VIII.3.3-INSQPLOT   INSTANTANEOUS DISCHARGE PLOT OPERATION

Identifier: INSQPLOT

Operation Number: 12

Parameter Array: The FORTRAN identifier used for the parameter array
for this Operation is P. The contents of the P array are:

       Position   Contents

           1   Operation version number (integer value)

          2-6   General title or heading

           7   Number of time series to be plotted (integer value)

           8   Plot tabulation option:
                        0 = precipitation and runoff time series are not
                             tabulated
                        1 = only precipitation time series is tabulated
                        2 = only runoff time series is tabulated
                        3 = both precipitation and runoff time series are
                             tabulated

           9   Plot option:
                        0 = all discharge time series are plotted every
                             day
                        >0 = discharge time series that must have a non-
                             missing value for a day before all discharge
                             time series are plotted for that day

          10   Time increment of plot in hours (integer value)

          11   Rating Curve option:
                        0 = no Rating Curve information stored and no
                             stage scale will be computed
                        >0 = Rating Curve identifier stored in location
                             P(P(11)) - stage scale will be computed for
                             plot flood stage and lower and upper limit of
                             Rating Curve may be plotted

The remainder of the P array is filled as follows:

   o precipitation and runoff time series information - 7 positions
      for each time series filled as follows:
         1-2 time series identifier
          3   time series type
          4   time series time interval
         5-7 time series name or title

   o instantaneous discharge time series information - 8 positions for

each time series filled as follows:
   1-2 time series identifier
    3   time series type
    4   time series time interval
   5-7 time series name or title
    8   plotting symbol for time series

o Rating curve information (if P(11).GT.0) - 5 positions filled as follows:
   1-2 Rating Curve identifier
    3   plotting symbol for flood stage (do not plot if blank)
    4   plotting symbol for Rating Curve lower limit (do not plot if blank)
    5   plotting symbol for Rating Curve upper limit (do not plot if blank)

The minimum size of the P array is 19 positions and there is no maximum size.

Carryover Array: This Operation does not require carryover.

Subroutine Names and Functions:

Routine	Function
PIN12	Input cards and stores values in the P array
PRP12	Print information in the P array
EX12	Execute the Operation
PPT12	Determine plot location, prints out tabulation data and plots the instantaneous discharge for the required time series
HDNG12	Print the heading for the plot
LPLT12	Compute plotting positions
MAX12	Determine scale when plot indicator is greater than zero
SCAL12	Determine scale when plot indicator is zero
PUC12	Punch information in the P array
TAB12	Operation table entry subroutine

Subroutines PIN12, PRP12 and PUC12 have standard argument lists for these subroutines as given in Section VIII.4.3.

```
SUBROUTINE EX12 (P,PCPN,RO,D,LPLOTQ,ORD,ORDI,LSYM,IDTQ,PSBL,IQDAY)
```

Function: This is the execution subroutine for Operation INSQPLOT.

Argument List:

Argument	Input/ Output	Type	Dimension	Description
P	Input	R*4	Variable	The parameter array for this Operation
PCPN	Input	R*4	Variable	Precipitation time series
RO	Input	R*4	Variable	Runoff time series
D	Input	R*4	Variable	Entire D array
LPLOTQ	Input	I*4	Variable	Beginning location of time series to be plotted in D array 1/
ORD	-	R*4	101	Work space 1/
ORDI	-	R*4	Variable	Work space 1/
LSYM	-	I*4	Variable	Work space 1/
IDTQ	-	I*4	Variable	Work space 1/
PSBL	-	R*4	Variable	Work space 1/
IQDAY	-	I*4	Variable	Work space 2/

Notes:

1/ Size will be the number of discharge time series to be plotted
   which will always be in position (7).

2/ Size will be equal to maximum number of days that can be plotted if
   the plot option is not zero.

```
SUBROUTINE PPT12 (P,D,PCPN,RO,ORDI,PSBL,LSYM,ORD,LPLOTQ,IDTQ,DIV,
                  KDA,KHR,KDART,KHRRT,IDTPN,IDTRO,NPLOTS,IOPTAB,IPTIM,
                  FS,IDTPLT,LOC,LOCLL,LOCUL,IRC,JBUG)
```

Function: This routine determines the time series to be tabulated and
the location of each plotting symbol for all the time series to be
plotted. It prints out the real time, tabulates all required time
series and plots the instantaneous discharges at that specific time.

Argument List:

Input/

Argument	Output	Type	Dimension	Description
P	Input	R*4	Variable	The parameter for this Operation
D	Input	R*4	Variable	The instantaneous discharge time series to be plotted
PCPN	Input	R*4	Variable	Precipitation time series to be tabulated
RO	Input	R*4	Variable	Runoff (channel inflow) time series to be tabulated
ORDI	–	R*4	Variable	Work space
PSBL	Input	R*4	Variable	Plotting symbols for time series
LSYM	–	I*4	Variable	Work space
ORD	Input	R*4	101	Contains ordinates of plot
LPLOTQ	Input	I*4	Variable	Starting location of time series to be plotted in D array
IDTQ	Input	I*4	Variable	Time interval of all time series to be plotted
DIV	Input	R*4	1	Scale division
KDA	Input	I*4	1	Internal time – day
KHR	Input	I*4	1	Internal time – hour
KDART	Input	I*4	1	Real time – day
KHRRT	Input	I*4	1	Real time – hour
IDTPN	Input	I*4	1	Precipitation time series time interval

