V.3.3-PLOT-TUL TULSA TIME SERIES LIST AND PLOT OPERATION

Identifier: PLOT-TUL

Application: All programs

Description: This Operation lists and plots time series data.

It is used primarily for plotting hydrographs in the Operational Forecast Program but can be used in Calibration System programs.

The special provisions of this Operation include the following:

1. Any number of time series can be plotted as long as their units are the same.

2. This Operation will only plot or list time series. It will not convert adjusted flows to stages, perform blend computations or generate hydrograph components. These computations must be done in previous Operations.

3. The listing and plotting order will be determined by the order input: the first entered will be listed first on the plot, left to right; the last entered will be plotted first and overwritten by the previous entries.

4. The listing of more than three time series with the plot will imply the use of an ordinate size of 51 characters versus 101.

5. Only eight time series can be listed on a plot; the first three time series will be listed to the left of the plot and will be real variables; last five time series will be listed to the right of the plot and will be real variables.

Allowable Data Time Intervals: 1, 2, 3, 4, 6, 8, 12 and 24 hours

Time Series Used: The time series used may have different time intervals. All time series to be plotted must have the same units. Time series to be listed can have different units. Missing values are allowed in all time series.

Input Summary: The card input for this Operation is as follows:

Card	Format	Columns	Contents
1	I5	1-5	Plot is a hydrograph with a Rating Curve option (0, 1 or 9) 1/
	I5	6-10	Top of page option (0 or 1) 2/

Card	Format	Columns	Contents
	I5	11-15	Plot size option (51 or 101) 3/
	I5	16-20	Punch stream of plot (0, 1 or 2) 4/
	I5	21-25	Minimum scale increment 5/
	I5	26-30	Default time series interval 6/ 7/
	I5	31-35	Time increment of plot 8/
	I5	36-40	Total number of time series 9/
	I5	41-45	Number of time series to list 10/
	4X,A1	50	Ordinate plotting symbol 11/
	4X,A1	55	Current time plotting symbol 12/
	I5	56-60	Plot criteria if no Rating Curve defined 13/
	I5	61-65	Plot base value (defaults to zero) 14/
If plot is not a hydrograph with a Rating Curve:			
2	10A4	1-40	Plot name label 15/
If plot is a hydrograph with a Rating Curve:			
2	I5	1-5	Plot stage 16/
	I5	6-10	Percent of flood flow 17/
	4X,A1	15	Flood flow plotting symbol 18/
	4X,A1	20	Rating upper limit plot symbol 19/
	4X,A1	25	Maximum of record plotting symbol 20/
	2X,2A4	28-35	Rating Curve identifier 21/
If plot size is 101 or if plot size is 51 with number of listed time series less than 4:			
3	5A4	1-20	Left side column heading 22/
If plot size is 51 with number of listed time series greater than 3:			
3	5A4	1-20	Left side column heading 22/
	13A4	21-72	Right side column heading 23/
For each time series (1 card for each):			

Card	Format	Columns	Contents
4	2A4,2X	1-8	Time series identifier 24/
	A4,1X	11-14	Time series data type code 25/
	A4,1X	16-19	List/plot/both option 26/
	A1,4X	21	Plotting symbol 27/
	2A4,1X	26-33	Listing format (real) 28/
	A1,1X	35	'S' if this is a reservoir time series and the desired output units are in acre-feet (ACFT) or thousand cubic meters (TCUM)
	I2,1X	37-38	Time series time interval (optional) 7/ 29/
	5A4	39-58	Time series description (optional) 30/
Last	A4	1-4	9999 or 'END ' 31/

Notes:

1/ Is plot a hydrograph with a Rating Curve:
- 0 = plot has no Rating Curve (even if it is a hydrograph)
- 1 = plot is a hydrograph with a Rating Curve
- 9 = plot is not to be treated as a hydrograph by the HCL Technique PLOTHYD (i.e., printing of the plot is not controlled by PLOTHYD)

If less than 0 will be set to 0.
If greater than 1 will be set to 1.

2/ Top of page option:
- 0 = will not advance to top of page for each plot
- 1 = will advance to top of page for each plot

If less than 0 will be set to 0.
If greater than 1 will be set to 1.

