CHAPTER 6

GEMPAK Real-time Decoders

6.1 DECODER Common Characteristics

The GEMPAK real-time decoders are a set of programs that translate meteorological ASCII data into data suitable for storage in GEMPAK files. The following decoders are currently implemented for use on real-time ASCII data feeds:

DCACFT	decodes AIREP, PIREP, RECCO and AMDAR reports
DCAIRM	decodes airmet reports
DCCSIG	decodes convective sigmet and convective outlook reports
DCFFG	decodes Flash Flood Guidance data
DCGMOS	decodes GFS Model Output Statistics
DCHRCN	decodes tropical forecast/advisory reports
DCIDFT	decodes sea ice drift bulletins
DCISIG	decodes international SIGMET reports
DCLSFC	decodes land surface synoptic reports
DCMETR	decodes raw SAO and METAR reports
DCMSFC	decodes raw buoy, ship, and C-MAN reports
DCNCON	decodes non-convective SIGMET reports
DCNMOS	decodes NGM Model Output Statistics
DCRDF	decodes Regional Digital Forecast (RDF)
DCSCD	decodes Supplemental Climatological Data reports
DCSVRL	decodes severe local storm reports
DCTAF	decodes raw TAF (terminal aerodrome forecast) reports
DCUAIR	decodes Upper Air Sounding data
DCWARN	decodes flash flood/tornado/severe t-storm warnings
DCWCN	decodes watch county notification reports
DCWOU	decodes watch outline update reports
DCWSTM	decodes winter storm reports
DCWTCH	decodes tornado/severe t-storm watch and status reports
DCXMOS	decodes eXtended GFS Model Output Statistics data

Additional decoders for the Unidata distribution are available:

DCACARS	decodes NetCDF ACARS files from FSL
DCGRIB	decodes GRIB data
DCGRIB2	decodes GRIB data
DCNCPROF	decodes NetCDF format profiler data from FSL
DCNEXR2	uncompresses and stores NEXRAD Level II data
DCNLDN	decodes NLDN lightning
DCPROF	decodes BUFR format profiler data
DCREANAL	Converts NetCDF format reanalysis grid files
DCREDBOOK	generates plots of REDBOOK graphics from STDIN
DCSHEF	decodes SHEF hydrologic bulletins
DCSTORM	decodes WWUS60 storm reports
DCSUOMI	decodes SuomiNet GPS files
DCTROP	decodes Tropical storm buletins
DCWATCH	decodes WWUS40 watch box locations

Each real-time decoder is a stand-alone program that may be activated from the UNIX command line, from a shell script, or from another program. The command line options are as follows:

-v N	Set the level of verbosity for the logs
-c curtim	Set the "current" time
-b nhours	Number of hours to decode prior to "current" time
-d decoder_log	Set the decoder log file name
-t time_out	Set the interval for the time out
-n	Set a flag to NOT save the text data
-h	Print the help file, then exit the program
-p prmfil	Set the parameter packing table
-s stntbl	Set the station table
-a iadstn	Set the number of additional stations
-m maxtim	Set the maximum number of times
-e PARM=value	Set the environment variable PARM to value

The input data stream is fed to each decoder via the standard input. The standard input, in turn, may be fed from a file or from a real-time data feed.

Each decoder writes its output to a GEMPAK data file. For example:

dcamos [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the decoded bulletin or report to replace the following characters:

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.2 DCACARS (Unidata)

DCACARS is a decoder for use with the NetCDF format ACARS data files from NOAA/FSL. DCACARS places the individual aircraft reports of altitude, temperature, wind speed and direction and relative humidity (RH is reported by a few aircraft) into Gempak surface ship format files.

In order to read the NetCDF file from standard input, a temporary file is created on disk consiting of the NetCDF product. Upon completion, the temporary file is removed, or if desired, the "-n netcdf_file" option may be used to store the input file in addition to the GEMPAK format file.

The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcacars [options] output_file

When decoding existing files, the input file name can be specified using the "-f filename" argument.

dcacars -f input_file [options] output_file

A template may be used to specify the output file name. The file name template uses the date and time of the observations within the NetCDF file to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

Command line options specific to DCACARS:

-f input_file	Read NetCDF file from disk instead of STDIN
-n output_netcdf file	Save NetCDF file from STDIN to disk

The following ancillary tables are used:

$GEMTBL/pack/acars.pack	Packing file

6.3 DCACFT

DCACFT decodes raw AIREP, PIREP, RECCO and AMDAR reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcacft [options] output_file

Currently, for real-time operation, each output file represents a single hour, of the form YYMMDDHH.acf.

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcacft -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.4 DCAIRM

DCAIRM decodes airmet (AIRman's METeorological Information) reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcairm [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcairm -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_time|End_time|Identifier|Update|Flt_lvl_1|
Flt_lvl_2|Corr_amd_tst_flag|Cancel_flag
Lat1 Lon1
Lat2 Lon2
Lat3 Lon3
. .
. .
. .

(Note that the first two lines shown above appear as a single line in the output file.) Where: Type is IR (instrument flight rules), MO (mountain obscuration), TB (turbulence), IC (icing) or
SW (sustained winds).
Start_time and End_time are full GEMPAK date/time strings
Identifier is composed of the region and a sequence number
Update is the airmet update number
Flt_lvl_1 and Flt_lvl_2 are the flight levels
Corr_amd_tst_flag is a flag indicating a correction (1),
an amendment (2), and/or a test (flag + 3)
Cancel_flag is a flag indicating a cancellation (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The latitude and longitude values are read using the FORTRAN format (2F9.2). The number of points may vary.

6.5 DCCSIG

DCCSIG decodes convective sigmet and convective outlook reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dccsig [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dccsig -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_time|End_time|Sequence ID|Intensity|Direction|
Speed|Flt_lvl_1|Flt_lvl_2|Distance|Correction_flag
Lat1 Lon1
Lat2 Lon2
Lat3 Lon3
. .
. .
. .

