ARIZONA DEPARTMENT OF TRANSPORTATION

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SIMPLIFIED BRIDGE LOAD RATING METHODOLOGY USING THE NATIONAL BRIDGE INVENTORY FILE

Volume II: Program Listing

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16. ABSTRACT

The purpose of this research was to develop a computerized system to determine the adequacy of a bridge or group of bridges to carry specified overload vehicles. The system utilizes two levels of analysis. The Level 1 analysis is the basic rating system for the Arizona Department of Transportation. This analysis computes the overload capacity with a limited amount of data. A Level 2 evaluation, which conducts a more detailed evaluation, uses an enhanced NBIF database, Standard Plans, or a more detailed analysis similar to Brass. A Special Level 2 analysis was also developed to analyze continuous slab bridges by utilizing data from standard slab plans.

Detailed case studies were conducted on twenty-five typical Arizona bridges to verify the methodology used in the Level 1 procedure and to correlate the bridge plans with data in the NBIF. The Level 1 procedure gives ratings which are within 10% of the Level 2 procedure for bridges which satisfy the level one assumptions. Similarly, the Special Level 2 analysis for reinforced concrete continuous bridges gives ratings within 10% of the Level 2 analysis. The NBIF compared well with general bridge plans and is applicable to Level 1 analysis for "typical bridges".

The research results are reported in three documents:
1. Final Report
2. Volume I: Users Manual
3. Volume II: Program Listing

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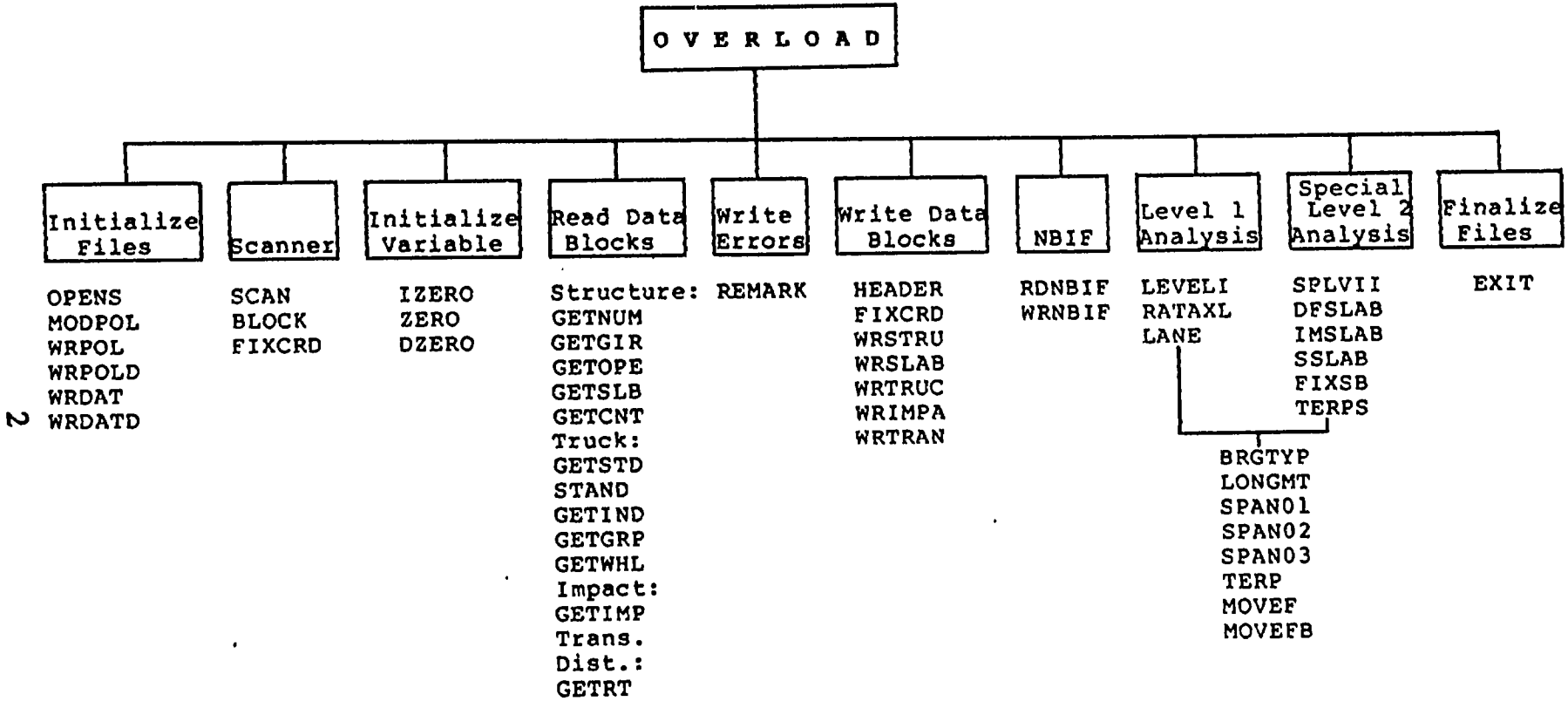

FIGURE 1. OVERLOAD SUBROUTINE CHART

```
C
C
C   THIS PROGRAM CREATES A SEQUENTIAL FILE OF A REDUCED NBIF
C
C ---------------------------------------------------------------
C
C   CALLS TO :  NONE
C
C ---------------------------- ----------------------------------
C
C   VARIABLE DEFINITION
C
C        N       - NUMBER OF RE ORDS IN THE NBIF
C        REC1    - STATE CODE
C        IREC2   - STRUCTURE NUMBER
C        REC3A   - INVENTORY ROUTE
C        REC3B   - INVENTORY ROUTE
C        REC4    - STATE HIGHWAY DEPARTMENT DISTRICT
C        REC5    - COUNTY (PARISH)
C        REC6    - CITY/TOWN CODE
C        REC7    - FEATURES INTERSECTED
C        REC8    - FACILITY CARRIED BY STRUCTURE
C        REC9    - LOCATION
C        IREC10  - INVENTORY ROUTE, MIN. VERTICAL CLEARANCE
C        IREC11  - MILEPOINT
C        REC12   - ROAD SECTION NUMBER
C        REC13   - BRIDGE DESCRIPTION
C        IREC14  - DEFENSE MILEPOINT
C        IREC15  - DEFENSE SECTION LENGTH
C        IREC16  - LATITUDE
C        IREC17  - LONGITUDE
C        IREC18  - PHYSICAL VULNERABILITY
C        IREC19  - BYPASSS, DETOUR LENGTH
C        IREC20  - TOLL
C        IREC21  - CUSTODIAN
C        IREC22  - OWNER
C        REC23   - FEDERAL-AID PROJECT NUMBER
C        IREC24  - HIGHWAY SYSTEM
C        IREC25  - ADMINISTRATIVE JURISDICTION
C        IREC26  - FUNCTIONAL CLASSIFICATION
C        IREC27  - YEAR BUILT
C        IREC28  - LANES ON AND UNDER STRUCTURE
C        IREC29  - AVERAGE DAILY TRAFFIC
C        IREC30  - YEAR OF AVERAGE DAILY TRAFFIC
C        IREC31  - DESIGN LOAD
C        IREC32  - APPROACH ROADWAY WIDTH
C        IREC33  - BRIDGE MEDIAN
C        IREC34  - SKEW
C        IREC35  - STRUCTURE FLARED
C        REC36   - TRAFFIC SAFETY FEATURES
C        IREC37  - NAVIGATION CONTROL
C        IREC38  - NAVIGATION VERTICAL CLEARANCE
C        IREC39  - NAVIGATION HORIZONTAL CLEARANCE
C        REC40   - STRUCTURE OPEN, POSTED, CLOSED TO TRAFFIC
C        IREC41  - TYPE SERVICE
C        IREC42  - STRUCTURE TYPE, MAIN
C        IREC43  - STRUCTURE TYPE, APPROACH SPANS
```

```
C
C        IREC44  - NUMBER OF SPANS IN MAIN UNIT
C        IREC45  - NUMBER OF APPROACH SPANS
C        IREC46  - TOTAL HORIZONTAL CLEARANCE
C        IREC47  - LENGTH OF MAXIMUM SPAN
C        IREC48  - STRUCTURE LENGTH
C        IREC49  - CURB OR SIDEWALK WIDTHS
C        IREC50  - BRIDGE ROADWAY WIDTH, CURB TO CURB
C        IREC51  - DECK WIDTH, OUT TO OUT
C        IREC52  - MIN. VERTICAL CLEARANCE OVER BRIDGE ROADWAY
C        IREC53  - MIN. VERTICAL UNDERCLEARANCE
C        IREC54  - MIN. LATERAL UNDERCLEARANCE ON RIGHT
C        IREC55  - MIN. LATERAL UNDERCLEARANCE ON LEFT
C        REC56   - WEARING SURFACE - PROTECTIVE SYSTEM
C        REC57   - DECK
C        REC58   - SUPERSTRUCTURE
C        REC59   - SUBSTRUCTURE
C        REC60   - CHANNEL AND CHANNEL PROTECTION
C        REC61   - CULVERT AND RETAINING WALLS
C        IREC62  - ESTIMATE REMAINING LIFE
C        IREC63  - OPERATING RATING
C        REC64   - APPROACH ROADWAY ALIGNMENT
C        IREC65  - INVENTORY RATING
C        REC66   - STRUCTURAL CONDITION
C        REC67   - DECK GEOMETRY
C        REC68   - UNDERCLEARANCES, VERTICAL AND HORIZONTAL
C        REC69   - SAFE LOAD CAPACITY
C        REC70   - WATERWAY ADEQUACY
C        REC71   - APPROACH ROADWAY ALIGNMENT
C        IREC72  - YEAR NEEDED
C        IREC73  - TYPE OF SERVICE
C        IREC74  - TYPE OF WORK
C        IREC75  - LENGTH OF IMPROVEMENT
C        IREC76  - PROPOSED DESIGN LOADING OF IMPROVEMENT
C        IREC77  - PROPOSED ROADWAY WIDTH
C        IREC78  - PROPOSED NUMBER OF LANES
C        IREC79  - DESIGN ADT
C        IREC80  - YEAR OF ESTIMATED ADT
C        IREC81  - YEAR OF PROPOSED ADJACENT ROADWAY IMPROVEMENTS
C        IREC82  - TYPE OF PROPOSED ADJACENT ROADWAY IMPROVEMENTS
C        IREC83  - COST OF IMPROVEMENTS
C        IREC84  - P.E. COST
C        REC85   - DEMOLITION COST
C        IREC86  - SUBSTRUCTURE COST
C        IREC87  - SUPERSTRUCTURE COST
C        IREC88  - DATE OF LAST INSPECTION
C        REC89   - SUFFICIENCY RATING
C        REC90   - RESERVED SPACE FOR WASHING OFFICE
C
C ------------------------------------------------------------
C
C   MODIFICATION LOG
C
C      07/01/1986    RAS    INITIAL CODING
C
C ------------------------------------------------------------
C
      REAL*8  REC50
C
      INTEGER I,II,N,IREC21
      INTEGER  IREC2,IREC10,IREC11,                    IREC14,IREC15,
```

```
C
     1         IREC16,IREC17,IREC18,IREC19,IREC20,IREC21,IREC22,
     2               IREC24,IREC25,IREC26,IREC27,IREC28,IREC29,
     3         IREC30,IREC31,IREC32,IREC33,IREC34,IREC35,
     4         IREC37,IREC38,IREC39,       IREC41,IREC42,IREC43,
     5         IREC44,IREC45,IREC46,IREC47,IREC48,IREC49,IREC50,
     6         IREC51,IREC52,IREC53,IREC54,IREC55,
     7                                     IREC62,IREC63,
     8         IREC65,
     9         IREC72,IREC73,IREC74,IREC75,IREC76,IREC77,IREC78,
     A         IREC79,IREC80,IREC81,IREC82,IREC83,IREC84,
     B         IREC86,IREC87,IREC88
C
      INTEGER  KK(17)
      CHARACTER*1  CK1,CK5,CK6,CK7,CK8,CK9,CK10
      CHARACTER*9  CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
      CHARACTER*1  BL1,BL5,BL6,BL7,BL8,BL9,BL10
      CHARACTER*9  BL2
      CHARACTER*18 BL3
      CHARACTER*25 BL4
C
      CHARACTER*3   REC1,REC5,REC85
      CHARACTER*8   REC3B
      CHARACTER*2   REC4,REC13
      CHARACTER*4   REC6,REC36
      CHARACTER*18  REC8
      CHARACTER*25  REC7,REC9
      CHARACTER*7   REC23
      CHARACTER*1   REC3A,REC40,REC56,REC57,REC61,REC66,REC67,REC68
      CHARACTER*1   REC69,REC70,REC71,REC64,REC60,REC58,REC59
      CHARACTER*5   REC12,REC89
      CHARACTER*28  REC90
C
       DATA    BL1    /' '/
       DATA    BL2    /'         '/
       DATA    BL3    /'                   '/
       DATA    BL4    /'                            '/
       DATA    BL5    /' '/
       DATA    BL6    /' '/
       DATA    BL7    /' '/
       DATA    BL8    /' '/
       DATA    BL9    /' '/
       DATA    BL10   /' '/
C
C      OPEN THE FILES
C
       CALL INIT
C
       READ(5,10) N
10     FORMAT(I5)
C
       IREC2=0
       IREC2I=0
C
C      READ IN THE NBIF
C
       DO 500 II=1,N
C
       READ(5,20)   REC1, IREC2,REC3A,REC3B,  REC4,  REC5,  REC6,  REC7,
```

```
C
     1             REC8,  REC9,      IREC10,IREC11, REC12, REC13,IREC14,
     2            IREC15,IREC16,     IREC17,IREC18,IREC19,IREC20,IREC21,
     3            IREC22, REC23,     IREC24,IREC25,IREC26,IREC27,IREC28,
     4            IREC29,IREC30,     IREC31,IREC32,IREC33,IREC34,IREC35,
     5             REC36,IREC37,     IREC38,IREC39, REC40,IREC41,IREC42,
     6            IREC43,IREC44,     IREC45,IREC46,IREC47,IREC48,IREC49,
     7            IREC50,IREC51,     IREC52,IREC53,IREC54,IREC55, REC56,
     8             REC57, REC58,      REC59, REC60, REC61,IREC62,IREC63,
     9             REC64,IREC65,      REC66, REC67, REC68, REC69, REC70,
     A             REC71,IREC72,     IREC73,IREC74,IREC75,IREC76,IREC77,
     B            IREC78,IREC79,     IREC80,IREC81,IREC82,IREC83,IREC84,
     C             REC85,IREC86,     IREC87,IREC88, REC89, REC90
C
C     CHECK FOR UNDERCROSSINGS
C
      IF( IREC2 .EQ. IREC2I .AND. REC3A .EQ. '2') GOTO 400
C
      NI = IREC2I + 1
C
C     IDENTIFY STRUCTURES THAT ARE SEQUENTIALLY MISSING
C     BY USING THE BRIDGE NUMBER
C
      IF(IREC2 .EQ. NI) GOTO 100
      NF = IREC2 - 1
         DO 50 I=1,17
           KK(I)=0
 50      CONTINUE
         CK1 = BL1
         CK2 = BL2
         CK3 = BL3
         CK4 = BL4
         CK5 = BL5
         CK6 = BL6
         CK7 = BL7
         CK8 = BL8
         CK9 = BL9
         CK10= BL10 .
C
C     ZERO OUT INFORMATION FOR MISSING STRUCTURES
C
      DO 60 I = NI,NF
         WRITE(6,70)KK(1),CK1,CK2,CK3,CK4,(KK(J),J=2,7),CK5,
     1              (KK(J),J=8,15),CK6,CK7,CK8,CK9,(KK(J),J=16,17),
     2              CK10
 60   CONTINUE
C
C     WRITE OUT SEQUENTIAL REDUCED NBIF
C
 100  WRITE(6,70)         IREC2,REC3A,REC3B,
     1             REC8,  REC9,            IREC11,
     2
     3                                                 IREC27,
     4           IREC29,IREC30,            IREC32,     IREC34,
     5                                             REC40,      IREC42,
     6           IREC43,IREC44,     IREC45,      IREC47,IREC48,
     7           IREC50,            IREC52,                   REC56,
     8            REC57, REC58,      REC59,                  IREC63,
     9                  IREC65,      REC66
C
 400  IREC2I=IREC2
```

```
C
 500  CONTINUE
C
 20   FORMAT (       A3,    I15,      A1,A8,     A2,     A3,     A4,    A25,
     1              A18,    A25,         I4,     I5,     A5,     A2,     I4,
     2               I3,     I5,         I6,     I1,     I2,     I1,     I1,
     3               I1,     A7,         I2,     I1,     I2,     I4,     I4,
     4               I6,     I2,         I1,     I3,     I1,     I2,     I1,
     5               A4,     I1,         I3,     I4,     A1,     I2,     I3,
     6               I3,     I3,         I4,     I3,     I4,     I6,     I6,
     7               I4,     I4,         I4,     I4,     I3,     I3,     A1,
     8               A1,     A1,         A1,     A1,     A1,     I2,     I3,
     9               A1,     I3,         A1,     A1,     A1,     A1,     A1,
     A               A1,     I2,         I1,     I3,     I6,     I1,     I4,
     B               I2,     I6,         I2,     I2,     I1,     I5,     I3,
     C               A3,     I5,         I5,     I6,     A5,    A28)
C
 70   FORMAT(I15,A1,A8,A18,A25,I5,I4,I6,I2,I3,
     1       I2,A1,3I3,2I4,I6,2I4,4A1,2I3,A1)
C
C     CLOSE THE FILES
C
      CALL CLOSIT
C
      STOP
      END
```

```
$DEBUG
C
C ****************************************************************
C
C  DATABASE - CREATE ARIZONA DIRECT ACCESS FILE FROM REDUCED NBIF
C
C ----------------------------------------------------------------
C
C  CALLS TO : NONE
C
C ----------------------------------------------------------------
C
C  VARIABLE DEFINITION
C
C     NREC    - NO. RECORDS IN NBIF
C     KK(1)   - STRUCTURE NUMBER
C     CK1     - INVENTORY ROUTE
C     CK2     - INVENTORY ROUTE
C     CK3     - FACILITY CARRIED BY STRUCTURE
C     CK4     - LOCATION
C     KK(2)   - MILEPOINT
C     KK(3)   - YEAR BUILT
C     KK(4)   - AVERAGE DAILY TRAFFIC
C     KK(5)   - YEAR OF AVERAGE DAILY TRAFFIC
C     KK(6)   - APPROACH ROADWAY WIDTH
C     KK(7)   - SKEW
C     CK5     - OPEN, CLOSED, POSTED TO TRAFFIC
C     KK(8)   - STRUCTURE TYPE, MAIN
C     KK(9)   - STRUCTURE TYPE, APPROACH SPANS
C     KK(10)  - NO. OF SPANS IN MAIN UNIT
C     KK(11)  - NO. OF APPROACH SPANS
C     KK(12)  - LENGTH OF MAXIMUM SPAN
C     KK(13)  - STRUCTURE LENGTH
C     KK(14)  - BRIDGE WIDTH, CURB TO CURB
C     KK(15)  - MINIMUM VERTICAL CLEARANCE
C     CK6     - WEARING SURFACE
C     CK7     - DECK CONDITION
C     CK8     - SUPERSTRUCTURE CONDITION
C     CK9     - SUBSTRUCTURE CONDITION
C     KK(16)  - OPERATING RATING
C     KK(17)  - INVENTORY RATING
C     CK10    - STRUCTURAL CONDITION
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07-01/1986  RAS INITIAL CODING
C
C ----------------------------------------------------------------
C
      INTEGER KK(17),NREC,I,J
      CHARACTER*1  CK1,CK5,CK6,CK7,CK8,CK9,CK10
      CHARACTER*8  CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
      CHARACTER*20 FLNM
      LOGICAL ST
C
      WRITE(0,'('' SEQUENTIAL FILE :'',$ )')
```

```
      READ(0,'(A)')FLNM
      OPEN(UNIT=8,FILE=FLNM,STATUS='OLD')
C
      WRITE(0,'('' DIRECT ACCESS FILE:'',$)')
      READ(0,'(A)')FLNM
      OPEN(UNIT=9,FILE=FLNM,STATUS='NEW',RECL=126,ACCESS='DIRECT')
C
      WRITE(0,'('' DATABASE NOW EXECUTING'', )')
C
      NREC=1

      DO 100 I=1,NREC
        II=I
      READ(8,10)KK(1),CK1,CK2,CK3,CK4,(KK(J),J=2,7),CK5,
     1          (KK(J),J=8,15),CK6,CK7,CK8,CK9,(KK(J),J=16,17),
     2          CK10

 10   FORMAT(I15,A1,A8,A18,A25,I5,I4,I6,I2,I3,
     1       I2,A1,3I3,2I4,I6,2I4,4A1,2I3,A1)

      WRITE(9,REC=II)KK(1),CK1,CK2,CK3,CK4,(KK(J),J=2,7),CK5,
     1          (KK(J),J=8,15),CK6,CK7,CK8,CK9,(KK(J),J=16,17),
     2          CK10
 100  CONTINUE
C
      CLOSE(8)
      CLOSE(9)
C
      STOP
      END
```

```
$DEBUG
C
C ****************************************************************
C
C                   OVERLOAD MAIN PROGRAM
C
C     A BRIDGE RATING PROGRAM USING A LEVEL 1 PROCEDURE
C
C               IMBSEN AND ASSOCIATES, INC.
C                   3213 RAMOS CIRCLE
C                 SACRAMENTO, CA  95827
C
C     THIS PROGRAM MAY USE THE WINDOWS OPTION FOR POL INPUT
C     THIS PROGRAM USES THE 'SCAN' INTERPRETER TO READ INPUT
C
C ---------------------------------------------------------------
C
C     CALLS TO :
C
C       OPENS
C       SETIN    (SCAN ROUTINE)
C       SETOUT   (SCAN ROUTINE)
C       SCINIT   (SCAN ROUTINE)
C       ZERO
C       READSC   (SCAN ROUTINE)
C       EXIT
C       IZERO
C       DZERO
C       GETNUM
C       GETGIR
C       GETOPE
C       GETSLB
C       GETCNT
C       GETIND
C       GETGRD
C       GETWHL
C       GETSTD
C       STAND
C       GETIMP
C       GETRT
C       HEADER
C       FIXCRD
C       WRSTRU
C       WRTRUC
C       WRIMPA
C       WRTRAN
C       RDNBIF
C       WRNBIF
C       LEVEL1
C       SPLV11
C       REMARK
C
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       MAXILD          - MAXIMUM AXLE LOADS PERMITTED
C       MAXSTR          - MAXIMUM NUMBER STRUCTURES PERMITTED
C       NSTRUC(MAXSTR) - STRUCTURE NUMBER
```

```
C       OPRING(MAXSTR) - OPERATING RATING
C       ISPLAN(MAXSTR) - SLAB PLANS
C       CONTIN(MAXSTR) - CONTINUITY
C       GRDSPC(MAXSTR) - GIRDER SPACING
C       FACIMP(MAXSTR) - IMPACT FACTOR
C       RT(MAXSTR)     - TRANSVERSE DISTRIBUTION RATIO
C       IGROUP(MAXILD) - GROUP IDENTIFICATION
C       PL(MAXILD)     - AXLE LOADS
C       DX(MAXILD)     - DISTANCE TO THE AXLES
C       WHO(MAXILD)    - OUTER WHEEL GAGE
C       WHI(MAXILD)    - INNER WHEEL GAGE
C       IFL            - NUMBER OF INDIVIDUAL AXLES ENTERED
C       JFG            - NUMBER OF GROUP AXLES ENTERED
C       ISTRUC         - NUMBER OF STRUCTURES ENTERED
C       IPAGE          - PAGE NUMBER
C       ICAP           - CAPTION IDENTIFICATION
C       NREC           - NUMBER RECORDS IN NBIF
C       KK(17)         - INTEGER VARIABLES FROM REDUCED NBIF
C       WIDTH          - WIDTH OF TRUCK
C       CK(1-10)       - CHARACTER VARIABLES FROM REDUCED NBIF
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C       07/02/1986   RAS   POL MODIFICATION
C
C ***************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      COMMON /SCANLN/ COL,JUMP,NENT,PSTATE,SKIP,DOREAD,INCOL,
     1                JSTART(80),IBUFF(81),JBUFF(81),IDIGIT(81),
     2                CARD(81)
      COMMON /SCANTB/ NSEPTB, NCLASS, ITAB(256), ICLASS(256)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER COL,SKIP,PSTATE,NBLANK,RECLEN,ENDCHR,DUMMY
      LOGICAL PROMSW,ECHOSW,COMSW,ATRDSW,EOLSW,EOFSW,MENUSW,PTSW,
     1        SIGNSW,NEXT,MATCH,DOREAD,ENDFIL,NUMI,NUMR,STRING,
     2        ENDCRD,SEP,INTEGR
C
      INTEGER MAXILD,MAXSTR
      PARAMETER (MAXILD=30,MAXSTR=40)
C
      INTEGER NSTRUC(MAXSTR),OPRING(MAXSTR),ISPLAN(MAXSTR)
      INTEGER CONTIN(MAXSTR)
      REAL*8  GRDSPC(MAXSTR),FACIMP(MAXSTR),RT(MAXSTR)
C
      INTEGER IGROUP(MAXILD)
      REAL*8  PL(MAXILD),DX(MAXILD),WHO(MAXILD),WHI(MAXILD)
C
      INTEGER I,IMSG,INTEG,INUNIT,IOUT,IER
      INTEGER IPAGE,ICAP,LEVOUT,ISTRUC,ISLAB
      INTEGER IFL,JFG
      INTEGER NREC,KK(17),ICSLAB
```

```
      REAL*4  REEL
      REAL*8  WIDTH
      CHARACTER*1 CK1,CK5,CK6,CK7,CK8,CK9,CK10
      CHARACTER*9 CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
      CHARACTER*4  BLANK1,TITLE(20)
      DATA BLANK1/'    '/
C
      NREC  =9861
C
      IMSG  =6
      INUNIT=5
      IOUT  =6
      IER   =0
      IPAGE =0
      IOVLD =0
C
C  OPEN FILES
C
      CALL OPENS
C
C  INITIALIZE SCAN ROUTINES
C
      NBLANK=80
      RECLEN=80
      ENDCHR='$'
      PROMSW=.FALSE.
      ECHOSW=.TRUE.
      COMSW=.FALSE.
      ATRDSW=.FALSE.
      EOLSW=.TRUE.
      EOFSW=.TRUE.
      MENUSW=.FALSE.
      PTSW=.FALSE.
      SIGNSW=.FALSE.