3/ Plot size option:

If 101:
- o can only list 3 time series
- o if more identified on input will be set to 51
- o cannot produce punch stream

If 51:
- o can list from 1 to a maximum of 8 time series
- o can produce punch stream, but will list only maximum of 3 time series

4/ Punch stream of plot option:
- 0 = no punch stream
- 1 = punch stream only (plot size of 51)
- 2 = punch and print stream (plot size of 51)

5/ Minimum scale increment:
- o a scale increment is 10 plot ordinates
- o can be any value from 1 to 99999
- o if 0, execution routine will determine scale
- o if 99999 will be set to 100000
- o if less than 0 will be set to 0
- o value is dimensionless and will not be converted based on the display units (therefore, define in typical display units)

6/ Default time series time interval:
- o applies to all time series
- o default is 6

7/ Time series time interval:
- o must be 1, 2, 3, 4, 6, 8, 12 or 24
- o only the Interactive Forecast Program (IFP) will plot data values in time series that have a data time interval different than the default time series time interval

8/ Time increment of plot:
- o must be 1, 2, 3, 4, 6, 8, 12 or 24
- o default is the time interval of time series
- o better if the same as the time interval of time series
- o if not, cannot be less than the time interval
- o if greater than the time interval, must be an even multiple of the time interval
- o if less than the time interval will be set to the time interval of the time series

9/ Total number of time series:
- o minimum value is 1
- o no maximum value

10/ Number of time series to be listed on plot:
- o minimum value is 1
- o maximum value is 8 (plot size of 51)
- o if greater than 3, plot size must be 51

11/ Ordinate plotting symbol:
- o identifies every tenth ordinate on the plot
- o can use any or none
- o 'I' or '!' is commonly used
- o no check is made on plotting symbol

12/ Current time plotting symbol:
- o indicates time of last observed data values on plot
- o can use any or none
- o '-' is commonly used
- o no check is made on plotting symbol

13/ Plot criteria for no Rating Curve:
- o only used if plot has no Rating Curve defined
- o can be any value from 1 to 99999:
  - 0 = not used
  - If 99999 will be set to 100000.
  - If less than 0 will be set to 0.

- o value is dimensionless and will not be converted based on output units specified
- o plot is only generated if one or more values exceed this criteria

14/ Plot base value:
- o allows the plot scale to start at a non-zero value
- o can be any value from 1 to 99999:
  If less than 0 will be set to 0.
  If 99999 will be set to 100000.
- o value is dimensionless and will not be converted based on output units specified at run-time

15/ Plot name label:
- o 40-character field providing title for plot

16/ Plot stage:
- o plot is only generated if one or more values exceed this stage
- o no check is made on input value
- o value is dimensionless and will not be converted based on output units specified

17/ Percent of flood flow:
- o if the maximum flow on a hydrograph is within X percent of the flood flow, the scale will be adjusted so that the flood flow will appear on the plot
- o if less than 0, it will be set to 0
- o if 0, no adjustment will take place

18/ Flood flow plotting symbol:
- o identifies on the plot the ordinate that represents flood flow
- o can use any or none
- o no check is made on plotting symbol

19/ Rating upper limit plotting symbol:
- o can use any or none
- o no check is made on plotting symbol

20/ Maximum of record plotting symbol:
- o can use any or none
- o no check is made on plotting symbol

21/ Rating Curve identifier:
- o used to determine stage scale from flow scale column headings on plot

22/ Left side column headings
- o no checks are made on the column heading
- o maximum of 20 characters
- o better if the first character is a blank to provide spacing between date and time and the first time series to be listed

23/ Right side column heading
- o no checks are made on the column heading

- maximum of 52 characters
- better if the first character is a blank to provide spacing between plot and the fourth time series to be listed

24/ Time series identifier:
- maximum of 8 characters
- must be a previously defined time series

25/ Type code:
- all time series to be plotted must have the same dimensions, units and time interval

26/ List/plot/both option:
- LIST to list time series
- PLOT to plot time series
- BOTH to list and plot time series
- if LIST or BOTH is specified, time series time interval must be the same as the default time series time interval

27/ Plotting symbol:
- can use any or none
- no check is made on plotting symbol

28/ Listing format:
- must be a real format, not integer
- no check is made on the listing format
- only an 8-character field which must include spacing formats and commas
- sum of field lengths for values listed on the left side should equal 21
- see sample input for examples

29/ Time interval to be plotted and/or listed for each time series. If not entered the value entered in field 6 of card 1 will be used.

30/ The time series description will be printed in the plotting and/or listing header information.