(Note that the first two lines shown above appear as a single line in the output file.) Where: Type is AR (area), LN (line), IS (isolated area), CS (nil convective sigmet), OL (outlook)

Start_time and End_time are full GEMPAK date/time strings
Sequence ID is composed of the sequence number and a region
Intensity is DMSHG (weakening), DSIPTG (ending)
INTSFYG (strengthening), DVLPG (beginning/growing)
Direction is in tens of degrees
Speed is in knots
Flt_lvl_1 and Flt_lvl_2 are the flight levels
Distance is the Distance or Area diameter of the area or line
Correction_flag is a flag indicating a cancellation (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The latitude and longitude values are read using the FORTRAN format (2F9.2). The number of points may vary.

Nil convective sigmets and convective outlook reports are decoded and are indicated in the decoded files by assigning the region id as: '0E', '0C' or '0W' for both convective sigmets and convective outlooks. Only convective sigmets use 'CS' as the type identifier to further indicate a nil issuance for a region. Also, there is no latitude or longitude information following the decoded nil issuance.

6.6 DCFFG

DCFFG decodes flash flood guidance data from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcffg [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcffg -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.7 DCGMOS

DCGMOS decodes Global Forecast System (GFS) Model Output Statistics data from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcgmos [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcgmos -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.8 DCGRIB (Unidata)

DCGRIB decodes GRIB format model grids from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK grid file. The program is controlled by inputs to the command line.

The inputs are program options, the PACK keyword if packing is to be used and the output file name or template. For example, for real-time data feeds:

dcgrib [options] PACK output_file

When using with the LDM, the GEMPAK grib routines must be able to access the grib tables located in the gempak distribution. This is done through the GEMTBL environmental variable. If the the LDM process does not have the GEMTBL variable set, then you must use the -g "path" option.

If running the program interactively with standard input, the input file must be also be specified. For example:

```
dcgrib -c YYMMDD/HHNN [options] output_file < input_file
```

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.9 DCGRIB2 (Unidata)

DCGRIB2 decodes GRIB format grids from a real-time data feed, or from a file fed to the program through standard input, and writes the data to GEMPAK grid files. The program is controlled by inputs to the command line as well as several configuration tables.

DCGRIB2 utilizes the GEMPAK GB library routines (as NAGRIB does) although several distinct features have been added to facilitate the use of the decoder with GRIB bulletins transmitted via NOAAPORT/FOS.

1. DCGRIB2 posses the capability to "stitch" together grids transmitted in tiles. Currently these grids are typically global grids, such as the "thinned" AVN, MRF, and ECMWF tiles. Since GRIB bulletins transmitted as tiles generally lack the projection information of the larger grid system of which the tile is imbedded, a lookup table $GEMTBL/grid/dcgrib.tbl is maintained with this information.

2. Ouput file name templates are supported using keys described below.

3. If an output filename is not provided, the program will attempt to find a suitable template from the table $GEMTBL/grid/gribkey.tbl. By using this feature, a single dcgrib2 process may be invoked for many different sources of GRIB data (typically for real-time data). If a matching set of criteria exist, the grid is decoded. The first template that matches the search criteria will be used, such that global matches can be permitted. The number of grid entries in the output file can be set in the gribkey.tbl file.

4. Up to MMFILE files will be opened at a time to allow for cycling of output files when different data sets are inter-mixed in the data stream.

The command line inputs are program options, and the output_file name may use the defined template characters below. If the output_file name is ommited, a template in the gribkey.tbl file will be used if defined.

For example, for real-time data feeds:

dcgrib2 [options] [output_file]

When using with the LDM, the GEMPAK grib routines must be able to access the grib tables located in the gempak distribution. This is done through the GEMTBL environmental variable. If the the LDM process does not have the GEMTBL variable set, then you must use the "-e GEMTBL=path" option.

The following tables files are expected to be found:

$GEMTBL/grid/cntrgrib[X].tbl
$GEMTBL/grid/vcrdgrib[X].tbl
$GEMTBL/grid/wmogrib[X].tbl
$GEMTBL/grid/[CENTER]grib[X].tbl
$GEMTBL/grid/dcgrib.tbl
$GEMTBL/grid/gribkey.tbl

If running the program interactively with standard input, the input file must be also be specified. For example:

dcgrib2 [options] [output_file] < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute
FF	Forecast hour (2 digit)
FFF	Forecast hour (3 digit)
###	Generating process model id (PDS Octet 5)
@@@	Grid number (PDS Octet 7)
%%%	Generating subcenter (PDS Octet 26)

Valid command line options for DCGRIB2 are:

-v N, -m maxgrids, -d logfile, -t timeout, -h show help, -e PARM=value

Other DC decoder options are ignored.

6.10 DCHRCN

DCHRCN decodes forecast/advisory reports for tropical depressions, tropical storms and hurricanes for the Atlantic and Pacific Oceans from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dchrcn [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dchrcn -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file (with the 2 '|' lines given below appearing as one line in the file) is as follows:

|Type|Valid_time|Name|Advisory_Number|Position_accuracy
|Direction|Speed|Minimum_Central_Press|Corr_flag
Lat Lon Type
Quadrant data

Where: Type is TD (tropical depression), TS (tropical storm), HU (hurricane) or HUT (typhoon). If type is not 'HUT',
an 'E' or 'S' is appended for an extratropical or subtropical storm, respectively
Valid_time is the full GEMPAK date/time string
Name is the storm name
Advisory_number is the number assigned to the storm
Position_accuracy is how close the center of the eye is to the given latitude and longitude
Direction is the direction that the storm is moving toward
Speed is the speed of the storm in knots
Minimum_Central_Press is the pressure value in mb in the eye at the valid time
Corr_flag is a flag indicating a correction (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The current and forecast latitude and longitude values and storm type are read using the FORTRAN format (2F9.2,4X,A).