      CALL SETIN(INUNIT)
      CALL SETOUT(IOUT)
      CALL SCINIT(NBLANK,RECLEN,ENDCHR,PROMSW,ECHOSW,COMSW,ATRDSW,
     1            EOLSW,EOFSW,MENUSW,PTSW,SIGNSW)
C
C  READ OVERLOAD BLOCK DATA
C
      CALL ZERO(TITLE,20,BLANK1)
      CALL READSC
      IF(ENDFIL(DUMMY)) CALL EXIT
      IF(.NOT. MATCH('OVERLOAD',3)) GOTO 8000
      IF(ENDCRD(DUMMY))             GOTO 40
      IF(.NOT. STRING(DUMMY))       GOTO 8001
        DO 30 I=1,NWD
            TITLE(I) =ENTITY(I)
            ENTITY(I)=BLANK1
  30    CONTINUE
  40  CALL READSC
      IF(.NOT. MATCH('OUTPUT',3))   GOTO 8024
      IF(.NOT. MATCH('LEVEL',3))    GOTO 8027
      IF(.NOT. INTEGR(INTEG))       GOTO 8023
        LEVOUT=INTEG
        IF(LEVOUT .LT. 1 .OR. LEVOUT .GT. 3) GOTO 8029
C
```

```
C  READ STRUCTURE DATA BLOCK
C
      CALL READSC
      CALL IZERO(NSTRUC,MAXSTR,0)
      CALL DZERO(GRDSPC,MAXSTR,0.D0)
      CALL IZERO(OPRING,MAXSTR,0)
      CALL IZERO(ISPLAN,MAXSTR,0)
      CALL IZERO(CONTIN,MAXSTR,0)
      IF(.NOT. MATCH('STRUCTURES',3))GOTO 8002
      IF(.NOT. MATCH('NUMBER',3)   )GOTO 8003
      CALL GETNUM(NSTRUC,ISTRUC,MAXSTR,IMSG)
      CALL READSC
      IF(MATCH ('GIRDER',3)       ) GOTO 100
        GOTO 120
  100 IF(.NOT. MATCH('SPACING',3) ) GOTO 8005
      CALL GETGIR(GRDSPC,ISTRUC,IMSG)
      CALL READSC
  120 IF(MATCH('OPERATING',3))      GOTO 130
        GOTO 135
  130 IF(.NOT. MATCH('RATING',3))   GOTO 8026
      CALL GETOPE(OPRING,ISTRUC,IMSG)
      CALL READSC
  135 IF(MATCH('SLAB',3))           GOTO 137
        GOTO 140
  137 IF(.NOT. MATCH('PLANS',3))    GOTO 8028
      CALL GETSLB(ISPLAN,ISLAB,ISTRUC,IMSG)
      CALL READSC
  140 IF(MATCH('CONTINUITY',3))     GOTO 142
        GOTO 145
  142 CALL GETCNT(CONTIN,ISTRUC,IMSG)
      CALL READSC
C
C  READ TRUCK DATA BLOCK
C
  145 CALL IZERO(IGROUP,MAXILD,0)
      CALL DZERO(PL    ,MAXILD,0.D0)
      CALL DZERO(DX    ,MAXILD,0.D0)
      CALL DZERO(WHO,MAXILD,0.D0)
      CALL DZERO(WHI,MAXILD,0.D0)
      IF(.NOT. MATCH('TRUCK',3)   ) GOTO 8007
      IF( MATCH('STANDARD',3)     ) GOTO 205
      IF( MATCH('INDIVIDUAL',3)   ) GOTO 150
      IF(.NOT. MATCH('GROUP',3)   ) GOTO 8008
C
C     GET LOAD CONFIGURATION
C
      CALL GETGRP(PL,DX,IGROUP,IFL,JFG,MAXILD,IMSG)
        GOTO 160
  150 CALL GETIND(PL,DX,IGROUP,IFL,JFG,MAXILD,IMSG)
C
  160 CALL READSC
C
C     READ OUTER WHEEL CONFIGURATION
C
      IF( .NOT. MATCH('OUTER',3))   GOTO 8009
      IF( .NOT. MATCH('WHEEL',3))   GOTO 8010
      IF( .NOT. MATCH('SPACING',3)) GOTO 8011
      CALL GETWHL(IGROUP,WHO,IFL,JFG,MAXILD,IMSG)
C
      CALL READSC
```

```
C
C     READ INNER WHEEL CONFIGURATION
C
      IF(MATCH('INNER',3))          GOTO 200
        GOTO 210
 200  IF( .NOT. MATCH('WHEEL',3))   GOTO 8012
      IF( .NOT. MATCH('SPACING',3)) GOTO 8013
      CALL GETWHL(IGROUP,WHI,IFL,JFG,MAXILD,IMSG)
      GOTO 208
C
C     READ STANDARD VEHICLES
C
 205  IF(.NOT. INTEGR(INTEG))       GOTO 8023
        IOVLD=INTEG
        IF( IOVLD .LT. 1 .OR. IOVLD .GT. 11) GOTO 8030
      CALL STAND(IOVLD,IGROUP,PL,DX,WHO,WHI,IFL,JFG,IMSG)
C
 208  CALL READSC
 210  IF(.NOT. MATCH('VEHICLE',3))  GOTO 8014
      IF(.NOT. MATCH('WIDTH',3))    GOTO 8015
      IF(.NOT. NUMR(REEL))          GOTO 8016
        WIDTH=DBLE(REEL)
C
C     READ IMPACT DATA BLOCK
C
      CALL READSC
      CALL DZERO(FACIMP,MAXSTR,0.D0)
      IF(      MATCH('IMPACT',3))   GOTO 220
        GOTO 230
 220  CALL GETIMP(FACIMP,ISTRUC,IMSG)
C
C     READ TRANSVERSE DISTRIBUTION BLOCK
C
      CALL READSC
 230  CALL DZERO(RT,MAXSTR,1.D0)
      IF(      MATCH('TRANSVERSE',3)) GOTO 235
        GOTO 240
 235  IF(.NOT. MATCH('DISTRIBUTION',3))     GOTO 8020
      IF( .NOT. MATCH ('RATIO',3))          GOTO 8019
      CALL GETRT(RT,ISTRUC,IMSG)
C
      CALL READSC
 240  IF(.NOT. MATCH('FINISH',3))   GOTO 8021
C
      CALL HEADER(TITLE,1,IPAGE)
      REWIND 5
      CALL FIXCRD
C
      CALL HEADER(TITLE,2,IPAGE)
      CALL WRSTRU(NSTRUC,GRDSPC,OPRING,CONTIN,ISTRUC)
C
      IF(ISLAB .EQ. 0) GOTO 250
      CALL HEADER(TITLE,2,IPAGE)
      CALL WRSLAB(ISPLAN,ISLAB)
C
 250  CALL HEADER(TITLE,2,IPAGE)
      CALL WRTRUC(PL,DX,IFL,IGROUP,WHO,WHI,WIDTH,IOVLD)
C
      CALL HEADER(TITLE,2,IPAGE)
      CALL WRIMPA(FACIMP,NSTRUC,ISTRUC)
```

```
C
      CALL HEADER(TITLE,2,IPAGE)
      CALL WRTRAN(NSTRUC,RT,ISTRUC)
C
      ICSLAB=0
      DO 500 I=1,ISTRUC
      CALL RDNBIF(NREC,NSTRUC(I),KK,CK1,CK2,CK3,CK4,CK5,CK6,CK7,CK8,CK9,
     1            CK10)
      IF(LEVOUT .NE. 3)CALL HEADER(TITLE,3,IPAGE)
      IF(LEVOUT .NE. 3)CALL WRNBIF(NREC,NSTRUC(I),KK,CK1,CK2,CK3,CK4,
     1                             CK5,CK6,CK7,CK8,CK9,CK10,LEVOUT)
C
      IF(LEVOUT .EQ. 2)GOTO 500
        CALL HEADER(TITLE,4,IPAGE)
        IF( KK(8) .EQ. 201) GOTO 350
        GOTO 400
 350    ICSLAB = ICSLAB + 1
        IF(ISPLAN(ICSLAB).GT.0)GOTO 450
 400    CALL LEVELI(NREC,KK,CK1,CK2,CK3,CK4,CK5,CK10,PL,
     1              DX,GRDSPC(I),WHO,WHI,WIDTH,FACIMP(I),IGROUP,IFL,
     2              OPRING(I),NSTRUC(I),RT(I),CONTIN(I),IOVLD)
        GOTO 500
 450    CALL SPLVII(NREC,KK,CK1,CK2,CK3,CK4,CK5,CK10,PL,
     1              DX,GRDSPC(I),WHO,WHI,WIDTH,FACIMP(I),IGROUP,IFL,
     2              NSTRUC(I),RT(I),ISPLAN(ICSLAB),IOVLD)
 500  CONTINUE
C
      CALL EXIT
C
C  ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - THE WORD <OVERLOAD> IS MISSING.      ')
         GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - TITLE IS MISSING.                    ')
         GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - THE WORD <STRUCTURE> IS MISSING.     ')
         GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - THE WORD <NUMBER> IS MISSING.        ')
         GOTO 8990 .
 8004 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.     ')
         GOTO 8990
 8005 CALL REMARK(IMSG,'ERROR - THE WORD <SPACING> IS MISSING.       ')
         GOTO 8990
 8006 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
         GOTO 8990
 8007 CALL REMARK(IMSG,'ERROR - THE WORD <TRUCK> IS MISSING.         ')
         GOTO 8990
 8008 CALL REMARK(IMSG,'ERROR - THE WORD <GROUP> IS MISSING.         ')
         GOTO 8990
 8009 CALL REMARK(IMSG,'ERROR - THE WORD <OUTER> IS MISSING.         ')
         GOTO 8990
 8010 CALL REMARK(IMSG,'ERROR - THE WORD <WHEEL> IS MISSING.         ')
         GOTO 8990
 8011 CALL REMARK(IMSG,'ERROR - THE WORD <SPACING> IS MISSING.       ')
         GOTO 8990
 8012 CALL REMARK(IMSG,'ERROR - THE WORD <WHEEL> IS MISSING.         ')
         GOTO 8990
 8013 CALL REMARK(IMSG,'ERROR - THE WORD <SPACING> IS MISSING.       ')
         GOTO 8990
 8014 CALL REMARK(IMSG,'ERROR - THE WORD <VEHICLE> IS MISSING.       ')
```

```
        GOTO 8990
8015 CALL REMARK(IMSG,'ERROR - THE WORD <WIDTH> IS MISSING.          ')
        GOTO 8990
8016 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
        GOTO 8990
8017 CALL REMARK(IMSG,'ERROR - THE WORD <IMPACT> IS MISSING.        ')
        GOTO 8990
8018 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
        GOTO 8990
8019 CALL REMARK(IMSG,'ERROR - THE WORD <RATIO> IS MISSING.         ')
        GOTO 8990
8020 CALL REMARK(IMSG,'ERROR - THE WORD <DISTRIBUTION> IS MISSING.  ')
        GOTO 8990
8021 CALL REMARK(IMSG,'ERROR - THE WORD <FINISH> IS MISSING.        ')
        GOTO 8990
8023 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.     ')
        GOTO 8990
8024 CALL REMARK(IMSG,'ERROR - THE WORD <OUTPUT> IS MISSING.        ')
        GOTO 8990
8026 CALL REMARK(IMSG,'ERROR - THE WORD <RATING> IS MISSING.        ')
        GOTO 8990
8027 CALL REMARK(IMSG,'ERROR - THE WORD <LEVEL> IS MISSING.         ')
        GOTO 8990
8028 CALL REMARK(IMSG,'ERROR - THE WORD <PLANS> IS MISSING.         ')
        GOTO 8990
8029 CALL REMARK(IMSG,'ERROR - INCORRECT OUTPUT LEVEL INPUT.        ')
        GOTO 8990
8030 CALL REMARK(IMSG,'ERROR - INCORRECT STANDARD VEHICLE INPUT.    ')
C
8990 CALL EXIT
     END
```

```
C
C     OPENS  - OPEN FILES
C
C     THIS SUBROUTINE OPENS THE FILES
C
C ---------------------------------------------------------------
C
C     CALLS TO :  MODPOL
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :  NONE
C
C       RETURNED : NONE
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C       07/14/1986   RAS   ADDED MENU FILES
C
C ***************************************************************
C
      CHARACTER*3  QUES
      CHARACTER*20 FLNM
      LOGICAL ST
C
      WRITE(0,'('' '', )')
      WRITE(0,'('' ADOT OVERLOAD BRIDGE RATING (VERSION 1.3)'', )')
      WRITE(0,'('' '', )')
      WRITE(0,'('' Do you want to read in the MENU file?'', )')
      WRITE(0,'('' (Enter YES or NO)'',$ )')
      READ(0,'(A)')QUES
      WRITE(0,'('' '', )')
      IF(QUES .EQ. 'YES' .OR. QUES .EQ. 'Y  ') GOTO 100
      IF(QUES .EQ. 'NO ' .OR. QUES .EQ. 'N  ') GOTO 200
      WRITE(0,'('' Error in input - execution terminated'',)')
      STOP
C
 100  OPEN(UNIT=9,FILE='ADOT.POL',STATUS='OLD')
C
      INQUIRE(FILE='OVER.DAT',EXIST=ST)
      IF(ST) THEN
       OPEN(UNIT=5,FILE='OVER.DAT',STATUS='OLD')
       CLOSE(UNIT=5,STATUS='DELETE')
      ENDIF
      OPEN(UNIT=5,FILE='OVER.DAT',STATUS='NEW')
C
      IOUTER=5
C
      CALL MODPOL(IOUTER)
      REWIND 5
      GOTO 300
```

```
C
 200  WRITE(0,'('' Input File Name :'',$ )')
      READ(0,'(A)')FLNM
      OPEN(UNIT=5,FILE=FLNM,STATUS='OLD')
C
 300  WRITE(0,'('' Scan Echo Name  :'',$)')
      READ(0,'(A)')FLNM
      INQUIRE(FILE=FLNM,EXIST=ST)
      IF(ST) THEN
       OPEN(UNIT=6,FILE=FLNM,STATUS='OLD')
       CLOSE(UNIT=6,STATUS='DELETE')
      ENDIF
      OPEN(UNIT=6,FILE=FLNM,STATUS='NEW')
C
      WRITE(0,'('' Output File Name:'',$)')
      READ(0,'(A)')FLNM
      INQUIRE(FILE=FLNM,EXIST=ST)
      IF(ST) THEN
       OPEN(UNIT=7,FILE=FLNM,STATUS='OLD')
       CLOSE(UNIT=7,STATUS='DELETE')
      ENDIF
      OPEN(UNIT=7,FILE=FLNM,STATUS='NEW')
C
      OPEN(UNIT=8,FILE='ARIZONA.DIR',STATUS='OLD',RECL=126,
     1     ACCESS='DIRECT')
C
      WRITE(0,'('' '', )')
      WRITE(0,'('' OVERLOAD NOW EXECUTING'', )')
      WRITE(0,'('' '', )')
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE MODPOL(IOUTER)
C
C ****************************************************************
C
C     MODPOL - MODIFY POL
C
C     THIS SUBROUTINE MODIFIES THE POL
C     FROM THE RUNFILE OF MENU WINDOWS
C
C ----------------------------------------------------------------
C
C     CALLS TO :
C
C       WRPOL
C       WRPOLD
C       WRDAT
C       WRDATD
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         IOUTER - FILE UNIT NUMBER
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/14/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*1 AB(80),AE(80),IBK(80)
      INTEGER I,INITL
C
      INITL=0
C
      READ(9,1) (AB(I), I=1,80)
 1    FORMAT(80A1)
C
 5    READ(9,1,END=999) (AE(I), I=1,80)
C
      IF(AB(1).NE.AE(1).OR.AB(2).NE.AE(2).OR.AB(3).NE.AE(3))GOTO 100
        GOTO 200
 100  IF(INITL .EQ. 0) GOTO 125
        GOTO 150
 125  CALL WRPOL(AB,IOUTER)
C
      DO 140 I=1,80
        IBK(I) = AB(I)
        AB(I)  = AE(I)
 140  CONTINUE
C
      GOTO 5
C
 150  CALL WRDAT(AB,IOUTER)
C
```

```
      DO 175 I=1,80
        IBK(I) = AB(I)
        AB(I)  = AE(I)
 175  CONTINUE
C
      INITL=0
      GOTO 5
C
 200  IF(INITL .EQ. 0) GOTO 250
        GOTO 300
C
 250  CALL WRPOLD(AB,IOUTER)
        INITL=1
      DO 270 I=1,80
        IBK(I) = AB(I)
        AB(I)  = AE(I)
 270  CONTINUE
C
      GOTO 5
C
 300  CALL WRDATD(AB,IOUTER)
        INITL=1
      DO 350 I=1,80
        IBK(I)= AB(I)
        AB(I) = AE(I)
 350  CONTINUE
      GOTO 5
C
 999  IF(AB(1).EQ.IBK(1) .AND. AB(2).EQ.IBK(2)
     1   .AND. AB(3).EQ.IBK(3)) GOTO 900
      CALL WRPOL(AB,IOUTER)
      GOTO 950
 900  CALL WRDAT(AB,IOUTER)
C
 950  WRITE(IOUTER,1000)
 1000 FORMAT('FINISH')
      END
```

```
$DEBUG
      SUBROUTINE WRPOL(AB,IOUTER)
C
C ****************************************************************
C
C     WRPOL  - WRITE POL
C
C     THIS SUBROUTINE WRITES OUT THE POL EXACT FROM
C     THE RUNFILE OF MENU WINDOWS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         AB     - BEGINNING LINE WITH 80 CHARACTERS
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/14/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*1 AB(80),ABW(80)
      INTEGER I,ICNT
C
      IF( AB(1).EQ. 'O' .AND.AB(2) .EQ. 'V' .AND.AB(3).EQ. 'E')GOTO 100
C
      DO 50 I=1,80
        IF( AB(I) .EQ. ';')  GOTO 25
        GOTO 30
 25   ABW(I) = ' '
        GOTO 50
 30   ABW(I) = AB(I)
 50   CONTINUE
C
      WRITE(IOUTER,75)(ABW(I),I=1,80)
 75   FORMAT(80A1)
      RETURN
C
 100  ICNT=0
      DO 150 I=1,80
        IF( AB(I) .EQ. ';')  GOTO 120
        GOTO 125
 120  ICNT = ICNT + 1
        ABW(I) = ' '
        IF( ICNT .EQ. 2) ABW(I) = '"'
        IF( ICNT .EQ. 3) ABW(I) = '"'
        GOTO 150
 125    ABW(I) = AB(I)
 150  CONTINUE
C
      WRITE(IOUTER,200)(ABW(I),I=1,80)
```

```
200  FORMAT(80A1)
     RETURN
     END
```

```
C
C     WRPOLD - WRITE POL WITH A DASH AT THE END
C
C     THIS SUBROUTINE WRITES OUT THE POL EXACT WITH A DASH AT THE
C     END FROM THE RUNFILE OF MENU WINDOWS
C
C ------------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ------------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         AB      - BEGINNING LINE WITH 80 CHARACTERS
C
C ------------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/14/1986   RAS   INITIAL CODING
C
C ******************************************************************
C
      CHARACTER*1 AB(80),ABW(80)
      INTEGER I,ICNT
C
      ICNT=0
C
      DO 50 I=1,80
        IF( AB(I) .EQ. ';')  GOTO 25
        GOTO 30
 25   ICNT=ICNT+1
        ABW(I) = ' '
        IF(ICNT .EQ. 4) ABW(I) = '-'
        GOTO 50
 30     ABW(I) = AB(I)
 50   CONTINUE
C
      WRITE(IOUTER,75)(ABW(I),I=1,80)
 75   FORMAT(80A1)
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRDAT (AB,IOUTER)
C
C ****************************************************************
C
C     WRDAT  - WRITE DATA ONLY
C
C     THIS SUBROUTINE WRITES OUT ONLY
C     FROM THE RUNFILE OF MENU WINDOWS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         AB      - BEGINNING LINE WITH 80 CHARACTERS
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/14/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*1 AB(80),ABW(80)
      INTEGER I,ICNT, IDELB, IDELE
C
      ICNT=0
C
      DO 50 I=1,80
        IF( AB(I) .EQ. ';')  GOTO 25
        GOTO 50
 25   ICNT=ICNT+1
        IF(ICNT .EQ. 2) IDELB=I
        IF(ICNT .EQ. 3) IDELE=I
 50   CONTINUE
C
      DO 100 I=1,IDELB
        ABW(I) = ' '
 100  CONTINUE
C
      DO 200 I=IDELB+1,IDELE-1
        ABW(I) = AB(I)
 200  CONTINUE
C
      DO 300 I=IDELE,80
        ABW(I) = ' '
 300  CONTINUE
C
      WRITE(IOUTER,400)(ABW(I),I=1,80)
 400  FORMAT(80A1)
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRDATD(AB,IOUTER)
C
C ****************************************************************
C
C     WRDATD - WRITE DATA ONLY WITH A DASH AT THE END
C
C     THIS SUBROUTINE WRITES OUT ONLY THE DATA WITH A DASH AT THE
C     END FROM THE RUNFILE OF MENU WINDOWS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         AB      - BEGINNING LINE WITH 80 CHARACTERS
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/14/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*1 AB(80),ABW(80)
      INTEGER I,ICNT, IDELB, IDELE
C
      ICNT=0
C
      DO 50 I=1,80
        IF( AB(I) .EQ. ';')  GOTO 25
        GOTO 50
 25   ICNT=ICNT+1
        IF(ICNT .EQ. 2) IDELB=I
        IF(ICNT .EQ. 3) IDELE=I
 50   CONTINUE
C
      DO 100 I=1,IDELB
        ABW(I) = ' '
 100  CONTINUE
C
      DO 200 I=IDELB+1,IDELE-1
        ABW(I) = AB(I)
 200  CONTINUE
C
      ABW(IDELE)  = ' '
      ABW(IDELE+1)= '-'
C
      DO 300 I=IDELE+2,80
        ABW(I) = ' '
 300  CONTINUE
C
      WRITE(IOUTER,400)(ABW(I),I=1,80)
 400  FORMAT(80A1)
```

```
      RETURN
      END
```

```
$DEBUG
C ************************************************************************
C ************************************************************************
C ************************************************************************
C **                                                                    **
C **                                                                    **
C **                          S C A N                                   **
C **                          =======                                   **
C **                                                                    **
C **            A FREE FORM INPUT FORTRAN SUBPROGRAM SYSTEM             **
C **                     IBM-AT AND XT VERSION                          **
C **                                                                    **
C **                                                                    **
C **               CIVIL ENGINEERING SYSTEMS LABORATORY                 **
C **                 DEPARTMENT OF CIVIL ENGINEERING                    **
C **            UNIVERSITY OF ILLINOIS AT URABANA-CHAMPAIGN             **
C **                                                                    **
C **                                                                    **
C **    VERSION MODIFIED AT E. C. C. FOR USE ON THE IBM-AT              **
C **                                                                    **
C **                                                                    **
C ************************************************************************
C ************************************************************************
C *                                                                      *
C * SCAN                                                                 *
C *                                                                      *
C ************************************************************************
      SUBROUTINE SCAN
C
C         SCAN
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      COMMON /SCANTB/ NSEPTB, NCLASS, ITAB(256), ICLASS(256)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      EQUIVALENCE (IVAL(1),VALUE,IVALUE), (FLT,INT)
      REAL F,FLT,SEIDSH
      INTEGER RECSIZ, FILES, FILPT, FILLIM, COL, SKIP, PSTATE
      INTEGER ISTATE(110), STATE, EXP, OCOL, NDOT, ISIG, NSIG
      INTEGER NBLANK, LIM, INT
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, DOREAD, NEXT
      DATA OCOL/0/, NDOT/0/
      DATA ISIG/1/,NSIG/1/,INT/0/,F/.1/,EXP/0/
C                     D  +  -  E  A  Q  .  S  B  $
C                     I           L  U     E  L
C                     G           P  O     P  A
C                     I           H  T        N
C                     T           A  E        K
C        1     GET
C        2     +-
C        3     INTEGER
C        4     REAL
C        5     START EXP
```

```
C        6     EXP
C        7     LABEL
C        8     NAME, STRING
C        9     STRING
C        A     ANYTEXT
C        9     ANYTEXT
      DATA ISTATE / 18, 17, 16, 26, 26, 30, 32, 29,  6,  7,
     1              18, 17, 16, 26, 26, 13, 32, 29,  6,  7,
     2              18, 11, 11, 11, 11, 11, 35, 11, 11, 11,
     3              19, 11, 11, 28, 28, 11, 20, 11, 11, 11,
     4              21, 10, 10, 22, 28, 10, 28, 10, 10, 10,
     5              25, 24, 23, 28, 28,  9, 28,  9,  9,  9,
     6              25,  9,  9, 28, 28,  9, 28,  9,  9,  9,
     7               4,  8,  8,  4,  4,  8, 27,  8,  8,  8,
     8               4, 14, 14,  4,  4, 14, 27, 14, 14, 14,
     9               4,  4,  4,  4,  4, 12,  4,  4,  4, 33,
     A               4,  8,  8,  4,  4,  8,  4,  8,  8,  8 /
C
C
 2    NENT=NENT+1
      NCHAR = 0
      STATE = PSTATE
      NBLANK = 0
      ENTITY(1) = BLANK
      JSTART(NENT)=0
      OCOL=COL
      LIM=LIMIT
C
C  GO TO ACTION
C
 1    GOTO (10,20,30,40,50,60,70,80,90,100,110,120,130,140,150,160,
     1      170,180,190,200,210,220,230,240,250,260,270,280,290,
     2      300,310,320,330,340,350),JUMP
C
C  GET A LINE
C
 5    DOREAD = .TRUE.
 10   IF(DOREAD)CALL SCANRD
      COL = 0
      NENT = 1
      JSTART(1) = 0
      JUMP=2
      LIM=80
      IF(MODE.EQ.10)GOTO 12
         GOTO 20
C
C  END OF FILE
C
 12   FILPT = FILPT-1
      IF(FILPT.GT.0)INUNIT = FILES(FILPT)
      IF(FILPT.EQ.0)MODE=-10
      IF(LEOF)GO TO 13
      IF(FILPT.GT.0)GO TO 5
      CALL SCANMS(1)
      CALL EXIT
 13   JUMP = 1
      DOREAD = .TRUE.
         GOTO 150
C
C  NEXT CHARACTER
```

```
C
 20   COL = COL+1
C
C  GET CHARACTER
C
 30   JUMP = ISTATE(10*STATE+IBUFF(COL))
        GOTO 1
C
C  SET JUMP TO NEXT CHARACTER
C
 40   JUMP = 2
C
C  PACK CHARACTER
C
 50   NCHAR = NCHAR + 1
        GOTO 1
C
C  COUNT BLANKS
C
 60   NBLANK = NBLANK + 1
      IF(NBLANK.LE.LIM)GOTO 20
C
C  CHECK IF END OF STRING
C
      IF(PSTATE.EQ.1)GOTO 130
C
C  END LINE
C
 70   IF(.NOT.EOL)GO TO 75
      JUMP = 3
      IF(AUTORD)JUMP = 1
      IF(AUTORD)DOREAD = .TRUE.
      ENTITY(1)=BLANK
      MODE = 9
      NCHAR=0
      NWD = 0
      COL=MAX0(OCOL,1)
      JSTART(NENT)=COL
        GOTO 150
 75   NCHAR = 0
      NWD = 0
      NBLANK = 0
      STATE = PSTATE
        GOTO 5
C
C  PACK BLANK EXIT
C
 80   JUMP = 3
 85   ICOLMN = 0
      IF(NENT.NE.0)ICOLMN = JSTART(NENT)
      CALL SCANPK
      IF(ENTITY(1).EQ.SEIDSH)GOTO 75
      IF(MODE.EQ.6 .AND. IVALUE.EQ.16)GOTO 2
        GOTO 150
C
C  END EXPONENT
C
 90   FLT = FLT * 10. ** EXP
      EXP = 0
      NSIG = 1
```

```
C
C  END REAL
C
 100  F = 0.1
C
C  END INTEGER
C
 110  IVALUE = INT
      ISIG = 1
      INT = 0
         GOTO 80
C
C  END STRING
C
 120  SKIP = COL
 340  JUMP = 2
         GOTO 85
C
C  END GET STRING
C
 130  MODE = 8
      PSTATE = 0
      JUMP = 2
         GOTO 150
C
C  END NAME
C
 140  NCHAR = NDOT + 1
         GOTO 80
C
C  RETURN
C
 150  RETURN
C
C  MINUS FOUND
C
 160  ISIG = -1
C
C  PLUS FOUND
C
 170  STATE = 2
      MODE = 6
      INT = ITAB(JBUFF(COL)+1)
      IVALUE = INT
         GOTO 310
C
C  START INTEGER
C
 180  STATE = 3
      INT = 0
      MODE = 1
      IF(JSTART(NENT).EQ.0)JSTART(NENT)=COL
C
C  CONTINUE INTEGER
C
 190  INT = INT*10 + IDIGIT(COL) * ISIG
         GOTO 40
C
C  CHANGE TO REAL
C
```

```
 200  STATE = 4
      MODE = 2
      FLT = INT
         GOTO 40
C
C  CONTINUE REAL
C
 210  FLT = FLT + FLOAT(IDIGIT(COL)*ISIG)*F
      F = F * 0.1
         GOTO 40
C
C  START EXPONENT
C
 220  STATE = 5
         GOTO 40
C
C  MINUS EXP
C
 230  NSIG = -1
C
C  PLUS EXP
C
 240  STATE = 6
         GOTO 40
C
C  CONTINUE EXP
C
 250  EXP = EXP * 10 + IDIGIT(COL)*NSIG
      STATE = 6
         GOTO 40
C
C  START LABEL
C
 260  STATE = 7
      NDOT = 0
      MODE = 3
         GOTO 310
C
C  START NAME
C
 270  STATE = 8
      NDOT = NDOT + 1
      NCHAR = NDOT
      MODE = 4
      JSTART(NENT+NDOT) = COL+1
         GOTO 20
C
C  ANY TEXT
C
 280  MODE = 5
      STATE = 10
      ISIG = 1
      INT = 0
      EXP = 0
      F = 0.1
      NSIG = 1
         GOTO 40
C
C  SEPARATER
C
```

```
 290  INT = ITAB(JBUFF(COL)+1)
      IVALUE = INT
      MODE = 6
      JUMP = 34
      JSTART(NENT) = COL
      ISIG = 1
         GOTO 50
C
C  START STRING
C
 300  STATE = 9
      MODE = 7
 305  JSTART(NENT) = COL
         GOTO 20
C
C  SET BEGINNING COL NUMBER
C
 310  JSTART(NENT) = COL
      IF(MODE.EQ.6.AND.SIGNED)GO TO 290
         GOTO 40
C
C  START REAL
C
 320  JSTART(NENT) = COL
      INT = 0
         GOTO 200
C
C  END LINE AND END STRING
C
 330  SKIP=COL
         GOTO 80
C
C  START SIGNED REAL
C
 350  INT=0
         GOTO 200
      END
C ***************************************************************************
C *                                                                         *
C * RDLINE                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE RDLINE
C
C         READ A CARD
C
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      INTEGER COL, SKIP, PSTATE
      LOGICAL DOREAD
      JUMP = 1
      CALL SCANRD
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCANMS                                                                  *
C *                                                                         *
C ***************************************************************************
```

```
      SUBROUTINE SCANMS( ERRNO )
C
C         ISSUE ERROR MESSAGES
C
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      INTEGER ERRNO, FILES, FILPT, FILLIM
C
C         SEND ERROR MESSAGE AND RETURN
C
      GO TO (  10,  20,  30 ), ERRNO
   10 WRITE(IOUT,1001)
      GO TO 9999
   20 WRITE(IOUT,1002)
      GO TO 9999
   30 WRITE(IOUT,1003)
      GO TO 9999
 9999 RETURN
C
 1001 FORMAT(40H0 .....END OF FILE - PROGRAM TERMINATED  /)
 1002 FORMAT(40H0 .....INPUT ERROR - PROGRAM TERMINATED  /)
 1003 FORMAT(40H0 .....FILE LIST OVERFLOW                /)
      END
C ***************************************************************************
C *                                                                         *
C * SETIN                                                                   *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SETIN(IN)
C
C         SET SCAN INPUT UNIT
C
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      INTEGER IN, FILES, FILPT, FILLIM
      INUNIT = IN
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SETOUT                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SETOUT(OUT)
C
C         SET SCAN ECHO OUTPUT UNIT
C
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      INTEGER OUT, FILES, FILPT, FILLIM
      IOUT = OUT
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SETREM                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SETREM(IUNIT)
C
C          SET THE REMOTE UNIT FOR PROMPTING
C
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
```

```
      INTEGER IUNIT, FILES, FILPT, FILLIM
      LREMOT = IUNIT
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SETFIL                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SETFIL(FILIST,NFILES)
C
C         STACK A LIST OF INPUT FILES
C
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      INTEGER J, K, NFIL, NFILES, FILIST(10), FILES, FILPT, FILLIM
      NFIL = NFILES
      IF(FILPT+NFIL.LE.FILLIM) GO TO 10
      NFIL=FILLIM-FILPT
      CALL SCANMS(3)
   10 J=FILPT+NFIL+1
      IF(NFIL.EQ.0)GO TO 30
      DO 20 K=1,NFIL
   20 FILES(J-K)=FILIST(K)
      FILPT=FILPT+NFIL
      INUNIT=FILES(FILPT)
   30 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCINIT                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCINIT(NBLANK, RECLEN, ENDCHR, PROMSW, ECHOSW, COMSW,
     1                  ATRDSW, EOLSW, EOFSW, MENUSW, PTSW, SIGNSW )
C
C         INITIALIZE
C
C
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      INTEGER RECSIZ, RECLEN
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED
      LOGICAL PROMSW, ECHOSW, COMSW, ATRDSW, EOLSW, EOFSW, PTSW,
     1        MENUSW, SIGNSW
      INIT = .TRUE.