31/ 9999 or 'END ':
- last card
- must be entered

Sample Input and Output: Sample input, sample output from the parameter print subroutines and sample output from the execution subroutine are shown in Figures 1 through 9.

Error and Warning Messages: The error and warning messages generated by this Operation and the corrective action to take when they occur are as follows:

1. **WARNING** PLOTTED TIME INTERVAL MUST BE LESS THAN OR EQUAL TO THE TIME SERIES TIME INTERVAL.
   TSTIME = XX

Action: Check and adjust input.

2. **WARNING** TOP OF PAGE OPTION = XX
   TOP OF PAGE OPTION MUST EQUAL 0 OR 1
   IF LESS THAN 0, IT WILL BE CHANGED TO 0
   IF GREATER THAN 1, IT WILL BE CHANGED TO 1.

   Action: Check and adjust input.

3. **WARNING** INPUT PLOT SIZE OPTION = XX
   PLOT SIZE MUST EQUAL 51 OR 101
   IF LESS THAN 100, IT WILL BE CHANGED TO 51
   IF GREATER THAN 99, IT WILL BE CHANGED TO 101.

   Action: Check and adjust input.

4. **WARNING** PLOT PUNCH STREAM OPTION = XX
   PLOT PUNCH STREAM OPTION MUST EQUAL 0, 1 OR 2
   IT WILL BE CHANGED TO 0.

   Action: Check and adjust input.

5. **WARNING** PLOT SIZE OPTION = XX
   WITH PLOT PUNCH STREAM OPTION = YY
   PLOT SIZE MUST EQUAL 51 WITH PUNCH STREAM OPTION EQUAL TO 1 OR 2 PLOT SIZE WILL BE CHANGED TO 51.

   Action: Check and adjust input.

6. **WARNING** MINIMUM SCALE SPECIFICATION = XX
   MINIMUM SCALE MUST BE BETWEEN 1 AND 99999
   IF LESS THAN 0, IT WILL BE CHANGE TO 0
   IF EQUAL TO 99999, IT WILL BE CHANGED TO 100000.

   Action: Check and adjust input

7. **WARNING** INPUT TIME INTERVAL OF TIME SERIES = XX
   TIME INTERVAL MUST EQUAL 1, 2, 3, 4, 6, 8, 12 OR 24
   IT WILL BE CHANGED TO 6.

   Action: Check and adjust input

8. **WARNING** PREFERRED TIME INCREMENT OF PLOT = XX
   TIME INCREMENT MUST EQUAL 1, 2, 3, 4, 6, 8, 12 OR 24
   IT WILL BE CHANGED TO YY

   Action: Check and adjust input. Make sure that value is less than time interval and/or is an even multiple of the time interval of the time series.

9. **WARNING** PREFERRED TIME INCREMENT OF PLOT = XX
   VALUE IS NOT AN EVEN MULTIPLE OF INTRVL = YY
   IT WILL BE CHANGED TO ZZ.

   Action: Check and adjust input. Make sure that value is less than time interval and/or is an even multiple of the time

interval of the time series.

10.
WARNING PREFERRED TIME INCREMENT OF PLOT = XX
VALUE IS LESS THAN INTRVL = YY
IT WILL BE CHANGED TO ZZ.

Action: Check and adjust input. Make sure that value is less than time interval and/or is an even multiple of the time interval of the time series.

11.
ERROR INPUT NUMBER OF TIME SERIES = XX
THERE MUST BE AT LEAST 1 TIME SERIES INPUT.

Action: Check and adjust input.

12.
ERROR INPUT NUMBER OF TIME SERIES TO LIST = XX
THERE MUST BE AT LEAST 1 TIME SERIES LISTED AND NOT MORE THAN 8.

Action: Check and adjust input.

13.
WARNING PERCENT OF FLOOD FLOW = XX
PERCENT OF FLOOD FLOW MUST BE EQUAL TO OR GREAT THAN 0
IF LESS THAN 0, IT WILL BE CHANGED TO 0.

Action: Check and adjust input.

14.
ERROR INPUT DISPLAY OPTION = XXXX
DOES NOT EQUAL ANY OF AVAILABLE CHOICES
LIST/PLOT/BOTH.

Action: Check and adjust input.

15.
ERROR ALL THE TIME SERIES TO BE PLOTTED DO NOT HAVE IDENTICAL DIMENSION CODES, UNITS AND/OR TIME INTERVALS
AAAA VS. BBBB
CCCC VS. DDDD AND/OR
EEEE VS. FFFF

Action: Check and adjust input. Make sure that all the time series to be plotted have the same dimension codes, units and time intervals.

