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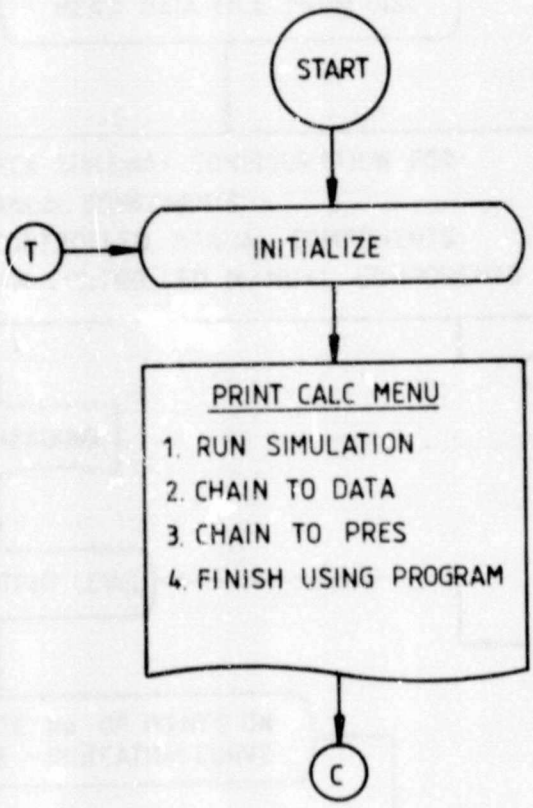
Option reservoir operation during floods

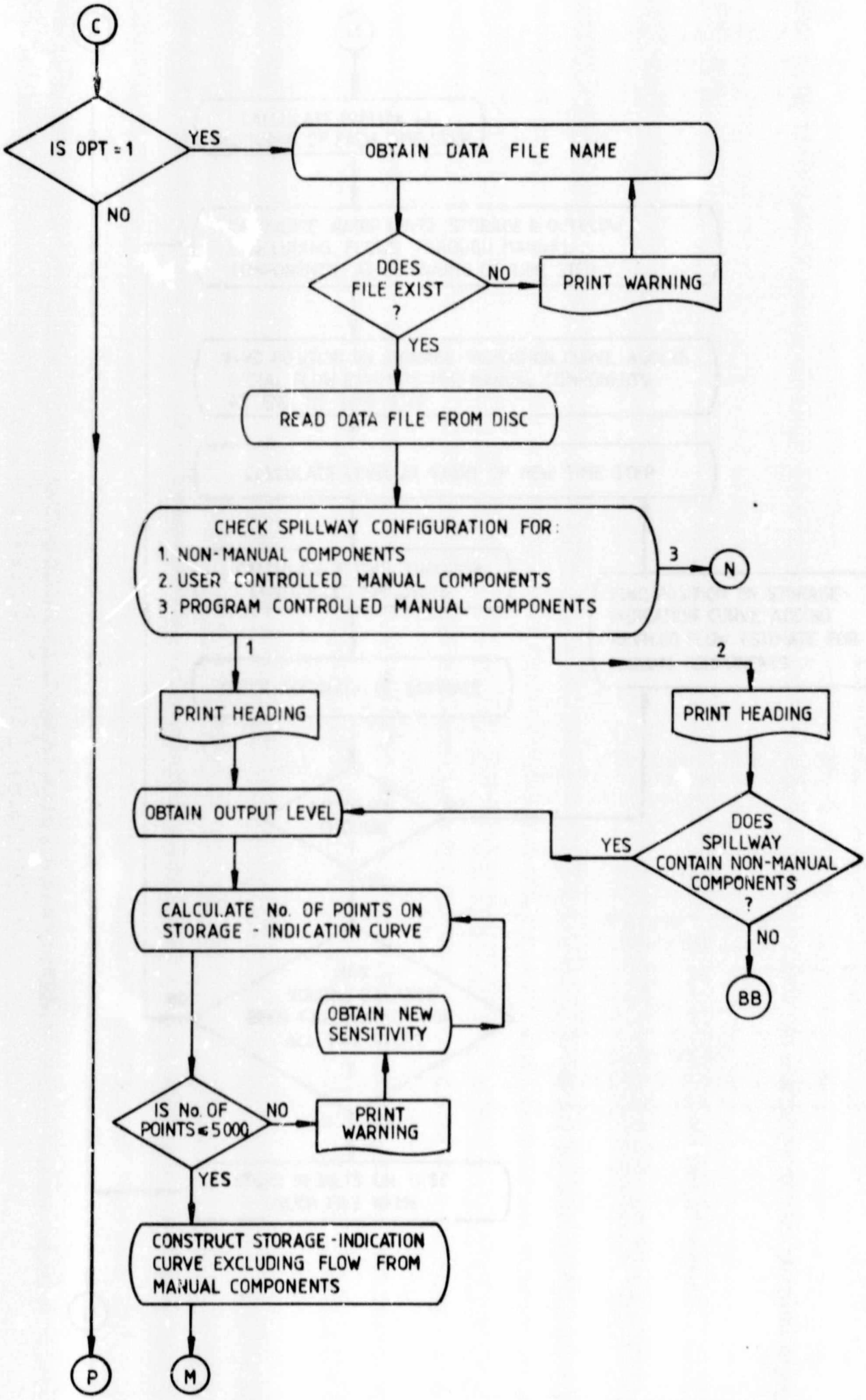
Furstenburg, Leon

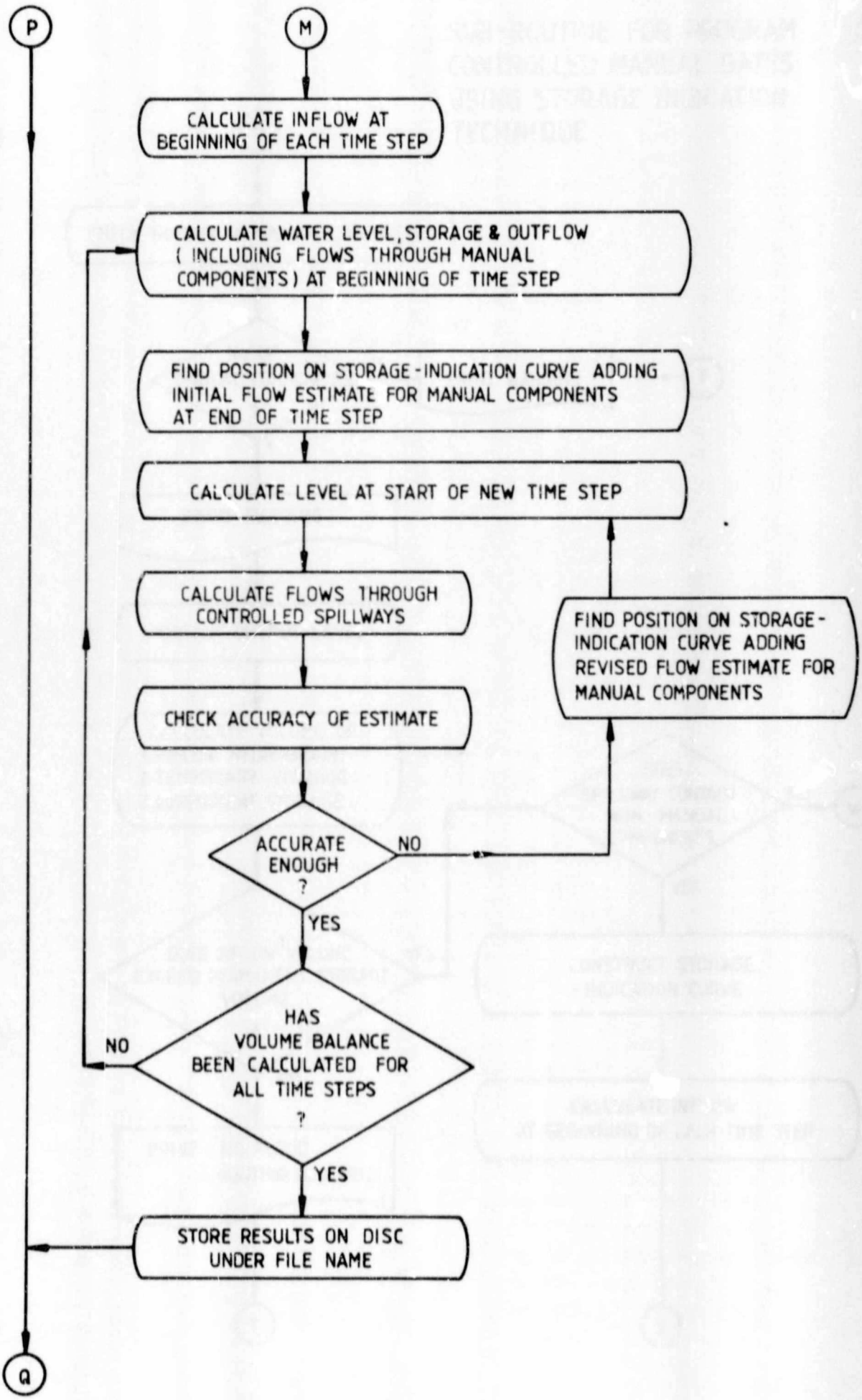
2015-01-26
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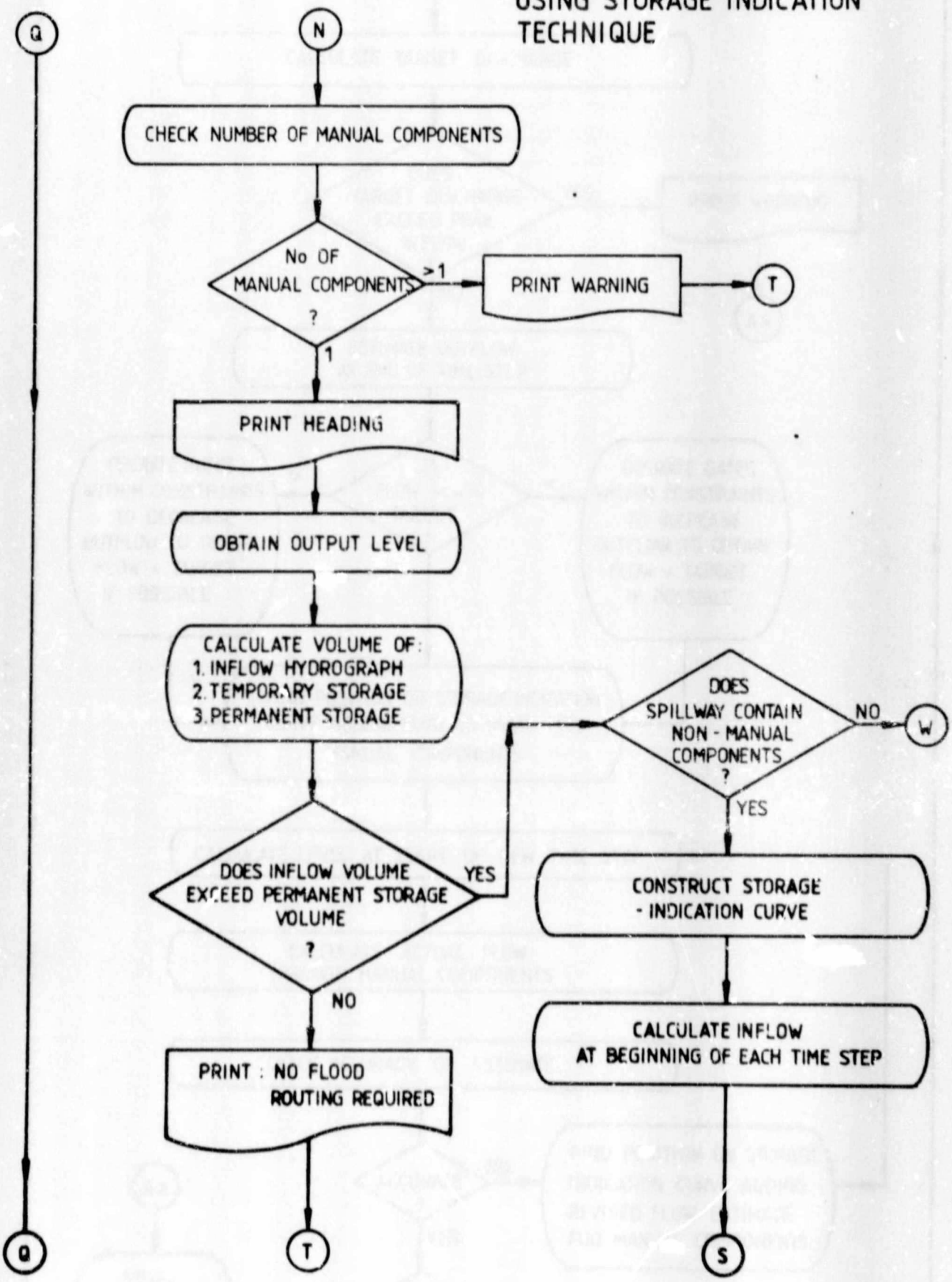
FLOW CHART FOR CALC PROGRAM BLOCK