      ECHAR = ENDCHR
      ECHO = ECHOSW
      LEOF = EOFSW
      EOL = EOLSW
      MENU = MENUSW
      AUTORD = ATRDSW
      COMMNT = .NOT.COMSW
      PROMT = PROMSW
      POINT = PTSW
      SIGNED = SIGNSW
      LIMIT = MIN0(RECSIZ,NBLANK)
      MARK = MIN0(RECSIZ,RECLEN)
      RETURN
```

```
      END
C ***************************************************************************
C *                                                                         *
C * ADDLAB                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE ADDLAB(LABEL)
C
C         ADD LABEL FOR SCAN ECHO
C
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      INTEGER RECSIZ, LABEL
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED
      ILABEL = LABEL
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * BACKSP                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE BACKSP(NUMENT)
C
C         BACKSPACE THE SCANNER
C
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      INTEGER COL, SKIP, PSTATE, NUMENT
      LOGICAL DOREAD
      IF(NENT.LT.NUMENT) GO TO 10
      NENT = NENT - NUMENT
      COL = JSTART(NENT + 1)
      JUMP = 3
      GO TO 20
   10 COL = 0
      JUMP = 2
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * GETSTR                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE GETSTR
C
C         PARSE A STRING
C
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      INTEGER COL, SKIP, PSTATE
      LOGICAL DOREAD
      COL = JSTART(NENT)
      PSTATE = 1
      JUMP = 2
      RETURN
```

```
      END
C ***************************************************************************
C *                                                                         *
C * RESET                                                                   *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE RESET
C
C         START LINE OVER
C
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER COL, SKIP, PSTATE
      LOGICAL NEXT, DOREAD
      COL = 0
      JUMP = 2
      NENT = 0
      ENTITY(1) = BLANK
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SKPSTR                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SKPSTR
C
C         SKIP TO END OF STRING
C
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      INTEGER COL, SKIP, PSTATE
      LOGICAL DOREAD
      COL = SKIP
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SEPTAB                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SEPTAB(NEWTAB)
C
C         CHANGE SEPERATOR TABLE
C
      INTEGER I, NEWTAB(1)
      COMMON /SCANTB/ NSEPTB, NCLASS, ITAB(256), ICLASS(256)
      DO 10 I = 1, NSEPTB
   10 ITAB(I) = NEWTAB(I)
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * DOSCAN                                                                  *
C *
```

```
C ***************************************************************************
      LOGICAL FUNCTION DOSCAN(DUMMY)
C
C          ADVANCE THE SCANNER NOW
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER DUMMY
      LOGICAL NEXT
      IF(NEXT)CALL SCAN
      NEXT = .FALSE.
      DOSCAN = .TRUE.
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * ENDCRD                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION ENDCRD(DUMMY)
C
C          IS THE CURRENT SCAN ENTITY AN END OF LINE
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODEOL, DUMMY
      LOGICAL NEXT
      DATA MODEOL/9/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 ENDCRD = .FALSE.
      IF(MODE.NE.MODEOL)GO TO 20
      ENDCRD = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * ENDFIL                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION ENDFIL(DUMMY)
C
C          IS THE CURRENT SCAN ENTITY AN END OF FILE
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      LOGICAL NEXT
      INTEGER MODEOF, DUMMY
      DATA MODEOF/10/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 ENDFIL = .FALSE.
      IF(MODE.NE.IABS(MODEOF))GO TO 20
      ENDFIL = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
```

```
C ***************************************************************************
C *                                                                         *
C * ENTIT                                                                   *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE ENTIT(TEXT,NC,NW)
C
C          RETURN THE CURRENT CHARACTERS FROM ENTITY
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      DIMENSION TEXT(1)
      INTEGER I, NC, NW
      LOGICAL NEXT
      NC = NCHAR
      NW = NWD
      DO 10 I = 1, NW
   10 TEXT(I) = ENTITY(I)
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * INTEGR                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION INTEGR(INTEG)
C
C          IS THE CURRENT SCAN ENTITY AN INTEGER
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODINT, INTEG
      LOGICAL NEXT
      DATA MODINT/1/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 INTEGR = .FALSE.
      IF(MODE.NE.MODINT)GO TO 20
      INTEG = IVALUE
      INTEGR = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * LABEL                                                                   *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION LABEL(DUMMY)
C
C          IS THE CURRENT SCAN ENTITY A LABEL
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODLAB, DUMMY
      LOGICAL NEXT
      DATA MODLAB/3/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
```

```
      NEXT = .FALSE.
   10 LABEL = .FALSE.
      IF(MODE.NE.MODLAB)GO TO 20
      LABEL = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * MATCH                                                                   *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION MATCH(STRING,NC)
C
C         MATCH A CHARACTER ARRAY AGAINST THE CURRENT SCAN ENTITY
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      DIMENSION STRING(1)
      INTEGER NC
      LOGICAL NEXT, SCANMC
      MATCH = .FALSE.

      IXT = .TRUE.
   20 RETURN
      END
C ************            *                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION NAME(DUMMY)
C
C         IS THE CURRENT SCAN ENTITY A NAME
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODNAM, DUMMY
      LOGICAL NEXT
      DATA MODNAM/4/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 NAME = .FALSE.
      IF(MODE.NE.MODNAM)GO TO 20
      NAME = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * NOSCAN                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION NOSCAN(DUMMY)
```

```
C
C         DO NOT ADVANCE THE SCANNER
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER DUMMY
      LOGICAL NEXT
      NEXT = .FALSE.
      NOSCAN = .TRUE.
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * NUMI                                                                    *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION NUMI(INTEGR)
C
C         IS THE CURRENT SCAN ENTITY A NUMBER, CONVERT TO INTEGER
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODREL, INTEGR
      LOGICAL NEXT
      DATA MODREL/2/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 NUMI = .FALSE.
      IF (MODE .GT. MODREL)  GO TO 20
      IF (MODE .EQ. MODREL ) INTEGR = VALUE
      IF (MODE .NE. MODREL ) INTEGR = IVALUE
      NUMI = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * NUMR                                                                    *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION NUMR(REAL)
C
C         IS THE CURRENT SCAN ENTITY A NUMBER, CONVERT TO REAL
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      REAL REAL
      INTEGER MODREL, MODINT
      LOGICAL NEXT
      DATA MODREL/2/, MODINT/1/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
   10 NEXT = .FALSE.
      NUMR = .FALSE.
      IF (MODE .GT. MODREL) GO TO 20
      IF (MODE .EQ. MODINT ) REAL = IVALUE
      IF (MODE .NE. MODINT ) REAL = VALUE
      NUMR = .TRUE.
      NEXT = .TRUE.
```

```
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * READSC                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE READSC
C
C         ADVANCE THE SCANNER NOW
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER RECSIZ, MODEOL
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, NEXT
      DATA MODEOL/9/
      IF(.NOT.AUTORD.OR.(AUTORD.AND.MODE.NE.MODEOL))CALL RDLINE
      NEXT = .TRUE.
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * REALN                                                                   *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION REALN(REAL)
C
C         IS THE CURRENT SCAN ENTITY A REAL
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      LOGICAL NEXT
      REAL REAL
      INTEGER MODREL
      DATA MODREL/2/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 REALN = .FALSE.
      IF(MODE.NE.MODREL)GO TO 20
      REAL = VALUE
      REALN = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SEP                                                                     *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION SEP(SEPTYP)
C
C         IS THE CURRENT SCAN ENTITY A SEPERATOR
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
```

```
      INTEGER SEPTYP, MODSEP
      LOGICAL NEXT
      DATA MODSEP/6/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 SEP = .FALSE.
      IF(MODE.NE.MODSEP)GO TO 20
      SEPTYP = IVALUE
      SEP = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * STRING                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION STRING(DUMMY)
C
C         IS THE CURRENT SCAN ENTITY A STRING
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER MODSTR, DUMMY
      LOGICAL NEXT
      DATA MODSTR/7/
      IF(.NOT.NEXT)GO TO 10
      CALL SCAN
      NEXT = .FALSE.
   10 STRING = .FALSE.
      IF(MODE.NE.MODSTR)GO TO 20
      STRING = .TRUE.
      NEXT = .TRUE.
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * TRUE                                                                    *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION TRUE(DUMMY)
C
C         ADVANCE THE SCANNER BEFORE THE NEXT TEST
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER DUMMY
      LOGICAL NEXT
      NEXT = .TRUE.
      TRUE = .TRUE.
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCANCL                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCANCL
C
```

```
C       CLASSIFY THE INPUT CHARACTERS
C
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      COMMON /SCANTB/ NSEPTB, NCLASS, ITAB(256), ICLASS(256)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK .
      INTEGER I, NN, J, K, RECSIZ, COL, SKIP, PSTATE
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, DOREAD
      CHARACTER*1 XCARD(320), XBUFF(320)
C     EQUIVALENCE ( XCARD(1), CARD(1) ), ( XBUFF(1), JBUFF(1) )
      EQUIVALENCE ( XCARD(1), CARD(1) )
      J = 1
      K = NCPW
      NN = MINO(INCOL,MARK)
      NN = NN+1
      CARD(NN) = ECHAR
      DO 10 I = 1, NN
C     XBUFF(K) = XCARD(J)
      JBUFF(I) = ICHAR(XCARD(J))
      IDIGIT(I) = -1
      IF(JBUFF(I).GE.INTZER.AND.JBUFF(I).LE.INTNIN)
     1    IDIGIT(I) = JBUFF(I)-INTZER
      J = J+NCPW
      K = K+NCPW
      IBUFF(I) = ICLASS(JBUFF(I)+1)
      IF(CARD(I).EQ.ECHAR)IBUFF(I) = 10
   10 CONTINUE
      RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCANIN                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCANIN(IN,BUFF,RECLEN,ERRCOD,IOUT,ECHO)
C
C         INPUT A RECORD FROM A DEVICE
C
      COMMON /SCANIM/ NCPW, BLANK, INTZER, INTNIN, INTC, INTCOM, INTBLK
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      INTEGER IN,RECLEN,ERRCOD,IOUT
      INTEGER COL,SKIP,PSTATE
      INTEGER I,IDUM
      REAL*4  BUFF(1)
      LOGICAL DOREAD,ECHO
         ERRCOD=0
 1       IDUM=RECLEN
C        CALL SCANDB
         READ(IN,1001,ERR=20,END=30)(BUFF(I),I=1,RECLEN)
         DO 10 I=1,RECLEN
            IF(.NOT.(BUFF(IDUM).EQ.BLANK))GOTO 40
            IDUM=IDUM-1
 10      CONTINUE
```

```
      IF(ECHO)WRITE(IOUT,1002)
         GOTO 1
20    ERRCOD= 1
         GOTO 40
30    ERRCOD= -1
40    RECLEN=MAXO(IDUM,2)
      RETURN
1001  FORMAT(80A1)
1002  FORMAT(/)
      END
C ***************************************************************************
C *                                                                         *
C * SCANPK                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCANPK
C
C          PACK THE SCANER RESULT IN ENTITY AT 4 CHARACTERS PER WORD
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      CHARACTER*1 XENTIT(80), XCARD(320)
      EQUIVALENCE ( XENTIT(1), ENTITY(1) ), ( XCARD(1), CARD(1) )
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER I, ISTART, COL, SKIP, PSTATE
      LOGICAL NEXT, DOREAD
      NWD = (NCHAR+NCPW-1)/NCPW
      IF(NWD.LE.0)NWD = 1
      ENTITY(NWD) = BLANK
      IF(NWD.LT.20)ENTITY(NWD+1) = BLANK
      ISTART = (ICOLMN-1)*NCPW+1
      IF(NCHAR.EQ.0)NWD = 0
      IF(NCHAR.EQ.0)GO TO 20
      IF(MODE.EQ.7)ISTART = ISTART+NCPW
      DO 10 I = 1, NCHAR
      XENTIT(I) = XCARD(ISTART)
      ISTART = ISTART+NCPW
      IF(MODE.EQ.4)ISTART = (JSTART(NENT+1)-1)*NCPW+1
   10 CONTINUE
   20 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCANRD                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCANRD
C
C          INPUT FOR SCAN
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
```

```
     2                IDIGIT(81), CARD(81)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER I, NN, IERR, RECSIZ, FILES, FILPT, FILLIM
      INTEGER COL, SKIP, PSTATE
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, NEXT, DOREAD, REREAD
C
C         READ A RECORD
C
      DOREAD = .FALSE.
 10   IF(PROMT)WRITE(LREMOT,1003)
      REREAD = .FALSE.
      INCOL = RECSIZ
C     CALL SCANDB
      CALL SCANIN (INUNIT,CARD,INCOL,IERR,IOUT,ECHO)
      IF(IERR)20,40,30
C
C  EOF,ERR
C
 20   MODE=10
         GOTO 100
 30   CALL SCANMS(2)
      CALL EXIT
C
C  CLASSIFY
C
 40   CALL SCANCL
      MODE = 0
C
C  COMMENT  'C ' IN CC 1&2  = ZC3, Z40 =  195, 64
C
      IF(JBUFF(1).NE.INTC.OR.JBUFF(2).NE.INTBLK)GO TO 50
      IF(COMMNT)REREAD = .TRUE.
         GOTO 70
C
C  POINT 'DDDD,DDDD' IN CC1-9 = (4@ZF0-F9),Z6B,(4@ZF0-F9)
C                             = (4@240-249),107,(4@240-249)
C
 50   IF(.NOT.POINT)GO TO 70
      IF(INCOL.NE.9)GO TO 70
      IF(JBUFF(5).NE.INTCOM)GO TO 70
      DO 60 I=1,4
         IF(IDIGIT(I).EQ.-1.OR.IDIGIT(I+5).EQ.-1)GOTO 70
 60   CONTINUE
      MODE=11
         GOTO 70
C
C  ECHO (NOT A POINT WITH MENUING)
C
 70   IF(MODE.EQ.11.AND.MENU)GO TO 100
      IF(.NOT.ECHO)GO TO 90
      NN = MINO(INCOL,MARK)
      IF(ILABEL.EQ.0)GO TO 80
      WRITE(IOUT,1001)ILABEL,(CARD(I),I=1,NN)
      ILABEL = 0
         GOTO 90
 80   WRITE(IOUT,1002)(CARD(I),I=1,NN)
 90   IF(REREAD)GOTO 10
 100  RETURN
```

```
 1001 FORMAT(1X,I5,1X,80A1)
 1002 FORMAT(7X,      80A1)
 1003 FORMAT(3H ? )
      END
C ***************************************************************************
C *                                                                         *
C * SCANMC                                                                  *
C *                                                                         *
C ***************************************************************************
      LOGICAL FUNCTION SCANMC(TEXTA,TEXTB,NCHAR)
C
C         CHARACTER MATCH OF A AND B FOR NCHARS
C
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      DIMENSION TEXTA(1), TEXTB(1)
      REAL JA, JB, JC, JD
      CHARACTER*1 AA(4), BB(4), CC(4), DD(4)
      EQUIVALENCE (AA(1),JA), (BB(1),JB), (CC(1),JC), (DD(1),JD)
      INTEGER I, NW, NR
      SCANMC = .FALSE.
      NW = NCHAR/NCPW
      NR = NCHAR-NW*NCPW
      IF(NW.EQ.0)GO TO 20
      DO 10 I = 1, NW
      IF(TEXTA(I).NE.TEXTB(I))GO TO 50
   10 CONTINUE
   20 IF(NR.EQ.0)GO TO 40
      JA = TEXTA(NW+1)
      JB = TEXTB(NW+1)
      JC = BLANK
      JD = BLANK
      DO 30 I = 1, NR
      CC(4) = AA(I)
      DD(4) = BB(I)
      IF(JC.NE.JD)GO TO 50
   30 CONTINUE
   40 SCANMC = .TRUE.
   50 RETURN
      END
C ***************************************************************************
C *                                                                         *
C * SCANDB                                                                  *
C *                                                                         *
C ***************************************************************************
      SUBROUTINE SCANDB
C
C         DEBUG - ALL CHARACTER OUTPUT AT 4 PER WORD
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER RECSIZ, FILES, FILPT, FILLIM, COL, SKIP, PSTATE
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, NEXT, DOREAD
```

```
      WRITE(   6,901)
  901  FORMAT('  A NEW STATEMENT')
C901  FORMAT ( 1H1,/,  ' **********************'/,
C     1             ' * S C A N   D E B U G *'/,
C     2             ' **********************'/)
      WRITE(IOUT,1002)RECSIZ, LIMIT, MARK, ECHAR, ECHO, PROMT, ILABEL,
     1               INIT, POINT, MENU, LEOF, EOL, AUTORD, COMMNT,
     2               SIGNED
      WRITE(IOUT,1003)INUNIT, IOUT, LREMOT, FILPT, FILLIM, FILES
      WRITE(IOUT,1004)COL, JUMP, NENT, PSTATE, SKIP, DOREAD, INCOL,
     3               CARD, JBUFF, IBUFF, IDIGIT
      WRITE(IOUT,1005)ENTITY, MODE, VALUE, IVALUE, IVAL, NCHAR, NWD,
     1               NEXT, ICOLMN
      RETURN
 1002 FORMAT( 5X, 25HC O N T R O L   S T A T E/
     1       10X, 14HRECORD SIZE - ,I10/
     2       10X, 15HRECORD LIMIT - , I2/
     3       10X, 13HRECORD END - , I2/
     4       10X, 23HRECORD END CHARACTER - , A1/
     5       10X, 14HECHO SWITCH - , L1/
     6       10X, 16HPROMPT SWITCH - , L1/
     7       10X, 13HLINE LABEL - , I5/
     8       10X, 24HINITIALIZATION SWITCH - , L1/
     9       10X, 15HPOINT SWITCH - , L1/
     A       10X, 14HMENU SWITCH - , L1/
     B       10X, 21HEND OF FILE SWITCH - , L1/
     C       10X, 21HEND OF LINE SWITCH - , L1/
     D       10X, 19HAUTO READ SWITCH - ,L1/
     E       10X, 17HCOMMENT SWITCH - , L1/
     F       10X, 14HSIGN SWITCH - , L1/)
 1003 FORMAT( 5X, 17HI / O   S T A T E/
     1       10X, 13HINPUT UNIT - , I2/
     2       10X, 14HOUTPUT UNIT - , I2/
     3       10X, 14HREMOTE UNIT - , I2/
     4       10X, 21HFILE STACK POINTER - , I2/
     5       10X, 13HFILE LIMIT - , I2/
     6       10X, 13HFILE STACK - , 10(I2, 2X)/)
 1004 FORMAT( 5X, 19HS C A N   S T A T E/
     1       10X, 9HCOLUMN - , I2/
     2       10X, 7HJUMP - , I2/
     3       10X, 16HENTITY NUMBER - , I2/
     4       10X, 15HSTRING STATE - , I2/
     5       10X, 13HSKIP STATE - , I2/
     6       10X, 14HREAD SWITCH - , L1/
     7       10X, 14HRECORD SIZE - , I2/
     8       10X, 13HINPUT LINE - , 81A1/
     9       10X, 18HINTERNAL RECORD - , 20(I3,1X)/28X,20(I3,1X)/
     A            28X,20(I3,1X)/28X,21(I3,1X)/
     B       10X, 8HCLASS - , 20(I3,1X)/18X,20(I3,1X)/18X,20(I3,1X)/
     C            18X,21(I3,1X)/
     D       10X, 9HDIGITS - , 20(I3,1X)/19X,20(I3,1X)/19X,20(I3,1X)/
     E            19X,21(I3,1X)/)
C
C               THE A4 FORMAT IS MACHINE DEPENDENT
C
 1005 FORMAT( 5X, 11HE N T I T Y/
     1       10X, 9HENTITY - , 20A4/
     2       10X, 8HVALUE - , G20.10/
     3       10X, 9HIVALUE - , I20/
     4       10X, 7HIVAL - , 2I20/
```

```
5       10X, 7HMODE - , I2/
6       10X, 12HCHARACTER - , I2/
7       10X, 8HWORDS - , I2/
8       10X, 7HNEXT - , L1/
9       10X, 9HCOLUMN - , I2///)
 END
```

```
$DEBUG
C ********************************************************************************
C *                                                                              *
C * BLOCK DATA                                                                   *
C *                                                                              *
C ********************************************************************************
      BLOCK DATA
C
C          INITIALZE THE SCANNER
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      COMMON /SCANCT/ ECHAR, ECHO, ILABEL, LIMIT, MARK, PROMT,
     1                POINT, RECSIZ, INIT, LEOF, EOL, MENU,
     2                AUTORD, COMMNT, SIGNED
      COMMON /SCANIO/ INUNIT, IOUT, FILES(10), FILPT, FILLIM, LREMOT
      COMMON /SCANLN/ COL, JUMP, NENT, PSTATE, SKIP, DOREAD,
     1                INCOL, JSTART(80), IBUFF(81), JBUFF(81),
     2                IDIGIT(81), CARD(81)
      COMMON /SCANTB/ NSEPTB, NCLASS, ITAB(256), ICLASS(256)
      COMMON /SCANIM/ NCPW,BLANK,INTZER,INTNIN,INTC,INTCOM,INTBLK
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      EQUIVALENCE (BLANK,TORAK1),(ENTITY,TORAK2),(CARD,TORAK3),
     1            (ECHAR,TORAK4)
      INTEGER RECSIZ, FILES, FILPT, FILLIM, COL, SKIP, PSTATE
      LOGICAL ECHO, PROMT, POINT, INIT, LEOF, EOL, MENU,
     1        COMMNT, AUTORD, SIGNED, NEXT, DOREAD
      CHARACTER*4 TORAK1,TORAK2(20),TORAK3(81),TORAK4
C
C         /SCANER/
C
      DATA TORAK2/20*'    '/, IVAL/2*0/, MODE/0/, NCHAR/0/,
     1     NWD/0/, NEXT/.FALSE./, ICOLMN/0/
C
C         /SCANCT/
C
      DATA TORAK4/'$   '/, ECHO/.TRUE./, ILABEL/0/, LIMIT/80/, MARK/80/,
     1     POINT/.FALSE./, RECSIZ/80/, INIT/.FALSE./, LEOF/.FALSE./,
     2     EOL/.TRUE./, MENU/.FALSE./, AUTORD/.FALSE./,
     3     COMMNT/.TRUE./, SIGNED/.FALSE./, PROMT/.FALSE./
C
C         /SCANIO/
C
      DATA INUNIT/5/, IOUT/6/, FILES/10*0/, FILPT/0/, FILLIM/10/,
     1     LREMOT/6/
C
C         /SCANLN/
C
      DATA COL/0/, JUMP/1/, NENT/1/, PSTATE/0/, SKIP/1/,
     1     DOREAD/.TRUE./, INCOL/80/, JSTART/80*0/,
     2     IBUFF/81*9/, JBUFF/81*9/, IDIGIT/81*0/,
     3     TORAK3/81*'    '/
C
C         /SCANTB/
C
      DATA NSEPTB/256/, NCLASS/256/
      DATA ITAB/8*0,                          8*0,
     2          8*0,                          8*0,
     4          00,00,26,22,09,17,07,24,      04,11,10,05,16,03,02,15,
     6          8*0,                          00,00,21,12,00,25,19,20,
     8          23,00,00,00,00,00,00,00,      8*0,
```

```
     A          8*0,                          00,00,00,01,00,08,13,00,
     C          8*0,                          8*0,
     E          8*0,                          00,00,00,C0,06,00,00,00,
     1          8*0,                          8*0,
     3          8*0,                          8*0,
     5          00,00,26,22,09,17,07,24,      04,11,10,05,16,03,02,15,
     7          8*0,                          00,00,21,12,00,25,19,20,
     9          23,00,00,00,00,00,00,00,      8*0,
     B          8*0,                          00,00,00,01,00,08,13,00,
     D          8*0,                          8*0,
     F          8*0,                          00,00,00,00,06,00,00,00/
      DATA ICLASS/8*8,                  8*8,
     2            8*8,                  8*8,
     4            9,8,6,8,8,8,8,6,      8,8,8,2,8,3,7,8,
     6            8*1,                  1,1,8,8,8,8,8,8,
     8            8,5,5,5,5,5,4,5,5,    8*5,
     A            8*5,                  5,5,5,8,8,8,8,5,
     C            8,5,5,5,5,5,5,5,5,    8*5,
     E            8*5,                  5,5,5,8,8,8,8,8,
     1            8*8,                  8*8,
     3            8*8,                  8*8,
     5            9,8,6,8,8,8,8,6,      8,8,8,2,8,3,7,8,
     7            8*1,                  1,1,8,8,8,8,8,8,
     9            8,5,5,5,5,5,4,5,5,    8*5,
     B            8*5,                  5,5,5,8,8,8,8,5,
     D            8,5,5,5,5,5,5,5,5,    8*5,
     F            8*5,                  5,5,5,8,8,8,8,8/
C
C         /SCANIM/
C
      DATA NCPW/4/, TORAK1/'    '/, INTZER/48/,
     1     INTNIN/57/, INTC/67/, INTCOM /44/, INTBLK/32/
C
      END
```

```
$DEBUG
      SUBROUTINE FIXCRD
C
C ******************************************************************
C
C     FIXCRD - FIX CARD
C
C     THIS SUBROUTINE READS FROM THE SCAN INPUT FILE AND
C     WRITES TO THE OUTPUT FILE
C
C ------------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ------------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED : NONE
C
C       RETURNED: NONE
C
C ------------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ******************************************************************
C
      CHARACTER*4 CARD(20)
      INTEGER IR,IW
C
 10   READ(5,20,END=100) (CARD(IR),IR=1,20)
 20   FORMAT(20A4)
      WRITE(7,30)( CARD(IW),IW=1,20)
 30   FORMAT(10X,20A4)
      GOTO 10
 100  CONTINUE
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE IZERO (A,N,VALUE)
C
C ****************************************************************
C
C     IZERO  - INTEGER ZERO
C
C     THIS SUBROUTINE INITIALIZES THE INTEGER ARRAY TO VALUE
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         VALUE  - INTEGER VALUE
C         N      - SIZE OF ARRAY
C
C       RETURNED :
C
C         A      - INTEGER ARRAY
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER VALUE,A(N)
      INTEGER I,N
          DO 100 I=1,N
           A(I) = VALUE
100       CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE ZERO (A,N,VALUE)
C
C ****************************************************************
C
C     ZERO  - REAL ZERO
C
C     THIS SUBROUTINE INITIALIZES THE REAL*4 ARRAY TO VALUE
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C          VALUE  - REAL*4 VALUE
C          N      - SIZE OF ARRAY
C
C       RETURNED :
C
C          A      - REAL*4 ARRAY
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      REAL*4  VALUE,A(N)
      INTEGER I,N
          DO 100 I=1,N
           A(I) = VALUE
100       CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE DZERO (A,N,VALUE)
C
C ***************************************************************
C
C     DZERO  - DOUBLE PRECISION ZERO
C
C     THIS SUBROUTINE INITIALIZES THE REAL*8 ARRAY TO VALUE
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         VALUE  - REAL*8 VALUE
C         N      - SIZE OF ARRAY
C
C       RETURNED :
C
C         A      - REAL*8 ARRAY
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      REAL*8  VALUE,A(N)
      INTEGER I,N
          DO 100 I=1,N
           A(I) = VALUE
100       CONTINUE
      RETURN
      END
```

```
$DEBUG
C
C ****************************************************************
C  THIS SUBROUTINE GETS THE STRUCTURE NUMBERS                     *
C ****************************************************************
C
      SUBROUTINE GETNUM(NSTRUC,ISTRUC,MAXSTR,IMSG)
C
C ****************************************************************
C
C     GETNUM - GET STRUCTURE NUMBER
C
C     THIS SUBROUTINE GETS THE STRUCTURE NUMBER
C
C ---------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         MAXSTR - MAXIMUM NUMBER OF STRUCTURES PERMITTED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         NSTRUC - STRUCTURE NUMBER
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS   INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY,INTEG
      INTEGER NSTRUC(1),IMSG,ISTRUC
      LOGICAL SEP,ENDCRD,INTEGR,NEXT
C
      ISTRUC=1
 10   IF( .NOT. INTEGR(INTEG))        GOTO 8000
        NSTRUC(ISTRUC) = INTEG
      IF( ENDCRD(DUMMY)) RETURN
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)                GOTO 8001
        CALL READSC
 30   ISTRUC=ISTRUC+1
```

```
      IF( ISTRUC .GT. MAXSTR)        GOTO 8002
        GOTO 10
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.      ')
          GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.       ')
          GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - INCREASE MAXSTR TO:                   ')
      WRITE(IMSG,8003)ISTRUC
 8003 FORMAT(10X,I10)
          GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETGIR(GRDSPC,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETGIR - GET GIRDER SPACING
C
C     THIS SUBROUTINE GETS THE GIRDER SPACING
C
C ----------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C         IMSG   - ERROR MESSAGE FILE NUMBER.