Quadrant data (current 100 kt or 64 kt, 50 kt, and 34 kt winds and 12 ft seas, and forecast 100 kt or 64 kt, 50 kt and 34 kt winds) are read using the FORTRAN format (4X,A).

Prior to June 1, 2004, reports from the Joint Typhoon Warning Center (JTWC) included 100 kt winds instead of 64 kt winds. As of June 1, 2004, the JTWC reports 64 kt winds, as do the TPC and CPHC. In the decoded quadrant sections, the first wind position, originally labelled as '64', is now labelled as 'MW', the maximum wind, where 'MW' represents either the 64 kt winds from any report or the 100 kt winds from Western Pacific (JTWC) reports issued before June 1, 2004. If the storm type is 'HUT' and the date is prior to June 1, 2004, the first quadrant data is assumed to be the 100 kt wind information.

6.11 DCISIG

DCISIG decodes international SIGMET reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcisig [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcisig -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

```
|Type|Start_tm|End_tm|Msg_id|Orig_idFlt_lvl|Dir|Spd|Name_Loc|Corr
        Lat1    Lon1
        Lat2    Lon2
        Lat3    Lon3
        Lat4    Lon4
         .       .
         .       .
         .       .
```

Where: Type is TS (thunderstorm), TB (turbulence), HU (hurricane), TR (tropical storm), TD (tropical depression),
VA (volcanic ash cloud), MW (marked mountain waves),
TC (tropical cyclone), SQ (squall line), CT (CAT),
IC (icing), GR (hail), DS (duststorm), SS (sandstorm),
CB (cumulonimbus), WS (low level wind shear, or CN (cancel)
Start_tm and End_tm are full GEMPAK date/time strings
Msg_id is the message identification and sequence number
Ori_id is the originating station for the message
Flt_lvl is the flight level (or flight level range,
expressed as nnn-nnn) in hundreds of feet
Dir is the direction of movement of the phenomenon
Spd is the speed of the phenomenon in knots
Name_Loc is the name of the storm, where applicable, or
location of the volcano, where applicable, or the
word, OTHER for reports not from CONUS, Hawaii, Guam,
Japan, UK, Tahiti, and Cuba
Corr is a flag indicating a correction (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The latitude and longitude values describing the bounds of the phenomenon are read using the FORTRAN format (2F9.2). The number of points may vary. For a phenomenon at a point (e.g., a hurricane), only that point is specified. For a phenomenon centered at a point (e.g., a thunderstorm), the first point is the center and the second point gives the radius (in nautical miles), followed by RMISSD.

6.12 DCLSFC

DCLSFC decodes land surface synoptic reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dclsfc [options] output_file

Currently, for real-time operation, each output file represents a single day, of the form YYMMDD.syn.

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dclsfc -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.13 DCMETR

DCMETR decodes raw SAO and METAR reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcmetr [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcmetr -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY or YYYY	Year
MM	Month number
DD	Day
HH	Hour
NN	Minute

To decode off-time reports, setting the -m option to 72 will decode up to two off-time reports in addition to the hourly report.

6.14 DCMSFC

DCMSFC decodes raw buoy, ship, C-MAN, and Coast Guard reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcmsfc [options] output_file

Currently, the decoder can be run in two different modes. If the -a option is not used, the decoder will create hourly files of all marine surface data (ship, C-MAN, fixed and drifting buoys, Coast Guard). If the option "-a 6" is specified, 6-hour files of ship data only will be created. For real-time operation, output files have the form YYYYMMDDHH.ship, and are placed in different directories depending on whether they are hourly or 6-hour files.

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcmsfc -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.15 DCNCON

DCNCON decodes non-convective SIGMET reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcncon [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcncon -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_tm|End_tm|Msg_id|Flt_lvl_1|Flt_lvl_2|Corr_amd_tst

Lat1	Lon1
Lat2	Lon2
Lat3	Lon3
Lat4	Lon4
.	.
.	.
.	.

Where: Type is IC (icing), TB (turbulence), VA (volcanic ash), DU (duststorm or sandstorm), or CN (cancel)

Start_tm and End_tm are full GEMPAK date/time strings
Msg_id is the message identification and sequence number
Flt_lvl_1 is the lower flight level in hundreds of feet
Flt_lvl_2 is the upper flight level in hundreds of feet
Corr_amd_tst is a flag indicating a correction (1), an amendment (2), and/or a test (flag + 3)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The latitude and longitude values describing the bounds of the phenomenon are read using the FORTRAN format (2F9.2). The number of points may vary.

6.16 DCNCPROF (Unidata)

DCNCPROF decodes NetCDF format profiler reports provided by NOAA/FSL from a real-time data feed through standard input, or a NetCDF file on disk, and writes the data to a GEMPAK merged upperair file. FSL profiler data is provided in 6 minute observations as well as hourly summaries (currently available on the Unidata IDD FSL2 feed). In order to read the NetCDF file from standard input, a temporary file is created on disk consiting of the NetCDF product. Upon completion, the temporary file is removed, or if desired, the "-n netcdf_file" option may be used to store the input file in addition to the GEMPAK format file.

The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcncprof [options] output_file

When decoding existing files, the input file name can be specified using the "-f filename" argument.

dcprof -f input_file [options] output_file

A template may be used to specify the output file name. The file name template uses the date and time of the observations within the NetCDF file to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

Command line options specific to DCNCPROF:

-f input_file	Read NetCDF file from disk instead of STDIN
-n output_netcdf file	Save NetCDF file from STDIN to disk

The following ancillary tables are used:

$GEMTBL/pack/profiler_fsl.pack	Packing file
$GEMTBL/stns/profiler_fsl.stn	Station table

6.17 DCNEXR2 (Unidata)

DCNEXR2 is used to receive the Level II NEXRAD data from the CRAFT IDD data stream. Products are received in BZIP2 compressed pieces from a file or data stream fed to the program through standard input, and appended to an output file for use with display programs. The program is controlled by inputs to the command line.

