Attachment C

DFDAT84 PROGRAM LISTING (FORTRAN)

```
      PROGRAM DFDAT84
C
C           DAYFLOW DATA DECK CREATION
C           FOR WATER YEAR 8384
C
C                 INDIVIDUAL INPUT DATA FILES ARE READ IN,
C                 PREPARATORY CALCULATIONS ARE MADE, AND
C                 THE OUTPUT IS WRITTEN ON A FILE IN THE
C                 FORMAT REQUIRED TO RUN THE DAYFLOW PGM.
C
      CHARACTER*3 MONTH(11)
      INTEGER BRCR(336), CALR(336), QCCC(336), QDPP(336), FCSL(336)
      INTEGER OPENF(336), OPENP(336), QPREC(336), SDC(336)
      INTEGER SPCR(336), QTPP(336), QCRM(336), QMOKE(336), QSAC(336)
      INTEGER QSJR(336), YOLOW(336), QMISC(336), QYOLO(336)
      INTEGER QDEPL(336), DRCR(336), SWSYBP(336), QMID(336)
      INTEGER YEAR(11), MDAY(11), DATFLG(11), FDAY(11), LDAY(11)
      INTEGER TDAY, TMONTH, FDM, LDM
C
C           OPEN INPUT FILES
C
      OPEN (10,FILE='DFHEAD.DAT')
      OPEN (11,FILE='BRCR84E.DAT')
      OPEN (12,FILE='CALR84.DAT')
      OPEN (13,FILE='CCC84.DAT')
      OPEN (14,FILE='CLBBD84.DAT')
      OPEN (15,FILE='FCSL84.DAT')
      OPEN (16,FILE='GATE84.DAT')
      OPEN (17,FILE='DFGCDLY.DAT')
      OPEN (18,FILE='PREC84.DAT')
      OPEN (19,FILE='SDC84E.DAT')
      OPEN (20,FILE='SPCR84E.DAT')
      OPEN (21,FILE='SWS84.DAT')
      OPEN (22,FILE='TPP84.DAT')
      OPEN (23,FILE='MOKE84.DAT')
      OPEN (24,FILE='CSMR84.DAT')
      OPEN (25,FILE='YOLW84E.DAT')
      OPEN (26,FILE='SJR84.DAT')
      OPEN (27,FILE='SAC84.DAT')
      OPEN (28,FILE='DRCR84E.DAT')
C
C           OPEN OUTPUT FILE
C
      OPEN (100,FILE='DFWY84.DAT',STATUS='NEW')
C
C           READ IN HEADERS
C
      READ (10,101)  TDAY, TMONTH
      READ (10,102)  ( YEAR(M), MONTH(M), MDAY(M), DATFLG(M),
     1                M=1,TMONTH )
```

```
C
C           DETERMINATION OF I / O FLAGS
C
            FDAY(1) = 1
            LDAY(1) = MDAY(1)
      DO 300 M=2,TMONTH
            FDAY(M) = LDAY(M - 1) + 1
            LDAY(M) = FDAY(M) + MDAY(M) - 1
  300 CONTINUE
C
C           READ INPUT DATA
C
      DO 400 M=1,TMONTH
            FDM = FDAY(M)
            LDM = LDAY(M)
            READ (11,111)   ( BRCR(I),  I=FDM,LDM )
            READ (12,111)   ( CALR(I),  I=FDM,LDM )
            READ (13,111)   ( QCCC(I),  I=FDM,LDM )
            READ (14,111)   ( QDPP(I),  I=FDM,LDM )
            READ (15,111)   ( FCSL(I),  I=FDM,LDM )
            READ (16,161)   ( OPENF(I), OPENP(I),  I=FDM,LDM)
            READ (17,111)   ( QDEPL(I),  I=FDM,LDM )
            READ (18,111)   ( QPREC(I),  I=FDM,LDM )
            READ (19,111)   ( SDC(I),   I=FDM,LDM )
            READ (20,111)   ( SPCR(I),  I=FDM,LDM )
            READ (21,111)   ( SWSYBP(I),  I=FDM,LDM )
            READ (22,111)   ( QTPP(I),  I=FDM,LDM )
            READ (23,231)   ( QMOKE(I),  I=FDM,LDM )
