

## VI.5.2B OPERATIONAL FORECAST PROGRAM (FCST) HYDROLOGIC COMMAND LANGUAGE (HCL) SYNTAX RULES

### Introduction

The Operational Forecast Program (FCST) Hydrologic Command Language (HCL) commands contain combinations of keywords, dates, character strings and real and integer values. For these elements to be recognized, they must be entered according to the HCL syntax rules which define the structure of expressions in the language. The use of each of these elements is defined in this Section along with ways of specifying Arguments, comments, continuations, delimiters and identifiers. The topics are listed in alphabetical order.

### Arguments

Arguments are values associated with a Technique. When a Technique is defined, an ordered list of Arguments and their defaults may be specified which is retained with the definition of the Technique. When the program is executed, Arguments can be entered:

- o by position (in the order specified in the Technique definition)
- o by Argument name

If an Argument is entered by name and the next Argument is entered by positional, the positional value will be assigned to the next Argument specified when the Technique was defined.

To illustrate how Argument values are specified, assume a user wished to define a local MAP estimation Technique called MAPEST3 and set defaults for the Arguments CNVDIS, CONVEC, MDR and EST. In this example CNVDIS is a real number, CONVEC is a logical quantity and MDR and EST are integers. The following command would be used to define the Technique:

```
@DEFINEL TECHNIQUE MAPEST3
A:CNVDIS=15.7 T=R
A:CONVEC=.FALSE. T=L
A:MDR=1
A:EST=0
```

The following examples show how the Argument values could be specified:

<u>Input</u>	<u>Description</u>
10, .TRUE., 0	CNVDIS=10.0, CONVEC=TRUE, MDR=0
CNVDIS=10., MDR=0	CNVDIS=10.0, MDR=0
MDR=0, 1	MDR=0, EST=1
10.0, MDR=0, 1	CNVDIS=10.0, MDR=0, EST=1

### Blanks

In general, blanks are valid delimiters between fields. There are 2 cases where blanks may not be used:

- o between a Technique name and it's value, which is enclosed in parenthesis
- o surrounding an equal sign

The following are examples of valid and invalid uses of blanks:

<u>Input</u>	<u>Description</u>
MDRONLY(1)	Valid input for Technique MDRONLY setting a value of one
PRNTFMAP (0)	Invalid input for setting a Technique value
WEIGHT1=.55,WEIGHT2=.45	Valid input setting values for Arguments WEIGHT1 and WEIGHT2
BLENGTH=3 WTLENGTH= 4	Invalid input for Argument WTLENGTH

### Character Strings

All input enclosed in apostrophes is considered to be a character string. If a character string has embedded apostrophes, each of them should be replaced by two apostrophes. Any input element which is not an integer, real value or keyword is assumed to be a character string.

<u>Input</u>	<u>Field Type</u>	<u>Field Value</u>
STATION	character	STATION
'STATION'	character	STATION
'PROC'	character	PROC
PROC	keyword	PROC
'DON''T'	character	DON'T
109	integer	109
'109'	character	109

### Comments

All comments start with a \$ and continue from the \$ to the end of the card. The \$ can be in the first non-blank character in which case the whole card is a comment. Comments can also be included on command cards because any information after a \$ is treated as a comment.

```
$ THIS IS A COMMENT CARD
```

```
@COMP MAP $ CALCULATE MAP FOR DESIGNATED AREAS
```

### Continuations

All HCL commands must begin with an @. For a command to be recognized, it must be the first field on the card image. HCL will continue processing a command until another command is encountered.

```
@DEFINE FUNCTION MAP TECH=MDR,SS,TULSAEST,CNVDIS
EST1
@DEFINEL PROC MAP&MAT
```

## Dates

The following general date formats allow any date on or after January 1, 1900 to be entered:

1) MMDDYYHHTZC

where MM is the month (must be two digits 01 to 12)  
DD is the day (must be two digits 01 to 31)  
YY is the year (must be two digits 00 to 99) 1/  
HH is the hour (must be two digits 00 to 24)  
TZC is the time zone code 2/

2) \*±daysHHTZC

where \* is TODAY's date 3/  
days is the number of days before (-) or after (+)  
TODAY (must be two digits)

3) MMDD/year/HHTZC

where year is the year (must be four digits)

4) #±nn

where # indicates the date and time are to be set to a specific interval of the day relative to the current time 4/  
nn is the interval at which the date and time are to be set after (+) or before (-) the current clock time and must be:  
o greater than or equal to 1  
o less than or equal to 24  
o evenly divisible into 24

5) %±HHTZC

where % indicates the date and time are to be set to a specific time of day relative to the current time. The date and time are set to the next occurring (+) hour in the specified time zone, or in the previously occurring (-) hour in the specified time zone. 4/

6) LASTPP24

This format can be used to set the date to the date of the last day of PP24 data in the Preprocessor Data base.

