LABEL 000000000PRINTER00175099CC EX OBJECT/READ;FILE SOURCEFILE=SYMBOL/AFILTER;END←

OBJECT /READ

SYMBOL/AFILTER

```
COMMENT ..........................................................00001000
:                                                                :00002000
:              ******** ALGOL FILTER ROUTINE ********            :00003000
   COMMENT: THIS  MATERIAL  IS  PROPRIETARY  TO  BURROUGHS        00003010
            CORPORATION  AND IS NOT TO BE REPRODUCED, USED        00003011
            OR DISCLOSED EXCEPT IN ACCORDANCE WITH PROGRAM        00003012
            LICENSE  OR  UPON WRITTEN AUTHORIZATION OF THE        00003013
            PATENT DIVISION OF BURROUGHS CORPORATION,             00003014
            DETROIT, MICHIGAN 48232.                              00003015
                                                                  00003016
            COPYRIGHT (C) 1968, 1971, 1972                        00003017
            BURROUGHS CORPORATION  DETROIT, MICHIGAN              00003018
            AA32500;                                              00003019
:                                                                :00004000
:                        JAMES C. PAU  (03/26/68)                :00005000
:                                                                :00006000
:................................................................:00007000
BEGIN  COMMENT OUTERMOST BLOCK TO FIX THE BLOCK & RECORD SIZES FOR THE  00008000
               INPUT FILES "TAPE" AND "CARD". * * * * * * * * * * * *;00009000
REAL             DEBUGN;   % DEBUGGING THE GENERATED CODES.           00010000
INTEGER          I,J,K,Z;  % BLOCK & RECORD SIZES ALSO SCRATCHES.     00011000
INTEGER          I1,J1;                                               00011100
COMMENT DO NOT DISTURBE THE ORDER OF THE FOLLOWING DECLARATIONS (UP    00011900
        TO SEQ NO.00033000),PROC.DSKFILE DEPENDS ON EXISTING ORDER;    00011910
BOOLEAN STREAM PROCEDURE  DSKFILE(FSQ);  % CHECK IF IT IS A DISK FILE. 00012000
     VALUE       FSQ;                                                 00013000
            BEGIN                                                     00014000
                SI←LOC DSKFILE; SI←SI"7;                              00015000
                DI←LOC DSKFILE; DI←DI+5; SKIP 3 DB;                   00016000
                9(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB);          00017000
                DS←LIT"3"; SI←DSKFILE;  DI←LOC DSKFILE;  DS←WDS;      00018000
                SI←DSKFILE;  FSQ(SI←SI+40);  SI←SI+31;                00019000
                IF SC="-" THEN TALLY←1 ELSE                           00020000
                IF SC>"9" THEN TALLY←1 ELSE TALLY←0;                  00021000
                DSKFILE←TALLY;                                        00022000
            END  DSKFILE;                                             00023000
                IF DSKFILE(1) THEN  % 1 FOR INPUT FILE "TAPE".        00024000
                BEGIN I←10; J←150 END ELSE BEGIN I←56; J←10 END;       00025000
                IF DSKFILE(2) THEN  % 2 FOR INPUT FILE "CARD".        00026000
                BEGIN K←2; Z←150 END ELSE BEGIN K←5; Z←10 END;         00027000
                IF DSKFILE(3) THEN% 3 FOR OUTPUT FILE "NEWTAPE"       00027100
                BEGIN I1:=10;J1:=150 END% OUTPUT TO DISK              00027200
                ELSE BEGIN I1:=56; J1:=10; END;% OCRDIMG TAPE         00027300
    BEGIN  COMMENT THIS IS THE BEGINNING OF THE PROGRAM.  * * * * * * * *;00028000
    FILE OUT     LINE 18(1,15);                                       00029000
    FILE         TAPE(2,I,J);                                         00030000
    FILE         @ACH "CARD"(K,10,Z);                                 00031000
    SAVE FILE    NEWTAPE DISK SERIAL[20:3000](2,I1,J1,SAVE 100);      00032000
    FILE         PUNCH 0(2,10);                                       00032500
    FILE         DFSK DISK RANDOM[20:100](1,12,60);                   00033000
    SAVE ARRAY   CV[0:11]; % OLD CARD IMAGE.                          00034000
    SAVE ARRAY   CI[0:11]; % NEW GENERATE CARD IMAGE.                 00035000
    SAVE ARRAY   DCI[0:11];     % CARD IMAGE FOR BUILDING DEFINE.      00036000
    SAVE ARRAY   EV[0:19]; % RESULT FROM SCANNING.                    00037000
    ARRAY        PC,PPC[0:12];  % PREVIOUS CARD IMAGE.                00038000
    ARRAY        STKHD[0:124];  % SCRAMBLED-INDEX ARRAY.              00039000
    ARRAY        INFO[0:31,0:255];   % IDENTIFIER STORAGE ARRAY.      00040000
    ARRAY        CB[0:99,0:11]; % GENERATED CARD IMAGES.             00041000
    ARRAY        INF[0:11];     % DEFINE ENTRY TO INFO[*,*].          00042000
    ARRAY        STR[0:7,0:49]; % STORE FOR SCANNING.                00043000
```

```
ARRAY       ACT[0:7]; % STORAGE OF DOLLAR CARD FOR DELAY ACTION.  00044000
ARRAY       A,B[0:14];     % SCRATCH ARRAYS.                      00045000
INTEGER     IFX;      % INDEX OF INFO[*,*] IN THE SCANNING.      00046000
INTEGER     CCO;      % STARTING ADDRESS OF THE CURRENT SCAN.    00047000
INTEGER     CC;       % CURRENT ADDRESS IN CARD BUFFER.          00048000
INTEGER     EST,EET;  % STARTING ADDRESS OF CARD BUFFER, CV[*].  00049000
INTEGER     CED;      % ENDING ADDRESS OF CARD BUFFER.           00050000
INTEGER     CST;      % STARTING ADDRESS OF CARD BUFFER.         00051000
INTEGER     IST;      % STARTING ADDRESS OF CI[0].               00052000
INTEGER     IC;       % CURRENT ADDRESS OF CI[*].                00053000
INTEGER     DST;      % STARTING ADDRESS OF DCI[*].              00054000
INTEGER     NCR;      % NO. OF CHRS SCANNED.                     00055000
INTEGER     NXT;      % NEXT CHR IN CARD BUFFER.                 00056000
INTEGER     NCD;      % CARD INDEX OF INPUT.                     00057000
INTEGER     NCO;      % CARD INDEX OF CURRENT SCAN STARTED.      00058000
INTEGER     NCE;      % CARD INDEX OF CURRENT SCAN ENDING.       00059000
INTEGER     OUTN;     % OUTPUT CARD IMAGE COUNT.                 00060000
INTEGER     ERX;      % ERROR INDICATION DURING EDITING.         00061000
INTEGER     ERRDFN;   % ERROR INDICATION DURING EXECUTING DEFINE.00062000
INTEGER     LFX;      % LOW INDEX OF INFO[*,*].                  00063000
INTEGER     HFX;      % HIGHEST INDEX OF INFO[*,*].              00064000
INTEGER     NFX;      % NEXT AVAILABLE INDEX OF INFO[*,*].       00065000
INTEGER     DFX;      % MAX INFO-INX OF RESRVD WDS FOR DECLARATN.00066000
INTEGER     RFX;      % MAX INFO-INX OF ABSOLUTE RESERVED WORDS. 00067000
INTEGER     CFX;      % MAX INFO-INX OF CONDITIONAL RESERVED WDS.00068000
ARRAY         XALG[0:21];                                        00068100
INTEGER     EITNINES; % DECIMAL VALUE OF 99999999.               00069000
INTEGER     BLKCNT;   % BLOCK COUNT.                            00070000
INTEGER     DOLLAR;   % CARD INDEX AT WHICH $-CARD FUNCTIONS.   00071000
INTEGER     BBB,BB;   % NO. OF BLANKS ON THE CARD JUST READ.    00072000
INTEGER     NNO,INC;  % NEW SEQUENCE NO. AND INCREAMENT.        00073000
REAL        INV;      % OCT1400000000000000.                    00074000
REAL        DX;       % RECORD INDEX OF DFSK-FILE.               00075000
REAL        LDF;      % CURRENT LEVEL INDEX OF DEFINE EXECUTING. 00076000
REAL        LLF;      % LOWEST DEFINE LEVEL IN "CHECKNEXT".      00077000
REAL        CBX;      % ROW INDEX OF CB[*,*].                    00078000
REAL        AVC;      % NO. OF AVAILABLE CHRS IN CI[*].          00079000
REAL        BLK;      % 3-ZERO AND 5-BLANK.                      00080000
REAL        A89;      % "99999999".                              00081000
REAL        TO,T1,T2; % PROGRAM STARTING DATE AND TIME.         00082000
REAL        FST,LST;  % FIRST AND LAST CHR TYPE IN EDITING.     00083000
REAL        ND,NN,NR,NE;  % COUNTS OF DELD,NEW,RETAINED AND ERRS.00084000
REAL        R,P,T;    % SRATCH REALS.                            00085000
BOOLEAN     EOF;      % END-OF-FILE ON BOTH SYMBOLIC & PATCH.    00086000
BOOLEAN     NEWTP;    % CREATION OF A NEW SYMBOLIC FILE.         00087000
BOOLEAN     NEWTPED;  % THERE IS A NEWTAPE CREATED.             00088000
BOOLEAN     PNCH;     % PUNCH DECK REQUIRED.                     00088300
BOOLEAN     PNCHED;   % THERE HAS BEEN A PUNCH DECK.            00088600
BOOLEAN     RESQ;     % RESEQUENCE REQUIRED.                     00089000
BOOLEAN     XRESV;    % ADD Q TO RESERVED WORDS IN XALGOL.       00089100
BOOLEAN     GENERATE; % GENERATION OF THE CURRENT STATEMENT.     00090000
BOOLEAN     CIVALID;  % CI[*] HAS VALID INFORMATION.            00091000
BOOLEAN     NEWCARD;  % A CARD JUST READ BEFORE ANY SCAN.       00092000
BOOLEAN     NEWCD;    % THE ITEM JUST SCANNED IS 1ST ITEM ON CRD.00093000
BOOLEAN     DFINE;    % DURING PROCESS OF A "DEFINE".            00094000
BOOLEAN     ENDCMMT;  % DURING SCANNING OF COMMENT AFTER "END".  00095000
BOOLEAN     B47;      % INDICATION OF GENERATING "47=".          00096000
BOOLEAN     BBK;      % BLANK INDICATOR USED IN SCAN-PROCEDURE.  00097000
BOOLEAN     FRSTPRNT; % FIRST LINE TO BE PRINTED.               00098000
BOOLEAN     STRM;     % DURING PROCCESSING OF A STREAM PROCEDURE.00099000
```

```
BOOLEAN          SQ1ST;    % INCREASE 1ST NEW CARD FOR NONRESEQUENCE.  00100000
BOOLEAN          LSTO,LSTN,LSTD;     % LISTING OF OLD, NEW & DELETED.  00101000
DEFINE           CNC=EV[17]#;   % SEQUENCE NO. OF THE SYMBOLIC FILE.  00102000
DEFINE           PNO=EV[18]#;   % SEQUENCE NO. OF THE PATCH DECK.     00103000
DEFINE           ENO=EV[19]#;   % ENDING SEQ NO. OF ITEM JUST SCANNED.00104000
DEFINE           FOU=LINE#,  CARD=TAPE#,  NTP=NEWTAPE#;               00105000
FORMAT           HDNG(X20,"BURROUGHS B-5500 TO B-6500 ALGOL FILTER",  00106000
                      X8,A4,I3,", ",A2,X3,I2,":",I2,X1,A1,",M,"/);    00107000
FORMAT           TAIL(/X10,                                           00108000
                      "NUMBER OF CARDS WITH POSSIBLE ERRORS:",I6,","   00109000
                      /X10,                                           00110000
                      "NUMBER OF CARDS DELETED:",I6,","/X10,          00111000
                      "TOTAL NUMBER OF CARDS IN THE PROGRAM:",I6,     00112000
                      ";      RETAINED:",I6,";      GENERATED:",I6,   00113000
                      ","/X10,                                        00114000
                      "TIME USED FOR FILTERING:     PROCESSING:",I4,  00115000
                      " MIN, ",I2," SEC.;     ELAPSED:",I4," MIN. ",  00116000
                      I2," SEC.,");                                   00117000
FORMAT           DBG(13(10,X1));                                      00118000
PROCEDURE        DUMPARRAY(A,AXL,AXH,FOU,AB,ALPHANAME,NUMBER);        00119000
COMMENT ..........................................................    00120000
:       DUMP OUT THROUGH FILE (FOU) AN ONE-DIMENSIONAL ARRAY (A)     :00121000
: STARTING FROM (A[AXL]) TO (A[AXH]) IN ALPHA (AB=1) OR OCTAL (AB=0) :00122000
: FORM, (ALPHANAME) AND (NUMBER) WILL BE SHOWN AS THE HEADLINE.      :00123000
:                        -------- J. C. PAO   08/25/65 --------:00124000
:.....................................................................;00125000
    VALUE        AXL,AXH,AB,ALPHANAME,NUMBER;                         00126000
    INTEGER      AXL,AXH,AB,NUMBER;                                   00127000
    ALPHA        ALPHANAME;                                           00128000
    ARRAY        A[*];                                                00129000
    FILE         FOU;                                                 00130000
          BEGIN                                                       00131000
      ARRAY      LN[0:14];                                            00132000
      INTEGER    I,W,L;                                               00133000
      BOOLEAN    BOOL;                                                00134000
      FORMAT     TTL("RECORD ",A6,I8,X5,"[",2A6,"]");                 00135000
      SWITCH FORMAT F←("----  ",6(X2,"----------------"),              00136000
                     (X2,"----",X2,10(X2,"----------")));              00137000
      DEFINE     SLH=F[AB]#;                                          00138000
      LABEL      LL;                                                  00139000
STREAM PROCEDURE OCT12(I,O1,O2);                                      00140000
    VALUE        I;                                                   00141000
          BEGIN                                                       00142000
          SI←LOC I;  SI←SI+2;                                         00143000
          DI←O1;  DI←DI+2;                                            00144000
          6(SKIP 3 DB;                                                00145000
            3(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB));             00146000
          DI←O2;  DI←DI+2;                                            00147000
          6(SKIP 3 DB;                                                00148000
            3(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB));             00149000
          END  OCT12;                                                 00150000
BOOLEAN STREAM PROCEDURE  SAME(A,B,N);                                00151000
    VALUE        N;                                                   00152000
          BEGIN                                                       00153000
      LABEL      LL;                                                  00154000
          SI←B; DI←A; TALLY←0;                                        00155000
          N(IF 8 SC=DC THEN JUMP OUT TO LL);                          00156000
          TALLY←1;                                                    00157000
       LL:SAME←TALLY;                                                 00158000
          END  SAME;                                                  00159000
```

```
STREAM PROCEDURE   EDIT(L,A,I,N,AB);                                    00160000
     VALUE         I,N,AB;                                              00161000
               BEGIN                                                    00162000
     LOCAL         W,T;                                                 00163000
                   SI←LOC AB; SI←SI+7; DI←L;                            00164000
                   IF SC="0" THEN                                       00165000
                   BEGIN                                                00166000
                     TALLY←6; N(TALLY←TALLY+63); T←TALLY;               00167000
                     SI←LOC I; DS←4 DEC; DS←2 LIT"  "; SI←A;            00168000
                     N(DS←LIT " ";                                      00169000
                       2(DS←LIT " ";                                    00170000
                         8(DS←3 RESET;                                  00171000
                           3(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB)  00172000
                       ) ) );                                           00173000
                     T(DS←19 LIT "    ");                             00174000
                   END ELSE                                             00175000
                   BEGIN                                                00176000
                     TALLY←10; N(TALLY←TALLY+63); T←TALLY;              00177000
                     SI←LOC I; DS←2 LIT"  "; DS←4 DEC; DS←2 LIT"  ";    00178000
                   SI←A;                                                00179000
                     N(DS←LIT " "; 2(DS←LIT " "; DS←4 CHR));            00180000
                     T(DS←11 LIT "    "); DS←2 LIT "  ";               00181000
                   END;                                                 00182000
               END EDIT;                                                00183000
                   WRITE(FOU); OCT12(NUMBER,L,W);                       00184000
                   WRITE(FOU[DBL],TTL,ALPHANAME,NUMBER,L,W);            00185000
                   IF AB=0 THEN W←6 ELSE BEGIN AB←1; W←10 END;          00186000
                   IF (L←(AXH-AXL) DIV W + 1)=1 THEN W←AXH-AXL+1;       00187000
                   FOR I←1 STEP 1 UNTIL L DO                            00188000
                   BEGIN                                                00189000
                     IF I=1 THEN GO TO LL ELSE                          00190000
                     IF I=L THEN BEGIN W←AXH-(AXL←AXL+W)+1;GO TO LL END;00191000
                     IF SAME(A[AXL],A[AXL+AXL+W],W) THEN                00192000
                     BEGIN                                              00193000
                       IF NOT BOOL THEN                                 00194000
                       BEGIN WRITE(FOU,SLH); BOOL←TRUE END;             00195000
                     END ELSE                                           00196000
                     BEGIN                                              00197000
                       IF BOOL THEN BOOL←FALSE;                         00198000
LL:                    EDIT(LN[0],A[AXL],AXL,W,AB);                    00199000
                       IF I=L THEN WRITE(FOU[DBL],15,LN[*]) ELSE        00200000
                       WRITE(FOU,15,LN[*]);                             00201000
                     END;                                               00202000
                   END;                                                 00203000
               END DUMPARRAY;                                           00204000
STREAM PROCEDURE   ADDSS(S,A);                                          00205000
COMMENT ..........................................................      00206000
:  THIS PROCEDURE STORE THE ABSOLUTE ADDRESS OF (A) INTO (S).          :00207000
:                        -------- J. C. PAO   11/02/66 --------       :00208000
:..........................................................;            00209000
               BEGIN                                                    00210000
                   SI←A; A←SI; SI←LOC A; DI←S; DS←WDS;                  00211000
               END ADDSS;                                               00212000
STREAM PROCEDURE   TRNSFBTS(B,A,BB,AB,BITS);                            00213000
COMMENT ..........................................................      00214000
:    THIS PROCEDURE WILL TRANSFER "BITS" BITS FROM "A", BIT POSITION    :00215000
: "AB" TO "B", BIT POSITION "BB".    ("BITS"≤4095)                      :00216000
:..........................................................;            00217000
     VALUE         BB,AB,BITS;                                          00218000
               BEGIN                                                    00219000
```

```
        LOCAL       N;                                                      00220000
                    DI←LOC N; DI←DI+7; SI←LOC BITS; SI←SI+6; DS←CHR;        00221000
                    SI←A; SKIP AB SB; DI←B; SKIP BB DB;                     00222000
                    N(2(32(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB)));     00223000
                    BITS(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB);         00224000
                END TRNSFBTS;                                               00225000
    STREAM PROCEDURE TRNSFCHR(A,B,AS,BS,CH);                                00226000
    COMMENT ....................................................................00227000
    :  TRANSFER FROM (B), STARTING CHARACTER INDEX (BS), INTO (A), STARTING:00228000
    :CHARACTER INDEX (AS), FOR (CH) CHARACTERS.   (CH≤63)                   :00229000
    :..........................................................................;00230000
        VALUE       AS,BS,CH;                                               00231000
                BEGIN                                                       00232000
                    DI←A; DI←DI+AS;   SI←B; SI←SI+BS;   DS←CH CHR;          00233000
                END TRNSFCHR;                                               00234000
    STREAM PROCEDURE TRNSFWDS(A,B,WD);                                      00235000
    COMMENT ....................................................................00236000
    :  TRANSFER FROM "B" INTO "A" FOR "WD" WORDS.  ("WD" ≤ 4095)            :00237000
    :..........................................................................;00238000
        VALUE       WD;                                                     00239000
                BEGIN                                                       00240000
        LOCAL       N;                                                      00241000
                    DI←LOC N; DI←DI+7; SI←LOC WD; SI←SI+6; DS←CHR;          00242000
                    DI←A; SI←B;                                             00243000
                    N(DS←32 WDS; DS←32 WDS);  DS←WD WDS;                    00244000
                END TRNSFWDS;                                               00245000
    STREAM PROCEDURE CHRTRNSF(T,F,NC);                                      00246000
    COMMENT ....................................................................00247000
    :     THIS PROCEDURE TRANSFERS (N) CHARACTERS FROM (F) TO (T).  BOTH (F):00248000
    : AND (T) ARE CONSIDERED AS THE ABSOLUTE ADDRESSES.  AT THE END OF      :00249000
    :TRANSFERRING, ONLY (T) IS UPDATED.                                     :00250000
    :                        --------  J. C. PAO   04/15/66  ------          :00251000
    :..........................................................................;00252000
        VALUE       F,NC;                                                   00253000
                BEGIN                                                       00254000
        LOCAL       I,J;                                                    00255000
                    SI←T; DI←LOC J; DS←WDS;                                 00256000
                    SI←LOC NC; SI←SI+6;  DI←LOC I; DI←DI+7;  DS←CHR;        00257000
                    SI←F;  DI←J;                                            00258000
                    I(2(DS←32 CHR));  DS←NC CHR;                            00259000
                    J←DI; SI←LOC J; DI←T; DS←WDS;                           00260000
                END CHRTRNSF;                                               00261000
    INTEGER STREAM PROCEDURE  COMPAREA(A,B,AC,BC,N);                        00262000
    COMMENT ....................................................................00263000
    :  TO COMPARE INFORMATION IN (A) AND (B) STARTING FROM CHARACTER INDEX  :00264000
    :(AC) AND (BC) RESPECTIVELY FOR (N) CHARACTERS.                         :00265000
    :  THE VALUE OF "COMPARE":  A=B: 0,   A>B: +1,   A<B: -1.               :00266000
    :                        --------  J. C. PAO   08/25/65  --------       :00267000
    :..........................................................................;00268000
        VALUE       AC,BC,N;                                                00269000
                BEGIN                                                       00270000
          LABEL     L1,L2,L3,L4;                                            00271000
                    SI←A; SI←SI+AC;  DI←B; DI←DI+BC;                        00272000
            L1:     N(IF SC>DC THEN JUMP OUT 1 TO L2;                       00273000
                      SI←SI-1; DI←DI-1;                                     00274000
                      IF SC<DC THEN JUMP OUT 1 TO L3; );                    00275000
                    GO TO L4;                                               00276000
            L2:     TALLY←1; COMPAREA←TALLY; GO TO L4;                      00277000
            L3:     DI←LOC COMPAREA; DS←8 LIT "+0000001";                   00278000
            L4: END COMPAREA;                                               00279000
```

```
INTEGER PROCEDURE   COMPAREB(A,B,AB,BB,N);                              00280000
COMMENT ..................................................................00281000
:  TO COMPARE INFORMATION IN (A) AND (B) STARTING FROM CHARACTER INDEX :00282000
:(AC) AND (BC) RESPECTIVELY FOR (N) BITS IN BINARY,                    :00283000
:                          -------- J. C. PAO   08/25/65 --------     :00284000
:..........................................................................:00285000
     VALUE          AB,BB,N;                                            00286000
     INTEGER        AB,BB,N;                                            00287000
     REAL           A,B;                                                00288000
          BEGIN                                                         00289000
       INTEGER      I,J,T,AW,BW;                                        00290000
       LABEL        L1;                                                 00291000
INTEGER STREAM PROCEDURE  INT(A,AW,AB,BTS,IO);                          00292000
     VALUE          AW,AB,BTS,IO;                                       00293000
          BEGIN                                                         00294000
               DI←LOC INT; SKIP IO DB;                                  00295000
               SI←A; AW(SI←SI+8); SKIP AB SB;                           00296000
               BTS(IF SB THEN DS←SET ELSE DS←RESET; SKIP SB);           00297000
          END INT;                                                      00298000
     L1:       AW←AW + (AB DIV 48);  AB←AB MOD 48;                     00299000
               BW←BW + (BB DIV 48);  BB←BB MOD 48;                     00300000
               T←IF N>39 THEN 39 ELSE N;                               00301000
               IF (I←INT(A,AW,AB,T,48-T))>(J←INT(B,BW,BB,T,48-T))      00302000
               THEN COMPAREB←1 ELSE                                    00303000
               IF I<J THEN COMPAREB←-1 ELSE                            00304000
               IF N=T THEN COMPAREB←0 ELSE                             00305000
               BEGIN N←N-T; AB←AB+T; BB←BB+T; GO TO L1; END;           00306000
          END  COMPAREB;                                                00307000
STREAM PROCEDURE   ZERO(A,WD);                                          00308000
COMMENT ..................................................................00309000
:  SARTING FROM (A), SET (WD) WORDS TO BE ZEROES.  (1≤WD≤64)           :00310000
:                          -------- J. C. PAO   12/09/66 --------     :00311000
:..........................................................................:00312000
     VALUE          WD;                                                 00313000
               BEGIN                                                    00314000
                    DI←A; DS←8 LIT"0000";  SI←A;                        00315000
                    TALLY←WD; TALLY←TALLY+63, WD←TALLY;  DS←WD WDS;     00316000
               END  ZERO;                                               00317000
STREAM PROCEDURE   IOCVRT(A,B,ST,CH,IO);                                00318000
COMMENT ..................................................................00319000
:  THIS PROCEDURE DOES INPUT ("IO"=1) OR OUTPUT ("IO"=0) CONVERT FROM  :00320000
:"B" INTO "A", STARTING CHR-POSITION "ST", FOR "CH" CHRS.              :00321000
:                          -------- J. C. PAO   04/21/64 --------     :00322000
:..........................................................................:00323000
     VALUE          ST,CH,IO;                                           00324000
               BEGIN                                                    00325000
                    DI←A;  SI←LOC IO; SI←SI+7; SKIP 5 SB;               00326000
                    IF SB THEN                                          00327000
                    BEGIN SI←B; SI←SI+ST; DS←CH OCT END ELSE            00328000
                    BEGIN SI←B; DI←DI+ST; DS←CH DEC END;                00329000
               END  IOCVRT;                                             00330000
REAL PROCEDURE     DATE(T);                                             00331000
COMMENT ..................................................................00332000
:  THIS PROCEDURE CONVERTS THE VALUE OF AN SYSTEM INTERNAL DATE INTO    :00333000
:MONTH, DAY AND YEAR.                                                  :00334000
:  VALUE OF RESULT:   CHR 1-4: MONTH (IN CHARACTERS).                  :00335000
:                     CHR 5-6: YEAR (IN CHARACTERS).                   :00336000
:                     CHR 7  : DAY (IN BINARY).                        :00337000
:                          -------- J. C. PAO   06/21/66 --------     :00338000
:..........................................................................:00339000
```

```
        VALUE           T;                                                      00340000
        REAL            T;                                                      00341000
                BEGIN                                                           00342000
          INTEGER       D,M;                                                    00343000
          LABEL         LE;                                                     00344000
                        IF (D←T.[42:6]+10×(T.[36:6]+10×(T.[30:6])))≤31 THEN     00345000
                        BEGIN M←"JAN."; GO TO LE END;  D←D-31;                  00346000
                        IF D≤(M←IF (M←T.[24:6]+10×(T.[18:6])).[46:2]=0 THEN     00347000
                        29 ELSE 28) THEN                                        00348000
                        BEGIN M←"FEB."; GO TO LE END;  D←D-M;                   00349000
                        IF D≤31 THEN BEGIN M←"MAR."; GO TO LE END; D←D-31;      00350000
                        IF D≤30 THEN BEGIN M←"APR."; GO TO LE END; D←D-30;      00351000
                        IF D≤31 THEN BEGIN M←" MAY"; GO TO LE END; D←D-31;      00352000
                        IF D≤30 THEN BEGIN M←"JUN."; GO TO LE END; D←D-30;      00353000
                        IF D≤31 THEN BEGIN M←"JUL."; GO TO LE END; D←D-31;      00354000
                        IF D≤31 THEN BEGIN M←"AUG."; GO TO LE END; D←D-31;      00355000
                        IF D≤30 THEN BEGIN M←"SEP."; GO TO LE END; D←D-30;      00356000
                        IF D≤31 THEN BEGIN M←"OCT."; GO TO LE END; D←D-31;      00357000
                        IF D≤30 THEN BEGIN M←"NOV."; GO TO LE END; D←D-30;      00358000
                        M←"DEC.";                                               00359000
             LE:        DATE←D&M[6:24:24]&T[30:18:12];                          00360000
                END     DATE;                                                   00361000
    INTEGER PROCEDURE   INFOENTRY(F,WDS);                                       00362000
    COMMENT .....................................................................00363000
    :     THIS PROCEDURE ENTERS AN ENTRY INTO INFO[*,*] AND UPDATES ALL THE :00364000
    :CONCERNED INDEXES.  "F" IS THE ARRAY IDENTIFIER WHICH CONTAINS "WDS"  :00365000
    :WORDS IN THIS ENTRY.                                                  :00366000
    :                          -------  J. C. PAO   04/27/68  -------     :00367000
    :.....................................................................;00368000
        VALUE           WDS;                                                    00369000
        REAL            WDS;                                                    00370000
        ARRAY           F[0];                                                   00371000
                BEGIN                                                           00372000
          INTEGER       S;                                                      00373000
    IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"INFENY",F[0],WDS);                   00374000
    COMMENT  CHECK IF THE REMAINING WORDS OF THE CURRENT ROW OF INFO[*,*]        00375000
             CAN NOT HOLD THIS ENTRY, START WITH A THE NEXT ROW;                00376000
                IF NFX.[40:8]+WDS>257 THEN NFX←(NFX+256)&1[40:40:8];            00377000
    COMMENT  STORE THE FOLLOWING INDEXES IN THIS ENTRY:                         00378000
             [40: 8]: REL INX OF THE ADDITIONAL INFO.  (ALREADY IN F[0]).       00379000
             [33: 7]: INX OF STKHD[*].  (SEE NOTE 3).                           00380000
             [25: 8]: REL INX OF THE PREVIOUS ENTRY.  (SEE NOTE 1).             00381000
             [12:13]: ABS INX OF THE PREVIOUS ENTRY WITH THE SAME VALUE, OR     00382000
                      THE SAME INX OF STKHD[*].  (SEE NOTE 2).                  00383000
             [ 4: 8]: TOTAL UNMBER OF WORDS IN THIS ENTRY.  (SEE NOTE 4).       00384000
             [ 1: 3]: THE TYPE OF IDENTIFIER:                                   00385000
                      0: RESERVED WORD OR DONT-CARE. (REGARDLESS OF "STRM"),    00386000
                      2: SUBSCRIPTED IDENTIFIER.     ("STRM" SHOULD BE OFF),    00387000
                      4: DEFINE.                     (REGARDLESS OF "STRM"),    00388000
                      6: SIMPLE VARIABLE.            ("STRM" SHOULD BE OFF),    00389000
                      1: STREAM PROCEDURE.           (WHEN "STRM" IS OFF),      00390000
                         STREAM VALUE VARIABLE.      (WHEN "STRM" IS ON),       00391000
                      3: STREAM NAME VARIABLE.       ("STRM" SHOULD BE ON),     00392000
                      5: STREAM VALUE IN LOCAL[*].   ("STRM" SHOULD BE ON),     00393000
                      7: STREAM NAME IN LOCAL[*].    ("STRM" SHOULD BE ON),     00394000
                                                                                ;00395000
              F[0]←F[0]&(NFX-HFX)[25:40:8]              % NOTE 1,               00396000
                  &STKHD[S←(F[1] MOD 125)][12:35:13]% NOTE 2,                   00397000
                  &S[33:41:7]&WDS[4:40:8];          % NOTES 3 & 4,            00398000
    COMMENT  TRANSFER THE ENTRY INTO INFO[*,*];                                 00399000
```

```
                    TRNSFWDS(INFO[(INFOENTRY+HFX+STKHD[S]+NFX).[35:5],
                      NFX.[40:8]-1],F[0],WDS);
COMMENT  IF THE NEXT AVAILABLE INDEX OF INFO[*,*] IS POINTED TO THE
         0TH WORD OF THE ROW, MOVE IT TO THE 1ST WORD OF THE NEXT ROW;
                    IF (NFX+NFX+WDS).[40:8]=0 THEN NFX+NFX+1;
IF DEBUGN=3 THEN DUMPARRAY(F,0,WDS-1,FOU,1,"ENTRY:",HFX);
               END  INFOENTRY;
PROCEDURE           INFOREMOVE(START);
COMMENT .....................................................................
:    THIS PROCEDURE REMOVES THE ENTRIES FROM INFO[*,*].  REMOVAL STARTS:
:FROM THE INFO-INDEX "START".  AL THE CONCERNED INDEXES ARE UPDATED.   :
:                          -------- J. C. PAO   04/27/68 --------:
:.....................................................................;
     VALUE          START;
     REAL           START;
               BEGIN
       REAL         P;
       LABEL        LE;
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"INFRMV",START,HFX,NFX);
                    IF HFX<START THEN GO TO LE;
                    DO
                    STKHD[(P+INFO[HFX.[35:5],HFX.[40:8]-1]),[33:7]]+
                    P.[12:13] UNTIL (HFX+HFX-P.[25:8])<START;
                    IF (NFX+HFX+INFO[HFX.[35:5],HFX.[40:8]-1].[4:8]),
                    [40:8]=0 THEN NFX+NFX+1;
LE:
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"INFRVM","START=",START,"HFX  =",
HFX,"NFX  =",NFX);
IF DEBUGN=3 THEN DUMPARRAY(STKHD,0,124,FOU,0,"STKHD:",HFX);
IF DEBUGN=3 THEN FOR START+0 STEP 1 UNTIL NFX.[35:5] DO
DUMPARRAY(INFO[START,*],0,255,FOU,1,"INFO :",START);
END; COMMENT
          LE:  END  INFOREMOVE;
BOOLEAN PROCEDURE   SCAN(TYP); VALUE TYP; INTEGER TYP;  FORWARD;
BOOLEAN PROCEDURE   INPUT;
COMMENT .....................................................................
:  THIS PROCEDURE READS THE SYMBOLIC FILE AND THE PATCH CARD DECK INTO :
:CV[*].  ACCORDING TO THEIR NEXT SEQUENCE NO., IT READS A CARD AT A   :
:TIME.                                                                :
:  VALUE OF RESULT:  TRUE: THE END OF BOTH FILES.                     :
:                          -------- J. C. PAO   04/01/68 --------:
:.....................................................................;
               BEGIN
BOOLEAN STREAM PROCEDURE  DOLLARSIGN(C);  % CHECK FOR DOLLAR SIGN CARD.
     VALUE          C;
               BEGIN
                    SI+C;
                    IF SC="$" THEN BEGIN TALLY+1; DOLLARSIGN+TALLY END;
               END  DOLLARSIGN;
PROCEDURE           DOLLARCARD;  % PROCCESS A DOLLAR SIGN CARD.
               BEGIN
STREAM PROCEDURE    VOID(V,C);
     VALUE          C;
               BEGIN
                    SI+C; SI+SI+7;  DI+V;  TALLY+8;
                    7(IF SC#" " THEN JUMP OUT;
                      SI+SI-1; TALLY+TALLY+63; DS+LIT" ");
                    SI+C;  C+TALLY;  DS+C CHR;
               END  VOID;
       REAL         I,J;
```

```
        LABEL       L1,L2,L3,L4,L5,L55,L56,L6,L7,L8,L9,LL,LE;                    00460000
COMMENT  STORE AWAY THE CURRENT SCAN AND PREPARE FOR SCANNING THE DOLLAR00461000
         SIGN CARD;                                                             00462000
                    STR[I+LDF+1,1]+REAL(DFINE);                                 00463000
                    STR[I, 2]+REAL(GENERATE);                                   00464000
                    STR[I, 3]+REAL(NEWCARD);                                    00465000
                    STR[I, 4]+IF RESQ THEN 3 ELSE 0;                            00466000
                    STR[I, 6]+NCD;                                              00467000
                    STR[I, 7]+CCD;                                              00468000
                    STR[I, 8]+NCO;                                              00469000
                    STR[I, 9]+NCR;                                              00470000
                    STR[I,10]+NXT;                                              00471000
                    STR[I,11]+FST;                                              00472000
                    STR[I,12]+LST;                                              00473000
                    STR[I,13]+REAL(BBK);                                        00474000
                    STR[I,14]+NCE;                                              00475000
                    TRNSFWDS(STR[I,17],EV[0],17);                               00476000
                    TRNSFWDS(STR[I,36],EV[19],1);                               00477000
                    DFINE+BOOLEAN(2);  % STOP SWITCH IN SCAN FOR $-CARD.        00478000
                    GENERATE+NEWCARD+BBK+FALSE;                                 00479000
                    RESQ+TRUE;  CC+CST;                                         00480000
                    IF SCAN(1) THEN GO TO LL;                                   00481000
                    IF NXT.[42:6]#2 THEN GO TO LL;                              00482000
COMMENT  CHECK FOR VOID CARD AND SKIP BOTH PATCH DECK AND OLD FILE;             00483000
                    IF NXT.[36:6]#"V" THEN GO TO L5;                            00484000
                    IF SCAN(5) THEN GO TO LL;                                   00485000
                    IF NCR#4 THEN GO TO LL;                                     00486000
                    IF EV[0].[18:24]#"VOID" THEN GO TO LL;                      00487000
                    VOID(ACT[0],CC);                                            00488000
         L1:        READ(PACH[NO])[L2];                                         00489000
                    TRNSFWDS(PNO,PACH(9),1);                                    00490000
                    IF COMPAREA(PNO,ACT[0],0,0,8)<0 THEN                        00491000
                    BEGIN READ(PACH); GO TO L1 END ELSE GO TO L3;               00492000
         L2:        PNO+A89;                                                    00493000
         L3:        IF COMPAREA(CNO,INV,0,0,8)#0 THEN                           00494000
                    IF COMPAREA(CNO,ACT[0],0,0,8)<0 THEN                        00495000
                    BEGIN                                                       00496000
                      READ(CARD);  READ(CARD[NO])[L4];                          00497000
                      TRNSFWDS(CNO,CARD(9),1);  GO TO L3;                       00498000
         L4:          CNO+A89;                                                  00499000
                    END;  GO TO LL;                                             00500000
COMMENT  THIS IS NOT A VOID CARD, SCAN IT;                                      00501000
         L5:        IF SCAN(5) THEN GO TO LL;                                   00502000
                    IF NCR#4 THEN GO TO LL;                                     00503000
                    IF (J+EV[0].[18:24])="CARD" THEN                            00504000
                    IF COMPAREA(CNO,A89,0,0,8)#0 THEN                           00505000
                    BEGIN CNO+INV; GO TO L56 END ELSE GO TO L56;                00506000
                    IF J#"TAPE" THEN GO TO LL;                                  00507000
                    IF COMPAREA(CNO,INV,0,0,8)=0 THEN                           00508000
                    BEGIN                                                       00509000
                      READ(CARD[NO])[L55];                                      00510000
                      TRNSFWDS(CNO,CARD(9),1);  GO TO L56;                      00511000
         L55:         CNO+A89;                                                  00512000
                    END;                                                        00513000
         L56:       DOLLAR+NCD;  ZERO(ACT[1],5);                                00514000
                    XRESV + FALSE;                                              00514100
                    IF BOOLEAN(STR[I,4])THEN ACT[6]+ANO+(ACT[7]+INC) ELSE       00515000
                    BEGIN  IOCVRT(ACT[6],ENO,0,8,1);                            00516000
                      IF ACT[6]<(ACT[7]+0) THEN ACT[6]+0;                       00517000
                    END;                                                        00518000
```