            READ (24,231)   ( QCRM(I),  I=FDM,LDM )
            READ (25,231)   ( YOLOW(I),  I=FDM,LDM )
            READ (26,231)   ( QSJR(I),  I=FDM,LDM )
            READ (27,271)   ( QSAC(I),  I=FDM,LDM )
            READ (28,231)   ( DRCR(I),  I=FDM,LDM )
  400 CONTINUE
C
C          CALCULATION OF QMISC
C
      DO 500 I=1,TDAY
            QMISC(I) = BRCR(I) + CALR(I) + FCSL(I) + SDC(I) + DRCR(I)
  500 CONTINUE
C
C           CALCULATION OF QYOLO
C
      DO 600 I=1,TDAY
            QYOLO(I) = YOLOW(I) + SWSYBP(I) + SPCR(I)
  600 CONTINUE
C
C           INPUT QMID AS ZERO
C
      DO 700 I=1,TDAY
```

```
            QMID(I) = 0
  700 CONTINUE
C
C           WRITE DATA DECK FILE
C
      DO 800 M=1,TMONTH
            FDM = FDAY(M)
            LDM = LDAY(M)
            WRITE(100,1010)  YEAR(M), MONTH(M), MDAY(M)
            WRITE(100,1020)  ( QSJR(I), I=FDM,LDM )
            WRITE(100,1020)  ( QCRM(I), I=FDM,LDM )
            WRITE(100,1020)  ( QMOKE(I), I=FDM,LDM )
            WRITE(100,1020)  ( QMISC(I), I=FDM,LDM )
            WRITE(100,1020)  ( QYOLO(I), I=FDM,LDM )
            WRITE(100,1020)  ( QSAC(I), I=FDM,LDM )
            WRITE(100,1020)  ( QMID(I), I=FDM,LDM )
            WRITE(100,1020)  ( QCCC(I), I=FDM,LDM )
            WRITE(100,1020)  ( QTPP(I), I=FDM,LDM )
            WRITE(100,1020)  ( QDPP(I), I=FDM,LDM )
            WRITE(100,1020)  ( QDEPL(I), I=FDM,LDM )
            WRITE(100,1020)  ( QPREC(I), I=FDM,LDM )
            WRITE(100,1030)  ( OPENF(I), OPENP(I), I=FDM,LDM )
            WRITE(100,1040)  DATFLG(M)
  800 CONTINUE
C
C           FORMAT STATEMENTS
C
  101 FORMAT(10X,I5,1X,I4)
  102 FORMAT(11X,I4,1X,A4,1X,I4,1X,I4)
  111 FORMAT(6X,11(I6,1X)/(6X,11(I6,1X)))
  161 FORMAT(6X,22(I3,1X)/(6X,22(I3,1X)))
  231 FORMAT(25X,8I7/25X,8I7)
  271 FORMAT(25X,8(I6,1X)/(25X,8(I6,1X)))
 1010 FORMAT(10X,I4,A4,I4)
 1020 FORMAT(6X,11I6/6X,11I6)
 1030 FORMAT(6X,22I3/6X,22I3)
 1040 FORMAT(10X,I4)
C
C           END OF PROGRAM
C
      STOP 123
      END
```

Attachment D

DAYFLO2 PROGRAM LISTING

(REVISED DAYFLOW - FORTRAN)

```
      PROGRAM DAYFLO2
      DIMENSION QSJR(31),QCRM(31),QMOKE(31),QMISC(31),QSAC(31)
      DIMENSION QYOLO(31),QCCC(31),QTPP(31),QXGEO(31),QDPP(31)
      DIMENSION QEAST(31),QMID(31),QTOT(31),QCD(31),QRIO(31)
      DIMENSION QEXP(31),QOUT(31),QDIVER(31),NDAYS(31),QEFFECT(31)
      DIMENSION QDEPL(31),QPREC(31),QSFCD(31),QWEST(31),QEFFDIV(31)
      DIMENSION OPENF(31),OPENP(31),OPEN(31),PART(31),CLOSE(31)
C
C
C
C
C                        * * * * * * * * * * * * * * * * *
C                          * * *  PROGRAMMED  BY  * * *
C                            * * *  VIC  CHICO  * * *
C                        * * * * * * C . D . * * * * * * *
C
C LINE75 AND HEADINGS WERE MODIFIED 12/17/84 FOR 83-84 WY ADDENDUM.