The inputs are program options, and the output file name. For example:

dcnexr2 [options] output_file

By default, the program initially prepends a "." to the output file name, and renames the file upon closing in order to make it easier for programs to determine when a file is complete. Subsequent writes to an existing file bypass adding the leading "." to the filename.

The only useful option to the program is "-s STID" which allows the user to specify a 4 character station ID to be written in to the output data file in bytes 21-24 of the Archive2 Level II data header, which allows programs to identify the source of the radar data without having to rely on a file name convention.

6.18 DCNLDN (Unidata)

DCNLDN decodes NLDN lightning data reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK ship format file. The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcnldn [options] output_file

For archived data dcnldn [options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute
@@	File Sequence Number

Because the number of lightning strikes that may occur in a single hour can be very large, it is possible that the number of strikes will exceed the size of the output file. By default, when the size of the output file is exceeded, a new file is created and a sequence number _## is appended to the file name, where ## is 01 for the first additional file created, 02 for the second, etc.

The user may use the @@ template option to tailor the sequence numbering to suite local tastes. When using @@, the initial file will be numbered 00.

The default file size that will be created by dcnldn is 25,000. Typical summer conditions may exceed 25,000 a few hours during the day. The -m option may be used to create smaller files, which will be more space efficient during less active periods.

By default, strikes are assigned hourly DATTIM stamps. The user may specify data to be binned in NN minute bins by specifying the storage method using the "-s minuteNN" option. For example minute06 will generate DATTIMs with YYMMDD/HH00, YYMMDD/HH06, YYMMDD/HH12, ... times.

6.19 DCNMOS

DCNMOS decodes NGM Model Output Statistics data from a a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcnmos [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcnmos -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.20 DCPROF (Unidata)

DCPROF decodes BUFR format profiler reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK merged upperair file. The program is controlled by inputs to the command line.

The inputs are program options, the two BUFR table files and the output file name or template. For example, for real-time data feeds:

dcprof [options] bufrb_table bufrd_table output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcprof -c YYMMDD/HHNN [options] bufrb_table bufrd_table output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.21 DCRDF

DCRDF decodes Regional Digital Forecast (RDF) reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcrdf [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcrdf -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.22 DCREDBOOK (Unidata)

DCREDBOOK creates displays of Redbook graphic format products from a real-time data feed, or from a file fed to the program through standard input. The program is controlled by inputs to the command line. Output is created using the supplied GEMPAK device which accepts the standard parameters for each type of device driver. Program usage is:

dcredbook [options] device

The program produces products, just as can be done with GPMAP, though the input file is designed to be read from STDIN. Additionally, the program will use the $GEMTBL/

nafos/redbook.tbl file to supply an optional product name and graphics area for the final output. Since products transmitted using the WMO identifier do not provide a descriptive product name, the use of the redbook.tbl file is useful for creating automated product generation actions.

Three version of the program are provided: dcredbook, dcredbook_ps, and dcredbook_gf. The first instance uses the standard GPLT interface which allows any of the available device drivers to be selected. The second and third instances are linked directly to the GEMPAK postscript and gif drivers respectively to eliminate the need for creating the separate GPLT interface.

For example:

dcredbook 'gf|%P-YYYYMMDD_HHNN.gif' < redbook_file

A template may be used to specify the output file name. The file name template uses the date and time of the graphic file to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute
%P	Product name as given in $GEMTBL/nafos/redbook.tbl

6.23 DCSCD

DCSCD decodes Supplemental Climatological Data reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcscd [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcscd -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.24 DCSHEF VERSION 2

The GEMPAK DCSHEF program decodes raw SHEF reports from a real-time data feed (via an LDM), or from a file containing raw SHEF reports. The data is written to a GEMPAK surface file.

The decoder is available in the file dcshef.tar.Z and includes:

exe/hpux/dcshef DCSHEF decoder exe/linux/dcshef Available only in dcshef.linux.tar.Z gempak/help/dcshef.hlp Help file gempak/tables/... pack/shef.pack Sample SHEF parameter packing file pack/SHEFparms.txt Text listing of all valid SHEF parms stns/shefstns.tbl.master Master SHEF station table stns/shefunits.tbl Units conversion table README/dcshef.README This file. README/dcshef.FAQ FAQ to answer common questions about
decoding and viewing SHEF data.

Below, you will find a description of how the SHEF decoder works, and instructions on how to install DCSHEF. If you do not care how the decoder works, skip ahead to the installation steps.

I. How DCSHEF decodes SHEF Reports ----------

General:

The DCSHEF decoder will decode .A, .B, and .E SHEF reports. Data from different report types are stored together in the same output GEMPAK surface file. DCSHEF does not distinguish between data decoded from .A, .B, or .E reports.

When you configure DCSHEF to decode data, you have complete control over which stations are decoded, and what parameters are decoded. You can run multiple copies of DCSHEF, decoding different sets of parameters for different stations, as long as each configuration of DCSHEF has its own GEMPAK output file. You may not write to the same GEMPAK output file from separate instances of DCSHEF. See the installation steps below for more details.

Time:

All times in SHEF reports are converted to and stored in UTC time in the GEMPAK output file. Often, SHEF data is reported in local time. But, since there is no way to indicate the time zone in a GEMPAK data file, all times are converted to UTC. The only exception is the special time of 2400. In SHEF reports, 2400 is used to indicate the end of a given time period. For example, it may mean the end of a day or the end of a month. When DCSHEF encounters the time 2400, the time is not converted to UTC time. Instead, the date time string YYMMDD/2400 is assigned to the data.