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L6:     IF NXT.[42:6]≠2 THEN GO TO LL;                                  00519000
        IF NXT.[36:6]≠"L" THEN GO TO L7;                                00520000
        IF SCAN(5) THEN GO TO LL;                                       00521000
        IF NCR=4 THEN                                                   00522000
        IF EV[0].[18:24]≠"LIST" THEN GO TO LL ELSE                      00523000
        BEGIN ACT[1]←ACT[2]←ACT[3]←1; GO TO L6 END;                     00524000
        IF NCR≠5 THEN GO TO LL;                                         00525000
        IF (J←EV[0].[18:30])="LISTO" THEN                               00526000
        BEGIN ACT[1]←1; GO TO L6 END;                                   00527000
        IF J="LISTG" THEN                                               00528000
        BEGIN ACT[2]←1; GO TO L6 END;                                   00529000
        IF J="LISTD" THEN                                               00530000
        BEGIN ACT[3]←1; GO TO L6 END;  GO TO LL;                        00531000
L7:     IF NXT.[36:6] = "X" THEN                                        00532000
        BEGIN                                                           00532020
          IF SCAN(5) THEN GO TO LL;                                     00532030
          IF NCR ≠ 5 THEN GO TO LL;                                     00532040
          IF EV[0].[18:30] ≠ "XRESV" THEN GO TO LL;                     00532050
          XRESV ← TRUE;                                                 00532060
          IF NXT.[42:6] ≠ 2 THEN GO TO LL;                              00532070
        END;                                                            00532080
        IF NXT.[36:6] = "N" THEN                                        00532900
        BEGIN                                                           00533000
          IF SCAN(5) THEN GO TO LL;                                     00534000
          IF NCR≠3 THEN GO TO LL;                                       00535000
          IF EV[0].[18:18]≠"NEW" THEN GO TO LL;                         00536000
          IF NXT≠2&"T"[36:42:6] THEN GO TO LL;                          00537000
          IF SCAN(5) THEN GO TO LL;                                     00538000
          IF EV[0].[18:24]≠"TAPE" THEN GO TO LL;                        00539000
          ACT[4]←1;                                                     00540000
          IF NXT.[42:6]≠2 THEN GO TO LL;                                00541000
        END;                                                            00542000
        IF NXT.[36:6]="P" THEN                                          00542100
        BEGIN                                                           00542200
          IF SCAN(5) THEN GO TO LL;                                     00542300
          IF NCR≠5 THEN GO TO LL;                                       00542400
          IF EV[0].[18:30]≠"PUNCH" THEN GO TO LL;                       00542500
          ACT[4]←ACT[4]+2;                                              00542600
          IF NXT.[42:6]≠2 THEN GO TO LL;                                00542700
        END;                                                            00542800
        IF NXT.[36:6]≠"S" THEN GO TO LL;                                00543000
        IF SCAN(5) THEN GO TO LL;                                       00544000
        IF NCR≠3 THEN GO TO LL;                                         00545000
        IF EV[0].[18:18]≠"SEQ" THEN GO TO LL;                           00546000
        ACT[5]←1;  IF BOOLEAN(STR[I,4]) THEN STR[I,4]←1;                00547000
        IF NXT.[42:6]≠0 THEN GO TO L8;                                  00548000
        IF SCAN(0) THEN GO TO LL;                                       00549000
        IOCVRT(ACT[6],EV[0],3,IF NCR>8 THEN 8 ELSE NCR,1);              00550000
        ACT[6]←-ACT[6];                                                 00551000
L8:     IF NXT≠4&"+"[36:42:6] THEN GO TO LL;                            00552000
        IF SCAN(1) THEN GO TO LL;                                       00553000
        IF NXT.[42:6]≠0 THEN GO TO LL;                                  00554000
        IF SCAN(0) THEN GO TO LL;                                       00555000
        IOCVRT(ACT[7],EV[0],3,IF NCR>8 THEN 8 ELSE NCR,1);              00556000
COMMENT RESTORE THE ORIGINAL SCAN AND READ THE NEXT PATCH CARD;         00557000
LL:     DFINE    ←BOOLEAN(STR[I,1]);                                    00558000
        GENERATE←BOOLEAN(STR[I,2]);                                     00559000
        NEWCARD ←BOOLEAN(STR[I,3]);                                     00560000
        RESQ    ←BOOLEAN(STR[I,4]);                                     00561000
        NCD←STR[I, 6];                                                  00562000
```

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                    CCO←STR[I, 7];                                          00563000
                    NCO←STR[I, 8];                                          00564000
                    NCR←STR[I, 9];                                          00565000
                    NXT←STR[I,10];                                          00566000
                    FST←STR[I,11];                                          00567000
                    LST←STR[I,12];                                          00568000
                    BBK←BOOLEAN(STR[I,13]);                                 00569000
                    NCE←STR[I,14];                                          00570000
                    TRNSFWDS(EV[0],STR[I,17],17);                           00571000
                    TRNSFWDS(EV[19],STR[I,36],1);                           00572000
                    READ(PACH[NO])[L9];                                     00573000
                    TRNSFWDS(PNO,PACH(9),1);  GO TO LE;                     00574000
      L9:           PNO←A89;                                                00575000
      LE:  END      DOLLARCARD;                                             00576000
REAL                I;                                                      00577000
LABEL               L0,L1,L2,L23,L3,L4,LE;                                  00578000
  L0:               IF I←COMPAREA(PNO,CNO,0,0,8)<0 THEN                     00579000
                    IF COMPAREA(PNO,A89,0,0,8)=0 THEN GO TO L23 ELSE        00580000
  L1:               BEGIN  % READ FROM THE PATCH DECK.                      00581000
                      READ(PACH,9,CV[*]);  CV[9]←INV&4[45:45:3];            00582000
                      TRNSFWDS(CV[11],PNO,1);                               00583000
                      IF DOLLARSIGN(CST) THEN  % CHECK FOR $-CARD.          00584000
                      BEGIN DOLLARCARD; GO TO L0 END;                       00585000
                      READ(PACH[NO])[L2];                                   00586000
                      TRNSFWDS(PNO,PACH(9),1);  GO TO LE;                   00587000
  L2:                 PNO←A89;  GO TO LE;                                   00588000
                    END;                                                    00589000
                    IF I=0 THEN                                             00590000
                    IF COMPAREA(CNO,A89,0,0,8)=0 THEN                       00591000
  L23:              BEGIN  % END OF BOTH FILES.                             00592000
                      CLOSE(CARD,RELEASE);  CLOSE(PACH,RELEASE);            00593000
                      INPUT←TRUE;  GO TO LE;                                00594000
                    END ELSE                                                00595000
                    BEGIN  % REPLACEMENT FROM PATCH DECK.                   00596000
                      READ(CARD);  READ(CARD[NO])[L3];                      00597000
                      TRNSFWDS(CNO,CARD(9),1);  GO TO L1;                   00598000
  L3:                 CNO←A89;  GO TO L1;                                   00599000
                    END;                                                    00600000
                    % READ FROM THE SYMBOLIC FILE.                          00601000
                    READ(CARD,9,CV[*]);  CV[9]←INV;                         00602000
                    TRNSFWDS(CV[11],CNO,1);                                 00603000
                    READ(CARD[NO])[L4];                                     00604000
                    TRNSFWDS(CNO,CARD(9),1);  GO TO LE;                     00605000
  L4:               CNO←A89;                                                00606000
  LE:  END          INPUT;                                                  00607000
PROCEDURE           OUTPUT(A);                                              00608000
COMMENT .....................................................................00609000
:  THIS PROCEDURE TAKES CARE OF EDITING AND OUTPUT A CARD IMAGE OF ANY :00610000
:KIND, NEW, OLD, OR OLD DELETED.                                          :00611000
:                          --------  J. C. PAD   04/28/68  --------      :00612000
:.....................................................................;00613000
    ARRAY           A[0];                                                   00614000
                BEGIN                                                       00615000
STREAM PROCEDURE    PRNTEDT(P,C);                                           00616000
                BEGIN                                                       00617000
      LABEL         L1;                                                     00618000
                    DI←P; SI←C; DS←9 WDS; DS←8 LIT"     ";                  00619000
                    SI←SI+7; SKIP 5 SB;                                     00620000
                    IF SB THEN                                              00621000
                    BEGIN DS←8 LIT" DELETED"; SI←SI-1 END ELSE              00622000
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                    BEGIN DS←8 CHR; SI←SI-9 END;                                    00623000
                    SKIP 3 SB;  DS←LIT" ";                                          00624000
                    IF SB THEN DS←LIT"R" ELSE                                       00625000
                    BEGIN  SKIP SB;                                                 00626000
                      IF SB THEN                                                    00627000
                      BEGIN                                                         00628000
                        DS←11 LIT" GENERATED"; SI←SI-2; GO TO L1;                   00629000
                      END ELSE DS←LIT"T";                                           00630000
                    END;  DS←2 LIT"  "; SI←SI+8; DS←8 CHR; SI←SI-18;                00631000
          L1:       DS←4 LIT"    ";                                                00632000
                    IF SC="1" THEN 8(DS←2 RESET; DS←2 SET; DS←2 RESET)              00633000
                    ELSE DS←8 LIT"    "; DS←8 LIT"    ";                            00634000
                END PRNTEDT;                                                        00635000
          INTEGER   P,T;                                                            00636000
          LABEL     L1,L2,LE;                                                       00637000
                    IF BOOLEAN(A[9]) THEN                                           00638000
                    BEGIN  % DELETED CARD IMAGE.                                    00639000
                      ND←ND+1;  % DELETED CARD COUNT.                               00640000
                      IF LSTD THEN GO TO L1;                                        00641000
                      IF A[9].[36:6]≠0 THEN                                         00642000
          L1:         BEGIN                                                         00643000
                        IF FRSTPRNT THEN                                            00644000
                        BEGIN  FRSTPRNT←FALSE;                                      00645000
                          IF (T←T1 DIV 3600)<12 THEN P←"A" ELSE                     00646000
                          BEGIN IF T>12 THEN T←T-12; P←"P" END;                     00647000
                          WRITE(FOU[DBL],HDNG,TO.[6:24],TO.[42:6],                  00648000
                                TO.[30:12],T,(T1 MOD 3600) DIV 60,P);               00649000
                        END;                                                        00650000
                        PRNTEDT(FOU(0),A[0]);  RELEASE(FOU);                        00651000
                      END;                                                          00652000
                      GO TO LE;                                                     00653000
                    END;                                                            00654000
                    IF RESQ THEN                                                    00655000
                    BEGIN NNO←NNO+INC; IOCVRT(A[10],NNO,0,8,0) END;                 00656000
                    IF BOOLEAN(A[9].[45:2]) THEN                                    00657000
                    BEGIN  % GENERATED CARD IMAGE.                                  00658000
                      NN←NN+1;  % NEW GENERATED CARD COUNT.                         00659000
                      IF A[9].[36:6]≠0 THEN                                         00660000
                      BEGIN  NE←NE+1;  % ERROR COUNT.                               00661000
                        GO TO L2;                                                   00662000
                      END ELSE                                                      00663000
                      IF LSTN THEN GO TO L2;                                        00664000
                    END ELSE                                                        00665000
                    BEGIN  % OLD RETAINED CARD IMAGE.                               00666000
                      NR←NR+1;  % OLD RETAINED CARD COUNT.                          00667000
                      IF NOT RESQ THEN TRNSFWDS(A[10],A[11],1);                     00668000
                      IF A[9].[36:6]≠0 THEN                                         00669000
                      BEGIN  NE←NE+1;  % ERROR COUNT.                               00670000
          L2:           IF FRSTPRNT THEN                                          00671000
                        BEGIN  FRSTPRNT←FALSE;                                      00672000
                          IF (T←T1 DIV 3600)<12 THEN P←"A" ELSE                     00673000
                          BEGIN IF T>12 THEN T←T-12; P←"P" END;                     00674000
                          WRITE(FOU[DBL],HDNG,TO.[6:24],TO.[42:6],                  00675000
                                TO.[30:12],T,(T1 MOD 3600) DIV 60,P);               00676000
                        END;                                                        00677000
                        PRNTEDT(FOU(0),A[0]);  RELEASE(FOU);                        00678000
                      END ELSE                                                      00679000
                      IF LSTO THEN GO TO L2;                                        00680000
                    END;                                                            00681000
                    IF NEWTP THEN                                                   00682000
```