C
C            COLUMN    VARIABLE                DESCRIPTION
C               1        QSJR      SAN JOAQUIN RIVER NEAR VERNALIS FLOW
C               2        QCRM      COSUMNES RIVER AT MCCONNELL FLOW
C               3       QMOKE      MOKELUMNE RIVER AT WOODBRIDGE FLOW
C               4       QMISC      MISCELLANEOUS FLOWS WHICH INCLUDES CALAV
C                                  RAS RIVER,BEAR CREEK,MARSH CREEK,MORRISO
C                                  CREEK,DRY CREEK,STOCKTON DIVERTING CANAL
C                                  AND FRENCH CAMP SLOUGH.
C               5       QEAST      SUM OF SAN JOAQUIN RIVER,COSUMNES RIVER,
C                                  MOKELUMNE RIVER AND MISCELLANEOUS FLOWS.
C               6        QSAC      SACRAMENTO RIVER AT EYE STREET BRIDGE
C               7       QYOLO      YOLO BY PASS NEAR WOODLAND WHICH INCLUDE
C                                  SACRAMENTO WEIR SPILL TO YOLO BY PASS AN
C                                  SOUTH FORK PUTAH CREEK NEAR DAVIS.
C               8        QTOT      TOTAL INFLOW TO THE DELTA
C               9       QXGEO      FLOW AT DELTA CROSS CHANNEL AND GEORGIA-
C                                  NA SLOUGH.
C              10        QMID      MIDDLE RIVER PUMPING
C              11        QCCC      CONTRA COSTA CANAL PUMPING
C              12        QTPP      USBR TRACY PUMPING PLANT
C              13        QDPP      SWP DELTA PUMPING PLANT. CLIFTON COURT
C                                  FERRY MINUS BETHANY DIVERSION
C              14        QEXP      TOTAL EXPORTS.
C              15       QDEPL      GROSS CHANNEL DEPLETION
C              16       QPREC      PRECIPITATION TAKEN AT STOCKTON FIRE
C                                  STATION NO. 4
C              17         QCD      NET CHANNEL DEPLETION
C              18       QSFCD      65 PERCENT OF NET CHANNEL DEPLETION
C              19      QDIVER      PERCENT DIVERTED WHICH IS EQUAL TO TOTAL
C                                  EXPORTS PLUS NET CHANNEL DEPLETION DIVID
C                                  BY TOTAL INFLOW.
C              20       QWEST      FLOWS AT SAN JOAQUIN RIVER FROM WESTERN
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C                                          DELTA
C                 21        QOUT           TOTAL DELTA OUTFLOW AT CHIPPS ISLAND
C                 22      QEFFDIV          EFFECTIVE PERCENT DIVERTED FOR STRIPED
C                                          BASS SURVIVAL.
      OPEN(60,FILE='DAYCHEK')
      OPEN(61,FILE='OUTPUT')
   50 READ(60,30) IYEAR,IMO,KDAYS
   30 FORMAT(10X,I4,A4,I4)
C     ALL FLOWS ARE READ IN CUBIC FEET PER SECOND (CFS)
      READ(60,10) (QSJR(I) ,I=1,KDAYS)
      READ(60,10) (QCRM(I) ,I=1,KDAYS)
      READ(60,10) (QMOKE(I),I=1,KDAYS)
      READ(60,10) (QMISC(I),I=1,KDAYS)
      READ(60,10) (QYOLO(I),I=1,KDAYS)
      READ(60,10) (QSAC(I) ,I=1,KDAYS)
      READ(60,10) (QMID(I) ,I=1,KDAYS)
      READ(60,10) (QCCC(I) ,I=1,KDAYS)