16.
WARNING NUMBER OF TIME SERIES ACTUALLY READ IN XX DOES NOT EQUAL NUMBER DECLARED ON CARD 2 YY
THE LATTER WILL BE CHANGED TO AGREE WITH THE NUMBER ACTUALLY READ IN.

Action: Check and adjust input. Make sure last card has 9999

in columns 1-4.

17.
WARNING NUMBER OF TIME SERIES TO BE LISTED XX IS GREATER THAN 3 SO THE PLOT SIZE OPTION YY MUST BE 51
THE LATTER WILL BE CHANGED TO 51

Action: Check and adjust input.

18.
ERROR NUMBER OF TIME SERIES TO BE LISTED XX EXCEEDS MAXIMUM NUMBER OF 8

Action: Check and adjust input.

Carryover Transfer Rules: There is no carryover for this Operation.

Punch Card Limitations: There are no limitations for this Operation.

Figure 1. Sample Card Input For Operation PLOT-TUL With Rating Curve

```
                                    - Column -
    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
PLOT-TUL    BLASE
    1    0   51    0 2000    6    6    5    3    I    -    0    0    0
   10   20    F    U    M  BLASE       0    0    0
   ADJ-Q   SIM-Q  HG
BLASE     QIN  PLOT O                6 OBSERVED FLOW
BLASE     QINE BOTH A    F8.0,       6 ADJUSTED FLOW
BLASE     SQIN BOTH S    F8.0,       6 SIMULATED FLOW
ROSSEY    QINE PLOT X                1 1 HOUR ADJUSTED FLOW
BLASE     SSTG LIST      F5.1,       6 FORECAST STAGE
END
```

Figure 2. Sample Print Parameter Routine Output For Operation PLOT-TUL With Rating Curve

```
********************
PLOT-TUL OPERATION     NAME=BLASE        PREVIOUS NAME=
********************
         GENERAL PLOT VARIABLES ... version 2 of PLOT-TUL
         NOVRSN   IHYD     NEWPG    NPLTSZ   NPUNCH   MINSCL   INTRVL   NCRMNT   NUMTS    NMLIST   ORDSYM   CURTM
            2.       1.       0.      51.       0.    2000.       6.       6.       5.       3.    I        -

         NPLCRT   NBASE    IDUMMY
            0.       0.       0.

         HYDROGRAPH VARIABLES ...
         NPLSTG   NPRCNT   FLDSYM   RATLIM   RCDMAX   RC(1-2)
           10.      20.    F        U        M        BLASE

         IDUMMY   IDUMMY   IDUMMY
            0.       0.       0.

         LEFT SIDE COLUMN HEADINGS ...
            ADJ-Q   SIM-Q  HG

         TIME SERIES INFORMATION ...
         TSID(1-2) TYPE      PLTOPT    SYMBOL    FRMT(1-2)    TSTIME    DESCRIPTION
         ========= ====      ======    ======    =========    ======    ==============
         BLASE     QIN       PLOT        O                      6       OBSERVED FLOW
         BLASE     QINE      BOTH        A         F8.0,        6       ADJUSTED FLOW
         BLASE     SQIN      BOTH        S         F8.0,        6       SIMULATED FLOW
         ROSSEY    QINE      PLOT        X                      1       1 HOUR ADJUSTED FLOW
         BLASE     SSTG      LIST                F5.1,        6       FORECAST STAGE
```