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                    BEGIN  NEWTPED←TRUE;                                    00683000
                      TRNSFWDS(A[9],A[10],1);  WRITE(NTP,10,A[*]);          00684000
                    END;                                                    00685000
                    IF PNCH THEN                                            00685100
                    BEGIN  PNCHED←TRUE;                                     00685200
                      IF NEWTP THEN ELSE TRNSFWDS(A[9],A[10],1);            00685300
                      WRITE(PUNCH,10,A[*]);                                 00685400
                    END;                                                    00685500
            LE:  END  OUTPUT;                                               00686000
      PROCEDURE       OUTPUTNEW(CN);                                        00687000
      COMMENT ..................................................            00688000
      :    THIS PROCEDURE OUTPUTS THE GENERATED CARD IMAGES FROM CB[*,*] UP  :00689000
      :TO THE IMAGE WHICH HAS THE CARD INDEX NUMBER "CN".                    :00690000
      :                        -------- J. C. PAO   04/28/68 --------       :00691000
      :.....................................................................:00692000
          VALUE       CN;                                                   00693000
          REAL        CN;                                                   00694000
                BEGIN                                                       00695000
            REAL      I,J,N,S,X;                                            00696000
            LABEL     L1,L2,L3,L4,L5,LE;                                    00697000
                      IF CBX<0 THEN GO TO LE;                               00698000
                      IF (N←CB[I←J←0,11])>CN THEN GO TO LE;                 00699000
                      IF NOT RESQ THEN IOCVRT(S,CB[I,10],0,8,1);  GO TO L1; 00700000
                      DO BEGIN                                              00701000
                        IF CB[I,11]≠N THEN                                  00702000
                        BEGIN                                               00703000
                          IF NOT RESQ THEN IOCVRT(X,CB[I,10],0,8,1);        00704000
                          GO TO IF I=J+REAL(SQ1ST)=1 THEN L2 ELSE L4;       00705000
                        END;                                                00706000
                L1:   END UNTIL (I←I+1)>CBX;                                00707000
                      IF I=J+REAL(SQ1ST)=1 THEN                             00708000
                L2:   BEGIN N←0; GO TO L5 END;                              00709000
                      IF NEWCARD THEN IOCVRT(X,CV[11],0,8,1) ELSE           00710000
                      IF N←COMPAREA(PNO,CNO,0,0,8)<0 THEN GO TO L3 ELSE     00711000
                      IF N>0 THEN IOCVRT(X,CNO,0,8,1) ELSE                  00712000
                      IF COMPAREA(PNO,A89,0,0,8)≠0 THEN                     00713000
                L3:   IOCVRT(X,PNO,0,8,1) ELSE X←EITNINES;                  00714000
                L4:   N←(X-S) DIV (I-J+REAL(SQ1ST));                       00715000
                      IF SQ1ST THEN SQ1ST←FALSE ELSE GO TO L5;              00716000
                      DO BEGIN                                              00717000
                        IF NOT RESQ THEN                                    00718000
                        IF N>0 THEN                                         00719000
                        BEGIN S←S+N; IOCVRT(CB[J,10],S,0,8,0) END;          00720000
                L5:     OUTPUT(CB[J,*]);                                    00721000
                      END UNTIL (J←J+1)≥I;                                  00722000
                      IF I>CBX THEN CBX←-1 ELSE                             00723000
                      IF N←CB[I,11]≤CN THEN                                 00724000
                      BEGIN IF NOT RESQ THEN S←X; GO TO L1 END ELSE         00725000
                      BEGIN  J←-1;                                          00726000
                        DO TRNSFWDS(CB[J←J+1,0],CB[I,0],12)                 00727000
                        UNTIL (I←I+1)>CBX;  CBX←J;                          00728000
                      END;                                                  00729000
                LE:   IF DOLLAR≤CN THEN                                     00730000
                      BEGIN  % DOLLAR CARD STARTS FUNCTIONING.              00731000
                        LSTO←BOOLEAN(ACT[1]);                               00732000
                        LSTN←BOOLEAN(ACT[2]);                               00733000
                        LSTD←BOOLEAN(ACT[3]);                               00734000
                        PNCH←(NEWTP←BOOLEAN(ACT[4])).[46:1];                00735000
                        IF RESQ←BOOLEAN(ACT[5]) THEN                        00736000
                        BEGIN  INC←ACT[7];                                  00737000
```

```
                    NNO←IF BOOLEAN(ACT[6].[1:1]) THEN -ACT[6]-INC                00738000
                        ELSE ACT[6];                                             00739000
                  END;                                                           00740000
                  DOLLAR←BLK;                                                    00741000
                END;                                                             00742000
            END  OUTPUTNEW;                                                      00743000
PROCEDURE        STARTGEN;                                                       00744000
COMMENT ..........................................................................00745000
:    THIS PROCEDURE STARTS THE GENERATING PROCESS ON THE CARD "NCO" AT :00746000
:THE ADDRESS "CCO".  THE GENERATING PROCESS WILL BE TERMINATED IN THE  :00747000
:SCAN-PROCEDURE AT THE END OF THE CARD, IF NOTHING IS CONTINUED TO THE :00748000
:THE NEXT CARD.                                                        :00749000
:                          -------  J. C. PAO   04/11/68  -------      :00750000
:..........................................................................;00751000
          BEGIN                                                              00752000
    REAL        I;                                                           00753000
    LABEL       L1,LE;                                                       00754000
                IF OUTN≥NCO THEN GO TO LE;  % IT SHOULD NEVER HAPPEN.        00755000
                IF NCO=NCD-2 THEN                                            00756000
                BEGIN  PPC[9].[47:1]←1;  PC[9].[47:1]←1;                     00757000
                  CI[11]←NCD-2;                                              00758000
                  TRNSFWDS(A[0],CV[0],12);                                   00759000
                  TRNSFWDS(CV[0],PPC[0],12);  GO TO L1;                      00760000
                END ELSE                                                     00761000
                IF NCO=NCD-1 THEN                                            00762000
                BEGIN  PC[9].[47:1]←1;  CI[11]←NCD-1;                        00763000
                  TRNSFWDS(A[0],CV[0],12);                                   00764000
                  TRNSFWDS(CV[0],PC[0],12);                                  00765000
        L1:       IC←IST;                                                    00766000
                  CHRTRNSF(IC,CS],I←(CCO.[33:15]-CST)×8+CCO.[30:3]);          00767000
                  CI[9]←2&CV[9][36:36:6];                                    00768000
                  IF REAL(RESQ)≠1 THEN TRNSFWDS(CI[10],CV[11],1);            00769000
                  TRNSFWDS(CV[0],A[0],12);                                   00770000
                  IF NOT NEWCARD THEN CV[9].[47:1]←1;                        00771000
                END ELSE                                                     00772000
                BEGIN  CV[9].[47:1]←1;  IC←IST;  CI[11]←NCD;                 00773000
                  CHRTRNSF(IC,CST,I←(CCO.[33:15]-CST)×8+CCO.[30:3]);         00774000
                  CI[9]←2&CV[9][36:36:6];                                    00775000
                  IF REAL(RESQ)≠1 THEN TRNSFWDS(CI[10],CV[11],1);            00776000
                END;                                                         00777000
                LST←4;  AVC←72-I;  CIVALID←TRUE;                             00778000
                GENERATE←TRUE;                                               00779000
          LE:  END  STARTGEN;                                                00780000
PROCEDURE        EDITING(OP,NC);                                             00781000
COMMENT ..........................................................................00782000
:  THIS PROCEDURE DOES EDITING JOB INTO THE GENERATED CARD IMAGE,  "OP":00783000
:INDICATES THE TYPE OF EDITING OPERATIONS:                             :00784000
:  OP=0: SET "NC" NUMBER OF BLANKS.                                    :00785000
:  OP=1: TRANSFER "NC" NUMBER OF CHARACTERS.                           :00786000
:  OP=2: MAKE A STRING WHICH HAS "NC" NUMBER OF CHARACTERS EXCLUDING   :00787000
:        BOTH QUOTATIONS.                                              :00788000
:                          -------  J. C. PAO   03/27/68  -------      :00789000
:..........................................................................;00790000
    VALUE           OP,NC;                                                   00791000
    REAL            OP,NC;                                                   00792000
              BEGIN                                                          00793000
STREAM PROCEDURE    EDT(T,F,LST,OP,NC);                                      00794000
    VALUE           F,OP,NC;                                                 00795000
              BEGIN                                                          00796000
      LOCAL         I;                                                       00797000
```

```
                LABEL   L1;                                                     00798000
                        SI←T; DI←LOC I; DS←WDS; DI←I;                           00799000
                        SI←LOC OP; SKIP SB;                                     00800000
                        IF SB THEN DS←LIT" ";  SI←SI+6;                         00801000
                        IF SC="1" THEN                                          00802000
                        BEGIN  % TRANSFER CHARACTERS.                           00803000
                          SI←F; DS←NC CHR; NC←DI;                               00804000
                          DI←LST; DS←7 LIT"0000";                               00805000
                          SI←NC; SI←SI-1;                                       00806000
                          IF SC>"9" THEN DS←LIT"4" ELSE                         00807000
                          IF SC≥"0" THEN DS←LIT"0" ELSE                         00808000
                          IF SC=ALPHA THEN DS←LIT"2" ELSE DS←LIT"4";            00809000
                        END ELSE                                                00810000
                        IF SC="0" THEN                                          00811000
                        BEGIN  % SET BLANKS.                                    00812000
                          NC(DS←LIT" ");  SI←LOC NC; SI←SI+6;                   00813000
                          IF SC≠"0" THEN                                        00814000
                          BEGIN  I←DI;  DI←LOC F; DI←DI+7; DS←CHR;              00815000
                            DI←I;  F(2(DS←32 LIT"    "));                       00816000
                          END;  GO TO L1;                                       00817000
                        END ELSE                                                00818000
                        BEGIN  % TRANSFER A STRING.                             00819000
                          DS←LIT"'"; SI←F; DS←NC CHR; DS←LIT"'";                00820000
                    L1:   NC←DI;  DI←LST; DS←7 LIT"0000"; DS←LIT"4";            00821000
                        END;                                                    00822000
                        SI←LOC NC; DI←T; DS←WDS;                                00823000
                END     EDT;                                                    00824000
                REAL    A;                                                      00825000
                BOOLEAN B;                                                      00826000
                LABEL   L1,LE;                                                  00827000
                        IF NC=0 THEN                                            00828000
                        IF OP≠0 THEN GO TO LE;                                  00829000
                        IF (IF CIVALID THEN AVC ELSE AVC←72-BB)<(A←             00830000
                        IF OP=0 THEN NC ELSE                                    00831000
                        (IF OP=2 THEN NC+2 ELSE NC)+REAL(B←LST≠4 AND FST≠4))    00832000
                        THEN                                                    00833000
                        BEGIN  % ITEM CAN NOT BE HELD ON THIS CARD.             00834000
                          IF CIVALID THEN  % OUTPUT THE VALID CARD FIRST.       00835000
                          BEGIN                                                 00836000
                          IF AVC>0 THEN EDT(IC,0,LST,0,AVC);  AVC←72-BB;        00837000
                            TRNSFWDS(CB[CBX←CBX+1,0],CI[0],12);                 00838000
                          END;  GO TO L1;                                       00839000
                        END ELSE                                                00840000
                        IF NOT CIVALID THEN                                     00841000
                    L1: BEGIN  IC←IST;                                          00842000
                          IF BB≠0 THEN                                          00843000
                          IF BB+NC≤72 THEN                                      00844000
                          BEGIN  EDT(IC,0,LST,0,BB);                            00845000
                            IF B THEN                                           00846000
                            BEGIN B←FALSE; A←IF OP=2 THEN NC+2 ELSE NC END;     00847000
                          END ELSE AVC←72;  CI[9]←2;                            00848000
                        END;                                                    00849000
                        IF BOOLEAN(EV[0].[1:1]) THEN CI[9].[36:6]←1;            00850000
                        IF CI[11]≠NCE THEN                                      00851000
                        BEGIN  CI[11]←NCE;                                      00852000
                          IF REAL(RESW)≠1 THEN TRNSFWDS(CI[10],END,1);          00853000
                        END;                                                    00854000
                        IF A≠0 THEN EDT(IC,EST,LST,IF B THEN -OP ELSE OP,NC);   00855000
                        IF (AVC←AVC-A)≠0 THEN CIVALID←TRUE ELSE                 00856000
                        IF OP=0 THEN                                            00857000
```

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                    BEGIN  % END OF THE CARD, GO TO CB[*,*].                  00858000
                      TRNSFWDS(CB[CBX←CBX+1,0],CI[0],12);                    00859000
                      CIVALID←FALSE;                                         00860000
                    END ELSE CIVALID←TRUE;                                   00861000
              LE:   END  EDITING;                                            00862000
PROCEDURE                ERREDT(NC);                                         00863000
      VALUE              NC;                                                 00864000
      REAL               NC;                                                 00865000
                BEGIN                                                        00866000
        INTEGER          A,B;                                                00867000
        LABEL            L1;                                                 00868000
                         B←BB; BB←0; GO TO L1;                               00869000
                         DO BEGIN  FST←4;                                    00870000
                           TRNSFCHR(EV[0],EV[IF A≥5 THEN (A-5).[39:6]+1ELSE 0]00871000
                             ,3,IF A≥5 THEN (A-5).[45:3] ELSE A+3,NC←NC-A);  00872000
          L1:              IF CIVALID THEN                                   00873000
                           IF AVC=0 THEN EDITING(0,0);                       00874000
                           IF (A←IF NC≥(IF CIVALID THEN AVC ELSE AVC←72)     00875000
                              THEN AVC ELSE NC)>63 THEN A←63;                00876000
                           EDITING(1,A);                                     00877000
                         END UNTIL NC=A;  BB←B;                              00878000
                END  ERREDT;                                                 00879000
INTEGER STREAM PROCEDURE  LEADING0(A,NC);                                    00880000
      VALUE              NC;                                                 00881000
                BEGIN                                                        00882000
        LABEL            L1,LE;                                              00883000
                         SI←A; SI←SI+3;  TALLY←NC;                           00884000
                         IF SC≠"0" THEN BEGIN LEADING0←TALLY; GO TO LE END;  00885000
                         A←SI;                                               00886000
                         NC←IF SC≠"0" THEN JUMP OUT 1 TO L1 ELSE             00887000
                            BEGIN SI←SI+1; TALLY←TALLY+63 END);              00888000
                         TALLY←1; LEADING0←TALLY;  DI←A; DS←LIT"0"; GO TO LE; 00889000
          L1:            LEADING0←TALLY;  DI←A; DS←LEADING0 CHR;             00890000
          LE:   END      LEADING0;                                           00891000
BOOLEAN PROCEDURE        SCAN(TYP);                                          00892000
COMMENT ..................................................................   00893000
;  PROCEDURE SCAN DOES THE SCANNING WORK ON AN INPUT CARD FILE.  IT          ;00894000
;SCANS DEFFERENT TYPES OF INFORMATION ACCORDING TO THE VALUE OF "TYP"        ;00895000
;WHICH IS THE ONLY FORMAL PARAMETER PASSED TO THE PROCEDURE.  IT ALSO        ;00896000
;SKIPS BLANKS AND TELLS THE NEXT CARACTER IN THE INPUT STRING.  THE          ;00897000
;CONTINUITY OF COLUMN 72 ON A CARD AND COLUMN 1 ON THE NEXT IS ALSO          ;00898000
;TAKEN INTO CONSIDERATION.                                                   ;00899000
;      TYP=0:  SCAN FOR A STRING OF DIGITS.                                  ;00900000
;      TYP=1:  PICK UP THE FIRST CHR WHICH MUST NOT BE AN INVALID CHR.       ;00901000
;      TYP=2:  SCAN FOR A STRING OF LETTERS.                                 ;00902000
;      TYP=3:  SKIP BLANKS UNTIL A VALID CHR ENCOUNTERED.                    ;00903000
;      TYP=4:  SKIP UNTIL A CHR WHICH EQUALS TO TYP.[36:6] WHICH MAY BE      ;00904000
;              AN INVALID CHARACTER.                                         ;00905000
;      TYP=5:  SCAN FOR A STRING OF COMBINATION OF LETTERS AND DIGITS.       ;00906000
;      TYP=6:  PICK UP CHRS UNTIL A """ ENCOUNTERED, THEN SKIP THIS """.     ;00907000
;              REST PROCESS IS SAME AS TYP=3.                                ;00908000
;      TYP=7:  SEE THE NEXT CHARACTER.                                       ;00909000
;    BESIDES "TYP", SEVERAL OUTSIDE PARAMETERS ARE ALSO CONCERNED IN         ;00910000
;THIS PROCEDURE.                                                            ;00911000
;      CARD :  THE CARD FILE WHICH SUPPLIES THE INPUT CARDS.                 ;00912000
;      CV[*]:  A SAVE ARRAY WHICH IS USED AS THE CARD BUFFER.  THE 1ST       ;00913000
;              CHARACTER OF CV[9] MUST BE AN INVALID CHARACTER.              ;00914000
;      CST  :  THE ADDRESS OF CV[0] EXPRSSED AS AN OPERAND.                  ;00915000
;      CED  :  THE ADDRESS OF CV[9] EXPRSSED AS AN OPERAND.                  ;00916000
;      EST  :  THE STARTING ADDRESS WHERE THE SCANNED INFORMATION GOES.      ;00917000
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:              IT IS ALSO EXPRESSED AS AN OPERAND.                                  :00918000
:     EET   :  SAME AS "EST" EXCEPT WHEN THE SCANNING IS IN COORPARATION            :00919000
:              WITH A "STRING" (SEE ALSO PROCEDURE "STRING").                       :00920000
:     CC    :  THE CURRENT ADDRESS WHERE THE SCANNING SHOULD START.                 :00921000
:              AFTER TH SCANNING, IT IS MODIFIED SO THAT IT POINTS TO               :00922000
:              THE NEXT VISIBLE CHARACTER.                                          :00923000
:     NCR   :  NO. OF CHARACTERS SCANNED.                                           :00924000
:     NXT   :  TWO FIELDS TO COMMUNICATE OUTSIDE:                                   :00925000
:              NXT.[36:6]:  THE NEXT VISIBLE CHR AFTER SCANNING.                    :00926000
:              NXT.[42:6]:  THE CHR-CODE OF THE NEXT CHR,                           :00927000
:                  0: DIGIT,  2: LETTER,  4: SPECIAL CHR,                           :00928000
:                  1 OR 3: INVALID CHR, THIS IS END-OF-FILE CODE.                   :00929000
:     I,J,K:   THESE ARE USED AS SCRATCH PARAMETERS.                                :00930000
:  VALUE OF RESULT:                                                                 :00931000
:     BIT 47:  INDICATION OF ERRORS (SEE FOLLOWING),                                :00932000
:     BIT 46:  AN INVALID CHARACTER ENCOUNTERED (BIT 47 ON).                        :00933000
:     BIT 45:  NUMBER OF CHARACTERS SCANNED MORE THAN 63 (BIT 47 ON).               :00934000
:                        -------- J. C. PAD   06/10/67 --------                    :00935000
:.....:00936000
      VALUE          TYP;                                                         00937000
      INTEGER        TYP;                                                         00938000
             BEGIN                                                                00939000
REAL STREAM PROCEDURE  SCANNING(D,S,BK,TY);                                       00940000
      VALUE          TY;                                                          00941000
             BEGIN                                                                00942000
        LOCAL        T,B;                                                         00943000
        LABEL        DIGITS,SNGLCHR,LETTERS,DEBLANK,IDENTFR,CHARACTER;            00944000
        LABEL        COMENT,CHRCTR,CONTINUE,NEXT,DBK,RESULT;                      00945000
                     SI←D; DI←LOC SCANNING; DS←WDS;                               00946000
                     SI←S; DI←LOC T; DS←WDS;                                      00947000
                     DI←SCANNING;  SI←T;                                          00948000
                     CI←CI+TY;  % BRANCH ACCORDING TO VALUE OF TY.                00949000
                     GO TO DIGITS;   % TY=0,                                      00950000
                     GO TO SNGLCHR;  % TY=1,                                      00951000
                     GO TO LETTERS;  % TY=2,                                      00952000
                     GO TO DEBLANK;  % TY=3,                                      00953000
                     GO TO CHARACTER;% TY=4,                                      00954000
                     GO TO IDENTFR;  % TY=5,                                      00955000
                     GO TO COMENT;   % TY=6, ELSE (TY=7) SEE NEXT CHR.           00956000
                     IF SC>"9" THEN GO TO CONTINUE;                               00957000
                     GO TO NEXT;                                                  00958000
        COMENT:      IF SC>"9" THEN GO TO CONTINUE;                               00959000
                     IF SC≠"'" THEN BEGIN DS←CHR; GO TO COMENT END;               00960000
                     SI←SI+1; GO TO DEBLANK;                                      00961000
        CHARACTER:   BI←LOC TY;  DI←DI+6;                                         00962000
        CHRCTR:      IF SC≠DC THEN                                                00963000
                     BEGIN  SI←SI-1; DI←DI-1;                                     00964000
                       IF SC>"9" THEN GO TO CONTINUE;                             00965000
                       SI←SI+1; GO TO CHRCTR;                                     00966000
                     END;  DI←SCANNING;                                           00967000
                     GO TO DEBLANK;                                               00968000
        IDENTFR:     IF SC>"9" THEN GO TO CONTINUE;                               00969000
                     IF SC=ALPHA THEN                                             00970000
                     BEGIN DS←CHR; GO TO IDENTFR END ELSE                         00971000
                     GO TO DEBLANK;                                               00972000
        LETTERS:     IF SC>"9" THEN GO TO CONTINUE;                               00973000
                     IF SC≥"0" THEN GO TO DEBLANK;                                00974000
                     IF SC=ALPHA THEN                                             00975000
                     BEGIN DS←CHR; GO TO LETTERS END ELSE                         00976000
                     GO TO DEBLANK;                                               00977000
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DIGITS:   IF SC>"9" THEN                                                00978000
CONTINUE: BEGIN TALLY←3; GO TO RESULT END;                              00979000
          IF SC≥"0" THEN                                                00980000
          BEGIN DS←CHR; GO TO DIGITS END ELSE                           00981000
          GO TO DEBLANK;                                                00982000
SNGLCHR:  IF SC>"9" THEN GO TO CONTINUE;                                00983000
          DS←CHR;                                                       00984000
DEBLANK:  IF SC=" " THEN                                                00985000
          BEGIN  TALLY←1; B←TALLY;                                      00986000
DBK:        SI←SI+1;                                                    00987000
            IF SC=" " THEN GO TO DBK;                                   00988000
          END;                                                          00989000
          IF SC>"9" THEN TALLY←1 ELSE                                   00990000
NEXT:     IF SC≥"0" THEN TALLY←0 ELSE                                   00991000
          IF SC=ALPHA THEN TALLY←2 ELSE TALLY←4;                        00992000
RESULT:   SCANNING←DI;  T←SI;                                           00993000
          DI←D; SI←LOC SCANNING; DS←WDS;  % UPDATE DI.                  00994000
          SCANNING←TALLY;  SI←T;                                        00995000
          DI←LOC SCANNING; DI←DI+6; DS←CHR;  % NEXT CHR.                00996000
          DI←S; SI←LOC T; DS←WDS;  % UPDATE SI.                         00997000
          SI←LOC B;  SI←SI+7;                                           00998000
          IF SC≠"0" THEN                                                00999000
          BEGIN DI←BK; SI←LOC B; DS←WDS END;                            01000000
      END SCANNING;                                                     01001000
STREAM PROCEDURE  INVLID(A);                                            01002000
      BEGIN                                                             01003000
LOCAL     T;                                                            01004000
          SI←A; DI←LOC T; DS←WDS;                                       01005000
          DI←T;  DS←2 RESET; DS←2 SET; DS←2 RESET;  T←DI;               01006000
          SI←LOC T; DI←A; DS←WDS;                                       01007000
      END INVLID;                                                       01008000
  INTEGER I,J,K;                                                        01009000
     REAL   P;                                                          01009100
  BOOLEAN BC;       % ITEM SCANNED CONTINUED TO THE NEXT CARD.         01010000
  BOOLEAN BR;       % SCRATCH BOOLEAN.                                 01011000
    LABEL L00,L0,L01,L1,L2,L3,L4,L5,L6,LE;                              01012000
COMMENT  IF THE CURRENT SCANNING STARTS AT A NEW CARD, AND IF IT IS NOT 01013000
         DURING PROCESS OF A "DEFINE", OUTPUT ALL THE ORIGINAL SYMBOLIC 01014000
         AND NEW GENERATED CARDS, AND TERMINATES THE GENERATING PROCESS;01015000
          IF NEWCARD THEN  % END OF LAST CARD.                          01016000
          BEGIN  NEWCD←BOOLEAN(1&BB[36:39:9]);                          01017000
            BB←BBB;  % NO. OF LEADING BLANKS ON THE NEW CARD.           01018000
            IF GENERATE THEN  % DURING GENERATING PROCESS.              01019000
            BEGIN  % TERMINATE GENERATING AT THE END OF A CARD.         01020000
              IF CIVALID THEN EDITING(0,AVC);  GENERATE←FALSE;          01021000
            END;                                                        01022000
            IF OUTN<NCD-2 THEN                                          01023000
            BEGIN  OUTPUT(PPC);  OUTN←OUTN+1;                           01024000
              OUTPUTNEW(NCD-2);  GO TO L00;                             01025000
            END;                                                        01026000
            IF OUTN=NCD-2 THEN                                          01027000
L00:        BEGIN  OUTPUT(PC);  OUTN←OUTN+1;                            01028000
              OUTPUTNEW(NCD-1);                                         01029000
            END;  NEWCARD←FALSE;                                        01030000
          END ELSE NEWCD←FALSE;                                         01031000
COMMENT  PREPARING FOR SCANNING;                                        01032000
          IF (I←J←EET)≠EST THEN                                         01033000
          BEGIN NCR←1; EV[0]←BLK&""[18:42:6] END ELSE                   01034000
          BEGIN NCR←0; EV[0]←BLK END;                                   01035000
          % WHEN EET≠EST SEE PROCEDURE "STRING".                        01036000
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                    IF TYP≠7 THEN                                          01037000
                    IF ERX≠0 THEN BEGIN EV[0].[1:1]←1; ERX←0 END;          01038000
                    K←3;  % A VALUE TO INDICATE THE STATUS IN SCANNING.    01039000
                          % K=0:  SCANNING COMPLETE, POINTER AT THE NEXT    01040000
                          %       VISIBLE CHARACTER.                       01041000
                          % K=1:  SCANNING COMPLETE, POINTER CAN NOT FIND   01042000
                          %       A VISIBLE CHARACTER ON THIS CARD.        01043000
                          % K=3:  SCANNING TO BE CONTINUED TO THE NEXT     01044000
                          %       CARD.                                    01045000
                    CCO←CC;  % ADDRESS THAT THE SCANNING STARTS.           01046000
                    NCO←NCE←NCD;  % CARD NO. THE SCANNING STARTS & ENDS.   01047000
                    IF DFINE THEN GO TO LO;                                01048000
                    IF REAL(RESQ)≠1 THEN TRNSFWDS(END,CV[11],1);           01049000
                    IF BBK THEN FST←LST←0 ELSE FST←4;                      01050000
                    BBK←FALSE;                                             01051000
          COMMENT   THE SCANNING IS PERFORMED IN THE STREAM PROCEDURE "SCANNING",  01052000
                    WHEN "BOOLEAN(K)" IS TRUE, READING THE NEXT CARD IS PERFORMED  01053000
                    IN THE PROCEDUR "INPUT" WHICH YEILDS A RESULT=VALUE OF TRUE IF 01054000
                    IT IS THE END OF THE "DEFINE" (WHEN DFINE=TRUE), OR THE END OF 01055000
                    THE SYMBOLIC FILE AND PATCH DECK (WHEN DFINE=FALSE);           01056000
                    LO:       WHILE BOOLEAN                                01057000
                    (K←(NXT←SCANNING(I,CC,BBK,IF K=3 THEN TYP ELSE 3))     01058000
                    .[45:3]) DO                                            01059000
                    BEGIN  % READ NEXT CARD IS NECESSARY.                  01060000
                      IF CC≠CED THEN  % INVALID CHR ON CARD.               01061000
                      BEGIN  CV[9].[36:6]←1;                               01062000
                        BR←BR OR BOOLEAN(5);                               01063000
                        IF TYP=7 THEN GO TO L5;                            01064000
                        CC←IF CC.[30:3]=7 THEN CC.[33:15]+1 ELSE           01065000
                          CC&(CC.[30:3]+1)[30:45:3];                       01066000
                      INVLID(I);                                           01067000
                      K←1;  EV[0].[1:1]←1;  GO TO LO;                      01068000
                    END;                                                   01069000
                    IF K=3 THEN                                            01070000
                    BEGIN  % INFORMATION TO BE CONTINUED TO NEXT CARD.     01071000
                      BC←TRUE;  % ITEM MAY BE CONTINUED TO NEXT CARD.      01072000
          L01:        IF NCR←NCR+                                          01073000
                      (I.[33:15]-J.[33:15])×8+I.[30:3]-J.[30:3]>63         01074000
                      THEN  % NO. OF CHR IN STRING GREATER THAN 63.        01075000
                      BEGIN  CV[9].[36:6]←1;  % MARK ERROR ON OLD CARD.    01076000
                        IF GENERATE THEN                                   01077000
                        BEGIN  % KEEP ON TRANSFERRING TO THE NEW CARD.     01078000
                          EV[0].[1:1]←1;  % SETTING ERROR IN EDITING.       01079000
                          IF BR.[44:1] THEN FST←4 ELSE                     01080000
                          IF TYP=6 THEN  % ADD OPENNING """ TO STRING.     01081000
                          BEGIN  I←EV[0];  EV[0]←0&"""[18:42:6];           01082000
                            ERREDT(1);  EV[0]←I;                           01083000
                          END;                                             01084000
                          ERREDT(NCR);                                     01085000
                        END;  NCR←0;  I←J←EST;                             01086000
                        BR←BR OR BOOLEAN(9);                               01087000
                      END;                                                 01088000
                      J←I;  % RETAIN DESTINATION ADDRESS.                  01089000
                    END ELSE                                               01090000
                    IF BC THEN                                             01091000
                    BEGIN                                                  01092000
                      BC←FALSE;                                            01093000
                      IF I=J THEN GO TO IF DFINE THEN L4 ELSE L1 ELSE      01094000
                      BEGIN  NCE←NCD;                                      01095000
                        IF REAL(RESQ)≠1 THEN TRNSFWDS(END,CV[11],1);       01096000
```