      READ(60,10) (QTPP(I) ,I=1,KDAYS)
      READ(60,10) (QDPP(I) ,I=1,KDAYS)
      READ(60,10) (QDEPL(I),I=1,KDAYS)
      READ(60,10) (QPREC(I),I=1,KDAYS)
      READ(60,11)(OPENF(I),OPENP(I),I=1,KDAYS)
   55 CONTINUE
   10 FORMAT(6X,11F6.0)
   11 FORMAT(6X,11(F3.0,F3.0)/(6X,11(F3.0,F3.0)))
      KOUNT=0
      TSJR=0
      TCRM=0
      TMOKE=0
      TMISC=0
      TEAST=0
      TSAC=0
      TYOLO=0
      TTOT=0
      TXGEO=0
      TMID=0
      TCCC=0
      TTPP=0
      TDPP=0
      TEXP=0
      TDEPL=0
      TPREC=0
      TCD=0
      TSFCD=0
      TWEST=0
      TOUT=0
      TEFFECT=0
      DO 20 I=1,KDAYS
      KOUNT = KOUNT + 1
      NDAYS(I) = KOUNT
```

```
      QEAST(I) = QSJR(I)+QCRM(I)+QMOKE(I)+QMISC(I)
      QTOT(I) = QSAC(I)+QYOLO(I)+QEAST(I)
C     DELTA CROSS CHANNEL AND GEORGINIANA FLOWS BASED ON THE LATEST CURV
C        OPENF = FULLY OPEN      OPENP = PARTIALLY OPEN
      OPEN(I) = OPENF(I)/100
      PART(I) = OPENP(I)/100
 4500 CONTINUE
C
C              GATES FULLY OPENED IN A DAY
C
      IF(OPEN(I).EQ.0.AND.PART(I).EQ.0) GO TO 21
      GO TO 22
   21 QXGEO(I)=(0.293*QSAC(I)+2090)
      GO TO 5
   22 IF(OPEN(I).NE.0.AND.PART(I).EQ.0) GO TO 23
      GO TO 25
C
C              GATES FULLY CLOSED IN A DAY
C
   23 CLOSE(I)=1-(OPEN(I))
      IF(CLOSE(I).EQ.0) GO TO 24
      GO TO 26
   24 QXGEO(I)=(0.133*QSAC(I)+829)
      GO TO 5
C
C              GATES OPENED AND CLOSED IN A DAY
C
   26 LOG1=OPEN(I)*(0.293*QSAC(I)+2090)
      LOG2=CLOSE(I)*(0.133*QSAC(I)+829)
      QXGEO(I)=LOG1+LOG2
      GO TO 5
C
C              GATES PARTIALLY OPENED AND CLOSED IN A DAY
C
   25 IF(OPEN(I).EQ.0.AND.PART(I).NE.0) GO TO 27
      GO TO 28
   27 CLOSE(I)= 1-PART(I)
      LOG1=PART(I)*(0.216*QSAC(I)+2660)
      LOG2=CLOSE(I)*(0.133*QSAC(I)+829)
      QXGEO(I)=LOG1+LOG2
      GO TO 5
C
C              GATES FULLY OPENED AND PARTIALLY OPENED AND/OR OPENED,
C              PARTIALLY OPENED AND CLOSED IN A DAY
C
   28 IF(OPEN(I).NE.0.AND.PART(I).NE.0) CLOSE(I)=1-(OPEN(I)+PART(I))
      LOG1=OPEN(I)*(0.293*QSAC(I)+2090)
      LOG2=PART(I)*(0.216*QSAC(I)+2660)
      LOG3=CLOSE(I)*(0.133*QSAC(I)+829)
      QXGEO(I)=LOG1+LOG2+LOG3
```

```
C
    5 QEXP(I) = QCCC(I)+QTPP(I)+QDPP(I)+QMID(I)
      QCD(I) = QDEPL(I)-QPREC(I)
      QSFCD(I) = 0.65 * QCD(I)
      IF(QCD(I).LE.0.AND.ABS(QCD(I)).GE.QEXP(I)) GO TO 15
      GO TO 16
   15 QDIVER(I) = 0.
      GO TO 17
   16 QDIVER(I) = ((QEXP(I) + QCD(I)) / QTOT(I)) * 100
   17 QWEST(I) = QEAST(I)+QXGEO(I)-QEXP(I)-QSFCD(I)
      QOUT(I) = QTOT(I)-QCD(I)-QEXP(I)
C              FOR DELTA STRIPED BASS STUDY
C         QEFFECT        EFFECTIVE INFLOW WHICH IS COMPUTED BASED ON TWO
C                        CONDITIOS:
C
C                      1. IF EXPORTS PLUS 42\ OF CHANNEL DEPLETION IS GREA
C                         OR EQUAL TO SAN JOAQUIN RIVER FLOW THEN EFFECTIV
C                         INFLOW EQUALS TOTAL INFLOW MINUS SAN JOAQUIN RI-
C                         VER FLOW.