Argument	Input/ Output	Type	Dimension	Description
IDTRO	Input	I*4	1	Runoff time series time interval
NPLOTS	Input	I*4	1	Number of time series to be plotted
IOPTAB	Input	I*4	1	Plot tabulation option
IPTIM	Input	I*4	1	Time from beginning of when plot was started
IDTPLT	Input	I*4	1	Plotting time interval in hours
LOCFS	Input	I*4	1	Location of flood stage in the 101 word plotting array (not plotted if value outside range 1 to 101)
LOCLL	Input	I*4	1	Location of the lower limit of Rating Curve (not plotted if value outside range 1 to 101)
LOCUL	Input	I*4	1	Location of the upper limit of the Rating Curve (not plotted if value outside range 1 to 101)
IRC	Input	I*4	1	The location in the P array of the Rating Curve identifier: 0 = none
JBUG	Input	I*4	1	Debug print option: 0 = do not print 1 = print

```
SUBROUTINE HDNG12 (P,IDTQ,PSBL,CMO,NDAYS,UNIT,UNITP,NPLOTS,IOPTAB,
                   SCALE,LOCFS,LOCLL,LOCUL,IBUG)
```

<u>Function</u>: This routine prints the heading for the INSQPLOT Operation.

<u>Argument List</u>:

Argument	Input/ Output	Type	Dimension	Description
P	Input	R*4	Variable	Parameter array for this Operation
IDTQ	-	I*4	Variable	Work space
PSBL	-	R*4	Variable	Work space
CMO	Input	R*4	12	Name of month
NDAYS	Input	I*4	12	Days per month
UNIT	Input	R*4	2	Units of discharge
UNITP	Input	R*4	2	Units of precipitation or runoff
NPLOTS	Input	I*4	1	Number of time series to be plotted
IOPTAB	Input	I*4	1	Plot tabulation option
SCALE	Input	R*4	10	Scale of graph
LOCFS	Output	I*4	1	Location of flood stage in the 101 word plotting array <u>1</u>/
LOCLL	Output	I*4	1	Location of the lower limit of the Rating Curve <u>1</u>/
LOCUL	Output	I*4	1	Location of the upper limit of the Rating Curve <u>1</u>/
IBUG	Input	I*4	1	Debug print option: 0 = do not print 1 = print

Notes:
1/ not plotted if value outside range 1 to 101.

```
SUBROUTINE MAX12 (IQDAY,NPLOTS,IPTIM,IDTPLT,IDTQ,LPLOTQ,
                  D,KHRT,KDRT,KMTHRT,IYRRT,SCALE,
                  DIV,ORD,NDAYS,NDAY,IHRND,NPPDAY)
```

Function: This routine determines the maximum flow and scale to be
used in the INSQPLOT Operation for the option to plot only days when a
specified time series has a nonmissing value.

Argument List:

Argument	Input/ Output	Type	Dimension	Description
IQDAY	Input	I*4	Variable	Contains a flag to tell whether a time series had a nonmissing value
NPLOTS	Input	I*4	1	Number of time series to be plotted
IPTIM	Input	I*4	1	Time since beginning of plot
IDTPLT	Input	I*4	1	Time interval of plot
IDTQ	Input	I*4	Variable	Time interval of time series to be plotted
D	Input	I*4	Variable	Contains time series to be plotted
LPLOTQ	Input	I*4	Variable	Starting location of time series in D array
KHRT	Input	I*4	1	Real-time initial hour
KDRT	Input	I*4	1	Real-time initial day
KMTHRT	Input	I*4	1	Real-time initial month
IYRRT	Input	I*4	1	Real-time initial year
SCALE	Output	R*4	10	Scale of plots
DIV	Output	R*4	1	Value of ordinate increment
ORD	Output	R*4	101	Ordinate array
NDAYS	Input	I*4	12	Number of days in each month
NDAY	Input	I*4	1	Number of days to be plotted

Argument	Input/ Output	Type	Dimension	Description
NPPDAY	Input	I*4	1	Number of times each day the values are plotted

SUBROUTINE SCAL12 (NPLOTS,IDTQ,LPLOTQ,D,ORD,DIV,SCALE)

Function: This routine determines the maximum flow and scale to be
used for Operation INSQPLOT when all days are to be plotted regardless
of missing values.

Argument List:

	Input/			
Variable	Output	Type	Dimension	Description
NPLOTS	Input	I*4	Variable	Number of time series to be plotted
IDTQ	Input	I*4	Variable	Time interval of time series to be plotted
LPLOTQ	Input	I*4	Variable	Starting location of time series in D array
D	Input	R*4	Variable	Contains time series to be plotted
ORD	Output	R*4	101	Ordinate array
DIV	Output	R*4	1	Value of ordinate increment
SCALE	Output	R*4	10	Scale of plots

SUBROUTINE TAB12 (TO,LEFT,IUSET,NXT,LPO,PO,TS,MTS,NWORK,NDD,LWORK,IDT)

Function: This is the Operations Table entry subroutine for the Operation INSQPLOT.

Argument List: The arguments for this subroutine are similar to the arguments for the Operations Table entry subroutines for other Operations. A description of the arguments is contained in Section VIII.4.2-TAB.

Operation Table Array: The contents of the TO array are:

Position	Contents
1	Operation number
2	Location in the T array of the next Operation to be executed
3	Location of the parameter array for this Operation in the P array
4	Location of rain plus melt data in the D array: 0 = none used
5	Location of runoff data in the D array: 0 = none used
6	Location of Rating Curve identifier in the PO array: 0 = none used
7	Location of work space in the D array
8-NPLOT+7	Location of data in the D array for each time series to be plotted (NPLOT is number of time series to be plotted)