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                    GO TO L01;                                                  01097000
                  END;                                                          01098000
                END ELSE                                                        01099000
                IF NEWCARD THEN                                                 01100000
L1:             BEGIN NCD←NCD-1; BBK←TRUE; GO TO L4 END; %SKIP BLK.             01101000
                IF REAL(DFINE)>0 THEN GO TO L4;                                 01102000
                IF OUTN<NCD-2 THEN  % PPC[*] HAS VALID CARD IMAGE.              01103000
                BEGIN  OUTPUT(PPC); OUTN←OUTN+1;                                01104000
                  OUTPUTNEW(NCD-2); GO TO L2;                                   01105000
                END ELSE                                                        01106000
                IF OUTN=NCD-2 THEN  % PC[*] HAS VALID CARD IMAGE.               01107000
L2:             BEGIN  % MAKE PC[*] AVAILABLE FOR CV[*].                        01108000
                  IF NCO≤NCD-1 THEN TRNSFWDS(PPC[0],PC[0],12) ELSE              01109000
                  BEGIN  OUTPUT(PC); OUTN←OUTN+1;                               01110000
                    OUTPUTNEW(NCD-1);                                           01111000
                  END;  GO TO L3;                                               01112000
                END ELSE                                                        01113000
                IF OUTN=NCD-1 THEN  % CV[*] HAS VALID CARD IMAGE.               01114000
L3:             BEGIN  TRNSFWDS(PC[0],CV[0],12);                                01115000
                  IF NEWCARD THEN                                               01116000
                  IF GENERATE THEN PC[9].[47:1]←1;  % MARK DELETED.             01117000
                END;                                                            01118000
L4:             IF DFINE THEN                                                   01119000
                BEGIN  READ(DFSK[NCD←NCD+1],12,CV[*]);                          01120000
                  IF CV[9] .[36:6]≠0 THEN ERRDFN←1;                             01121000
                END ELSE                                                        01122000
                IF REAL(DFINE)=2 THEN GO TO L5 ELSE                             01123000
                BEGIN                                                           01124000
                  IF EOF←INPUT THEN  % READ NEXT INPUT CARD.                    01125000
                  GO TO L5;  NCD←NCD+1;                                         01126000
                  NEWCARD←TRUE  % REMEMBER A NEW CARD JUST READ.                01127000
                END;  CC←CST;  % SET SCAN POINTER AT BEGINNING.                 01128000
              END;  % END OF "WHILE-LOOP".                                      01129000
L5:           IF NEWCARD THEN BBB←(CC.[33:15]-CST)×8+CC.[30:3];                 01130000
              IF TYP=7 THEN GO TO LE;                                           01131000
              IF NOT DFINE THEN                                                 01132000
              IF BC THEN                                                        01133000
              IF I≠J THEN                                                       01134000
              IF NCO=NCD-1 THEN                                                 01135000
              BEGIN  % ITEM CONTINUED TO THIS CARD.                             01136000
                IF GENERATE THEN CV[9].[47:1]←1;                                01137000
                BBB←0;  NEWCARD←FALSE;  NCE←NCD;                                01138000
                IF REAL(RESQ)≠1 THEN TRNSFWDS(END,CV[11],1);                    01139000
              END;                                                              01140000
              IF NCR←NCR+                                                       01141000
              (I.[33:15]-J.[33:15])×8+1.[30:3]-J.[30:3]>63 THEN                 01142000
L6:           BEGIN  CV[9].[36:6]←1;  % CHRS IN ITEM > 63;                      01143000
                IF GENERATE THEN                                                01144000
                BEGIN                                                           01145000
                  EV[0].[1:1]←1;  % SETTING ERROR IN EDITING.                   01146000
                  IF BR.[44:1] THEN FST←4 ELSE                                  01147000
                  IF TYP=6 THEN  % ADD OPENNING """ TO THE STRING.              01148000
                  BEGIN  I←EV[0];  EV[0]←0&""""[18:42:6];                       01149000
                    ERREDT(1);  EV[0]←I;                                        01150000
                  END;                                                          01151000
                  ERREDT(NCR);                                                  01152000
                  IF TYP=6 THEN  % ADD CLOSING """ TO THE STRING.               01153000
                  BEGIN EV[0]←0&""""[18:42:6]; FST←4; ERREDT(1) END;            01154000
                END;                                                            01155000
                BR←BR OR BOOLEAN(9);                                            01156000
```

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                    END ELSE                                                    01157000
                    IF BR.[44:1] THEN GO TO L6 ELSE                             01158000
                    IF BR.[45:1] THEN                                           01159000
                    IF GENERATE THEN EDITING(1,NCR);                            01160000
          LE:       SCAN←BR;                                                    01161000
                    IF TYP = 5 THEN IF REAL(DFINE) = 0 THEN                     01161010
                    IF NOT XRESV THEN                                           01161015
                    IF NCR LEQ 7 THEN                                           01161020
                    BEGIN P←EV[0].[18:30]; J←0;                                 01161030
                          FOR I ← 0 STEP 2 UNTIL 9                              01161040
                          DO IF XALG[I] = P THEN                                01161050
                          BEGIN IF NCR LEQ 5 THEN J←I+10 ELSE                   01161060
                                IF COMPAREA(EV[1],XALG[I+1],0,0,NCR-5)=0        01161070
                                THEN J←I+10;                                    01161080
                          END;                                                  01161090
                          IF J GTR 0 THEN                                       01161100
                          BEGIN NCR ← NCR +1;                                   01161110
                                TRNSFCHR(EV[0],XALG[J],3,3,NCR);                01161120
                                IF NOT GENERATE THEN STARTGEN;                  01161130
                          END;                                                  01161140
                     END;                                                       01161150
                END  SCAN;                                                      01162000
REAL PROCEDURE      SCANNING;                                                   01163000
COMMENT ....................................................................    01164000
;    THIS PROCEDURE SCANS A WORD.  IF THE WORD IS A "DEFINE", SCANNING :01165000
:WILL AUTOMATICALLY BRANCH TO THE DEFINETO GET "NXT" AND DO                     01166000
:RETRY.  IF THE WORD IS A "COMMENT", THE COMMENT WILL BE SKIPPED AND    :01167000
:DOES THE RETRY AS THAT IN HANDLING THE DEFINE.                         :01168000
;    VALUE OF RESULT:                                                   :01169000
;      0:  A RESERVED WORD IS SCANNED.                                  :01170000
;      1:  THE WORD SCANNED HAS MORE THEN 63 CHRS OR AN INVALID CHR,    :01171000
;          THE WORD IS EDITED.                                          :01172000
;      2:  A DEFINE, BIT[29:13] CONTAINS THE INDEX OF INFO[*,*].        :01173000
;      4:  A SUBSCRIPTED IDENTIFIER.                                    :01174000
;      6:  A SIMPLE IDENTIFIER.                                         :01175000
;      8:  NOT FOUND IN INFO[*,*].  (IFX ALWAY SET TO BLK).             :01176000
;     10:  STREAM PROCEDURE OR A STREAM VALUE VARIABLE IF "STRM" IS ON.:01177000
;     12:  STREAM NAME VARIABLE.                                       :01178000
;     14:  STREAM VALUE VARIABLE ALSO IN LOCAL[*].                     :01179000
;     16:  STREAM NAME VARIABLE ALSO IN LOCAL[*].                      :01180000
;                        -------- J. C. PAO   04/23/68 --------       :01181000
;.....................................................................;01182000
                BEGIN                                                           01183000
          REAL        P,X,Y;                                                    01184000
          LABEL       LL,L0,L1,LE;                                              01185000
                      IF SCAN(5) THEN                                           01186000
                      BEGIN SCANNING←1; IFX←BLK; GO TO LE END;                  01187000
                      P←EV[0]&NCR[1:31:17];                                     01188000
                      IF (IFX←STKHD[P MOD 125])=0 THEN GO TO L0;                01189000
                      DO                                                        01190000
                      IF INFO[X←IFX.[35:5],Y←IFX.[40:8]]=P THEN                 01191000
                      BEGIN                                                     01192000
                        IF NCR≤5 THEN GO TO                                     01193000
                        IF IFX≥LFX THEN L1 ELSE IF IFX≤RFX THEN L1 ELSE LL;     01194000
                        IF COMPAREA(EV[1],INFO[X,Y+1],0,0,NCR-5)=0 THEN GO      01195000
                        IF IFX≥LFX THEN L1 ELSE IF IFX≤RFX THEN L1 ELSE LL;     01196000
            LL:       END UNTIL (IFX←INFO[X,Y-1].[12:13])=0;                    01197000
            L0:       IFX←BLK;  SCANNING←8;  GO TO LE;                          01198000
            L1:       IF BOOLEAN(X←(P←INFO[X,Y-1]).[1:3]) THEN                  01199000
                      IF X=1 THEN SCANNING←10 ELSE                              01200000
```

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                    IF STRM THEN SCANNING←9+X ELSE GO TO LO ELSE          01201000
                    IF X=0 THEN GO TO LE ELSE                             01202000
                    IF X=4 THEN SCANNING←2&(IFX←P.[40:8])[29:35:13] ELSE  01203000
                    IF STRM THEN GO TO LO ELSE                            01204000
                    IF (SCANNING←X)=2 THEN SCANNING←4;                    01205000
          LE:  END  SCANNING;                                             01206000
PROCEDURE           ERROR;                                                01207000
                BEGIN                                                     01208000
      LABEL         LE;                                                   01209000
                    IF DFINE THEN BEGIN ERRDFN←1; GO TO LE END;           01210000
                    EV[0].[1:1]←1;                                        01211000
                    IF NCO=NCD=2 THEN                                     01212000
                    BEGIN PPC[9].[36:6]←1; PC[9].[36:6]←1 END ELSE        01213000
                    IF NCO=NCD=1 THEN                                     01214000
                    BEGIN PC[9].[36:6]←1; CV[9].[36:6]←1 END ELSE         01215000
                    CV[9].[36:6]←1;                                       01216000
          LE:  END  ERROR;                                                01217000
PROCEDURE           DFINEIN(F);                                           01218000
COMMENT .....................................................................01219000
:     THIS PROCEDURE STORES UP ALL THE CONCERNED INFORMATION OF THE      :01220000
:CURRENT SCANNING AND READS "DFSK" FILE STARTS THE SCANNING OF THE       :01221000
: DEFINE.  "F" IS THE INFO-INDEX OF THE ADDITIONAL INFORMATION OF THE    :01222000
:DEFINE.                                                                 :01223000
:                          --------  J. C. PAO   05/04/68  --------      :01224000
:.....................................................................;   01225000
      VALUE         F;                                                    01226000
      REAL          F;                                                    01227000
                BEGIN                                                     01228000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU[NO],DBG,"DFN-IN",NXT,F,LDF);            01229000
                    STR[LDF←LDF+1,0]←0;                                   01230000
                    STR[LDF, 1]←REAL(DFINE);                              01231000
                    STR[LDF, 2]←REAL(GENERATE);                           01232000
                    STR[LDF, 3]←REAL(NEWCARD);                            01233000
                    STR[LDF, 4]←REAL(RESQ);                               01234000
                    STR[LDF, 5]←CC;                                       01235000
                    STR[LDF, 6]←NCD;                                      01236000
                    STR[LDF, 7]←CCO;                                      01237000
                    STR[LDF, 8]←NCO;                                      01238000
                    STR[LDF, 9]←NCR;                                      01239000
                    STR[LDF,10]←NXT;                                      01240000
                    STR[LDF,11]←FST;                                      01241000
                    STR[LDF,12]←LST;                                      01242000
                    STR[LDF,13]←REAL(BBK);                                01243000
                    STR[LDF,14]←NCE;                                      01244000
                    TRNSFWDS(STR[LDF,17],EV[0],20);                       01245000
                    TRNSFWDS(STR[LDF,37],CV[0],12);                       01246000
                    DFINE←RESQ←TRUE;  LST←4;                              01247000
                    GENERATE←NEWCARD←BBK←FALSE;                           01248000
                    READ(DFSK[NCD←F],12,CV[*]);  CC←CST;                  01249000
                    ERRDFN←CV[9].[36:6];  F←REAL(SCAN(3));                01250000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"      ","      ","      ",        01251000
"      ","AFTER:",NXT,LDF);                                               01252000
IF DEBUGN=3 THEN DUMPARRAY(CV,0,11,FOU,1,"CV[*]:",CC);                    01253000
                END DFINEIN;                                              01254000
PROCEDURE           DFINEOUT;                                             01255000
COMMENT .....................................................................01256000
:     THIS PROCEDURE RESTORES THE ORIGINAL SCANNING INFORMATION AND      :01257000
:CONTINUES THE ORIGINAL SCANNING.                                        :01258000
:                          --------  J. C. PAO   05/04/68  --------      :01259000
:.....................................................................;   01260000
```

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                BEGIN                                                                   01261000
        REAL            I;                                                              01262000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU[NO],DBG,"DFNOUT",NXT,STR[0,0],LDF);                   01263000
                        DFINE    ←BOOLEAN(STR[LDF,1]);                                  01264000
                        GENERATE←BOOLEAN(STR[LDF,2]);                                   01265000
                        NEWCARD ←BOOLEAN(STR[LDF,3]);                                   01266000
                        RESQ     ←BOOLEAN(STR[LDF,4]);                                  01267000
                        CC ←STR[LDF, 5];                                                01268000
                        NCD←STR[LDF, 6];                                                01269000
                        CCO←STR[LDF, 7];                                                01270000
                        NCO←STR[LDF, 8];                                                01271000
                        NCR←STR[LDF, 9];                                                01272000
                        NXT←STR[LDF,10];                                                01273000
                        FST←STR[LDF,11];                                                01274000
                        LST←STR[LDF,12];                                                01275000
                        BBK←BOOLEAN(STR[LDF,13]);                                       01276000
                        NCE←STR[LDF,14];                                                01277000
                        TRNSFWDS(CV[0],STR[LDF,37],12);                                 01278000
                        IF LDF=0 THEN                                                   01279000
                        IF (I←STR[0,0])≠0 THEN                                          01280000
                        BEGIN                                                           01281000
                          IF BOOLEAN(I) THEN                                            01282000
                          BEGIN  EV[0]←0&"/"[18:42:6];                                  01283000
                            IF NOT GENERATE THEN STARTGEN;  EDITING(1,1);               01284000
                          END;                                                          01285000
                          IF BOOLEAN(I.[46:1]) THEN                                     01286000
                          BEGIN  EV[0]←"4/=  ";                                         01287000
                            IF NOT GENERATE THEN STARTGEN;  EDITING(1,3);               01288000
                          END;                                                          01289000
                          IF BOOLEAN(I.[45:1]) THEN                                     01290000
                          BEGIN  EV[0]←"POINT"; EV[1]←0&"ER("[1:31:17];                 01291000
                            IF NOT GENERATE THEN STARTGEN;  EDITING(1,8);               01292000
                          END;                                                          01293000
                          IF BOOLEAN(I.[44:1]) THEN                                     01294000
                          BEGIN  EV[0]←0&")"[18:42:6];                                  01295000
                            IF NOT GENERATE THEN STARTGEN;  EDITING(1,1);               01296000
                          END;                                                          01297000
                        END;                                                            01298000
                        TRNSFWDS(EV[0],STR[LDF,17],20);                                 01299000
                        IF (LDF←LDF-1)<0 THEN                                           01300000
                        BEGIN                                                           01301000
                          IF ERRDFN≠0 THEN                                              01302000
                          BEGIN EV[0].[1:1]←1; CV[9].[36:6]←1; ERRDFN←0 END;            01303000
                          IF GENERATE THEN EDITING(1,NCR);                              01304000
                        END;                                                            01305000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"      ","      ","      ",                       01306000
"      ","AFTER:",NXT,LDF);                                                             01307000
                END  DFINEOUT;                                                          01308000
PROCEDURE            PERCENT;                                                           01309000
COMMENT ..........................................................................      01310000
;  THIS PROCEDURE TAKES CARE OF SCANNING AND EDITING OF THE NOTES AFTER:                01311000
;A "%" ON THE CARD.                                                                     ;01312000
;                          -------- J. C. PAO   04/15/68 ------                        ;01313000
;.........................................................................;            01314000
                BEGIN                                                                   01315000
        INTEGER         N;                                                              01316000
        LABEL           L0,L1,LE;                                                       01317000
          L0:           N←(CED-CC.[33:15])×8-CC.[30:3];  % NO. OF CHRS AFT %.           01318000
                        IF GENERATE THEN                                                01319000
                        IF NOT NEWCARD THEN                                             01320000
```

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                    BEGIN                                                    01321000
                      IF CIVALID THEN                                        01322000
                      BEGIN                                                  01323000
                        IF N>AVC THEN                                        01324000
                        BEGIN EDITING(0,AVC); GO TO L1 END;                  01325000
                      END ELSE                                               01326000
          L1:         BEGIN IC←IST; CIVALID←TRUE; AVC←72; CI[9]←2 END;       01327000
                      IF AVC≠N THEN EDITING(0,AVC-N);                        01328000
                      CHRTRNSF(IC,CC,N);                                     01329000
                      LST←4;  AVC←0;                                         01330000
                    END;  CC←CED;                                            01331000
COMMENT  IF THE "%" IS AT COLUMN 72 ON THE CARD, SKIP THE NEXT CARD;         01332000
                    IF N=1 THEN  % A "%" AT COLUMN 72.                       01333000
                    BEGIN  % SKIP THE NEXT CARD.                             01334000
                      IF EOF THEN GO TO LE;                                  01335000
                      N←REAL(SCAN(7));  % SEE THE NEXT CHR TO STOP SCAN.     01336000
                      CC←CED;                                                01337000
                    END;                                                     01338000
COMMENT  SET THE STARTING SCANNING ADDRESS AT THE FIRST VISIBLE CHR;         01339000
                    IF EOF THEN GO TO LE;                                    01340000
                    N←REAL(SCAN(3));                                         01341000
                    IF NXT,[36:6]="%" THEN GO TO L0;                         01342000
          LE:  END  PERCENT;                                                 01343000
PROCEDURE           COMMNT;                                                  01344000
COMMENT ..................................................................01345000
:  THIS PROCEDURE TAKES CARE THE SCANNING AND EDITING OF A COMMENT.      :01346000
:THE PROCESS TERMINATES AT END-OF-FILE OR AFTER A SEMICOLUMN.  THE       :01347000
:ENTIRE COMMENT WILL BE EDITED AT THE SAME COLUMN AS ON THE OLD CARD.    :01348000
:                        -------  J. C. PAO   04/15/68  ------           :01349000
:.........................................................................:01350000
          BEGIN                                                              01351000
INTEGER       N,S;                                                          01352000
LABEL         L1,L2,L3,L4,LE;                                               01353000
              IF GENERATE THEN                                               01354000
              BEGIN  % DURING GENERATING PROCESS.                            01355000
                IF NOT CIVALID THEN                                          01356000
                BEGIN IC←IST; CIVALID←TRUE; AVC←72; CI[9]←2 END;             01357000
                IF AVC>(N←(CED-CC0.[33:15])×8-CC0.[30:3]) THEN               01358000
                BEGIN EDITING(0,AVC-N); GO TO L2 END ELSE                    01359000
                IF AVC=N THEN GO TO IF LST≠4 THEN L1 ELSE L2 ELSE            01360000
                BEGIN                                                        01361000
    L1:           EDITING(0,AVC);                                            01362000
                  EDITING(0,72-N-BB);  CI[9]←2;                              01363000
    L2:           ERREDT(7);  % EDIT THE WORD "COMMENT".                     01364000
                  IF N>7 THEN                                                01365000
                  IF NCO<NCD THEN GO TO L3 ELSE                              01366000
                  EDITING(0,AVC-(CED-CC.[33:15])×8+CC.[30:3]) ELSE           01367000
                  IF N<7 THEN                                                01368000
                  BEGIN                                                      01369000
                    IF NCO=NCD-2 THEN                                        01370000
    L3:             EDITING(0,AVC) ELSE                                      01371000
                  EDITING(0,65+N-(CED-CC.[33:15])×8+CC.[30:3]);              01372000
                  END ELSE  % N=7.                                           01373000
                  IF CC=CST THEN EDITING(0,72);                              01374000
                END;                                                         01375000
              END;                                                           01376000
COMMENT  SCANNING UNTIL AFTER SEMICOLUMN, EDITING UNTIL THE END OF THE       01377000
         ORIGINAL CARD (END OF GENERATING);                                  01378000
         L4:  IF EOF THEN GO TO LE;                                          01379000
              IF GENERATE THEN S←NXT;                                        01380000
```

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                    IF NXT.[36:6]=";" THEN                                  01381000
                    BEGIN  N←REAL(SCAN(1));                                 01382000
                      IF GENERATE THEN                                      01383000
                      BEGIN LST←4; EDITING(1,1) END;  GO TO LE;             01384000
                    END;                                                    01385000
                    CC←IF CC.[30:3]=7 THEN CC.[33:15]+1 ELSE                01386000
                       CC&(CC.[30:3]+1)[30:45:3];                           01387000
                    N←REAL(SCAN(7));                                        01388000
                    IF GENERATE THEN                                        01389000
                    BEGIN LST←4; EV[0]←0&S[18:36:6]; EDITING(1,1) END;      01390000
                    GO TO L4;                                               01391000
          LE:  END  COMMNT;                                                 01392000
PROCEDURE           STRING;                                                 01393000
COMMENT .....................................................................01394000
;    THIS PROCEDURE TAKES CARE OF SCANNING AND EDITING OF A STRING.         ;01395000
;THIS PROCEDURE ONLY BE CALLED WHEN THE OPENNING QUOTE OF A STRING IS        ;01396000
;INDICATED BY "NXT".                                                        ;01397000
;                          --------  J. C. PAO   04/16/68  --------         ;01398000
;.............................................................................;01399000
            BEGIN                                                           01400000
      INTEGER     I,J;                                                      01401000
      LABEL       LE;                                                       01402000
                  J←CC&NCD[9:27:21]&REAL(BBK)[1:47:1];                      01403000
                  CC←IF (I←CC.[30:3])=7 THEN CC.[33:15]+1 ELSE              01404000
                     CC&(I+1)[30:45:3];  % SKIP THE OPENNING QUOTE.         01405000
                  I←REAL(SCAN(7));  % SEE THE NEXT CHARACTER.               01406000
                  IF NEWCARD THEN                                           01407000
                  BEGIN  IF GENERATE THEN CV[9].[47:1]←1;                   01408000
                    BBB←0;  NEWCARD←FALSE;  NCE←NCD;                        01409000
                    IF REAL(RES@)≠1 THEN TRNSFWDS(END,CV[11],1);            01410000
                  END;                                                      01411000
                  IF NXT.[36:6]="'" THEN                                    01412000
                  BEGIN  % THE 1ST CHARACTER OF THE STRING IS A "'".        01413000
                    EET.[30:3]←4;                                           01414000
                    CC←IF (I←CC.[30:3])=7 THEN CC.[33:15]+1 ELSE            01415000
                       CC&(I+1)[30:45:3];  % SKIP THE OPENNING QUOTE.       01416000
                    IF SCAN(6) THEN   % ERROR ENCOUNTERED IN SCANNING.      01417000
                    BEGIN EET←EST; GO TO LE END;                            01418000
                    EET←EST;                                                01419000
                  END ELSE                                                  01420000
                  IF SCAN(6) THEN GO TO LE;                                 01421000
                  IF GENERATE THEN                                          01422000
                  BEGIN  IF BOOLEAN(J.[1:1]) THEN LST←FST←0;                01423000
                    EDITING(2,NCR);                                         01424000
                  END ELSE                                                  01425000
                  BEGIN  BBK←BOOLEAN(J.[1:1]);                              01426000
                    CCO←J.[30:18];  NCO←J.[9:21];                           01427000
                  END;                                                      01428000
          LE:  END  STRING;                                                 01429000
PROCEDURE           NUMBER;                                                 01430000
COMMENT .....................................................................01431000
;    THIS PROCEDURE PICKS UP A NUMBER.                                      ;01432000
;                          --------  J. C. PAO   04/25/68  --------         ;01433000
;.............................................................................;01434000
            BEGIN                                                           01435000
      LABEL       L1,L2,L3,L4,LE;                                           01436000
                  IF NXT.[36:6]="." THEN GO TO L1;                          01437000
                    IF NXT.[36:6]="@" THEN GO TO L3;                        01438000
                  IF NOT SCAN(0) THEN                                       01439000
                  IF GENERATE THEN EDITING(1,NCR);                          01440000
```

```
                IF EOF THEN GO TO LE;                                    01441000
                IF NXT.[36:6]="." THEN                                   01442000
                BEGIN  % IT MAY BE A DECIMAL POINT.                      01443000
                  IF BBK THEN  % NOT DECIMAL POINT, PICK UP ANY WAY.     01444000
                  BEGIN                                                  01445000
                    IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;      01446000
                    IF NOT SCAN(1) THEN                                  01447000
                    IF GENERATE THEN EDITING(1,1);  GO TO LE;            01448000
                  END;                                                   01449000
          L1:     IF NOT SCAN(1) THEN                                    01450000
                  IF GENERATE THEN EDITING(1,1);                         01451000
                  IF EOF THEN GO TO L2;                                  01452000
                  IF NXT.[42:6]≠0 THEN                                   01453000
                  BEGIN  % NOT A DECIMAL POINT.                          01454000
          L2:       IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;      01455000
                    GO TO LE;                                            01456000
                  END ELSE                                               01457000
                  IF BBK THEN GO TO L2;                                  01458000
                  IF NOT SCAN(0) THEN                                    01459000
                  IF GENERATE THEN EDITING(1,NCR);                       01460000
                END;                                                     01461000
                IF EOF THEN GO TO LE;                                    01462000
                IF NXT.[36:6]="%" THEN PERCENT;                          01463000
                IF NXT.[36:6]≠"@" THEN GO TO LE;                         01464000
          L3:   IF NOT SCAN(1) THEN                                      01465000
                IF GENERATE THEN EDITING(1,1);                           01466000
                IF EOF THEN GO TO L2;                                    01467000
                IF NXT.[36:6]="%" THEN PERCENT;                          01468000
                IF NXT.[36:6]="+" THEN GO TO L4;                         01469000
                IF NXT.[36:6]="-" THEN                                   01470000
          L4:   IF NOT SCAN(1) THEN                                      01471000
                IF GENERATE THEN EDITING(1,1);                           01472000
                IF EOF THEN GO TO L2;                                    01473000
                IF NXT.[36:6]="%" THEN PERCENT;                          01474000
                IF NXT.[42:6]≠0 THEN GO TO L2;                           01475000
                IF NOT SCAN(0) THEN                                      01476000
                IF GENERATE THEN EDITING(1,NCR);                         01477000
          LE:   END  NUMBER;                                             01478000
      PROCEDURE      FOURTY7(S);                                         01479000
          VALUE      S;                                                  01480000
          REAL       S;                                                  01481000
      COMMENT ....................................................       01482000
      :     THIS PROCEDURE SCANS AN INTEGER AND EDITS INTO THE NEW CARD IMAGE :01483000
      :A VALUE OF 47 MINUS THAT INTEGER.  IF THE SCANNING HAS ERROR OR THE   :01484000
      :NEW VALUE IS NO GOOD THE ERROR WILL BE SET IN BOTH OLD AND NEW CARD.  :01485000
      :***** IMPORTANT: THE PROCEDURE ONLY BE CALLED WHEN "DFINE" IS FALSE.  :01486000
      :                        -------- J. C. PAO   04/18/68 --------:      01487000
      :..........................................................;           01488000
                BEGIN                                                    01489000
            INTEGER  I;                                                  01490000
            LABEL    L1,LE;                                              01491000
      IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"FOUR-7",NXT);               01492000
                       IF BOOLEAN($) THEN                                01493000
                       IF SCAN(0) THEN GO TO LE;                         01494000
                       IF NCR>2 THEN                                     01495000
                       IF NCR←LEADINGO(EV[0],NCR)>2 THEN                 01496000
            L1:        BEGIN  % NO. OF DIGITS MORE THAN 2.               01497000
                         ERROR;                                          01498000
                         IF GENERATE THEN EDITING(1,NCR);                01499000
                         GO TO LE;                                       01500000
```