C
C                      2. IF EXPORTS PLUS 42\ OF  CHANNEL DEPLETION IS LES
C                         THAN SAN JOAQUIN RIVER FLOW THEN EFFECTIVE INFLO
C                         EQUALS TOTAL INFLOW MINUS THE LESSER OF 65\ OF
C                         SAN JOAQUIN RIVER FLOW PLUS 15\ OF CHANNEL DEPLE
C                         TION  OR  EXPORTS PLUS 42\ OF CHANNEL DEPLETION.
C
      CHECK1=(0.42*QCD(I)+QEXP(I))
      IF(CHECK1.GE.QSJR(I)) GO TO 70
      GO TO 80
   70 QEFFECT(I)=QTOT(I)-QSJR(I)
      GO TO 90
   80 CHECK2=(0.65*QSJR(I)+0.15*QCD(I))
      IF(CHECK2.LT.CHECK1) GO TO 110
      GO TO 120
  110 QEFFECT(I)=QTOT(I)-CHECK2
      GO TO 90
  120 QEFFECT(I)=QTOT(I)-CHECK1
   90 IF(QEFFECT(I).LE.QOUT(I)) GO TO 91
      GO TO 93
   91 QEFFDIV(I) = 0.
      GO TO 92
   93 QEFFDIV(I)=((QEFFECT(I)-QOUT(I))/QEFFECT(I))*100
   92 CONTINUE
C
      TSJR = TSJR + QSJR(I)
      TCRM = TCRM + QCRM(I)
      TMOKE = TMOKE + QMOKE(I)
      TMISC = TMISC + QMISC(I)
      TEAST = TEAST + QEAST(I)
      TSAC = TSAC + QSAC(I)
```

```
      TYOLO = TYOLO + QYOLO(I)
      TTOT = TTOT + QTOT(I)
      TXGEO = TXGEO + QXGEO(I)
      TMID = TMID + QMID(I)
      TCCC = TCCC + QCCC(I)
      TTPP = TTPP + QTPP(I)
      TDPP = TDPP + QDPP(I)
      TEXP = TEXP + QEXP(I)
      TDEPL = TDEPL + QDEPL(I)
      TPREC = TPREC + QPREC(I)
      TCD = TCD + QCD(I)
      TEFFECT=TEFFECT+QEFFECT(I)
      TSFCD = TSFCD + QSFCD(I)
      TWEST = TWEST + QWEST(I)
      TOUT = TOUT + QOUT(I)
      TDAYS = NDAYS(I)
   20 CONTINUE
C
      ASJR = TSJR/TDAYS
      ACRM = TCRM/TDAYS
      AMOKE = TMOKE/TDAYS
      AMISC = TMISC/TDAYS
      AEAST = TEAST/TDAYS
      ASAC = TSAC/TDAYS
      AYOLO = TYOLO/TDAYS
      ATOT = TTOT/TDAYS
      AXGEO = TXGEO/TDAYS
      AMID = TMID/TDAYS
      ACCC = TCCC/TDAYS
      ATPP = TTPP/TDAYS
      ADPP = TDPP/TDAYS
      AEXP = TEXP/TDAYS
      ADEPL = TDEPL/TDAYS
      APREC = TPREC/TDAYS
      ACD = TCD/TDAYS
      AEFFECT=TEFFECT/TDAYS
      ASFCD = TSFCD/TDAYS
      IF(ACD.LE.0.AND.ABS(ACD).GE.AEXP) GO TO 41
      GO TO 42
   41 ADIVER = 0
      GO TO 43
   42 ADIVER = ((AEXP + ACD) / ATOT) * 100
   43 CONTINUE
      AWEST = TWEST/TDAYS
      AOUT = TOUT/TDAYS
      IF(AOUT.GE.AEFFECT) GO TO 31
      GO TO 32
   31 AEFFDIV=0
      GO TO 33
   32 AEFFDIV=((AEFFECT-AOUT)/AEFFECT)*100
```

```
   33 CONTINUE
      DO 9000 I=1,KDAYS
 9000 QRIO(I)=QSAC(I)+QYOLO(I)-QXGEO(I)-.28*QCD(I)
C
      WRITE(61,100)
      WRITE(61,800) IYEAR
      WRITE(61,900) IMO
      WRITE(61,200)
      WRITE(61,300)
