URS
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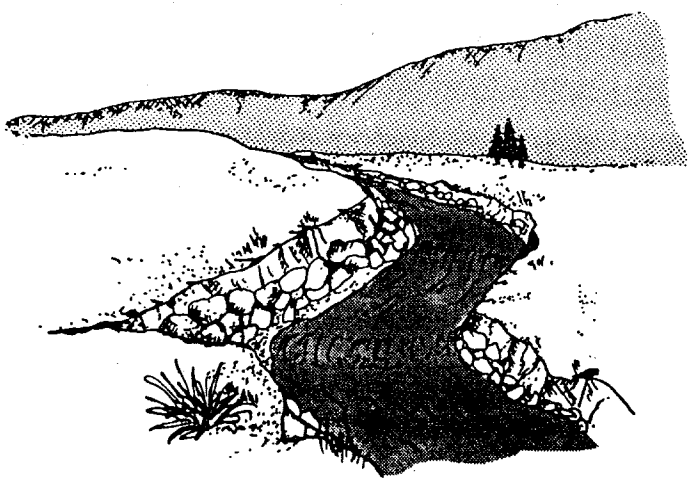
WORK™

Technical Addendum
Monument Branch Drainage Basin
Planning Study

City of Colorado Springs
and El Paso County



April, 1987

TECHNICAL ADDENDUM
MONUMENT BRANCH DRAINAGE BASIN
PLANNING STUDY
APRIL 13, 1987
JUNE 22, 1987 (REV.)
AUGUST 6, 1987 (REV.)

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URS Corporation Project No. 46382

MONUMENT BRANCH DRAINAGE BASIN PLANNING STUDY

ADDENDUM 1: TR-20 HISTORIC & RECOMMENDED COMPUTER RUNS FOR:

Historic

- Input File
- 100-yr. 24-hour
- 100-yr. 2-hour
- 10-yr. 24-hour
- 10-yr. 2-hour

Recommended

- Input File
- 100-yr. 24-hour

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MONUMENT BRANCH MASTER DRAINAGE STUDY - PRESENT CONDITIONS
STORM, 1, 0.5, Type IIA 24-hour storm distribution
0.0000    0.0025    0.0050    0.0075    0.0100
0.0150    0.0200    0.0250    0.0300    0.0500
0.0600    0.1000    0.7000    0.7500    0.7800
0.8000    0.8200    0.8300    0.8400    0.8500
0.8600    0.8650    0.8700    0.8850    0.8900
0.9000    0.9050    0.9100    0.9150    0.9213
0.9275    0.9338    0.9400    0.9450    0.9500
0.9550    0.9600    0.9650    0.9700    0.9750
0.9800    0.9825    0.9850    0.9875    0.9900
0.9925    0.9950    0.9975    1.0000    1.0000
STORM, 2, .0833, Type IIA 2-hour storm distribution
0.0000    0.0087    0.0346    0.0744    0.1436
0.2647    0.4810    0.6021    0.6713    0.7249
0.7682    0.8028    0.8374    0.8720    0.8893
0.9066    0.9170    0.9273    0.9377    0.9481
0.9585    0.9689    0.9792    0.9896    1.0000
C, Input data (El, Q, A) for X-Sect 1
XSECT, 1
6900          0          0
6901        171         27
6902        571         60
6903       1182         99
   0          0          0
C, Input data (El, Q, A) for X-Sect 2
XSECT, 2
6885          0          0
6886         10          2
6887         24          4
6888         67         12
6889        255         32
6890        664         64
   0          0          0
C, Input data (El, Q, A) for X-Sect 3
XSECT, 3
6820          0          0
6821        411         64
6822       1338        136
6823       2701        216
   0          0          0
C, Input data (El, Q, A) for X-Sect 4
XSECT, 4
6770          0          0
6770.5       46         12
6771        150         25
6772        496         54
6773       1020         89
6774       1728        128
   0          0          0
C, Input data (El, Q, A) for X-Sect 5
XSECT, 5
6678          0          0
6679        408         63
6680       1316        132
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6681          2630           206
   0             0             0
C, Input data (El, Q, A) for X-Sect 6
XSECT, 6
6916             0             0
6916.5          10             4
6917            61            14
6918           366            54
6919          1062           120
   0             0             0
C, Input data (El, Q, A) for X-Sect 7
XSECT, 7
6836             0             0
6837            71            18
6838           217            34
6839           624            75
6840          1325           132
6841          2383           205
   0             0             0
C, Input data (El, Q, A) for X-Sect 8
XSECT, 8
6681             0             0
6682           213            35
6683           719            78
6684          1510           131
   0             0             0
C, Input data (El, Q, A) for X-Sect 9
XSECT, 9
6630             0             0
6630.5          94            28
6631           332            67
6631.5         723           116
6632          1289           177
6632.5        2048           248
6633          3020           330
   0             0             0
C, Input data (El, Q, A) for X-Sect 11
XSECT, 11
6691             0             0
6692            16             4
6693            85            12
6694           232            26
6695           706            64
   0             0             0
C, Input data (El, Q, A) for X-Sect 12
XSECT, 12
6558             0             0
6558.5          10             3
6559            37             8
6560           165            24
6561           419            48
6562           828            80
6563          1184           124
6564          1809           213
6565          2420           311
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6566        3748          412
6567        5621          515
   0           0            0
C, Input data (El, Q, A) for X-Sect 13
XSECT, 13
6600           0            0
6601          30            4
6602         105           10
6603         231           18
6604         416           28
6605         668           40
   0           0            0
C, Basin B1
RUNOFF,      B1            1          .20          .28          69
C, Route B1 thru  B2
REACH,        1            1           2          2000
C, Basin B2
RUNOFF,      B2            1          .09          .12          69
C, Total below B2
ADD,          1            2           3
C, Route to confluence in G2
REACH,        1            3           4          1300
C, Basin A & G1
RUNOFF,     AG1            1          .20          .22          69.5
C, Print hydrograph for basin AG1
C, Route to confluence in G2
REACH,        1            1           2          1700
C, Combine at confluence in G2
ADD,          2            4           1
C, Route thru G2
REACH,        1            1           2          1300
C, Basin G2
RUNOFF,     G2             1          .20          .27          69
C, Total below G2
ADD,          1            2           3
C, Basin E
RUNOFF,      E             1          .20          .33          70
C, Route thru F
REACH,        2            1           2          1800
C, Basin F
RUNOFF,      F             1          .11          .33          69
C, Total below F
ADD,          1            2           4
C, Total D.P. #1
ADD,          3            4           1
C, Route to below J1
REACH,        3            1           2          2700
C, Basin J
RUNOFF,      J             1          .25          .33          69
C, Combine to below J
ADD,          1            2           3
C, Basin I
RUNOFF,      I             1          .15          .14          70
C, Route to below J
REACH,        3            1           2          1500
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C, Combine I to total below J
ADD,          2          3          4
C, Basins K
RUNOFF,       K          1       .028        .07        69.6
C, Route to DP 2
REACH,        3          1          3        1400
C, Total at DP 2
ADD,          3          4          2
C, Route to DP 3
REACH,        4          2          1        2875
C, Basin N2
RUNOFF,      N2          2        .06         .18          69
C, Combine N2 to DP 3
ADD,          1          2          3
C, Basin N1
RUNOFF,      N1          1        .11         .27          69
C, Combine N1 to DP 3
ADD,          1          3          2
C, Route total DP 3 to DP 7 - North Branch
REACH,        5          2          1        3250
C, Basin R
RUNOFF,       R          2        .08         .23          69
C, Total North Branch DP 7
ADD,          1          2          7
C, Basin C1
RUNOFF,      C1          1        .19         .27          69
C, Route to DP 5
REACH,        7          1          2        2125
C, Basin C2
RUNOFF,      C2          1        .10         .32          69
C, Combine C1 & C2 at DP 5
ADD,          1          2          3
C, Basin D
RUNOFF,       D          1        .17         .27          69
C, Total at DP 5
ADD,          1          3          2
C, Route to DP 6A
REACH,        7          2          3        2060
C, Basin H
RUNOFF,       H          1        .10         .26          69
C, Route H to DP 6A
REACH,        6          1          2        1175
C, Combine DP 5 & H DP 6A
ADD,          2          3          1
C, Basin O1
RUNOFF,      O1          2        .10         .19          69
C, Total at DP 6A
ADD,          1          2          3
C, Route to DP 6
REACH,        7          3          2        3500
C, Basin O2
RUNOFF,      O2          1        .17         .23          69
C, Total at DP 6
ADD,          1          2          3
C, Route to DP 7
```

```
REACH,       8            3            2          3000
C, Basin S
RUNOFF,      S            1          .10          .18          69
C, Total at DP 7 - South Branch
ADD,         1            2            3
C, Total at DP 7
ADD,         3            7            6
C, Route to DP 8A
REACH,       9            6            7          875
C, Basin T2
RUNOFF,     T2            1          .02          .08          69
C, Basin T3
RUNOFF,     T3            2          .07          .14          69
C, Combine T2 & T3
ADD,         1            2            3
C, Total at DP 8A
ADD,         3            7            6
C, Route to DP 8
REACH,       9            6            7          600
C, Basin T1
RUNOFF,     T1            1          .06          .17          69
C, Total at DP 8
ADD,         1            7            6
C, Route DP 8 to DP 13
REACH,      13            6            7          500
C, Basin L1
RUNOFF,     L1            1          .06          .13          70
C, Basin L2
RUNOFF,     L2            2          .02          .08          69
C, Total at DP 9
ADD,         1            2            3
C, Route to DP 10
REACH,      11            3            1          2125
C, Basin M1
RUNOFF,     M1            2          .05          .13          69
C, Basin M2
RUNOFF,     M2            3          .13          .22          69
ADD,         2            3            4
C, Total DP 10
ADD,         1            4            2
C, Route DP 10 to DP 11A
REACH,      11            2            1          3000
C, Basin Q2
RUNOFF,     Q2            2          .27          .23          69
C, Total DP 11A
ADD,         1            2            3
C, Route DP 11A to DP 11
REACH,      11            3            1          500
C, Basin Q1
RUNOFF,     Q1            2          .03          .11          69
C, Total DP 11
ADD,         1            2            3
C, Total DP 12A
C, Basin P2
RUNOFF,     P2            1          .08          .21          69
```

```
C, Route to DP 12
REACH,      11              1               2             750
C, Basin P1
RUNOFF,     P1              1             .03             .08              69
C, Total DP 12
ADD,         1              2               4
C, Route DP 12 to DP 11
REACH,      13              4               1            1500
C, Total below DP 11
ADD,         1              3               2
C, Route to DP 13
REACH,      13              2               1            1250
C, Basin U
RUNOFF,      U              2             .10             .23              74
C, Total DP 13
ADD,         1              2               3
ADD,         3              7               1
C, Route to DP 14
REACH,      12              1               2            2250
C, Basin V
RUNOFF,      V              1             .19             .35              69
C, Total DP 14 (Basin Total)
ADD,         1              2               3
```

```
==========================================================================
                  program  R U N O F F  version 2
==========================================================================
08-10-1987     10:06:59

Input file name: B:6382HIST.DAT
MONUMENT BRANCH MASTER DRAINAGE STUDY - PRESENT CONDITIONS
100-YEAR 24-HOUR STORM : Project No 46382