C
C       RETURNED :
C
C         GRDSPC - GIRDER SPACING
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY
      INTEGER IMSG,ISTRUC
      REAL*4 REEL
      REAL*8 GRDSPC(1)
      LOGICAL SEP,ENDCRD,NUMR,NEXT
C
      I=1
 10   IF( .NOT. NUMR(REEL))       GOTO 8000
        GRDSPC(I) = DBLE(REEL)
      IF( ENDCRD(DUMMY)) GOTO 40
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)            GOTO 8001
        CALL READSC
 30   I=I+1
      IF(I .GT. ISTRUC)           GOTO 8002
        GOTO 10
 40   IF(I .LT. ISTRUC)           GOTO 8003
```

```
        RETURN
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
          GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.     ')
          GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY GIRDER SPACINGS ENTERED.   ')
          GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - TOO FEW GIRDER SPACINGS ENTERED.    ')
          GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETOPE(OPRING,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETOPE - GET OPERATING RATING
C
C     THIS SUBROUTINE GETS THE OPERATING RATING
C
C ----------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         OPRING - OPERATING RATING
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS    INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY,INTEG
      INTEGER OPRING(1),IMSG,ISTRUC
      LOGICAL SEP,ENDCRD,INTEGR,NEXT
C
      I=1
 10   IF( .NOT. INTEGR(INTEG))    GOTO 8000
        OPRING(I) = INTEG
      IF( ENDCRD(DUMMY)) GOTO 40
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)            GOTO 8001
        CALL READSC
 30   I=I+1
      IF(I .GT. ISTRUC)           GOTO 8002
        GOTO 10
 40   IF(I .LT. ISTRUC)           GOTO 8003
        RETURN
C
C     ERROR MESSAGES
```

```
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.     ')
      GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.     ')
      GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY OPERATING RATINGS ENTERED. ')
      GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - TOO FEW OPERATING RATINGS ENTERED.  ')
      GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
C
C ****************************************************************
C  THIS SUBROUTINE GETS THE SLAB PLAN NUMBERS                     *
C ****************************************************************
C
      SUBROUTINE GETSLB(ISPLAN,ISLAB,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETSLB - GET SLAB PLANS
C
C     THIS SUBROUTINE GETS THE SLAB PLANS
C
C ---------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - MAXIMUM NUMBER OF STRUCTURES ENTERED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         ISPLAN - SLAB PLAN NUMBER
C         ISLAB  - NUMBER OF SLAB PLANS INPUT
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/02/1986  RAS   INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY,INTEG
      INTEGER ISPLAN(1),IMSG,ISLAB,ISTRUC
      LOGICAL SEP,ENDCRD,INTEGR,NEXT
C
      ISLAB=1
 10   IF( .NOT. INTEGR(INTEG))       GOTO 8000
        ISPLAN(ISLAB) = INTEG
      IF( ENDCRD(DUMMY)) RETURN
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)               GOTO 8001
        CALL READSC
 30   ISLAB=ISLAB+1
```

```
      IF( ISLAB  .GT. ISTRUC)        GOTO 8002
        GOTO 10
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.     ')
          GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.      ')
          GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY SLAB PLANS ENTERED.         ')
          GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETCNT(CONTIN,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETCTN - GET CONTINUITIES
C
C     THIS SUBROUTINE GETS THE CONTINUITIES
C
C ----------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         CONTIN - CONTINUITY
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY,INTEG
      INTEGER CONTIN(1),IMSG,ISTRUC
      LOGICAL SEP,ENDCRD,INTEGR,NEXT
C
      I=1
 10   IF( .NOT. INTEGR(INTEG))    GOTO 8000
        CONTIN(I) = INTEG
      IF( ENDCRD(DUMMY)) GOTO 40
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)            GOTO 8001
        CALL READSC
 30   I=I+1
      IF(I .GT. ISTRUC)           GOTO 8002
        GOTO 10
 40   IF(I .LT. ISTRUC)           GOTO 8003
        RETURN
C
C     ERROR MESSAGES
```

```
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER INPUT.     ')
      GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.     ')
      GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY CONTINUITY ITEMS ENTERED.  ')
      GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - TOO FEW CONTINUITY ITMES ENTERED.   ')
      GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETSTD(IOVLD,IMSG)
C
C ****************************************************************
C
C     GETSTD - GET STANDARD VEHICLES
C
C     THIS SUBROUTINE GETS THE STANDARD VEHICLES TO BE RATED
C
C ----------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         IOVLD  - STANDARD VEHICLE IDENTIFICATION
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY
      INTEGER IMSG,IOVLD
      LOGICAL SEP,ENDCRD,MATCH,NEXT
C
      IF(MATCH('H20',3))       GOTO 110
      IF(MATCH('HS20',4))      GOTO 120
      IF(MATCH('ALTERNATE',3))GOTO 130
      IF(MATCH('TYPE',3))      GOTO 140
      IF(MATCH('P5',2))        GOTO 150
      IF(MATCH('P7',2))        GOTO 160
      IF(MATCH('P9',2))        GOTO 170
      IF(MATCH('P11',3))       GOTO 180
      IF(MATCH('P13',3))       GOTO 190
        GOTO 8000
 110  IOVLD=1
        RETURN
 120  IOVLD=2
        RETURN
 130  IF(.NOT. MATCH('MILITARY',3))GOTO 8001
      IOVLD=3
```

```
      RETURN
140   IF(  MATCH('3S2',3))GOTO 145
      IF(  MATCH('33' ,2))GOTO 146
      IF(  MATCH('3'  ,1))GOTO 147
        GOTO 8002
145   IOVLD=5
        RETURN
146   IOVLD=6
        RETURN
147   IOVLD=4
        RETURN
150   IOVLD=7
        RETURN
160   IOVLD=8
        RETURN
170   IOVLD=9
        RETURN
180   IOVLD=10
        RETURN
190   IOVLD=11
        RETURN
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT STANDARD VEHICLE INPUT.    ')
          GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - THE WORD <MILITARY> IS MISSING.      ')
          GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - <3S2>, <33>, OR <3> IS MISSING.      ')
          GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE STAND(IOVLD,IGROUP,PL,DX,WHO,WHI,IFL,JFG,IMSG)
C
C ***************************************************************
C
C     STAND - STANDARD OVERLOAD/RATING VEHICLES
C
C     THIS SUBROUTINE READS IN STANDARD VEHICLES TO BE RATED
C
C ---------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C          IOVLD   -  OVERLOAD VEHICLE IDENTIFICATION
C
C       RETURNED:
C
C          IGROUP  -  GROUP IDENTIFICATION
C          PL      -  AXLE LOADS
C          DX      -  DISTANCES TO THE AXLES
C          WHO     -  OUTER WHEEL GAGE
C          WHI     -  INNER W----------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS    INITIAL CODING
C
C ***************************************************************
C
      INTEGER IGROUP(1),IFL,JFG,IMSG,IOVLD,I
      REAL*8  PL(1),WHO(1),WHI(1),DX(1)
      INTEGER IGRPA(2), IGRPB(3), IGRPC(2), IGRPD(3), IGRPE(5)
      INTEGER IGRPF(6), IGRPG(3), IGRPH(4), IGRPI(5), IGRPJ(6)
      INTEGER IGRPK(7)
      REAL*8  TRUCKA(2),TRUCKB(3),TRUCKC(2),TRUCKD(3),TRUCKE(5)
      REAL*8  TRUCKF(6),TRUCKG(3),TRUCKH(4),TRUCKI(5),TRUCKJ(6)
      REAL*8  TRUCKK(7)
      REAL*8  DXA(2)   ,DXB(3)  , DXC(2)   ,DXD(3)   ,DXE(5)
      REAL*8  DXF(6)   ,DXG(3)  , DXH(4)   ,DXI(5)   ,DXJ(6)
      REAL*8  DXK(7)
      REAL*8  WHOA(2)  ,WHOB(3) , WHOC(2)  ,WHOD(3)  ,WHOE(5)
      REAL*8  WHOF(6)  ,WHOG(3) , WHOH(4)  ,WHOI(5)  ,WHOJ(6)
      REAL*8  WHOK(7)
C
      DATA IGRPA  /     1,     2/
      DATA TRUCKA /  8.00, 32.00/
      DATA DXA    /   0. , 14.00/
      DATA WHOA   /   6.0,  6.00/
C
```

```
      DATA IGRPB  /     1,     2,     3/
      DATA TRUCKB / 8.00, 32.00, 32.00/
      DATA DXB    /  0.  , 14.00, 28.00/
      DATA WHOB   /  6.  ,  6.  ,  6.  /
C
      DATA IGRPC  /     1,     2/
      DATA TRUCKC / 24.00, 24.00/
      DATA DXC    /   0. ,  4.00/
      DATA WHOC   /   6.0,  6.00/
C
      DATA IGRPD  /     1,     2,     3/
      DATA TRUCKD / 16.00, 17.00, 17.00/
      DATA DXD    /  0.  , 15.00, 19.00/
      DATA WHOD   /  6.  ,  6.  ,  6.  /
C
      DATA IGRPE  /     1,     2,     3,     4,     5/
      DATA TRUCKE / 10.00, 15.50, 15.50, 15.50, 15.50/
      DATA DXE    /  0.  , 11.00, 15.00, 37.00, 41.00/
      DATA WHOE   /  6.  ,  6.  ,  6.  ,  6.  ,  6.  /
C
      DATA IGRPF  /     1,     2,     3,     4,     5,     6/
      DATA TRUCKF / 12.00, 12.00, 12.00, 16.00, 14.00, 14.00/
      DATA DXF    /  0.  , 15.00, 19.00, 34.00, 50.00, 54.00/
      DATA WHOF   /  6.  ,  6.  ,  6.  ,  6.  ,  6.  ,  6.  /
C
      DATA IGRPG  /     1,     2,     3/
      DATA TRUCKG / 26.00, 48.00, 48.00/
      DATA DXG    /  0.  , 18.00, 36.00/
      DATA WHOG   /  6.  ,  6.  ,  6.  /
C
      DATA IGRPH  /     1,     2,     3,     4/
      DATA TRUCKH / 26.00, 48.00, 48.00, 48.00/
      DATA DXH    /  0.  , 18.00, 36.00, 54.00/
      DATA WHOH   /  6.  ,  6.  ,  6.  ,  6.  /
C
      DATA IGRPI  /     1,     2,     3,     4,     5/
      DATA TRUCKI / 26.00, 48.00, 48.00, 48.00, 48.00/
      DATA DXI    /  0.  , 18.00, 36.00, 54.00, 72.00/
      DATA WHOI   /  6.  ,  6.  ,  6.  ,  6.  ,  6.  /
C
      DATA IGRPJ  /     1,     2,     3,     4,     5,     6/
      DATA TRUCKJ / 26.00, 48.00, 48.00, 48.00, 48.00, 48.00/
      DATA DXJ    /  0.  , 18.00, 36.00, 54.00, 72.00, 90.00/
      DATA WHOJ   /  6.  ,  6.  ,  6.  ,  6.  ,  6.  ,  6.  /
C
      DATA IGRPK  /     1,     2,     3,     4,     5,     6,     7/
      DATA TRUCKK / 26.00, 48.00, 48.00, 48.00, 48.00, 48.00, 48.00/
      DATA DXK    /  0.  , 18.00, 36.00, 54.00, 72.00, 90.00,108.00/
      DATA WHOK   /  6.  ,  6.  ,  6.  ,  6.  ,  6.  ,  6.  ,  6.  /
C
      GOTO(100,200,300,400,500,600,700,800,900,1000,1100)IOVLD
C
C     H20
C
  100 IFL=2
      JFG=2
      DO 110 I=1,IFL
        IGROUP(I) = IGRPA(I)
        PL(I)     = TRUCKA(I)
        DX(I)     = DXA(I)
```

```
        WHO(I)    = WHOA(I)
        WHI(I)    = 0.D0
  110 CONTINUE
      RETURN
C
C     HS20
C
  200 IFL=3
      JFG=3
      DO 210 I=1,IFL
        IGROUP(I) = IGRPB(I)
        PL(I)     = TRUCKB(I)
        DX(I)     = DXB(I)
        WHO(I)    = WHOB(I)
        WHI(I)    = 0.D0
  210 CONTINUE
      RETURN
C
C     ALTERNATE MILITARY
C
  300 IFL=2
      JFG=2
      DO 310 I=1,IFL
        IGROUP(I) = IGRPC(I)
        PL(I)     = TRUCKC(I)
        DX(I)     = DXC(I)
        WHO(I)    = WHOC(I)
        WHI(I)    = 0.D0
  310 CONTINUE
      RETURN
C
C     TYPE 3
C
  400 IFL=3
      JFG=3
      DO 410 I=1,IFL
        IGROUP(I) = IGRPD(I)
        PL(I)     = TRUCKD(I)
        DX(I)     = DXD(I)
        WHO(I)    = WHOD(I)
        WHI(I)    = 0.D0
  410 CONTINUE
      RETURN
C
C     TYPE 3-S2
C
  500 IFL=5
      JFG=5
      DO 510 I=1,IFL
        IGROUP(I) = IGRPE(I)
        PL(I)     = TRUCKE(I)
        DX(I)     = DXE(I)
        WHO(I)    = WHOE(I)
        WHI(I)    = 0.D0
  510 CONTINUE
      RETURN
C
C     TYPE 3-3
C
  600 IFL=6
```

```
      JFG=6
      DO 610 I=1,IFL
        IGROUP(I) = IGRPF(I)
        PL(I)     = TRUCKF(I)
        DX(I)     = DXF(I)
        WHO(I)    = WHOF(I)
        WHI(I)    = 0.D0
  610 CONTINUE
      RETURN
C
C     P5
C
  700 IFL=3
      JFG=3
      DO 710 I=1,IFL
        IGROUP(I) = IGRPG(I)
        PL(I)     = TRUCKG(I)
        DX(I)     = DXG(I)
        WHO(I)    = WHOG(I)
        WHI(I)    = 0.D0
  710 CONTINUE
      RETURN
C
C     P7
C
  800 IFL=4
      JFG=4
      DO 810 I=1,IFL
        IGROUP(I) = IGRPH(I)
        PL(I)     = TRUCKH(I)
        DX(I)     = DXH(I)
        WHO(I)    = WHOH(I)
        WHI(I)    = 0.D0
  810 CONTINUE
      RETURN
C
C     P9
C
  900 IFL=5
      JFG=5
      DO 910 I=1,IFL
        IGROUP(I) = IGRPI(I)
        PL(I)     = TRUCKI(I)
        DX(I)     = DXI(I)
        WHO(I)    = WHOI(I)
        WHI(I)    = 0.D0
  910 CONTINUE
      RETURN
C
C     P11
C
 1000 IFL=6
      JFG=6
      DO 1010 I=1,IFL
        IGROUP(I) = IGRPJ(I)
        PL(I)     = TRUCKJ(I)
        DX(I)     = DXJ(I)
        WHO(I)    = WHOJ(I)
        WHI(I)    = 0.D0
 1010 CONTINUE
```

```
      RETURN
C
C     P31
C
1100  IFL=7
      JFG=7
      DO 1110 I=1,IFL
        IGROUP(I) = IGRPK(I)
        PL(I)     = TRUCKK(I)
        DX(I)     = DXK(I)
        WHO(I)    = WHOK(I)
        WHI(I)    = 0.DO
 1110 CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE GETIND(PL,DX,IGROUP,IFL,JFG,MAXILD,IMSG)
C
C ***************************************************************
C
C     GETIND - GET INDIVIDUAL TRUCK CONFIGURATION
C
C     THIS SUBROUTINE GETS THE INDIVIDUAL TRUCK CONFIGURATION
C
C ---------------------------------------------------------------
C
C     CALLS TO : READSC
C                REMARK
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED:
C
C         MAXILD - MAXIMUM AXLE LOADS PERMITTED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED:
C
C         PL     - AXLE LOADS
C         DX     - DISTANCES TO THE AXLES
C         IGROUP - GROUP IDENTIFICATION
C         IFL    - NUMBER OF INDIVIDUAL AXLES
C         JFG    - NUMBER OF GROUP AXLES
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER  ILD,JGP,DUMMY,MAXILD,IFL,JFG,IMSG
      INTEGER  IGROUP(1)
      REAL*4   REEL
      REAL*8   DXTOT,PLOAD,AS
      REAL*8   PL(1),DX(1)
      LOGICAL  SEP,ENDCRD,NUMR,NEXT
C
      ILD=1
      JGP=1
      DXTOT=0.0D0
C
C     SINGLE LOAD
C
 15   IF( .NOT. NUMR (REEL) )  GOTO 8000
        PLOAD=   DBLE(REEL)
        PL(ILD)= PLOAD
```

```
        IGROUP(ILD)=JGP
        DX(ILD)= DXTOT
        IFL=ILD
        JFG=JGP
      IF( ENDCRD(DUMMY)) RETURN
C
C     SINGLE AXLE SPACING
C
      IF( .NOT. NUMR (REEL) )  GOTO 8000
        AS=DBLE(REEL)
        DXTOT= DXTOT + AS
      IF(ENDCRD (DUMMY))       GOTO 8001
      IF( SEP(DUMMY)   )GOTO 25
        GOTO 30
 25   IF( DUMMY .NE. 3)        GOTO 8011
        CALL READSC
 30   ILD=ILD+1
      JGP=JGP+1
      IF(ILD .GT. MAXILD)      GOTO 8009
        GOTO 15
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
         GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - AXLE LOAD MISSING.                   ')
         GOTO 8990
 8009 CALL REMARK(IMSG,'ERROR - INCREASE MAXILD TO:                  ')
         WRITE(IMSG,8100)IFL
 8100    FORMAT(10X,I10)
         GOTO 8990
 8011 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.      ')
         GOTO 8990
C
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETGRP(PL,DX,IGROUP,IFL,JFG,MAXILD,IMSG)
C
C ****************************************************************
C
C     GETGRP - GET GROUP TRUCK CONFIGURATION
C
C     THIS SUBROUTINE GETS THE INDIVIDUAL TRUCK CONFIGURATION
C
C ----------------------------------------------------------------
C
C     CALLS TO : READSC
C                REMARK
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED:
C
C         MAXILD - MAXIMUM AXLE LOADS PERMITTED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED:
C
C         PL     - AXLE LOADS
C         DX     - DISTANCES TO THE AXLES
C         IGROUP - GROUP IDENTIFICATION
C         IFL    - NUMBER OF INDIVIDUAL AXLES
C         JFG    - NUMBER OF GROUP AXLES
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C       07/02/1986   RAS   POL MODIFICATION
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER  ILD,JGP,INTEG,DUMMY,NAS,MAXILD,IFL,JFG,IMSG
      INTEGER  IGROUP(1)
      REAL*4   REEL
      REAL*8   DXTOT,PLOAD,AS
      REAL*8   PL(1),DX(1)
      LOGICAL  SEP,ENDCRD,INTEGR,NUMR ,NEXT
C
      ILD=1
      JGP=1
      IFL= ILD
      JFG= JGP
      DXTOT=0.0D0
      NAS=0
C
C     GROUP AXLE LOAD
```

```
C
  5   IF( .NOT. NUMR (REEL) )  GOTO 8000
        PLOAD=   DBLE(REEL)
      IF( ENDCRD      (DUMMY))  GOTO 10
        GOTO 20
 10     PL(ILD)      =PLOAD
        IGROUP(ILD) =JGP
        DX(ILD)      =DXTOT
        RETURN
C
C     NUMBER AXLES PER GROUP
C
 20   IF( .NOT. INTEGR(INTEG))  GOTO 8001
        NAS=INTEG
      IF( ENDCRD      (DUMMY))   GOTO 8002
C
C     GROUP AXLE SPACING
C
      IF( .NOT. NUMR (REEL))   GOTO 8000
        AS=DBLE(REEL)
      IF( ENDCRD      (DUMMY))  GOTO 40
        GOTO 75
 40     IFL = ILD + NAS -1
        JFG = JGP
        IF(IFL .GT. MAXILD)     GOTO 8009
        DO 45 I=ILD,IFL
          PL(I)      = PLOAD
          IGROUP(I) = JGP
          DX(I)      = DXTOT
          DXTOT      = DXTOT + AS
 45     CONTINUE
          DXTOT      = DXTOT -AS
        RETURN
C
C     SPACING TO NEXT GROUP
C
 75   IF(.NOT. NUMR (REEL))    GOTO 8000
        SNG= DBLE(REEL)
        IFL = ILD + NAS -1
        JFG = JGP
        IF(IFL .GT. MAXILD)    GOTO 8009
C
      DO 100 I=ILD,IFL
        PL(I)        = PLOAD
        IGROUP(I)    = JGP
        DX(I)        = DXTOT
        IF(IFL .EQ. 1) GOTO 100
        DXTOT        = DXTOT + AS
 100  CONTINUE
        DXTOT = DXTOT - AS
        DXTOT = DXTOT + SNG
      IF( SEP (DUMMY))          GOTO 120
        GOTO 8012
 120  IF( DUMMY .NE. 3)         GOTO 8011
        CALL READSC
      ILD = ILD + NAS
      JGP = JGP + 1
      IFL = ILD
      JFG = JGP
      IF(IFL .GT. MAXILD)       GOTO 8009
```

```
      GOTO 5
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL VALUE.        ')
      GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC INTEGER VALUE.     ')
      GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - AXLE SPACING MISSING.                ')
      GOTO 8990
 8009 CALL REMARK(IMSG,'ERROR - INCREASE MAXILD TO:                  ')
      WRITE(IMSG,8100)IFL
 8100 FORMAT(10X,I10)
      GOTO 8990
 8011 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.      ')
      GOTO 8990
 8012 CALL REMARK(IMSG,'ERROR - CONTINUATOR MISSING.                 ')
      GOTO 8990
C
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETWHL(IGROUP,WHL,IFL,JFG,MAXILD,IMSG)
C
C ****************************************************************
C
C     GETWHL - GET WHEEL CONFIGURATION
C
C     THIS SUBROUTINE GETS THE WHEEL CONFIGURATION
C
C ----------------------------------------------------------------
C
C     CALLS TO : REMARK
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         MAXILD  - MAXIMUM AXLE LOADS PERMITTED
C         IMSG    - ERROR MESSAGE FILE NUMBER
C         IFL     - NUMBER OF INDIVIDUAL AXLES
C         JFG     - NUMBER OF GROUP AXLES
C         IGROUP  - GROUP IDENTIFICATION
C
C       RETURNED :
C
C         WHL     - WHEEL GAGE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C       07/02/1986   RAS   POL MODIFICATION
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
      REAL*4  REEL
      INTEGER ILD,JGP,DUMMY,IFWO,IFWG,IGROUP(1),ICHCK1,ICHCK2,MAXILD
      REAL*8  WHL(MAXILD)
      LOGICAL SEP,NUMR,ENDCRD,NEXT
C
      ILD = 1
      JGP = 1
      IF(IFL .NE. JFG)GOTO 40
C
C     SINGLE WHEEL SPACING
C
 10   IF(ILD .GT. IFL)          GOTO 8001
      IF( .NOT. NUMR (REEL) )   GOTO 8002
        WHL(ILD) = DBLE(REEL)
        IFWO = ILD
        IFWG = JGP
      IF( ENDCRD(DUMMY) ) GOTO 300
      IF( SEP(DUMMY))     GOTO 15
```

```
        GOTO 17
 15   IF(DUMMY .NE. 3)    GOTO 8010
        CALL READSC
 17     JGP = JGP +1
        ILD = ILD +1
        GOTO 10
C
C     GROUP WHEEL SPACINGS
C
 40   IF(JGP .GT. JFG)          GOTO 8004
      IF( .NOT. NUMR (REEL))    GOTO 8005
        WHL(ILD) = DBLE(REEL)
 45     IF(ILD .EQ. IFL) GOTO 50
        ICHCK1 = IGROUP(ILD)
        ICHCK2 = IGROUP(ILD+1)
        IF( ICHCK1 .NE. ICHCK2) GOTO 50
        WHL(ILD+1) = WHL(ILD)
        ILD = ILD + 1
        GOTO 45
 50     IFWG = JGP
        IFWO = ILD
      IF (ENDCRD(DUMMY)) GOTO 400
      IF( SEP(DUMMY))    GOTO 100
        GOTO 150
 100  IF(DUMMY .NE. 3  ) GOTO 8010
        CALL READSC
 150    JGP=JGP + 1
        ILD=ILD + 1
        GOTO 40
C
 300  IF( IFWO .NE. IFL)        GOTO 8008
        RETURN
 400  IF( IFWG .NE. JFG)        GOTO 8009
        RETURN
C
 8000 CALL REMARK(IMSG,'ERROR - SEPARATOR NOT ALLOWED.                ')
          GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - TOO MANY SINGLE WHEEL SPACINGS.       ')
          GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - INCORRECT SINGLE WHEEL SPACING.       ')
          GOTO 8990
 8004 CALL REMARK(IMSG,'ERROR - TOO MANY GROUP WHEEL SPACINGS.        ')
          GOTO 8990
 8005 CALL REMARK(IMSG,'ERROR - INCORRECT GROUP WHEEL SPACING.        ')
          GOTO 8990
 8008 CALL REMARK(IMSG,'ERROR - INCORRECT NO. SINGLE WHEEL SPACINGS. ')
          GOTO 8990
 8009 CALL REMARK(IMSG,'ERROR - INCORRECT NO. GROUP WHEEL SPACINGS.  ')
          GOTO 8990
 8010 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATOR.                  ')
          GOTO 8990
C
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETIMP(FACIMP,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETIMP - GET IMPACT FACTOR
C
C     THIS SUBROUTINE GETS THE IMPACT FACTOR
C
C ----------------------------------------------------------------
C
C     CALLS TO : READSC
C                REMARK
C                EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C         IMSG   - ERROR MESSAGE FILE NUMBER
C
C       RETURNED :
C
C         FACIMP - IMPACT FACTOR OF OVERLOAD VEHICLE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS    INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY
      INTEGER IMSG,ISTRUC
      REAL*4 REEL
      REAL*8 FACIMP(1)
      LOGICAL SEP,ENDCRD,NUMR,NEXT
C
      I=1
 10   IF( .NOT. NUMR(REEL))        GOTO 8000
        FACIMP(I) = DBLE(REEL)
      IF( ENDCRD(DUMMY)) GOTO 40
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)             GOTO 8001
        CALL READSC
 30   I=I+1
      IF(I .GT. ISTRUC)            GOTO 8002
        GOTO 10
 40   IF(I .LT. ISTRUC)            GOTO 8003
        RETURN
```

```
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.        ')
      GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.     ')
      GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY IMPACT FACTORS ENTERED.    ')
      GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - TOO FEW IMPACT FACTORS ENTERED.     ')
      GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE GETRT(RT,ISTRUC,IMSG)
C
C ****************************************************************
C
C     GETRT  - GET TRANSVERSE DISTRIBUTION RATIO
C
C     THIS SUBROUTINE GETS THE TRANSVERSE DISTRIBUTION RATIO
C
C ----------------------------------------------------------------
C
C     CALLS TO :  READSC
C                 REMARK
C                 EXIT
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C         IMSG   - ERROR MESSAGE FILE NUMBER.
