT
command.

VAL>FW Data value larger than specified field width.

PLT Processing Errors

LLM (non-fatal) Invalid latitude/longitude/map constant
value(s).

File Maintenance Errors

CPFIL Unable to establish intermediate storage file ('FILE
IN USE').

CMFIL Unable to establish intermediate storage file ('FILE
IN USE').

PMFIL Specified format parameter file not disk resident.

AFOS AFOS product storage unsuccessful (AFOS down?)

Eastern Region Computer Programs and Problems (Continued)

- 19 Verification of Asynchronous Transmissions. Lawrence Cedrone, March 1984. (PB84 189885)
- 20 AFOS Hurricane Plotter. Charles Little, May 1984. (PB84 199629)
- 21 WARN - A Warning Formatter. Gerald G. Rigdon, June 1984. (PB84 204551)
- 22 Plotting TDL Coastal Wind Forecasts, Paula Severe, June 1984 (Revised) (PB84-220789)
- 23 Severe Weather Statistics STADTS Decoder (SWX) and Plotter (SWY), Hugh M. Stone, June 1984. (PB84-213693)
- 24 WXR, Harold Opitz, August 1984. (PB84-23722)
- 25 FTASUM: Aviation Forecast Summaries, Matthew Peroutka, August 1984. (PB85-112977)
- 26 SAOSUM: A Short Summary of Observations. Matthew Peroutka, October 1984. (PB85-120384)
- 27 TRAJ - Single Station Trajectory Plot, Tom Nizio1, December 1984. (PB85-135002)
- 28 VIDTEX, Gerald G. Rigdon, February 1985 (PB85-175669/AS)
- 29 ISENTROPIC PLOTTER, Charles D. Little, February 1985 (PB85-175651/AS)
- 30 CERR: An Aviation Verification Program, M. Peroutka, April 1985. (PB85-204324/AS)
- 31 Correlation and Regression Equation Program - REGRS, H. Stone, May 1985. (PB85-213353/AS)
- 32 Scatter Diagram and Histogram Program - SCATR, H. Stone, May 1985.(PB85-213346/AS)
- 33 TIMCHEK, Gerald G. Rigdon, June 1985. (PB85-221257/AS)

NOAA SCIENTIFIC AND TECHNICAL PUBLICATIONS

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