Time increment .1 hrs


Storm pattern no. 1
     time increment= .5  hrs
          0.0000     0.0025     0.0050     0.0075     0.0100
          0.0150     0.0200     0.0250     0.0300     0.0500
          0.0600     0.1000     0.7000     0.7500     0.7800
          0.8000     0.8200     0.8300     0.8400     0.8500
          0.8600     0.8650     0.8700     0.8850     0.8900
          0.9000     0.9050     0.9100     0.9150     0.9213
          0.9275     0.9338     0.9400     0.9450     0.9500
          0.9550     0.9600     0.9650     0.9700     0.9750
          0.9800     0.9825     0.9850     0.9875     0.9900
          0.9925     0.9950     0.9975     1.0000     1.0000

Total rain depth 4.6 inches

*  Input data (El, Q, A) for X-Sect 1


Reach no. 1
            Elev          Q          Area
             ft           cfs        sqft
          6900.00         0.0         0.0
          6901.00       171.0        27.0
          6902.00       571.0        60.0
          6903.00      1182.0        99.0


*  Input data (El, Q, A) for X-Sect 2


Reach no. 2
            Elev          Q          Area
             ft           cfs        sqft
          6885.00         0.0         0.0
          6886.00        10.0         2.0
          6887.00        24.0         4.0
          6888.00        67.0        12.0
          6889.00       255.0        32.0
          6890.00       664.0        64.0


*  Input data (El, Q, A) for X-Sect 3


Reach no. 3
            Elev          Q          Area
             ft           cfs        sqft
          6820.00         0.0         0.0
          6821.00       411.0        64.0
```

6822.00	1338.0	136.0
6823.00	2701.0	216.0

* Input data (El, Q, A) for X-Sect 4

Reach no. 4

Elev	Q	Area
ft	cfs	sqft
6770.00	0.0	0.0
6770.50	46.0	12.0
6771.00	150.0	25.0
6772.00	496.0	54.0
6773.00	1020.0	89.0
6774.00	1728.0	128.0

* Input data (El, Q, A) for X-Sect 5

Reach no. 5

Elev	Q	Area
ft	cfs	sqft
6678.00	0.0	0.0
6679.00	408.0	63.0
6680.00	1316.0	132.0
6681.00	2630.0	206.0

* Input data (El, Q, A) for X-Sect 6

Reach no. 6

Elev	Q	Area
ft	cfs	sqft
6916.00	0.0	0.0
6916.50	10.0	4.0
6917.00	61.0	14.0
6918.00	366.0	54.0
6919.00	1062.0	120.0

* Input data (El, Q, A) for X-Sect 7

Reach no. 7

Elev	Q	Area
ft	cfs	sqft
6836.00	0.0	0.0
6837.00	71.0	18.0
6838.00	217.0	34.0
6839.00	624.0	75.0
6840.00	1325.0	132.0
6841.00	2383.0	205.0

* Input data (El, Q, A) for X-Sect 8

Reach no. 8

Elev	Q	Area

ft	cfs	sqft
6681.00	0.0	0.0
6682.00	213.0	35.0
6683.00	719.0	78.0
6684.00	1510.0	131.0

* Input data (El, Q, A) for X-Sect 9

Reach no. 9

Elev ft	Q cfs	Area sqft
6630.00	0.0	0.0
6630.50	94.0	28.0
6631.00	332.0	67.0
6631.50	723.0	116.0
6632.00	1289.0	177.0
6632.50	2048.0	248.0
6633.00	3020.0	330.0

* Input data (El, Q, A) for X-Sect 11

Reach no. 11

Elev ft	Q cfs	Area sqft
6691.00	0.0	0.0
6692.00	16.0	4.0
6693.00	85.0	12.0
6694.00	232.0	26.0
6695.00	706.0	64.0

* Input data (El, Q, A) for X-Sect 12

Reach no. 12

Elev ft	Q cfs	Area sqft
6558.00	0.0	0.0
6558.50	10.0	3.0
6559.00	37.0	8.0
6560.00	165.0	24.0
6561.00	419.0	48.0
6562.00	828.0	80.0
6563.00	1184.0	124.0
6564.00	1809.0	213.0
6565.00	2420.0	311.0
6566.00	3748.0	412.0
6567.00	5621.0	515.0

* Input data (El, Q, A) for X-Sect 13

Reach no. 13

Elev ft	Q cfs	Area sqft
6600.00	0.0	0.0
6601.00	30.0	4.0

ft	cfs	sqft
6681.00	0.0	0.0
6682.00	213.0	35.0
6683.00	719.0	78.0
6684.00	1510.0	131.0

* Input data (El, Q, A) for X-Sect 9

Reach no. 9

Elev ft	Q cfs	Area sqft
6630.00	0.0	0.0
6630.50	94.0	28.0
6631.00	332.0	67.0
6631.50	723.0	116.0
6632.00	1289.0	177.0
6632.50	2048.0	248.0
6633.00	3020.0	330.0

* Input data (El, Q, A) for X-Sect 11

Reach no. 11

Elev ft	Q cfs	Area sqft
6691.00	0.0	0.0
6692.00	16.0	4.0
6693.00	85.0	12.0
6694.00	232.0	26.0
6695.00	706.0	64.0

* Input data (El, Q, A) for X-Sect 12

Reach no. 12

Elev ft	Q cfs	Area sqft
6558.00	0.0	0.0
6558.50	10.0	3.0
6559.00	37.0	8.0
6560.00	165.0	24.0
6561.00	419.0	48.0
6562.00	828.0	80.0
6563.00	1184.0	124.0
6564.00	1809.0	213.0
6565.00	2420.0	311.0
6566.00	3748.0	412.0
6567.00	5621.0	515.0

* Input data (El, Q, A) for X-Sect 13

Reach no. 13

Elev ft	Q cfs	Area sqft
6600.00	0.0	0.0
6601.00	30.0	4.0

6602.00	105.0	10.0
6603.00	231.0	18.0
6604.00	416.0	28.0
6605.00	668.0	40.0

* Basin B1

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .28 hours cn= 69

total volume= 17.77897 acre-ft
peak flow = 267.9275 cfs

* Route B1 thru B2

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 17.77898 acre-ft
peak flow = 264.0547 cfs

* Basin B2

Calculate the hydrograph for basin no. 0 to unit 1
area= .09 sq. miles tc= .12 hours cn= 69

total volume= 7.974239 acre-ft
peak flow = 155.2867 cfs

* Total below B2

Add the hydrographs in units 1 and 2 to unit 3

total volume= 25.75322 acre-ft
peak flow = 305.2114 cfs

* Route to confluence in G2

Route the hydrograph in unit 3 through reach 1 to unit 4

total volume= 25.75322 acre-ft
peak flow = 304.9077 cfs

* Basin A & G1

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .22 hours cn= 69.5

total volume= 18.15349 acre-ft
peak flow = 289.7718 cfs

```
*  Print hydrograph for basin AG1

*  Route to confluence in G2

Route the hydrograph in unit 1 through reach 1 to unit 2

     total volume= 18.1535 acre-ft
     peak flow   = 283.7748 cfs

*  Combine at confluence in G2

Add the hydrographs in units 2  and 4  to unit 1

     total volume= 43.90673 acre-ft
     peak flow   = 579.8565 cfs

*  Route thru G2

Route the hydrograph in unit 1 through reach 1 to unit 2

     total volume= 43.90675 acre-ft
     peak flow   = 579.3731 cfs

*  Basin G2

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles     tc= .27 hours     cn= 69

     total volume= 17.79119 acre-ft
     peak flow   = 270.3596 cfs

*  Total below G2

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 61.69791 acre-ft
     peak flow   = 749.8403 cfs

*  Basin E

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles     tc= .33 hours     cn= 70

     total volume= 18.56744 acre-ft
     peak flow   = 266.8068 cfs

*  Route thru F
```

Route the hydrograph in unit 1 through reach 2 to unit 2

total volume= 18.56745 acre-ft
peak flow = 263.4305 cfs

* Basin F

Calculate the hydrograph for basin no. 0 to unit 1
area= .11 sq. miles tc= .33 hours cn= 69

total volume= 9.785653 acre-ft
peak flow = 139.7529 cfs

* Total below F

Add the hydrographs in units 1 and 2 to unit 4

total volume= 28.3531 acre-ft
peak flow = 374.0994 cfs

* Total D.P. #1

Add the hydrographs in units 3 and 4 to unit 1

total volume= 90.05101 acre-ft
peak flow = 1123.94 cfs

* Route to below J1

Route the hydrograph in unit 1 through reach 3 to unit 2

total volume= 90.05099 acre-ft
peak flow = 1107.427 cfs

* Basin J

Calculate the hydrograph for basin no. 0 to unit 1
area= .25 sq. miles tc= .33 hours cn= 69

total volume= 22.24013 acre-ft
peak flow = 317.6204 cfs

* Combine to below J

Add the hydrographs in units 1 and 2 to unit 3

total volume= 112.2912 acre-ft
peak flow = 1260.558 cfs

```
*  Basin I

Calculate the hydrograph for basin no. 0 to unit 1
      area= .15 sq. miles      tc= .14 hours      cn= 70

      total volume= 13.88957 acre-ft
      peak flow   = 260.5715 cfs


*  Route to below J

Route the hydrograph in unit 1 through reach 3 to unit 2

      total volume= 13.88957 acre-ft
      peak flow   = 255.642 cfs


*  Combine I to total below J

Add the hydrographs in units 2  and 3  to unit 4

      total volume= 126.1807 acre-ft
      peak flow   = 1378.891 cfs


*  Basins K

Calculate the hydrograph for basin no. 0 to unit 1
      area= .028 sq. miles      tc= .07 hours      cn= 69.6

      total volume= 2.402122 acre-ft
      peak flow   = 52.96126 cfs


*  Route to DP 2

Route the hydrograph in unit 1 through reach 3 to unit 3

      total volume= 2.402121 acre-ft
      peak flow   = 52.29707 cfs


*  Total at DP 2

Add the hydrographs in units 3  and 4  to unit 2

      total volume= 128.5828 acre-ft
      peak flow   = 1391.014 cfs


*  Route to DP 3

Route the hydrograph in unit 2 through reach 4 to unit 1
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      total volume= 128.5828 acre-ft
      peak flow    = 1383.841 cfs