Figure 3. Sample Execution Routine Output For Operation PLOT-TUL With Rating Curve

```
BLANTYRE           - BLUERIDGE               APR 1993  MST      BLASE           *** ENGLISH UNITS ***

         O = BLASE    QIN  (CFS )     OBSERVED FLOW           F = FLOOD STAGE
         A = BLASE    QINE (CFS )     ADJUSTED FLOW           U = RATING UPPER LIMIT
         S = BLASE    SQIN (CFS )     SIMULATED FLOW          M = MAX OF RECORD

         FLOOD STAGE   =   17.0       FLOOD FLOW     =   12830.0
         WARNING STAGE = -999.0       BANKFULL STAGE =    -999.0
         PLOT STAGE    =   10.0       FCST CRITERIA  = DAMA
         TOTAL AREA    =   746.0      LOCAL AREA     =     431.0                      COMMENTS            =


                    STAGE2.40      16.0      18.9      20.9      22.3      23.5
DA HR   ADJ-Q   SIM-Q  HG 0.0   10000.0   20000.0   30000.0   40000.0   50000.0
29 11     68.     69.  2.4 O         I F       I         I         I         I
29 17    152.    225.  3.0 O         I F       I         I         I         I
29 23    599.    579.  4.5 O         I F       I         I         I         I
30  5   1381.   1179.  6.3 IO        I F       I         I         I         I
30 11   1997.   1682.  7.4 IO        I F       I         I         I         I
30 17   2329.   1987.  8.0 ISO       I F       I         I         I         I
30 23   2509.   2159.  8.4 I O       I F       I         I         I         I
31  5   2618.   2265.  8.6 I O       I F       I         I         I         I
31 11   2687.   2335.  8.7 I O       I F       I         I         I         I
31 17   2727.   2378.  8.7 I O       I F       I         I         I         I
31 23   2745.   2410.  8.8 I O       I F       I         I         I         I
 1  5   5775.   6697. 12.7 I    OS   I F       I         I         I         I
 1 11  10026.  10123. 16.0 I         O F       I         I         I         I
 1 17  12398.  12440. 16.9 I---------I-O-------I---------I---------I---------I
 1 23  15108.  15143. 17.7 I         I F  A    I         I         I         I
 2  5  27663.  27691. 20.5 I         I F       I      A  I         I         I
 2 11  46240.  46261. 23.1 I         I F       I         I         I     A   I
 2 17  39537.  39551. 22.3 I         I F       I         I        AI         I
 2 23  29254.  29261. 20.7 I         I F       I        AI         I         I
 3  5  24771.  24771. 20.0 I         I F       I   A     I         I         I
 3 11  22023.  22023. 19.4 I         I F       I A       I         I         I
 3 17  19961.  19961. 18.9 I         I F      AI         I         I         I
 3 23  18125.  18125. 18.5 I         I F     A I         I         I         I
 4  5  16606.  16606. 18.1 I         I F   A   I         I         I         I
 4 11  15571.  15571. 17.8 I         I F  A    I         I         I         I
 4 17  14761.  14761. 17.6 I         I F A     I         I         I         I
 4 23  14047.  14047. 17.4 I         I F A     I         I         I         I
 5  5  13422.  13422. 17.2 I         I FA      I         I         I         I
 5 11  12883.  12883. 17.0 I         I A       I         I         I         I
 5 17  12401.  12401. 16.9 I         I A       I         I         I         I
 5 23  11964.  11964. 16.7 I         IAF       I         I         I         I
 6  5  11582.  11582. 16.6 I         IAF       I         I         I         I
```

Figure 4. Sample Card Input For Operation PLOT-TUL With Rating Curve And Right Side Listings

```
                                    - Column -
    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
PLOT-TUL    BLASE
    1    0   51    0 2000    6    6   11    7    I    -    0    0    0
   10   20    F    U    M  BLASE       0    0    0
   ADJ-Q   SIM-Q  HG BVD:RAIM    BVD:RO  BLA:RAIM    BLA:RO
BLASE     QIN  PLOT O                6 OBSERVED FLOW
BLASE     QINE BOTH A    F8.0,       6 ADJUSTED FLOW
BLASE     SQIN BOTH S    F8.0,       6 SIMULATED FLOW
BLASE     SSTG LIST      F5.1,       6 FORECAST STAGE
BVDSE     SQIN PLOT 1                6 BREVARD FLOW
ROSSE     QINE PLOT 2                6 ROSMAN FLOW
ROSSEY    QINE PLOT X                1 1 HOUR ADJUSTED FLOW
BVDSE     RAIM LIST      F10.2,      6 BREVARD RAIN+MELT
BVDSE     INFW LIST      F10.2,      6 BREVARD RUNOFF
BLASE     RAIM LIST      F10.2,      6 BLANTYRE RAIN+MELT
BLASE     INFW LIST      F10.2,      6 BLANTYRE RUNOFF
END
```