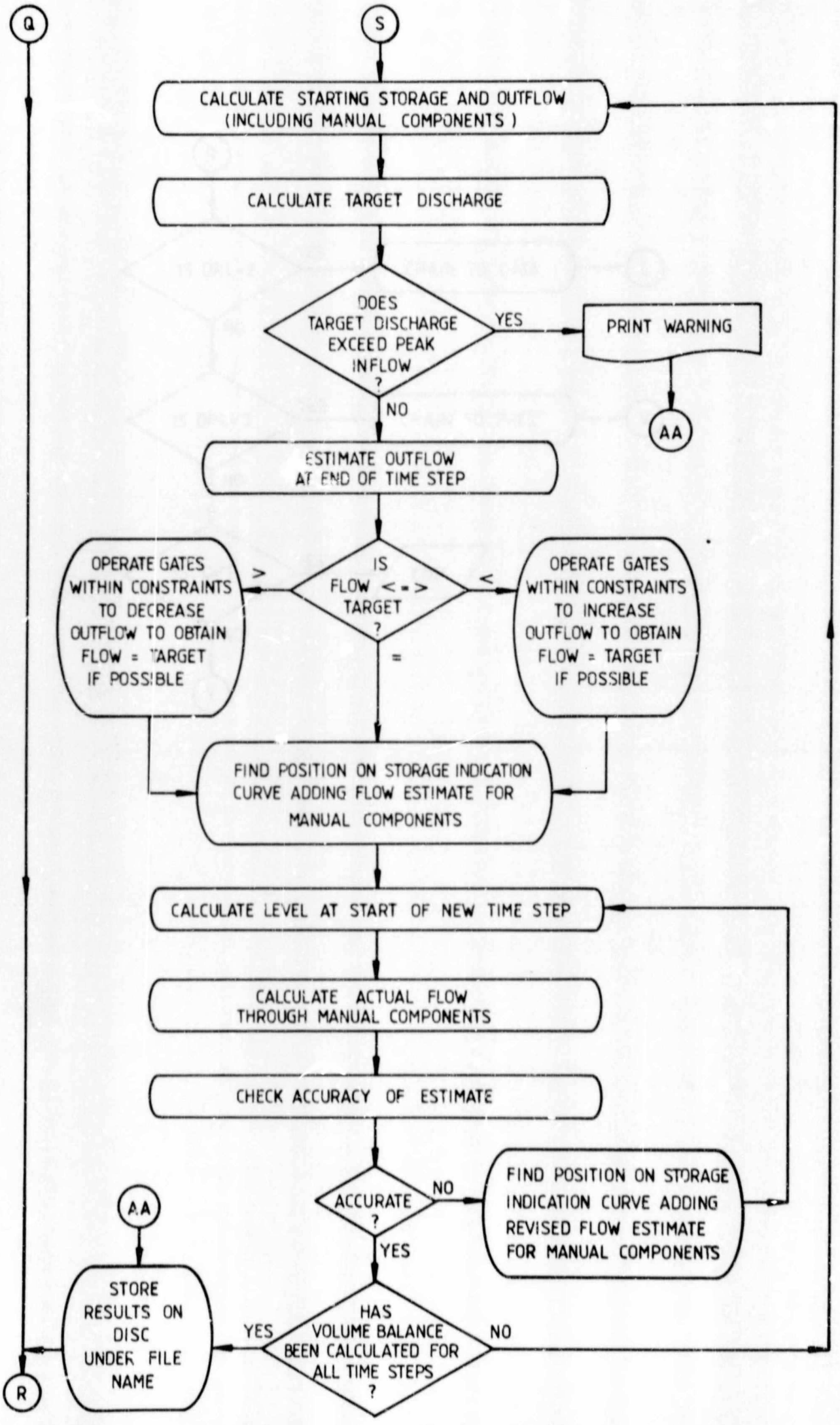


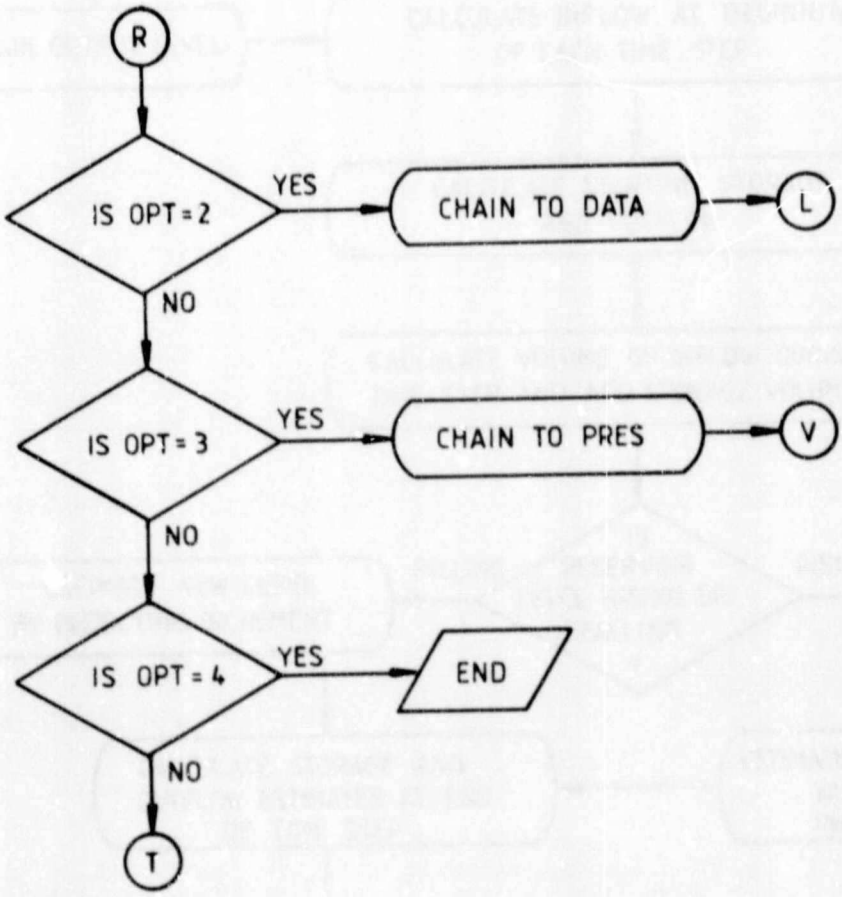

C
IS OPT = 1
YES
NO
OBTAIN DATA FILE NAME
DOES FILE EXIST ?
NO
PRINT WARNING
YES
READ DATA FILE FROM DISC
CHECK SPILLWAY CONFIGURATION FOR:
1. NON-MANUAL COMPONENTS
2. USER CONTROLLED MANUAL COMPONENTS
3. PROGRAM CONTROLLED MANUAL COMPONENTS
3
N
1
2
PRINT HEADING
PRINT HEADING
OBTAIN OUTPUT LEVEL
DOES SPILLWAY CONTAIN NON-MANUAL COMPONENTS ?
YES
NO
BB
CALCULATE No. OF POINTS ON STORAGE - INDICATION CURVE
OBTAIN NEW SENSITIVITY
IS No. OF POINTS ≤ 5000
NO
PRINT WARNING
YES
CONSTRUCT STORAGE - INDICATION CURVE EXCLUDING FLOW FROM MANUAL COMPONENTS
P
M


P
M
CALCULATE INFLOW AT BEGINNING OF EACH TIME STEP
CALCULATE WATER LEVEL, STORAGE & OUTFLOW (INCLUDING FLOWS THROUGH MANUAL COMPONENTS) AT BEGINNING OF TIME STEP
FIND POSITION ON STORAGE-INDICATION CURVE ADDING INITIAL FLOW ESTIMATE FOR MANUAL COMPONENTS AT END OF TIME STEP
CALCULATE LEVEL AT START OF NEW TIME STEP
CALCULATE FLOWS THROUGH CONTROLLED SPILLWAYS
CHECK ACCURACY OF ESTIMATE
FIND POSITION ON STORAGE-INDICATION CURVE ADDING REVISED FLOW ESTIMATE FOR MANUAL COMPONENTS
ACCURATE ENOUGH ?
NO
YES
HAS VOLUME BALANCE BEEN CALCULATED FOR ALL TIME STEPS ?
NO
YES
STORE RESULTS ON DISC UNDER FILE NAME
Q

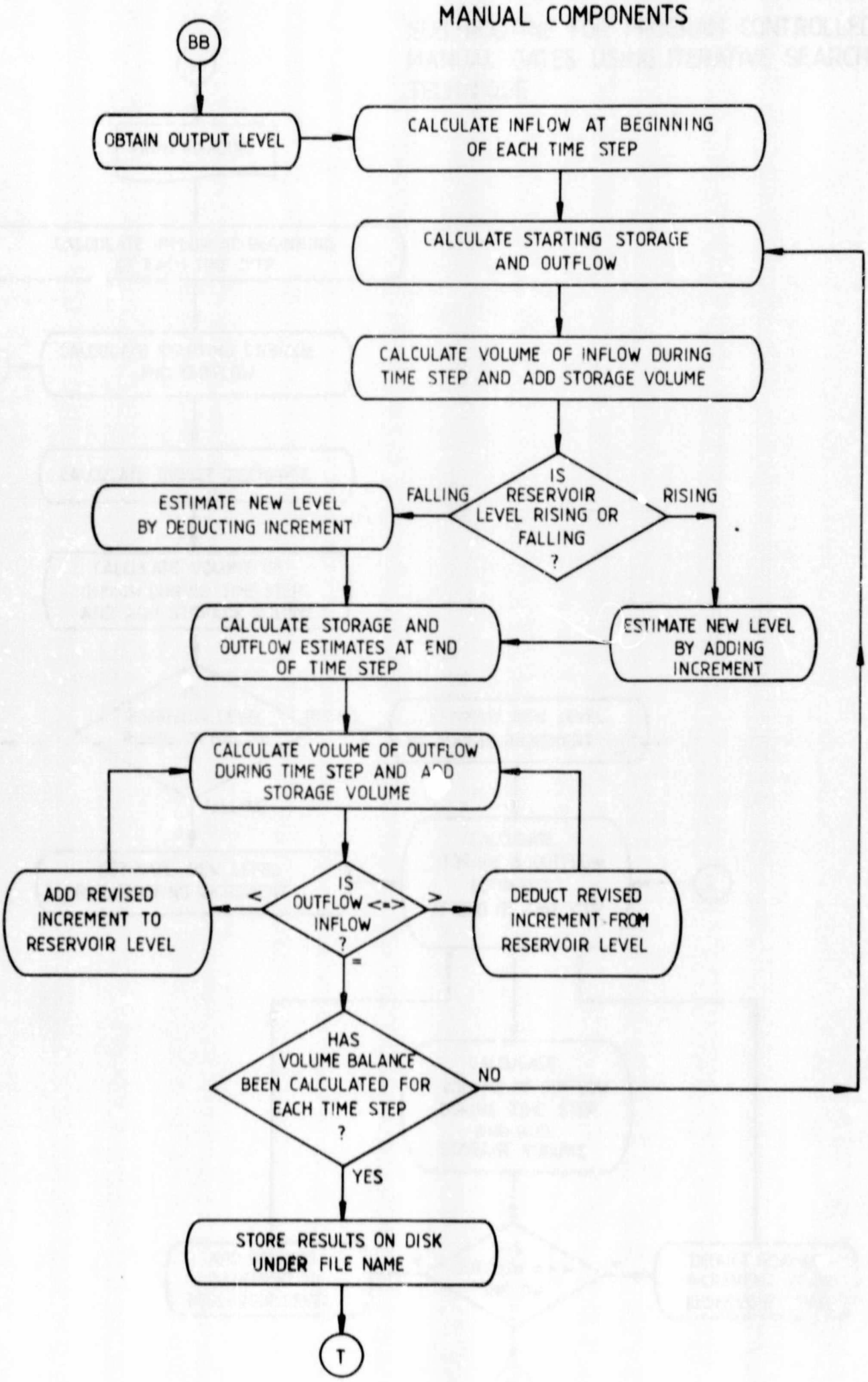
SUB-ROUTINE FOR PROGRAM CONTROLLED MANUAL GATES USING STORAGE INDICATION TECHNIQUE