*  Basin N2


Calculate the hydrograph for basin no. 0 to unit 2
      area= .06 sq. miles      tc= .18 hours      cn= 69

      total volume= 5.327237 acre-ft
      peak flow    = 92.31146 cfs


*  Combine N2 to DP 3


Add the hydrographs in units 1  and 2  to unit 3

      total volume= 133.9101 acre-ft
      peak flow    = 1398.786 cfs


*  Basin N1


Calculate the hydrograph for basin no. 0 to unit 1
      area= .11 sq. miles      tc= .27 hours      cn= 69

      total volume= 9.785149 acre-ft
      peak flow    = 148.6978 cfs


*  Combine N1 to DP 3


Add the hydrographs in units 1  and 3  to unit 2

      total volume= 143.6952 acre-ft
      peak flow    = 1448.48 cfs


*  Route total DP 3 to DP 7 - North Branch


Route the hydrograph in unit 2 through reach 5 to unit 1

      total volume= 143.6952 acre-ft
      peak flow    = 1435.216 cfs


*  Basin R


Calculate the hydrograph for basin no. 0 to unit 2
      area= .08 sq. miles      tc= .23 hours      cn= 69

      total volume= 7.110118 acre-ft
      peak flow    = 110.1597 cfs


*  Total North Branch DP 7
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Add the hydrographs in units 1 and 2 to unit 7

total volume= 150.8053 acre-ft
peak flow = 1453.948 cfs

* Basin C1

Calculate the hydrograph for basin no. 0 to unit 1
area= .19 sq. miles tc= .27 hours cn= 69

total volume= 16.90162 acre-ft
peak flow = 256.8416 cfs

* Route to DP 5

Route the hydrograph in unit 1 through reach 7 to unit 2

total volume= 16.90161 acre-ft
peak flow = 251.5053 cfs

* Basin C2

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .32 hours cn= 69

total volume= 8.885611 acre-ft
peak flow = 128.5155 cfs

* Combine C1 & C2 at DP 5

Add the hydrographs in units 1 and 2 to unit 3

total volume= 25.78723 acre-ft
peak flow = 350.2943 cfs

* Basin D

Calculate the hydrograph for basin no. 0 to unit 1
area= .17 sq. miles tc= .27 hours cn= 69

total volume= 15.1225 acre-ft
peak flow = 229.8056 cfs

* Total at DP 5

Add the hydrographs in units 1 and 3 to unit 2

total volume= 40.90971 acre-ft

peak flow = 580.0282 cfs

* Route to DP 6A

Route the hydrograph in unit 2 through reach 7 to unit 3

total volume= 40.90971 acre-ft
peak flow = 568.4238 cfs

* Basin H

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .26 hours cn= 69

total volume= 8.885161 acre-ft
peak flow = 134.5922 cfs

* Route H to DP 6A

Route the hydrograph in unit 1 through reach 6 to unit 2

total volume= 8.885162 acre-ft
peak flow = 133.6575 cfs

* Combine DP 5 & H DP 6A

Add the hydrographs in units 2 and 3 to unit 1

total volume= 49.79488 acre-ft
peak flow = 702.0813 cfs

* Basin O1

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .19 hours cn= 69

total volume= 8.883891 acre-ft
peak flow = 150.5748 cfs

* Total at DP 6A

Add the hydrographs in units 1 and 2 to unit 3

total volume= 58.67878 acre-ft
peak flow = 754.7131 cfs

* Route to DP 6

Route the hydrograph in unit 3 through reach 7 to unit 2

total volume= 58.6788 acre-ft
peak flow = 737.1651 cfs

* Basin 02

Calculate the hydrograph for basin no. 0 to unit 1
area= .17 sq. miles tc= .23 hours cn= 69

total volume= 15.10899 acre-ft
peak flow = 234.0894 cfs

* Total at DP 6

Add the hydrographs in units 1 and 2 to unit 3

total volume= 73.78775 acre-ft
peak flow = 797.103 cfs

* Route to DP 7

Route the hydrograph in unit 3 through reach 8 to unit 2

total volume= 73.78774 acre-ft
peak flow = 792.1733 cfs

* Basin S

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .18 hours cn= 69

total volume= 8.878726 acre-ft
peak flow = 153.8524 cfs

* Total at DP 7 - South Branch

Add the hydrographs in units 1 and 2 to unit 3

total volume= 82.66656 acre-ft
peak flow = 811.2806 cfs

* Total at DP 7

Add the hydrographs in units 3 and 7 to unit 6

total volume= 233.4718 acre-ft
peak flow = 2265.229 cfs

* Route to DP 8A

Route the hydrograph in unit 6 through reach 9 to unit 7

total volume= 233.4718 acre-ft
peak flow = 2264.429 cfs

* Basin T2

Calculate the hydrograph for basin no. 0 to unit 1
area= .02 sq. miles tc= .08 hours cn= 69

total volume= 1.731367 acre-ft
peak flow = 36.58978 cfs

* Basin T3

Calculate the hydrograph for basin no. 0 to unit 2
area= .07 sq. miles tc= .14 hours cn= 69

total volume= 6.210992 acre-ft
peak flow = 116.4942 cfs

* Combine T2 & T3

Add the hydrographs in units 1 and 2 to unit 3

total volume= 7.942359 acre-ft
peak flow = 153.084 cfs

* Total at DP 8A

Add the hydrographs in units 3 and 7 to unit 6

total volume= 241.4143 acre-ft
peak flow = 2280.084 cfs

* Route to DP 8

Route the hydrograph in unit 6 through reach 9 to unit 7

total volume= 241.4142 acre-ft
peak flow = 2279.987 cfs

* Basin T1

Calculate the hydrograph for basin no. 0 to unit 1
area= .06 sq. miles tc= .17 hours cn= 69

```
      total volume= 5.328621 acre-ft
      peak flow    = 94.22789 cfs

*  Total at DP 8

Add the hydrographs in units 1  and 7  to unit 6

      total volume= 246.7427 acre-ft
      peak flow    = 2288.951 cfs

*  Route DP 8 to DP 13

Route the hydrograph in unit 6 through reach 13 to unit 7

      total volume= 246.7427 acre-ft
      peak flow    = 2288.951 cfs

*  Basin L1

Calculate the hydrograph for basin no. 0 to unit 1
      area= .06 sq. miles      tc= .13 hours      cn= 70

      total volume= 5.552395 acre-ft
      peak flow    = 106.2565 cfs

*  Basin L2

Calculate the hydrograph for basin no. 0 to unit 2
      area= .02 sq. miles      tc= .08 hours      cn= 69

      total volume= 1.731367 acre-ft
      peak flow    = 36.58978 cfs

*  Total at DP 9

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 7.283762 acre-ft
      peak flow    = 142.8466 cfs

*  Route to DP 10

Route the hydrograph in unit 3 through reach 11 to unit 1

      total volume= 7.28376 acre-ft
      peak flow    = 139.661 cfs

*  Basin M1
```

```
Calculate the hydrograph for basin no. 0 to unit 2
     area= .05 sq. miles      tc= .13 hours      cn= 69

     total volume= 4.433841 acre-ft
     peak flow   = 84.90456 cfs


*  Basin M2


Calculate the hydrograph for basin no. 0 to unit 3
     area= .13 sq. miles      tc= .22 hours      cn= 69

     total volume= 11.54901 acre-ft
     peak flow   = 183.6354 cfs


Add the hydrographs in units 2  and 3  to unit 4

     total volume= 15.98285 acre-ft
     peak flow   = 268.54 cfs


*  Total DP 10


Add the hydrographs in units 1  and 4  to unit 2

     total volume= 23.26661 acre-ft
     peak flow   = 377.9732 cfs


*  Route DP 10 to DP 11A


Route the hydrograph in unit 2 through reach 11 to unit 1

     total volume= 23.26661 acre-ft
     peak flow   = 366.1158 cfs


*  Basin Q2


Calculate the hydrograph for basin no. 0 to unit 2
     area= .27 sq. miles      tc= .23 hours      cn= 69

     total volume= 23.99663 acre-ft
     peak flow   = 371.789 cfs


*  Total DP 11A


Add the hydrographs in units 1  and 2  to unit 3

     total volume= 47.26326 acre-ft
     peak flow   = 730.1814 cfs


*  Route DP 11A to DP 11
```

Route the hydrograph in unit 3 through reach 11 to unit 1

total volume= 47.26326 acre-ft
peak flow = 730.181 cfs

* Basin Q1

Calculate the hydrograph for basin no. 0 to unit 2
area= .03 sq. miles tc= .11 hours cn= 69

total volume= 2.655247 acre-ft
peak flow = 52.54515 cfs

* Total DP 11

Add the hydrographs in units 1 and 2 to unit 3

total volume= 49.9185 acre-ft
peak flow = 736.9535 cfs

* Total DP 12A

* Basin P2

Calculate the hydrograph for basin no. 0 to unit 1
area= .08 sq. miles tc= .21 hours cn= 69

total volume= 7.104972 acre-ft
peak flow = 115.442 cfs

* Route to DP 12

Route the hydrograph in unit 1 through reach 11 to unit 2

total volume= 7.104974 acre-ft
peak flow = 115.3003 cfs

* Basin P1

Calculate the hydrograph for basin no. 0 to unit 1
area= .03 sq. miles tc= .08 hours cn= 69

total volume= 2.59705 acre-ft
peak flow = 54.88467 cfs

* Total DP 12

Add the hydrographs in units 1 and 2 to unit 4

total volume= 9.702023 acre-ft
peak flow = 136.0406 cfs

* Route DP 12 to DP 11

Route the hydrograph in unit 4 through reach 13 to unit 1

total volume= 9.702024 acre-ft
peak flow = 135.5731 cfs

* Total below DP 11

Add the hydrographs in units 1 and 3 to unit 2

total volume= 59.62051 acre-ft
peak flow = 864.4777 cfs

* Route to DP 13

Route the hydrograph in unit 2 through reach 13 to unit 1

total volume= 59.62051 acre-ft
peak flow = 864.4696 cfs

* Basin U

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .23 hours cn= 74

total volume= 10.89406 acre-ft
peak flow = 174.793 cfs

* Total DP 13

Add the hydrographs in units 1 and 2 to unit 3

total volume= 70.51462 acre-ft
peak flow = 906.4457 cfs

Add the hydrographs in units 3 and 7 to unit 1

total volume= 317.2573 acre-ft
peak flow = 2439.474 cfs

* Route to DP 14

Route the hydrograph in unit 1 through reach 12 to unit 2

```
      total volume= 317.2573 acre-ft
      peak flow    = 2431.083 cfs


*  Basin V


Calculate the hydrograph for basin no. 0 to unit 1
      area= .19 sq. miles      tc= .35 hours      cn= 69

      total volume= 16.91673 acre-ft
      peak flow    = 234.8916 cfs


*  Total DP 14 (Basin Total)


Add the hydrographs in units 1  and 2  to unit 3

      total volume= 334.1741 acre-ft
      peak flow    = 2458.566 cfs

End of computation           10:10:32
```

```
==============================================================
                program  R U N O F F  version 2
==============================================================
08-07-1987    13:18:51

Input file name: a:6382hist.dat
MONUMENT BRANCH MASTER DRAINAGE STUDY - PRESENT CONDITIONS
100-Year 2-Hour Storm :Project No 46382

Time increment .02 hrs


Storm pattern no. 2
     time increment= .0833  hrs
        0.0000     0.0087     0.0346     0.0744     0.1436
        0.2647     0.4810     0.6021     0.6713     0.7249
        0.7682     0.8028     0.8374     0.8720     0.8893
        0.9066     0.9170     0.9273     0.9377     0.9481
        0.9585     0.9689     0.9792     0.9896     1.0000

Total rain depth 3 inches

*  Input data (El, Q, A) for X-Sect 1


Reach no. 1
           Elev          Q          Area
            ft          cfs         sqft
         6900.00        0.0         0.0
         6901.00      171.0        27.0
         6902.00      571.0        60.0
         6903.00     1182.0        99.0


*  Input data (El, Q, A) for X-Sect 2


Reach no. 2
           Elev          Q          Area
            ft          cfs         sqft
         6885.00        0.0         0.0
         6886.00       10.0         2.0
         6887.00       24.0         4.0
         6888.00       67.0        12.0
         6889.00      255.0        32.0
         6890.00      664.0        64.0


*  Input data (El, Q, A) for X-Sect 3


Reach no. 3
           Elev          Q          Area
            ft          cfs         sqft
         6820.00        0.0         0.0
         6821.00      411.0        64.0
         6822.00     1338.0       136.0
         6823.00     2701.0       216.0


*  Input data (El, Q, A) for X-Sect 4
```

Reach no. 4

Elev ft	Q cfs	Area sqft
6770.00	0.0	0.0
6770.50	46.0	12.0
6771.00	150.0	25.0
6772.00	496.0	54.0
6773.00	1020.0	89.0
6774.00	1728.0	128.0