Date Format 1 has the following abbreviated forms:

- 1a) MMDDYYHH      The time zone defaults to the default TZC in the User Parameter File
- 1b) MMDDHHTZC    The year defaults such that MMDD is closest to the current date (obtained from the computer clock)
- 1c) MMDDHH        The year defaults as in format 1b and the time zone defaults as in format 1a - this format is assumed if HH (i.e., the 5th and 6th digits) are in the range 00-24
- 1d) MMDDYY        The hour defaults to 12Z - this format is assumed if YY (i.e., the 5th and 6th digits) are in the range 25-99
- 1e) MMDD          The hour defaults as in format 1d and the year defaults as in format 1b

Date Format 2 has the following abbreviated forms:

- 2a) \*±daysHH     The time zone defaults as in format 1a - days must be two digits with this format
- 2b) \*±days        The hour defaults as in format 1d - days can be one or two digit with this format
- 2c) \*HHTZC        The value of days defaults to zero with this format
- 2d) \*HH            The time zone defaults as in format 1a
- 2e) \*              The value of days defaults to zero and the hour defaults as in format 1d (i.e., this date is TODAY at 12Z)

Date Format 3 has the following abbreviated forms:

- 3a) MMDD/year/HH    The time zone defaults as in format 1a
- 3b) MMDD/year/      The hour defaults as in format 1d
- 4a) #                The date and time default to the previously occurring interval as set by the INTERVAL user parameter (see VI.5.2C-SETUPARM)
- 4b) #±               The date and time default to the next occurring interval (+) or the previously occurring (-) interval as set by the INTERVAL user parameter (see VI.5.2C-SETUPARM)

Date Format 5 has the following abbreviated forms:

- 5a) %                   The date and time default to the previously occurring 12Z
- 5b) %±HH                The time zone defaults as in format 1a

Notes:

1/ YY minus the current year (obtained from the computer clock) cannot be greater than 2. HCL will consider a date invalid if YY is 3 or more greater than the current year. Use date format 3 to enter dates where YY minus the current year is greater than 2.

2/ Valid time zone codes are:

<u>Code</u>	<u>Description</u>
Z	Greenwich
EST	Eastern standard
EDT	Eastern daylight
CST	Central standard
CDT	Central daylight
MST	Mountain standard
MDT	Mountain daylight
PST	Pacific standard
PDT	Pacific daylight
AST	Alaska standard
ADT	Alaska daylight
HST	Hawaii standard
HDT	Hawaii daylight
NST	Nome standard
NDT	Nome daylight
INTL	Internal clock time

3/ TODAY's date is either set by the SETTODAY command or, by default, is obtained from the computer clock (see VI.5.2C-SETUPARM).

4/ Setting the date and time by this method is not affected by the use of the SETTODAY command. The date and time are still set by the current clock time, not by the day specified with SETTODAY.

### Examples of HCL date input

Valid date forms:

<u>Value Entered</u>	<u>Current Date (computer clock)</u>	<u>TODAY</u>	<u>TZC in User Parm</u>	<u>Date Interpreted as</u>	<u>Remarks</u>
02158607EST	02/01/86	1/	1/	02/15/86-7EST	Form 1
02158607	02/01/86	1/	Z	02/15/86-7Z	Form 1a, default TZC
021507EST	02/01/86	1/	1/	02/15/86-7EST	Form 1b, default YY
021507	02/01/86	1/	Z	02/15/86-7Z	Form 1c, default TZC
021586	02/01/86	1/	1/	02/15/86-12Z	Form 1d
0215	02/01/86	1/	1/	02/15/86-12Z	Form 1e
*+0407EST	1/	02/05/86	1/	02/09/86-7EST	Form 2
*+0407	1/	02/05/86	Z	02/09/86-7Z	Form 2a, default TZC
*-04	1/	02/05/86	1/	02/01/86-12Z	Form 2b, two digit days
*-4	1/	02/05/86	1/	02/01/86-12Z	Form 2b, one digit days
*07EST	1/	02/05/86	1/	02/05/86-7EST	Form 2c