Figure 5. Sample Output From The Print Parameter Routine For Operation PLOT-TUL With Rating Curve And Right Side Listings

```
********************
PLOT-TUL OPERATION     NAME=BLASE        PREVIOUS NAME=
********************
         GENERAL PLOT VARIABLES ... version 2 of PLOT-TUL
         NOVRSN   IHYD     NEWPG    NPLTSZ   NPUNCH   MINSCL   INTRVL   NCRMNT   NUMTS    NMLIST   ORDSYM   CURTM
            2.       1.       0.      51.       0.    2000.       6.       6.      11.       7.    I        -

         NPLCRT   NBASE    IDUMMY
            0.       0.       0.

         HYDROGRAPH VARIABLES ...
         NPLSTG   NPRCNT   FLDSYM   RATLIM   RCDMAX   RC(1-2)
           10.      20.    F        U        M        BLASE

         IDUMMY   IDUMMY   IDUMMY
            0.       0.       0.

         LEFT SIDE COLUMN HEADINGS ...
            ADJ-Q   SIM-Q  HG

         RIGHT SIDE COLUMN HEADINGS ...
          BVD:RAIM    BVD:RO  BLA:RAIM    BLA:RO

         TIME SERIES INFORMATION ...
         TSID(1-2) TYPE      PLTOPT    SYMBOL    FRMT(1-2)    TSTIME    DESCRIPTION
         ========= ====      ======    ======    =========    ======    ==============
         BLASE     QIN       PLOT        O                      6       OBSERVED FLOW
         BLASE     QINE      BOTH        A         F8.0,        6       ADJUSTED FLOW
         BLASE     SQIN      BOTH        S         F8.0,        6       SIMULATED FLOW
         BLASE     SSTG      LIST                  F5.1,        6       FORECAST STAGE
         BVDSE     SQIN      PLOT        1                      6       BREVARD FLOW
         ROSSE     QINE      PLOT        2                      6       ROSMAN FLOW
         ROSSEY    QINE      PLOT        X                      1       1 HOUR ADJUSTED FLOW
         BVDSE     RAIM      LIST                  F10.2,       6       BREVARD RAIN+MELT
         BVDSE     INFW      LIST                  F10.2,       6       BREVARD RUNOFF
         BLASE     RAIM      LIST                  F10.2,       6       BLANTYRE RAIN+MELT
         BLASE     INFW      LIST                  F10.2,       6       BLANTYRE RUNOFF
```