* Input data (El, Q, A) for X-Sect 5

Reach no. 5

Elev ft	Q cfs	Area sqft
6678.00	0.0	0.0
6679.00	408.0	63.0
6680.00	1316.0	132.0
6681.00	2630.0	206.0

* Input data (El, Q, A) for X-Sect 6

Reach no. 6

Elev ft	Q cfs	Area sqft
6916.00	0.0	0.0
6916.50	10.0	4.0
6917.00	61.0	14.0
6918.00	366.0	54.0
6919.00	1062.0	120.0

* Input data (El, Q, A) for X-Sect 7

Reach no. 7

Elev ft	Q cfs	Area sqft
6836.00	0.0	0.0
6837.00	71.0	18.0
6838.00	217.0	34.0
6839.00	624.0	75.0
6840.00	1325.0	132.0
6841.00	2383.0	205.0

* Input data (El, Q, A) for X-Sect 8

Reach no. 8

Elev ft	Q cfs	Area sqft
6681.00	0.0	0.0
6682.00	213.0	35.0
6683.00	719.0	78.0
6684.00	1510.0	131.0

* Input data (El, Q, A) for X-Sect 9

Reach no. 9

Elev	Q	Area
ft	cfs	sqft
6630.00	0.0	0.0
6630.50	94.0	28.0
6631.00	332.0	67.0
6631.50	723.0	116.0
6632.00	1289.0	177.0
6632.50	2048.0	248.0
6633.00	3020.0	330.0

* Input data (El, Q, A) for X-Sect 11

Reach no. 11

Elev	Q	Area
ft	cfs	sqft
6691.00	0.0	0.0
6692.00	16.0	4.0
6693.00	85.0	12.0
6694.00	232.0	26.0
6695.00	706.0	64.0

* Input data (El, Q, A) for X-Sect 12

Reach no. 12

Elev	Q	Area
ft	cfs	sqft
6558.00	0.0	0.0
6558.50	10.0	3.0
6559.00	37.0	8.0
6560.00	165.0	24.0
6561.00	419.0	48.0
6562.00	828.0	80.0
6563.00	1184.0	124.0
6564.00	1809.0	213.0
6565.00	2420.0	311.0
6566.00	3748.0	412.0
6567.00	5621.0	515.0

* Input data (El, Q, A) for X-Sect 13

Reach no. 13

Elev	Q	Area
ft	cfs	sqft
6600.00	0.0	0.0
6601.00	30.0	4.0
6602.00	105.0	10.0
6603.00	231.0	18.0
6604.00	416.0	28.0
6605.00	668.0	40.0

```
*  Basin B1

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles     tc= .28 hours     cn= 69

     total volume= 7.119707 acre-ft
     peak flow   = 102.0635 cfs

*  Route B1 thru  B2

Route the hydrograph in unit 1 through reach 1 to unit 2

     total volume= 7.119709 acre-ft
     peak flow   = 101.3581 cfs

*  Basin B2

Calculate the hydrograph for basin no. 0 to unit 1
     area= .09 sq. miles     tc= .12 hours     cn= 69

     total volume= 3.204386 acre-ft
     peak flow   = 58.58446 cfs

*  Total below B2

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 10.32409 acre-ft
     peak flow   = 139.4213 cfs

*  Route to confluence in G2

Route the hydrograph in unit 3 through reach 1 to unit 4

     total volume= 10.3241 acre-ft
     peak flow   = 138.8049 cfs

*  Basin A & G1

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles     tc= .22 hours     cn= 69.5

     total volume= 7.355782 acre-ft
     peak flow   = 114.305 cfs

*  Print hydrograph for basin AG1

*  Route to confluence in G2
```

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 7.355782 acre-ft
peak flow = 113.6011 cfs

* Combine at confluence in G2

Add the hydrographs in units 2 and 4 to unit 1

total volume= 17.67988 acre-ft
peak flow = 241.5643 cfs

* Route thru G2

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 17.67987 acre-ft
peak flow = 241.2018 cfs

* Basin G2

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .27 hours cn= 69

total volume= 7.120408 acre-ft
peak flow = 102.64 cfs

* Total below G2

Add the hydrographs in units 1 and 2 to unit 3

total volume= 24.80029 acre-ft
peak flow = 329.2388 cfs

* Basin E

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .33 hours cn= 70

total volume= 7.594946 acre-ft
peak flow = 104.5318 cfs

* Route thru F

Route the hydrograph in unit 1 through reach 2 to unit 2

total volume= 7.59494 acre-ft
peak flow = 104.1909 cfs

```
*  Basin F

Calculate the hydrograph for basin no. 0 to unit 1
     area= .11 sq. miles      tc= .33 hours      cn= 69

     total volume= 3.916433 acre-ft
     peak flow   = 53.1525 cfs

*  Total below F

Add the hydrographs in units 1  and 2  to unit 4

     total volume= 11.51138 acre-ft
     peak flow   = 155.1807 cfs

*  Total D.P. #1

Add the hydrographs in units 3  and 4  to unit 1

     total volume= 36.31165 acre-ft
     peak flow   = 483.8876 cfs

*  Route to below J1

Route the hydrograph in unit 1 through reach 3 to unit 2

     total volume= 36.31164 acre-ft
     peak flow   = 481.7141 cfs

*  Basin J

Calculate the hydrograph for basin no. 0 to unit 1
     area= .25 sq. miles      tc= .33 hours      cn= 69

     total volume= 8.900984 acre-ft
     peak flow   = 120.8011 cfs

*  Combine to below J

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 45.21266 acre-ft
     peak flow   = 584.7557 cfs

*  Basin I

Calculate the hydrograph for basin no. 0 to unit 1
```

```
      area= .15 sq. miles      tc= .14 hours      cn= 70

      total volume= 5.696122 acre-ft
      peak flow    = 102.7194 cfs


*  Route to below J


Route the hydrograph in unit 1 through reach 3 to unit 2

      total volume= 5.696125 acre-ft
      peak flow    = 101.3997 cfs


*  Combine I to total below J


Add the hydrographs in units 2  and 3  to unit 4

      total volume= 50.90877 acre-ft
      peak flow    = 644.1097 cfs


*  Basins K


Calculate the hydrograph for basin no. 0 to unit 1
      area= .028 sq. miles      tc= .07 hours      cn= 69.6

      total volume= 1.036635 acre-ft
      peak flow    = 21.43625 cfs


*  Route to DP 2


Route the hydrograph in unit 1 through reach 3 to unit 3

      total volume= 1.036635 acre-ft
      peak flow    = 20.96456 cfs


*  Total at DP 2


Add the hydrographs in units 3  and 4  to unit 2

      total volume= 51.94541 acre-ft
      peak flow    = 654.3033 cfs


*  Route to DP 3


Route the hydrograph in unit 2 through reach 4 to unit 1

      total volume= 51.94539 acre-ft
      peak flow    = 653.451 cfs
```

Calculate the hydrograph for basin no. 0 to unit 2
area= .06 sq. miles tc= .18 hours cn= 69

total volume= 2.136119 acre-ft
peak flow = 34.86876 cfs

* Combine N2 to DP 3

Add the hydrographs in units 1 and 2 to unit 3

total volume= 54.08152 acre-ft
peak flow = 675.1747 cfs

* Basin N1

Calculate the hydrograph for basin no. 0 to unit 1
area= .11 sq. miles tc= .27 hours cn= 69

total volume= 3.916225 acre-ft
peak flow = 56.45197 cfs

* Combine N1 to DP 3

Add the hydrographs in units 1 and 3 to unit 2

total volume= 57.99775 acre-ft
peak flow = 716.5571 cfs

* Route total DP 3 to DP 7 - North Branch

Route the hydrograph in unit 2 through reach 5 to unit 1

total volume= 57.99775 acre-ft
peak flow = 714.8218 cfs

* Basin R

Calculate the hydrograph for basin no. 0 to unit 2
area= .08 sq. miles tc= .23 hours cn= 69

total volume= 2.848058 acre-ft
peak flow = 43.28665 cfs

* Total North Branch DP 7

Add the hydrographs in units 1 and 2 to unit 7

total volume= 60.8458 acre-ft

```
      peak flow    = 739.0269 cfs

*  Basin C1

Calculate the hydrograph for basin no. 0 to unit 1
      area= .19 sq. miles      tc= .27 hours      cn= 69

      total volume= 6.764388 acre-ft
      peak flow    = 97.50795 cfs

*  Route to DP 5

Route the hydrograph in unit 1 through reach 7 to unit 2

      total volume= 6.764389 acre-ft
      peak flow    = 96.25556 cfs

*  Basin C2

Calculate the hydrograph for basin no. 0 to unit 1
      area= .1 sq. miles      tc= .32 hours      cn= 69

      total volume= 3.560461 acre-ft
      peak flow    = 48.65556 cfs

*  Combine C1 & C2 at DP 5

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 10.32485 acre-ft
      peak flow    = 142.613 cfs

*  Basin D

Calculate the hydrograph for basin no. 0 to unit 1
      area= .17 sq. miles      tc= .27 hours      cn= 69

      total volume= 6.052346 acre-ft
      peak flow    = 87.24396 cfs

*  Total at DP 5

Add the hydrographs in units 1  and 3  to unit 2

      total volume= 16.37719 acre-ft
      peak flow    = 222.988 cfs

*  Route to DP 6A
```

Route the hydrograph in unit 2 through reach 7 to unit 3

total volume= 16.3772 acre-ft
peak flow = 221.9395 cfs

* Basin H

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .26 hours cn= 69

total volume= 3.560293 acre-ft
peak flow = 52.19349 cfs

* Route H to DP 6A

Route the hydrograph in unit 1 through reach 6 to unit 2

total volume= 3.560293 acre-ft
peak flow = 51.61361 cfs

* Combine DP 5 & H DP 6A

Add the hydrographs in units 2 and 3 to unit 1

total volume= 19.93749 acre-ft
peak flow = 268.9488 cfs

* Basin 01

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .19 hours cn= 69

total volume= 3.560146 acre-ft
peak flow = 57.22371 cfs

* Total at DP 6A

Add the hydrographs in units 1 and 2 to unit 3

total volume= 23.49764 acre-ft
peak flow = 308.8761 cfs

* Route to DP 6

Route the hydrograph in unit 3 through reach 7 to unit 2

total volume= 23.49763 acre-ft
peak flow = 307.2195 cfs

```
*  Basin 02

Calculate the hydrograph for basin no. 0 to unit 1
     area= .17 sq. miles      tc= .23 hours      cn= 69

     total volume= 6.052122 acre-ft
     peak flow   = 91.98412 cfs

*  Total at DP 6

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 29.54975 acre-ft
     peak flow   = 370.6734 cfs

*  Route to DP 7

Route the hydrograph in unit 3 through reach 8 to unit 2

     total volume= 29.54975 acre-ft
     peak flow   = 369.2397 cfs

*  Basin S

Calculate the hydrograph for basin no. 0 to unit 1
     area= .1 sq. miles      tc= .18 hours      cn= 69

     total volume= 3.560199 acre-ft
     peak flow   = 58.1146 cfs

*  Total at DP 7 - South Branch

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 33.10995 acre-ft
     peak flow   = 397.4656 cfs

*  Total at DP 7

Add the hydrographs in units 3  and 7  to unit 6

     total volume= 93.95574 acre-ft
     peak flow   = 1135.643 cfs

*  Route to DP 8A

Route the hydrograph in unit 6 through reach 9 to unit 7
```