C
C       RETURNED :
C
C         RT     - TRANSVERSE DISTRIBUTION RATIO
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      COMMON /SCANER/ ENTITY(20),IVAL(2),MODE,NCHAR,NWD,NEXT,ICOLMN
      EQUIVALENCE (IVAL(1),VALUE,IVALUE)
      INTEGER IVALUE
      REAL*4  VALUE
C
      INTEGER DUMMY
      INTEGER IMSG,ISTRUC
      REAL*4 REEL
      REAL*8 RT(1)
      LOGICAL SEP,ENDCRD,NUMR,NEXT
C
      I=1
 10   IF( .NOT. NUMR(REEL))       GOTO 8000
           RT(I) = DBLE(REEL)
      IF( ENDCRD(DUMMY)) GOTO 40
      IF(SEP (DUMMY)) GOTO 25
        GOTO 30
 25   IF(DUMMY .NE. 3)            GOTO 8001
        CALL READSC
 30   I=I+1
      IF(I .GT. ISTRUC)           GOTO 8002
        GOTO 10
 40   IF(I .LT. ISTRUC)           GOTO 8003
        RETURN
```

```
C
C     ERROR MESSAGES
C
 8000 CALL REMARK(IMSG,'ERROR - INCORRECT NUMERIC REAL INPUT.          ')
      GOTO 8990
 8001 CALL REMARK(IMSG,'ERROR - ILLEGAL CONTINUATION SEPARATOR.       ')
      GOTO 8990
 8002 CALL REMARK(IMSG,'ERROR - TOO MANY RATIOS ENTERED.              ')
      GOTO 8990
 8003 CALL REMARK(IMSG,'ERROR - TOO FEW RATIOS ENTERED.               ')
      GOTO 8990
 8990 CALL EXIT
      END
```

```
$DEBUG
      SUBROUTINE REMARK(UNIT,MSG)
C
C ****************************************************************
C
C     REMARK - WRITE REMARKS
C
C     THIS SUBROUTINE WRITES REMARKS TO OUTPUT UNIT
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         UNIT   - ERROR MESSAGE FILE NUMBER
C         MSG    - ERROR MESSAGE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER  UNIT
      CHARACTER*45 MSG
C
      WRITE(UNIT,100)MSG
  100 FORMAT(10X,A45)
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE HEADER(TITLE,ICAP,IPAGE)
C
C ****************************************************************
C
C     HEADER - HEADINGS
C
C     THIS SUBROUTINE WRITES OUT THE HEADER TO THE OUTPUT FILE
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ICAP   - CAPTION IDENTIFICATION
C
C       RETURNED :
C
C         TITLE  - TITLE HEADING
C         IPAGE  - PAGE NUMBER
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*4 TITLE(20)
      CHARACTER*50 CAP(4),KAP
      INTEGER IPAGE,ICAP,I
      DATA CAP /   '.                    OVERLOAD SCAN ECHO          ',
     1             '                     OVERLOAD DATA CHECK         ',
     2             '                NATIONAL BRIDGE INVENTORY FILE   ',
     3             '                        RESULTS                  '/
C
      IPAGE = IPAGE + 1
      KAP   = CAP(ICAP)
C
      WRITE(7,10)IPAGE,(TITLE(I),I=1,20)
 10   FORMAT('1',///,67X,'PAGE',I4,/,
     1           10X,'******* OVERLOAD *******',11X,'(VERSION 1.3)',/,
     2           10X,'ADOT OVERLOAD BRIDGE RATING',3X,
     3                    '     BY IMBSEN AND ASSOCIATES, INC.',//,
     4           10X,20(A4))
C
      WRITE(7,20)KAP
 20   FORMAT(/,10X,65('*'),/,10X,A50,/,10X,65('*'),/)
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE FIXCRD
C
C ****************************************************************
C
C     FIXCRD - FIX CARD
C
C     THIS SUBROUTINE READS FROM THE SCAN INPUT FILE AND
C     WRITES TO THE OUTPUT FILE
C
C ----------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED : NONE
C
C       RETURNED: NONE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CHARACTER*4 CARD(20)
      INTEGER IR,IW
C
 10   READ(5,20,END=100) (CARD(IR),IR=1,20)
 20   FORMAT(20A4)
      WRITE(7,30)( CARD(IW),IW=1,20)
 30   FORMAT(10X,20A4)
      GOTO 10
 100  CONTINUE
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRSTRU(NSTRUC,GRDSPC,OPRING,CONTIN,ISTRUC)
C
C ****************************************************************
C
C     WRSTRU  - WRITE STRUCTURE BLOCK
C
C     THIS SUBROUTINE WRITES THE STRUCTURE DATA BLOCK INPUT
C
C ----------------------------------------------------------------
C
C     CALL TO : NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED:
C
C         NSTRUC - STRUCTURE NUMBER
C         GRDSPC - GIRDER SPACING INPUT
C         OPRING - OPERATING RATING INPUT
C         CONTIN - CONTINUITY
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C
C       RETURNED : NONE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS     INITIAL CODING
C
C ****************************************************************
C
      INTEGER NSTRUC(1),OPRING(1),CONTIN(1),ISTRUC
      REAL*8 GRDSPC(1)
C
      WRITE(7,85)
 85   FORMAT(/ ,10X, '*************** STRUCTURE DATA ***************')
      WRITE(7,90)
 90   FORMAT(/,  10X,'    STRUCTURE    GIRDER  OPERATING  CONTINUITY',
     1       /,  10X,'       NUMBER   SPACING     RATING  (0- NBIF ',
     2                                                    'DEFAULT)',
     3       /,  10X,'                   (FT)  (0- NBIF  (1-SIMPLE)',
     4       /,  10X,'                          DEFAULT)  (2-CONTIN',
     5                                                    'UOUS)',
     6       /)
        DO 100 I=1,ISTRUC
          WRITE(7,95)NSTRUC(I),GRDSPC(I),OPRING(I),CONTIN(I)
 95       FORMAT(13X,I10,F10.2,1X,I10,2X,I10)
 100    CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRSLAB(ISPLAN,ISLAB)
C
C ****************************************************************
C
C     WRSLAB  - WRITE SLAB DATA
C
C     THIS SUBROUTINE WRITES THE STANDARD SLAB PLAN DATA
C
C ----------------------------------------------------------------
C
C     CALL TO : NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED:
C
C         ISPLAN - SLAB PLAN CODE
C         ISLAB  - NUMBER OF STANDARD SLAB PLAN CODES ENTERED
C
C       RETURNED : NONE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986  RAS     INITIAL CODING
C
C ****************************************************************
C
      INTEGER ISPLAN(ISLAB),ISLAB,ITOGGL,ICODE,ICODEP
      CHARACTER*10 PLAN(9)
      CHARACTER*15 ANALYS(3)
C
      DATA PLAN / 'NA        ','CS-2-15   ','CS-2-20   ',
     1            'CS-3-20   ','CS-4-20   ','CS-5-20 I ',
     2            'CS-20     ','CS-20 I   ','CODE ERROR'/
C
      DATA ANALYS/ 'LEVEL 1        ','SPECIAL LEVEL 2',
     1             'ERROR IN INPUT '/
C
      WRITE(7,85)
 85   FORMAT(/ ,10X, '*************** SLAB PLAN DATA ***************')
      WRITE(7,90)
 90   FORMAT(/,  10X,'       SLAB        SLAB        SLAB'
     1       /,  10X,'   SEQUENCE        PLAN        PLAN       TYPE OF'
     2       /,  10X,'     NUMBER        CODE      ACTUAL      ANALYSIS'
     3       /)
        DO 100 I=1,ISLAB
          ITOGGL=1
          ICODE =ISPLAN(I)
          ICODEP=ICODE+1
          IF(ICODEP .GT. 8)ICODEP=9
          IF(ICODE.GT. 0) ITOGGL=2
          IF(ICODE.GT. 7) ITOGGL=3
          WRITE(7,95)I,ICODE,PLAN(ICODEP),ANALYS(ITOGGL)
 95       FORMAT(11X,I10,1X,I10,5X,A10,1X,A15)
 100    CONTINUE
```

```
      WRITE(7,110)
  110 FORMAT(/,10X,'NOTE: SPECIAL LEVEL 2 DOES NOT CONSIDER A',/
     1         10X,'       SLAB WITH HINGES')
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRTRUC(PL,DX,IFL,IGROUP,WHO,WHI,WIDTH,IOVLD)
C
C ****************************************************************
C
C     WRTRUC - WRITE TRUCK BLOCK
C
C     THIS SUBROUTINE WRITES THE TRUCK BLOCK DATA INPUT
C
C ----------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         PL     - AXLE LOADS
C         DX     - DISTANCES TO THE AXLES
C         IFL    - NUMBER OF INDIVIDUAL AXLES
C         IGROUP - GROUP IDENTIFICATION
C         WHO    - OUTER WHEEL GAGE
C         WHI    - INNER WHEEL GAGE
C         WIDTH  - VEHICLE WIDTH
C         IOVLD  - STANDARD OVERLOAD IDENTIFICATION
C
C       RETURNED :  NONE
C
C ----------------------------------------------------------------
C
C       MODIFICATION LOG
C
C         06/11/1986  RAS     INITIAL CODING
C
C ****************************************************************
C
      INTEGER IGROUP(1),IFL,I,IOVLD
      REAL*8 PL(1),DX(1),WHO(1),WHI(1),WIDTH
      CHARACTER*18 SV(11)
C
      DATA SV / '       H20        ', '       HS20       ',
     1          'ALTERNATE MILITARY', '     TYPE 3       ',
     2          '     TYPE 3-S2    ', '    TYPE 3-3      ',
     3          '       P5         ', '       P7         ',
     4          '       P9         ', '       P11        ',
     5          '       P13        '/
      WRITE(7,85)
 85   FORMAT(/ ,10X, '***************** TRUCK DATA *****************')
      IF(IOVLD .GT. 0) WRITE(7,97) SV(IOVLD)
 97   FORMAT(    10X,'    STANDARD VEHICLE: ',A18)
      WRITE(7,100)
100   FORMAT(/,11X,'AXLE       AXLE     AXLE     WHEEL SPACING    AXLE',
     1       /,11X,'LOAD       LOAD   LAYOUT     OUTER    INNER  GROUP',
     2      /,10X,'   ID     (KIPS)     (FT)      (FT)     (FT)     ID',
     3      /)
      DO 300 I=1,IFL
        WRITE(7,200)I,PL(I),DX(I),WHO(I),WHI(I),IGROUP(I)
 200    FORMAT(10X,I5,3F10.2,F9.2,2X,I5)
```

```
300  CONTINUE
       WRITE(7,400)WIDTH
400    FORMAT(/,10X, '          VEHICLE WIDTH      ',F10.2,' (FT)')
     RETURN
     END
```

```
$DEBUG
      SUBROUTINE WRIMPA(FACIMP,NSTRUC,ISTRUC)
C
C ***************************************************************
C
C     WRIMPA - WRITE IMPACT DATA BLOCK
C
C     THIS SUBROUTINE WRITES THE IMPACT DATA BLOCK INPUT
C
C ---------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         FACIMP - IMPACT FACTOR OF OVERLOAD VEHICLE
C         NSTRUC - STRUCTURE NUMBER
C         ISTRUC - NUMBER OF STRUCTURES TO BE RATED
C
C       RETURNED : NONE
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS     INITIAL CODING
C
C ***************************************************************
C
      INTEGER I,NSTRUC(1),IMESS
      REAL*8 FACIMP(1)
      CHARACTER*1 IFLAG(2),STAR
C
      DATA IFLAG/ ' ','*'/
C
      IMESS=0
      WRITE(7,100)
  100 FORMAT( /,10X, '***************** IMPACT DATA *****************')
      WRITE(7,150)
  150 FORMAT( /,10X, ' STRUCTURE    IMPACT',
     1        /,10X, '    NUMBER    FACTOR',
     2        /)
        DO 180 I=1,ISTRUC
          STAR=IFLAG(1)
          IF(FACIMP(I) .EQ. 0.D0)IMESS=IMESS+1
          IF(FACIMP(I) .EQ. 0.D0)STAR=IFLAG(2)
          WRITE(7,175)NSTRUC(I),FACIMP(I),STAR
  175     FORMAT(10X,I10,F10.2,1X,A1)
  180   CONTINUE
      IF(IMESS .GT. 0)WRITE(7,185)
  185 FORMAT(//,10X,'ASTERISK (*) INDICATES DEFAULTS TO AASHTO IMPACT',
     1          ' FORMULA')
      RETURN
      END
```

```
C
C     WRTRAN - WRITE TRANSVERSE DISTRIBUTION BLOCK
C
C     THIS SUBROUTINE WRITES THE TRANSVERSE DISTRIBUTION DATA
C     BLOCK INPUT
C
C ------------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ------------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         NSTRUC  -  STRUCTURE NUMBER
C         RT      -  TRANSVERSE DISTRIBUTION RATIO
C         ISTRUC  -  NUMBER OF STRUCTURES TO BE RATED
C
C       RETURNED : NONE
C
C ------------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS   INITIAL CODING
C
C ******************************************************************
C
      INTEGER NSTRUC(1),ISTRUC
      REAL*8 RT(1)
C
      WRITE(7,85)
 85   FORMAT(/ ,10X, '******** TRANSVERSE DISTRIBUTION DATA ********')
      WRITE(7,90)
 90   FORMAT(/,  10X,'         STRUCTURE     RATIO',
     1       /,  10X,'            NUMBER           ',
     2       /)
        DO 100 I=1,ISTRUC
          WRITE(7,95)NSTRUC(I),RT(I)
 95       FORMAT(17X,I10,F10.2)
 100    CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE RDNBIF(NREC,NSTRUC,KK,CK1,CK2,CK3,CK4,CK5,CK6,
     1                  CK7,CK8,CK9,CK10)
C
C ***************************************************************
C
C     RDNBIF  - READ NBIF (NATIONAL BRIDGE INVENTORY FILE)
C
C     THIS SUBROUTINE READS IN SELECTED DATA FROM A REDUCED
C     NBIF (DIRECT ACCESS FILE)
C
C ---------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         NREC   - NUMBER OF RECORDS IN THE NBIF
C         NSTRUC - ARIZONA STRUCTURE NUMBER
C
C       RETURNED :
C                       NBIF   DESCRIPTION                NO. BYTES
C                       ITEM
C         KK(1)  -       8     STRUCTURE NUMBER              4
C         CK1    -       5     INVENTORY ROUTE ) SPLIT       1
C         CK2    -       5     INVENTORY ROUTE )             8
C         CK3    -       7     FACILITY CARRIED BY STRUCT   18
C         CK4    -       9     LOCATION                     25
C         KK(2)  -      11     MILEPOINT                     4
C         KK(3)  -      27     YEAR BUILT                    4
C         KK(4)  -      29     AVERAGE DAILY TRAFFIC         4
C         KK(5)  -      30     YEAR OF ADT                   4
C         KK(6)  -      32     APPROACH ROADWAY WIDTH        4
C         KK(7)  -      34     SKEW                          4
C         CK5    -      41     STRUCTURE OPEN,POSTED,CLOSED  1
C         KK(8)  -      43     STRUCTURE TYPE, MAIN          4
C         KK(9)  -      44     STRUCTURE TYPE, APPROACH      4
C         KK(10) -      45     NUMBER SPANS, MAIN            4
C         KK(11) -      46     NUMBER APPROACH SPANS         4
C         KK(12) -      48     LENGTH MAXIMUM SPAN           4
C         KK(13) -      49     STRUCTURE LENGTH              4
C         KK(14) -      51     BRIDGE WIDTH (C-TO-C)         4
C         KK(15) -      53     MINIMUM VERTICAL CLEARANCE    4
C         CK6    -      57     WEARING SURFACE               1
C         CK7    -      58     DECK                          1
C         CK8    -      59     SUPERSTRUCTURE                1
C         CK9    -      60     SUBSTRUCTURE                  1
C         KK(16) -      64     OPERATING RATING              4
C         KK(17) -      66     INVENTORY RATING              4
C         CK10   -      67     STRUCTURAL CONDITION          1
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/86    RAS    INITIAL CODING
```

```
C
C ****************************************************************
C
      INTEGER KK(1),NREC,NSTRUC
      CHARACTER*1 CK1,CK5,CK6,CK7,CK8,CK9,CK10
      CHARACTER*8 CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
C
      IF(NSTRUC .GT. NREC) RETURN
      READ(8,REC=NSTRUC)KK(1),CK1,CK2,CK3,CK4,(KK(J),J=2,7),
     1                  CK5,(KK(J),J=8,15),CK6,CK7,CK8,CK9,
     2                  (KK(J),J=16,17),CK10
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE WRNBIF(NREC,NSTRUC,KK,CK1,CK2,CK3,CK4,
     1                  CK5,CK6,CK7,CK8,CK9,CK10,LEVOUT)
C
C ****************************************************************
C
C     WRNBIF - WRITE NBIF (NATIONAL BRIDGE INVENTORY FILE)
C
C     THIS SUBROUTINE WRITES THE INFORMATION FROM THE REDUCED
C     NBIF
C
C ----------------------------------------------------------------
C
C     CALLS TO : REMARK
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         CK(1-10) - CHARACTER VARIABLES FROM NBIF
C         KK       - INTEGER VARIABLES FROM NBIF
C         NREC     - NUMBER OF RECORDS IN NBIF
C         NSTRUC   - STRUCTURE NUMBER
C         LEVOUT   - LEVEL OF OUTPUT FLAG
C
C       RETURNED : NONE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITAL CODING
C
C ****************************************************************
C
      INTEGER NREC,NSTRUC,KK(1)
      REAL*8 XKK2,XKK14
      CHARACTER*1 CK1,CK5,CK6,CK7,CK8,CK9,CK10
      CHARACTER*8 CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
C
      IF(NSTRUC .GT. NREC)     GOTO 8000
      XKK2 = DBLE(KK(2))/100.D0
      XKK14= DBLE(KK(14))/10.D0
      WRITE(7,85)
 85   FORMAT(/ ,10X, '*************** STATE OF ARIZONA **************')
      WRITE(7,200)
 200  FORMAT(/,12X,'ITEM   ITEM       ',
     3       /,11X,'NUMBER  NAME       ',/)
C
      WRITE(7,210)KK(1)
 210  FORMAT(13X,'08',4X,'STRUCTURE NO. ....................',I6)
C
      WRITE(7,220)CK1,CK2
 220  FORMAT(13X,'05',4X,'INVENTORY ROUTE ..................',A1,A8)
C
      WRITE(7,230)CK3
```

```
 230  FORMAT(13X,'07',4X,'FACILITY CARRIED BY STRUCTURE.....',A18)
C
      WRITE(7,240)CK4
 240  FORMAT(13X,'09',4X,'LOCATION ..........................',A25)
C
      WRITE(7,250)XKK2
 250  FORMAT(13X,'11',4X,'MILEPOINT .........................',F6.2)
C
      WRITE(7,260)KK(3)
 260  FORMAT(13X,'27',4X,'YEAR BUILT/RECONSTRUCTION .........',I4)
C
      WRITE(7,270)KK(4)
 270  FORMAT(13X,'29',4X,'AVERAGE DAILY TRAFFIC .............',I6)
C
      WRITE(7,280)KK(5)
 280  FORMAT(13X,'30',4X,'YEAR OF AVERAGE DAILY TRAFFIC ....',I2)
C
      WRITE(7,290)KK(6)
 290  FORMAT(13X,'32',4X,'APPROACH ROADWAY WIDTH (FT) ......',I3)
C
      WRITE(7,300)KK(7)
 300  FORMAT(13X,'34',4X,'SKEW (DEGREES) ....................',I2)
C
      WRITE(7,310)CK5
 310  FORMAT(13X,'41',4X,'OPEN(A),POSTED(P),CLOSED(C) .......',A1)
C
      WRITE(7,320)KK(8)
 320  FORMAT(13X,'43',4X,'STRUCTURE TYPE, MAIN ..............',I3)
C
      WRITE(7,330)KK(9)
 330  FORMAT(13X,'44',4X,'STRUCTURE TYPE, APPROACH SPANS ...',I3)
C
      WRITE(7,340)KK(10)
 340  FORMAT(13X,'45',4X,'NO. OF SPANS IN MAIN UNIT .........',I3)
C
      WRITE(7,350)KK(11)
 350  FORMAT(13X,'46',4X,'NO. OF APPROACH SPANS .............',I4)
C
      WRITE(7,360)KK(12)
 360  FORMAT(13X,'48',4X,'LENGTH OF MAXIMUM SPAN (FT) .......',I4)
C
      WRITE(7,370)KK(13)
 370  FORMAT(13X,'49',4X,'STRUCTURE LENGTH (FT) .............',I6)
C
      WRITE(7,380)XKK14
 380  FORMAT(13X,'51',4X,'BRIDGE WIDTH,CURB-TO-CURB (FT) ...',F5.1)
C
      WRITE(7,390)KK(15)
 390  FORMAT(13X,'53',4X,'MINIMUM VERTICAL CLEARANCE .......',I4)
C
      WRITE(7,400)CK6
 400  FORMAT(13X,'57',4X,'WEARING SURFACE ...................',A1)
C
      WRITE(7,410)CK7
 410  FORMAT(13X,'58',4X,'DECK CONDITION ....................',A1)
C
      WRITE(7,420)CK8
 420  FORMAT(13X,'59',4X,'SUPERSTRUCTURE CONDITION .........',A1)
C
      WRITE(7,430)CK9
```

```
 430  FORMAT(13X,'60',4X,'SUBSTRUCTURE CONDITION .....',A1)
C
      WRITE(7,440)KK(16)
 440  FORMAT(13X,'64',4X,'OPERATING RATING .................',I3)
C
      WRITE(7,450)KK(17)
 450  FORMAT(13X,'66',4X,'INVENTORY RATING .................',I3)
C
      WRITE(7,460)CK10
 460  FORMAT(13X,'67',4X,'STRUCTURAL CONDITION .............',A1)
C
      IF(LEVOUT .EQ. 2)WRITE(7,500)
 500  FORMAT(10X,/,'         ANALYSIS TERMINATED- ECHO CHECK ONLY')
      IF( KK(1) .EQ. 0)        GOTO 8001
      RETURN
 8000 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER > 9861.            ')
          GOTO 8990
 8001 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER NOT IN NBIF.       ')
          GOTO 8990
 8990 RETURN
      END
```

```
$DEBUG
      SUBROUTINE LEVEL1(NREC,KK,CK1,CK2,CK3,CK4,CK5,CK10,PL,DX,
     1                  GRDSPC,WHO,WHI,WIDTH,FACIMP,IGROUP,IFL,
     2                  OPRING,NSTRUC,RTMT,CONTIN,IOVLD)
C
C ***************************************************************
C
C     LEVEL1 - LEVEL 1 ANALYSIS
C
C     THIS SUBROUTINE DOES A LEVEL 1 ANALYSIS
C
C ---------------------------------------------------------------
C
C     CALLS TO :
C
C       BRGTYP
C       LONGMT
C       DZERO
C       RATAXL
C       LANE
C       REMARK
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C        PASSED :
C
C       NSTRUC          - STRUCTURE NUMBER
C       OPRING          - OPERATING RATING
C       GRDSPC          - GIRDER SPACING
C       FACIMP          - IMPACT FACTOR
C       RTMT            - TRANSVERSE DISTRIBUTION RATIO
C       CONTIN          - CONTINUITY
C       PL              - AXLE LOADS
C       DX              - DISTANCE TO THE AXLES
C       WHO             - OUTER WHEEL GAGE
C       WHI             - INNER WHEEL GAGE
C       IGROUP          - GROUP IDENTIFICATION
C       IFL             - NUMBER OF INDIVIDUAL AXLES ENTERED
C       NREC            - NUMBER RECORDS IN NBIF
C       KK(17)          - INTEGER VARIABLES FROM REDUCED NBIF
C       WIDTH           - WIDTH OF TRUCK
C       CK(1-10)        - CHARACTER VARIABLES FROM REDUCED NBIF
C       IOVLD           - STANDARD TRUCK CODE
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
C
      INTEGER ITRUCK,MAINST,NSPAN,IGROUP(1),IFL,IOPER,INVEN,KK(1)
      INTEGER NAXLE,NTYPE,NMAT,OPRING,NSTRUC,IOP,NSPALL,CONTIN
      REAL*8  OPERWT,SPANMX,PL(1),DX(1),GRDSPC
      REAL*8  WHO(1),WHI(1),WIDTH,FACIMP
      REAL*8  RATEWT,RL(6),RX(6)
```

```
      REAL*8  RTMT,RIMT,RTGIMP,OVDIMP,RFOP,SPANRT
      REAL*8  TRANS(3,3),OVLDRR(3,3),C(3,3)
      REAL*8  MO(3,3),MR(3,3),LOCO(3,3),LOCR(3,3)
      REAL*8  ML(3,3),MLR(3,3),RM(3,3),MLO(3,3)
      REAL*8  XKK6,XKK14,XKK2
      REAL*8  TEMP1,TEMP2
      CHARACTER*1 SCON,CK1,CK5,CK10
      CHARACTER*6 CONT
      CHARACTER*9 LABEL1
      CHARACTER*8 LABEL2
      CHARACTER*15 LABELT
      CHARACTER*8 CK2
      CHARACTER*18 CK3
      CHARACTER*25 CK4
      CHARACTER*16 MESSAG
      CHARACTER*32 IFLAG(2),IFLG
C
      DATA IFLAG / '(NOTE- POSITIVE MOMENT CONTROLS)',
     1             '(NOTE- NEGATIVE MOMENT CONTROLS)'/
C
      IFLG = IFLAG(1)
      DO 10 I=1,3
      DO 5  J=1,3
        MO(I,J)   = 0.D0
        MR(I,J)   = 0.D0
        LOCO(I,J) = 0.D0
        LOCR(I,J) = 0.D0
        ML(I,J)   = 0.D0
        MLR(I,J)  = 0.D0
        MLO(I,J)  = 0.D0
        RM(I,J)   = 0.D0
        C(I,J)    = 0.D0
        OVLDRR(I,J)=0.D0
        TRANS(I,J)= 0.D0
 5    CONTINUE
 10   CONTINUE
C
      IBLT  = KK(3)/100
      IRNS  = MOD(KK(3),100)
      MAINST= KK(8)
      NTYPE = MOD(MAINST,100)
      NMAT  = MAINST/100
      IF(CONTIN .EQ. 0) GOTO 50
      IF(CONTIN .EQ. 1) GOTO 40
      IF(CONTIN .EQ. 2) GOTO 30
        GOTO 50
C
 30   IF(NMAT .EQ. 1 .OR. NMAT .EQ. 2) NMAT=2
      IF(NMAT .EQ. 3 .OR. NMAT .EQ. 4) NMAT=4
      IF(NMAT .EQ. 5 .OR. NMAT .EQ. 6) NMAT=6
        GOTO 50
C
 40   IF(NMAT .EQ. 1 .OR. NMAT .EQ. 2) NMAT=1
      IF(NMAT .EQ. 3 .OR. NMAT .EQ. 4) NMAT=3
      IF(NMAT .EQ. 5 .OR. NMAT .EQ. 6) NMAT=5
C
 50   XKK2  = DBLE(KK(2))/100.D0
C
      CALL BRGTYP(NTYPE,NMAT,LABEL1,LABEL2,CONT)
C
```

```
      WRITE(7,100)NSTRUC,IBLT,IRNS,CK1,CK2,KK(10),CK3,KK(11),CK4,KK(12),
     1            XKK2,KK(13)
  100 FORMAT(  ,10X,'********** NBIF GENERAL INFORMATION **********',
     1       //,10X,'  STRUCTURE NO.',15X,I10,     5X,'YR BLT/RECON  ',
     2                                                 I2,'/'I2,
     3        /,10X,'  INVENTORY RT.',16X,A1,A8,   5X,'NO.SPANS,MAIN',I6,
     4        /,10X,'  FAC. CARRIED ',7X,A18,      5X,'NO.SPANS,APP ',I6,
     5        /,10X,'  LOCATION     ',A25,         5X,'LEN. MAX SPAN',I6,
     6        /,10X,'  MILEPOINT    ',19X,F6.2,    5X,'STRUCTURE LEN',I6)
      IF(NSTRUC .GT. NREC)     GOTO 8000
      IF( KK(1) .EQ. 0)        GOTO 8001
C
      IF(CONTIN .EQ. 1 .OR. CONTIN .EQ. 2) GOTO 110
      WRITE(7,105) LABEL1,LABEL2,CONT
  105 FORMAT( /,12X,'STRUCTURE TYPE : ',
     1              A9,1X,A8,1X,'(',A6,' -NBIF DEFAULT)')
      GOTO 115
  110 WRITE(7,111) LABEL1,LABEL2,CONT
  111 FORMAT( /,12X,'STRUCTURE TYPE : ',
     1              A9,1X,A8,1X,'(',A6,' -NBIF OVERWRITE)')
C
  115 IF(NTYPE .EQ.  7)  GOTO 700
      IF(NTYPE .EQ.  8)  GOTO 700
      IF(NTYPE .EQ.  9)  GOTO 700
      IF(NTYPE .EQ. 10)  GOTO 700
      IF(NTYPE .EQ. 11)  GOTO 700
      IF(NTYPE .EQ. 12)  GOTO 700
      IF(NTYPE .EQ. 13)  GOTO 700
      IF(NTYPE .EQ. 14)  GOTO 700
      IF(NTYPE .EQ. 15)  GOTO 700
      IF(NTYPE .EQ. 16)  GOTO 700
      IF(NTYPE .EQ. 17)  GOTO 700
      IF(NTYPE .EQ. 18)  GOTO 700
      IF(NTYPE .EQ.  0)  GOTO 700
C
C
      XKK6=   DBLE(KK(6))
      XKK14=  DBLE(KK(14))/10.D0
      NSPAN=  KK(10)
      NSPALL= KK(10) + KK(11)
      IF(OPRING .EQ.0)IOPER=KK(16)
      IF(OPRING .GT.0)IOPER=OPRING
      INVEN=  KK(17)
      SCON=   CK10
C
      IF(CK1 .EQ. '2')                              GOTO 8002
      IF(CK5 .EQ. 'P')WRITE(7,8003)