Figure 6. Sample Execution Routine Output For Operation PLOT-TUL With Rating Curve And Right Side Listings

```
BLANTYRE           - BLUERIDGE               APR 1993  MST      BLASE           *** ENGLISH UNITS ***

          O = BLASE    QIN  (CFS )     OBSERVED FLOW           F = FLOOD STAGE
          A = BLASE    QINE (CFS )     ADJUSTED FLOW           U = RATING UPPER LIMIT
          S = BLASE    SQIN (CFS )     SIMULATED FLOW          M = MAX OF RECORD
          1 = BVDSE    SQIN (CFS )     BREVARD FLOW
          2 = ROSSE    QINE (CFS )     ROSMAN FLOW

          FLOOD STAGE   =   17.0       FLOOD FLOW     =   12830.0                    MAX OF RECORD  STAGE =     25.0
          WARNING STAGE = -999.0       BANKFULL STAGE =    -999.0                                   FLOW  =  75000.0
          PLOT STAGE    =   10.0       FCST CRITERIA  = DAMA                                        DATE  = 10- 5-1964
          TOTAL AREA    =  746.0       LOCAL AREA     =     431.0                    COMMENTS             =

                      STAGE2.40      18.9      22.3      24.2      25.2      26.1
DA HR   ADJ-Q   SIM-Q  HG 0.0   20000.0   40000.0   60000.0   80000.0  100000.0 BVD:RAIM    BVD:RO  BLA:RAIM    BLA:RO

29 11     68.     69.  2.4 O     F   I         I         I      M  I         I       .00       .03       .00       .03
29 17    152.    225.  3.0 O     F   I         I         I      M  I         I       .00       .03       .00       .03
29 23    599.    579.  4.5 O2    F   I         I         I      M  I         I       .00       .03       .00       .03
30  5   1381.   1179.  6.3 O2    F   I         I         I      M  I         I       .00       .03       .00       .03
30 11   1997.   1682.  7.4 O2    F   I         I         I      M  I         I       .00       .03       .00       .03
30 17   2329.   1987.  8.0 SO    F   I         I         I      M  I         I       .00       .03       .00       .03
30 23   2509.   2159.  8.4 1O    F   I         I         I      M  I         I       .00       .03       .00       .03
31  5   2618.   2265.  8.6 1O    F   I         I         I      M  I         I       .00       .03       .00       .03
31 11   2687.   2335.  8.7 1O    F   I         I         I      M  I         I       .00       .03       .00       .03
31 17   2727.   2378.  8.7 1O    F   I         I         I      M  I         I       .00       .03       .00       .03
31 23   2745.   2410.  8.8 1O    F   I         I         I      M  I         I       .00       .03       .08       .03
 1  5   5775.   6697. 12.7 1 OS  F   I2        I         I      M  I         I       .00       .03      4.53      2.92
 1 11  10026.  10123. 16.0 1    OF   I         I      2  I      M  I         I       .00       .03      4.10      3.39
 1 17  12398.  12440. 16.9 1-----O---I---------I--------2I------M--I---------I       .44       .09      1.74      1.06
 1 23  15108.  15143. 17.7 I1    FA  I       2 I         I      M  I         I       .54       .12       .00       .11
 2  5  27663.  27691. 20.5 1     F   2  A      I         I      M  I         I       .09       .07       .00       .08
 2 11  46240.  46261. 23.1 1     F  2I         I  A      I      M  I         I       .06       .05       .00       .07
 2 17  39537.  39551. 22.3 1     F 2 I        AI         I      M  I         I       .11       .06       .00       .06
 2 23  29254.  29261. 20.7 1     F2  I   A     I         I      M  I         I       .19       .07       .00       .06
 3  5  24771.  24771. 20.0 1     2   I A       I         I      M  I         I       .17       .07       .00       .06
 3 11  22023.  22023. 19.4 1     2   IA        I         I      M  I         I       .16       .07       .00       .06
 3 17  19961.  19961. 18.9 1    2F  AI         I         I      M  I         I       .21       .08       .00       .06
 3 23  18125.  18125. 18.5 1    2F  AI         I         I      M  I         I       .26       .09       .00       .05
 4  5  16606.  16606. 18.1 1    2F A I         I         I      M  I         I       .24       .09       .00       .05
 4 11  15571.  15571. 17.8 1    2FA  I         I         I      M  I         I       .25       .09       .00       .05
 4 17  14761.  14761. 17.6 I1   2FA  I         I         I      M  I         I       .31       .10       .00       .05
 4 23  14047.  14047. 17.4 I1  2 FA  I         I         I      M  I         I       .31       .11       .00       .05
 5  5  13422.  13422. 17.2 I1  2 A   I         I         I      M  I         I       .25       .10       .00       .05
 5 11  12883.  12883. 17.0 I1  2 A   I         I         I      M  I         I       .26       .11       .00       .05
 5 17  12401.  12401. 16.9 I1  2 A   I         I         I      M  I         I       .35       .12       .00       .05
 5 23  11964.  11964. 16.7 I1  2AF   I         I         I      M  I         I       .34       .12       .00       .05
 6  5  11582.  11582. 16.6 I1  2AF   I         I         I      M  I         I       .26       .12       .00       .05
```

Figure 7. Sample Card Input For Operation PLOT-TUL With No Rating Curve And Full Size Hydrograph

```
                                    - Column -
    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
PLOT-TUL    WHINE
    0    0  101    0  100    6    6    4    3    I    - 2000    0    0
WHITE RIVER DAM INFLOW, OUTFLOW, & POOL
 RAIM  INFLOW  BASEF
WHINE     RAIM LIST      F5.2,       6 RAIN+MELT
WHINEINF  SQIN BOTH I    F8.0,       6 INFLOW
WHINE     SQIN PLOT S                6 SIM OUTFLOW
WHINEBF   SQIN BOTH B    F7.0,       6 BASEFLOW
END
```

Figure 8. Sample Output From The Print Parameter Routine For Operation PLOT-TUL With No Rating Curve And Full Size Hydrograph

```
********************
PLOT-TUL OPERATION     NAME=WHINE        PREVIOUS NAME=
********************
         GENERAL PLOT VARIABLES ... version 2 of PLOT-TUL
         NOVRSN   IHYD     NEWPG    NPLTSZ   NPUNCH   MINSCL   INTRVL   NCRMNT   NUMTS    NMLIST   ORDSYM   CURTM
            2.       0.       0.     101.       0.     100.       6.       6.       4.       3.    I        -

         NPLCRT   NBASE    IDUMMY
         2000.       0.       0.

         PLOT NAME LABEL ...
         WHITE RIVER DAM INFLOW, OUTFLOW, & POOL

         LEFT SIDE COLUMN HEADINGS ...
          RAIM  INFLOW  BASEF

         TIME SERIES INFORMATION ...
         TSID(1-2) TYPE      PLTOPT    SYMBOL    FRMT(1-2)    TSTIME    DESCRIPTION
         ========= ====      ======    ======    =========    ======    ==============
         WHINE     RAIM      LIST                 F5.2,        6       RAIN+MELT
         WHINEINF  SQIN      BOTH         I       F8.0,        6       INFLOW
         WHINE     SQIN      PLOT         S                    6       SIM OUTFLOW
         WHINEBF   SQIN      BOTH         B       F7.0,        6       BASEFLOW
```