total volume= 93.95575 acre-ft
peak flow = 1134.883 cfs

* Basin T2

Calculate the hydrograph for basin no. 0 to unit 1
area= .02 sq. miles tc= .08 hours cn= 69

total volume= .7119843 acre-ft
peak flow = 14.22289 cfs

* Basin T3

Calculate the hydrograph for basin no. 0 to unit 2
area= .07 sq. miles tc= .14 hours cn= 69

total volume= 2.492112 acre-ft
peak flow = 43.72636 cfs

* Combine T2 & T3

Add the hydrographs in units 1 and 2 to unit 3

total volume= 3.204096 acre-ft
peak flow = 56.56913 cfs

* Total at DP 8A

Add the hydrographs in units 3 and 7 to unit 6

total volume= 97.15987 acre-ft
peak flow = 1154.015 cfs

* Route to DP 8

Route the hydrograph in unit 6 through reach 9 to unit 7

total volume= 97.15983 acre-ft
peak flow = 1153.202 cfs

* Basin T1

Calculate the hydrograph for basin no. 0 to unit 1
area= .06 sq. miles tc= .17 hours cn= 69

total volume= 2.135751 acre-ft
peak flow = 35.52909 cfs

* Total at DP 8

Add the hydrographs in units 1 and 7 to unit 6

total volume= 99.2956 acre-ft
peak flow = 1166.524 cfs

* Route DP 8 to DP 13

Route the hydrograph in unit 6 through reach 13 to unit 7

total volume= 99.29562 acre-ft
peak flow = 1166.512 cfs

* Basin L1

Calculate the hydrograph for basin no. 0 to unit 1
area= .06 sq. miles tc= .13 hours cn= 70

total volume= 2.278527 acre-ft
peak flow = 41.96301 cfs

* Basin L2

Calculate the hydrograph for basin no. 0 to unit 2
area= .02 sq. miles tc= .08 hours cn= 69

total volume= .7119843 acre-ft
peak flow = 14.22289 cfs

* Total at DP 9

Add the hydrographs in units 1 and 2 to unit 3

total volume= 2.990511 acre-ft
peak flow = 55.65002 cfs

* Route to DP 10

Route the hydrograph in unit 3 through reach 11 to unit 1

total volume= 2.990511 acre-ft
peak flow = 53.79405 cfs

* Basin M1

Calculate the hydrograph for basin no. 0 to unit 2
area= .05 sq. miles tc= .13 hours cn= 69

total volume= 1.780204 acre-ft

peak flow = 32.00333 cfs

* Basin M2

Calculate the hydrograph for basin no. 0 to unit 3
area= .13 sq. miles tc= .22 hours cn= 69

total volume= 4.628476 acre-ft
peak flow = 71.12479 cfs

Add the hydrographs in units 2 and 3 to unit 4

total volume= 6.408681 acre-ft
peak flow = 99.80991 cfs

* Total DP 10

Add the hydrographs in units 1 and 4 to unit 2

total volume= 9.399195 acre-ft
peak flow = 152.9188 cfs

* Route DP 10 to DP 11A

Route the hydrograph in unit 2 through reach 11 to unit 1

total volume= 9.399197 acre-ft
peak flow = 151.3009 cfs

* Basin Q2

Calculate the hydrograph for basin no. 0 to unit 2
area= .27 sq. miles tc= .23 hours cn= 69

total volume= 9.612192 acre-ft
peak flow = 146.0924 cfs

* Total DP 11A

Add the hydrographs in units 1 and 2 to unit 3

total volume= 19.01139 acre-ft
peak flow = 286.8066 cfs

* Route DP 11A to DP 11

Route the hydrograph in unit 3 through reach 11 to unit 1

peak flow = 286.6127 cfs

* Basin Q1

Calculate the hydrograph for basin no. 0 to unit 2
area= .03 sq. miles tc= .11 hours cn= 69

total volume= 1.068096 acre-ft
peak flow = 20.04271 cfs

* Total DP 11

Add the hydrographs in units 1 and 2 to unit 3

total volume= 20.07948 acre-ft
peak flow = 299.7583 cfs

* Total DP 12A

* Basin P2

Calculate the hydrograph for basin no. 0 to unit 1
area= .08 sq. miles tc= .21 hours cn= 69

total volume= 2.848236 acre-ft
peak flow = 44.43858 cfs

* Route to DP 12

Route the hydrograph in unit 1 through reach 11 to unit 2

total volume= 2.848236 acre-ft
peak flow = 44.30919 cfs

* Basin P1

Calculate the hydrograph for basin no. 0 to unit 1
area= .03 sq. miles tc= .08 hours cn= 69

total volume= 1.067976 acre-ft
peak flow = 21.33433 cfs

* Total DP 12

Add the hydrographs in units 1 and 2 to unit 4

total volume= 3.916212 acre-ft
peak flow = 58.77375 cfs

* Route DP 12 to DP 11

Route the hydrograph in unit 4 through reach 13 to unit 1

total volume= 3.916212 acre-ft
peak flow = 58.68103 cfs

* Total below DP 11

Add the hydrographs in units 1 and 3 to unit 2

total volume= 23.99569 acre-ft
peak flow = 358.1247 cfs

* Route to DP 13

Route the hydrograph in unit 2 through reach 13 to unit 1

total volume= 23.9957 acre-ft
peak flow = 357.8832 cfs

* Basin U

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .23 hours cn= 74

total volume= 4.828179 acre-ft
peak flow = 81.31857 cfs

* Total DP 13

Add the hydrographs in units 1 and 2 to unit 3

total volume= 28.82388 acre-ft
peak flow = 421.0667 cfs

Add the hydrographs in units 3 and 7 to unit 1

total volume= 128.1194 acre-ft
peak flow = 1419.958 cfs

* Route to DP 14

Route the hydrograph in unit 1 through reach 12 to unit 2

total volume= 128.1195 acre-ft
peak flow = 1418.41 cfs

```
*  Basin V

Calculate the hydrograph for basin no. 0 to unit 1
     area= .19 sq. miles      tc= .35 hours      cn= 69

     total volume= 6.764505 acre-ft
     peak flow   = 89.92089 cfs


*  Total DP 14 (Basin Total)


Add the hydrographs in units 1  and 2  to unit 3

     total volume= 134.884 acre-ft
     peak flow   = 1472.83 cfs

End of computation          13:22:31
```

```
==========================================================
                program  R U N O F F  version 2
==========================================================
08-10-1987     10:19:42

Input file name: B:6382HIST.DAT
MONUMENT BRANCH MASTER DRAINAGE STUDY - PRESENT CONDITIONS
10-YEAR 24-HOUR STORM : Project No 46382

Time increment .1 hrs


Storm pattern no. 1
     time increment= .5  hrs
        0.0000     0.0025     0.0050     0.0075     0.0100
        0.0150     0.0200     0.0250     0.0300     0.0500
        0.0600     0.1000     0.7000     0.7500     0.7800
        0.8000     0.8200     0.8300     0.8400     0.8500
        0.8600     0.8650     0.8700     0.8850     0.8900
        0.9000     0.9050     0.9100     0.9150     0.9213
        0.9275     0.9338     0.9400     0.9450     0.9500
        0.9550     0.9600     0.9650     0.9700     0.9750
        0.9800     0.9825     0.9850     0.9875     0.9900
        0.9925     0.9950     0.9975     1.0000     1.0000

Total rain depth 3 inches

*  Input data (El, Q, A) for X-Sect 1


Reach no. 1
          Elev          Q          Area
           ft          cfs         sqft
       6900.00         0.0          0.0
       6901.00       171.0         27.0
       6902.00       571.0         60.0
       6903.00      1182.0         99.0


*  Input data (El, Q, A) for X-Sect 2


Reach no. 2
          Elev          Q          Area
           ft          cfs         sqft
       6885.00         0.0          0.0
       6886.00        10.0          2.0
       6887.00        24.0          4.0
       6888.00        67.0         12.0
       6889.00       255.0         32.0
       6890.00       664.0         64.0


*  Input data (El, Q, A) for X-Sect 3


Reach no. 3
          Elev          Q          Area
           ft          cfs         sqft
       6820.00         0.0          0.0
       6821.00       411.0         64.0
```

6822.00	1338.0	136.0
6823.00	2701.0	216.0

* Input data (El, Q, A) for X-Sect 4

Reach no. 4

Elev ft	Q cfs	Area sqft
6770.00	0.0	0.0
6770.50	46.0	12.0
6771.00	150.0	25.0
6772.00	496.0	54.0
6773.00	1020.0	89.0
6774.00	1728.0	128.0

* Input data (El, Q, A) for X-Sect 5

Reach no. 5

Elev ft	Q cfs	Area sqft
6678.00	0.0	0.0
6679.00	408.0	63.0
6680.00	1316.0	132.0
6681.00	2630.0	206.0

* Input data (El, Q, A) for X-Sect 6

Reach no. 6

Elev ft	Q cfs	Area sqft
6916.00	0.0	0.0
6916.50	10.0	4.0
6917.00	61.0	14.0
6918.00	366.0	54.0
6919.00	1062.0	120.0

* Input data (El, Q, A) for X-Sect 7

Reach no. 7

Elev ft	Q cfs	Area sqft
6836.00	0.0	0.0
6837.00	71.0	18.0
6838.00	217.0	34.0
6839.00	624.0	75.0
6840.00	1325.0	132.0
6841.00	2383.0	205.0

* Input data (El, Q, A) for X-Sect 8

Reach no. 8

Elev	Q	Area

ft	cfs	sqft
6681.00	0.0	0.0
6682.00	213.0	35.0
6683.00	719.0	78.0
6684.00	1510.0	131.0

* Input data (El, Q, A) for X-Sect 9

Reach no. 9

Elev ft	Q cfs	Area sqft
6630.00	0.0	0.0
6630.50	94.0	28.0
6631.00	332.0	67.0
6631.50	723.0	116.0
6632.00	1289.0	177.0
6632.50	2048.0	248.0
6633.00	3020.0	330.0

* Input data (El, Q, A) for X-Sect 11

Reach no. 11

Elev ft	Q cfs	Area sqft
6691.00	0.0	0.0
6692.00	16.0	4.0
6693.00	85.0	12.0
6694.00	232.0	26.0
6695.00	706.0	64.0

* Input data (El, Q, A) for X-Sect 12

Reach no. 12

Elev ft	Q cfs	Area sqft
6558.00	0.0	0.0
6558.50	10.0	3.0
6559.00	37.0	8.0
6560.00	165.0	24.0
6561.00	419.0	48.0
6562.00	828.0	80.0
6563.00	1184.0	124.0
6564.00	1809.0	213.0
6565.00	2420.0	311.0
6566.00	3748.0	412.0
6567.00	5621.0	515.0

* Input data (El, Q, A) for X-Sect 13

Reach no. 13

Elev ft	Q cfs	Area sqft
6600.00	0.0	0.0
6601.00	30.0	4.0

6602.00	105.0	10.0
6603.00	231.0	18.0
6604.00	416.0	28.0
6605.00	668.0	40.0

* Basin B1

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .28 hours cn= 69

total volume= 7.122334 acre-ft
peak flow = 99.81606 cfs

* Route B1 thru B2

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 7.122335 acre-ft
peak flow = 96.05452 cfs