For .A & .B reports, the report time is rounded to the hour using the standard GEMPAK rounding rule. That is, when the report time is greater than or equal to 45 minutes after the hour, the valid time is rounded to the next hour. When the report time is less than 45 minutes after the hour, the valid time is rounded down to the current hour. The actual report time is always available in the special GEMPAK parameter STIM. STIM can be accessed like any other data parameter, even though it is not listed in the parameter packing file.

For .E reports, the report time is rounded up to the nearest 15 minute interval. Thus, valid times will be HH00, HH15, HH30, or HH45. For .E reports with increments less than 15 minutes, data is stored only when the valid time is unique. Thus, for a report containing data every 5 minutes, only the data at HH00, HH05, HH20, HH35, and HH50 are stored at HH00, HH15, HH30, HH45 and (HH+1)00, respectively. Again, the actual report time for each stored report is always available in the STIM variable.

Parameters:

DCSHEF will decode any valid SHEF parameter. SHEF parameters can be up to 7 characters long, although usually they are only 2 or 3 characters long. The file $GEMTBL/pack/SHEFparms.txt contains text versions of Tables 1-4 from the SHEF Users Guide. (http://hsp.nws.noaa.gov/hrl/shef/contents.htm). These tables list the available codes used to create the parameters names. You can also look at some raw SHEF reports to see examples of the parameter names.

DCSHEF will allow you to decode any of these parameters simply by listing the parameter name in a GEMPAK parameter packing file. For best results, you should use 4 characters to define a parameter in the GEMPAK parameter packing file. If you use fewer than 4 characters, DCSHEF will expand the parameter name to 4 characters using the default values for character 3 and 4 ("I" and "R", respectively). DCSHEF will expand the parameter names both in the packing table and in the data, so that all the appropriate data is decoded. However, if you use fewer than 4 characters, you will not be able to use any of the mathematical functions on these data. Therefore, I suggest that you expand all 2 and 3 character parameter names to four characters by using the default values of "I" and "R" for characters 3 and 4, respectively.

In the SOO distribution of NAWIPS/DCSHEF, up to 40 parameters may be listed in a single parameter packing file. If you want to decode more than 40 SHEF parameters, you will have to create a second packing table, and run two copies of the DCSHEF

decoder from two entries in the LDM pattern action file. Note that each packing table requires it's own output GEMPAK data file, so you will have to store the data in separate GEMPAK files. Here's an example: In shef.pack, I list some standard parameters like temps, press, precip, and wind data. I decode this data into the files YYMMDD_shef.gem. In addition, I create a second packing table called shefriver.pack where I list river information such as stage heights, gate openings, fish counts, water quality, and discharge information. I decode this data into the files YYMMDD_river.gem.

You can change the parameters to decode at any time, by changing the parameter packing file. However, note that changes only take affect when the GEMPAK data file is created. That is usually at the start of a new day.

Finally, note that SHEF parameter names can use up to 7 characters. DCSHEF nor GEMPAK can distinguish between the SHEF parameter names that differ in the 5th, 6th, or 7th character. Thus, if a single report contains data for two different parameters whose names differ only in characters 5-7, DCSHEF will decode only one of those data. Usually, this situation does not occur.

Stations:

There are 10s of thousands of stations in the US reporting data in SHEF. The SOO distribution of NAWIPS & DCSHEF will only support up to 4700 stations per GEMPAK data file. Therefore, you will have to choose your favorite 4700 (or fewer) stations to decode.

The file $GEMTBL/stns/shefstns.tbl.master contains a list of stations (ordered by state) which report precipitation data. This is the most complete list of stations I have been able to find. You can start by selecting the stations of interest to you from this master station list. Note, however that the shefstns.tbl.master file may not be complete, and you may need to supplement this table with stations of your own.

If you must decode SHEF reports from more than 4700 stations, you will have to create two station tables, and run two copies of the DCSHEF decoder from two entries in the LDM pattern action file. Again, you must use separate file names for each copy of DCSHEF. For example, I may put all the stations reporting SHEF data from Colorado in shefstnsco.tbl and decode that data into YYMMDD_shefco.gem. And, I may put all the stations reporting SHEF data from Wyoming in shefstnswy.tbl and decode the data into YYMMDD_shefwy.gem.

Finally, there are some HADS stations that are not in the shefstns.tbl.master file. You may want to check the HADS list at http://hsp.nws.noaa.gov/oh/hads/hsas/hsas.htm, and add any stations of interest to your shefstns.tbl file. Simply follow the existing format shown in shefstns.tbl.master.

Units:

SHEF data is stored in the output GEMPAK data file in English units. These units are the default for SHEF data, and are listed with the parameter names in Table 1 of the SHEF Users Guide and in the file $GEMTBL/pack/SHEFparms.txt. If the units function "DUS" is used in a SHEF report, that means the data values are reported in S.I. units. DCSHEF will then convert the data values from S.I. units into English units and store them in the output GEMPAK data file.

Data:

Once the SHEF data is decoded into an output GEMPAK data file, you can view the data using any surface data plotting program. You can create maps using SFMAP. You can create meteograms using SFGRAM. You can even do an objective analysis on the data using OABSFC to create gridded data. (Be sure that the available SHEF data provides enough spatial coverage so that the objective analysis is valid.) You can list the SHEF data using the SFLIST program.

SHEF data can also be viewed in GARP. To configure GARP to view SHEF data, you must add a few keys to the $NAWIPS/garp/config/Garp_defaults file. For example:

sfc_keys : "surf,shb,shef" sfc_labels : "Hourly/METAR,Ship/Buoy,SHEF" sfc_tables : "sfcparms.lst,shbparms.lst,shefparms.lst" shef_dir : $METDAT/gempak/shef shef_parms: ";TAIR;TADR;TNIR;TXIR;PPPR;PPQR;STIM"

Your "shef_parms" list will contain those data you routinely want plotted in GARP. You should put your complete list of SHEF parameters (from your shef.pack file) in a $NAWIPS/garp/tables/shefparms.lst file. (You can use the $NAWIPS/garp/tables/ sfcparms.lst file as a sample.)

