

VIII.4.2-PIN FORECAST COMPONENT OPERATION PARAMETER INPUT SUBROUTINE
(PINn)

Function: The parameter input subroutine:

- o reads from cards or generate by default all of the parameters, initial carryover and other information needed by the Operation
- o checks all of the values
- o stores the values for use by the other subroutines associated with the Operation

Arguments: The argument list for this subroutine is:

SUBROUTINE PINn (PO,LEFTP,IUSEP,CO,LEPTC,IUSEC).

The contents of the argument list are:

1. PO - real array dimensioned PO(*) which is used to store all of the parameters, time series identification, options, titles, etc. for the Operation (output)
2. LEFTP - integer variable which indicates how much space is left in the Forecast Component P array, i.e., the maximum amount of space available for the PO array (input)
3. IUSEP - integer variable which indicates how much space in the P array is used by this Operation, i.e., the number of words of storage used for the PO array (output)
4. CO - real array dimensioned CO(*) which is used to store the initial values of the state variables, i.e., carryover values, for the Operation (output)
5. LEFTC - integer variable indicating the maximum amount of space available for the CO array (input)
6. IUSEC - integer variable indicating the number of words of storage used for the CO array (output).

If the Operation has no carryover values the form of the argument list is:

SUBROUTINE PINn (PO,LEFTP,IUSEP)

Input Cards: This should be the only subroutine associated with an Operation that has card input. Only columns 1 through 72 on the input cards should be used.

In some Operations initial estimates of carryover values must be input from cards and then stored. In other Operations there could be an option to input initial carryover values from cards or set them to

default values.

Checks: This subroutine where most of the checking of information for an Operation should be done. All values stored in the PO and CO arrays should be checked. Three types of checks must be made:

1. The space available for storage in the PO and CO arrays must be checked before any values are stored in these arrays. This check can be made by calling the subroutines CHECKP and CHECKC (see Section IX.3.3B). Do not store values in the PO and CO arrays if space is not available.
2. Time series used by the Operation must be checked by calling subroutine CHEKTS (Section IX.3.3B). CHEKTS makes sure that the time series has been defined and meets other requirements of the Operation. The standard internal units associated with a specific data type can be checked by calling subroutine FDCODE (also in Section IX.3.3B).
3. If a Rating Curve is used subroutine CHEKRC (Section IX.3.3B) must be called to check if the Rating Curve is defined.

In addition the input subroutine should check to make sure:

1. all parameter values are legitimate
2. allowable values are used for initial carryover

Rules to Follow When Storing Information: The following rules must be followed when storing information in the PO and CO arrays:

1. Check if space is available before storing any values.
2. If an error is found call subroutine ERROR so that the Segment definition is not written to the Forecast Component Data Base.
3. Return the correct value of IUSEP and IUSEC. The information stored in the PO and CO arrays should allow the print parameter (PRP) and print carryover (PRC) subroutine for the Operation to execute properly. If the information stored in the PO array will not allow the PRP subroutine to execute, set IUSEP=0 before returning. Also if the information in the CO array will not allow the PRC subroutine to execute set IUSEC=0 before returning.

Storage of Information in the PO Array: All of the parameters for an Operation are stored in the PO array. The amount of information stored can vary from one application of the Operation to another. The information that needs to be stored in the PO array is:

1. parameters needed by the execution subroutine to execute the Operation

2. internal identification information for all time series used by the Operation (needed by the Operations Table entry subroutine, the card punch subroutine and the print parameter subroutine)
3. headings or titles needed by the print parameter and card punch subroutines
4. the amount of work space needed or at least the values used to calculate the amount of working space
5. for Operations that can have default carryover values store a variable that indicates whether real or default values were used for the initial carryover
6. for Operations that need information from other Operations store the name of the other Operations plus any other necessary information
7. for Operations that use a Rating Curve store the 8-character Rating Curve identifier

A version number for the Operation should be stored as the first value in the PO array. If the Operation is modified so that the information stored is expanded or changed in any way then all the information for the Operation stored in the Forecast Component Data Base for all users may not be identical. In this case the execution and the other subroutines for the Operation need to be able to differentiate between the various storage orders by use of the version number.

The main guideline for how information is stored in the PO array is that it should be stored so that the information can easily be retrieved for use in the other subroutines associated with the Operation. Some other comments on storing information in the PO array are:

1. since PO is a real array 0.01 should be added to all integer values that are stored to insure that they will have the correct value when retrieved (e.g., $PO(I)=IDT+0.01$)
2. the data time interval for a time series does not have to be stored if the Operation uses a fixed data time interval
3. only store information that is actually needed (all of the information in the PO array should be used by the other subroutines associated with the Operation)

The input subroutine is the only subroutine associated with an Operation that stores values in the PO array. None of the other subroutines should change any of the information stored in the PO array.

Storage of Information in the CO Array: The input subroutine stores initial carryover values in the CO array for all Operations that need carryover. These initial values can be changed by both the execution

and carryover transfer subroutines.

The CO array should only contain carryover values. For Operations that can have a variable number of carryover values the PO array should contain the information that indicates how many carryover values exist for this particular application of the Operation.

Carryover for Rating Curves: Operations can use Rating Curves for two reasons. One is to perform stage-discharge conversions. The other is to obtain information for use when plotting or tabulating hydrographs, such as the upper and lower limits of the Rating Curve, the limits of the cross-sectional data used for extending the Rating Curve or the method used to make extensions or stage-discharge conversions.

Operations that use Rating Curves for stage-discharge conversions must store the carryover values needed for this conversion. The carryover values needed are:

1. previous stage value
2. previous discharge value
3. rate of change in stage (if converting discharge to stage) or discharge (if converting stage to discharge)
4. the number of missing values since the last valid value

These carryover values are only used for a loop rating. However, the carryover must always be provided because the procedure used for the stage-discharge conversion is not controlled by the Operation but by the information on the Rating Curve file. The Rating Curve can be changed from a single-valued curve to a loop rating simply by redefining the Rating Curve. Such a change will not require redefining all Operations using the Rating Curve, as long as the Operations have stored the proper carryover values.

Obtaining Information from other Operations: A few Operations will need to obtain information other than time series data from preceding Operations within the Segment or at least need to check to determine if another Operation exists. For example the WEIGH-TS Operation in some cases needs to get the area represented by unit hydrographs from preceding UNIT-HG Operations. Subroutine FSERCH can be used to obtain information about another Operation.

The call to subroutine FSERCH is:

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CALL FSERCH (NUMOP,OPNAME,LOCP,P,MP)
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where NUMOP is the Operation number to be searched for
OPNAME is the 8-character user supplied name for the
Operation (a given Operation is uniquely
identified within a Segment by the Operation
number and a name which is specified by the user

when the Operation is defined)
LOCP is the location in the P array where the Operation
was found
P is the P array
MP is the dimension of the P array

A description of subroutine FSEARCH is in Section IX.3.3B.