* Basin B2

Calculate the hydrograph for basin no. 0 to unit 1
area= .09 sq. miles tc= .12 hours cn= 69

total volume= 3.192444 acre-ft
peak flow = 60.93563 cfs

* Total below B2

Add the hydrographs in units 1 and 2 to unit 3

total volume= 10.31478 acre-ft
peak flow = 105.8074 cfs

* Route to confluence in G2

Route the hydrograph in unit 3 through reach 1 to unit 4

total volume= 10.31477 acre-ft
peak flow = 105.5551 cfs

* Basin A & G1

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .22 hours cn= 69.5

total volume= 7.351299 acre-ft
peak flow = 108.6495 cfs

```
*  Print hydrograph for basin AG1

*  Route to confluence in G2

Route the hydrograph in unit 1 through reach 1 to unit 2

      total volume= 7.3513 acre-ft
      peak flow   = 107.4848 cfs

*  Combine at confluence in G2

Add the hydrographs in units 2  and 4  to unit 1

      total volume= 17.66608 acre-ft
      peak flow   = 209.057 cfs

*  Route thru G2

Route the hydrograph in unit 1 through reach 1 to unit 2

      total volume= 17.66608 acre-ft
      peak flow   = 207.5953 cfs

*  Basin G2

Calculate the hydrograph for basin no. 0 to unit 1
      area= .2 sq. miles      tc= .27 hours      cn= 69

      total volume= 7.126806 acre-ft
      peak flow   = 101.6036 cfs

*  Total below G2

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 24.79287 acre-ft
      peak flow   = 249.6798 cfs

*  Basin E

Calculate the hydrograph for basin no. 0 to unit 1
      area= .2 sq. miles      tc= .33 hours      cn= 70

      total volume= 7.602717 acre-ft
      peak flow   = 98.90573 cfs

*  Route thru F
```

Route the hydrograph in unit 1 through reach 2 to unit 2

total volume= 7.602715 acre-ft
peak flow = 94.5084 cfs

* Basin F

Calculate the hydrograph for basin no. 0 to unit 1
area= .11 sq. miles tc= .33 hours cn= 69

total volume= 3.920604 acre-ft
peak flow = 49.9753 cfs

* Total below F

Add the hydrographs in units 1 and 2 to unit 4

total volume= 11.52332 acre-ft
peak flow = 136.7341 cfs

* Total D.P. #1

Add the hydrographs in units 3 and 4 to unit 1

total volume= 36.3162 acre-ft
peak flow = 386.4139 cfs

* Route to below J1

Route the hydrograph in unit 1 through reach 3 to unit 2

total volume= 36.31621 acre-ft
peak flow = 365.1832 cfs

* Basin J

Calculate the hydrograph for basin no. 0 to unit 1
area= .25 sq. miles tc= .33 hours cn= 69

total volume= 8.910465 acre-ft
peak flow = 113.5802 cfs

* Combine to below J

Add the hydrographs in units 1 and 2 to unit 3

total volume= 45.22666 acre-ft
peak flow = 425.4094 cfs

```
*  Basin I

Calculate the hydrograph for basin no. 0 to unit 1
     area= .15 sq. miles      tc= .14 hours      cn= 70

     total volume= 5.684266 acre-ft
     peak flow    = 103.1905 cfs

*  Route to below J

Route the hydrograph in unit 1 through reach 3 to unit 2

     total volume= 5.684262 acre-ft
     peak flow    = 100.05 cfs

*  Combine I to total below J

Add the hydrographs in units 2  and 3  to unit 4

     total volume= 50.91093 acre-ft
     peak flow    = 450.437 cfs

*  Basins K

Calculate the hydrograph for basin no. 0 to unit 1
     area= .028 sq. miles      tc= .07 hours      cn= 69.6

     total volume= .9586611 acre-ft
     peak flow    = 22.20317 cfs

*  Route to DP 2

Route the hydrograph in unit 1 through reach 3 to unit 3

     total volume= .9586613 acre-ft
     peak flow    = 21.74635 cfs

*  Total at DP 2

Add the hydrographs in units 3  and 4  to unit 2

     total volume= 51.86958 acre-ft
     peak flow    = 452.8333 cfs

*  Route to DP 3

Route the hydrograph in unit 2 through reach 4 to unit 1
```

total volume= 51.8696 acre-ft
peak flow = 450.7376 cfs

* Basin N2

Calculate the hydrograph for basin no. 0 to unit 2
area= .06 sq. miles tc= .18 hours cn= 69

total volume= 2.133868 acre-ft
peak flow = 33.70208 cfs

* Combine N2 to DP 3

Add the hydrographs in units 1 and 2 to unit 3

total volume= 54.00345 acre-ft
peak flow = 455.7792 cfs

* Basin N1

Calculate the hydrograph for basin no. 0 to unit 1
area= .11 sq. miles tc= .27 hours cn= 69

total volume= 3.919743 acre-ft
peak flow = 55.88199 cfs

* Combine N1 to DP 3

Add the hydrographs in units 1 and 3 to unit 2

total volume= 57.92321 acre-ft
peak flow = 468.8756 cfs

* Route total DP 3 to DP 7 - North Branch

Route the hydrograph in unit 2 through reach 5 to unit 1

total volume= 57.9232 acre-ft
peak flow = 463.7989 cfs

* Basin R

Calculate the hydrograph for basin no. 0 to unit 2
area= .08 sq. miles tc= .23 hours cn= 69

total volume= 2.847778 acre-ft
peak flow = 41.81498 cfs

* Total North Branch DP 7

```
Add the hydrographs in units 1  and 2  to unit 7

      total volume= 60.77096 acre-ft
      peak flow    = 469.7285 cfs


*  Basin C1


Calculate the hydrograph for basin no. 0 to unit 1
     area= .19 sq. miles      tc= .27 hours      cn= 69

      total volume= 6.770468 acre-ft
      peak flow    = 96.52343 cfs


*  Route to DP 5


Route the hydrograph in unit 1 through reach 7 to unit 2

      total volume= 6.770464 acre-ft
      peak flow    = 86.8923 cfs


*  Basin C2


Calculate the hydrograph for basin no. 0 to unit 1
     area= .1 sq. miles      tc= .32 hours      cn= 69

      total volume= 3.559402 acre-ft
      peak flow    = 46.31522 cfs


*  Combine C1 & C2 at DP 5


Add the hydrographs in units 1  and 2  to unit 3

      total volume= 10.32987 acre-ft
      peak flow    = 124.7803 cfs


*  Basin D


Calculate the hydrograph for basin no. 0 to unit 1
     area= .17 sq. miles      tc= .27 hours      cn= 69

      total volume= 6.057781 acre-ft
      peak flow    = 86.36307 cfs


*  Total at DP 5


Add the hydrographs in units 1  and 3  to unit 2

      total volume= 16.38764 acre-ft
```

```
      peak flow    = 195.4011 cfs

*  Route to DP 6A

Route the hydrograph in unit 2 through reach 7 to unit 3

      total volume= 16.38765 acre-ft
      peak flow    = 182.4142 cfs

*  Basin H

Calculate the hydrograph for basin no. 0 to unit 1
      area= .1 sq. miles      tc= .26 hours      cn= 69

      total volume= 3.559332 acre-ft
      peak flow    = 50.91016 cfs

*  Route H to DP 6A

Route the hydrograph in unit 1 through reach 6 to unit 2

      total volume= 3.559333 acre-ft
      peak flow    = 48.87593 cfs

*  Combine DP 5 & H DP 6A

Add the hydrographs in units 2  and 3  to unit 1

      total volume= 19.94697 acre-ft
      peak flow    = 230.2159 cfs

*  Basin 01

Calculate the hydrograph for basin no. 0 to unit 2
      area= .1 sq. miles      tc= .19 hours      cn= 69

      total volume= 3.558117 acre-ft
      peak flow    = 54.27715 cfs

*  Total at DP 6A

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 23.50509 acre-ft
      peak flow    = 251.8778 cfs

*  Route to DP 6
```

Route the hydrograph in unit 3 through reach 7 to unit 2

total volume= 23.5051 acre-ft
peak flow = 236.6016 cfs

* Basin 02

Calculate the hydrograph for basin no. 0 to unit 1
area= .17 sq. miles tc= .23 hours cn= 69

total volume= 6.051525 acre-ft
peak flow = 88.85683 cfs

* Total at DP 6

Add the hydrographs in units 1 and 2 to unit 3

total volume= 29.55664 acre-ft
peak flow = 253.6763 cfs

* Route to DP 7

Route the hydrograph in unit 3 through reach 8 to unit 2

total volume= 29.55661 acre-ft
peak flow = 244.3492 cfs

* Basin S

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .18 hours cn= 69

total volume= 3.556446 acre-ft
peak flow = 56.17013 cfs

* Total at DP 7 - South Branch

Add the hydrographs in units 1 and 2 to unit 3

total volume= 33.11308 acre-ft
peak flow = 249.7043 cfs

* Total at DP 7

Add the hydrographs in units 3 and 7 to unit 6

total volume= 93.88403 acre-ft
peak flow = 716.846 cfs

* Route to DP 8A

Route the hydrograph in unit 6 through reach 9 to unit 7

total volume= 93.88402 acre-ft
peak flow = 714.8683 cfs

* Basin T2

Calculate the hydrograph for basin no. 0 to unit 1
area= .02 sq. miles tc= .08 hours cn= 69

total volume= .6880605 acre-ft
peak flow = 14.9615 cfs

* Basin T3

Calculate the hydrograph for basin no. 0 to unit 2
area= .07 sq. miles tc= .14 hours cn= 69

total volume= 2.487317 acre-ft
peak flow = 44.6664 cfs

* Combine T2 & T3

Add the hydrographs in units 1 and 2 to unit 3

total volume= 3.175377 acre-ft
peak flow = 59.6279 cfs

* Total at DP 8A

Add the hydrographs in units 3 and 7 to unit 6

total volume= 97.0594 acre-ft
peak flow = 719.3626 cfs

* Route to DP 8

Route the hydrograph in unit 6 through reach 9 to unit 7

total volume= 97.05944 acre-ft
peak flow = 718.9006 cfs

* Basin T1

Calculate the hydrograph for basin no. 0 to unit 1
area= .06 sq. miles tc= .17 hours cn= 69

```
      total volume= 2.13431 acre-ft
      peak flow    = 34.83454 cfs


*  Total at DP 8


Add the hydrographs in units 1  and 7  to unit 6

      total volume= 99.19374 acre-ft
      peak flow    = 721.8555 cfs


*  Route DP 8 to DP 13


Route the hydrograph in unit 6 through reach 13 to unit 7

      total volume= 99.19374 acre-ft
      peak flow    = 721.8555 cfs


*  Basin L1


Calculate the hydrograph for basin no. 0 to unit 1
      area= .06 sq. miles      tc= .13 hours      cn= 70

      total volume= 2.272033 acre-ft
      peak flow    = 42.54363 cfs


*  Basin L2


Calculate the hydrograph for basin no. 0 to unit 2
      area= .02 sq. miles      tc= .08 hours      cn= 69

      total volume= .6880605 acre-ft
      peak flow    = 14.9615 cfs


*  Total at DP 9


Add the hydrographs in units 1  and 2  to unit 3

      total volume= 2.960093 acre-ft
      peak flow    = 57.50514 cfs


*  Route to DP 10


Route the hydrograph in unit 3 through reach 11 to unit 1

      total volume= 2.960092 acre-ft
      peak flow    = 53.94115 cfs


*  Basin M1
```