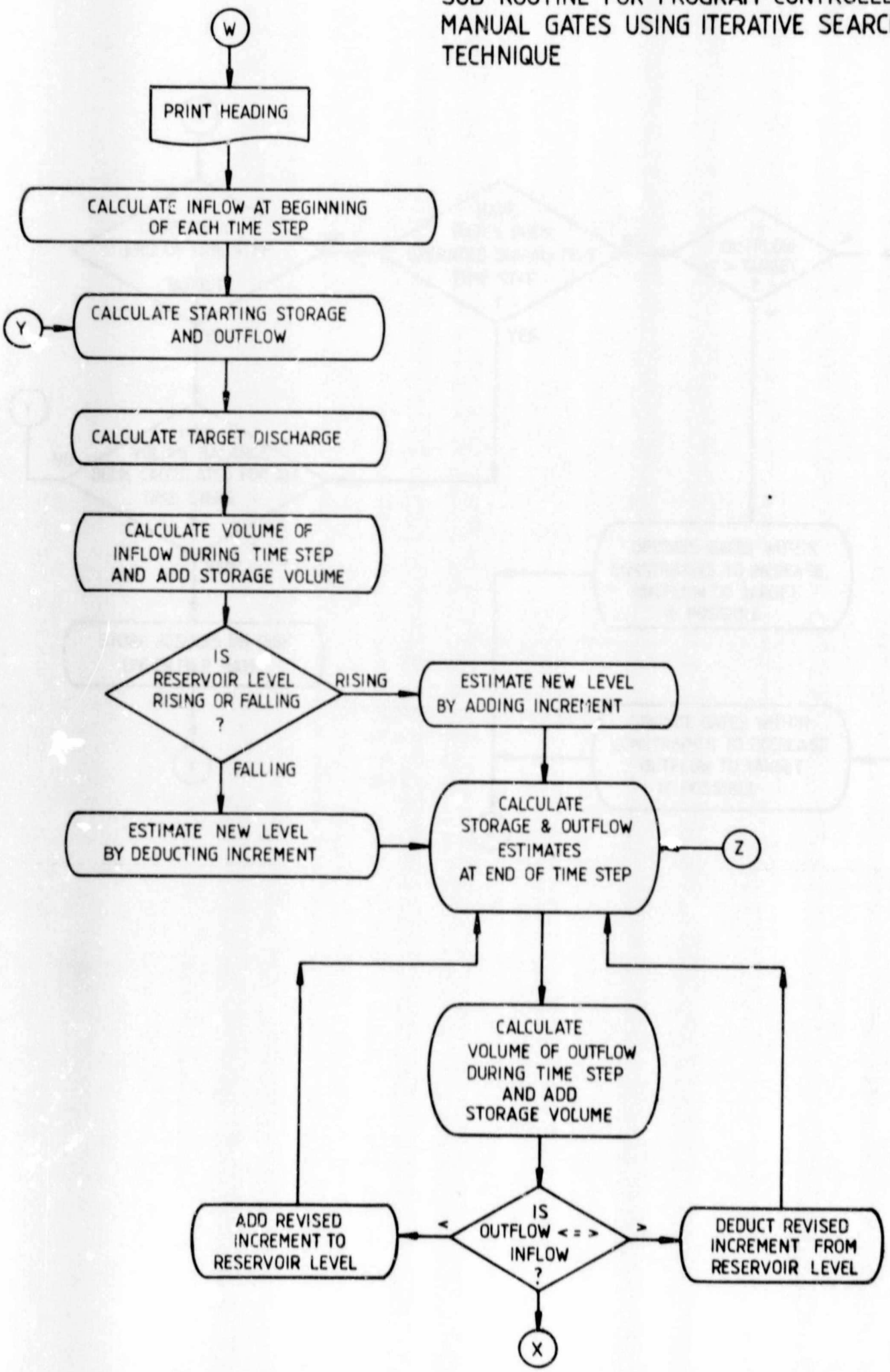

Q
S
CALCULATE STARTING STORAGE AND OUTFLOW (INCLUDING MANUAL COMPONENTS)
CALCULATE TARGET DISCHARGE
DOES TARGET DISCHARGE EXCEED PEAK INFLOW ?
YES
PRINT WARNING
AA
NO
ESTIMATE OUTFLOW AT END OF TIME STEP
IS FLOW <=> TARGET ?
>
OPERATE GATES WITHIN CONSTRAINTS TO DECREASE OUTFLOW TO OBTAIN FLOW = TARGET IF POSSIBLE
=
<
OPERATE GATES WITHIN CONSTRAINTS TO INCREASE OUTFLOW TO OBTAIN FLOW = TARGET IF POSSIBLE
FIND POSITION ON STORAGE INDICATION CURVE ADDING FLOW ESTIMATE FOR MANUAL COMPONENTS
CALCULATE LEVEL AT START OF NEW TIME STEP
CALCULATE ACTUAL FLOW THROUGH MANUAL COMPONENTS
CHECK ACCURACY OF ESTIMATE
ACCURATE ?
NO
FIND POSITION ON STORAGE INDICATION CURVE ADDING REVISED FLOW ESTIMATE FOR MANUAL COMPONENTS
YES
AA
HAS VOLUME BALANCE BEEN CALCULATED FOR ALL TIME STEPS ?
YES
NO
STORE RESULTS ON DISC UNDER FILE NAME
R