 8003 FORMAT(/,10X,'WARNING - STRUCTURE IS POSTED.')
      IF(CK5 .EQ. 'C')WRITE(7,8004)
 8004 FORMAT(/,10X,'WARNING - STRUCTURE IS CLOSED.')
      IF(IOPER  .EQ. 800)                           GOTO 8005
      IF(IOPER  .GE. 700 .AND. IOPER  .LT. 800)GOTO 8006
      IF(IOPER  .GE. 900)                           GOTO 8007
      IF(IOPER  .EQ. 0)                             GOTO 8008
      IF(XKK6 .LT. WIDTH) WRITE(7,8009)
 8009 FORMAT(/,10X,'WARNING - APPROACH WIDTH < VEHICLE WIDTH.')
      IF(XKK14 .LT. WIDTH)WRITE(7,8010)
 8010 FORMAT(/,10X,'WARNING - BRIDGE WIDTH < VEHICLE WIDTH.')
C
      ITRUCK=IOPER/100
```

```
         IOP=MOD(IOPER,100)
       OPERWT=IOP
       SPANMX=DBLE( KK(12))
       SPANRT = ( DBLE(KK(13))-(NSPALL -2)*SPANMX )/(2.D0*SPANMX)
       IF(NSPALL .EQ. 1) SPANRT = 0.D0
       IF(NSPALL .EQ. 2) SPANRT = 1.D0
       IF(SPANRT .GT. 1.D0) SPANRT = 1.00D0
C
C      CALCULATE MOMENT FOR OVERLOAD TRUCK
C
       CALL LONGMT(IFL,SPANMX,PL,DX,SPANRT,CONT,NSPALL,MO,LOCO)
C      WRITE(7,140)
C140   FORMAT(' OVERLOAD TRUCK MOMENTS')
C      WRITE(7,150)MO(1,1),MO(1,2),MO(1,3)
C      WRITE(7,150)MO(2,1),MO(2,2),MO(2,3)
C      WRITE(7,150)MO(3,1),MO(3,2),MO(3,3)
C150   FORMAT(3F10.2)
C
       CALL DZERO(RL,6,0.D0)
       CALL DZERO(RX,6,0.D0)
C
C      GET RATING VEHICLE AXLE CONFIGURATION
C
       CALL RATAXL(ITRUCK,NAXLE,RL,RX,RATEWT,LABELT)
C
C      CALCULATE MOMENT FOR RATING VEHICLE
C
       CALL LONGMT(NAXLE,SPANMX,RL,RX,SPANRT,CONT,NSPALL,MR,LOCR)
C      WRITE(7,141)
C141   FORMAT(' RATING TRUCK MOMENTS')
C      WRITE(7,150)MR(1,1),MR(1,2),MR(1,3)
C      WRITE(7,150)MR(2,1),MR(2,2),MR(2,3)
C      WRITE(7,150)MR(3,1),MR(3,2),MR(3,3)
         MO(1,1) = DMAX1(MO(1,1),MO(1,2))
C
C      CHECK FOR LANE LOAD CONTROL FOR H20 AND HS20 TRUCKS
C
       IF(IOVLD .EQ. 1 .OR. IOVLD .EQ. 2) GOTO 150
         GOTO 155
C
  150    CALL LANE(SPANMX,SPANRT,CONT,NSPALL,MLO)
         MO(1,1) = DMAX1(MLO(1,1),MO(1,1) )
         MO(2,1) = DMAX1(MLO(2,1),MO(2,1) )
           TEMP1 = DABS (MLO(2,2)          )
           TEMP2 = DABS ( MO(2,2)          )
         MO(2,2) =-DMAX1(TEMP1,TEMP2       )
         MO(3,1) = DMAX1(MLO(3,1),MO(3,1) )
         MO(3,2) = DMAX1(MLO(3,2),MO(3,2) )
           TEMP1 = DABS(MLO(3,3)           )
           TEMP2 = DABS( MO(3,3)           )
         MO(3,3) =-DMAX1(TEMP1,TEMP2       )
C
  155  IF(ITRUCK .EQ.1) CALL LANE(SPANMX,SPANRT,CONT,NSPALL,ML)
       IF(ITRUCK .EQ.2) CALL LANE(SPANMX,SPANRT,CONT,NSPALL,ML)
C      WRITE(7,142)
C142   FORMAT(' LANE LOADING MOMENTS')
C      WRITE(7,150)ML(1,1),ML(1,2),ML(1,3)
C      WRITE(7,150)ML(2,1),ML(2,2),ML(2,3)
C      WRITE(7,150)ML(3,1),ML(3,2),ML(3,3)
C
```

```
        MLR(1,1) = DMAX1(ML(1,1),MR(1,1),MR(1,2))
        MLR(2,1) = DMAX1(ML(2,1),MR(2,1)          )
            TEMP1= DABS(ML(2,2))
            TEMP2= DABS(MR(2,2))
        MLR(2,2) =-DMAX1(TEMP1,  TEMP2            )
        MLR(3,1) = DMAX1(ML(3,1),MR(3,1)          )
        MLR(3,2) = DMAX1(ML(3,2),MR(3,2)          )
            TEMP1= DABS(ML(3,3))
            TEMP2= DABS(MR(3,3))
        MLR(3,3) =-DMAX1(TEMP1,  TEMP2            )
C     WRITE(7,143)
C143  FORMAT(' MAX LANE/RATING MOMENTS')
C       WRITE(7,200) MLR(1,1),MLR(1,2),MLR(1,3)
C       WRITE(7,200) MLR(2,1),MLR(2,2),MLR(2,3)
C       WRITE(7,200) MLR(3,1),MLR(3,2),MLR(3,3)
C200    FORMAT(6F10.2)
C
C     CALCULATE LONGITUDINAL RATIO
C
        RM(1,1) = MO(1,1)/MLR(1,1)
      IF(NSPALL .EQ. 1 .OR. CONT .EQ. 'SIMPLE')GOTO 300
      IF(NSPALL .EQ. 2 .AND.CONT .EQ. 'CONTIN')GOTO 255
      IF(NSPALL .GT. 2 .AND.CONT .EQ. 'CONTIN')GOTO 260
C
 255    RM(2,1) = MO(2,1)/MLR(2,1)
        RM(2,2) = MO(2,2)/MLR(2,2)
        GOTO 300
C
 260    RM(3,1) = MO(3,1)/MLR(3,1)
        RM(3,2) = MO(3,2)/MLR(3,2)
        RM(3,3) = MO(3,3)/MLR(3,3)
C
C     CALCULATE CONTINUITY FACTOR
C
 300  C(1,1) = 1.D0
      C(2,1) = RM(2,1)/ RM(1,1)
      C(2,2) = RM(2,2)/ RM(1,1)
      C(3,1) = RM(3,1)/ RM(1,1)
      C(3,2) = RM(3,2)/ RM(1,1)
      C(3,3) = RM(3,3)/ RM(1,1)
C
C     CALCULATE IMPACT RATIO
C
      RTGIMP = 50.D0/(SPANMX + 125.D0)  + 1.D0
      IF(RTGIMP .GT. 1.30D0)RTGIMP=1.30D0
      IF(NMAT .EQ. 7)       RTGIMP=1.00D0
      IF(FACIMP .GT. 0.D0)GOTO 350
        OVDIMP=RTGIMP
        GOTO 355
 350  OVDIMP = FACIMP  + 1.D0
 355  RIMT   = OVDIMP/RTGIMP
C
C     TRANSFORMATION FUNCTION
C
      IF(NSPALL .EQ. 1 .OR. CONT .EQ. 'SIMPLE')GOTO 356
      IF(NSPALL .EQ. 2 .AND.CONT .EQ. 'CONTIN')GOTO 357
      IF(NSPALL .GT. 2 .AND.CONT .EQ. 'CONTIN')GOTO 358
C
 356  TRANS(1,1) = 1.D0/(RM(1,1)*C(1,1)*RTMT*RIMT)
      GOTO 360
```

```
C
 357  TRANS(2,1) = 1.D0/(RM(1,1)*C(2,1)*RTMT*RIMT)
      TRANS(2,2) = 1.D0/(RM(1,1)*C(2,2)*RTMT*RIMT)
      GOTO 360
C
 358  TRANS(3,1) = 1.D0/(RM(1,1)*C(3,1)*RTMT*RIMT)
      TRANS(3,2) = 1.D0/(RM(1,1)*C(3,2)*RTMT*RIMT)
      TRANS(3,3) = 1.D0/(RM(1,1)*C(3,3)*RTMT*RIMT)
C
 360    IF(INVEN .NE. IOPER)                          GOTO 400
        IF(SCON .EQ. '7') OPERWT=OPERWT*1.36D0
        IF(SCON .EQ. '8') OPERWT=OPERWT*1.36D0
        IF(SCON .EQ. '9') OPERWT=OPERWT*1.36D0
 400  RFOP = OPERWT/RATEWT
      OVLDRR(1,1) = TRANS(1,1)*RFOP
      OVLDRR(2,1) = TRANS(2,1)*RFOP
      OVLDRR(2,2) = TRANS(2,2)*RFOP
      OVLDRR(3,1) = TRANS(3,1)*RFOP
      OVLDRR(3,2) = TRANS(3,2)*RFOP
      OVLDRR(3,3) = TRANS(3,3)*RFOP
C
      WRITE(7,510) LABELT,OPERWT,RATEWT
 510  FORMAT( /,10X,'********** RATING VEHICLE INFORMATION ********',/,
     1          ,26X,A15,                                            ,//,
     2          12X,'OPERATING WEIGHT        (TONS)   =',F12.2,/,
     3          12X,'WT. RATING VEHICLE      (TONS)   =',F12.2)
C
      IF(OPRING .EQ. 0) WRITE(7,512)RFOP
 512  FORMAT(  12X,'RF: OPERATING   (NBIF DEFAULT)   =',F12.2)
      IF(OPRING .GT. 0) WRITE(7,514)RFOP
 514  FORMAT(  12X,'RF: OPERATING   (NBIF OVERWRITE) =',F12.2)
C
      WRITE(7,515)
 515  FORMAT(/,12X,'         LIVE LOAD MOMENT PER LANE (K-FT)  AASHTO',/
     1          12X,'SPAN           EXT          INT         BENT IMPACT')
C
      WRITE(7,516)MLR(1,1),RTGIMP
 516  FORMAT(/,12X,'SIMPLE          NA',F12.2,'          NA',F7.2)
C
      IF(NSPALL.EQ.2.AND.CONT.EQ.'CONTIN')WRITE(7,520)MLR(2,1),MLR(2,2),
     1                                                 RTGIMP
 520  FORMAT(  12X,'TWO             NA',F12.2,F12.2,F7.2)
      IF(NSPALL.GT.2.AND.CONT.EQ.'CONTIN')WRITE(7,525)MLR(3,1),MLR(3,2),
     1                                    MLR(3,3),RTGIMP
 525  FORMAT(  12X,'THREE ',F12.2,F12.2,F12.2,F7.2)
C
      IF(INVEN .NE. IOPER) GOTO 550
        IF(SCON .EQ. '7') WRITE(7,540)
        IF(SCON .EQ. '8') WRITE(7,540)
        IF(SCON .EQ. '9') WRITE(7,540)
 540  FORMAT(/, 10X,'NOTE: THIS BRIDGE WAS ADMINISTRATIVELY RATED.',
     1       /, 10X,'       THE OPERATING RATING WAS MULTIPLIED BY',
     2       /, 10X,'       1.36 FOR STRUCTURAL CONDITIONS > 6.')
C
 550  WRITE(7,560)
 560  FORMAT( /,10X,'******** OVERLOAD VEHICLE INFORMATION ********')
      WRITE(7,562)
 562  FORMAT(/,12X,'         LIVE LOAD MOMENT PER LANE (K-FT)        ',/
     1          12X,'SPAN           EXT          INT         BENT IMPACT')
C
```

```
      IF(FACIMP .GT. 0.D0)GOTO 570
      MESSAG= '(AASHTO DEFAULT)'
        GOTO 575
  570 MESSAG= '(OVERWRITE)     '
C
  575 WRITE(7,580)MO(1,1),OVDIMP,MESSAG
  580 FORMAT(/,12X,'SIMPLE          NA',F12.2,'          NA',F7.2,1X,
     1                A16)
C
      IF(NSPALL.EQ.2.AND.CONT.EQ.'CONTIN')WRITE(7,585)MO(2,1),MO(2,2),
     1                                                 OVDIMP,MESSAG
  585 FORMAT(  12X,'TWO             NA',F12.2,F12.2,F7.2,1X,A16)
      IF(NSPALL.GT.2.AND.CONT.EQ.'CONTIN')WRITE(7,590)MO(3,1),MO(3,2),
     1                                    MO(3,3),OVDIMP,MESSAG
  590 FORMAT(  12X,'THREE ',F12.2,F12.2,F12.2,F7.2,1X,A16)
C
      WRITE(7,595)SPANRT
  595 FORMAT( /,10X,'************** LEVEL 1 ANALYSIS **************',/
     1         ,42X,'                SPAN RATIO ',F6.3,/,
     2         ,10X,'         MOMENT        IMPACT  TRAN.          ',/
     3          10X,'          RATIO CONTIN  RATIO  RATIO OVLDRR')
C
      IF(NSPALL .EQ. 1 .OR. CONT .EQ. 'SIMPLE') GOTO 600
      IF(NSPALL .EQ. 2 .AND.CONT .EQ. 'CONTIN') GOTO 625
      IF(NSPALL .GT. 2 .AND.CONT .EQ. 'CONTIN') GOTO 650
C
  600 WRITE(7,605) RM(1,1),C(1,1),RIMT,RTMT,OVLDRR(1,1)
  605 FORMAT(/,12X,'SIMPLE',5F7.2)
      CONTROL=OVLDRR(1,1)
      GOTO 680
C
  625 WRITE(7,630) RM(1,1),C(2,1),RIMT,RTMT,OVLDRR(2,1)
  630 FORMAT(/,12X,'   INT',5F7.2)
      WRITE(7,635) RM(1,1),C(2,2),RIMT,RTMT,OVLDRR(2,2)
  635 FORMAT(  12X,'  BENT',5F7.2)
      CONTROL=DMIN1(OVLDRR(2,1),OVLDRR(2,2))
      IF(OVLDRR(2,2) .LT. OVLDRR(2,1))IFLG=IFLAG(2)
      GOTO 680
C
  650 WRITE(7,655) RM(1,1),C(3,1),RIMT,RTMT,OVLDRR(3,1)
  655 FORMAT(/,12X,'   EXT',5F7.2)
      WRITE(7,660) RM(1,1),C(3,2),RIMT,RTMT,OVLDRR(3,2)
  660 FORMAT(  12X,'   INT',5F7.2)
      WRITE(7,665) RM(1,1),C(3,3),RIMT,RTMT,OVLDRR(3,3)
  665 FORMAT(  12X,'  BENT',5F7.2)
      CONTROL=DMIN1(OVLDRR(3,1),OVLDRR(3,2),OVLDRR(3,3))
      IF(OVLDRR(3,3) .LT. OVLDRR(3,1) .AND.
     1   OVLDRR(3,3) .LT. OVLDRR(3,2)) IFLG=IFLAG(2)
C
  680 WRITE(7,685)CONTROL,IFLG
  685 FORMAT(/,12X,'CONTROLLING OVLDRR =',F10.2,1X,A32)
C
      IF(CONTROL .GE. 1.D0)                              WRITE(7,686)
      IF(CONTROL .GE. 0.70D0 .AND. CONTROL .LT. 1.D0)WRITE(7,690)
      IF(CONTROL .LT. 0.70D0)                            WRITE(7,695)
  686 FORMAT( /,10X,'      ***** THIS BRIDGE IS A GO *****       ')
  690 FORMAT( /,10X,'    ***** LEVEL 2 ANALYSIS REQUIRED *****    ')
  695 FORMAT( /,10X,'     ***** THIS BRIDGE IS A NO GO *****     ')
      RETURN
C
```

```
700  WRITE(7,690)
     RETURN
8000 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER > 9861.          ')
          GOTO 8990
8001 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER NOT IN NBIF.     ')
          GOTO 8990
8002 CALL REMARK(   7,'ERROR - STRUCTURE IS AN UNDERCROSSING.    ')
          GOTO 8990
8005 CALL REMARK(   7,'ERROR - PEDESTRIAN LOADING ONLY.          ')
          GOTO 8990
8006 CALL REMARK(   7,'ERROR - RAILROAD LOADING ONLY.            ')
          GOTO 8990
8007 CALL REMARK(   7,'ERROR - GROSS LOADING ONLY.               ')
          GOTO 8990
8008 CALL REMARK(   7,'ERROR - OPERATING RATING IS NOT GIVEN.    ')
          GOTO 8990
8990 RETURN
     END
```

```
$DEBUG
      SUBROUTINE RATAXL(ITRUCK,NAXLE,RL,RX,RATEWT,LABELT)
C
C ***************************************************************
C
C     RATAXL - RATING AXLE CONFIGURATION
C
C     THIS SUBROUTINE GETS THE AXLE LOADS AND CONFIGURATION
C     FOR THE RATING TRUCK
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ITRUCK - TRUCK TYPE CODE
C
C       RETURNED :
C
C         NAXLE  - NUMBER OF AXLES
C         RL     - AXLE LOADS
C         RX     - DISTANCES TO THE AXLES
C         RATEWT - TRUCK RATING WEIGHT
C         LABELT - TRUCK LABEL
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS    INITIAL CODING
C
C ***************************************************************
C
      INTEGER ITRUCK,NAXLE
      REAL*8 RL(1),RX(1),RATEWT
      CHARACTER*15 LABELT,TR(6)
C
      DATA TR/ '   H20 TRUCK   ',
     1         '  HS20 TRUCK   ',
     2         'ALTERNATE TRUCK',
     3         ' TYPE 3 TRUCK  ',
     4         'TYPE 3-S2 TRUCK',
     5         'TYPE  3-3 TRUCK'/
C
      IF(ITRUCK .EQ. 1)   GOTO 110
      IF(ITRUCK .EQ. 2)   GOTO 120
      IF(ITRUCK .EQ. 3)   GOTO 130
      IF(ITRUCK .EQ. 4)   GOTO 140
      IF(ITRUCK .EQ. 5)   GOTO 150
      IF(ITRUCK .EQ. 6)   GOTO 160
      WRITE(7,200)
  200 FORMAT(/,10X,'ERROR - RATING VEHICLE CODE INCORRECT IN',
     1           ,' SUBROUTINE RATAXL')
      STOP
C
```

```
C     H20 TRUCK
C
 110  NAXLE = 2
      RL(1) = 8.D0
      RL(2) = 32.D0
      RX(1) = 0.D0
      RX(2) = 14.D0
      RATEWT= 20.D0
      LABELT= TR(1)
      GOTO 170
C
C     HS20 TRUCK
C
 120  NAXLE = 3
      RL(1) = 8.D0
      RL(2) = 32.D0
      RL(3) = 32.D0
      RX(1) = 0.D0
      RX(2) = 14.D0
      RX(3) = 28.D0
      RATEWT= 36.D0
      LABELT= TR(2)
      GOTO 170
C
C     ALTERNATE MILITARY
C
 130  NAXLE = 2
      RL(1) = 24.D0
      RL(2) = 24.D0
      RX(1) = 0.D0
      RX(2) = 4.D0
      RATEWT= 24.D0
      LABELT= TR(3)
      GOTO 170
C
C     TYPE 3
C
 140  NAXLE = 3
      RL(1) = 16.D0
      RL(2) = 17.D0
      RL(3) = 17.D0
      RX(1) = 0.D0
      RX(2) = 15.D0
      RX(3) = 19.D0
      RATEWT= 25.D0
      LABELT= TR(4)
      GOTO 170
C
C     TYPE 3-S2
C
 150  NAXLE = 5
      RL(1) = 10.D0
      RL(2) = 15.5D0
      RL(3) = 15.5D0
      RL(4) = 15.5D0
      RL(5) = 15.5D0
      RX(1) = 0.D0
      RX(2) = 11.D0
      RX(3) = 15.D0
      RX(4) = 37.D0
```

```
      RX(5) = 41.D0
      RATEWT= 36.D0
      LABELT= TR(5)
      GOTO 170
C
C     TYPE 3-3
C
 160  NAXLE = 6
      RL(1) = 12.D0
      RL(2) = 12.D0
      RL(3) = 12.D0
      RL(4) = 16.D0
      RL(5) = 14.D0
      RL(6) = 14.D0
      RX(1) = 0.D0
      RX(2) = 15.D0
      RX(3) = 19.D0
      RX(4) = 34.D0
      RX(5) = 50.D0
      RX(6) = 54.D0
      RATEWT= 40.D0
      LABELT= TR(6)
C
 170  RETURN
      END
```

```
$DEBUG
      SUBROUTINE LANE(SPANMX,SPANRT,CONT,NSPAN,ML)
C
C ****************************************************************
C
C     LANE   - LANE LOADING
C
C     THIS SUBROUTINE CALCULATES THE LANE LOAD MOMENT
C     FOR A H20 AND HS20 TRUCK
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPANMX - MAXIMUM SPAN LENGTH
C         SPANRT - END SPAN RATIO
C         NSPAN  - NUMBER OF SPANS
C         CONT   - CONTINUITY
C
C       RETURNED :
C
C         ML     - MOMENT
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      REAL*8 R1T(3),R2T(3),R3T(3)
      REAL*8 W,RIDER,SPANMX,C1,C2,SPANRT
      REAL*8 DD1,DD2,DD3,DD4
      REAL*8 ML(3,3)
      CHARACTER*6 CONT
      INTEGER NSPAN
C
      W=0.64D0
      RIDER=18.D0
      C1= W*SPANMX*SPANMX
      C2= RIDER*SPANMX
      CALL DZERO(R1T,3,0.D0)
      CALL DZERO(R2T,3,0.D0)
      CALL DZERO(R3T,3,0.D0)
C
C ****************************************************************
C     SIMPLE BEAM MOMENT
C ****************************************************************
C
      ML(1,1)= 0.125D0   *C1 + 0.25D0    *C2
      IF(NSPAN .EQ. 1 .OR. CONT .EQ. 'SIMPLE') RETURN
C
C ****************************************************************
```

```
C     TWO SPAN MOMENT
C ******************************************************************
C
C     (POSITIVE MOMENT)
      ML(2,1)= 0.095703D0*C1 + 0.207401D0*C2
C
C     (NEGATIVE MOMENT)
      ML(2,2)= -0.125D0   *C1 - 0.1875D0  *C2
      IF(NSPAN .EQ. 2) RETURN
C
C ******************************************************************
C     THREE SPAN MOMENT
C ******************************************************************
C
C     (POSITIVE MOMENT- 0.4 PT)
 100  R1T(1) = 0.1000D0*C1 + 0.20416D0*C2
      R1T(2) = 0.0581D0*C1 + 0.15648D0*C2
      R1T(3) = 0.0269D0*C1 + 0.10740D0*C2
C
C     (POSITIVE MOMENT- 0.5 PT)
      R2T(1) = 0.0750D0*C1 + 0.17500D0*C2
      R2T(2) = 0.0694D0*C1 + 0.16667D0*C2
      R2T(3) = 0.0625D0*C1 + 0.15625D0*C2
C
C     (NEGATIVE MOMENT)
      R3T(1) = -0.1167D0*C1 -0.1824D0*C2
      R3T(2) = -0.0884D0*C1 -0.1568D0*C2
      R3T(3) = -0.0742D0*C1 -0.1380D0*C2
C
      IF(SPANRT .GE. 0.75)GOTO 200
      IF(SPANRT .GE. 0.50)GOTO 300
      GOTO 400
C
 200  DD4 = (SPANRT -0.75D0)/0.25D0
        DD1 = R1T(1) - R1T(2)
        DD2 = R2T(1) - R2T(2)
        DD3 = R3T(1) - R3T(2)
        ML(3,1)= R1T(2) + DD4*DD1
        ML(3,2)= R2T(2) + DD4*DD2
        ML(3,3)= R3T(2) + DD4*DD3
      RETURN
 300  DD4 = (SPANRT -0.50D0)/0.25D0
        DD1 = R1T(2) - R1T(3)
        DD2 = R2T(2) - R2T(3)
        DD3 = R3T(2) - R3T(3)
        ML(3,1)= R1T(3) + DD4*DD1
        ML(3,2)= R2T(3) + DD4*DD2
        ML(3,3)= R3T(3) + DD4*DD3
      RETURN
 400    ML(3,1)= R1T(3)
        ML(3,2)= R2T(3)
        ML(3,3)= R3T(3)
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE SPLVII(NREC,KK,CK1,CK2,CK3,CK4,CK5,CK10,PL,DX,
     1                  GRDSPC,WHO,WHI,WIDTH,FACIMP,IGROUP,IFL,
     2                  NSTRUC,RTMT,ISPLAN,IOVLD)
C
C ***************************************************************
C
C     SPLVII - SPECIAL LEVEL 2 ANALYSIS
C
C     THIS SUBROUTINE DOES A SPECIAL LEVEL 2 ANALYSIS FOR
C     SLAB BRIDGES
C
C ---------------------------------------------------------------
C
C     CALLS TO :
C
C       SSLAB
C       DFSLAB
C       IMSLAB
C       FIXSB
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C         PASSED :
C
C       NSTRUC          - STRUCTURE NUMBER
C       GRDSPC          - GIRDER SPACING
C       FACIMP          - IMPACT FACTOR
C       RTMT            - TRANSVERSE DISTRIBUTION RATIO
C       PL              - AXLE LOADS
C       DX              - DISTANCE TO THE AXLES
C       WHO             - OUTER WHEEL GAGE
C       WHI             - INNER WHEEL GAGE
C       IGROUP          - GROUP IDENTIFICATION
C       IFL             - NUMBER OF INDIVIDUAL AXLES ENTERED
C       NREC            - NUMBER RECORDS IN NBIF
C       KK(17)          - INTEGER VARIABLES FROM REDUCED NBIF
C       WIDTH           - WIDTH OF TRUCK
C       CK(1-10)        - CHARACTER VARIABLES FROM REDUCED NBIF
C       ISPLAN          - STANDARD SLAB PLAN CODE
C       IOVLD           - STANDARD TRUCK CODE
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
C
      INTEGER MAINST,NSPAN,IGROUP(1),IFL,KK(1)
      INTEGER NTYPE,NMAT,NSTRUC,NSPALL
      INTEGER ISPLAN
      REAL*8  SPANMX,BRDWTH,PL(1),DX(1),GRDSPC
      REAL*8  WHO(1),WHI(1),WIDTH,FACIMP
      REAL*8  RTMT,OVDIMP,SPANRT
      REAL*8  MO(3,3),LOCO(3,3),MLO(3,3)
```

```
      REAL*8  XKK6,XKK14,XKK2
      REAL*8  DF(3),IM(3),SLABRR(3),RIMT(3),MCAPDL(3),MLL(3),CONTROL
      REAL*8  MAXS(5),ALPHAS(5),EXTS(5),INTS(5),NEGS(5)
      REAL*8  TEMP1,TEMP2
      CHARACTER*1 SCON,CK1,CK5,CK10
      CHARACTER*6 CONT
      CHARACTER*9 LABEL1
      CHARACTER*8 LABEL2
      CHARACTER*8 CK2
      CHARACTER*18 CK3
      CHARACTER*32 IFLAG(2),IFLG
C
      DATA IFLAG / '(NOTE- POSITIVE MOMENT CONTROLS)',
     1             '(NOTE- NEGATIVE MOMENT CONTROLS)'/
C
      IFLG = IFLAG(1)
C
      DO 10 I=1,3
      DO 5  J=1,3
        MO(I,J)   = 0.D0
        MLO(I,J)  = 0.D0
        LOCO(I,J) = 0.D0
 5    CONTINUE
 10   CONTINUE
C
      IBLT  = KK(3)/100
      IRSN  = MOD(KK(3),100)
      MAINST= KK(8)
      NTYPE = MOD(MAINST,100)
      NMAT  = MAINST/100
      XKK2  = DBLE(KK(2))/100.D0
C
      CALL BRGTYP(NTYPE,NMAT,LABEL1,LABEL2,CONT)
C
      WRITE(7,100)NSTRUC,IBLT,IRSN,CK1,CK2,KK(10),CK3,KK(11),CK4,KK(12),
     1            XKK2,KK(13)
 100  FORMAT(//,10X,'********** NBIF GENERAL INFORMATION **********',
     1       //,10X,'  STRUCTURE NO.',15X,I10,    5X,'YR BLT/RECON  ',
     2                                                 I2,'/',I2,
     3        /,10X,'  INVENTORY RT.',16X,A1,A8,  5X,'NO.SPANS,MAIN',I6,
     4        /,10X,'  FAC. CARRIED ',7X,A18,     5X,'NO.SPANS,APP ',I6,
     5        /,10X,'  LOCATION     ',A25,        5X,'LEN. MAX SPAN',I6,
     6        /,10X,'  MILEPOINT    ',19X,F6.2,   5X,'STRUCTURE LEN',I6)
      IF(NSTRUC .GT. NREC)     GOTO 8000
      IF( KK(1) .EQ. 0)        GOTO 8001
      WRITE(7,105) LABEL1,LABEL2,CONT
 105  FORMAT( /,10X,'  STRUCTURE TYPE :   ',A9,1X,A8,1X,'(',A6,')')
C
      XKK6=   DBLE(KK(6))
      XKK14=  DBLE(KK(14))/10.D0
      NSPAN=  KK(10)
      NSPALL= KK(10) + KK(11)
      SCON=   CK10
C
      IF(CK1 .EQ. '2')                          GOTO 8002
      IF(CK5 .EQ. 'P')WRITE(7,8003)