Calculate the hydrograph for basin no. 0 to unit 2
area= .05 sq. miles tc= .13 hours cn= 69

total volume= 1.775373 acre-ft
peak flow = 32.9456 cfs

* Basin M2

Calculate the hydrograph for basin no. 0 to unit 3
area= .13 sq. miles tc= .22 hours cn= 69

total volume= 4.62565 acre-ft
peak flow = 68.10144 cfs

Add the hydrographs in units 2 and 3 to unit 4

total volume= 6.401024 acre-ft
peak flow = 96.69054 cfs

* Total DP 10

Add the hydrographs in units 1 and 4 to unit 2

total volume= 9.361114 acre-ft
peak flow = 141.0347 cfs

* Route DP 10 to DP 11A

Route the hydrograph in unit 2 through reach 11 to unit 1

total volume= 9.361116 acre-ft
peak flow = 137.6559 cfs

* Basin 02

Calculate the hydrograph for basin no. 0 to unit 2
area= .27 sq. miles tc= .23 hours cn= 69

total volume= 9.611254 acre-ft
peak flow = 141.1255 cfs

* Total DP 11A

Add the hydrographs in units 1 and 2 to unit 3

total volume= 18.97237 acre-ft
peak flow = 260.7206 cfs

* Route DP 11A to DP 11

Route the hydrograph in unit 3 through reach 11 to unit 1

total volume= 18.97238 acre-ft
peak flow = 260.7169 cfs

* Basin Q1

Calculate the hydrograph for basin no. 0 to unit 2
area= .03 sq. miles tc= .11 hours cn= 69

total volume= 1.062736 acre-ft
peak flow = 20.84491 cfs

* Total DP 11

Add the hydrographs in units 1 and 2 to unit 3

total volume= 20.03511 acre-ft
peak flow = 263.6542 cfs

* Total DP 12A

* Basin P2

Calculate the hydrograph for basin no. 0 to unit 1
area= .08 sq. miles tc= .21 hours cn= 69

total volume= 2.846054 acre-ft
peak flow = 41.76054 cfs

* Route to DP 12

Route the hydrograph in unit 1 through reach 11 to unit 2

total volume= 2.846053 acre-ft
peak flow = 41.72492 cfs

* Basin P1

Calculate the hydrograph for basin no. 0 to unit 1
area= .03 sq. miles tc= .08 hours cn= 69

total volume= 1.032091 acre-ft
peak flow = 22.44225 cfs

* Total DP 12

Add the hydrographs in units 1 and 2 to unit 4

total volume= 3.878143 acre-ft
peak flow = 45.34731 cfs

* Route DP 12 to DP 11

Route the hydrograph in unit 4 through reach 13 to unit 1

total volume= 3.878144 acre-ft
peak flow = 45.27583 cfs

* Total below DP 11

Add the hydrographs in units 1 and 3 to unit 2

total volume= 23.91324 acre-ft
peak flow = 308.9301 cfs

* Route to DP 13

Route the hydrograph in unit 2 through reach 13 to unit 1

total volume= 23.91324 acre-ft
peak flow = 308.868 cfs

* Basin U

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .23 hours cn= 74

total volume= 4.827838 acre-ft
peak flow = 72.93187 cfs

* Total DP 13

Add the hydrographs in units 1 and 2 to unit 3

total volume= 28.74107 acre-ft
peak flow = 328.3785 cfs

Add the hydrographs in units 3 and 7 to unit 1

total volume= 127.9348 acre-ft
peak flow = 772.0808 cfs

* Route to DP 14

Route the hydrograph in unit 1 through reach 12 to unit 2

```
      total volume= 127.9348 acre-ft
      peak flow    = 768.2561 cfs

*  Basin V

Calculate the hydrograph for basin no. 0 to unit 1
      area= .19 sq. miles      tc= .35 hours      cn= 69

      total volume= 6.775018 acre-ft
      peak flow    = 82.65997 cfs

*  Total DP 14 (Basin Total)

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 134.7099 acre-ft
      peak flow    = 778.1176 cfs

End of computation              10:22:46
```

```
================================================================
                program  R U N O F F  version 2
================================================================
08-07-1987    13:28:02

Input file name: a:6382hist.dat
MONUMENT BRANCH MASTER DRAINAGE STUDY - PRESENT CONDITIONS
10-Year 2-Hour Storm :   Project No 46382

Time increment .02 hrs


Storm pattern no. 2
     time increment= .0833  hrs
          0.0000     0.0087     0.0346     0.0744     0.1436
          0.2647     0.4810     0.6021     0.6713     0.7249
          0.7682     0.8028     0.8374     0.8720     0.8893
          0.9066     0.9170     0.9273     0.9377     0.9481
          0.9585     0.9689     0.9792     0.9896     1.0000

Total rain depth 2 inches

*  Input data (El, Q, A) for X-Sect 1


Reach no. 1
           Elev          Q         Area
            ft          cfs        sqft
         6900.00         0.0         0.0
         6901.00       171.0        27.0
         6902.00       571.0        60.0
         6903.00      1182.0        99.0


*  Input data (El, Q, A) for X-Sect 2


Reach no. 2
           Elev          Q         Area
            ft          cfs        sqft
         6885.00         0.0         0.0
         6886.00        10.0         2.0
         6887.00        24.0         4.0
         6888.00        67.0        12.0
         6889.00       255.0        32.0
         6890.00       664.0        64.0


*  Input data (El, Q, A) for X-Sect 3


Reach no. 3
           Elev          Q         Area
            ft          cfs        sqft
         6820.00         0.0         0.0
         6821.00       411.0        64.0
         6822.00      1338.0       136.0
         6823.00      2701.0       216.0


*  Input data (El, Q, A) for X-Sect 4
```

Reach no. 4

Elev	Q	Area
ft	cfs	sqft
6770.00	0.0	0.0
6770.50	46.0	12.0
6771.00	150.0	25.0
6772.00	496.0	54.0
6773.00	1020.0	89.0
6774.00	1728.0	128.0

* Input data (El, Q, A) for X-Sect 5

Reach no. 5

Elev	Q	Area
ft	cfs	sqft
6678.00	0.0	0.0
6679.00	408.0	63.0
6680.00	1316.0	132.0
6681.00	2630.0	206.0

* Input data (El, Q, A) for X-Sect 6

Reach no. 6

Elev	Q	Area
ft	cfs	sqft
6916.00	0.0	0.0
6916.50	10.0	4.0
6917.00	61.0	14.0
6918.00	366.0	54.0
6919.00	1062.0	120.0

* Input data (El, Q, A) for X-Sect 7

Reach no. 7

Elev	Q	Area
ft	cfs	sqft
6836.00	0.0	0.0
6837.00	71.0	18.0
6838.00	217.0	34.0
6839.00	624.0	75.0
6840.00	1325.0	132.0
6841.00	2383.0	205.0

* Input data (El, Q, A) for X-Sect 8

Reach no. 8

Elev	Q	Area
ft	cfs	sqft
6681.00	0.0	0.0
6682.00	213.0	35.0
6683.00	719.0	78.0
6684.00	1510.0	131.0

* Input data (El, Q, A) for X-Sect 9

Reach no. 9

Elev ft	Q cfs	Area sqft
6630.00	0.0	0.0
6630.50	94.0	28.0
6631.00	332.0	67.0
6631.50	723.0	116.0
6632.00	1289.0	177.0
6632.50	2048.0	248.0
6633.00	3020.0	330.0

* Input data (El, Q, A) for X-Sect 11

Reach no. 11

Elev ft	Q cfs	Area sqft
6691.00	0.0	0.0
6692.00	16.0	4.0
6693.00	85.0	12.0
6694.00	232.0	26.0
6695.00	706.0	64.0

* Input data (El, Q, A) for X-Sect 12

Reach no. 12

Elev ft	Q cfs	Area sqft
6558.00	0.0	0.0
6558.50	10.0	3.0
6559.00	37.0	8.0
6560.00	165.0	24.0
6561.00	419.0	48.0
6562.00	828.0	80.0
6563.00	1184.0	124.0
6564.00	1809.0	213.0
6565.00	2420.0	311.0
6566.00	3748.0	412.0
6567.00	5621.0	515.0

* Input data (El, Q, A) for X-Sect 13

Reach no. 13

Elev ft	Q cfs	Area sqft
6600.00	0.0	0.0
6601.00	30.0	4.0
6602.00	105.0	10.0
6603.00	231.0	18.0
6604.00	416.0	28.0
6605.00	668.0	40.0

```
*  Basin B1

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles      tc= .28 hours      cn= 69

     total volume= 2.30582 acre-ft
     peak flow    = 28.20539 cfs

*  Route B1 thru  B2

Route the hydrograph in unit 1 through reach 1 to unit 2

     total volume= 2.30582 acre-ft
     peak flow    = 28.15427 cfs

*  Basin B2

Calculate the hydrograph for basin no. 0 to unit 1
     area= .09 sq. miles      tc= .12 hours      cn= 69

     total volume= 1.037679 acre-ft
     peak flow    = 14.13278 cfs

*  Total below B2

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 3.343499 acre-ft
     peak flow    = 41.06986 cfs

*  Route to confluence in G2

Route the hydrograph in unit 3 through reach 1 to unit 4

     total volume= 3.343499 acre-ft
     peak flow    = 41.04672 cfs

*  Basin A & G1

Calculate the hydrograph for basin no. 0 to unit 1
     area= .2 sq. miles      tc= .22 hours      cn= 69.5

     total volume= 2.430362 acre-ft
     peak flow    = 31.25784 cfs

*  Print hydrograph for basin AG1

*  Route to confluence in G2
```

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 2.430361 acre-ft
peak flow = 31.19249 cfs

* Combine at confluence in G2

Add the hydrographs in units 2 and 4 to unit 1

total volume= 5.773859 acre-ft
peak flow = 70.48013 cfs

* Route thru G2

Route the hydrograph in unit 1 through reach 1 to unit 2

total volume= 5.773859 acre-ft
peak flow = 70.39727 cfs

* Basin G2

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .27 hours cn= 69

total volume= 2.30586 acre-ft
peak flow = 28.40856 cfs

* Total below G2

Add the hydrographs in units 1 and 2 to unit 3

total volume= 8.07972 acre-ft
peak flow = 97.68957 cfs

* Basin E

Calculate the hydrograph for basin no. 0 to unit 1
area= .2 sq. miles tc= .33 hours cn= 70