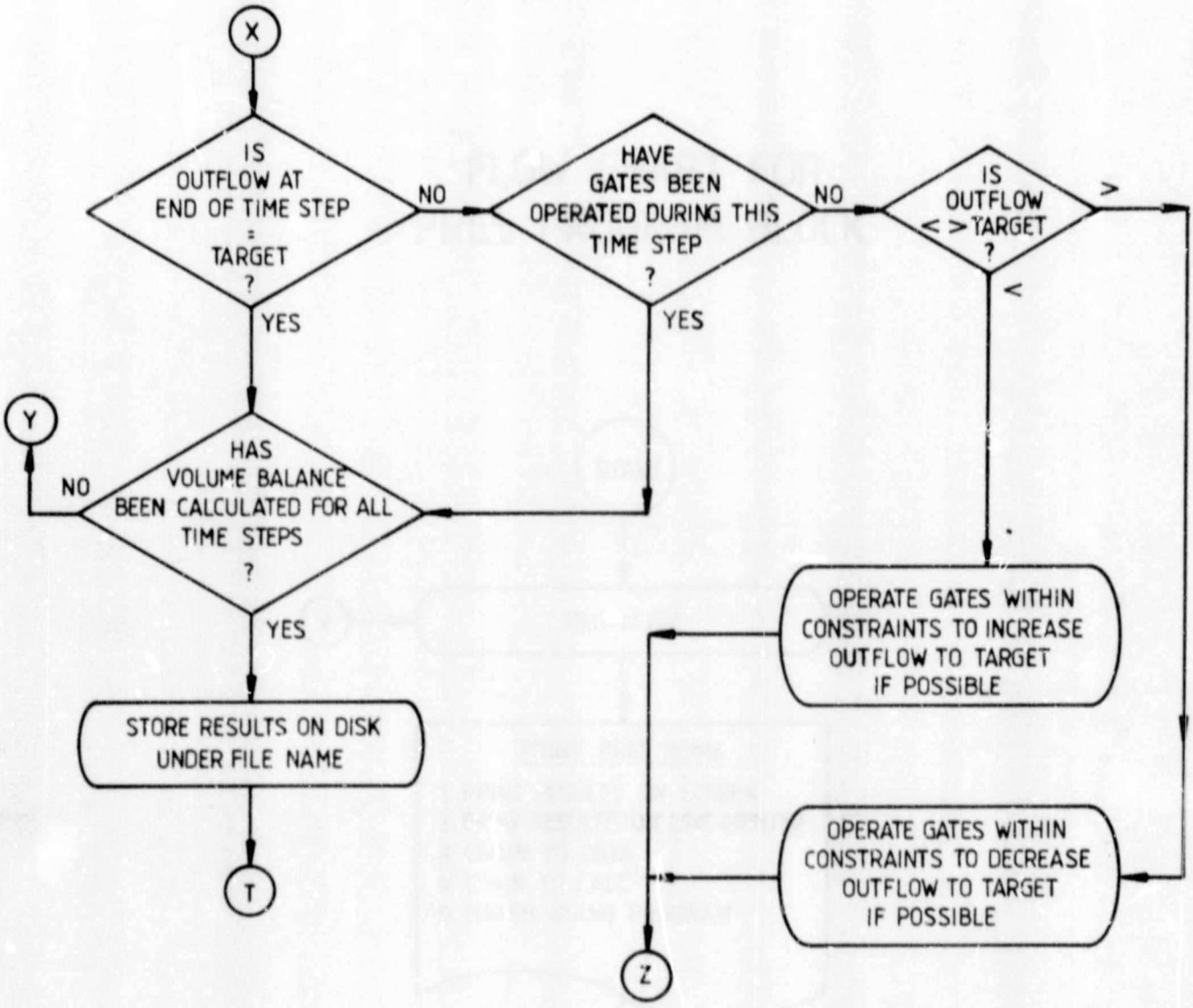

R
IS OPT = 2
YES
CHAIN TO DATA
L
NO
IS OPT = 3
YES
CHAIN TO PRES
V
NO
IS OPT = 4
YES
END
NO
T

SUB-ROUTINE FOR USER CONTROLLED MANUAL COMPONENTS

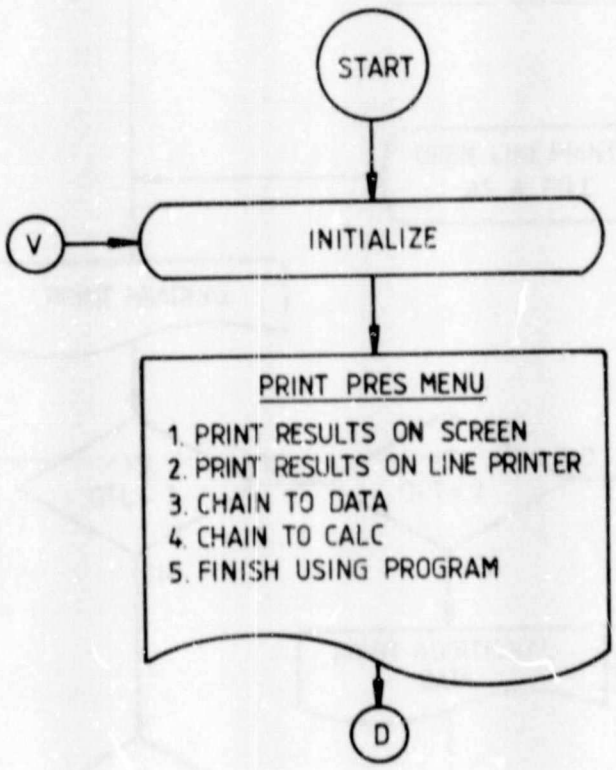


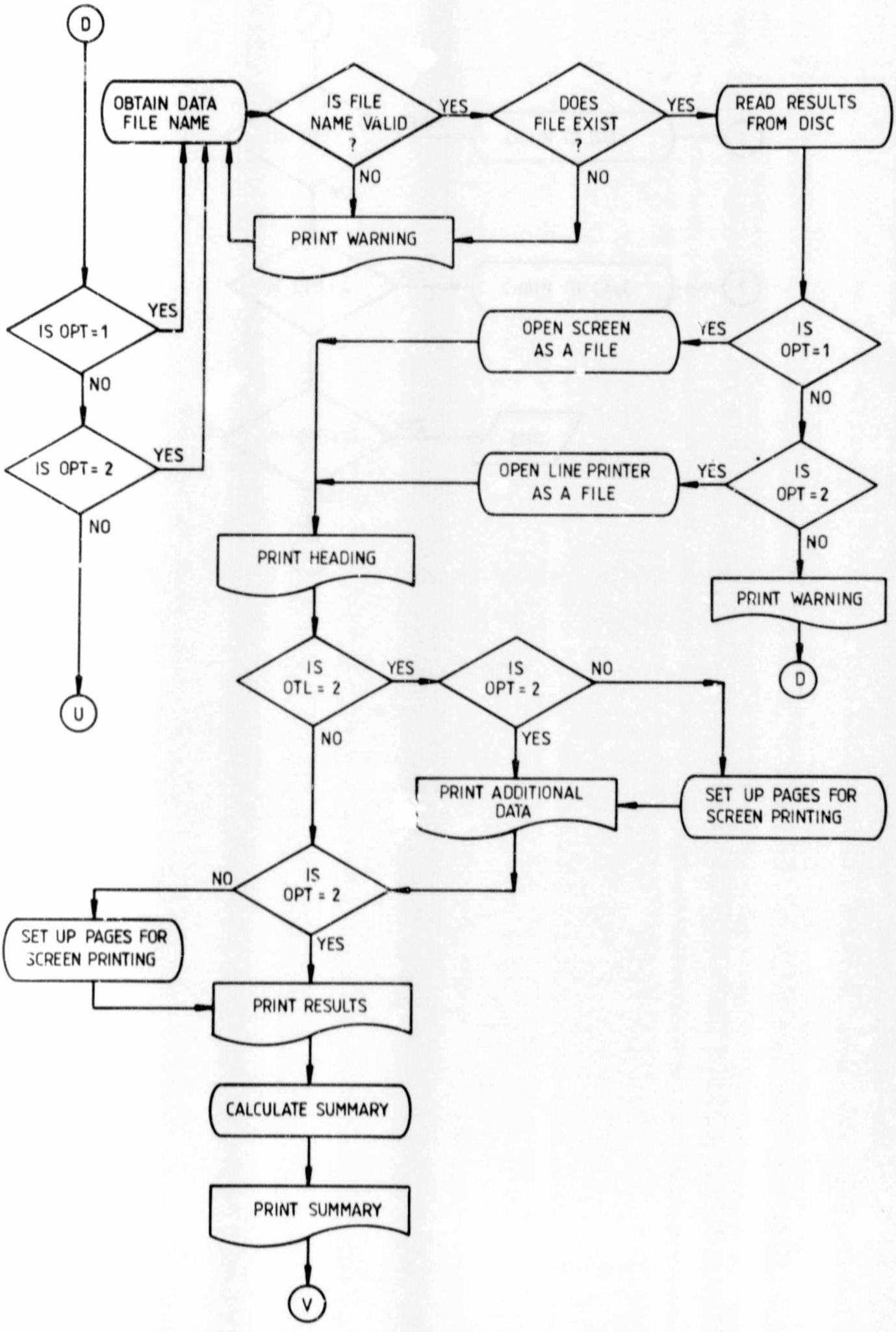
SUB-ROUTINE FOR PROGRAM CONTROLLED MANUAL GATES USING ITERATIVE SEARCH TECHNIQUE

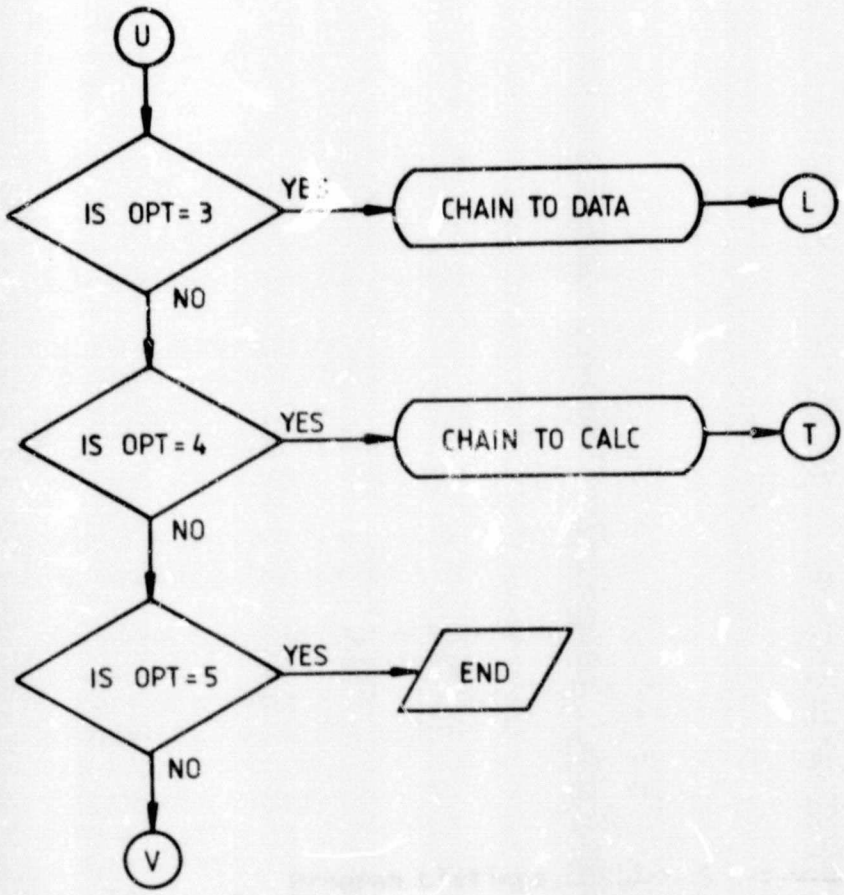



X
IS OUTFLOW AT END OF TIME STEP = TARGET ?
NO
YES
HAVE GATES BEEN OPERATED DURING THIS TIME STEP ?
NO
YES
IS OUTFLOW < > TARGET ?
>
<
Y
NO
HAS VOLUME BALANCE BEEN CALCULATED FOR ALL TIME STEPS ?
YES
STORE RESULTS ON DISK UNDER FILE NAME
T
OPERATE GATES WITHIN CONSTRAINTS TO INCREASE OUTFLOW TO TARGET IF POSSIBLE
OPERATE GATES WITHIN CONSTRAINTS TO DECREASE OUTFLOW TO TARGET IF POSSIBLE
Z

FLOW CHART FOR PRES PROGRAM BLOCK




D
OBTAIN DATA FILE NAME
IS FILE NAME VALID ?
YES
NO
DOES FILE EXIST ?
YES
NO
READ RESULTS FROM DISC
PRINT WARNING
IS OPT=1
YES
NO
IS OPT=2
YES
NO
U
OPEN SCREEN AS A FILE
YES
IS OPT=1
NO
OPEN LINE PRINTER AS A FILE
YES
IS OPT=2
NO
PRINT WARNING
D
PRINT HEADING
IS OTL=2
YES
NO
IS OPT=2
NO
YES
PRINT ADDITIONAL DATA
SET UP PAGES FOR SCREEN PRINTING
IS OPT=2
NO
YES
SET UP PAGES FOR SCREEN PRINTING
PRINT RESULTS
CALCULATE SUMMARY
PRINT SUMMARY
V