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                    END;                                                    01501000
                    IF (I←47-(IF NCR=1 THEN EV[0].[18:6] ELSE               01502000
                      EV[0].[18:6]×10+EV[0].[24:6]))<0 THEN                 01503000
                    GO TO L1;                                               01504000
                    IF I<10 THEN BEGIN NCR←1; EV[0].[18:6]←I END ELSE       01505000
                    IF I≤46 THEN                                            01506000
                    BEGIN  NCR←2;                                           01507000
                      EV[0].[18:12]←ENTIER(I MOD 10)&(I DIV 10)[36:42:6];   01508000
                    END ELSE GO TO L1;                                      01509000
                    IF NOT GENERATE THEN STARTGEN;  EDITING(1,NCR);         01510000
          LE:  END  FOURTY7;                                                01511000
REAL PROCEDURE      CHECKNEXT(NEXT);                                        01512000
COMMENT ..........................................................          01513000
:    THIS PROCEDURE CHECKS THE "NXT" AGAINST THE GIVEN VALUE OF "NEXT".:    01514000
:IT ALSO TAKES CARE OF BRANCHING INTO A DEFINE AND SKIPPING THE "%" AND:    01515000
:THE "COMMENT".                                                         :    01516000
:    VALUE OF RESULT:                                                   :    01517000
:      0:  A RESERVED WORD OR "DONT-CARE" OR NOT FOUND, IF IFX=LBK.     :    01518000
:      1:  THE END-OF-FILE.                                             :    01519000
:      2:  A SPECIAL CHARACTER OR DIGIT WHICH NOT EQUAL TO "NEXT".      :    01520000
:          (THE ONLY CASE THE "NXT" IS NOT SCANNED EVEN NOT MATCH).     :    01521000
:      3:  THE RESERVED WORD "BEGIN".  (NOT EDITED).                    :    01522000
:      4: A SUBSCRIPTED IDENTIFIER.                                     :    01523000
:      5:  THE RESERVED WORD "END".  (NOT EDITED).                      :    01524000
:      6:  A SIMPLE IDENTIFIER.                                         :    01525000
:      8: THE "NXT" EQUALS TO THE GIVEN "NEXT".  (NOT SCANNED).         :    01526000
:      9:  AN INVALID CHR OR NO. OF CHRS > 63.          ("STRM" IS ON).:    01527000
:     10:  STREAM PROCEDURE OR STREAM VALUE VARIABLE IF "STRM" IS ON.   :    01528000
:     12:  STREAM NAME VARIABLE.                       ("STRM" IS ON).:    01529000
:     14:  STREAM VALUE VARIABLE ALSO IN LOCAL[*].     ("STRM" IS ON).:    01530000
:     16:  STREAM NAME VARIABLE ALSO IN LOCAL[*].      ("STRM" IS ON).:    01531000
:                        --------  J. C. PAO   04/22/68  --------      :    01532000
:..........................................................................;    01533000
      VALUE         NEXT;                                                   01534000
      REAL          NEXT;                                                   01535000
            BEGIN                                                           01536000
        REAL        I;                                                      01537000
        LABEL       L1,L4,LE;                                               01538000
                    LLF←LDF;  % LOWEST DEFINE LEVEL ENCOUNTERED.            01539000
          L1:       IF EOF THEN                                             01540000
                    BEGIN CHECKNEXT←1; GO TO LE END;                        01541000
                    IF NXT=NEXT THEN BEGIN CHECKNEXT←8; GO TO LE END;       01542000
                    IF I←NXT.[36:6]="%" THEN BEGIN PERCENT; GO TO L1 END;   01543000
                    IF I="#" THEN                                           01544000
                    IF DFINE THEN BEGIN DFINEOUT; LLF←LDF; GO TO L1 END;    01545000
                    IF NXT.[42:6]≠2 THEN BEGIN CHECKNEXT←2; GO TO LE END;   01546000
COMMENT  CHECK THE  NEXT CHARACTER IS A LETTER, CHECK WHAT IT IS;           01547000
                    IF BOOLEAN(I←SCANNING) THEN                             01548000
                    BEGIN IF STRM THEN CHECKNEXT←9; GO TO LE END;           01549000
                    IF I=0 THEN                                             01550000
                    BEGIN                                                   01551000
                      IF IFX=DFX+2 THEN  % RESERVED WORD "BEGIN".           01552000
                      BEGIN CHECKNEXT←3; GO TO LE END;                      01553000
                      IF IFX=DFX+4 THEN  % RESERVED WORD "END".             01554000
                      BEGIN CHECKNEXT←5; GO TO LE END;                      01555000
                      IF IFX=DFX+6 THEN  % RESERVED WORD "COMMENT".         01556000
                      IF NOT ENDCMNT THEN                                   01557000
                      BEGIN COMMNT; GO TO L1 END;                           01558000
                      GO TO IF REAL(STRM)=0 THEN L4 ELSE LE;                01559000
                    END;                                                    01560000
```

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                    IF I.[42:6]≠2 THEN                                          01561000
                    IF STRM THEN                                                01562000
                    BEGIN  CHECKNEXT←IF I=8 THEN 0 ELSE I;                      01563000
                      GO TO LE;                                                 01564000
                    END ELSE                                                    01565000
                    BEGIN  CHECKNEXT←IF I=8 THEN 0 ELSE I;                      01566000
                      GO TO IF REAL(STRM)=0 THEN L4 ELSE LE;                    01567000
                    END ELSE                                                    01568000
                    BEGIN  % THIS IS A DEFINE.                                  01569000
                      DFINEIN(INFO[I.[29:5],I.[34:8]]);                         01570000
                      IF B47 THEN                                               01571000
                      IF LDF=0 THEN STR[0,0].[46:1]←1;  GO TO L1;               01572000
                    END;                                                        01573000
            L4:     IF GENERATE THEN EDITING(1,NCH);                            01574000
            LE:     B47←FALSE;                                                  01575000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"CHKNXT",NXT,IFX); END; COMMENT ..        01576000
                END CHECKNEXT;                                                  01577000
REAL PROCEDURE      BALABALA(I);  VALUE I; REAL I;  FORWARD;                    01578000
REAL PROCEDURE      BRACKET(CLOS,EDT);                                          01579000
COMMENT ..........................................................              01580000
;    THIS PROCEDURE PROCESSES A STRING OF ALGOL LANGUAGE ENCLOSED IN A          ;01581000
;PAIR OF BRACKETS OF PARENTHESES.                                               ;01582000
;    VALUE OF RESULT:                                                           ;01583000
;      0:  THE GIVEN "]" OR ")" NOT FOUND, STOPPED AT ")", "]" OR A             ;01584000
;          SEMICOLUMN.                                                        ;01585000
;      1:  STOPPED AT END-OF-FILL.                                            ;01586000
;      3:  STOPPED AT "BEGIN".                                                ;01587000
;      4:  THE GIVEN "]" OR ")" WAS FOUND AND PROCESSED.                      ;01588000
;      5:  STOPPED AT "END".                                                  ;01589000
;                        -------- J. C. PAO   04/22/68 --------              ;01590000
;..........................................................................;    01591000
      VALUE           CLOS,EDT;                                                 01592000
      REAL            CLOS,EDT;                                                 01593000
                BEGIN                                                           01594000
        REAL          I;                                                        01595000
        LABEL         LE;                                                       01596000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"PRACKT",NXT,CLOS,EDT);                   01597000
                    IF BOOLEAN(EDT) THEN                                        01598000
                    BEGIN                                                       01599000
                      IF DFINE THEN                                             01600000
                      IF CLOS="]" THEN IF CV[9].[43:2]≠0 THEN ERRDFN←1;         01601000
                      IF NOT SCAN(1) THEN                                       01602000
                      IF GENERATE THEN EDITING(1,1);                            01603000
                    END;                                                        01604000
                    IF BOOLEAN(BRACKET←BALABALA(0)) THEN                        01605000
                    BEGIN ERROR; GO TO LE END;                                  01606000
                    IF NXT.[36:6]≠CLOS THEN                                     01607000
                    BEGIN  % ERROR CONDITION.                                   01608000
                      IF DFINE THEN ERRDFN←1 ELSE                               01609000
                      BEGIN CV[9].[36:6]←1; ERX←1 END;                          01610000
                      GO TO LE;                                                 01611000
                    END;                                                        01612000
                    IF NOT SCAN(1) THEN                                         01613000
                    IF GENERATE THEN EDITING(1,1);  BRACKET←4;                  01614000
          LE:  END  BRACKET;                                                    01615000
REAL PROCEDURE      SUBSCRIPT;                                                  01616000
COMMENT ..........................................................              01617000
;    THIS PROCEDURE PICKS UP THE SUBSCRIPTION IF THERE IS ANY.                  ;01618000
;    VALUE OF RESULT:  0:  NO SUBSCRIPTION IS FOUND.                            ;01619000
;                      1:  STOPED AT "BEGIN".                                   ;01620000
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:                    3:  STOPED AT "END".                                    :01621000
:                    8:  THE SUBSCRIPTION IS PICKED UP.                      :01622000
:                          --------  J. C. PAO   04/22/68  --------          :01623000
:.....:01624000
          BEGIN                                                              01625000
      REAL        I;                                                         01626000
      LABEL       L1,L2,L3,LE;                                               01627000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"SUBSPT",NXT);                         01628000
                  IF EOF THEN                                                01629000
        L1:       BEGIN SUBSCRIPT←1; GO TO LE END;                           01630000
                  IF NXT.[36:6]="[" THEN GO TO L2;                           01631000
                  IF (I←CHECKNEXT(4&"["[36:42:6]))=8 THEN                    01632000
                  BEGIN                                                      01633000
        L2:         IF (I←BRACKET("]",1))=4 THEN                             01634000
                    BEGIN SUBSCRIPT←8; GO TO LE END ELSE                     01635000
                    IF NOT BOOLEAN(I) THEN I←2;                              01636000
                  END ELSE                                                   01637000
                  IF I=2 THEN                                                01638000
                  IF NXT.[42:6]=4 THEN GO TO L3;                             01639000
COMMENT  ILEAGAL ITEM FOLLOWS THIS SUBSCRIPTED ID, POSSIBLE ERROR;           01640000
                  IF DEINE THEN ERRDFN←1 ELSE                                01641000
                  IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                        01642000
                  BEGIN ERROR; CI[9].[36:6]←1 END;                           01643000
        L3:       SUBSCRIPT←I;                                               01644000
        LE:  END  SUBSCRIPT;                                                 01645000
REAL PROCEDURE    PARTIAL(P);                                                01646000
COMMENT .....:01647000
:    THIS PROCEDURE SCANS FOR A PARTIAL-FIELD IF P=1, OR SCANS FOR A         :01648000
:CONCATENATE-FIELD IF P≠1.                                                   :01649000
:    VALUE OF RESULT:                                                        :01650000
:      0:  A RESEVED WORD.                                                   :01651000
:      1:  THE END-OF-FILE.                                                  :01652000
:      2:  A SPECIAL CHARACTER OR DIGIT.                                     :01653000
:          (NOT SCANNED).                                                    :01654000
:      3:  THE RESERVED WORD "BEGIN".  (NOT EDITED).                         :01655000
:      4:  A SUBSCRIPTED IDENTIFIER.                                         :01656000
:      5:  THE RESERVED WORD "END".  (NOT EDITED).                           :01657000
:      6:  A SIMPLE IDENTIFIER.                                              :01658000
:      8:  THE FIELD IS PROCESSED.                                           :01659000
:                          --------  J. C. PAO   04/26/68  --------          :01660000
:.....:01661000
     VALUE        P;                                                         01662000
     REAL         P;                                                         01663000
          BEGIN                                                              01664000
       REAL       I;                                                         01665000
       LABEL      L1,L2,L3,L4,L5,L6,L7,L8,L9,LE;                             01666000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"PARTIL",NXT,P);                       01667000
                  P←IF BOOLEAN(P) THEN 2 ELSE 3;                             01668000
COMMENT  LOOKING FOR "[" FIRST;                                              01669000
                  IF EOF THEN                                                01670000
        L1:       BEGIN PARTIAL←1; GO TO LE END;                             01671000
                  IF NXT.[36:6]="[" THEN GO TO L4;                           01672000
                  IF NXT.[42:6]=0 THEN                                       01673000
        L2:       BEGIN  % POSSIBLE ERROR, THE "[" NOT FOUND.                01674000
                    IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;          01675000
                    PARTIAL←2;  GO TO LE;                                    01676000
                  END;                                                       01677000
                  IF (I←CHECKNEXT(4&"["[36:42:6]))≠8 THEN                    01678000
                  BEGIN                                                      01679000
                    IF I=2 THEN GO TO L2;                                    01680000
```

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                    IF DFINE THEN ERRDFN←1 ELSE                                  01681000
                    BEGIN ERROR; CI[9].[36:6]←1 END;                             01682000
              L3:   PARTIAL←I; GO TO LE;                                         01683000
                  END;                                                           01684000
              L4: IF NOT SCAN(1) THEN                                            01685000
                  IF GENERATE THEN EDITING(1,1);                                 01686000
      COMMENT IF IT IS DURING EXECUTION OF A DEFINE, AND THE "[" WAS MARKED      01687000
              NOT RECOGNIZED AS A PARTIAL-FIELD, NO SCANNING IS NEED;            01688000
                  IF DFINE THEN                                                  01689000
                  BEGIN                                                          01690000
                    IF ERRDFN=0 THEN                                             01691000
                    IF I←CV[9].[43:2]≠0 THEN                                     01692000
                    BEGIN  % CHANGE WAS MADE IN THE DEFINE.                      01693000
                      IF I≠P-1 THEN ERRDFN←1;                                    01694000
                    END ELSE ERRDFN←1;                                           01695000
                  END;                                                           01696000
      COMMENT     MAKE SURE THE BIT INDEX IS A INTEGER;                          01697000
              L6: IF EOF THEN GO TO L1;                                          01698000
                  B47←P>1;                                                       01699000
                  IF NXT.[42:6]=0 THEN GO TO L8;                                 01700000
                  IF (I←CHECKNEXT(1))≠2 THEN  % NOT A DIGIT.                     01701000
              L7: BEGIN  % MARK ERROR.                                           01702000
                    IF DFINE THEN ERRDFN←1 ELSE                                  01703000
                    IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                          01704000
                    BEGIN ERROR; CI[9].[36:6]←1 END;                             01705000
                    IF (PARTIAL←BRACKET("]",0))=4 THEN PARTIAL←8;                01706000
                    GO TO LE;                                                    01707000
                  END;                                                           01708000
                  IF NXT.[42:6]≠0 THEN GO TO L7;                                 01709000
              L8: IF (P←P-1)=0 THEN                                              01710000
                  BEGIN                                                          01711000
                    IF NOT SCAN(0) THEN                                          01712000
                    IF GENERATE THEN EDITING(1,NCR);                             01713000
                  END ELSE                                                       01714000
                  IF DFINE THEN I←REAL(SCAN(0)) ELSE FOURTY7(1);                 01715000
      COMMENT     CHECK THE ":" OR "]";                                          01716000
                  IF EOF THEN GO TO L1;                                          01717000
                  IF NXT=(I←4&(IF P=0 THEN "]" ELSE ":")[36:42:6]) THEN          01718000
                  GO TO L9;                                                      01719000
                  IF NXT.[42:6]=0 THEN BEGIN I←2; GO TO L7 END;                  01720000
                  IF (I←CHECKNEXT(1))≠8 THEN GO TO L7;                           01721000
              L9: IF NOT SCAN(1) THEN                                            01722000
                  IF GENERATE THEN EDITING(1,1);                                 01723000
                  IF P>0 THEN GO TO L6;                                          01724000
                  PARTIAL←8;                                                     01725000
              LE: B47←FALSE;                                                     01726000
                  PARTIAL;                                                       01727000
            END   STRMPROCDUR;  FORWARD;                                         01728000
      REAL PROCEDURE CONCATENATE;                                                01729000
      COMMENT ..................................................................01730000
      ;     THIS PROCEDURE SCANS FOR THE PART STARTING FROM AFTER THE "&" IN  ;01731000
      ;A CONCATENATE EXPRESSION.                                               ;01732000
      ;     VALUE OF RESULT;                                                   ;01733000
      ;       0;  A RESEVED WORD.                                              ;01734000
      ;       1;  THE END-OF-FILE.                                             ;01735000
      ;       2;  A SPECIAL CHARACTER OR DIGIT.                                ;01736000
      ;           (NOT SCANNED).                                               ;01737000
      ;       3;  THE RESERVED WORD "BEGIN".  (NOT EDITED).                    ;01738000
      ;       4;  A SUBSCRIPTED IDENTIFIER.                                    ;01739000
      ;       5;  THE RESERVED WORD "END".  (NOT EDITED).                      ;01740000
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:       6:  A SIMPLE IDENTIFIER.                                                :01741000
:       8:  THE CONCATENATE ERPRESSION IS COMPLETLY PROCESSED.                  :01742000
:                          -------- J. C. PAO   04/26/68 --------               :01743000
:.....................................................................;01744000
                BEGIN                                                           01745000
        REAL            I;                                                      01746000
        LABEL           L1,L2,L3,L4,L5,L6,LE;                                   01747000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"CONCAT",NXT);                            01748000
                        IF EOF THEN                                             01749000
          L1:           BEGIN CONCATENATE←1; GO TO LE END;                      01750000
                        IF BOOLEAN(I←CHECKNEXT(1)) THEN                         01751000
          L2:           BEGIN                                                   01752000
                          IF DFINE THEN ERRDFN←1 ELSE                           01753000
                          IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                   01754000
                          BEGIN ERROR; C[[9],[36:6]←1 END;                      01755000
          L3:             CONCATENATE←I;  GO TO LE;                             01756000
                        END;                                                    01757000
                        IF I=6 THEN GO TO L4;                                   01758000
                        IF I=2 THEN                                             01759000
                        BEGIN                                                   01760000
                          IF NXT.[36:6]="""" THEN BEGIN STRING; GO TO L4 END;   01761000
                          IF NXT.[36:6]="(" THEN                                01762000
                          GO TO IF (I←BRACKET(")",1))=4 THEN L4 ELSE L2;        01763000
                          IF NXT.[42:6]=0 THEN                                  01764000
                          BEGIN                                                 01765000
                            IF NOT SCAN(0) THEN                                 01766000
                            IF GENERATE THEN EDITING(1,NCR);  GO TO L6;         01767000
                          END;  GO TO L2;                                       01768000
                        END;                                                    01769000
                        IF I=0 THEN                                             01770000
                        BEGIN                                                   01771000
                          IF NXT.[36:6]="(" THEN                                01772000
                          GO TO IF (I←BRACKET(")",1))=4 THEN L4 ELSE L2;        01773000
                        END;                                                    01774000
                        IF I=10 THEN                                            01775000
                        GO TO IF (I←STRMPROCDUR)=8 THEN L4 ELSE L2;             01776000
                        IF I=4 THEN                                             01777000
                        IF (I←SUBSCRIPT)≠8 THEN GO TO L2;                       01778000
          L4:           IF EOF THEN GO TO L1;                                   01779000
                        IF I←NXT.[36:6]="[" THEN GO TO L6;                      01780000
                        IF I="." THEN GO TO L5;                                 01781000
                        IF NXT.[42:6]=0 THEN GO TO L2;                          01782000
                        IF (I←CHECKNEXT(4&"."[36:42:6]))=8 THEN                 01783000
          L5:           BEGIN  % NEXT IS A "." PICK UP PARTIAL-FIELD 1ST.       01784000
                          IF NOT SCAN(1) THEN                                   01785000
                          IF GENERATE THEN EDITING(1,1);                        01786000
                          GO TO IF (I←PARTIAL(1))=8 THEN L6 ELSE L2;            01787000
                        END;                                                    01788000
          L6:           GO TO IF (I←PARTIAL(0))=8 THEN L3 ELSE L2;              01789000
          LE:  END      CONCATENATE;                                            01790000
REAL PROCEDURE          FILLSTATEMENT;                                          01791000
COMMENT .....................................................................01792000
:     THIS PROCEDURE PROCESSES A FILL-STATEMENT.                                :01793000
:     VALUE OF RESULT:  0-6: SAME AS IN "CHECKNEXT" PROCEDURE.                  :01794000
:                         8: PROCESSED WITH A SEMICOLUM.                        :01795000
:                          -------- J. C. PAO   06/19/68 --------               :01796000
:.....................................................................;01797000
                BEGIN                                                           01798000
        REAL            I;                                                      01799000
        LABEL           L1,L2,L3,LX,LX1,LX2,LE;                                 01800000
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                IF GENERATE THEN EDITING(1,NCR);  % THE WORD "FILL".  01801000
                IF (I←CHECKNEXT(1))≠4 THEN                            01802000
          LX:   BEGIN                                                 01803000
                  IF DFINE THEN ERRDFN←1 ELSE                         01804000
                  IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                 01805000
                  BEGIN ERROR; CI[9].[36:6]←1 END;                    01806000
          LX1:    FILLSTATEMENT←I;  GO TO LE;                         01807000
                END;                                                  01808000
                IF (I←SUBSCRIPT)≠8 THEN GO TO LX;                     01809000
                IF (I←CHECKNEXT(1))≠0 THEN GO TO LX;                  01810000
                IF IFX≠DFX+33 THEN GO TO LX;  % DFX+33 IS "WITH".     01811000
          L1:   STRM←BOOLEAN(2);  I←CHECKNEXT(1);  STRM←FALSE;        01812000
                IF I=2 THEN                                           01813000
                BEGIN                                                 01814000
                  IF NXT.[42:6]=0 THEN                                01815000
                  BEGIN                                               01816000
                    IF NOT SCAN(0) THEN                               01817000
                    IF GENERATE THEN EDITING(1,NCR);                  01818000
                  END ELSE                                            01819000
                  IF NXT.[36:6]="""" THEN STRING ELSE GO TO LX;       01820000
                  GO TO L2;                                           01821000
                END;                                                  01822000
                IF I≠0 THEN GO TO IF BOOLEAN(I) THEN LX ELSE LX2;     01823000
                IF IFX≠BLK THEN GO TO LX2;                            01824000
                IF EV[0].[18:18]≠"OCT" THEN                           01825000
          LX2:  BEGIN                                                 01826000
                  IF GENERATE THEN EDITING(1,NCR);  GO TO LX;         01827000
                END;                                                  01828000
                IF NOT GENERATE THEN STARTGEN;                        01829000
                EV[0].[18:6]←3;  EDITING(1,1);                        01830000
                TRNSFCHR(EV[0],EV[0],3,6,NCR←NCR-3);                  01831000
                FST←4;  EDITING(2,NCR);                               01832000
          L2:   IF (I←CHECKNEXT(4&",","[36:42:6]))=8 THEN GO TO L3;   01833000
                IF I=2 AND NXT.[36:6]=";" THEN                        01834000
                BEGIN  I←";";                                         01835000
          L3:     IF NOT SCAN(1) THEN                                 01836000
                  IF GENERATE THEN EDITING(1,1);                      01837000
                  IF I=";" THEN I←8 ELSE GO TO L1;                    01838000
                END;  GO TO LX1;                                      01839000
          LE:  END  FILLSTATEMENT;                                    01840000
      REAL PROCEDURE  STRMPROCDUR;                                    01841000
      COMMENT ....................................................    01842000
      :    THIS PROCEDURE PROCESSES A STREAM-PROCEDURE-CALL STATEMENT.  :01843000
      :    VALUE OF RESULT:  0 TO 6:  SAME AS INDICATED IN "CHECKNEXT".  :01844000
      :                      8:  THE PROCESS IS COMPLETED.              :01845000
      :                        -------- J. C. PAO   06/06/68 --------   :01846000
      :..................................................................;01847000
                BEGIN                                                 01848000
          REAL        I,J,N,B,P,X;                                    01849000
          ARRAY       E[0:8];                                         01850000
          LABEL       L1,L2,L3,L4,L45,L5,L6,L7,LE;                    01851000
      IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"STMCLL",NXT);            01852000
      COMMENT  FROM THE INFO-INDEX OF THE STREAM PROCEDURE IDENTIFIER, IFX,  01853000
               OBTAIN THE FORMAL PARAMETERS INFORMATION.  WHERE       01854000
            N:  ONE PLUS THE NUMBER OF WORDS OF THE ADDITIONAL INFORMATION  01855000
                OF THIS ENTRY IN INFO[*,*], OR                        01856000
                N = 1 + (<NUMBER OF FORMAL PARAMETERS> + 7) DIV 8.    01857000
            X:  ONE MINUS THE INFO-INDEX OF THE ADDITIONAL INFORMATION OF  01858000
                THIS ENTRY IN INFO[*,*];                              01859000
                  N←(P←INFO[IFX.[35:5],IFX.[40:8]-1]).[4:8]           01860000
```