total volume= 2.558253 acre-ft
peak flow = 30.74719 cfs

* Route thru F

Route the hydrograph in unit 1 through reach 2 to unit 2

total volume= 2.558253 acre-ft
peak flow = 30.709 cfs

```
*  Basin F

Calculate the hydrograph for basin no. 0 to unit 1
     area= .11 sq. miles      tc= .33 hours      cn= 69

     total volume= 1.268226 acre-ft
     peak flow   = 15.20563 cfs

*  Total below F

Add the hydrographs in units 1  and 2  to unit 4

     total volume= 3.826479 acre-ft
     peak flow   = 45.89385 cfs

*  Total D.P. #1

Add the hydrographs in units 3  and 4  to unit 1

     total volume= 11.9062 acre-ft
     peak flow   = 143.511 cfs

*  Route to below J1

Route the hydrograph in unit 1 through reach 3 to unit 2

     total volume= 11.90619 acre-ft
     peak flow   = 143.3871 cfs

*  Basin J

Calculate the hydrograph for basin no. 0 to unit 1
     area= .25 sq. miles      tc= .33 hours      cn= 69

     total volume= 2.882331 acre-ft
     peak flow   = 34.55824 cfs

*  Combine to below J

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 14.78853 acre-ft
     peak flow   = 176.3572 cfs

*  Basin I

Calculate the hydrograph for basin no. 0 to unit 1
```

```
Calculate the hydrograph for basin no. 0 to unit 2
     area= .06 sq. miles      tc= .18 hours      cn= 69

     total volume= .6917563 acre-ft
     peak flow    = 9.071014 cfs


*  Combine N2 to DP 3


Add the hydrographs in units 1  and 2  to unit 3

     total volume= 17.74218 acre-ft
     peak flow    = 207.9353 cfs


*  Basin N1


Calculate the hydrograph for basin no. 0 to unit 1
     area= .11 sq. miles      tc= .27 hours      cn= 69

     total volume= 1.268223 acre-ft
     peak flow    = 15.62471 cfs


*  Combine N1 to DP 3


Add the hydrographs in units 1  and 3  to unit 2

     total volume= 19.01041 acre-ft
     peak flow    = 220.1101 cfs


*  Route total DP 3 to DP 7 - North Branch


Route the hydrograph in unit 2 through reach 5 to unit 1

     total volume= 19.01041 acre-ft
     peak flow    = 219.2601 cfs


*  Basin R


Calculate the hydrograph for basin no. 0 to unit 2
     area= .08 sq. miles      tc= .23 hours      cn= 69

     total volume= .9223157 acre-ft
     peak flow    = 11.68395 cfs


*  Total North Branch DP 7


Add the hydrographs in units 1  and 2  to unit 7

     total volume= 19.93272 acre-ft
```

```
      peak flow    = 224.8651 cfs

*  Basin C1

Calculate the hydrograph for basin no. 0 to unit 1
      area= .19 sq. miles      tc= .27 hours      cn= 69

      total volume= 2.190568 acre-ft
      peak flow    = 26.98813 cfs

*  Route to DP 5

Route the hydrograph in unit 1 through reach 7 to unit 2

      total volume= 2.190568 acre-ft
      peak flow    = 26.84919 cfs

*  Basin C2

Calculate the hydrograph for basin no. 0 to unit 1
      area= .1 sq. miles      tc= .32 hours      cn= 69

      total volume= 1.152853 acre-ft
      peak flow    = 13.87421 cfs

*  Combine C1 & C2 at DP 5

Add the hydrographs in units 1  and 2  to unit 3

      total volume= 3.343421 acre-ft
      peak flow    = 40.7234 cfs

*  Basin D

Calculate the hydrograph for basin no. 0 to unit 1
      area= .17 sq. miles      tc= .27 hours      cn= 69

      total volume= 1.959982 acre-ft
      peak flow    = 24.14728 cfs

*  Total at DP 5

Add the hydrographs in units 1  and 3  to unit 2

      total volume= 5.303404 acre-ft
      peak flow    = 64.54132 cfs

*  Route to DP 6A
```

Route the hydrograph in unit 2 through reach 7 to unit 3

total volume= 5.303401 acre-ft
peak flow = 64.3359 cfs

* Basin H

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .26 hours cn= 69

total volume= 1.152954 acre-ft
peak flow = 14.30634 cfs

* Route H to DP 6A

Route the hydrograph in unit 1 through reach 6 to unit 2

total volume= 1.152954 acre-ft
peak flow = 14.20207 cfs

* Combine DP 5 & H DP 6A

Add the hydrographs in units 2 and 3 to unit 1

total volume= 6.456356 acre-ft
peak flow = 78.19585 cfs

* Basin 01

Calculate the hydrograph for basin no. 0 to unit 2
area= .1 sq. miles tc= .19 hours cn= 69

total volume= 1.152898 acre-ft
peak flow = 15.027 cfs

* Total at DP 6A

Add the hydrographs in units 1 and 2 to unit 3

total volume= 7.609253 acre-ft
peak flow = 90.03132 cfs

* Route to DP 6

Route the hydrograph in unit 3 through reach 7 to unit 2

total volume= 7.609257 acre-ft
peak flow = 89.27563 cfs

* Basin 02

Calculate the hydrograph for basin no. 0 to unit 1
area= .17 sq. miles tc= .23 hours cn= 69

total volume= 1.959921 acre-ft
peak flow = 24.8284 cfs

* Total at DP 6

Add the hydrographs in units 1 and 2 to unit 3

total volume= 9.569171 acre-ft
peak flow = 101.7534 cfs

* Route to DP 7

Route the hydrograph in unit 3 through reach 8 to unit 2

total volume= 9.569176 acre-ft
peak flow = 101.4093 cfs

* Basin S

Calculate the hydrograph for basin no. 0 to unit 1
area= .1 sq. miles tc= .18 hours cn= 69

total volume= 1.152927 acre-ft
peak flow = 15.11836 cfs

* Total at DP 7 - South Branch

Add the hydrographs in units 1 and 2 to unit 3

total volume= 10.7221 acre-ft
peak flow = 106.7377 cfs

* Total at DP 7

Add the hydrographs in units 3 and 7 to unit 6

total volume= 30.65483 acre-ft
peak flow = 327.8216 cfs

* Route to DP 8A

Route the hydrograph in unit 6 through reach 9 to unit 7

```
     total volume= 30.65483 acre-ft
     peak flow   = 327.413 cfs


*  Basin T2


Calculate the hydrograph for basin no. 0 to unit 1
     area= .02 sq. miles      tc= .08 hours      cn= 69

     total volume= .230563 acre-ft
     peak flow   = 3.230854 cfs


*  Basin T3


Calculate the hydrograph for basin no. 0 to unit 2
     area= .07 sq. miles      tc= .14 hours      cn= 69

     total volume= .8068342 acre-ft
     peak flow   = 10.86893 cfs


*  Combine T2 & T3


Add the hydrographs in units 1  and 2  to unit 3

     total volume= 1.037397 acre-ft
     peak flow   = 14.02903 cfs


*  Total at DP 8A


Add the hydrographs in units 3  and 7  to unit 6

     total volume= 31.69222 acre-ft
     peak flow   = 332.0933 cfs


*  Route to DP 8


Route the hydrograph in unit 6 through reach 9 to unit 7

     total volume= 31.69223 acre-ft
     peak flow   = 331.6975 cfs


*  Basin T1


Calculate the hydrograph for basin no. 0 to unit 1
     area= .06 sq. miles      tc= .17 hours      cn= 69

     total volume= .6917385 acre-ft
     peak flow   = 9.139708 cfs


*  Total at DP 8
```

Add the hydrographs in units 1 and 7 to unit 6

total volume= 32.38395 acre-ft
peak flow = 334.8507 cfs

* Route DP 8 to DP 13

Route the hydrograph in unit 6 through reach 13 to unit 7

total volume= 32.38397 acre-ft
peak flow = 334.8496 cfs

* Basin L1

Calculate the hydrograph for basin no. 0 to unit 1
area= .06 sq. miles tc= .13 hours cn= 70

total volume= .767606 acre-ft
peak flow = 10.63347 cfs

* Basin L2

Calculate the hydrograph for basin no. 0 to unit 2
area= .02 sq. miles tc= .08 hours cn= 69

total volume= .230563 acre-ft
peak flow = 3.230854 cfs

* Total at DP 9

Add the hydrographs in units 1 and 2 to unit 3

total volume= .9981691 acre-ft
peak flow = 13.79399 cfs

* Route to DP 10

Route the hydrograph in unit 3 through reach 11 to unit 1

total volume= .9981689 acre-ft
peak flow = 13.69191 cfs

* Basin M1

Calculate the hydrograph for basin no. 0 to unit 2
area= .05 sq. miles tc= .13 hours cn= 69

total volume= .576593 acre-ft

```
     peak flow    = 7.809487 cfs

*  Basin M2

Calculate the hydrograph for basin no. 0 to unit 3
     area= .13 sq. miles      tc= .22 hours      cn= 69

     total volume= 1.498889 acre-ft
     peak flow    = 19.1229 cfs

Add the hydrographs in units 2  and 3  to unit 4

     total volume= 2.075483 acre-ft
     peak flow    = 26.62904 cfs

*  Total DP 10

Add the hydrographs in units 1  and 4  to unit 2

     total volume= 3.073652 acre-ft
     peak flow    = 40.10654 cfs

*  Route DP 10 to DP 11A

Route the hydrograph in unit 2 through reach 11 to unit 1

     total volume= 3.073651 acre-ft
     peak flow    = 39.79109 cfs

*  Basin Q2

Calculate the hydrograph for basin no. 0 to unit 2
     area= .27 sq. miles      tc= .23 hours      cn= 69

     total volume= 3.112815 acre-ft
     peak flow    = 39.43333 cfs

*  Total DP 11A

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 6.186465 acre-ft
     peak flow    = 77.49067 cfs

*  Route DP 11A to DP 11

Route the hydrograph in unit 3 through reach 11 to unit 1

     total volume= 6.186468 acre-ft
```

peak flow = 77.48541 cfs

* Basin Q1

Calculate the hydrograph for basin no. 0 to unit 2
area= .03 sq. miles tc= .11 hours cn= 69

total volume= .3458733 acre-ft
peak flow = 4.722916 cfs

* Total DP 11

Add the hydrographs in units 1 and 2 to unit 3

total volume= 6.532344 acre-ft
peak flow = 81.8464 cfs

* Total DP 12A

* Basin P2

Calculate the hydrograph for basin no. 0 to unit 1
area= .08 sq. miles tc= .21 hours cn= 69

total volume= .9223342 acre-ft
peak flow = 11.8492 cfs

* Route to DP 12

Route the hydrograph in unit 1 through reach 11 to unit 2

total volume= .9223343 acre-ft
peak flow = 11.8175 cfs

* Basin P1

Calculate the hydrograph for basin no. 0 to unit 1
area= .03 sq. miles tc= .08 hours cn= 69

total volume= .3458446 acre-ft
peak flow = 4.846281 cfs

* Total DP 12

Add the hydrographs in units 1 and 2 to unit 4

total volume= 1.268179 acre-ft
peak flow = 15.96351 cfs

```
*  Route DP 12 to DP 11

Route the hydrograph in unit 4 through reach 13 to unit 1

     total volume= 1.268178 acre-ft
     peak flow   = 15.92695 cfs

*  Total below DP 11

Add the hydrographs in units 1  and 3  to unit 2

     total volume= 7.800519 acre-ft
     peak flow   = 97.45802 cfs

*  Route to DP 13

Route the hydrograph in unit 2 through reach 13 to unit 1

     total volume= 7.80052 acre-ft
     peak flow   = 97.44715 cfs

*  Basin U

Calculate the hydrograph for basin no. 0 to unit 2
     area= .1 sq. miles     tc= .23 hours     cn= 74

     total volume= 1.859713 acre-ft
     peak flow   = 26.15726 cfs

*  Total DP 13

Add the hydrographs in units 1  and 2  to unit 3

     total volume= 9.660232 acre-ft
     peak flow   = 118.0489 cfs

Add the hydrographs in units 3  and 7  to unit 1

     total volume= 42.0442 acre-ft
     peak flow   = 393.7196 cfs

*  Route to DP 14

Route the hydrograph in unit 1 through reach 12 to unit 2

     total volume= 42.0442 acre-ft
     peak flow   = 393.4313 cfs
```

* Basin V

Calculate the hydrograph for basin no. 0 to unit 1
area= .19 sq. miles tc= .35 hours cn= 69

total volume= 2.19056 acre-ft
peak flow = 26.13601 cfs

* Total DP 14 (Basin Total)

Add the hydrographs in units 1 and 2 to unit 3

total volume= 44.23475 acre-ft
peak flow = 405.5121 cfs

End of computation 13:31:07