U
IS OPT = 3
YES
CHAIN TO DATA
L
NO
IS OPT = 4
YES
CHAIN TO CALC
T
NO
IS OPT = 5
YES
END
NO
V

Appendix D

Program Listings

LISTING FOR DATA PROGRAM BLOCK

```
10 CLEAR:CLS
20 ';GENERAL DEFINITIONS ----------------------------------------------------
30 A$="BOX CULVERTS":B$="FREE OVERFLOW WIER"
40 C$="AUTOMATICALLY CONTROLLED OVERFLOW WEIR"
50 D$="MANUALLY CONTROLLED OVERFLOW WIER"
60 E$="MANUALLY CONTROLLED HIGH PRESSURE OUTLET"
70 F$="FUSEPLUG EMERGENCY SPILLWAY"
80 G$="USER DEFINED SPILLWAY"
90 H$="PLEASE ENTER CORRECT DATA DISK IN DRIVE A"
100 I$="PLEASE REVISE SENSITIVITY AS MODELLING MATRIX TOO LARGE"
110 J$="USER DEFINED SPILLWAY CAPACITY EXCEEDED"
120 K$="JOB ABANDONED****"
130 L$="**********************************************************************
********"
140 M$="RESERVOIR LEVEL EXCEEDS STORAGE/ELEVATION DATA"
150 N$="RESERVOIR LEVEL EXCEEDS MAXIMUM ALLOWABLE LEVEL"
160 O$="STORAGE-INDICATION CURVE EXCEEDED"
170 P$="DATA SET INCONSISTENT"
180 ';PROGRAM HEADING ------------------------------------------------------
190 PRINT L$:PRINT
200 PRINT "          FLOOD ROUTING THROUGH DAM WITH MULTIPLE SPILLWAY SYSTEM"
210 PRINT: PRINT "          L. FURSTENBURG  (011-683-1665)
 1985"
220 PRINT:PRINT"          DATA MANIPULATION BLOCK":PRINT:PRINT L$:PRINT
230 PRINT"          THE FOLLOWING OPTIONS ARE PROVIDED:-":PRINT
240 PRINT"               1. ENTER NEW DATA FILE"
250 PRINT"               2. REVISE/VIEW EXISTING DATA FILE"
260 PRINT"               3. DELETE OLD DATA FILES"
270 PRINT"               4. DISPLAY DISK DIRECTORY"
280 PRINT"               5. CHAIN TO CALC"
290 PRINT"               6. CHAIN TO PRES"
300 PRINT"               7. FINISH USING THE PROGRAM"
310 PRINT:INPUT"          PLEASE SELECT OPTION:- ",O
320 ON OPT GOSUB 370,590,7810,7950,340,350,360
330 GOTO 10
340 CHAIN "A:CALC"
350 CHAIN "A:PRES"
360 CLS:END
370 ';ENTER NEW DATA FILE----------------------------------------------------
-
380 CLS:PRINT L$:PRINT
390 INPUT"PLEASE ENTER NAME OF NEW DATA FILE:-",X$:IF X$="" THEN PRINT CHR$(7);"
A NAME IS REQUIRED":GOTO 390
400 ON ERROR GOTO 480
410 OPEN X$ FOR INPUT AS #1
420 ON ERROR GOTO 0
430 CLOSE #1
440 PRINT CHR$(7):PRINT"THIS FILE ALREADY EXISTS";
450 INPUT". DO YOU WANT TO OVERWRITE (Y/N)";Q$
460 IF Q$="N" THEN GOTO 380
470 GOTO 490
480 RESUME 490
490 PRINT:PRINT"PLEASE ENTER TITLE 1 TO DESCRIBE THE RESERVOIR AND ITS FLOOD STA
TUS AT THE STARTOF THE SIMULATION"
500 INPUT "",TITLE1$
510 PRINT"PLEASE ENTER TITLE 2 TO DESCRIBE THE FLOOD EVENT"
520 INPUT "",TITLE2$
530 GOSUB 830
540 GOSUB 1220
550 GOSUB 4050
560 GOSUB 4510
```

```
570 GOSUB 4670
580 RETURN
590 ':REVISE EXISTING DATA FILE-----------------------------------------------
-
600 CLS:PRINT L$:PRINT
610 INPUT"PLEASE ENTER NAME OF DATA FILE TO BE REVISED/VIEWED:",X$: IF X$="" THE
N PRINT CHR$(7);"A NAME IS REQUIRED": GOTO 610
620 ON ERROR GOTO 660
630 OPEN X$ FOR INPUT AS £1
640 ON ERROR GOTO 0
650 GOTO 680
660 PRINT"THIS FILE DOES NOT EXIST. PLEASE ENTER NEW DISK AND/OR FILENAME."
670 RESUME 600
680 GOSUB 5860
690 GOSUB 7030
700 PRINT:INPUT"DO YOU WANT TO SAVE A REVISED DATA FILE (Y/N)";Q$
710 IF Q$="N" THEN RETURN
720 INPUT"PLEASE ENTER NAME OF REVISED DATA FILE:";X$: IF X$="" THEN PRINT CHR$(
7);"A NAME IS REQUIRED": GOTO 720
730 ON ERROR GOTO 800
740 OPEN X$ FOR INPUT AS £1
750 ON ERROR GOTO 0
760 CLOSE £1
770 PRINT"THIS FILE ALREADY EXISTS"
780 INPUT"DO YOU WANT TO OVERWRITE (Y/N):";Q$
790 IF Q$="N" THEN GOTO 720
800 GOSUB 4670
810 RETURN
820 ':RESERVOIR CHARACTERISTICS ----------------------------------------------
-
830 CLS:PRINT L$:PRINT
840 PRINT TITLE1$:PRINT TITLE2$:PRINT
850 PRINT "RESERVOIR BASIN CHARACTERISTICS":PRINT:PRINT L$
860 ':STORAGE  ELEVATION POINTS ENTERED ---------------------------------------

870 PRINT:INPUT"NUMBER OF STORAGE - ELEVATION POINTS:-",NOSTEL
880 PRINT:INPUT"STORAGE CONVERSION FACTOR:-",SCF
890 DIM ELEV(NOSTEL),STOR(NOSTEL)
900 CLS:PRINT "STORAGE - ELEVATION DATA:-":PRINT
910 FOR I=1 TO NOSTEL
920 PRINT "DATA POINT NUMBER ";I
930 INPUT "ELEVATION(m):",ELEV(I)
940 INPUT "STORAGE(m3) :",STOR(I)
950 NEXT I
960 FOR I=1 TO NOSTEL
970 STOR(I)=STOR(I)*SCF
980 NEXT I
990 ':STORAGE - ELEVATION DATA CHECK -----------------------------------------

1000 CLS:PRINT "STORAGE - ELEVATION DATA CHECK:-"
1010 INPUT "DO YOU REQUIRE A DATA CHECK (Y/N)";Q$
1020 IF Q$="N" THEN RETURN
1030 PRINT:PRINT"                    ELEVATION          STORAGE"
1040 FOR I=1 TO NOSTEL
1050 PRINT TAB(20) ELEV(I), TAB(40) STOR(I)
1060 IF I=20 THEN GOSUB 1120
1070 IF I=40 THEN GOSUB 1120
1080 IF I=60 THEN GOSUB 1120
1090 NEXT I
1100 GOSUB 1120
1110 RETURN
```

```
1120 INPUT "ARE THESE DATA POINTS CORRECT (Y/N)";Q$
1130 IF Q$="Y" THEN RETURN
1140 INPUT "HOW MANY DATA POINTS MUST BE CORRECTED";N
1150 FOR K=1 TO N
1160 INPUT "WHICH DATA POINT MUST BE CORRECTED";W
1170 INPUT "ELEVATION(m):",ELEV(W)
1180 INPUT "STORAGE(m3) :",STOR(W)
1190 STOR(W)=STOR(W)*SCF
1200 NEXT K
1210 GOTO 1000
1220 ':SPILLWAY DATA ------------------------------------------------------------

1230 CLS:PRINT L$:PRINT
1240 PRINT TITLE1$:PRINT TITLE2$:PRINT
1250 PRINT "SPILLWAY DATA":PRINT:PRINT L$:PRINT
1260 ':SPILLWAY CONFIGURATION ENTERED ---------------------------------------
1270 PRINT "PLEASE SELECT THE REQUIRED SPILLWAY";
1280 PRINT " CONFIGURATION FROM THE FOLLOWING LIST:"
1290 PRINT:PRINT "     1. "; A$:PRINT "     2. "; B$:PRINT "     3. "; C$
1300 PRINT "     4. "; D$:PRINT "     5. "; E$:PRINT "     6. "; F$:PRINT "
7. "; G$
1310 PRINT:INPUT "SELECT NUMBER OF SPILLWAY COMPONENTS:-",SPILLNO
1320 DIM SPILLWAY(SPILLNO)
1330 FOR I=1 TO SPILLNO
1340 SPILLWAY (I)=0
1350 NEXT I
1360 PRINT "PLEASE INPUT - WITH RETURN AFTER EACH NUMBER - THE SPILLWAY COMPONEN
TS REQUIRED:"
1370 FOR I=1 TO SPILLNO
1380 INPUT SPILLWAY(I)
1390 NEXT I
1400 ':SPILLWAY CONFIGURATION CHECK -----------------------------------------

1410 CLS:PRINT "YOU HAVE SELECTED A ";SPILLNO;" COMPONENT SPILLWAY SYSTEM";
1420 PRINT " CONSISTING OF:-":PRINT
1430 FOR I=1 TO SPILLNO
1440 ON SPILLWAY (I) GOSUB 1470,1480,1490,1500,1510,1520,1530
1450 NEXT I
1460 GOTO 1540
1470 PRINT "     ";A$:RETURN
1480 PRINT "     ";B$:RETURN
1490 PRINT "     ";C$:RETURN
1500 PRINT "     ";D$:RETURN
1510 PRINT "     ";E$:RETURN
1520 PRINT "     ";F$:RETURN
1530 PRINT "     ";G$:RETURN
1540 PRINT:INPUT"IS THIS CORRECT (Y/N)";Q$
1550 IF Q$="Y" THEN GOTO 1580
1560 ERASE SPILLWAY:CLS:GOTO 1270
1570 ':SPILLWAY DATA ENTERED ------------------------------------------------

1580 FOR L=1 TO SPILLNO
1590 ON SPILLWAY(L) GOSUB 1620,2150,2210,2630,3330,3890,3960
1600 NEXT L
1610 RETURN
1620 ':BOX CULVERT DATA ENTERED---------------------------------------------
1630 CLS:PRINT A$:PRINT "------------"
1640 PRINT:INPUT "NUMBER OF CULVERTS:-",CULNO
1650 DIM CULHEIGHT(CULNO), CULWIDTH(CULNO), CULINVERT(CULNO)
1660 DIM CULUNCOEF(CULNO),CULSUBCOEF(CULNO),S(5)
1670 PRINT:INPUT "ARE ALL CULVERTS THE SAME WIDTH (Y/N)";Q$
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```
1680 IF Q$="N" THEN S(1)=1:GOTO 1730
1690 INPUT "WIDTH OF CULVERTS(m):-",CULWIDTH
1700 FOR I=1 TO CULNO
1710 CULWIDTH(I)=CULWIDTH
1720 NEXT I
1730 INPUT "ARE ALL CULVERTS THE SAME HEIGHT (Y/N)";Q$
1740 IF Q$="N" THEN S(2)=2:GOTO 1790
1750 INPUT "HEIGHT OF CULVERTS(m):-",CULHEIGHT
1760 FOR I=1 TO CULNO
1770 CULHEIGHT (I)=CULHEIGHT
1780 NEXT I
1790 INPUT "ARE ALL CULVERT INVERTS AT THE SAME LEVEL (Y/N)";Q$
1800 IF Q$ = "N" THEN S(3)=3:GOTO 1850
1810 INPUT "CULVERT INVERT LEVEL(m):-",CULINVERT
1820 FOR I=1 TO CULNO
1830 CULINVERT(I)=CULINVERT
1840 NEXT I
1850 INPUT"DO ALL CULVERTS HAVE THE SAME UNSUBMERGED DISCHARGE COEFFICIENT (Y/N)
";Q$
1860 IF Q$ = "N" THEN S(4)=4:GOTO 1910
1870 INPUT "UNSUBMERGED DISCHARGE COEFFICIENT:-",CULUNCOEF
1880 FOR I=1 TO CULNO
1890 CULUNCOEF(I)=CULUNCOEF
1900 NEXT I
1910 INPUT "DO ALL CULVERTS HAVE THE SAME SUBMERGED DISCHARGE COEFFICIENT (Y/N)"
;Q$
1920 IF Q$ = "N" THEN S(5)=5: GOTO 1970