```
                -(P←P.[40:8]);                                                  01861000
              X←IFX←P-1;  J←7;                                                  01862000
              IF (I←CHECKNEXT(4&"("[36:42:6]))≠8 THEN                           01863000
L1:           BEGIN                                                             01864000
                IF DFINE THEN ERRDFN←1 ELSE                                     01865000
                IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                             01866000
                BEGIN ERROR; CI[9].[36:6]←1 END;                                01867000
                IF BOOLEAN(I) THEN STRMPROCDUR←I ELSE                           01868000
                IF BOOLEAN(B) THEN                                              01869000
                IF STRMPROCDUR←BRACKET(")",0)=4 THEN STRMPROCDUR←8              01870000
                ELSE ELSE STRMPROCDUR←I;  GO TO LE;                             01871000
              END;                                                              01872000
              B←1;  % B REMINES THE FACT THAT "(" WAS PROCESSED.                01873000
L2:           IF NOT SCAN(1) THEN                                               01874000
              IF GENERATE THEN EDITING(1,1);                                    01875000
              STRM←BOOLEAN(2);  I←CHECKNEXT(1);  STRM←FALSE;                    01876000
              IF BOOLEAN(I) THEN GO TO L1;                                      01877000
COMMENT  CHECK THIS ACTURAL PARAMETER AND SEE IF IT IS CALLED BY NAME OR        01878000
BY VALUE;                                                                       01879000
              IF (J←J+1)=8 THEN                                                 01880000
              BEGIN  J←0;                                                       01881000
                IF (N←N-1)≤0 THEN                                               01882000
                BEGIN  % SHOULD HAVE NO MORE PARAMETER.                         01883000
L3:               IF I≠2 THEN                                                   01884000
                  IF GENERATE THEN EDITING(1,NCR);  GO TO L1;                   01885000
                END;  P←INFOL(X←X+1).[35:5],X,[40:8]];                          01886000
              END;  TRNSFCHR(B,P,7,J,1);                                        01887000
              IF NOT BOOLEAN(B) THEN BEGIN B←1; GO TO L3 END;                   01888000
              IF B=3 THEN GO TO L4;                                             01889000
COMMENT  THIS ACTURAL PARAMETER IS CALLED BY VALUE;                             01890000
              IF I≠2 THEN                                                       01891000
              IF GENERATE THEN EDITING(1,NCR);                                  01892000
              IF BOOLEAN(I←BALABALA(I&",","[36:42:6])) THEN GO TO L1;           01893000
              IF I←NXT.[36:6]="," THEN GO TO L2;                                01894000
              IF I=")" THEN GO TO L7;                                           01895000
              I←2;  GO TO L1;                                                   01896000
COMMENT  THIS ACTURAL PARAMETER IS CALLED BY NAME;                              01897000
L4:           IF DFINE THEN IF LLF≥0 THEN GO TO L3 ELSE                         01898000
              BEGIN STR[0,0].[45:1]←1; GO TO L45 END;                           01899000
              IF NOT GENERATE THEN STARTGEN;                                    01900000
              E[0]←EV[0];                                                       01901000
              IF NCR>5 THEN TRNSFWDS(E[1],EV[1],(NCR+2),[36:9]);                01902000
              EV[0]←"POINT"; EV[1]←0&"ER("[1:31:17];  EDITING(1,8);             01903000
              EV[0]←E[0];                                                       01904000
              IF NCR>5 THEN TRNSFWDS(EV[1],E[1],(NCR+2),[36:9]);                01905000
              EDITING(1,NCR);                                                   01906000
L45:          IF I=4 THEN                                                       01907000
              IF (I←SUBSCRIPT)≠8 THEN                                           01908000
              BEGIN                                                             01909000
                IF I=2 THEN                                                     01910000
                IF NXT.[36:6]="," THEN GO TO L5 ELSE                            01911000
                IF NXT.[36:6]=")" THEN GO TO L6;                                01912000
              END ELSE                                                          01913000
              IF (I←CHECKNEXT(4&",","[36:42:6]))=8 THEN                         01914000
L5:           BEGIN  CCO←CC; NCO←NCD;                                           01915000
                IF DFINE THEN IF LLF≥0 THEN GO TO L3 ELSE                       01916000
                BEGIN STR[0,0].[44:1]←1; GO TO L2 END;                          01917000
                IF NOT GENERATE THEN STARTGEN;                                  01918000
                EV[0]←0&")"[18:42:6];  FST←4;  EDITING(1,1);                    01919000
                GO TO L2;                                                       01920000
```

```
                    END ELSE                                                    01921000
                    IF I=2 AND NXT.[36:6]=")" THEN                              01922000
          L6:       BEGIN  CCO←CC; NCO←NCD;                                     01923000
                      IF DFINE THEN IF LLF≥0 THEN GO TO L3 ELSE                 01924000
                      BEGIN STR[0,0].[44:1]←1; GO TO L7 END;                    01925000
                      IF NOT GENERATE THEN STARTGEN;                            01926000
                      EV[0]←0&")"[18:42:6];  FST←4;  EDITING(1,1);              01927000
          L7:         IF NOT SCAN(1) THEN                                       01928000
                      IF GENERATE THEN EDITING(1,1);                            01929000
                      STRMPROCDUR←8;  GO TO LE;                                 01930000
                    END;                                                        01931000
                    ERROR;  CI[9].[36:6]←1;                                     01932000
                    IF BOOLEAN(I) THEN GO TO L1;                                01933000
                    IF BOOLEAN(I←BALABALA(I&","[36:42:6])) THEN GO TO L1;       01934000
                    IF I←NXT.[36:6]="," THEN GO TO L5;                          01935000
                    IF I≠")" THEN GO TO L6;                                     01936000
                    I←2;  GO TO L1;                                             01937000
          LE:  END  STRMPROCDUR;                                                01938000
    REAL PROCEDURE  BALABALA(I);                                                01939000
    COMMENT ..................................................................  01940000
    :    THIS PROCEDURE PROCESSES A STRING OF ALGOL LANGUAGE UNTIL THE       :  01941000
    :NEXT IS A "]", ")","BEGIN","END" OR SEMICOLUMN.                         :  01942000
    :    VALUE OF RESULT:  0:  STOPPED AT A "]",")" OR SEMICOLUMN.           :  01943000
    :                      1:  STOPPED AT END-OF-FILE.                       :  01944000
    :                      3:  STOPPED AT "BEGIN".                           :  01945000
    :                      5:  STOPPED AT "END".                             :  01946000
    :                          -------- J. C. PAO   04/22/68 --------       :  01947000
    :.........................................................................;  01948000
        VALUE           I;                                                      01949000
        REAL            I;                                                      01950000
                BEGIN                                                           01951000
          REAL          STOP;                                                   01952000
          LABEL         L1,L2,L3,LE;                                            01953000
          LABEL         N1;                                                     01954000
          LABEL         C1,C2;                                                  01955000
          LABEL         W1,W2;                                                  01956000
          LABEL         WS1,WS2;                                                01957000
          LABEL         WP1,WP2,WP3;                                            01958000
          LABEL         WC1,WC2;                                                01959000
    IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"BALABA",NXT,I);                      01960000
                        IF (STOP←I.[36:6])≠0 THEN I←I.[42:6];                   01961000
                        IF I=4 THEN GO TO WS1 ELSE  % START TO PICK SUBSCRPT.   01962000
                        IF I=6 THEN GO TO WP1 ELSE  % START TO PICK PARTIAL.    01963000
                        IF I=10 THEN GO TO WS2;     % START TO PROCS STRM PR.   01964000
    COMMENT   THIS IS THE END-OF-FILE;                                          01965000
              L1:       IF EOF THEN                                             01966000
              L2:       BEGIN BALABALA←1; GO TO LE END;                         01967000
                        IF I=0 THEN                                             01968000
                        IF IFX=DFX+31 THEN                                      01969000
                        BEGIN I←FILLSTATEMENT; GO TO WP3 END;                   01970000
    COMMENT   THE NEXT CHARACTER IS A DIGIT;                                    01971000
              L3:       IF I←NXT.[42:6]=0 THEN                                  01972000
              N1:       BEGIN NUMBER; GO TO WC1 END;                            01973000
    COMMENT   THE NEXT CHARACTER IS A SPECIAL CHARACTER;                        01974000
                        IF I=2 THEN GO TO W1;                                   01975000
              C1:       IF I←NXT.[36:6]=";" THEN GO TO LE;                      01976000
                        IF I=")" THEN GO TO LE;                                 01977000
                        IF I="]" THEN GO TO LE;                                 01978000
                        IF I=STOP THEN GO TO LE;                                01979000
                        IF I="%" THEN BEGIN PERCENT; GO TO L1 END;              01980000
```

```
                IF I="""" THEN BEGIN STRING; GO TO WP1 END;                    01981000
                IF I="(" THEN                                                  01982000
                GO TO IF BOOLEAN(I←BRACKET(")",1)) THEN W2 ELSE                01983000
                      IF I=4 THEN WP1 ELSE L3;                                 01984000
                IF I="[" THEN                                                  01985000
                GO TO IF BOOLEAN(I←BRACKET("]",1)) THEN W2 ELSE L3;            01986000
                IF I="#" THEN                                                  01987000
                IF DFINE THEN BEGIN DFINEOUT; GO TO L1 END ELSE                01988000
                GO TO C2;                                                      01989000
                IF I="." THEN GO TO N1;  % MUST BE A DECIMAL POINT.            01990000
                IF I="@" THEN GO TO N1;  % EXPONENT.                           01991000
                IF I="&" THEN                                                  01992000
          C2:   BEGIN  % POSSIBLE ERROR.                                       01993000
                  IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;              01994000
                END;                                                           01995000
                IF NOT SCAN(1) THEN                                            01996000
                IF GENERATE THEN EDITING(1,1);  GO TO L1;                      01997000
COMMENT   THE NEXT CHARACTER IS A LETTER;                                      01998000
          W1:   IF BOOLEAN(I←CHECKNEXT(1)) THEN  % FORCE TO SCAN.              01999000
          W2:   BEGIN BALABALA←I; GO TO LE END;                                02000000
                IF I=0 THEN GO TO L1;                                          02001000
                IF I=2 THEN GO TO L3;                                          02002000
COMMENT   PICK UP THE SUBSCRIPTION IF THERE IS ANY;                            02003000
                IF I=4 THEN  % THIS ID MAY BE FOLLOWED BY [ ].                 02004000
          WS1:  GO TO IF (I←SUBSCRIPT)=8 THEN WP1 ELSE WP3;                    02005000
COMMENT   THIS IS A STREAM PROCEDURE CALL STATEMENT;                           02006000
                IF I=10 THEN                                                   02007000
          WS2:  GO TO IF (I←STRMPROCDUR)=8 THEN WP1 ELSE WP3;                  02008000
COMMENT   PICK UP THE PARTIAL-FIELD IF THERE IS ONE;                           02009000
          WP1:  IF EOF THEN GO TO L2;                                          02010000
                IF I←NXT.[42:6]=0 THEN GO TO N1;                               02011000
                IF I=4 THEN                                                    02012000
                IF I←NXT.[36:6]="," THEN GO TO WP2 ELSE                        02013000
                IF I="&" THEN GO TO WC2;                                       02014000
                IF (I←CHECKNEXT(4&","[36:42:6]))=8 THEN                        02015000
          WP2:  BEGIN  % THE NEXT IS A ",".                                    02016000
                  IF NOT SCAN(1) THEN                                          02017000
                  IF GENERATE THEN EDITING(1,1);                               02018000
                  IF (I←PARTIAL(1))=8 THEN GO TO WC1;                          02019000
                END ELSE                                                       02020000
                IF I=2 THEN                                                    02021000
                IF NXT.[36:6]="&" THEN GO TO WC2;                              02022000
          WP3:  GO TO IF BOOLEAN(I) THEN W2 ELSE IF I=4 THEN WS1 ELSE          02023000
                      IF I=6 THEN WP1 ELSE L1;                                 02024000
COMMENT   PICK UP THE CONCATENATE-FIELD IF THERE ARE ANY;                      02025000
          WC1:  IF EOF THEN GO TO W2;                                          02026000
                IF NXT.[36:6]="&" THEN GO TO WC2;                              02027000
                IF NXT.[42:6]=0 THEN GO TO N1;                                 02028000
                IF (I←CHECKNEXT(4&"&"[36:42:6]))=8 THEN                        02029000
          WC2:  BEGIN                                                          02030000
                  IF NOT SCAN(1) THEN                                          02031000
                  IF GENERATE THEN EDITING(1,1);                               02032000
                  IF (I←CONCATENATE)=8 THEN GO TO WC1;                         02033000
                END;                                                           02034000
                GO TO WP3;                                                     02035000
          LE:   END  BALABALA;                                                 02036000
REAL PROCEDURE      STATEMENT;                                                 02037000
COMMENT ..........................................................             02038000
;    THIS PROCEDURE PROCESSES THE ALGOL LANGUAGE AND STOPS AFTER A             ;02039000
; SEMICOLUMN.                                                                  ;02040000
```

```
:    VALUE OF RESULT:  0:  STOPPED AFTER A SEMICOLUMN.                    :02041000
:                      1:  STOPPED AT END-OF-FILE.                        :02042000
:                      3:  STOPPED AT "BEGIN".                            :02043000
:                      5:  STOPPED AT "END".                              :02044000
:                          -------- J. C. PAO   05/01/68 --------         :02045000
:.....:02046000
            BEGIN                                                          02047000
      REAL          I;                                                     02048000
        LABEL       L1,L2,LE;                                              02049000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"STATEM",NXT);                       02050000
                    IF NXT.[36:6]=";" THEN GO TO L2;                       02051000
          L1:       IF BOOLEAN(I←BALABALA(0)) THEN                         02052000
                    BEGIN STATEMENT←I; GO TO LE END;                       02053000
                    IF NXT.[36:6]≠";" THEN                                 02054000
                    BEGIN                                                  02055000
                      IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;      02056000
                      IF NOT SCAN(1) THEN                                  02057000
                      IF GENERATE THEN EDITING(1,1); GO TO L1;             02058000
                    END;                                                   02059000
          L2:       IF NOT SCAN(1) THEN                                    02060000
                    IF GENERATE THEN EDITING(1,1);                         02061000
          LE: END   STATEMENT;                                             02062000
BOOLEAN PROCEDURE   SKIPUNTIL(CH);                                         02063000
COMMENT .....02064000
:    THIS PROCEDURE SKIPS UNTIL THE GIVEN SPECIAL CHARACTER "CH".          :02065000
:    VALUE OF RESULT:  TRUE:  "CH" NOT FOUND.                              :02066000
:                      1:  END-OF-FILE.                                    :02067000
:                      3:  "BEGIN".                                        :02068000
:                      5:  "END".                                          :02069000
:                          -------- J. C. PAO   04/25/68 --------         :02070000
:.....:02071000
      VALUE         CH;                                                    02072000
      REAL          CH;                                                    02073000
            BEGIN                                                          02074000
        REAL        I;                                                     02075000
        LABEL       L1,LE;                                                 02076000
          L1:       IF (I←CHECKNEXT(4&CH[36:42:6]))=8 THEN GO TO LE;       02077000
                    IF BOOLEAN(I) THEN                                     02078000
                    BEGIN SKIPUNTIL←BOOLEAN(I); GO TO LE END;              02079000
                    IF I≠2 THEN GO TO L1;                                  02080000
                    IF NXT.[36:6]="""" THEN BEGIN STRING; GO TO L1 END;    02081000
                    IF NOT SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN        02082000
                    IF GENERATE THEN EDITING(1,NCR); GO TO L1;             02083000
          LE: END   SKIPUNTIL;                                             02084000
PROCEDURE           BUILDEFINE;                                            02085000
COMMENT .....02086000
:    THIS PROCEDURE ENTERS A FIRST LEVEL DEFINE DECLARATION INTO THE       :02087000
:INFO[*,*] AS WELL AS DESK-FILE.  INSIDE THE DEFINE BODY, EACH "[" WILL    :02088000
:START WITH A NEW RECORD AND THE 9TH WORD, BIT[44:1] INDICATES THIS "["    :02089000
:IS QUESTIONABLE TO BE USED AS A PATIAL-FIELD OR CONCATENATE-FIELD.         :02090000
:THE BIT INDEX WILL BE CHANGED INTO 47 MINUS THAT INDEX IF THE NEXT IS     :02091000
: A ":".                                                                   :02092000
:                          -------- J. C. PAO   04/27/68 --------         :02093000
:.....:02094000
            BEGIN                                                          02095000
      OWN INTEGER IC;       % CURRENT ADDRESS OF DCI[*].                   02096000
      OWN INTEGER BB;       % NO. OF BLANKS PRECEEDING BUILDING DEFINE.    02097000
      OWN INTEGER LST;      % THE CHR-CODE OF THE LAST CHR EDITED.         02098000
      OWN INTEGER AVC;      % NO. OF AVAILABLE CHRS IN DCI[*].             02099000
STREAM PROCEDURE    DFER(F,E);                                             02100000
```

```
                BEGIN                                                          02101000
        LOCAL       NC;                                                        02102000
                    DI←F; DS←28 LIT"XXXXXXXX DEFINES FOLLOWING ";              02103000
                    DS←LIT""""; F←DI; DS←11 LIT"    "; SI←F; DS←9 WDS;         02104000
                    DS←8 LIT"XXXX";                                            02105000
                    SI←E; SI←SI+2; DI←LOC NC; DI←DI+7; DS←CHR;                 02106000
                    DI←F; DS←NC CHR; DS←LIT""""; DS←13 LIT" ARE IGNORED.";     02107000
                END DFER;                                                      02108000
PROCEDURE           EDIT(OP,NC);                                               02109000
COMMENT ..........................................................             02110000
:  THIS PROCEDURE EDITS THE 1ST LEVEL FEFINE DECLARATION INTO DCI[*].          :02111000
:THIS IS SO CALLED "BUILD THE FEFINE". "OP" INDICATES THE TYPE OF              :02112000
:EDITING OPERATIONS:                                                           :02113000
:  OP=0: SET "NC" NUMBER OF BLANKS.                                            :02114000
:  OP=1: TRANSFER "NC" NUMBER OF CHARACTERS.                                   :02115000
:  OP=2: MAKE A STRING WHICH HAS "NC" NUMBER OF CHARACTERS EXCLUDING           :02116000
:        BOTH QUOTATIONS.                                                      :02117000
:                        -------- J. C. PAO  04/28/68 --------                :02118000
:..............................................................;              02119000
      VALUE         OP,NC;                                                     02120000
      REAL          OP,NC;                                                     02121000
                BEGIN                                                          02122000
STREAM PROCEDURE    EDT(T,F,LST,OP,NC);                                        02123000
      VALUE         F,OP,NC;                                                   02124000
                BEGIN                                                          02125000
        LOCAL       I;                                                         02126000
        LABEL       L1;                                                        02127000
                    SI←T; DI←LOC I; DS←WDS; DI←I;                              02128000
                    SI←LOC OP; SKIP SB;                                        02129000
                    IF SB THEN DS←LIT" "; SI←SI+6;                             02130000
                    IF SC="1" THEN                                             02131000
                    BEGIN % TRANSFER CHARACTERS.                               02132000
                      SI←F; DS←NC CHR; NC←DI;                                  02133000
                      DI←LST; DS←7 LIT"0000";                                  02134000
                      SI←NC; SI←SI-1;                                          02135000
                      IF SC>"9" THEN DS←LIT"4" ELSE                            02136000
                      IF SC≥"0" THEN DS←LIT"0" ELSE                            02137000
                      IF SC=ALPHA THEN DS←LIT"2" ELSE DS←LIT"4";               02138000
                    END ELSE                                                   02139000
                    IF SC="0" THEN                                             02140000
                    BEGIN % SET BLANKS.                                        02141000
                      NC(DS←LIT" ");  SI←LOC NC; SI←SI+6;                      02142000
                      IF SC≠"0" THEN                                           02143000
                      BEGIN  I←DI;  DI←LOC F; DI←DI+7; DS←CHR;                 02144000
                        DI←I;  F(2(DS←32 LIT"    "));                         02145000
                      END;  GO TO L1;                                          02146000
                    END ELSE                                                   02147000
                    BEGIN % TRANSFER A STRING.                                 02148000
                      DS←LIT""""; SI←F; DS←NC CHR; DS←LIT"""";                 02149000
          L1:       NC←DI;  DI←LST; DS←7 LIT"0000"; DS←LIT"4";               02150000
                    END;                                                       02151000
                    SI←LOC NC; DI←T; DS←WDS;                                   02152000
                END EDT;                                                       02153000
        REAL        A;                                                         02154000
        BOOLEAN     B;                                                         02155000
        LABEL       LE;                                                        02156000
IF DEBUGN=3 THEN                                                               02157000
BEGIN WRITE(FOU,DBG,"**EDIT");                                                 02158000
      DUMPARRAY(DCI,0,11,FOU,1,"DCI[*]",DST);                                  02159000
      DUMPARRAY(EV,0,18,FOU,1,"EV[*]",EST);                                    02160000
```

```
        WRITE(FOU,DBG,OP,NC,AVC,BB,LST,FST,IC);                                 02161000
    END;                                                                        02162000
                    IF NC=0 THEN                                                02163000
                    IF OP≠0 THEN GO TO LE;                                      02164000
                    IF AVC<(A←IF OP=0 THEN NC ELSE                              02165000
                    (IF OP=2 THEN NC+2 ELSE NC)+REAL(B←LST≠4 AND FST≠4))        02166000
                    THEN                                                        02167000
                    BEGIN  % ITEM CAN NOT BE HELD ON THIS CARD.                 02168000
                      IF AVC>0 THEN EDT(IC,0,LST,0,AVC);                        02169000
                      IF AVC≥0 THEN WRITE(DFSK[DX←DX+1],12,DCI[*]);             02170000
                      IC←DST;  % RESTART WITH A NEW CARD IMAGE.                 02171000
                      IF BB=0 THEN AVC←72 ELSE                                  02172000
                      IF BB+NC≤72 THEN                                          02173000
                      BEGIN  EDT(IC,0,LST,0,BB);  AVC←72-BB;                    02174000
                        IF B THEN                                               02175000
                          BEGIN B←FALSE; A←IF OP=2 THEN NC+2 ELSE NC END;       02176000
                      END ELSE AVC←72;  DCI[9]←INV&5[42:42:6];                  02177000
                    END;                                                        02178000
                    IF BOOLEAN(EV[0].[1:1]) THEN DCI[9].[36:6]←1;               02179000
                    IF A≠0 THEN EDT(IC,EST,LST,IF B THEN -OP ELSE OP,NC);       02180000
                    IF (AVC←AVC-A)=0 THEN                                       02181000
                    IF OP=0 THEN                                                02182000
                    BEGIN  % END OF THE CARD, GO TO CB[*,*].                    02183000
                      WRITE(DFSK[DX←DX+1],12,DCI[*]);                           02184000
                      DCI[9]←INV&5[42:42:6];  AVC←-1;                           02185000
                    END;                                                        02186000
    IF DEBUGN=3 THEN                                                            02187000
    BEGIN                                                                       02188000
        DUMPARRAY(DCI,0,11,FOU,1,"DCI[*]",DST);                                 02189000
        DUMPARRAY(CI,0,11,FOU,1,"CI[*]:",IST);                                  02190000
        WRITE(FOU,DBG,OP,NC,AVC,BB,LST,FST,IC);                                 02191000
        WRITE(FOU,DBG,"←←EDIT");                                                02192000
    END;                                                                        02193000
        LE:  END  EDIT;                                                         02194000
    REAL PROCEDURE     CHECKNXT(NEXT);                                          02195000
    COMMENT ;.....................................................................02196000
    :    THIS PROCEDURE CHECKS THE "NXT" AGAINST THE GIVEN "NEXT".              :02197000
    :    VALUE OF RESULT:                                                       :02198000
    :      0: NOT MATCH:  NOTHING ELSE SCANNED. "NXT" IS A CHR OR DIGIT.        :02199000
    :      1: END-OF-FILE.                                                      :02200000
    :      2: NOT MATCH:  THE "NXT" IS SCANNED.                                 :02201000
    :      4: NOT MATCH:  THE "NXT" IS PROCESSED.  (SCANNING ERROR)             :02202000
    :      6: MATCHES.                                                          :02203000
    :                          --------  J. C. PAO   04/26/68  --------        :02204000
    :.....................................................................;      02205000
        VALUE          NEXT;                                                    02206000
        REAL           NEXT;                                                    02207000
              BEGIN                                                             02208000
          LABEL        L1,L2,LE;                                                02209000
            L1:        IF EOF THEN BEGIN CHECKNXT←1; GO TO LE END;              02210000
                       IF NXT=NEXT THEN BEGIN CHECKNXT←6; GO TO LE END;         02211000
                       IF NXT.[36:6]="%" THEN                                   02212000
                       BEGIN PERCENT; GO TO L1 END;                             02213000
                       IF NXT.[42:6]≠2 THEN GO TO LE;                           02214000
    COMMENT  CHECK THE "NXT" MAY BE A COMMENT;                                  02215000
                       IF SCAN(5) THEN BEGIN CHECKNXT←4; GO TO LE END;          02216000
                       IF NCR≠7 THEN GO TO L2;                                  02217000
                       IF EV[0].[18:30]≠"COMME" THEN GO TO L2;                  02218000
                       EV[2]←"NT";                                              02219000
                       IF COMPAREA(EV[1],EV[2],0,6,2)≠0 THEN                    02220000
```