      WRITE(61,400)
      WRITE(61,1000) (NDAYS(I),QSJR(I),QCRM(I),QMOKE(I),QMISC(I),QEAST(I
     $               ),QSAC(I),QYOLO(I),QTOT(I),QXGEO(I),QMID(I),QCCC(I)
     $               ,I=1,KDAYS)
      WRITE(61,2000)  TSJR,TCRM,TMOKE,TMISC,TEAST,TSAC,TYOLO,TTOT,TXGEO,
     $                TMID,TCCC
      WRITE(61,3000)  ASJR,ACRM,AMOKE,AMISC,AEAST,ASAC,AYOLO,ATOT,AXGEO,
     $                AMID,ACCC
      WRITE(61,100)
      WRITE(61,800) IYEAR
      WRITE(61,900) IMO
      WRITE(61,500)
      WRITE(61,600)
      WRITE(61,700)
      WRITE(61,4000) (NDAYS(I),QTPP(I),QDPP(I),QEXP(I),QDEPL(I),QPREC(I)
     *               ,QCD(I),QEFFECT(I),QDIVER(I),QWEST(I),QOUT(I),
     $               QEFFDIV(I),I=1,KDAYS)
      WRITE(61,2500) TTPP,TDPP,TEXP,TDEPL,TPREC,TCD,TEFFECT,TWEST,TOUT
      WRITE(61,3500) ATPP,ADPP,AEXP,ADEPL,APREC,ACD,AEFFECT,ADIVER,
     *               AWEST,AOUT,AEFFDIV
C
      READ(60,40) KONTROL
      IF(KONTROL.EQ.1111) GO TO 50
      CONTINUE
      IF(KONTROL.EQ.9999) STOP 123
C
   40 FORMAT(10X,I4)
  100 FORMAT(1H1,///43X,46HHISTORIC VALUES IN CUBIC FEET PER SECOND (CFS
     $)///)
  800 FORMAT(56X,13HCALENDAR YEAR,2X,I4///)
  900 FORMAT(52X,23HFLOWS FOR THE MONTH OF ,A4)
  200 FORMAT(1H0/,15X,111H   SAN JOA-  COSUMNES MOKELUMNE     MISC.  SUB
     *TOTAL SACRAMEN-      YOLO      TOTAL  DEL-X-CH    MISC.      CONTRA)
  300 FORMAT(1H0,6X,4HDATE,5X,110H  QUIN RIV  RIVER AT  RIVER AT    STRE
     *AM  SJR+COS+  TO RIVER    BYPASS    INFLOW GEORGIANA DIVERSION
     $ COSTA)
  400 FORMAT(1H0,15X,110H  VERNALIS  MICH.BAR WODBRIDGE     FLOWS MOKE+M
     *ISC  FREEPORT      FLOW      (CFS)      FLOW      (CFS)   PUMPING/)
  500 FORMAT(1H0/,15X,111H      TRACY   CLIFTON     TOTAL GROSS CHN    P
     *RECI-  NET CHN. EFFECTIVE   PERCENT  SJR FLOW   OUTFLOW EFFECTIVE)
  600 FORMAT(1H0,6X,4HDATE,5X,110H   PUMPING     COURT   EXPORTS DEPLETI
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    *ON  PITATION DEPLETION    INFLOW  DIVERTED  FR. WES-    CHIPPS   P
    $ERCENT)
 700 FORMAT(1H0,15X,110H     PLANT    INFLOW     (CFS)      (CFS)      (C
    $FS)      (CFS)      (CFS)            TERN DELT    ISLAND  DIVERTED/)
1000 FORMAT(1H ,6X,I4,5X,11F10.0)
2000 FORMAT(1H0,5X,10HSUMMATION ,11F10.0)
2500 FORMAT(1H0,5X,10HSUMMATION ,7F10.0,10X,2F10.0)
3000 FORMAT(1H0,5X,10HAVERAGE   ,11F10.0)
3500 FORMAT(1H0,5X,10HAVERAGE   ,7F10.0,7X,F3.0,2F10.0,7X,F3.0)
4000 FORMAT(1H ,6X,I4,5X,7F10.0,7X,F3.0,2F10.0,7X,F3.0)
     END
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