1930 INPUT "SUBMERGED DISCHARGE COEFFICIENT:-",CULSUBCOEF
1940 FOR I=1 TO CULNO
1950 CULSUBCOEF(I)=CULSUBCOEF
1960 NEXT I
1970 FOR I=1 TO 5
1980 IF S(I)>0 THEN GOTO 2010
1990 NEXT I
2000 RETURN
2010 FOR I=1 TO CULNO
2020 CLS:PRINT "CULVERT NUMBER ";I:PRINT
2030 FOR J=1 TO 5
2040 ON S(J) GOSUB 2070,2080,2090,2100,2110
2050 NEXT J
2060 GOTO 2120
2070 INPUT "WIDTH OF CULVERT(m):-",CULWIDTH(I):RETURN
2080 INPUT "HEIGHT OF CULVERT(m):-",CULHEIGHT(I):RETURN
2090 INPUT"CULVERT INVERT LEVEL(m):-",CULINVERT(I):RETURN
2100 INPUT "UNSUBMERGED DISCHARGE COEFFICIENT:-",CULUNCOEF(I):RETURN
2110 INPUT "SUBMERGED DISCHARGE COEFICIENT:-",CULSUBCOEF(I):RETURN
2120 NEXT I
2130 RETURN
2140 ':FREE OVERFLOW WIER DATA ENTERED ----------------------------------------

2150 CLS:PRINT B$:PRINT "-----------------"
2160 PRINT:INPUT "LENGTH OF OVERFLOW WIER(m):-",WIERLENGTH
2170 INPUT "WIER CREST LEVEL(m):-",WIERINVERT
2180 INPUT "WIER DISCHARGE COEFFICIENT:-",WIERCOEF
2190 RETURN
2200 ':AUTOMATICALLY CONTROLLED WIER DATA ENTERED ----------------------------

2210 CLS:PRINT C$:PRINT "-----------------------------------"
2220 PRINT:INPUT "NUMBER OF GATES:-",GATELNO
2230 DIM GATELS(GATELNO), GATELE(GATELNO), GATELCOEF(GATELNO)
2240 DIM GATELINVERT(GATELNO), GATELWIDTH(GATELNO), GATELHEIGHT(GATELNO), T(4),
GATELTIME(GATELNO)
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2250 PRINT:INPUT "ARE ALL WIER INVERTS AT THE SAME LEVEL (Y/N)";Q$
2260 IF Q$="N" THEN T(1)=1:GOTO 2310
2270 INPUT "WIER CREST LEVEL(m):-",WCL
2280 FOR I=1 TO GATELNO
2290 GATELINVERT(I)=WCL
2300 NEXT I
2310 INPUT "ARE ALL DISCHARGE COEFFICIENTS THE SAME (Y/N)";Q$
2320 IF Q$="N" THEN T(2)=2:GOTO 2370
2330 INPUT"DISCHARGE COEFFICIENT FOR FREEFLOW:-",DFF
2340 FOR I=1 TO GATELNO
2350 GATELCOEF(I)=DFF
2360 NEXT I
2370 INPUT "ARE ALL THE GATES OF THE SAME WIDTH (Y/N)";Q$
2380 IF Q$="N" THEN T(3)=3 :GOTO 2430
2390 INPUT "GATE WIDTH(m):-",GW
2400 FOR I=1 TO GATELNO
2410 GATELWIDTH (I)=GW
2420 NEXT I
2430 INPUT "ARE ALL THE GATE TRAVELS THE SAME (Y/N)";Q$
2440 IF Q$="N" THEN T(4)=4 :GOTO 2490
2450 INPUT "GATE TRAVEL(m):-",GT
2460 FOR I=1 TO GATELNO
2470 GATELHEIGHT(I)=GT
2480 NEXT I
2490 FOR I=1 TO GATELNO
2500 CLS:PRINT:PRINT"GATE NUMBER ";I:PRINT
2510 INPUT "WATER ELEVATION AT START OF GATE OPENING(m):-",GATELS(I)
2520 INPUT"WATER ELEVATION AT FULL GATE OPENING(m):-",GATELE(I)
2530 FOR J=1 TO 4
2540 ON T(J) GOSUB 2580,2590,2600,2610
2550 NEXT J
2560 NEXT I
2570 RETURN
2580 INPUT "WIER CREST LEVEL(m):-",GATELINVERT(I):RETURN
2590 INPUT "DISCHARGE COEFFICIENT FOR FREE FLOW:-",GATELCOEF(I):RETURN
2600 INPUT "GATE  WIDTH(m):-",GATEWIDTH(I):RETURN
2610 INPUT "GATE  TRAVEL(m):-",GATELHEIGHT(I):RETURN
2620 ':MANUALLY CONTROLLED WIER DATA ENTERED ---------------------------------

2630 CLS:PRINT D$:PRINT "--------------------------------"
2640 PRINT:INPUT "NUMBER OF GATES:-",GATEMNO
2650 DIM GATEMCOEF(GATEMNO),GATEMINVERT(GATEMNO),GATEMSIZE(GATEMNO)
2660 DIM GATEMWIDTH(GATEMNO), GATEMHEIGHT(GATEMNO),TE(6),GATESPILL(GATEMNO)
2670 PRINT:INPUT "ARE ALL WIER INVERTS AT THE SAME LEVEL (Y/N)";Q$
2680 IF Q$="N" THEN TE(1)=1:GOTO 2730
2690 INPUT "WIER CREST LEVEL(m):-",WCL
2700 FOR I=1 TO GATEMNO
2710 GATEMINVERT (I)=WCL
2720 NEXT I
2730 INPUT "ARE ALL DISCHARGE COEFFICIENTS FOR FREE FLOW THE SAME (Y/N)";Q$
2740 IF Q$="N" THEN TE(2)=2:GOTO 2790
2750 INPUT "DISCHARGE COEFFICIENT FOR FREE FLOW:-",DFF
2760 FOR I=1 TO GATEMNO
2770 GATEMCOEF(I)=DFF
2780 NEXT I
2790 INPUT"ARE ALL DISCHARGE COEFFICIENTS FOR GATE SPILL THE SAME (Y/N)";Q$
2800 IF Q$="N" THEN TE(6)=6:GOTO 2850
2810 INPUT"DISCHARGE COEFFICIENT FOR GATE SPILL:-",DSF
2820 FOR I=1 TO GATEMNO
2830 GATESPILL(I)=DSF
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```
2840 NEXT I
2850 INPUT "ARE ALL THE GATES OF THE SAME WIDTH (Y/N)";Q$
2860 IF Q$="N" THEN TE(3)=3:GOTO 2910
2870 INPUT "GATE WIDTH(m):-",GW
2880 FOR I=1 TO GATEMNO
2890 GATEMWIDTH(I)=GW
2900 NEXT I
2910 INPUT"ARE ALL THE GATES THE SAME HEIGHT (Y/N)";Q$
2920 IF Q$="N" THEN TE(5)=5:GOTO 2970
2930 INPUT"GATE HEIGHT(m):-",GH
2940 FOR I=1 TO GATEMNO
2950 GATEMSIZE(I)=GH
2960 NEXT I
2970 INPUT "ARE ALL THE GATE TRAVELS THE SAME (Y/N)";Q$
2980 IF Q$="N" THEN TE(4)=4:GOTO 3030
2990 INPUT "GATE TRAVEL(m):-",GT
3000 FOR I=1 TO GATEMNO
3010 GATEMHEIGHT(I)=GT
3020 NEXT I
3030 FOR J=1 TO 6
3040 IF TE(J)>0 THEN GOTO 3070
3050 NEXT J
3060 GOTO 3200
3070 FOR I=1 TO GATEMNO
3080 CLS:PRINT"GATE NUMBER ";I:PRINT
3090 FOR J=1 TO 6
3100 ON TE(J) GOSUB 3140,3150,3160,3170,3180,3190
3110 NEXT J
3120 NEXT I
3130 GOTO 3200
3140 INPUT "WIER CREST LEVEL(m):-",GATEMINVERT(I):RETURN
3150 INPUT "DISCHARGE COEFFICIENT FOR FREE FLOW:-",GATEMCOEF(I):RETURN
3160 INPUT "GATEWIDTH(m):-",GATEMWIDTH(I):RETURN
3170 INPUT "GATE TRAVEL(m):-",GATEMHEIGHT(I):RETURN
3180 INPUT"GATE HEIGHT (m):-",GATEMSIZE(I):RETURN
3190 INPUT"DISCHARGE COEFFICIENT FOR GATE SPILL:-",GATESPILL(I):RETURN
3200 ': OPERATIONAL MODE ENTERED ------------------------------------------------

3210 CLS:PRINT "MANUAL GATE OPERATION MODE":PRINT
3220 PRINT "MANUAL GATES CAN BE:-"
3230 PRINT "    1.USER OPERATED"
3240 PRINT "    2.PROGRAM OPERATED":PRINT
3250 INPUT "PLEASE SELECT OPERATION MODE (U/P):-",Q1$
3260 IF Q1$="U" THEN GOTO 8090
3270 INPUT "DELAY TIME TO FIRST OPERATION(hours):-",GATEMSTART
3280 INPUT "MAXIMUM NUMBER OF GATES OPERABLE AT ONE TIME:-",GATEMSUM
3290 INPUT "MAXIMUM DESIRABLE OUTFLOW RATE(m3/s):-",GATEMFLOW
3300 INPUT "MAXIMUM ALLOWABLE OUTFLOW RATE INCREASE(m3/s/h):-",FLOWMESC
3310 RETURN
3320 ': MANUALLY CONTROLLED HIGH PRESSURE GATE DATA ENTERED ---------------------

3330 CLS:PRINT E$:PRINT "---------------------------------------"
3340 PRINT:INPUT "NUMBER OF GATES:-",GATEHNO
3350 DIM GATEHCOEF(GATEHNO), GATEHINVERT(GATEHNO)
3360 DIM GATEHWIDTH(GATEHNO),GATEHHEIGHT(GATEHNO),U(4)
3370 PRINT:INPUT "ARE ALL INVERTS AT THE SAME LEVEL (Y/N)";Q$
3380 IF Q$="N" THEN U(1)=1:GOTO 3430
3390 INPUT "INVERT LEVEL(m):-",WCL
3400 FOR I=1 TO GATEHNO
3410 GATEHINVERT (I)=WCL
3420 NEXT I
```

```
3430 INPUT "ARE ALL DISCHARGE COEFFICIENTS THE SAME (Y/N)";Q$
3440 IF Q$="N" THEN U(2)=2:GOTO 3490
3450 INPUT"DISCHARGE COEFFICIENT FOR ORIFICE FLOW:-",DFF
3460 FOR I=1 TO GATEHNO
3470 GATEHCOEF(I)=DFF
3480 NEXT I
3490 INPUT "ARE ALL GATES OF THE SAME WIDTH (Y/N)";Q$
3500 IF Q$="N" THEN U(3)=3:GOTO 3550
3510 INPUT "GATEWIDTH(m):-",GW
3520 FOR I=1 TO GATEHNO
3530 GATEHWIDTH(I)=GW
3540 NEXT I
3550 INPUT "ARE ALL THE GATE HEIGHTS THE SAME (Y/N)";Q$
3560 IF Q$="N" THEN U(4)=4:GOTO 3610
3570 INPUT "GATE HEIGHT(m):-",GT
3580 FOR I=1 TO GATEHNO
3590 GATEHHEIGHT(I)=GT
3600 NEXT I
3610 FOR J=1 TO 4
3620 IF U(J)>0 THEN GOTO 3650
3630 NEXT J
3640 GOTO 3770
3650 FOR I=1 TO GATEHNO
3660 CLS:PRINT "GATE NUMBER ";I:PRINT
3670 FOR J=1 TO 4
3680 ON U(J)GOSUB 3720,3730,3740,3750
3690 NEXT J
3700 NEXT I
3710 GOTO 3770
3720 INPUT "INVERT LEVEL(m):-",GATEHINVERT(I):RETURN
3730 INPUT "DISCHARGE COEFFICIENT FOR ORIFICE FLOW:-",GATEHCOEF(I):RETURN
3740 INPUT "GATEWIDTH(m):-",GATEHWIDTH(I):RETURN
3750 INPUT "GATE HEIGHT(m):-",GATEHHEIGHT(I):RETURN
3760 ':OPERATIONAL MODE ENTERED ----------------------------------------------

3770 CLS:PRINT "MANUAL GATE OPERATION MODE:":PRINT
3780 PRINT "MANUAL GATES CAN BE:-"
3790 PRINT"     1.USER OPERATED"
3800 PRINT"     2.PROGRAM OPERATED":PRINT
3810 INPUT "PLEASE SELECT OPERATION MODE (U/P)";Q2$
3820 IF Q2$="U" THEN GOTO 8420
3830 INPUT "DELAY TIME TO FIRST OPERATION(hours):-",GATEHSTART
3840 INPUT "MAXIMUM NUMBER OF GATES OPERABLE AT ONE TIME:-",GATEHSUM
3850 INPUT "MAXIMUM DESIRABLE OUTFLOW RATE(m3/s):-",GATEHFLOW
3860 INPUT "MAXIMUM ALLOWABLE OUTFLOW RATE INCREASE(m3/s/h):-",FLOWHESC
3870 RETURN
3880 ': FUSEPLUG DATA ENTERED ------------------------------------------------

3890 CLS: PRINT F$: PRINT "--------------------------"
3900 PRINT: INPUT "ELEVATION AT START OF WASH(m):-",FUSESTART
3910 INPUT "ELEVATION OF SPILLWAY CREST(m):-",FUSECREST
3920 INPUT "LENGTH OF SPILLWAY(m):-",FUSELENGTH