```
          L2:       BEGIN CHECKNXT←2; GO TO LE END;                          02221000
                    COMMNT;  GO TO L1;  * IT IS COMMENT, RE-CHECK.           02222000
LE:IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"CHNXTO",NXT,NEXT) END; COMMENT     02223000
          LE:  END  CHECKNXT;                                                02224000
PROCEDURE           SKIPDEFINE;                                              02225000
COMMENT .....................................................................02226000
:    THIS PROCEDURE SKIPS UNTIL AFTER A "#".  THE COMMENTS, STRINGS,        :02227000
:DEFINES AND "%"S ARE RECOGNIZED.                                           :02228000
:                          -------- J. C. PAD   04/25/68 --------          :02229000
:.....................................................................;     02230000
                BEGIN                                                       02231000
        REAL        I,UNTL;                                                 02232000
        LABEL       L1,L2,LE;                                               02233000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"SKIPDF",NXT);                        02234000
                    UNTL←4&"#"[36:42:0];                                    02235000
          L1:       IF (I←CHECKNXT(UNTL))=6 THEN                            02236000
                    BEGIN  % END OF THE DEFINE.                             02237000
                      IF NOT SCAN(1) THEN                                   02238000
                      IF GENERATE THEN EDITING(1,1);                        02239000
                      GO TO LE;                                             02240000
                    END;                                                    02241000
                    IF I=4 THEN GO TO L1;                                   02242000
                    IF BOOLEAN(I) THEN GO TO LE;                            02243000
                    IF I=0 THEN                                             02244000
                    IF NXT.[36:6]="""" THEN                                 02245000
                    BEGIN STRING; GO TO L1 END ELSE                         02246000
                    IF SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN GO TO L1;   02247000
COMMENT  CHECK IF THERE IS ANY DEFINE INSIDE THIS DEFINE;                   02248000
                    IF NCR=6 THEN                                           02249000
                    IF EV[0].[18:30]="DEFIN" THEN                           02250000
                    BEGIN  EV[2]←"E";                                       02251000
                      IF COMPARLA(EV[1],EV[2],0,7,1)=0 THEN                 02252000
                      BEGIN                                                 02253000
                        IF GENERATE THEN EDITING(1,6);                      02254000
          L2:           SKIPDEFINE;                                         02255000
                        IF (I←CHECKNXT(4&";"[36:42:6]))=6 THEN              02256000
                        BEGIN                                               02257000
                          IF NOT SCAN(1) THEN                               02258000
                          IF GENERATE THEN EDITING(1,1);  GO TO L1;         02259000
                        END;                                                02260000
                        IF BOOLEAN(I) THEN GO TO LE;                        02261000
                        IF I=4 THEN GO TO L2;                               02262000
                        IF I=0 THEN                                         02263000
                        IF SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN         02264000
                        GO TO L2;                                           02265000
                        IF GENERATE THEN EDITING(1,NCR);                    02266000
                        GO TO L2;                                           02267000
                      END;                                                  02268000
                    END;                                                    02269000
                    IF GENERATE THEN EDITING(1,NCR);  GO TO L1;             02270000
          LE:  END  SKIPDEFINE;                                             02271000
REAL PROCEDURE      GHGDFN47;                                               02272000
COMMENT .....................................................................02273000
:    THIS PROCEDURE CHANGES THE VALUE INSIDE A PARTIAL-FIELD OR A           :02274000
:CONCATENATE-FIELD INTO 47 MINUS THAT VALUE.  THIS CHGE IS MADE, IF AND     :02275000
:ONLY IF THE NEXT IS A ":".  **** ONLY BE CALLED WHEN DFINE=FALSE ****      :02276000
:    VALUE OF RESULT:                                                       :02277000
:      0: NOT CHANGED AND NOTHING PROCESSED.                                :02278000
:      1: ERROR CAUSES THE ENTIRE DEFINE IGNORED.                           :02279000
:      2: NOT CHANGED BUT SOMETHING PROCESSED.                              :02280000
```

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:       4: NOT CHANGED BUT MORE THAN ONE ITEM PROCESSED.                    :02281000
:       6: CHANGED.                                                         :02282000
:                          -------- J. C. PAO   04/25/68 --------          :02283000
:.....................................................................;02284000
            BEGIN                                                           02285000
      REAL        I,J,K;                                                    02286000
      LABEL       L1,L2,L3,L4,LE;                                           02287000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"CHNG47",NXT);                        02288000
COMMENT  SCAN FOR THE ITEM SUPPOSEDLY TO BE CHANGED AND SEE WHAT IT IS;     02289000
                  IF BOOLEAN(I←CHECKNXT(1)) THEN                            02290000
        L1:       BEGIN CHGDFN47←1; GO TO LE END;                           02291000
                  IF I=4 THEN GO TO L1;                                     02292000
                  IF I=0 THEN                                               02293000
                  BEGIN                                                     02294000
                    IF NXT.[42:6]=4 THEN GO TO LE ELSE                      02295000
                    IF SCAN(0) THEN GO TO L1;                               02296000
                  END ELSE                                                  02297000
                  % HERE I=2: IT WAS A WORD JUST SCANNED.                   02298000
                  IF NCR=6 THEN                                             02299000
                  IF EV[0].[18:30]="DEFIN" THEN                             02300000
                  BEGIN  EV[2]←"E";                                         02301000
                    IF COMPAREA(EV[1],EV[2],0,7,1)=0 THEN                   02302000
                    BEGIN                                                   02303000
                      IF GENERATE THEN EDITING(1,NCR);  GO TO L1;           02304000
                    END;                                                    02305000
                  END;                                                      02306000
COMMENT  CHECK THE NEXT ITEM, CHANGE WILL BE MADE IF IT IS A ":";           02307000
                  IF NXT.[42:6]=0 THEN                                      02308000
        L2:       BEGIN  CHGDFN47←2;                                        02309000
        L3:         EDIT(1,NCR);                                            02310000
                    IF GENERATE THEN EDITING(1,NCR);                        02311000
                    GO TO LE;                                               02312000
                  END;                                                      02313000
                  IF NXT.[42:6]=4 THEN                                      02314000
                  IF NXT.[36:6]=":" THEN GO TO L4 ELSE                      02315000
                  IF NXT.[36:6]≠"%" THEN GO TO L2;                          02316000
      COMMENT  THE NEXT ITEM IS NOT ":", BUT THE ":" MAY COME AFTER "%"S OR 02317000
               COMMENTS.  AT THIS POINT START THE GENERATING PROCESS ANYWAY. 02318000
               NOTE: THE "%"S OR COMMENTS WILL BE MOVED INTO THE FRONT OF THE 02319000
               ITEM TO BE CHANGED, REGARDLESS THE CHANGE IS MADE OR NOT;     02320000
                  IF NOT GENERATE THEN STARTGEN;                            02321000
                  TRNSFCHR(A[0],EV[0],0,3,J←NCR);                           02322000
                  IF (K←CHECKNXT(4&":"[36:42:6]))=6 THEN                    02323000
                  BEGIN TRNSFCHR(EV[0],A[0],3,0,NCR←J); GO TO L4 END;       02324000
                  IF BOOLEAN(K) THEN GO TO L1;                              02325000
                  IF K=4 THEN  % 2 ITEMS SWITCHED, IT IS BAD ANY WAY.       02326000
                  BEGIN  TRNSFCHR(EV[0],A[0],3,0,J);                        02327000
                    IF NOT GENERATE THEN STARTGEN;  EDITING(1,J);           02328000
                    GO TO L1;                                               02329000
                  END;                                                      02330000
                  IF K=0 THEN                                               02331000
                  BEGIN TRNSFCHR(EV[0],A[0],3,0,NCR←J); GO TO L2 END;       02332000
                  TRNSFCHR(B[0],EV[0],0,3,NCR);                             02333000
                  TRNSFCHR(EV[0],A[0],3,0,J);                               02334000
                  EDIT(1,J);                                                02335000
                  IF NOT GENERATE THEN STARTGEN;  EDITING(1,J);             02336000
                  TRNSFCHR(EV[0],B[0],3,0,NCR);                             02337000
                  CHGDFN47←4;  GO TO L3;                                    02338000
        L4:       EDIT(1,NCR);                                              02339000
                  IF I=2 THEN                                               02340000
```

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                    BEGIN  I←EV[0]; EV[0]←0&"47-"[18:30:18];                02341000
                      IF NOT GENERATE THEN STARTGEN;                        02342000
                      EDITING(1,3); EV[0]←I; EDITING(1,NCR);                02343000
                    END ELSE FOURTY7(0);                                    02344000
                    IF SCAN(1) THEN GO TO L1;                               02345000
                    EDIT(1,1);                                              02346000
                    IF GENERATE THEN EDITING(1,1);                          02347000
                    CHGDFN47←6;                                             02348000
          LE:  END  CHGDFN47;                                               02349000
BOOLEAN PROCEDURE   BRCKT;                                                  02350000
COMMENT .....................................................................02351000
:    THIS PROCEDURE CHECKS THE DEFINE-STRING STARTING WITH A "[".  IF   :02352000
:THE "[" IS A PARTIAL-FIELD OR CONCATENATE-FIELD, DCI[9].[44:1]←1.      :02353000
:    VALUE OF RESULT:  TRUE: ERRORS CAUSE THE DEFINE BE IGNORED.       :02354000
:                      -------- J. C. PAO   04/25/68 --------          :02355000
:.....................................................................;02356000
            BEGIN                                                           02357000
        REAL        I,D,BST;                                                02358000
        LABEL       L1,L3,L34,L4,L5,LE;                                     02359000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"BRCKDF",NXT);                        02360000
                    IF AVC≥0 THEN EDIT(0,AVC); % STARTS A NEW CARD AT [.    02361000
                    IF DFINE THEN DCI[9].[36:9]←CV[9].[36:9] ELSE           02362000
                    BST←DX←1;                                               02363000
                    IF SCAN(1) THEN                                         02364000
          L1:       BEGIN BRCKT←TRUE; GO TO LE END;                         02365000
                    EDIT(1,1);                                              02366000
                    IF GENERATE THEN EDITING(1,1);                          02367000
                    IF DFINE THEN GO TO LE;                                 02368000
                    IF (I←CHGDFN47)=0 THEN D←1 ELSE                         02369000
                    GO TO IF BOOLEAN(I) THEN L1 ELSE LE;                    02370000
          L3:       IF BOOLEAN(I←CHGDFN47) THEN GO TO L1;                   02371000
                    IF I=6 THEN                                             02372000
                    IF (D←D+1)≤2 THEN GO TO L3 ELSE                         02373000
          L34:      BEGIN  % FLAG THE ERROR.                                02374000
                      ERROR; CI[9].[36:6]←1;  D←D&1[39:42:6]; GO TO L5;     02375000
                    END;                                                    02376000
                    IF I=2 THEN                                             02377000
                    BEGIN                                                   02378000
                      IF EOF THEN GO TO L1;                                 02379000
                      IF NXT.[36:6]="]" THEN                                02380000
          L4:         BEGIN                                                 02381000
                        IF SCAN(1) THEN GO TO L1;                           02382000
                        EDIT(1,1);                                          02383000
                        IF GENERATE THEN EDITING(1,1);                      02384000
          L5:           IF BST>DX THEN DCI[9].[36:9]←D ELSE                 02385000
                        BEGIN  READ(DFSK[BST],12,A[*]);                     02386000
                          A[9].[36:9]←D;  WRITE(DFSK[BST],12,A[*]);         02387000
                        END;  GO TO LE;                                     02388000
                      END;                                                  02389000
                      IF NXT.[42:6]=0 THEN GO TO L34;                       02390000
                      IF (I←CHECKNEXT(4&"]"[36:42:6]))=6 THEN GO TO L4;     02391000
                      IF I=4 THEN GO TO L1;                                 02392000
                      IF BOOLEAN(I) THEN GO TO L1;                          02393000
                      IF I=2 THEN                                           02394000
                      BEGIN  EDIT(1,NCR);                                   02395000
                        IF GENERATE THEN EDITING(1,NCR);                    02396000
                      END;  GO TO L34;                                      02397000
                    END ELSE GO TO L34;                                     02398000
          LE:  END  BRCKT;                                                  02399000
BOOLEAN PROCEDURE   DFNBODY;                                                02400000
```

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COMMENT ..........................................................02401000
:    THIS PROCEDURE BUILD THE BODY OF A DEFINE IN TO DFSK-FILE.  IF IT :02402000
:IS NOT DURING THE EXECUTION OF A DEFINE THE PARTIAL-FIELD AND THE     :02403000
:CONCATENATE-FIELD WILL BE CHANGED.                                    :02404000
:    VALUE OF RESULT:  TRUE: ERROR CAUSES THE ENTIRE DEFINE IGNORED.   :02405000
:                      -------- J. C. PAU   04/25/68 --------:02406000
:..........................................................;02407000
            BEGIN                                                      02408000
      REAL      I,J;                                                   02409000
      LABEL     L1,L2,L3,L34,L4,LE;                                    02410000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"DFBUDY",NXT);                   02411000
      L1:       IF EOF THEN GO TO L3;                                  02412000
                IF (I←NXT.[42:6])=4 THEN                               02413000
                BEGIN                                                  02414000
                  IF J←NXT.[36:6]="[" THEN                             02415000
                  GO TO IF BRCKT THEN L2 ELSE L1;                      02416000
                  IF J="'" THEN                                        02417000
                  BEGIN STRING; EDIT(2,NCR); GO TO L1 END;             02418000
                  IF J="%" THEN                                        02419000
                  BEGIN PERCENT; GO TO L1 END;                         02420000
                END;                                                   02421000
                IF SCAN(IF I=2 THEN 5 ELSE IF I=4 THEN 1 ELSE 0) THEN  02422000
      L2:       BEGIN  SKIPDEFINE;                                     02423000
      L3:         DFNBODY←TRUE;  GO TO LE;                             02424000
                END;                                                   02425000
                IF I=2 THEN                                            02426000
                IF NCR=7 THEN                                          02427000
                IF EV[0].[18:30]="COMME" THEN                          02428000
                BEGIN  EV[2]←"NT";                                     02429000
                  IF COMPAREA(EV[1],EV[2],0,6,2)=0 THEN                02430000
                  BEGIN COMMNT; GO TO L1 END;                          02431000
                END;                                                   02432000
                EDIT(1,NCR);                                           02433000
                IF GENERATE THEN EDITING(1,NCR);                       02434000
                IF I=4 THEN                                            02435000
                IF J="#" THEN GO TO LE ELSE                            02436000
                IF J=":" THEN                                          02437000
                BEGIN ERROR; DCI[9].[36:6]←1; CI[9].[36:6]←1 END;      02438000
                IF I≠2 THEN GO TO L1;                                  02439000
                IF NCR≠6 THEN GO TO L1;                                02440000
                IF EV[0].[18:30]≠"DEFIN" THEN GO TO L1;                02441000
                EV[2]←"E";                                             02442000
                IF COMPAREA(EV[1],EV[2],0,7,1)≠0 THEN GO TO L1;        02443000
COMMENT  PROCESSES THE DEFINES INSIDE THIS DEFINE;                     02444000
      L34:      IF BOOLEAN(I←CHECKNXT(1)) THEN GO TO L3;               02445000
                IF I≠2 THEN  % DEFINE ID DOESNT START WITH A LETTER.   02446000
      L4:       BEGIN  SKIPDEFINE;                                     02447000
                  GO TO IF EOF THEN L3 ELSE                            02448000
                  IF NXT.[36:6]=";" THEN L2 ELSE                       02449000
                  IF I←CHECKNXT(4&";"[36:42:6])=6 THEN L2 ELSE L4;     02450000
                END;                                                   02451000
                EDIT(1,NCR);                                           02452000
                IF GENERATE THEN EDITING(1,NCR);                       02453000
                IF EOF THEN GO TO L3;                                  02454000
                IF NXT.[36:6]≠"=" THEN                                 02455000
                BEGIN                                                  02456000
                  IF (I←CHECKNXT(4&"="[36:42:6]))=0 THEN               02457000
                  IF NXT.[36:6]="(" THEN                               02458000
                  BEGIN                                                02459000
                    IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;    02460000
```

```
                LFX←NFX;  I←BRACKET(")",1);  LFX←1;                    02461000
                IF I=4 THEN                                             02462000
                BEGIN  EV[0]←"0&"()"[18:36:12]; EDIT(1,2);              02463000
                  IF EOF THEN GO TO L3;                                 02464000
                  I←IF NXT.[36:6]="=" THEN 6 ELSE                       02465000
                  CHECKNXT(4&"="[36:42:6]);                             02466000
                END;                                                    02467000
              END;                                                      02468000
              IF BOOLEAN(I) THEN GO TO L3;                              02469000
              IF I=2 THEN                                               02470000
              BEGIN                                                     02471000
                IF GENERATE THEN EDITING(1,NCR); GO TO L4;              02472000
              END;                                                      02473000
              IF I≠6 THEN GO TO L4;                                     02474000
            END;                                                        02475000
            IF SCAN(1) THEN GO TO L4;                                   02476000
            EDIT(1,1);                                                  02477000
            IF GENERATE THEN EDITING(1,1);                              02478000
            IF DFNBODY THEN GO TO L4;                                   02479000
            IF EOF THEN GO TO L3;                                       02480000
            IF J←NXT.[36:6]≠"," THEN                                    02481000
            IF J≠";" THEN                                               02482000
            BEGIN                                                       02483000
              IF BOOLEAN(I←CHECKNXT(4&",","[36:42:6])) THEN             02484000
              GO TO L3;                                                 02485000
              IF I=2 THEN                                               02486000
              BEGIN                                                     02487000
                IF GENERATE THEN EDITING(1,NCR); GO TO L4;              02488000
              END;                                                      02489000
              IF I=0 THEN                                               02490000
                IF NXT.[36:6]≠";" THEN GO TO L4 ELSE                    02491000
                IF I≠6 THEN GO TO L4;                                   02492000
              END;                                                      02493000
              IF SCAN(1) THEN GO TO L2;                                 02494000
              EDIT(1,1);                                                02495000
              IF GENERATE THEN EDITING(1,1);                            02496000
              GO TO IF J=";" THEN L1 ELSE L34;                          02497000
        LE:   END  DFNBODY;                                             02498000
        REAL       I,J,INFOINX,DFST;                                    02499000
        LABEL      H0,H1,H12,H14,H2,HE;                                 02500000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"BULDFN",NXT,DX);                 02501000
COMMENT  INITIALIZING THE EDIT-PROCEDURE IN THIS BLOCK;                 02502000
              BB←2;  % BLANKS IN THE FRONT OF EACH CARD.                02503000
              DFST←DX;  AVC←-1;  DCI[9]←INV&5[42:42:6];                 02504000
COMMENT  SCAN FOR THE DEFINE IDENTIFIER;                                02505000
        H0:   IF BOOLEAN(I←CHECKNXT(1)) THEN GO TO H1;                  02506000
              IF I≠2 THEN  % DEFINE ID DOSNT START WITH A LETTER,       02507000
        H1:   BEGIN  DX←DFST;                                           02508000
                IF INFOINX=0 THEN                                       02509000
                BEGIN  INF[0]←"6DEFIN"; INF[1]←0&"E"[1:43:5];           02510000
                  DFER(FOU(0),INF[0]);                                  02511000
                END ELSE                                                02512000
                DFER(FOU(0),INFO[INFOINX.[35:5],INFOINX.[40:8]]);       02513000
                RELEASE(FOU);                                           02514000
        H12:    IF EOF THEN GO TO HE ELSE SKIPDEFINE;                   02515000
                IF EOF THEN GO TO HE;                                   02516000
                IF NXT.[36:6]=";" THEN                                  02517000
        H14:    BEGIN                                                   02518000
                  IF NOT SCAN(1) THEN                                   02519000
                  IF GENERATE THEN EDITING(1,1); GO TO HE;              02520000
```

```
                    END ELSE  GO TO                                          02521000
                    IF CHECKNXT(4&";"[36:42:6])=6 THEN H14 ELSE H12;         02522000
                  END;                                                       02523000
                  IF GENERATE THEN EDITING(1,NCR);                           02524000
      COMMENT  BUILD IN INF[*] THE ENTRY OF THIS DEFINE.  INF[*] WILL BE MOVED02525000
               TO INFO[*,*] WHEN THE PROCESS IS COMPLETE WITH NO ERROR;       02526000
                  INF[1]←EV[0]&NCR[1:31:17];                                 02527000
                  IF NCR>5 THEN                                              02528000
                  BEGIN                                                      02529000
                    INF[0]←-(NCR+10) DIV 8;  % ADDITIONAL INFO REL INX.      02530000
                    TRNSFWDS(INF[2],EV[1],-INF[0]-1);                        02531000
                  END ELSE INF[0]←-1;                                        02532000
      COMMENT  PICK UP THE "=", AFTER WHICH, THE DEFINE BODY STARTS;         02533000
                  IF EOF THEN GO TO H1;                                      02534000
                  IF NXT.[36:6]="=" THEN GO TO H2;                           02535000
                  IF (I←CHECKNXT(4&"="[36:42:6]))=6 THEN GO TO H2;           02536000
                  IF I=0 THEN                                                02537000
                  IF NXT.[36:6]="(" THEN                                     02538000
                  BEGIN                                                      02539000
                    IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;          02540000
                    LFX←NFX;  I←BRACKET(")",1);  LFX←1;                      02541000
                    IF I=4 THEN                                              02542000
                    IF (I←CHECKNXT(4&"="[36:42:6]))=6 THEN                   02543000
                    BEGIN EV[0].[1:1]←1; EDIT(0,0); GO TO H2 END;            02544000
                  END;                                                       02545000
                  IF I=2 THEN                                                02546000
                  IF GENERATE THEN EDITING(1,NCR);                           02547000
                  GO TO H1;                                                  02548000
      COMMENT  START TO BUILD THE DEFINE BODY INTO DFSK-FILE;                02549000
               H2:  IF NOT SCAN(1) THEN                                      02550000
                  IF GENERATE THEN EDITING(1,1);                             02551000
                  INF[1-INF[0]]←DX+1;  % STORE DFSK-INDEX OF FEFINE.         02552000
                  IF DFNBODY THEN GO TO H1;                                  02553000
      COMMENT  COMPLETE BUILDING THIS DEFINE, ENTER IT TO INFO[*,*];         02554000
                  IF AVC≥0 THEN EDIT(0,AVC);                                 02555000
                  INFOINX←INFOENTRY(INF,2-INF[0]);                           02556000
                  DFST←DX;                                                   02557000
      IF DEBUGN=3 THEN                                                       02558000
      BEGIN                                                                  02559000
            DUMPARRAY(INFO[0,*],0,255,FOU,1,"INFO:0",HEX);                   02560000
            FOR I←0 STEP 1 UNTIL DX DO                                       02561000
            BEGIN READ(DFSK[I],12,A[*]);DUMPARRAY(A,0,11,FOU,1,"DFSK :",I)END;02562000
      END;                                                                   02563000
      COMMENT  PICK UP THE SEMICOLUMN OR THE COMMA AFTER THIS DEFINE;        02564000
                  IF J←NXT.[36:6]≠";" THEN                                   02565000
                  IF J≠"," THEN                                              02566000
                  BEGIN                                                      02567000
                    IF BOOLEAN(I←CHECKNXT(4&";"[36:42:6])) THEN              02568000
                    GO TO H1;                                                02569000
                    IF I=2 THEN                                              02570000
                    BEGIN                                                    02571000
                      IF GENERATE THEN EDITING(1,NCR);  GO TO H1;            02572000
                    END;                                                     02573000
                    IF I=0 THEN                                              02574000
                    BEGIN IF J←NXT.[36:6]≠"," THEN GO TO H1 END ELSE         02575000
                    IF I=6 THEN J←NXT.[36:6] ELSE GO TO H1;                  02576000
                  END;                                                       02577000
                  IF NOT SCAN(1) THEN                                        02578000
                  IF GENERATE THEN EDITING(1,1);                             02579000
                  IF J≠";" THEN GO TO H0;                                    02580000
```

```
        HE:  END  BUILDEFINE;                                                  02581000
REAL PROCEDURE    DONTCARE(I);                                                 02582000
COMMENT ..........................................................................02583000
:    THIS PROCEDURE ENTERS A "DONT-CARE" INTO INFO[*,*] IF THE NEXT IS :02584000
:AN IDENTIFIER.  IF "I" IS AN EVEN NUMBER, NO SCAN IS PERFORMED AND    :02585000
:WHATEVER IS IN EV[*] WILL BE ENTERED INTO INFO[*,*].                  :02586000
:    VALUE OF RESULT:  0:  NEXT IS A ABSOLUTE RESERVED WORD.           :02587000
:                      1:  NEXT IS END-OF-FILE.                        :02588000
:                      2:  NEXT IS A DIGIT OR SPECIAL CHARACTER.       :02589000
:                      3:  NEXT IS "BEGIN".                            :02590000
:                      5:  NEXT IS "END".                              :02591000
:                      8:  NEXT IS ENTERED AS A "DONT-CARE".           :02592000
:                          --------  J. C. PAO   05/15/68  --------     :02593000
:..................................................................................02594000
    VALUE         I;                                                           02595000
    REAL          I;                                                           02596000
          BEGIN                                                                02597000
      ARRAY       A[0:9];                                                      02598000
      LABEL       L1,L2,LE;                                                    02599000
                  IF BOOLEAN(I) THEN                                           02600000
                  BEGIN LFX←NFX;  I←CHECKNEXT(1); LFX←1 END ELSE GO L2;        02601000
                  IF BOOLEAN(I) THEN                                           02602000
        L1:       BEGIN DONTCARE←I; GO TO LE END;                              02603000
                  IF I=2 THEN GO TO L1;                                        02604000
                  IF IFX≤RFX THEN GO TO LE;                                    02605000
        L2:       A[0]←0;  % MARK AS A RESERVED WORD --- "DONT-CARE".          02606000
                  A[1]←EV[0]&NCR[1:31:17];                                     02607000
                  IF NCR≤5 THEN I←0 ELSE                                       02608000
                  TRNSFWDS(A[2],EV[1],I←(NCR+2).[39:6]);                       02609000
                  I←INFOENTRY(A,I+2);                                          02610000
                  DONTCARE←8;                                                  02611000
          LE:  END  DONTCARE;                                                  02612000
REAL PROCEDURE    DCLARTYPE(AY);                                               02613000
COMMENT ..........................................................................02614000
:    THIS PROCEDURE ENTERS AN ARRAY IDENTIFIER ("AY"=1) OR A SIMPLE    :02615000
:IDENTIFIER ((AY=0) INTO INFO[*,*].                                    :02616000
:    VALUE OF RESULT:  0:  PROCESSED UNTIL AFTER THE SEMICOLUMN,       :02617000
:                      1:  STOPPED AT END-OF-FILE,                     :02618000
:                      3:  STOPPED AT "BEGIN",                         :02619000
:                      5:  STOPPED AT "END".                           :02620000
:                          --------  J. C. PAO   04/30/68  --------     :02621000
:..................................................................................02622000
    VALUE         AY;                                                          02623000
    REAL          AY;                                                          02624000
          BEGIN                                                                02625000
      REAL        H,I;                                                         02626000
      LABEL       L1,L2,L3,L4,L5,LX,LX1,LE;                                    02627000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"DCTYPE",NXT,AY);                        02628000
COMMENT  ENTER THE IDENTIFIER INTO INFO[*,*];                                  02629000
                  IF BOOLEAN(AY) THEN                                          02630000
                  BEGIN A[0]←0&1[1:46:2]; GO TO L3 END ELSE                    02631000
                  A[0]←0&3[1:46:2];                                            02632000
        L1:       A[1]←EV[0]&NCR[1:31:17];                                     02633000
                  IF NCR≤5 THEN I←0 ELSE                                       02634000
                  TRNSFWDS(A[2],EV[1],I←(NCR+2).[39:6]);                       02635000
                  I←INFOENTRY(A,I+2);                                          02636000
COMMENT  LOOKING FOR THE NEXT IDENTIFIER IF THERE ANY;                         02637000
                  IF (I←CHECKNEXT(4&",","[36:42:6]))=8 THEN                    02638000
        L2:       BEGIN  % LOOKING FOR THE NEXT IDENTIFIER.                    02639000
                    IF NOT SCAN(1) THEN                                        02640000
```