Performance:

DCSHEF is a standard GEMPAK decoder. It does quite a bit of string manipulation, and like other GEMPAK decoders, can be a little slow at times. In the case of METAR or upper air decoding, this is not a big deal. However, because of the overwhelming volume of data in SHEF, this can become an issue.

For most SOOs, who only receive reports from a few states, the performance of DCSHEF will be fine. However, if your office receives SHEF data from the entire country, you may run into slow decoding. For example, it took over 20 minutes to decode all the 12Z SHEF data on the NWS DD+ data feed. (The DD+ data feed includes most of the reports from the entire US.)

If you see slow decoding of the SHEF data, you might consider restricting the amount of data sent to DCSHEF by modifying the pattern in your pqact.conf file. For example, you might change the (...)(RR.) pattern to (NMC|SEA)RR(M|A|S).

Command line options:

DCSHEF uses a number of command line options. They are:

-v N Set the verbosity level to "N". As N goes up, more verbose logging occurs. **The default is "0". Level 1 will report stations not decoded. Level 2 will report stations & parameters not decoded. Levels 3, 4, & 5 will include Level 1 & 2 messages, along with additional debugging messages.**

-c curtim "curtim" is the pseudo-current time. This is a complete GEMPAK format date/time (YYMMDD/HHMM) and is used as the system time when decoding archive data. The default value for this variable is the system time.

-b nhours "nhours" is the number of hours prior to the current time. Only reports within this time period are decoded into the data file. The default value for this variable is 24 hours.

-d decoder_log "decoder_log" is the name and path of the decoder **log file. The default value is dcshef.log**

-t time_out "time_out" is the time-out value in seconds for the decoder. If no data is received within the specified time limit, the program will exit. The default time-out value is 600 seconds.

-h Print the usage statement and exit

-p prmfil Set the parameter packing table to "prmfil". The default **value is $GEMTBL/pack/shef.pack.**

-s stntbl Set the station table to "stntbl". The default value **is $GEMTBL/stns/shefstns.tbl.**

-a iadstn Define the maximum number of additional stations (beyond those in the station table specified in "-s stntbl") that can be added to the data file as "iadstn". The default value is 0.

-m maxtim Set the maximum number of times in a single data file **to "maxtim". The default value is 100.**

-g gemtbldir Set the path to the GEMPAK tables ($GEMTBL). This is required when running the decoder from the LDM. This definition can also be used for the parameter table and station table entries.

Limitations:

DCSHEF will decode most SHEF reports. There are a few exceptions:

1) .E reports with time increments of less than 15 minutes will only decode those data values at unique valid times. (See the "Times" section for more details.)

2) In the same report, parameter names that differ only in the 5-7th character are not distinguishable.

3) More than one date override function in the data or header section of .B reports can not be handled.

4) Data qualifier (DQ groups), duration information (DV groups), and creation date information (DC groups) are not decoded.

Log: PB/NWS 7/29/98 PB/NWS 8/20/98 Bug fix for reports with comments at end of line. PB/NWS 9/02/98 VERSION 2: Added code to append data to existing reports in GEMPAK data file.
PB/NWS 11/9/98 VERSION 2.1: Fixed bug in B reports with leading slash

II. Usage Guide ----------

1) Set up the list of parameters to decode in the parameter packing file. A sample packing file is included in the distribution in the file $GEMTBL/pack/shef.pack. You will find the complete list of valid SHEF parameters in the file $GEMTBL/pack/SHEFparm.txt, or in the on-line version of the SHEF Users Guide: http://hsp.nws.noaa.gov/hrl/shef/contents.htm See the "Parameters" section above for more information.

2) Set up a list of stations to decode in the station table file. A master list of stations is included in the distribution in the file $GEMTBL/stns/shefstns.tbl.master. You can copy up to 4700 stations into your station table. (default name $GEMTBL/stns/shefstns.tbl) See the "Stations" section above for more information.

3) Configure the pattern action file, pqact.conf, of your LDM to run DCSHEF upon receipt of a SHEF report. Here is an example entry (watch the TABS):

```
AFOS ^(...)RR.(..)
        PIPE        dcshef  -v  0
        -d  /metdat/gempak/shef/dcshef.log
        -g  /usr1/nawips/gempak/tables
        -p  shef.pack
        -s  shefstns.tbl
        /metdat/gempak/shef/YYMMDD_shef.gem
```

6.25 DCSTORM (Unidata)

DCSTORM decodes Severe Storm reports from the Storm Prediction Center (SPC) from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK ship format file. Bulletins decoded are hourly NWUS22 KWNS (formerly WWUS60 KMKC) products.

The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcstorm [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcstorm -c YYMMDD/HHNN [options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

User Controled Input Default

Parameter file	sels.pack
Station table	none
Maxstns	9999

6.26 DCSUOMI (Unidata)

DCSUOMI is a decoder for use with the NetCDF format SUOMINET data files from Unavco/Unidata. DCSUOMI places the individual GPS & Metstation reports into Gempak surface format files.

In order to read the NetCDF file from standard input, a temporary file is created on disk consiting of the NetCDF product. Upon completion, the temporary file is removed, or if desired, the "-n netcdf_file" option may be used to store the input file in addition to the GEMPAK format file.

The following list provides the surface file naming of decoded SUOMINET parameters:

NetCDF name GEMPAK name pwv PWVM pwv_err PWVE wet_delay DELW model_dry_delay DELD total_delay DELT final_dry_delay DELF pifact PIFC pres PRES temperature TMPC rh RELH met_flag MFLG

The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcacars [options] output_file

When decoding existing files, the input file name can be specified using the "-f filename" argument.

dcsuomi -f input_file [options] output_file

A template may be used to specify the output file name. The file name template uses the date and time of the observations within the NetCDF file to replace the following characters.