3930 INPUT "WIER DISCHARGE COEFFICIENT:-",FUSECOEF
3940 RETURN
3950 ': USER SPILLWAY DATA ENTERED -------------------------------------------

3960 CLS: PRINT G$: PRINT "--------------------"
3970 PRINT: INPUT "NUMBER OF DISCHARGE-ELEVATION POINTS:-",PTNOU
3980 DIM ELEVU(PTNOU), DISCHU(PTNOU)
3990 FOR I=1 TO PTNOU
4000 PRINT"ELEVATION(m)    ";I:INPUT ELEVU(I)
```

```
4010 PRINT "DISCHARGE(m3/s)";I:INPUT DISCHU(I)
4020 NEXT I
4030 RETURN
4040 ': FLOOD DATA ------------------------------------------------------------

4050 CLS: PRINT L$: PRINT
4060 PRINT TITLE1$:PRINT TITLE2$:PRINT
4070 PRINT "FLOOD DATA": PRINT: PRINT L$: PRINT
4080 IF OPT=2 THEN GOTO 4100
4090 GOTO 4120
4100 PRINT"PLEASE INPUT TITLE 2:-"
4110 INPUT TITLE2$
4120 PRINT: INPUT "NUMBER OF INFLOW HYDROGRAPH POINTS:-",NOHYD
4130 INPUT "INPUT TIME STEP (hours):-",ISTEP
4140 DIM INFLOW(NOHYD+2)
4150 INPUT"INFLOW AT START OF SIMULATION(m3/s):-",INFLOW(0)
4160 FOR I=1 TO NOHYD
4170 PRINT "INFLOW POINT";I:INPUT"(m3/s):",INFLOW(I)
4180 NEXT I
4190 ': FLOOD DATA CHECK ------------------------------------------------------

4200 INPUT "IS INFLOW HYDROGRAPH CORRECT AS ENTERED (Y/N)";Q$
4210 IF Q$="Y" THEN RETURN
4220 CLS:PRINT "WOULD YOU LIKE TO:"
4230 PRINT "     a. VIEW A BLOCK OF DATA OR"
4240 PRINT "     b. REVISE SOME DATA POINTS"
4250 INPUT "(a/b)"; Q$
4260 IF Q$="B" GOTO 4390
4270 INPUT "HOW MANY DATA POINTS MUST BE DISPLAYED:-",Q
4280 INPUT "PLEASE ENTER THE NUMBER OF THE FIRST DATA POINT:-",Q1
4290 FOR J=Q1 TO (Q1+Q-1)
4300 PRINT J, INFLOW(J)
4310 NEXT J
4320 PRINT "WOULD YOU LIKE TO:"
4330 PRINT "     a. ACCEPT DATA OR
4340 PRINT "     b. REVISE SOME DATA POINTS
4350 INPUT "(a/b)";Q$
4360 IF Q$="B" GOTO 4390
4370 RETURN
4380 ': DATA POINTS REVISED ---------------------------------------------------

4390 INPUT "HOW MANY DATA POINTS MUST BE REVISED:-",Q
4400 FOR J=1 TO Q
4410 INPUT "DATA POINT TO BE REVISED:-",Q1
4420 INPUT "REVISED VALUE FOR DATA POINT:-",INFLOW(Q1)
4430 NEXT J
4440 PRINT "WOULD YOU LIKE TO:"
4450 PRINT "     a. VIEW A BLOCK OF DATA OR"
4460 PRINT "     b. ACCEPT THE DATA SET
4470 INPUT "(a/b)";Q$
4480 IF Q$="A" THEN GOTO 4270
4490 RETURN
4500 ': RESERVOIR FLOOD STATUS ------------------------------------------------

4510 CLS: PRINT L$: PRINT
4520 PRINT TITLE1$: PRINT TITLE2$: PRINT
4530 PRINT "RESERVOIR FLOOD STATUS": PRINT: PRINT L$: PRINT
4540 IF OPT=2 THEN GOTO 4560
4550 GOTO 4580
4560 PRINT"PLEASE INPUT TITLE 1:-"
4570 INPUT TITLE1$
```

```
4580 INPUT "WATER LEVEL IN RESERVOIR AT START(m):-",RESSTA
4590 INPUT "WATER LEVEL REQUIRED AFTER FLOOD(m):-",RESLEV
4600 INPUT "MAXIMUM ALLOWABLE WATER LEVEL DURING FLOOD(m):-",RESMAX
4610 INPUT "ANALYSIS SENSITIVITY REQUIRED(m):-",LEVSENSE
4620 INPUT "TIME AT START OF ANALYSIS(hours):-", STATIME
4630 INPUT"COMPUTATIONAL TIME STEP (hours):-",CSTEP
4640 INPUT "NUMBER OF TIMESTEPS TO BE ANALYSED:-",NOSTEP
4650 RETURN
4660 ':STORAGE OF DATA ON DISK----------
4670 CLS:PRINT L$:PRINT
4680 PRINT"DATA STORAGE TO DISK"
4690 PRINT:PRINT L$:PRINT
4700 OPEN X$ FOR OUTPUT AS £1
4710 PRINT £1,NOSTEL
4720 FOR I=1 TO NOSTEL
4730 PRINT £1,ELEV(I):PRINT £1,STOR(I)
4740 NEXT I
4750 PRINT £1,NOSTEP
4760 PRINT £1,SPILLNO
4770 FOR I=1 TO SPILLNO
4780 PRINT £1,SPILLWAY(I)
4790 NEXT I
4800 FOR I=1 TO SPILLNO
4810 ON SPILLWAY(I) GOSUB 4840,4930,4970,5070,5350,5600,5650
4820 NEXT I
4830 GOTO 5710
4840 PRINT £1,CULNO
4850 FOR J=1 TO CULNO
4860 PRINT £1,CULWIDTH(J)
4870 PRINT £1,CULHEIGHT(J)
4880 PRINT £1,CULINVERT(J)
4890 PRINT £1,CULUNCOEF(J)
4900 PRINT £1,CULSUBCOEF(J)
4910 NEXT J
4920 RETURN
4930 PRINT £1,WIERLENGTH
4940 PRINT £1,WIERINVERT
4950 PRINT £1,WIERCOEF
4960 RETURN
4970 PRINT £1,GATELNO
4980 FOR J=1 TO GATELNO
4990 PRINT £1,GATELS(J)
5000 PRINT £1,GATELE(J)
5010 PRINT £1,GATELINVERT(J)
5020 PRINT £1,GATELCOEF(J)
5030 PRINT £1,GATELWIDTH(J)
5040 PRINT £1,GATELHEIGHT(J)
5050 NEXT J
5060 RETURN
5070 PRINT £1,GATEMNO
5080 FOR J=1 TO GATEMNO
5090 PRINT £1,GATEMINVERT(J)
5100 PRINT £1,GATESPILL(J)
5110 PRINT £1,GATEMCOEF(J)
5120 PRINT £1,GATEMWIDTH(J)
5130 PRINT £1,GATEMHEIGHT(J)
5140 PRINT £1,GATEMSIZE(J)
5150 NEXT J
5160 PRINT £1,Q1$
5170 IF Q1$="U" THEN GOTO 5230
5180 PRINT £1,GATEMSTART
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5190 PRINT £1,GATEMSUM
5200 PRINT £1,GATEMFLOW
5210 PRINT £1,FLOWMESC
5220 RETURN
5230 PRINT £1,Q3
5240 IF Q3=2 THEN GOTO 5310
5250 FOR I=0 TO NOSTEP
5260 FOR J=1 TO GATEHNO
5270 PRINT £1,MGATEOP(I,J)
5280 NEXT J
5290 NEXT I
5300 RETURN
5310 FOR I=0 TO NOSTEP
5320 PRINT £1,MGATEOP(I)
5330 NEXT I
5340 RETURN
5350 PRINT £1,GATEHNO
5360 FOR J=1 TO GATEHNO
5370 PRINT £1,GATEHINVERT(J)
5380 PRINT £1,GATEHCOEF(J)
5390 PRINT £1,GATEHWIDTH(J)
5400 PRINT £1,GATEHHEIGHT(J)
5410 NEXT J
5420 PRINT £1,Q2$
5430 IF Q2$="U" THEN GOTO 5480
5440 PRINT £1,GATEHSTART
5450 PRINT £1,GATEHFLOW
5460 PRINT £1,FLOWHESC
5470 RETURN
5480 PRINT £1,Q4
5490 IF Q4=2 THEN GOTO 5560
5500 FOR I=0 TO NOSTEP
5510 FOR J=1 TO GATEHNO
5520 PRINT £1,HGATEOP(I,J)
5530 NEXT J
5540 NEXT I
5550 RETURN
5560 FOR I=0 TO NOSTEP
5570 PRINT £1,HGATEOP(I)
5580 NEXT I
5590 RETURN
5600 PRINT £1,FUSESTART
5610 PRINT £1,FUSECREST
5620 PRINT £1,FUSELENGTH
5630 PRINT £1,FUSECOEF
5640 RETURN
5650 PRINT £1,PTNOU
5660 FOR J=1 TO PTNOU
5670 PRINT £1,ELEVU(J)
5680 PRINT £1,DISCHU(J)
5690 NEXT J
5700 RETURN
5710 PRINT £1,NOHYD
5720 PRINT £1,ISTEP
5730 FOR J=0 TO NOHYD
5740 PRINT £1,INFLOW(J)
5750 NEXT J
5760 PRINT £1,TITLE1$
5770 PRINT £1,TITLE2$
5780 PRINT £1,RESSTA
5790 PRINT £1,RESLEV
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```
5800 PRINT £1,RESMAX
5810 PRINT £1,LEVSENSE
5820 PRINT £1,STATIME
5830 PRINT £1,CSTEP
5840 PRINT £1,NOSTEP
5850 CLOSE £1:RETURN
5860 ':STORAGE - ELEVATION POINTS FROM DISK ----------------------------------
-
5870 CLS:PRINT L$:PRINT
5880 PRINT:PRINT"READING STORAGE/ELEVATION DATA FROM DISK."
5890 INPUT £1,NOSTEL
5900 DIM ELEV(NOSTEL),STOR(NOSTEL)
5910 FOR I=1 TO NOSTEL
5920 INPUT £1,ELEV(I),STOR(I)
5930 NEXT I
5940 INPUT £1,NOSTEP
5950 ': SPILLWAY DATA FROM DISK ----------------------------------------------

5960 PRINT: PRINT "READING SPILLWAY DATA FROM DISK."
5970 INPUT £1,SPILLNO
5980 DIM SPILLWAY(SPILLNO)
5990 FOR I=1 TO SPILLNO
6000 INPUT £1,SPILLWAY(I)
6010 NEXT I
6020 FOR I=1 TO SPILLNO
6030 ON SPILLWAY(I) GOSUB 6060,6150,6180,6270,6530,6800,6840
6040 NEXT I
6050 GOTO 6920
6060 ': BOX CULVERT DATA ----------------------------------------------------

6070 INPUT £1,CULNO
6080 DIM CULHEIGHT(CULNO),CULWIDTH(CULNO),CULINVERT(CULNO)
6090 DIM CULUNCOEF(CULNO),CULSUBCOEF(CULNO)
6100 FOR J=1 TO CULNO
6110 INPUT £1,CULWIDTH(J),CULHEIGHT(J),CULINVERT(J)
6120 INPUT £1,CULUNCOEF(J),CULSUBCOEF(J)
6130 NEXT J
6140 RETURN
6150 ': FREE OVERFLOW WIER DATA ----------------------------------------------

6160 INPUT £1,WIERLENGTH,WIERINVERT,WIERCOEF
6170 RETURN
6180 ': AUTOMATIC GATE DATA --------------------------------------------------

6190 INPUT £1,GATELNO
6200 DIM GATELS(GATELNO),GATELE(GATELNO),GATELCOEF(GATELNO)
6210 DIM GATELIVERT(GATELNO),GATELWIDTH(GATELNO),GATELHEIGHT(GATELNO),GATELTIME(
GATELNO)
6220 FOR J=1 TO GATELNO
6230 INPUT £1,GATELS(J),GATELE(J)
6240 INPUT £1,GATELINVERT(J),GATELCOEF(J),GATELWIDTH(J),GATELHEIGHT(J)
6250 NEXT J
6260 RETURN
6270 ': MANUAL GATE DATA ----------------------------------------------------

6280 INPUT £1,GATEMNO
6290 DIM GATEMCOEF(GATEMNO),GATEMINVERT(GATEMNO),GATEMSIZE(GATEMNO)
6300 DIM GATEMWIDTH(GATEMNO),GATEMHEIGHT(GATEMNO),GATESPILL(GATEMNO)
6310 FOR J=1 TO GATEMNO
6320 INPUT £1,GATEMINVERT(J),GATESPILL(J),GATEMCOEF(J),GATEMWIDTH(J)
6330 INPUT £1,GATEMHEIGHT(J),GATEMSIZE(J)
```

```
6340 NEXT J
6350 INPUT £1,Q1$
6360 IF Q1$ = "U" THEN GOTO 6390
6370 INPUT £1,GATEMSTART,GATEMSUM,GATEMFLOW,FLOWMESC
6380 RETURN
6390 INPUT £1,Q3
6400 IF Q3=2 THEN GOTO 6480
6410 DIM MGATEOP(NOSTEP+1,GATEMNO)
6420 FOR I=0 TO NOSTEP
6430 FOR J=1 TO GATEMNO
6440 INPUT £1,MGATEOP(I,J)
6450 NEXT J
6460 NEXT I
6470 RETURN
6480 DIM MGATEOP(NOSTEP+1)