Figure 9. Sample Output From The Execution Routine For Operation PLOT-TUL With No Rating Curve And Full Size Hydrograph

```
WHITE RIVER DAM INFLOW, OUTFLOW, & POOL      APR 1993  MST      WHINE           *** ENGLISH UNITS ***

         I = WHINEINF SQIN (CFS )     INFLOW
         S = WHINE    SQIN (CFS )     SIM OUTFLOW
         B = WHINEBF  SQIN (CFS )     BASEFLOW

DA HR RAIM  INFLOW  BASEF 0.0    2000.0    4000.0    6000.0    8000.0   10000.0   12000.0   14000.0   16000.0   18000.0   20000.0
29 11  .00    197.   197. I         I         I         I         I         I         I         I         I         I         I
29 17  .00    195.   195. I         I         I         I         I         I         I         I         I         I         I
29 23  .00    192.   192. I         I         I         I         I         I         I         I         I         I         I
30  5  .00    190.   190. I         I         I         I         I         I         I         I         I         I         I
30 11  .00    188.   188. I         I         I         I         I         I         I         I         I         I         I
30 17  .00    185.   185. I         I         I         I         I         I         I         I         I         I         I
30 23  .00    183.   183. I         I         I         I         I         I         I         I         I         I         I
31  5  .00    181.   181. I         I         I         I         I         I         I         I         I         I         I
31 11  .00    178.   178. I         I         I         I         I         I         I         I         I         I         I
31 17  .00    176.   176. I         I         I         I         I         I         I         I         I         I         I
31 23  .00    174.   174. I         I         I         I         I         I         I         I         I         I         I
 1  5  .00    171.   171. I         I         I         I         I         I         I         I         I         I         I
 1 11  .01    169.   169. I         I         I         I         I         I         I         I         I         I         I
 1 17 1.17   1037.   167. B--S-I----I---------I---------I---------I---------I---------I---------I---------I---------I---------I
 1 23  .68   4369.   165. B    S    I         II        I         I         I         I         I         I         I         I
 2  5  .11  10231.   163. B    S    I         I         I         I         I         II        I         I         I         I
 2 11  .09  10985.   161. B    S    I         I         I         I         I         I   I     I         I         I         I
 2 17  .15   8226.   159. B    S    I         I         I         I         II        I         I         I         I         I
 2 23  .24   6909.   157. B    S    I         I         I   I     I         I         I         I         I         I         I
 3  5  .22   6930.   155. B    S    I         I         I   I     I         I         I         I         I         I         I
 3 11  .20   7441.   153. B    S    I         I         I      I  I         I         I         I         I         I         I
 3 17  .22   7562.   151. B    S    I         I         I      I  I         I         I         I         I         I         I
 3 23  .23   7560.   149. B    S    I         I         I      I  I         I         I         I         I         I         I
 4  5  .19   7678.   147. B    S    I         I         I       I I         I         I         I         I         I         I
 4 11  .19   7683.   145. B    S    I         I         I       I I         I         I         I         I         I         I
 4 17  .25   7444.   143. B    S    I         I         I      I  I         I         I         I         I         I         I
 4 23  .26   7573.   141. B    S    I         I         I      I  I         I         I         I         I         I         I
 5  5  .20   8118.   140. B    S    I         I         I         I         I         I         I         I         I         I
 5 11  .18   8310.   138. B    S    I         I         I         II        I         I         I         I         I         I
 5 17  .27   8029.   136. B    S    I         I         I         I         I         I         I         I         I         I
 5 23  .28   8168.   134. B    S    I         I         I         I         I         I         I         I         I         I
 6  5  .20   8794.   133. B    S    I         I         I         I  I      I         I         I         I         I         I
```