 8003 FORMAT(/,10X,'WARNING - STRUCTURE IS POSTED.')
      IF(CK5 .EQ. 'C')WRITE(7,8004)
 8004 FORMAT(/,10X,'WARNING - STRUCTURE IS CLOSED.')
      IF(XKK6 .LT. WIDTH) WRITE(7,8009)
```

```
 8009 FORMAT(/,10X,'WARNING - APPROACH WIDTH < VEHICLE WIDTH.')
      IF(XKK14 .LT. WIDTH)WRITE(7,8010)
 8010 FORMAT(/,10X,'WARNING - BRIDGE WIDTH < VEHICLE WIDTH.')
C
      SPANMX=DBLE( KK(12))
      BRDWTH=XKK14
C
C     GET STANDARD SLAB PLAN CURVES
C
      CALL FIXSB(ISPLAN,SPANMX)
      CALL SSLAB(ISPLAN,MAXS,ALPHAS,EXTS,INTS,NEGS)
      CALL TERPS(SPANMX,MAXS,ALPHAS,SPANRT)
      CALL TERPS(SPANMX,MAXS,EXTS  ,MCAPDL(1))
      CALL TERPS(SPANMX,MAXS,INTS  ,MCAPDL(2))
      CALL TERPS(SPANMX,MAXS,NEGS  ,MCAPDL(3))
C
C     CALCULATE MOMENT FOR OVERLOAD TRUCK
C
      CALL LONGMT(IFL,SPANMX,PL,DX,SPANRT,CONT,NSPALL,MO,LOCO)
C
C     CHECK FOR LANE LOAD CONTROL FOR H20 AND HS20 TRUCKS
C
      IF(IOVLD .EQ. 1 .OR. IOVLD .EQ. 2) GOTO 150
        GOTO 155
C
 150    CALL LANE(SPANMX,SPANRT,CONT,NSPALL,MLO)
        MO(1,1) = DMAX1(MLO(1,1),MO(1,1) )
        MO(2,1) = DMAX1(MLO(2,1),MO(2,1) )
          TEMP1 = DABS (MLO(2,2)         )
          TEMP2 = DABS ( MO(2,2)         )
        MO(2,2) =-DMAX1(TEMP1,TEMP2      )
        MO(3,1) = DMAX1(MLO(3,1),MO(3,1) )
        MO(3,2) = DMAX1(MLO(3,2),MO(3,2) )
          TEMP1 = DABS(MLO(3,3)          )
          TEMP2 = DABS( MO(3,3)          )
        MO(3,3) =-DMAX1(TEMP1,TEMP2      )
C     WRITE(7,140)
C140  FORMAT(' OVERLOAD TRUCK MOMENTS')
C     WRITE(7,150)MO(1,1),MO(1,2),MO(1,3)
C     WRITE(7,150)MO(2,1),MO(2,2),MO(2,3)
C     WRITE(7,150)MO(3,1),MO(3,2),MO(3,3)
C150  FORMAT(3F10.2)
C
C     CALCULATE AASHTO DISTRIBUTION FACTOR
C
 155  CALL DFSLAB(SPANRT,SPANMX,DF(1),DF(2),DF(3))
C
C     CALCULATE AASHTO IMPACT FACTOR
C
      CALL IMSLAB(SPANRT,SPANMX,IM(1),IM(2),IM(3))
        IF(FACIMP .GT. 0.D0) GOTO 500
          RIMT(1) = 1.0D0
          RIMT(2) = 1.0D0
          RIMT(3) = 1.0D0
        GOTO 550
 500      OVDIMP  = FACIMP + 1.D0
          RIMT(1) = OVDIMP/IM(1)
          RIMT(2) = OVDIMP/IM(2)
          RIMT(3) = OVDIMP/IM(3)
C
```

```
C     CALCULATE OVERLOAD RATING FACTOR
C
 550  MLL(1)    = MO(3,1)*DF(1)*IM(1)
      MLL(2)    = MO(3,2)*DF(2)*IM(2)
      MLL(3)    = MO(3,3)*DF(3)*IM(3)
      SLABRR(1) = MCAPDL(1)/(MLL(1)*RIMT(1)*RTMT)
      SLABRR(2) = MCAPDL(2)/(MLL(2)*RIMT(2)*RTMT)
      SLABRR(3) =-MCAPDL(3)/(MLL(3)*RIMT(3)*RTMT)
      CONTROL   = DMIN1(SLABRR(1),SLABRR(2),SLABRR(3))
      IF(SLABRR(3) .LT. SLABRR(1) .AND.
     1   SLABRR(3) .LT. SLABRR(2)) IFLG=IFLAG(2)
C
      WRITE(7,560)
 560  FORMAT(//,10X,'******** OVERLOAD VEHICLE INFORMATION ********')
      WRITE(7,573)MO(3,1),IM(1),DF(1),MO(3,2),IM(2),DF(2),
     1            MO(3,3),IM(3),DF(3)
 573  FORMAT(/,12X,'          L.L. MOMENT      AASHTO    AASHTO LOAD',/
     1         12X,'             PER LANE      IMPACT   DISTRIBUTION',/
     2         12X,'               (K-FT)                   (LANES)',/
     3       /,12X,'EXT SPAN ',F12.2,F12.2,3X,F12.4,                ,/
     4         12X,'INT SPAN ',F12.2,F12.2,3X,F12.4,                ,/
     5         12X,'BENT     ',F12.2,F12.2,3X,F12.4)
C
      WRITE(7,580)
 580  FORMAT(//,10X,'********** SPECIAL LEVEL 2 ANALYSIS **********',/
     1         ,10X,'           (HINGES NOT CONSIDERED )           ')
      WRITE(7,583)SPANRT
 583  FORMAT( /,12X,'EXTERIOR TO INTERIOR SPAN RATIO ',F6.3)
      WRITE(7,585) MCAPDL(1),MLL(1),RIMT(1),RTMT,SLABRR(1),
     1             MCAPDL(2),MLL(2),RIMT(2),RTMT,SLABRR(2),
     2             MCAPDL(3),MLL(3),RIMT(3),RTMT,SLABRR(3)
 585  FORMAT(/,12X,'      MOMENT - DEAD  L.L.MOMENT   IMPACT   TRAN.',/
     1         12X,'      CAPACITY LOAD   PLUS IMP.   RATIO    RATIO',
     2             '   OVLDRR'
     3         12X,'             (K-FT)      (K-FT)                 ',/
     4       /,12X,'EXT SPAN ',F10.2,F12.2,F9.2,F8.2,F9.2            ,/
     5         12X,'INT SPAN ',F10.2,F12.2,F9.2,F8.2,F9.2            ,/
     6         12X,'BENT     ',F10.2,F12.2,F9.2,F8.2,F9.2)
C
      WRITE(7,590)CONTROL,IFLG
 590  FORMAT(/,12X,'CONTROLLING OVLDRR =',F10.2,1X,A32)
C
      IF(CONTROL .GE. 1.D0)                          WRITE(7,595)
      IF(CONTROL .GE. 0.70D0 .AND. CONTROL .LT. 1.D0)WRITE(7,596)
      IF(CONTROL .LT. 0.70D0)                        WRITE(7,597)
 595  FORMAT( /,10X,'       ***** THIS BRIDGE IS A GO *****        ')
 596  FORMAT( /,10X,'    ***** LEVEL 2 ANALYSIS REQUIRED *****     ')
 597  FORMAT( /,10X,'      ***** THIS BRIDGE IS A NO GO *****      ')
C
      RETURN
 8000 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER > 9861.            ')
           GOTO 8990
 8001 CALL REMARK(   7,'ERROR - STRUCTURE NUMBER NOT IN NBIF.       ')
           GOTO 8990
 8002 CALL REMARK(   7,'ERROR - STRUCTURE IS AN UNDERCROSSING.      ')
           GOTO 8990
 8990 RETURN
      END
```

```
$DEBUG
      SUBROUTINE DFSLAB(SPANRT,SPANMX,DFEXT,DFINT,DFNEG)
C
C ***************************************************************
C
C     DFSLAB - DISTRIBUTION FACTOR FOR SLAB BRIDGES
C
C     THIS SUBROUTINE CALCULATES THE AASHTO DISTRIBUTION FACTOR
C     FOR A SLAB BRIDGE
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPANMX - MAXIMUM SPAN LENGTH
C         SPANRT - END SPAN RATIO
C
C       RETURNED :
C
C         DFEXT  - DISTRIBUTION FACTOR AT THE EXTERIOR SPAN
C         DFINT  - DISTRIBUTION FACTOR AT THE INTERIOR SPAN
C         DFNEG  - DISTRIBUTION FACTOR AT THE BENT
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      REAL*8 SPANRT,SPANMX
      REAL*8 DFEXT,DFINT,DFNEG
C
      DFEXT = 4.D0  +  0.06D0*SPANRT*SPANMX
        IF(DFEXT .GT. 7.D0) DFEXT=7.D0
      DFEXT = 1.D0/(2.D0*DFEXT)
C
      DFINT = 4.D0  +  0.06D0*SPANMX
        IF(DFINT .GT. 7.D0) DFINT=7.D0
      DFINT = 1.D0/(2.D0*DFINT)
C
      DFNEG = 4.D0  +  0.06D0*(SPANMX + SPANMX*SPANRT)/2.D0
        IF(DFNEG .GT. 7.D0) DFNEG=7.D0
      DFNEG = 1.D0/(2.D0*DFNEG)
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE IMSLAB(SPANRT,SPANMX,IMEXT,IMINT,IMNEG)
C
C ****************************************************************
C
C     IMSLAB - IMPACT FACTOR
C
C     THIS SUBROUTINE CALCULATES THE AASHTO IMPACT FACTOR
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPANMX - MAXIMUM SPAN LENGTH
C         SPANRT - END SPAN RATIO
C
C       RETURNED :
C
C         IMEXT  - IMPACT FACTOR AT THE EXTERIOR SPAN
C         IMINT  - IMPACT FACTOR AT THE INTERIOR SPAN
C         IMNEG  - IMPACT FACTOR AT THE BENT
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      REAL*8 SPANRT,SPANMX
      REAL*8 IMEXT,IMINT,IMNEG
C
      IMEXT = SPANRT*SPANMX  + 125.D0
      IMEXT = 1.D0  + 50.D0/IMEXT
        IF(IMEXT .GT. 1.3D0) IMEXT = 1.3D0
C
      IMINT = SPANMX  + 125.D0
      IMINT = 1.D0  +  50.D0/IMINT
        IF(IMINT .GT. 1.3D0) IMINT = 1.3D0
C
      IMNEG = (SPANMX*SPANRT  + SPANMX)/2.D0  + 125.D0
      IMNEG = 1.0D0  + 50.D0/IMNEG
        IF(IMNEG .GT. 1.3D0) IMNEG = 1.3D0
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE SSLAB(ICURVE,MAXS,ALPHAS,EXTS,INTS,NEGS)
C
C ****************************************************************
C
C     SSLAB  - STANDARD SLAB PLANS
C
C     THIS SUBROUTINE GETS THE STANDARD SLAB PLANS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ICURVE - STANDARD PLAN CURVE CODE
C
C       RETURNED :
C
C         MAXS   - MAXIMUM SPAN LENGTH
C         ALPHAS - END SPAN RATIO
C         EXTS   - POS. EXT.SPAN : CAPACITY - DEAD LOAD (KIP-FT)
C         INTS   - POS. INT.SPAN : CAPACITY - DEAD LOAD (KIP=FT)
C         NEGS   - NEGATIVE      : CAPACITY - DEAD LOAD (KIP-FT)
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986  RAS    INITIAL CODING
C
C ****************************************************************
C
      INTEGER ICURVE
      REAL*8 MAXS(5),  MAXA(5),  MAXB(5),  MAXC(4),  MAXD(5),  MAXE(5)
      REAL*8 MAXF(4),  MAXG(4)
      REAL*8 ALPHAS(5),ALPHAA(5),ALPHAB(5),ALPHAC(4),ALPHAD(5),ALPHAE(5)
      REAL*8 ALPHAF(4),ALPHAG(4)
      REAL*8 EXTS(5),  EXTA(5),  EXTB(5),  EXTC(4),  EXTD(5),  EXTE(5)
      REAL*8 EXTF(4),  EXTG(4)
      REAL*8 INTS(5),  INTA(5),  INTB(5),  INTC(4),  INTD(5),  INTE(5)
      REAL*8 INTF(4),  INTG(4)
      REAL*8 NEGS(5),  NEGA(5),  NEGB(5),  NEGC(4),  NEGD(5),  NEGE(5)
      REAL*8 NEGF(4),  NEGG(4)
C
      DATA MAXA   / 25.0D0,  30.0D0,  35.0D0,  40.0D0,  45.0D0  /
      DATA ALPHAA / .820D0,  .817D0,  .814D0,  .813D0,  .811D0  /
      DATA EXTA   / 14.78D0, 18.92D0, 24.36D0, 29.09D0, 36.54D0 /
      DATA INTA   / 15.27D0, 19.59D0, 25.32D0, 30.39D0, 38.24D0 /
      DATA NEGA   / 23.06D0, 27.50D0, 30.52D0, 40.23D0, 42.56D0 /
C
      DATA MAXB   / 25.0D0,  30.0D0,  35.0D0,  40.0D0,  45.0D0  /
      DATA ALPHAB / .820D0,  .817D0,  .814D0,  .813D0,  .811D0  /
      DATA EXTB   / 15.37D0, 22.27D0, 29.93D0, 38.30D0, 48.14D0 /
      DATA INTB   / 15.86D0, 22.99D0, 30.96D0, 39.70D0, 49.94D0 /
      DATA NEGB   / 24.45D0, 30.39D0, 37.14D0, 47.76D0, 55.52D0 /
```

```
C
      DATA MAXC   / 25.0D0,  30.0D0,  35.0D0,  40.0D0          /
      DATA ALPHAC / .820D0,  .817D0,  .814D0,  .813D0          /
      DATA EXTC   / 24.28D0, 29.75D0, 35.98D0, 43.56D0         /
      DATA INTC   / 24.86D0, 30.59D0, 37.18D0, 45.06D0         /
      DATA NEGC   / 34.09D0, 37.38D0, 41.70D0, 51.16D0         /
C
      DATA MAXD   / 25.0D0,  30.0D0,  35.0D0,  40.0D0,  45.0D0 /
      DATA ALPHAD / .820D0,  .817D0,  .814D0,  .813D0,  .811D0 /
      DATA EXTD   / 24.27D0, 29.75D0, 37.07D0, 43.08D0, 49.83D0 /
      DATA INTD   / 24.89D0, 30.59D0, 38.27D0, 44.48D0, 51.73D0 /
      DATA NEGD   / 30.69D0, 35.46D0, 40.39D0, 48.56D0, 56.17D0 /
C
      DATA MAXE   / 25.0D0,  30.0D0,  35.0D0,  40.0D0,  45.0D0 /
      DATA ALPHAE / .820D0,  .817D0,  .814D0,  .813D0,  .811D0 /
      DATA EXTE   / 28.43D0, 34.56D0, 41.62D0, 46.33D0, 51.63D0 /
      DATA INTE   / 29.08D0, 35.46D0, 42.82D0, 47.93D0, 53.53D0 /
      DATA NEGE   / 35.65D0, 40.39D0, 45.25D0, 50.92D0, 57.42D0 /
C
      DATA MAXF   / 25.0D0,  30.0D0,  35.0D0,  40.0D0          /
      DATA ALPHAF / .820D0,  .817D0,  .814D0,  .813D0          /
      DATA EXTF   / 36.90D0, 45.78D0, 56.89D0, 70.10D0         /
      DATA INTF   / 37.62D0, 46.79D0, 58.19D0, 71.90D0         /
      DATA NEGF   / 42.63D0, 49.34D0, 57.52D0, 72.27D0         /
C
      DATA MAXG   / 25.0D0,  30.0D0,  35.0D0,  40.0D0          /
      DATA ALPHAG / .820D0,  .817D0,  .814D0,  .813D0          /
      DATA EXTG   / 43.58D0, 53.20D0, 60.87D0, 70.10D0         /
      DATA INTG   / 44.30D0, 54.21D0, 62.17D0, 71.90D0         /
      DATA NEGG   / 50.80D0, 58.10D0, 62.10D0, 72.27D0         /
C
      CALL DZERO(MAXS,  5,0.D0)
      CALL DZERO(ALPHAS,5,0.D0)
      CALL DZERO(EXTS,  5,0.D0)
      CALL DZERO(INTS,  5,0.D0)
      CALL DZERO(NEGS,  5,0.D0)
C
      IF(ICURVE .EQ. 1)   GOTO 10
      IF(ICURVE .EQ. 2)   GOTO 20
      IF(ICURVE .EQ. 3)   GOTO 30
      IF(ICURVE .EQ. 4)   GOTO 40
      IF(ICURVE .EQ. 5)   GOTO 50
      IF(ICURVE .EQ. 6)   GOTO 60
      IF(ICURVE .EQ. 7)   GOTO 70
      WRITE(7,200)
  200 FORMAT(/,10X,'ERROR - INCORRECT STANDARD SLAB PLAN CURVE')
      STOP
C
C     STANDARD PLAN CS-2-15
C
   10 DO 11 I=1,5
        MAXS(I)    = MAXA(I)
        ALPHAS(I)  = ALPHAA(I)
        EXTS(I)    = EXTA(I)
        INTS(I)    = INTA(I)
        NEGS(I)    = NEGA(I)
   11 CONTINUE
        RETURN
C
C     STANDARD PLAN CS-2-20
```

```
C
 20   DO 21 I=1,5
        MAXS(I)    = MAXB(I)
        ALPHAS(I)  = ALPHAB(I)
        EXTS(I)    = EXTB(I)
        INTS(I)    = INTB(I)
        NEGS(I)    = NEGB(I)
 21   CONTINUE
        RETURN
C
C     STANDARD PLAN CS-3-20
C
 30   DO 31 I=1,4
        MAXS(I)    = MAXC(I)
        ALPHAS(I)  = ALPHAC(I)
        EXTS(I)    = EXTC(I)
        INTS(I)    = INTC(I)
        NEGS(I)    = NEGC(I)
 31   CONTINUE
        RETURN
C
C     STANDARD PLAN CS-4-20
C
 40   DO 41 I=1,5
        MAXS(I)    = MAXD(I)
        ALPHAS(I)  = ALPHAD(I)
        EXTS(I)    = EXTD(I)
        INTS(I)    = INTD(I)
        NEGS(I)    = NEGD(I)
 41   CONTINUE
        RETURN
C
C     STANDARD PLAN CS-5-20 I
C
 50   DO 51 I=1,5
        MAXS(I)    = MAXE(I)
        ALPHAS(I)  = ALPHAE(I)
        EXTS(I)    = EXTE(I)
        INTS(I)    = INTE(I)
        NEGS(I)    = NEGE(I)
 51   CONTINUE
        RETURN
C
C     STANDARD PLAN CS-20
C
 60   DO 61 I=1,4
        MAXS(I)    = MAXF(I)
        ALPHAS(I)  = ALPHAF(I)
        EXTS(I)    = EXTF(I)
        INTS(I)    = INTF(I)
        NEGS(I)    = NEGF(I)
 61   CONTINUE
        RETURN
C
C     STANDARD PLAN CS-20 I
C
 70   DO 71 I=1,4
        MAXS(I)    = MAXG(I)
        ALPHAS(I)  = ALPHAG(I)
        EXTS(I)    = EXTG(I)
```

```
        INTS(I)    = INTG(I)
        NEGS(I)    = NEGG(I)
 71   CONTINUE
        RETURN
C
      END
```

```
$DEBUG
      SUBROUTINE FIXSB(ISPLAN,SPANMX)
C
C ****************************************************************
C
C     FIXSB  - FIX SLAB SPAN LENGTHS
C
C     THIS SUBROUTINE FIXES THE MINIMUM AND MAXIMUM SPAN
C     LENGTH CORRESPONDING TO THE STANDARD PLANS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         ISPLAN - STANDARD SLAB PLAN CODE
C
C       RETURNED :
C
C         SPANMX - MAXIMUM SPAN LENGTH
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/08/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER ISPLAN
      REAL*8 SPANMX
C
      IF(ISLPAN .EQ. 1)GOTO 10
      IF(ISPLAN .EQ. 2)GOTO 10
      IF(ISPLAN .EQ. 3)GOTO 20
      IF(ISPLAN .EQ. 4)GOTO 10
      IF(ISPLAN .EQ. 5)GOTO 10
      IF(ISPLAN .EQ. 6)GOTO 20
      IF(ISPLAN .EQ. 7)GOTO 20
      RETURN
C
 10   IF(SPANMX .LT. 25.D0) GOTO 15
      IF(SPANMX .GT. 45.D0) GOTO 18
      RETURN
C
 15   SPANMX = 25.D0
      WRITE(7,100)SPANMX
      RETURN
C
 18   SPANMX = 45.D0
      WRITE(7,200)SPANMX
      RETURN
C
 20   IF(SPANMX .LT. 25.D0) GOTO 25
      IF(SPANMX .GT. 40.D0) GOTO 28
```

```
      RETURN
C
 25   SPANMX = 25.DO
      WRITE(7,100)SPANMX
      RETURN
C
 28   SPANMX = 40.DO
      WRITE(7,200)SPANMX
      RETURN
C
 100  FORMAT(10X,' WARNING - FIXUP IN MAX SPAN LENGTH ',F10.3)
 200  FORMAT(10X,' WARNING - FIXUP IN MAX SPAN LENGTH ',F10.3)
      END
```

```
$DEBUG
      SUBROUTINE TERPS(SPANMX,X,Y,VALUE)
C
C ****************************************************************
C
C     TERP   - LINEAR INTERPOLATION
C
C     THIS SUBROUTINE INTERPOLATES LINEARLY BETWEEN TWO POINTS
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPANMX - MAXIMUM SPAN LENGTH
C         X      - X VALUES
C         Y      - Y VALUES
C
C       RETURNED :
C
C         VALUE  - INTERPOLATED VALUE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       07/07/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER J,K
      REAL*8 SPANMX,XK,YK,X(5),Y(5),VALUE
C
      K=0
      DO 100 J=1,5
      K=K+1
        IF(SPANMX .LT. X(J) ) GOTO 200
 100  CONTINUE
C
 200  XK = X(K) - X(K-1)
      YK = Y(K) - Y(K-1)
      VALUE = Y(K-1) + YK*( SPANMX - X(K-1) )/XK
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE BRGTYP(NTYPE,NMAT,LABEL1,LABEL2,CONT)
C
C ****************************************************************
C
C     BRGTYP - BRIDGE TYPE ID
C
C     THIS SUBROUTINE DETERMINES THE BRIDGE TYPE ID
C
C ----------------------------------------------------------------
C
C     CALLS TO : NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         NMAT  - SUPERSTRUCTURE DESIGN TYPE AND MATERIAL TYPE
C         NTYPE - SUPERSTRUCTURE CONSTRUCTION TYPE
C
C       RETURNED :
C
C         LABEL1 - MATERIAL TYPE LABEL
C         LABEL2 - CONSTRUCTION TYPE LABEL
C         CONT   - DESIGN TYPE LABEL (SIMPLE OR CONTINUOUS)
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C         06/11/1986  RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER NTYPE,NMAT
      CHARACTER*9 LABEL1,TYPE1(7)
      CHARACTER*6 CONT  ,DET(2)
      CHARACTER*5 LABEL2,TYPE2(20)
C
      DATA TYPE1/ 'REIN CONC', 'STEEL    ', 'P/S CONC ', 'TIMBER   ',
     1            'MASONRY  ', 'ALUMINUM ', 'OTHER    '/
C
      DATA TYPE2/ 'SLAB ', 'STRG ', 'GIRD ', 'TBEAM', 'BOX-M',
     2            'BOX-S', 'FRM  ', 'ORTH ', 'TRS-D', 'TRS-T',
     3            'ARC-D', 'ARC-T', 'SUS  ', 'STAY ', 'MOV-L',
     4            'MOV-B', 'MOV-S', 'TUN  ', 'CULVT', 'OTHER'/
C
      DATA DET  / 'SIMPLE', 'CONTIN' /
C
      IF(NMAT .EQ. 1) LABEL1=TYPE1(1)
      IF(NMAT .EQ. 2) LABEL1=TYPE1(1)
      IF(NMAT .EQ. 3) LABEL1=TYPE1(2)
      IF(NMAT .EQ. 4) LABEL1=TYPE1(2)
      IF(NMAT .EQ. 5) LABEL1=TYPE1(3)
      IF(NMAT .EQ. 6) LABEL1=TYPE1(3)
      IF(NMAT .EQ. 7) LABEL1=TYPE1(4)
      IF(NMAT .EQ. 8) LABEL1=TYPE1(5)
      IF(NMAT .EQ. 9) LABEL1=TYPE1(6)
```

```
      IF(NMAT .EQ. 0) LABEL1=TYPE1(7)
C
      CONT=DET(1)
      IF(NMAT .EQ. 2) CONT  =DET(2)
      IF(NMAT .EQ. 4) CONT  =DET(2)
      IF(NMAT .EQ. 6) CONT  =DET(2)
C
      IF(NTYPE .EQ. 1)LABEL2=TYPE2(1)
      IF(NTYPE .EQ. 2)LABEL2=TYPE2(2)
      IF(NTYPE .EQ. 3)LABEL2=TYPE2(3)
      IF(NTYPE .EQ. 4)LABEL2=TYPE2(4)
      IF(NTYPE .EQ. 5)LABEL2=TYPE2(5)
      IF(NTYPE .EQ. 6)LABEL2=TYPE2(6)
      IF(NTYPE .EQ. 7)LABEL2=TYPE2(7)
      IF(NTYPE .EQ. 8)LABEL2=TYPE2(8)
      IF(NTYPE .EQ. 9)LABEL2=TYPE2(9)
      IF(NTYPE .EQ.10)LABEL2=TYPE2(10)
      IF(NTYPE .EQ.11)LABEL2=TYPE2(11)
      IF(NTYPE .EQ.12)LABEL2=TYPE2(12)
      IF(NTYPE .EQ.13)LABEL2=TYPE2(13)
      IF(NTYPE .EQ.14)LABEL2=TYPE2(14)
      IF(NTYPE .EQ.15)LABEL2=TYPE2(15)
      IF(NTYPE .EQ.16)LABEL2=TYPE2(16)
      IF(NTYPE .EQ.17)LABEL2=TYPE2(17)
      IF(NTYPE .EQ.18)LABEL2=TYPE2(18)
      IF(NTYPE .EQ.19)LABEL2=TYPE2(19)
      IF(NTYPE .EQ. 0)LABEL2=TYPE2(20)
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE LONGMT(NA,SPAN,A,B,SPANRT,CONT,NSPAN,MM,LOC)
C
C ***************************************************************
C
C     LONGMT - LONGITUDINAL MOMENT
C
C     THIS SUBROUTINE CALCULATES THE MAXIMUM MOMENT FOR A
C     GENERAL TRUCK CONFIGURATION
C
C ---------------------------------------------------------------
C
C     CALLS TO :
C
C       DZERO
C       SPAN01
C       SPAN02
C       SPAN03
C       MOVEF
C       MOVEFB
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         NA     - NUMBER OF AXLES
C         SPAN   - MAXIMUM SPAN LENGTH
C         A      - AXLE LOAD
C         B      - DISTANCES TO THE AXLES
C         SPANRT - END SPAN RATIO
C         CONT   - CONTINUITY
C         NSPAN  - NUMBER OF SPANS
C
C       RETURNED :
C
C         MM     - MAXIMUM MOMENT
C         LOC    - DISTANCE TO LEAD AXLE AT MAXIMUM MOMENT
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      INTEGER NA,NSPAN,NN,KN
      REAL*8 SPAN,A(NA),B(NA)
      REAL*8 MM(3,3),LOC(3,3)
      REAL*8 H1(31),H2(31),H3(31),SX(31)
      REAL*8 SPANAD,SPANRT
      REAL*8 XINC(41),TRUCK
      CHARACTER*6 CONT
C
      TRUCK=B(NA)
C
      CALL DZERO(H1,31,0.D0)
      CALL DZERO(H2,31,0.D0)
      CALL DZERO(H3,31,0.D0)
```

```