YYYY	Year with century
YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

Command line options specific to DCSUOMI:

-f input_file	Read NetCDF file from disk instead of STDIN
-n output_netcdf file	Save NetCDF file from STDIN to disk

The following ancillary tables are used:

$GEMTBL/pack/suomi.pack	Packing file

6.27 DCSVRL

DCSVRL decodes severe local storm reports (tornado and severe thunderstorm watch reports) from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcsvrl [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcsvrl -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_time|End_time|Watch_number|Corr_flag
County_station_table_information_1
County_station_table_information_2
...
County_station_table_information_N

Where: Type is TS (severe thunderstorm) or TN (tornado)
Start_time and End_time are full GEMPAK date/time strings
Watch_number is the watch number
Corr_flag is a flag indicating a correction (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The County_station_table_information is read using the FORTRAN format (A8,1X,I6,1X,A32,1X,A2,1X,A2,1X,F9.2,1X,F9.2,1X,F9.2,1X,I2,1X,A20). The county information is the same as in the GEMPAK station tables.

6.28 DCTAF

DCTAF decodes raw TAF (terminal aerodrome forecast) reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dctaf [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcatf -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY or YYYY	Year
MM	Month number
DD	Day
HH	Hour
NN	Minute

6.29 DCTROP (Unidata)

DCTROP decodes Hurricane/Tropical storm reports reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK ship format file. Bulletins decoded are: WTNT4[1-5] (atlantic), WTPZ4[1-5] (east pacific), WTPA4[1-5] (central pacific), and WTPN3[1-5] (west pacific).

The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dctrop [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dctrop -c YYMMDD/HHNN [options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute
@@	Insert the Storm Name/number

User Controled Input Default

Parameter file	tropic.pack
Station table	none
Maxstns	3999

6.30 DCUAIR

DCUAIR decodes upper air sounding data from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK sounding file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcuair [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

dcuair -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY or YYYY	Year
MM	Month number
DD	Day
HH	Hour
NN	Minute

The dcuair decoder may be used to decode dropsonde data. If this is done, it is advisable to run a separate instance of the decoder from that used to decode standard upper air data. In this case,

a) the maximum number of stations to add should be set to at least 50 on the command line (-a 50), since all dropsonde reports are treated as additional stations
b) the maximum number of times should be set to 24 on the command line (-m 24), to create hourly entries instead of 3-hourly entries
c) only upper air bulletins having WMO bulletin headers beginning with UZ should be sent to the decoder

6.31 DCWARN

DCWARN decodes flash flood, tornado and severe thunderstorm warning reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcwarn [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcwarn -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_time|End_time|Orig_station|Corr_flag
County_station_table_information_1
County_station_table_information_2
...
County_station_table_information_N

Where: Type is SVR (thunderstorm), TOR (tornado) or FFW (flash flood)
Start_time and End_time are full GEMPAK date/time strings
Orig_station is the WFO that issued the warning
Corr_flag is a flag indicating a correction (0 or 1)

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The County_station_table_information is read using the FORTRAN format (A8,1X,I6,1X,A32,1X,A2,1X,A2,1X,F9.2,1X,F9.2,1X,F9.2,1X,I2,1X,A20). The county information is the same as in the GEMPAK station tables.

6.32 DCWATCH (Unidata)

DCWATCH decodes WWUS40 format Severe Thunderstorm and Tornado watch box bulletins from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK ship format file. The program is controlled by inputs to the command line.

The inputs are program options, and the output file name or template. For example, for real-time data feeds:

dcwatch [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must be also be specified. For example:

```
dcwatch -c YYMMDD/HHNN [options] output_file < input_file
```

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YY	Year without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

User Controled parameters	Suggested Default:
Parameter file	watch.pack
Station table	sfworld.tbl
Maxtim	1500

6.33 DCWCN

DCWCN decodes watch county notification reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

DCWCN [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

DCWCN -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

PROGRAM METHODOLOGY FOR TIME STRINGS

When decoding WCNs, assumptions on time varibles are made for those cases where the watch start time is '000000T0000Z'.

For 'NEW' reports, the watch starting and ending times are decoded from the VTEC line.

For 'CON' reports, where the watch starting time is '000000T0000Z' in the VTEC line, the start time is set equal to the bulletin issue time and the ending time is decoded from the VTEC line.

For 'CAN' reports, where the watch starting time is '000000T0000Z' in the VTEC line, the ending time is decoded from the VTEC line and the starting time is set equal to the ending time.

OUTPUT FORMATING

The format of the output ASCII file is as follows:

|Watch|Issue|Start|Stop|Watch |Bulletin |Significance|Corr|Cancel|Test |type |time |time |time|number|originator|code |flag|flag |flag

County/marine zone table entries, one per line, formatted as shown in the example below (county/marine zone information lines should appear just as they do in $GEMTBL/stns/mzcntys.tbl) . . . . . .

where:

Watch type is TSM thunderstorm watch
TOR tornado watch

Issue time is YYMMDD/HHMM - GEMPAK date/time format - time of the
of the WCN bulletin
Start time is YYMMDD/HHMM - GEMPAK date/time format - Start time
of the WCN bulletin
Stop time is YYMMDD/HHMM - GEMPAK date/time format - End time of

of the WCN bulletin

Bulletin originator is KALY, KBGM, etc. from 2nd field of 1st line of bulletin

Watch number is the decoded watch number

Significance code A Watch

Correction flag 0 Not a correction
1 A correction

Cancel flag 0 Not a cancellation or expired report
1 A cancellation or expired report