6490 FOR I=0 TO NOSTEP
6500 INPUT £1,MGATEOP(I)
6510 NEXT I
6520 RETURN
6530 ': MANUAL HIGH PRESSURE GATE DATA ----------------------------------------

6540 INPUT £1,GATEHNO
6550 DIM GATEHCOEF(GATEHNO),GATEHINVERT(GATEHNO)
6560 DIM GATEHWIDTH(GATEHNO),GATEHHEIGHT(GATEHNO)
6570 FOR J=1 TO GATEHNO
6580 INPUT £1,GATEHINVERT(J),GATEHCOEF(J)
6590 INPUT £1,GATEHWIDTH(J),GATEHHEIGHT(J)
6600 NEXT J
6610 INPUT £1,Q2$
6620 IF Q2$ = "U" THEN GOTO 6660
6630 INPUT £1,GATEHSTART,GATEHSUM
6640 INPUT £1,GATEHFLOW,FLOWHESC
6650 RETURN
6660 INPUT £1,Q4
6670 IF Q4=2 THEN GOTO 6750
6680 DIM HGATEOP(NOSTEP+1,GATEHNO)
6690 FOR I=0 TO NOSTEP
6700 FOR J=1 TO GATEHNO
6710 INPUT £1,HGATEOP(I,J)
6720 NEXT J
6730 NEXT I
6740 RETURN
6750 DIM HGATEOP(NOSTEP+1)
6760 FOR I=0 TO NOSTEP
6770 INPUT £1,HGATEOP(I)
6780 NEXT I
6790 RETURN
6800 ': FUSEPLUG DATA ----------------------------------------------------------

6810 INPUT £1,FUSESTART,FUSECREST
6820 INPUT £1,FUSELENGTH,FUSECOEF
6830 RETURN
6840 ': USER SPILLWAY DATA -----------------------------------------------------

6850 INPUT £1,PTNOU
6860 DIM ELEVU(PTNOU),DISCHU(PTNOU)
6870 FOR J=1 TO PTNOU
6880 INPUT £1,ELEVU(J),DISCHU(J)
6890 NEXT J
6900 RETURN
6910 ':FLOOD DATA READ FROM DISK-----------------------------------------------
```

```
6920 PRINT:PRINT"READING 'NFLOW HYDROGRAPH FROM DISK."
6930 INPUT £1,NOHYD,ISTEP
6940 DIM INFLOW(NOHYD+2)
6950 FOR I=0 TO NOHYD
6960 INPUT £1,INFLOW(I)
6970 NEXT I
6980 ':RESERVOIR FLOOD STATUS FROM DISK----------------------------------------
-
6990 PRINT:PRINT"READING RESERVOIR STATUS FROM DISK."
7000 INPUT £1,TITLE1$,TITLE2$
7010 INPUT £1,RESSTA,RESLEV,RESMAX,LEVSENSE,STATIME,CSTEP,NOSTEP
7020 CLOSE £1:RETURN
7030 ':DETERMINE DATA TO BE REVISED/VIEWED-------------------------------------
-
7040 CLS:PRINT L$:PRINT
7050 PRINT"REVISION/REVIEW OF DATA SET WITH THE FOLLOWING TITLES:"
7060 PRINT:PRINT TITLE1$:PRINT TITLE2$
7070 PRINT:PRINT L$:PRINT
7080 PRINT"DATA IS STORED IN FOUR BLOCKS:":PRINT
7090 PRINT"     1. RESERVOIR CHARACTERISTICS"
7100 PRINT"     2. SPILLWAY DATA"
7110 PRINT"     3. RESERVOIR FLOOD STATUS"
7120 PRINT"     4. FLOOD DATA"
7130 PRINT:PRINT"Do you want to    a)VIEW A BLOCK OF DATA"
7140 PRINT"           or    b)REVISE A BLOCK OF DATA"
7150 INPUT"(a/b)";Q3$
7160 IF Q3$="B" THEN GOTO 7190
7170 PRINT:INPUT"PLEASE SELECT NUMBER OF BLOCKS TO BE DISPLAYED:-",NZ
7180 GOTO 7200
7190 PRINT:INPUT"PLEASE SELECT NUMBER OF BLOCKS TO BE REVISED:-",NZ
7200 PRINT"PLEASE ENTER - WITH RETURN AFTER EACH NUMBER - THE BLOCK NUMBERS REQU
IRED:"
7210 DIM OPT(NZ)
7220 FOR I=1 TO NZ
7230 INPUT OPT(I)
7240 NEXT I
7250 IF Q3$="B" THEN GOTO 7270
7260 CLS:PRINT L$:PRINT:PRINT"YOU HAVE SELECTED TO DISPLAY";NZ;"DATA BLOCKS CONS
ISTING OF:-":PRINT:GOTO 7280
7270 CLS:PRINT L$:PRINT:PRINT"YOU HAVE SELECTED TO EDIT";NZ;"DATA BLOCKS CONSIST
ING OF:-":PRINT
7 90 FOR I=1 TO NZ
7300 IF OPT(I)=1 THEN PRINT "       RESERVOIR CHARACTERISTICS"
7 0 IF OPT(I)=2 THEN PRINT "       SPILLWAY DATA"
7310 IF OPT(I)=3 THEN PRINT "       RESERVOIR FLOOD STATUS"
7320 IF OPT(I)=4 THEN PRINT "       FLOOD DATA"
7330 NEXT I
7340 PRINT:INPUT"IS THIS CORRECT (Y/N)";Q$
7350 IF Q$="N" THEN ERASE OPT:GOTO 7040
7360 IF Q3$="B" THEN GOTO 7380
7370 GOTO 6690
7380 FOR ZI=1 TO NZ
7390 ON OPT(ZI) GOSUB 7430,7460,7740,7770
7400 NEXT
7410 RETURN
7420 ':REVISION OF RESERVOIR CHARACTERISTICS-----------------------------------

7430 ERASE ELEV,STOR
7440 GOSUB 830
7450 RETURN
7460 ':REVISION OF SPILLWAY DATA-----------------------------------------------
-
```

```
7470 FOR L=1 TO SPILLNO
7480 ON SPILLWAY(L) GOSUB 7540,7570,7590,7630,7660,7690,7710
7490 NEXT L
7500 ERASE SPILLWAY
7510 GOSUB 1230
7520 RETURN
7530 ':CLEAR BOX CULVERTS-----------------------------------------------------
-
7540 ERASE CULHEIGHT,CULWIDTH,CULINVERT,CULUNCOEF,CULSUBCOEF
7550 RETURN
7560 ':CLEAR WIER-------------------------------------------------------------
-
7570 RETURN
7580 ':CLEAR AUTOMATICALLY CONTROLLED WIER-------------------------------------
-
7590 ERASE GATELS,GATELE,GATELCOEF,GATELINVERT
7600 ERASE GATELWIDTH,GATELHEIGHT,GATELTIME
7610 RETURN
7620 ':CLEAR MANUALLY CONTROLLED WIER------------------------------------------
-
7630 ERASE GATEMCOEF,GATEMINVERT,GATEMWIDTH,GATEMHEIGHT,GATEMSIZE,GATESPILL,MGAT
EOP
7640 RETURN
7650 ':CLEAR MANUALLY CONTROLLED HIGH PRESSURE OUTLET--------------------------
-
7660 ERASE GATEHCOEF,GATEHINVERT,GATEHWIDTH,GATEHHEIGHT
7670 RETURN
7680 ':CLEAR FUSEPLUG-------- -------------------------------------------------
-
7690 RETURN
7700 ':CLEAR USER SPILLWAY----------------------------------------------------
-
7710 ERASE ELEVU,DISCHU
7720 RETURN
7730 ':REVISION OF RESERVOIR FLOOD STATUS--------------------------------------
-
7740 GOSUB 4510
7750 RETURN
7760 ':REVISION OF FLOOD DATA-------------------------------------------------
-
7770 ERASE INFLOW
7780 GOSUB 4050
7790 RETURN
7800 ':DELETE OLD DATA FILES--------------------------------------------------
-
7810 CLS:PRINT L$:PRINT
7820 INPUT"PLEASE ENTER NUMBER OF FILES TO BE DELETED:-";NO
7830 FOR I=1 TO NO
7840 INPUT"PLEASE ENTER NAME OF FILE TO BE DELETED:-";X$:IF X$="" THEN PRINT CHR
$(7);"A NAME IS REQUIRED":GOTO 7840
7850 ON ERROR GOTO 7920
7860 OPEN X$ FOR INPUT AS #1
7870 ON ERROR GOTO 0
7880 CLOSE #1
7890 KILL X$
7900 NEXT I
7910 RETURN
7920 PRINT"THIS FILE DOES NOT EXIST"
7930 RESUME 7840
7940 RETURN
7950 ':DISPLAY DISK DIRECTORY-------------------------------------------------
-
```

```
7960 CLS
7970 ON ERROR GOTO 8040
7980 INPUT"WHAT DIRECTORY/DISK MUST BE DISPLAYED";XX$
7990 IF XX$<>"" AND INSTR(XX$,":")=0 THEN PRINT"A DIRECTORY NAME IS REQUIRED":GO
TO 7970
8000 IF XX$="" THEN FILES:GOTO 8020
8010 FILES XX$
8020 PRINT:INPUT"PRESS ANY KEY TO CONTINUE",XX$
8030 RETURN
8040 RESUME 8050
8050 PRINT"ERROR WITH DRIVE";XX$
8060 PRINT:INPUT"PRESS ANY KEY TO CONTINUE",XX$
8070 GOTO 7970
8080 ':USER OPERATION OF MANUAL GATES----------------------------------------

8090 IF Q1$="P" THEN RETURN
8100 CLS:PRINT"DATA REQUIRED FOR OPERATION OF ";D$:PRINT
8110 PRINT"THE USER MAY OPERATE THE GATES IN ONE OF TWO WAYS:-"
8120 PRINT:PRINT"    1.BY DETERMINING A % GATE OPENING FOR EACH INDIVIDUAL GATE
 AT EACH TIME          INTERVAL, OR"
8130 PRINT"    2.BY DETERMINING THE NUMBER OF IDENTICAL GATES TO BE OPENED AT EA
CH TIME          INTERVAL"
8140 PRINT:INPUT"WHICH METHOD DO YOU PREFER(1/2)";Q3
8150 PRINT:INPUT"PLEASE ENTER NUMBER OF TIMESTEPS FOR GATE OPERATION:-",NOSTEP
8160 IF Q3=2 THEN GOTO 8280
8170 CLS:PRINT"YOU HAVE SELECTED TO DETERMINE A % GATE OPENING FOR EACH GATE AT
EACH TIME STEP"
8180 INPUT"IS THIS CORRECT(Y/N)";Q$
8190 IF Q$="N" THEN GOTO 8110
8200 DIM MGATEOP(NOSTEP+1,GATEMNO)
8210 FOR J2=0 TO NOSTEP
8220 PRINT"TIME STEP ";J2:PRINT
8230 FOR J3=1 TO GATEMNO
8240 PRINT"GATE OPENING FOR GATE ";J3:INPUT"%";MGATEOP(J2,J3)
8250 NEXT J3
8260 NEXT J2
8270 RETURN
8280 CLS:PRINT"YOU HAVE SELECTED TO DETERMINE THE NUMBER OF GATES TO BE OPENED A
T EACH TIME    INTERVAL":PRINT
8290 INPUT"IS THIS CORRECT (Y/N)";Q$
8300 IF Q$="N" THEN GOTO 8110
8310 PRINT:PRINT"IF NO VALUE IS ENTERED FOR A TIME STEP THE DEFAULT VALUE DISPLA
YED WILL BE      ACCEPTED":PRINT
8320 DIM MGATEOP(NOSTEP+1)
8330 FOR J2=0 TO NOSTEP
8340 PRINT"NUMBER OF GATES OPEN AT TIME STEP NUMBER";J2:PRINT"DEFAULT=";JJ$
8350 INPUT II$
8360 IF II$="" THEN II$=JJ$
8370 MGATEOP(J2)=VAL(II$)
8380 JJ$=II$
8390 NEXT J2
8400 RETURN
8410 ':USER OPERATION OF HIGH PRESSURE GATES---------------------------------

8420 CLS:PRINT"DATA REQUIRED FOR OPERATION OF ";E$:PRINT
8430 PRINT"THE USER MAY OPERATE THE OUTLETS IN ONE OF TWO WAYS:-"
8440 PRINT:PRINT"    1.BY DETERMINING A % OUTLET OPENING FOR EACH INDIVIDUAL OUT
LET AT EACH TIME       INTERVAL, OR"
8450 PRINT"    2.BY DETERMINING THE NUMBER OF IDENTICAL OUTLETS TO BE OPENED AT
EACH TIME        INTERVAL"
8460 PRINT:INPUT"WHICH METHOD DO YOU PREFER(1/2)";Q4
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