      CALL DZERO(SX,31,0.D0)
      CALL DZERO(XINC,41,0.D0)
C
C     SIMPLE BEAM MOMENT
C
      NN = 11
      KN = 21
      SPANAD = SPAN
      CALL SPAN01(SPAN,H1,H2,SX,XINC,TRUCK)
C
C     0.5 POINT
C
      CALL MOVEF (KN,NA,B,XINC,A,SPANAD,SX,H1,NN,SPAN,MM(1,1),LOC(1,1))
C
C     0.4 POINT
C
      CALL MOVEFB(KN,NA,B,XINC,A,SPANAD,SX,H2,NN,SPAN,MM(1,2),LOC(1,2))
      IF(NSPAN .EQ. 1 .OR. CONT .EQ. 'SIMPLE') RETURN
C
      IF(NSPAN .EQ. 2) GOTO 200
      IF(NSPAN .GE. 3) GOTO 300
C
C     TWO SPAN MOMENT
C
 200  CALL DZERO(H1,31,0.D0)
      CALL DZERO(H2,31,0.D0)
      CALL DZERO(H3,31,0.D0)
      CALL DZERO(SX,31,0.D0)
      CALL DZERO(XINC,41,0.D0)
C
      NN = 21
      KN = 31
      SPANAD = SPAN * 2.D0
      CALL SPAN02(SPAN,H1,H3,SX,XINC,TRUCK)
C
C     0.4 POINT
C
      CALL MOVEFB(KN,NA,B,XINC,A,SPANAD,SX,H1,NN,SPAN,MM(2,1),LOC(2,1))
C
C     BENT
C
      CALL MOVEF (KN,NA,B,XINC,A,SPANAD,SX,H3,NN,SPAN,MM(2,2),LOC(2,2))
      IF(NSPAN .EQ. 2) RETURN
C
C     THREE SPAN MOMENT
C
 300  CALL DZERO(H1,31,0.D0)
      CALL DZERO(H2,31,0.D0)
      CALL DZERO(H3,31,0.D0)
      CALL DZERO(SX,31,0.D0)
      CALL DZERO(XINC,41,0.D0)
C
      NN = 31
      KN = 41
      SPANAD = SPAN * (1.D0 + 2.D0 * SPANRT)
      CALL SPAN03(SPAN,H1,H2,H3,SX,SPANRT,XINC,TRUCK)
C
C     0.4 POINT SPAN 1
C
      CALL MOVEFB(KN,NA,B,XINC,A,SPANAD,SX,H1,NN,SPAN,MM(3,1),LOC(3,1))
```

```
C
C     0.5 POINT SPAN 2
C
      CALL MOVEF (KN,NA,B,XINC,A,SPANAD,SX,H2,NN,SPAN,MM(3,2),LOC(3,2))
C
C     BENT
C
      CALL MOVEFB(KN,NA,B,XINC,A,SPANAD,SX,H3,NN,SPAN,MM(3,3),LOC(3,3))
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE SPAN01(SPAN,H1,H2,SX,XINC,TRUCK)
C
C ***************************************************************
C
C     SPAN01 - ONE SPAN INFLUENCE LINES
C
C     THIS SUBROUTINE STORES OFF THE INFLUENCE LINE
C     COEFFICIENTS FOR A ONE SPAN BRIDGE
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPAN    - MAXIMUM SPAN LENGTH
C         TRUCK   - TRUCK LENGTH
C
C       RETURNED :
C
C         H2      - INFLUENCE LINE AT 0.4 POINT
C         H1      - INFLUENCE LINE AT 0.5 POINT
C         SX      - TENTH POINT OF SPAN
C         XINC    - INCREMENT TO MOVE TRUCK
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      INTEGER I
      REAL*8 SPAN,H1(1),H2(1),SX(1),COEFP4(11),COEFP5(11),TENTH(11)
      REAL*8 XX1,XX2,XINC(1)
C
      DATA TENTH /  0.0D0, 0.1D0, 0.2D0, 0.3D0, 0.4D0, 0.5D0,
     1                     0.6D0, 0.7D0, 0.8D0, 0.9D0, 1.0D0/
C
      DATA COEFP4/  0.0D0, .06D0, .12D0, .18D0, .24D0, .20D0,
     1                     .16D0, .12D0, .08D0, .04D0, .00D0/
C
      DATA COEFP5/  0.0D0, .05D0, .10D0, .15D0, .20D0, .25D0,
     1                     .20D0, .15D0, .10D0, .05D0, .00DC/
C
      DO 100 I=1,11
        SX(I)=TENTH(I)*SPAN
        H1(I)=COEFP5(I)
        H2(I)=COEFP4(I)
 100    CONTINUE
C
        XX1    = SPAN*0.1D0
        XX2    = TRUCK*0.1D0
C
```

```
      DO 200 I=1,11
        XINC(I) = XX1
 200  CONTINUE
      DO 250 I=12,21
        XINC(I) = XX2
 250  CONTINUE
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE SPAN02(SPAN,H1,H3,SX,XINC,TRUCK)
C
C ****************************************************************
C
C     SPAN02 - ONE SPAN INFLUENCE LINES
C
C     THIS SUBROUTINE STORES OFF THE INFLUENCE LINE
C     COEFFICIENTS FOR A TWO SPAN BRIDGE
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPAN    - MAXIMUM SPAN LENGTH
C         TRUCK   - TRUCK LENGTH
C
C       RETURNED :
C
C         H1      - INFLUENCE LINE AT 0.4 POINT
C         H3      - INFLUENCE LINE AT THE BENT
C         SX      - TENTH POINT OF SPAN
C         XINC    - INCREMENT TO MOVE TRUCK
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
C
      INTEGER I
      REAL*8 SPAN,H1(1),H3(1),SX(1),CURVL1(21),CURVL3(21),COEFXD(21)
      REAL*8 XINC(1),TRUCK,XX1,XX2
C
      DATA COEFXD / 0.0D0, 0.1D0, 0.2D0, 0.3D0, 0.4D0, 0.5D0,
     1                     0.6D0, 0.7D0, 0.8D0, 0.9D0, 1.0D0,
     2                     1.1D0, 1.2D0, 1.3D0, 1.4D0, 1.5D0,
     3                     1.6D0, 1.7D0, 1.8D0, 1.9D0, 2.0D0/
C
      DATA CURVL1/.000D0,  .0501D0, .1008D0, .1527D0, .2064D0, .1625D0,
     1                     .1216D0, .0843D0, .0512D0, .0229D0, .000D0,
     2                    -.0171D0,-.0288D0,-.0357D0,-.0384D0,-.0375D0,
     3                    -.0336D0,-.0273D0,-.0192D0,-.0099D0, .000D0/
C
      DATA CURVL3/.0D0,-.02475D0,-.04800D0,-.06825D0,-.0840D0,-.09375D0,
     1                -.0960D0, -.08925D0,-.0720D0,-.04275D0,.000D0,
     2                -.04275D0,-.0720D0, -.08925D0,-.0960D0,-.09375D0,
     3                -.0840D0, -.06825D0,-.0480D0, -.02475D0, .000D0/
C
      XX1  = SPAN*0.1D0
      XX2  = TRUCK*0.1D0
```

```
C
      DO 100 I=1,21
        SX(I)=COEFXD(I)*SPAN
        H1(I)=CURVL1(I)
        H3(I)=CURVL3(I)
 100    CONTINUE
      DO 125 I=1,21
        XINC(I)= XX1
 125  CONTINUE
      DO 150 I=22,31
        XINC(I)= XX2
 150  CONTINUE
C
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE SPAN03(SPAN,H1,H2,H3,SX,SPANRT,XINC,TRUCK)
C
C ***************************************************************
C
C     SPAN03 - THREE SPAN INFLUENCE LINES
C
C     THIS SUBROUTINE STORES OFF THE INFLUENCE LINE
C     COEFFICIENTS FOR A THREE SPAN BRIDGE
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         SPAN   - MAXIMUM SPAN LENGTH
C         TRUCK  - TRUCK LENGTH
C         SPANRT - END SPAN RATIO
C
C       RETURNED :
C
C         H1     - INFLUENCE LINE AT 0.4 POINT, SPAN 1
C         H2     - INFLUENCE LINE AT 0.5 POINT, SPAN 2
C         H3     - INFLUENCE LINE AT THE BENT
C         SX     - TENTH POINT OF SPAN
C         XINC   - INCREMENT TO MOVE TRUCK
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      INTEGER I
      REAL*8 SPAN,H1(1),H2(1),H3(1),SX(1)
      REAL*8 CURVL1(31),CURVL2(31),CURVL3(31)
      REAL*8 CURVQ1(31),CURVQ2(31),CURVQ3(31)
      REAL*8 CURVH1(31),CURVH2(31),CURVH3(31)
      REAL*8 COEFXD(31),DD1,DD2,DD3,DD4,SPANRT
      REAL*8 XINC(1),TRUCK,XX1,XX2,XX3
C
      DATA COEFXD / 0.0D0, 0.1D0, 0.2D0, 0.3D0, 0.4D0, 0.5D0,
     1              0.6D0, 0.7D0, 0.8D0, 0.9D0, 1.0D0,
     2              0.1D0, 0.2D0, 0.3D0, 0.4D0, 0.5D0,
     3              0.6D0, 0.7D0, 0.8D0, 0.9D0, 1.0D0,
     4              0.1D0, 0.2D0, 0.3D0, 0.4D0, 0.5D0,
     5              0.6D0, 0.7D0, 0.8D0, 0.9D0, 1.0D0/
C
      DATA CURVL1/0.D0, .04944D0, .09952D0, .15088D0, .20416D0, .1600D0,
     1           .11904D0, .08192D0, .04928D0, .02176D0, .000D0,
     2          -.01560D0,-.02560D0,-.03080D0,-.03200D0,-.0300D0,
     3          -.02560D0,-.01960D0,-.01280D0,-.00600D0, .000D0,
     4           .00456D0, .00768D0, .00952D0, .01024D0, .0100D0,
```

```
     5                .00896D0, .00728D0, .00512D0, .00264D0, .000D0/
C
      DATA CURVL2/0.D0,-.0099D0,-.0192D0,-.0273D0,-.0336D0,-.0375D0,
     1               -.0384D0,-.0357D0,-.0288D0,-.0171D0, .000D0,
     2                .0230D0, .0520D0, .0870D0, .1280D0, .175D0,
     3                .1280D0, .0870D0, .0520D0, .0230D0, .000D0,
     4               -.0171D0,-.0288D0,-.0357D0,-.0384D0,-.0375D0,
     5               -.0336D0,-.0273D0,-.0192D0,-.0099D0, .000D0/
C
      DATA CURVL3/0.D0,-.0264D0,-.0512D0,-.0728D0,-.0896D0,-.1000D0,
     1               -.1024D0,-.0952D0,-.0768D0,-.0456D0, .000D0,
     2               -.0390D0,-.0640D0,-.0770D0,-.0800D0,-.0750D0,
     3               -.0640D0,-.0490D0,-.0320D0,-.0150D0, .000D0,
     4                .0114D0, .0192D0, .0238D0, .0256D0, .0250D0,
     5                .0224D0, .0182D0, .0128D0, .0066D0, .000D0/
C
      DATA CURVQ1/0.D0, .0380 7D0, .0765 6D0, .1158 9D0, .1564 8D0,.1237 5D0,
     1                .0931 2D0, .0650 1D0, .0398 4D0, .0180 3D0, .000D0,
     2               -.0177 6D0,-.0290 1D0,-.0347 2D0,-.0358 4D0,-.0333 3D0,
     3               -.0281 6D0,-.0212 8D0,-.0136 5D0,-.0062 4D0, .000D0,
     4                .0034 2D0, .0057 6D0, .0071 4D0, .0076 8D0, .0075D0,
     5                .0067 2D0, .0054 6D0, .0038 4D0, .0019 8D0, .000D0/
C
      DATA CURVQ2/0.D0,-.0061 9D0,-.0120 0D0,-.0170 6D0,-.0210D0,-.0234 4D0,
     1               -.0240 0D0,-.0223 1D0,-.0180 0D0,-.0106 9D0, .000D0,
     2                .0200 0D0, .0466 7D0, .0800 0D0, .1200 0D0, .1666 7D0,
     3                .1200 0D0, .0800 0D0, .0466 7D0, .0200 0D0, .000D0,
     4               -.0106 9D0,-.0180 0D0,-.0223 1D0,-.0240 0D0,-.0234 4D0,
     5               -.0210 0D0,-.0170 6D0,-.0120 0D0,-.0061 9D0, .000D0/
C
      DATA CURVQ3/0.D0,-.0173 3D0,-.0336 0D0,-.0477 8D0,-.0588D0,-.0656 3D0,
     1               -.0672 0D0,-.0624 8D0,-.0504 0D0,-.0299 3D0, .000D0,
     2               -.0444 0D0,-.0725 3D0,-.0868 0D0,-.0896 0D0,-.0833 3D0,
     3               -.0704 0D0,-.0532 0D0,-.0341 3D0,-.0156 0D0, .000D0,
     4                .0085 5D0, .0144 0D0, .0178 5D0, .0192 0D0, .0187 5D0,
     5                .0168 0D0, .0136 5D0, .0096 0D0, .0049 5D0, .000D0/
C
      DATA CURVH1/0.D0, .0262 9D0, .0528 0D0, .0797 6D0, .1074 0D0,.0859 4D0,
     1                .0656 0D0, .0466 1D0, .0292 0D0, .0135 9D0, .000D0,
     2               -.0207 0D0,-.0336 0D0,-.0399 0D0,-.0408 0D0,-.0375 0D0,
     3               -.0312 0D0,-.0231 0D0,-.0144 0D0,-.0063 0D0, .000D0,
     4                .0021 4D0, .0036 0D0, .0044 6D0, .0048 0D0, .0046 9D0,
     5                .0042 0D0, .0034 1D0, .0024 0D0, .0012 4D0, .000D0/
C
      DATA CURVH2/0.D0,-.0030 9D0,-.0060 0D0,-.0085 3D0,-.0105D0,-.0117 2D0,
     1               -.0120 0D0,-.0111 6D0,-.0090 0D0,-.0053 4D0, .000D0,
     2                .0162 5D0, .0400 0D0, .0712 5D0, .1100 0D0, .1562 5D0,
     3                .1100 0D0, .0712 5D0, .0400 0D0, .0162 5D0, .000D0,
     4               -.0053 4D0,-.0090 0D0,-.0111 6D0,-.0120 0D0,-.0117 2D0,
     5               -.0105 0D0,-.0085 3D0,-.0060 0D0,-.0030 9D0, .000D0/
C
      DATA CURVH3/0.D0,-.0092 8D0,-.0180 0D0,-.0255 9D0,-.0315D0,-.0351 6D0,
     1               -.0360 0D0,-.0334 7D0,-.0270 0D0,-.0160 3D0, .000D0,
     2               -.0517 5D0,-.0840 0D0,-.0997 5D0,-.1020 0D0,-.0937 5D0,
     3               -.0780 0D0,-.0577 5D0,-.0360 0D0,-.0157 5D0, .000D0,
     4                .0053 4D0, .0090 0D0, .0111 6D0, .0120 0D0, .0117 2D0,
     5                .0105 0D0, .0085 3D0, .0060 0D0, .0030 9D0, .000D0/
C
      XX1 = SPAN*SPANRT*0.1D0
      XX2 = SPAN*0.1D0
```

```
      XX3 = TRUCK*0.1D0
C
      IF(SPANRT .GE. 0.75D0)GOTO 100
      IF(SPANRT .GE. 0.50D0)GOTO 200
      GOTO 300
C
 100  DD4  =(SPANRT-0.75D0)/0.25D0
        DO 150 I=1,31
          DD1  =CURVL1(I)-CURVQ1(I)
          DD2  =CURVL2(I)-CURVQ2(I)
          DD3  =CURVL3(I)-CURVQ3(I)
          H1(I)=CURVQ1(I) + DD1*DD4
          H2(I)=CURVQ2(I) + DD2*DD4
          H3(I)=CURVQ3(I) + DD3*DD4
 150    CONTINUE
          GOTO 500
C
 200  DD4  =(SPANRT-0.50D0)/0.25D0
        DO 250 I=1,31
          DD1  =CURVQ1(I)-CURVH1(I)
          DD2  =CURVQ2(I)-CURVH2(I)
          DD3  =CURVQ3(I)-CURVH3(I)
          H1(I)=CURVH1(I) + DD1*DD4
          H2(I)=CURVH2(I) + DD2*DD4
          H3(I)=CURVH3(I) + DD3*DD4
 250    CONTINUE
          GOTO 500
C
 300    DO 350 I=1,31
          H1(I)=CURVH1(I)
          H2(I)=CURVH2(I)
          H3(I)=CURVH3(I)
 350    CONTINUE
          GOTO 500
C
 500      SX(1)= COEFXD(1)
          XINC(1)=XX1
        DO 510 I=2,11
          SX(I)=SX(1)  + COEFXD(I)*SPAN*SPANRT
          XINC(I) = XX1
 510    CONTINUE
        DO 520 I=12,21
          SX(I)=SX(11) + COEFXD(I)*SPAN
          XINC(I) = XX2
 520    CONTINUE
        DO 530 I=22,31
          SX(I)=SX(21) + COEFXD(I)*SPAN*SPANRT
          XINC(I) = XX1
 530    CONTINUE
        DO 540 I=32,41
          XINC(I) = XX3
 540    CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE TERP(XDIS,X,Y,FX,NN)
C
C ***************************************************************
C
C     TERP   - LINEAR INTERPOLATION
C
C     THIS SUBROUTINE INTERPOLATES LINEARLY BETWEEN TWO POINTS
C
C ---------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         XDIS   - DISTANCE TO INTERPOLATE AT
C         X      - X VALUES
C         Y      - Y VALUES
C         NN     - NUMBER OF POINTS TO INTERPOLATE BETWEEN
C
C       RETURNED :
C
C         FX     - INTERPOLATED VALUE
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ***************************************************************
C
      INTEGER J,K,NN
      REAL*8 XDIS,XK,YK,X(NN),Y(NN),FX
C
      K=0
      DO 100 J=1,NN
      K=K+1
        IF(XDIS .LT. X(J) ) GOTO 200
  100 CONTINUE
C
  200 XK = X(K) - X(K-1)
      YK = Y(K) - Y(K-1)
      FX = Y(K-1) + YK*( XDIS - X(K-1) )/XK
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE MOVEF(KN,NA,B,XINC,A,SPANAD,SX,CURV,NN,SPAN,MOMENT,
     1                 LOCATE)
C
C ****************************************************************
C
C     MOVEF  - MOVE FOWARD
C
C     THIS SUBROUTINE MOVES THE TRUCK FOWARD
C
C ----------------------------------------------------------------
C
C     CALLS TO : TERP
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         KN     - NUMBER OF TENTH POINTS ALONG BRIDGE AND TRUCK LENGTH
C         NA     - NUMBER OF AXLES
C         XINC   - INCREMENT TO MOVE TRUCK
C         A      - AXLE LOADS
C         B      - DISTANCES TO THE AXLES
C         SPANAD - BRIDGE LENGTH
C         SX     - DISTANCE AT THE TENTH POINTS
C         CURV   - INFLUENCE CURV
C         NN     - NUMBER OF TENTH POINTS ALONG BRIDGE
C         SPAN   - MAXIMUM SPAN LENGTH
C
C       RETURNED :
C
C         MOMENT - MAXIMUM MOMENT
C         LOCATE - LOCATION OF TRUCK AT MAXIMUM MOMENT
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS   INITIAL CODING
C
C ****************************************************************
C
      INTEGER NA,NN,KN,K,I
      REAL*8  B(1),XINC(1),A(1),SPANAD,SX(1),CURV(NN),SPAN
      REAL*8  MOMENT,LOCATE
      REAL*8  SUM,XDIS,XLEAD,FX,P,XMMT
C
        MOMENT = 0.D0
        SUM= 0.D0
C
      DO 200 J=1,NA
        XLEAD= B(J) - XINC(1)
C
        DO 190 K=1,KN
        XLEAD=XLEAD + XINC(K)
C
        DO 150 I=1,NA
            P     = A(I)
```

```
            XDIS  = XLEAD - B(I)
            FX = 0.D0
            IF(XDIS.GT.1.D-4 .AND. XDIS.LE.SPANAD)
     1                                      CALL TERP(XDIS,SX,CURV,FX,NN)
            XMMT= SPAN*FX*P
            SUM = XMMT + SUM
C           WRITE(6,900)SUM,XMMT,SPAN,FX,P,XDIS,XLEAD
C900        FORMAT(7F10.3)
 150    CONTINUE
C
        IF(DABS(SUM) .LT. DABS(MOMENT))GOTO 175
          MOMENT = SUM
          LOCATE = XLEAD
 175    SUM = 0.D0
C
 190    CONTINUE
C
 200  CONTINUE
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE MOVEFB(KN,NA,B,XINC,A,SPANAD,SX,CURV,NN,SPAN,MOMENT,
     1                  LOCATE)
C
C ***************************************************************
C
C     MOVEFB  - MOVE FOWARD AND BACKWARD
C
C     THIS SUBROUTINE MOVES THE TRUCK FOWARD AND BACKWARD
C
C ---------------------------------------------------------------
C
C     CALLS TO : TERP
C
C ---------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :
C
C         KN      - NUMBER OF TENTH POINTS ALONG BRIDGE AND TRUCK LENGTH
C         NA      - NUMBER OF AXLES
C         XINC    - INCREMENT TO MOVE TRUCK
C         A       - AXLE LOADS
C         B       - DISTANCES TO THE AXLES
C         SPANAD  - BRIDGE LENGTH
C         SX      - DISTANCE AT THE TENTH POINTS
C         CURV    - INFLUENCE CURV
C         NN      - NUMBER OF TENTH POINTS ALONG BRIDGE
C         SPAN    - MAXIMUM SPAN LENGTH
C
C       RETURNED :
C
C         MOMENT - MAXIMUM MOMENT
C         LOCATE - LOCATION OF TRUCK AT MAXIMUM MOMENT
C
C ---------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986  RAS   INITIAL CODING
C
C ***************************************************************
C
      INTEGER NA,NN,KN,K,I
      REAL*8  B(1),XINC(1),A(1),SPANAD,SX(1),CURV(NN),SPAN
      REAL*8  MOMENT,LOCATE
      REAL*8  SUM,XDIS,XLEAD,FX,P,XMMT
C
C ***************************************************************
C     FOWARD                                                    *
C ***************************************************************
C
C       WRITE(6,6)LOCATE
C6      FORMAT (' LOCATE -PASSED THRU MOVEFB',F10.2)
        MOMENT = 0.D0
        SUM= 0.D0
C
      DO 200 J=1,NA
        XLEAD= B(J) - XINC(1)
```

```
C
        DO 190 K=1,KN
        XLEAD=XLEAD + XINC(K)
C
        DO 150 I=1,NA
            P     = A(I)
            XDIS  = XLEAD - B(I)
            FX = 0.D0
            IF(XDIS.GT.1.D-4 .AND. XDIS.LE.SPANAD)
     1                                      CALL TERP(XDIS,SX,CURV,FX,NN)
            XMMT= SPAN*FX*P
            SUM = XMMT + SUM
C           WRITE(6,900)SUM,XMMT,SPAN,FX,P,XDIS,XLEAD
C900        FORMAT(7F10.3)
 150    CONTINUE
C
        IF(DABS(SUM) .LT. DABS(MOMENT))GOTO 175
          MOMENT = SUM
          LOCATE = XLEAD
 175    SUM = 0.D0
C
 190    CONTINUE
C
 200  CONTINUE
C       WRITE(6,4)MOMENT
C4      FORMAT (' MOMENT -BETWEEN           ',F10.2)
C       WRITE(6,5)LOCATE
C5      FORMAT (' LOCATE -BETWEEN           ',F10.2)
C
C ***************************************************************
C     BACKWARD                                                  *
C ***************************************************************
C
      SUM    = 0.D0
C
      DO 400 J=1,NA
        XLEAD=-B(J) + SPANAD + XINC(1)
C
        DO 390 K=1,KN
        XLEAD=XLEAD - XINC(K)
C
        DO 350 I=1,NA
            P     = A(I)
            XDIS  = XLEAD +B(I)
            FX = 0.D0
            IF(XDIS.GT.1.D-4 .AND. XDIS.LE.SPANAD)
     1                                      CALL TERP(XDIS,SX,CURV,FX,NN)
            XMMT= SPAN*FX*P
            SUM  = XMMT + SUM
C           WRITE(6,1000)SUM,XMMT,SPAN,FX,P,XDIS,XLEAD
C1000       FORMAT(7F10.3)
 350    CONTINUE
C
        IF(DABS(SUM) .LT. DABS(MOMENT)   )GOTO 375
          MOMENT = SUM
          LOCATE = XLEAD
 375    SUM = 0.D0
C
 390    CONTINUE
C
```

```
 400  CONTINUE
C       WRITE(6,998)MOMENT
C998    FORMAT (' MOMENT -AFTER CALC         ',F10.2)
C     WRITE(6,999)LOCATE
C999  FORMAT(' AFTER CALC IN MOVEFB',F10.2)
      RETURN
      END
```

```
$DEBUG
      SUBROUTINE EXIT
C
C ****************************************************************
C
C     EXIT   - EXIT PROGRAM
C
C     THIS SUBROUTINE CLOSES THE FILES
C
C ----------------------------------------------------------------
C
C     CALLS TO :  NONE
C
C ----------------------------------------------------------------
C
C     VARIABLE DEFINITION
C
C       PASSED :  NONE
C
C       RETURNED : NONE
C
C ----------------------------------------------------------------
C
C     MODIFICATION LOG
C
C       06/11/1986   RAS   INITIAL CODING
C
C ****************************************************************
C
      CLOSE(5)
      CLOSE(6)
      CLOSE(7)
      CLOSE(8)
      STOP
      END
```