*07	<u>1/</u>	02/05/86	Z	02/05/86-7Z	Form 2d, default TZC
*	<u>1/</u>	02/05/86	<u>1/</u>	02/05/86-12Z	Form 2e
0215/1992/07EST	<u>1/</u>	<u>1/</u>	<u>1/</u>	02/15/92-7EST	Form 3
0215/1992/07	<u>1/</u>	<u>1/</u>	Z	02/15/92-7Z	Form 3a, default TZC
0215/1992/	<u>1/</u>	<u>1/</u>	<u>1/</u>	02/15/92-12Z	Form 3b
#-6	02/01/86-14Z	<u>1/</u>	<u>1/</u>	02/01/86-12Z	Form 4
#-6	02/01/86-05Z	<u>1/</u>	<u>1/</u>	02/01/86-00Z	Form 4
#-	02/01/86-14Z	<u>1/</u>	<u>1/</u>	02/01/86-12Z	Form 4b, INTERVAL=6
#	02/01/86-14Z	<u>1/</u>	<u>1/</u>	02/01/86-12Z	Form 4a, INTERVAL=6
#+6	02/01/86-14Z	<u>1/</u>	<u>1/</u>	02/01/86/18Z	Form 4
%-12Z	02/01/86-20Z	<u>1/</u>	<u>1/</u>	02/01/86-12Z	Form 5
%+18	02/01/86-15Z	<u>1/</u>	Z	02/01/86-18Z	Form 5b
%	02/01/86-20Z	<u>1/</u>	<u>1/</u>	02/01/86-12Z	Form 5a

Invalid date forms:

Value Entered (Invalid Portions <u>Underlined</u> )	Current Date (computer <u>clock</u> )	Remarks
<u>2</u> 158607EST	<u>1/</u>	One digit month entered
021586 <u>7</u>	<u>1/</u>	One digit hour entered
021507 <u>Z</u> ST	<u>1/</u>	Invalid time zone code entered
0215 <u>92</u>	02/01/86	Year too far in future entered
<u>2</u> 15	<u>1/</u>	One digit month entered
*+ <u>4</u> 07EST	<u>1/</u>	One digit days entered when hours present
*+0 <u>4</u> 7	<u>1/</u>	One digit hour entered
*7 <u>E</u> ST	<u>1/</u>	One digit hour entered
* <u>7</u>	<u>1/</u>	One digit hour entered
<u>2</u> 15/1992/07EST	<u>1/</u>	One digit month entered
0215/ <u>92</u> /07EST	<u>1/</u>	Two digit year entered in Form 3
0215/1992/ <u>7</u>	<u>1/</u>	One digit hour entered
0215/1992	<u>1/</u>	Only one slash entered in Form 3b
0215/ <u>1886</u> /	<u>1/</u>	Year before 1900
#- <u>5</u>	<u>1/</u>	Interval value not evenly divisible into 24
#+ <u>26</u>	<u>1/</u>	Interval greater than 24
#> <u>12</u> Z	<u>1/</u>	Only plus or minus sign allowed with this date format
%-12 <u>Z</u> ST	<u>1/</u>	Invalid time zone code entered
%+ <u>  </u>	<u>1/</u>	Hour must be entered with use of plus or minus sign
%< <u>12</u> Z	<u>1/</u>	Only plus or minus sign allowed with this date format

NOTE:

1/ This value has no impact on the interpretation of the date.

Delimiters

All input must be separated by at least one blank or a comma except when a special delimiter is indicated in a command.

The following statements are equivalent:

```
item1 item2
item1,item2
```

Integer Values

Any element that contains only the characters 0 thru 9 is an integer. The number may be immediately preceded by + or -.

<u>Input</u>	<u>Field Type</u>	<u>Field Value</u>
109	integer	+109
-109	integer	-109
-10 9	integer	-10 and +9
'109'	character	109

### Keywords

Keywords are words required by the commands. They can contain any number of characters but only the first 8 are significant.

<u>Input</u>	<u>Description</u>
@DUMPS TECH	DUMPS is the command, TECH is the keyword

### Identifiers

Identifiers are individual alphanumeric identifiers or a range of identifiers. The example shows a list and a range of segment names.

WTTOK,KANOK,ELDOK or WTTOK-TENOK

Exclusion may be made using characters '<' and '>' to indicate all but the enclosed item.

WITOK-TENOK <KANOK>

### Real Values

Any element that contains only the characters 0 thru 9 and only one decimal point is a real value. The number may be immediately preceded by + or -.

<u>Input</u>	<u>Field Type</u>	<u>Field Value</u>
109.	real	+109.0
-.123	real	-0.123
.12 3	real and integer	+0.12 and +3
1.09.	character	1.09.