Test flag 0 Not a test report
1 A test report

Example ------- |TOR|020807/1701|020807/1716|020807/2100|0002|KLSX|A|0|0|1 ILC121 17121 Marion IL US 38.65 -88.92 0.00 0 LSX ILC051 17051 Fayette IL US 39.00 -89.03 0.00 0 LSX ILC189 17189 Washington IL US 38.35 -89.41 0.00 0 LSX LHZ361 743610 LHZ361 LH US 45.65 -83.88 0.00 0 APX ANZ335 673350 ANZ335 AN US 41.04 -73.35 0.00 0 OKX ANZ338 673380 ANZ338 AN US 40.54 -74.08 0.00 0 OKX

6.34 DCWOU

DCWOU decodes watch outline update reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

DCWOU [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

DCWOU -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Watch|Issue|Start|Stop|Watch |Bulletin |Active|Time|Corr/test|Cancel |type |time |time |time|number|originator|WFOs |zone|flag | flag

County/marine zone table entries, one per line, formatted as shown in the example below (county/marine zone information lines should appear just as they do in $GEMTBL/stns/mzcntys.tbl) . . . . . .

where:

Watch type is TSM thunderstorm watch
TOR tornado watch

Issue time is YYMMDD/HHMM - GEMPAK date/time format - Issue time of the WOU bulletin

Start time is YYMMDD/HHMM - GEMPAK date/time format - Start time of the WOU bulletin

Stop time is YYMMDD/HHMM - GEMPAK date/time format - End time of the WOU bulletin

Bulletin originator is KALY, KBGM, etc. from 2nd field of 1st line of bulletin

Watch number is the decoded watch number

Active WFOs are the WFOs that the watch affects Time zone is the time zone where the watch has been issued Corr/test flag is 0 Not a correction; not a test

1	A correction; not a test
2	Not a correction; a test
3	A correction; a test

Cancel flag is 0 Not a cancellation
1 A cancellation

Example -------

|TOR|021008/1121|021008/1130|021008/
1700|102|KWNS|BMX;OHX;MEG;PAH;LMK;APX;OKX|CST|0|0 ALC077 1077 Lauderdale AL US 34.91 -87.65 0.00 0 BMX INC129 18129 Posey IN US 38.02 -87.88 0.00 0 PAH KYC031 21031 Butler KY US 37.21 -86.69 0.00 0 LMK MSC093 28093 Marshall MS US 34.77 -89.50 0.00 0 MEG TNC147 47147 Robertson TN US 36.53 -86.87 0.00 0 OHX LHZ361 743610 LHZ361 LH US 45.65 -83.88 0.00 0 APX ANZ335

673350 ANZ335 AN US 41.04 -73.35 0.00 0 OKX ANZ338 673380 ANZ338 AN US 40.54 -74.08 0.00 0 OKX

6.35 DCWSTM

DCWSTM decodes winter storm reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcwstm [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcwstm -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Message|Start|Stop|Bulletin |Weather|Corr/test|Cancel |type |time |time|originator|type |flag | flag

Zone table entries, one per line, formatted as shown in the example below (zone information lines should appear just as they do in $GEMTBL/stns/zones.tbl) . . . .

where:

Message type is WRN warning
WTC watch
ADV advisory

Start time is YYMMDD/HHMM - GEMPAK date/time format Stop time is YYMMDD/HHMM - GEMPAK date/time format

Bulletin originator is KALY, KBGM, etc. from 2nd field of 1st line of bulletin

Weather type is SNOW snow

ICE	ice
SL	sleet
FZRA	freezing rain
SLFZ	sleet/freezing rain

Corr/test flag is 0 Not a correction; not a test

1	A correction; not a test
2	Not a correction; a test
3	A correction; a test

Cancel flag is 0 Not a cancellation

1 A cancellation

Example -------

|ADV|020425/0913|020425/1600|KBOX| |0|0 MAZ005 210050 Western_Middlesex MA US 4252 -7136 0 0 BOX MAZ006 210060 Western_Essex MA US 4270 -7100 0 0 BOX NHZ012 290120 Hillsborough NH US 4293 -7173 0 0 BOX

6.36 DCWTCH

DCWTCH decodes tornado and severe thunderstorm watch box reports and watch status reports from a real-time data feed, or from a file fed to the program through standard input, and writes the data to an ASCII file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcwtch [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcwtch -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

The format of the output ASCII file is as follows:

|Type|Start_time|End_time|Watch_number|Corr_flag|Cancel_flag
Lat1 Lon1
Lat2 Lon2
Lat3 Lon3
Lat4 Lon4

Where: Type is TS (thunderstorm), TN (tornado) , RP (replaced) or ST (status)
Start_time and End_time are full GEMPAK date/time strings
Watch_number is the number assigned to the watch
Corr_flag is a flag indicating a correction (0 or 1)
Cancel_flag is a flag indicating a cancellation (0 or 1),
or, for type ST, the number of points which follow

Extra spaces may appear anywhere in this line of information, except in the first character position. The first character must be a bar (|).

The latitude and longitude values are read using the FORTRAN format (2F9.2). Types TS and TN will always have four points; the number of points for type ST may vary.

6.37 DCXMOS

DCXMOS decodes Global Forecast System - Extended (GFSX) Model Output Statistics data from a real-time data feed, or from a file fed to the program through standard input, and writes the data to a GEMPAK surface file. The program is controlled by inputs to the command line.

The inputs are program options and the output file name or template. For example, for real-time data feeds:

dcxmos [options] output_file

If running the program interactively with standard input, the -c option must be used. The input file must also be specified. For example:

dcxmos -c YYMMDD/HHNN [other_options] output_file < input_file

A template may be used to specify the output file name. The file name template uses the date and time of the bulletin or report to replace the following characters.

YYYY or YY	Year with or without the century
MM	Month number
DD	Day
HH	Hour
NN	Minute

Note that for data from Hawaii (WMO bulletin header FEPA20), parameter PP12 (probability of precipitation fcst in a 12-hr period) is valid for periods of 18-30, 30-42, ..., 186-198 hours after 0000 UTC. For all other sites, PP12 is valid for periods of 12-24, 24-36, ..., 180-192 hours after 0000 UTC.