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                    IF GENERATE THEN EDITING(1,1);                          02641000
          L3:       LFX←NFX;  I←CHECKNEXT(1);  LFX←1;                       02642000
                    GO TO IF BOOLEAN(I) THEN LX ELSE                        02643000
                         IF I=2 THEN LX ELSE                                02644000
                         IF IFX>RFX THEN L1 ELSE LX;                        02645000
                  END;                                                      02646000
                  IF I=2 THEN                                               02647000
                  BEGIN                                                     02648000
                    IF NXT.[36:6]="[" THEN                                  02649000
                    GO TO IF BOOLEAN(AY) THEN L4 ELSE LX;                   02650000
                    IF NXT.[36:6]=";" THEN                                  02651000
                    GO TO IF BOOLEAN(AY) THEN LX ELSE L5;                   02652000
                  END;  GO TO L5;                                           02653000
    COMMENT       SCAN FOR THE [ ] IN CASE OF AN ARRAY IDENTIFIER;          02654000
          L4:     IF (I←BRACKET("]",1))≠4 THEN GO TO LX;                    02655000
                  IF(I←CHECKNEXT(4&",","[36:42:6]))=8 THEN GO TO L2;        02656000
                  IF I=2 THEN                                               02657000
                  IF NXT.[36:6]=";" THEN GO TO L5;                          02658000
    COMMENT       ERROR SITUATION, MARK ERROR;                              02659000
          LX:     IF DFINE THEN ERRDFN←1 ELSE                               02660000
                  IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                       02661000
                  BEGIN ERROR; CI[9].[36:6]←1 END;                          02662000
                  IF BOOLEAN(I) THEN GO TO LX1;                             02663000
                  IF BOOLEAN(I←REAL(SKIPUNTIL(";"))) THEN                   02664000
          LX1:    BEGIN DCLARTYPE←1; GO TO LE END;                          02665000
          L5:     IF NOT SCAN(1) THEN                                       02666000
                  IF GENERATE THEN EDITING(1,1);                            02667000
          LE:  END  DCLARTYPE;                                              02668000
REAL PROCEDURE      BLOCK(BGN);  VALUE BGN; REAL BGN;  FORWARD;             02669000
REAL PROCEDURE      PROCEDUR(TP);                                           02670000
COMMENT .....................................................................02671000
;     THIS PROCEDURE TAKES CARE OF PROCESSING A PROCEDURE DECLARATION.      ;02672000
;     VALUE OF RESULT:  0:  PROCESS COMPLETE.                               ;02673000
;                       1:  STOPPED AT END-OF-FILE.                         ;02674000
;                       3:  STOPPED AT "BEGIN".                             ;02675000
;                       5:  STOPPED AT "END".                               ;02676000
;                            -------  J. C. PAO   05/03/68  -------         ;02677000
;.....................................................................;      02678000
      VALUE         TP;                                                     02679000
      BOOLEAN       TP;                                                     02680000
            BEGIN                                                           02681000
        REAL        I;                                                      02682000
        LABEL       L1,L2,LX,LX1,LE;                                        02683000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"PROCDR",NXT,TP);                     02684000
                    IF (I←DONTCARE(1))≠8 THEN                               02685000
          LX:       BEGIN  % THE NEXT IS A SPECIAL CHR OR A DIGIT.          02686000
                      IF DFINE THEN ERRDFN←1 ELSE                           02687000
                      IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                   02688000
                      BEGIN ERROR; CI[9].[36:6]←1 END;                      02689000
                      IF BOOLEAN(I) THEN GO TO LX1;                         02690000
          L1:         LFX←NFX;  I←REAL(SKIPUNTIL(";"));  LFX←1;             02691000
                      IF BOOLEAN(I) THEN                                    02692000
          LX1:        BEGIN PROCEDUR←I; GO TO LE END;                       02693000
                      IF NOT SCAN(1) THEN                                   02694000
                      IF GENERATE THEN EDITING(1,1);  GO TO L2;             02695000
                    END;                                                    02696000
                    IF BOOLEAN(I←CHECKNEXT(4&"("[36:42:6])) THEN            02697000
                    GO TO LX;                                               02698000
                    IF I=8 THEN GO TO L1;                                   02699000
                    IF I≠2 THEN GO TO LX;                                   02700000
```

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                    IF NXT.[36:6]≠";" THEN GO TO LX;                          02701000
                    IF NOT SCAN(1) THEN                                       02702000
                    IF GENERATE THEN EDITING(1,1);                            02703000
                    IF TP THEN                                                02704000
                    INFO[HFX.[35:5],HFX.[40:8]-1].[1:2]←3;                    02705000
              L2:   IF BOOLEAN(I←BLOCK(0)) THEN                               02706000
                    GO TO IF I=1 THEN LX ELSE LX1;                            02707000
                    IF NXT.[36:6]≠";" THEN                                    02708000
                    BEGIN                                                     02709000
                      IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;         02710000
                    END ELSE                                                  02711000
                    IF NOT SCAN(1) THEN                                       02712000
                    IF GENERATE THEN EDITING(1,1);                            02713000
              LE:   END   PROCEDUR;                                           02714000
    STREAM PROCEDURE    BGNEND(F,BE,BKCNT,CDNO,DFN,DFID,BDNO);                02715000
        VALUE           BE,BKCNT,DFN;                                         02716000
                BEGIN                                                         02717000
                    DI←F; 2(DS←33 LIT"    "); DS←5 LIT"****";                 02718000
                    SI←LOC BE; SI←SI+7;                                       02719000
                    IF SC="1" THEN                                            02720000
                    BEGIN DS←8 LIT" BEGIN ("; F←DI;                           02721000
                      DI←BDNO; SI←CDNO; DS←8 CHR; DI←F;                       02722000
                    END ELSE DS←8 LIT"** END (";                              02723000
                    SI←LOC BKCNT; DS←3 DEC; DS←5 LIT") ON ";                  02724000
                    SI←CDNO; DS←8 CHR;                                        02725000
                    SI←LOC DFN; SI←SI+7;                                      02726000
                    IF SC="1" THEN                                            02727000
                    BEGIN  DS←11 LIT" IN DEFINE ";                            02728000
                      SI←DFID; SI←SI+3; DS←5 CHR; DS←LIT" ";                  02729000
                    END ELSE BEGIN DS←LIT" "; DS←16 LIT"****" END;            02730000
                    SI←LOC BE; SI←SI+7;                                       02731000
                    IF SC≠"1" THEN                                            02732000
                    BEGIN DI←DI-1; DS←LIT" "; SI←BDNO; DS←8 CHR END ELSE      02733000
                    DS←8 LIT"****";                                           02734000
                END BGNEND;                                                   02735000
    REAL PROCEDURE      STREAMPROCEDURE(TP);                                  02736000
    COMMENT ..................................................................02737000
    :     THIS PROCEDURE PROCCESSES THE STREAM PROCEDURES.                    :02738000
    :                          -------- J. C. PAO   05/23/68 --------        :02739000
    :.....................................................................;02740000
        VALUE           TP;                                                   02741000
        BOOLEAN         TP;                                                   02742000
                BEGIN                                                         02743000
    REAL PROCEDURE      ERRSTREAM(J);   % 2: ")", ";".  4: "THEN".  6: "ELSE",02744000
        VALUE           J;              % 1,3,5: EOF, "BEGIN", "END".        02745000
        REAL            J;                                                    02746000
                BEGIN                                                         02747000
          REAL          I;                                                    02748000
          LABEL         L1,L2,LE;                                             02749000
    IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"ERRSTM",NXT,J);                    02750000
                    IF (I←LFX&J[1:1:1])<0 THEN J←-J; LFX←NFX; STRM←FALSE;     02751000
                    IF DFINE THEN ERRDFN←1 ELSE                               02752000
                    IF J=2 THEN CV[9].[36:6]←ERX←1 ELSE                       02753000
                    BEGIN  ERROR;  CI[9].[36:6]←1;                            02754000
                      IF BOOLEAN(J) THEN GO TO LE;                            02755000
              L1:     IF GENERATE THEN EDITING(1,NCR);                        02756000
                    END;                                                      02757000
              L2:   IF (J←CHECKNEXT(4&";"[36:42:6]))=8 THEN                   02758000
                    BEGIN J←2; GO TO LE END;                                  02759000
                    IF J=2 THEN                                               02760000
```

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                    IF NXT.[36:6]=")" AND I>0 THEN GO TO LE ELSE                02761000
                    IF NXT.[36:6]="'" THEN                                      02762000
                    BEGIN STRING; GO TO L2 END ELSE                             02763000
                    GO TO IF SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN L2        02764000
                         ELSE L1;                                               02765000
                    IF J=0 THEN IF IFX=BLK THEN GO TO L2;                       02766000
                    IF I>0 THEN                                                 02767000
                    IF IFX=DFX+9 THEN BEGIN J←6; GO TO LE END ELSE              02768000
                    IF IFX=DFX+19 THEN BEGIN J←4; GO TO LE END;                 02769000
                    IF NOT BOOLEAN(J) THEN GO TO L2;                            02770000
          LE:       LFX←ABS(I); STRM←TRUE;  ERRSTREAM←J;                        02771000
                END ERRSTREAM;                                                  02772000
PROCEDURE           LOCAL(X);  % MAKE A "LOCAL[INFO[X]]".                       02773000
    VALUE           X;                                                          02774000
    REAL            X;                                                          02775000
              BEGIN                                                             02776000
      REAL          I;                                                          02777000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"LOCAL ",NXT,X);                          02778000
                    IF NOT GENERATE THEN STARTGEN;                              02779000
                    EV[0]←"LOCAL"; EV[1]←0&"["[1:43:5];  EDITING(1,6);          02780000
                    EDITING(1,(EV[0]←INFO[I←X.[35:5],(X←X.[40:8])+              02781000
                    INFO[I,X←1].[40:8]]).[12:6]);  FST←4;                       02782000
                    EV[0]←0&"]"[18:42:6];  EDITING(1,1);                        02783000
                END LOCAL;                                                      02784000
PROCEDURE           REPEATFIELD(X);  % MAKE A REPEATFIELD.                      02785000
    VALUE           X;                                                          02786000
    REAL            X;                                                          02787000
              BEGIN                                                             02788000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"RPTFLD",NXT,X);                          02789000
                    IF NOT GENERATE THEN STARTGEN;                              02790000
                    IF X≠0 THEN LOCAL(X) ELSE                                   02791000
                    BEGIN EV[0]←"TALLY"; EDITING(1,5) END;                      02792000
                    EV[0]←0&","[18:42:6];  LST←4;  EDITING(1,1);                02793000
                    EV[0]←"[5:6]";  EDITING(1,5);                               02794000
                END REPEATFIELD;                                                02795000
REAL PROCEDURE      STATEMENT(J,B,BND);                                         02796000
                    VALUE J,B; REAL J,B; ARRAY BND[0];  FORWARD;                02797000
REAL PROCEDURE      SETPOINTER;  % ENTER WITH "S1" OR "DI".                     02798000
              BEGIN                 % 0: NEXT UNKNOWN.  2,4,6: "ERRSTREAM".     02799000
      REAL          I;            % 1,3,5: EOF, BEGIN, END.                    02800000
      LABEL         L1,L2,L3,LX,LE;                                             02801000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"SETPNT",NXT);                            02802000
                    IF GENERATE THEN EDITING(1,2);                              02803000
                    IF (I←CHECKNEXT(4&"←"[36:42:6]))≠8 THEN                     02804000
          LX:       BEGIN SETPOINTER←ERRSTREAM(I); GO TO LE END;                02805000
                    IF NOT SCAN(1) THEN                                         02806000
                    IF GENERATE THEN EDITING(1,1);                              02807000
                    IF (I←CHECKNEXT(1))≥10 THEN                                 02808000
                    BEGIN  IF I=10 OR I=14 THEN ERROR;                          02809000
                      IF GENERATE THEN EDITING(1,NCR);  GO TO LE;               02810000
                    END;                                                        02811000
                    IF I≠0 OR IFX≠BLK THEN GO TO LX;                            02812000
                    IF NCR=3 THEN                                               02813000
                    IF EV[0].[18:18]≠"LOC" THEN GO TO LX ELSE                   02814000
                    BEGIN  IF NOT GENERATE THEN STARTGEN;                       02815000
                      EV[0]←"POINT"; EV[1]←0&"ER("[1:31:17];                    02816000
                      EDITING(1,8);  BBK←FALSE;                                 02817000
                      IF (I←CHECKNEXT(1))<10 THEN GO TO LX;                     02818000
                      IF I<14 THEN                                              02819000
                      BEGIN  ERROR;                                             02820000
```

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                    IF GENERATE THEN EDITING(1,NCR);  GO TO L1;          02821000
                  END ELSE                                               02822000
                  BEGIN  LOCAL(IFX);                                     02823000
          L1:       IF NOT GENERATE THEN STARTGEN;                       02824000
                    EV[0]←0&")"[18:42:6];  EDITING(1,1);                 02825000
                    IF NOT GENERATE THEN STARTGEN;                       02826000
                  END;  GO TO LE;                                        02827000
                END  ELSE                                                02828000
                IF NCR≠2 THEN GO TO LX;                                  02829000
                IF I←EV[0].[18:12]="SI" THEN GO TO L3;                   02830000
                IF I="DI" THEN GO TO L3;                                 02831000
                IF I="SC" THEN GO TO L2;                                 02832000
                IF I="DC" THEN                                           02833000
          L2:   BEGIN  ERROR;                                            02834000
          L3:     IF GENERATE THEN EDITING(1,2);                         02835000
                  IF I.[42:6]="C" THEN GO TO LE;                         02836000
                  IF (I←CHECKNEXT(4&"+"[36:42:6]))≠8 THEN                02837000
                  IF I≠2 THEN GO TO LX ELSE                              02838000
                  IF NXT.[36:6]≠"-" THEN GO TO LX;                       02839000
                  IF NOT SCAN(1) THEN                                    02840000
                  IF GENERATE THEN EDITING(1,1);                         02841000
                  IF (I←CHECKNEXT(1))=2 THEN                             02842000
                  IF NXT.[42:6]≠0 THEN GO TO LX ELSE                     02843000
                  BEGIN                                                  02844000
                    IF NOT SCAN(0) THEN                                  02845000
                    IF GENERATE THEN EDITING(1,NCR);  GO TO LE;          02846000
                  END  ELSE                                              02847000
                  IF I<10 THEN GO TO LX;                                 02848000
                  IF I<14 THEN                                           02849000
                  BEGIN  ERROR;                                          02850000
                    IF GENERATE THEN EDITING(1,NCR);  GO TO LE;          02851000
                  END;                                                   02852000
                  REPEATFIELD(IFX);                                      02853000
                END ELSE GO TO LX;                                       02854000
            LE:  END  SETPOINTER;                                        02855000
        REAL PROCEDURE  PARAMETER(X,I);                                  02856000
            VALUE       X,I;                                             02857000
            REAL        X,I;                                             02858000
                    BEGIN                                                02859000
        REAL PROCEDURE  STORE(X,I);                                      02860000
            VALUE       X,I;                                             02861000
            REAL        X,I;                                             02862000
                    BEGIN                                                02863000
              REAL      J,K;                                             02864000
              LABEL     L1,L2,LX,LE;                                     02865000
        IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"STORE ",NXT,X,I);         02866000
                  IF I<14 THEN IF GENERATE THEN EDITING(1,NCR)ELSE ELSE  02867000
                  BEGIN IF NOT GENERATE THEN STARTGEN; K←LST END;        02868000
                  IF (J←CHECKNEXT(4&"←"[36:42:6]))≠8 THEN                02869000
              LX:   BEGIN STORE←ERRSTREAM(J); GO TO LE END;              02870000
                  IF SCAN(1) THEN GO TO LX;                              02871000
                  IF I<14 THEN IF GENERATE THEN EDITING(1,NCR)ELSE ELSE  02872000
                  IF NOT GENERATE THEN STARTGEN;                         02873000
                  IF (J←CHECKNEXT(1))≠0 THEN GO TO LX;                   02874000
                  IF IFX≠BLK THEN GO TO LX;                              02875000
                  IF NCR=2 THEN GO TO L1;                                02876000
                  IF NCR≠5 THEN GO TO LX;                                02877000
                  IF (J←EV[0]).[18:30]≠"TALLY" THEN GO TO LX;            02878000
                  IF I<14 THEN GO TO L2;                                 02879000
                  EST←0; LST←K;  LOCAL(X);                               02880000
```

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                    EV[0]←0&"←"[18:42:6]; EDITING(1,1);                          02881000
                    REPEATFIELD(0); GO TO LE;                                    02882000
              L1:   IF (J←EV[0]).[18:12]≠"SI" AND J.[18:12]≠"DI" THEN            02883000
              L2:   BEGIN ERROR; J.[1:1]←1 END ELSE                              02884000
                    IF I=10 OR I=14 THEN GO TO L2;                               02885000
                    IF I≤14 THEN                                                 02886000
                    BEGIN  IF GENERATE THEN EDITING(1,NCR);                      02887000
                      GO TO LE;                                                  02888000
                    END ELSE IF NOT GENERATE THEN STARTGEN;                      02889000
                    IF (I←(EV[0]←INFO[X.[35:5],X.[40:8]]).[12:6])>5 THEN         02890000
                    TRNSFWDS(EV[1],INFO[X.[35:5],X.[40:8]+1],                    02891000
                             (I+2).[36:9]);                                      02892000
                    FST←0; LST←K;  EDITING(1,I);                                 02893000
                    EV[0]←0&"←"[18:42:6]; LST←4;  EDITING(1,1);                  02894000
                    IF NCR=2 THEN                                                02895000
                    BEGIN EV[0]←J; EDITING(1,2) END ELSE                         02896000
                    BEGIN REREATFIELD(0); CI[9].[36:6]←1 END;                    02897000
              LE:   END  STORE;                                                  02898000
REAL PROCEDURE      LOOP(X,I);                                                   02899000
     VALUE          X,I;                                                         02900000
     REAL           X,I;                                                         02901000
               BEGIN                                                             02902000
       REAL         J;                                                           02903000
       BOOLEAN      N;                                                           02904000
       LABEL        L1,L2,LX1,LX,LE;                                             02905000
IF BOOLEAN(DEBUGN)  THEN WRITE(FOU,DBG,"LOOP  ",NXT,X,I);                        02906000
                    IF I=2 THEN                                                  02907000
                    BEGIN                                                        02908000
                      IF SCAN(0) THEN GO TO LX1;                                 02909000
                      IF (J←CHECKNEXT(4&"("[36:42:6]))≠8 THEN GO TO LX;          02910000
                      IF NCR>8 THEN                                              02911000
                      IF (NCR←LEADINGO(EV[0],NCR))>8 THEN GO TO LX;              02912000
                      IOCVRT(X,EV[0],3,NCR,1);                                   02913000
                      IF X>63 THEN X←X.[42:6];                                   02914000
                      IF X>9 THEN                                                02915000
                      BEGIN  NCR←2;                                              02916000
                        J←0&(X DIV 10)[18:42:6]&ENTIER(X MOD 10)                 02917000
                        [24:42:6];                                               02918000
                      END ELSE                                                   02919000
                      BEGIN J←0&X[18:42:6]; NCR←1 END;                           02920000
                    END ELSE                                                     02921000
                    BEGIN IF I<14 THEN ERROR; J←EV[0] END;                       02922000
                    IF NOT GENERATE THEN STARTGEN;                               02923000
                    EV[0]←"THRU ";  EDITING(1,5);                                02924000
                    IF I<14 THEN                                                 02925000
                    BEGIN EV[0]←J; EDITING(1,NCR) END ELSE                       02926000
                    REPEATFIELD(X); LST←FST←0;                                   02927000
                    EV[0]←"DO   ";  EDITING(1,2);                                02928000
                    IF N←NEWCD THEN EDITING(0,AVC);                              02929000
                    IF SCAN(1) THEN                                              02930000
              LX1:  BEGIN  J←0;                                                  02931000
              LX:     LOOP←ERRSTREAM(J);  GO TO LE;                              02932000
                    END;                                                         02933000
                    IF NOT GENERATE THEN                                         02934000
                    BEGIN  STARTGEN;                                             02935000
                      IF N THEN                                                  02936000
                      BEGIN BB←REAL(N,[36:9]); CIVALID←FALSE END;                02937000
                    END;  FST←0;                                                 02938000
                    EV[0]←"BEGIN";  EDITING(1,5);  BBK←TRUE;                     02939000
              L1:   IF BOOLEAN(J←STATEMENT(CHECKNEXT(1),0,A)) THEN GO LX;        02940000
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                    IF J≠2 THEN GO TO LX;                                   02941000
                    IF NXT.[36:6]=";" THEN                                  02942000
              L2:   BEGIN                                                   02943000
                      IF SCAN(1) THEN GO TO LX1;                            02944000
                      IF GENERATE THEN EDITING(1,1); GO TO L1;              02945000
                    END;                                                    02946000
                    IF NXT.[36:6]≠")" THEN GO TO LX;                        02947000
                    IF SCAN(1) THEN GO TO LX1;                              02948000
                    IF NOT GENERATE THEN STARTGEN;                          02949000
                    IF NOT NEWCD THEN LST←FST←0;                            02950000
                    EV[0]←"END  "; EDITING(1,3);                            02951000
              LE:   END LOOP;                                               02952000
           REAL     J,K;                                                    02953000
           LABEL    L1,LE;                                                  02954000
                    IF I=2 THEN GO TO L1;                                   02955000
                    J←EV[0]&NCR[1:31:17];                                   02956000
                    K←CHECKNEXT(4&"("[36:42:6]);                            02957000
                    NCR←(EV[0]←J).[1:17];                                   02958000
                    IF BOOLEAN(K) THEN                                      02959000
                    BEGIN                                                   02960000
                      IF GENERATE THEN EDITING(1,NCR);                      02961000
                      IF K=3 THEN BEGIN EV[0]←"BEGIN"; NCR←5 END ELSE       02962000
                      IF K=5 THEN BEGIN EV[0]←"END  "; NCR←3 END;           02963000
                      PARAMETER←ERRSTREAM(K); GO TO LE;                     02964000
                    END;                                                    02965000
                    IF K≠8 THEN PARAMETER←STORE(X,I) ELSE                   02966000
              L1:   PARAMETER←LOOP(X,1);                                    02967000
              LE:   END PARAMETER;                                          02968000
      REAL PROCEDURE TALLY;                                                 02969000
                BEGIN                                                       02970000
           REAL     I,B;                                                    02971000
           LABEL    L0,L1,L2,LX,LE;                                         02972000
      IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"TALLY ",NXT);                  02973000
                    IF GENERATE THEN EDITING(1,NCR);                        02974000
                    IF (I←CHECKNEXT(4&"←"[36:42:6]))≠8 THEN                 02975000
              LX:   BEGIN TALLY←ERRSTREAM(I); GO TO LE END;                 02976000
              L0:   IF NOT SCAN(1) THEN                                     02977000
                    IF GENERATE THEN EDITING(1,1);                          02978000
                    IF (I←CHECKNEXT(1))≥10 THEN                             02979000
                    BEGIN IF I<14 THEN BEGIN ERROR; GO TO L2 END;           02980000
                      REPEATFIELD(IFX); GO TO LE;                           02981000
                    END;                                                    02982000
                    IF I=2 THEN                                             02983000
              L1:   IF NXT.[42:6]≠0 THEN GO TO LX ELSE                      02984000
                    BEGIN                                                   02985000
                      IF NOT SCAN(0) THEN                                   02986000
              L2:     IF GENERATE THEN EDITING(1,NCR); GO TO LE;            02987000
                    END;                                                    02988000
                    IF BOOLEAN(B) THEN GO TO LX;                            02989000
                    IF I≠0 THEN GO TO LX;                                   02990000
                    IF IFX≠BLK THEN GO TO LX;                               02991000
                    IF NCR≠5 THEN GO TO LX;                                 02992000
                    IF EV[0].[18:30]≠"TALLY" THEN GO TO LX;                 02993000
                    IF GENERATE THEN EDITING(1,NCR); B←1;                   02994000
                    GO TO IF (I←CHECKNEXT(4&"+"[36:42:6]))=8 THEN L0        02995000
                         ELSE LX;                                           02996000
              LE:   END TALLY;                                              02997000
      REAL PROCEDURE GOTO;          % ENTER WITH "GO".                     02998000
                BEGIN               % 0: NEXT UNKNOWN.  2,4,6: "ERRSTREAM".02999000
           REAL     I,J;            % 1,3,5: EOF, "BEGIN", "END".          03000000
```

```
        LABEL       L1,LX,LE;                                          03001000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"GOTO  ",NXT);                   03002000
                    IF GENERATE THEN EDITING(1,NCR);  % THE WORD "GO". 03003000
     L1:            IF BOOLEAN(I←CHECKNEXT(1)) THEN                    03004000
     LX:            BEGIN GOTO←ERRSTREAM(I); GO TO LE END;             03005000
                    IF I≠0 THEN GO TO LX;                              03006000
                    IF IFX=DFX+23 THEN  % THE WORD "TO".               03007000
                    BEGIN  IF BOOLEAN(J) THEN GO TO LX ELSE J←1;       03008000
                      IF GENERATE THEN EDITING(1,NCR); GO TO L1;       03009000
                    END;                                               03010000
                    IF IFX=BLK OR IFX<LFX THEN GO TO LX;               03011000
                    IF GENERATE THEN EDITING(1,NCR);                   03012000
     LE:  END       GOTO;                                              03013000
REAL PROCEDURE      JUMPOUT;                                           03014000
          BEGIN                                                        03015000
        REAL        J,E,L;                                             03016000
        LABEL       L1,L2,LX,LE;                                       03017000
                    IF NOT GENERATE THEN STARTGEN;  L←LST;             03018000
                    IF J←CHECKNEXT(1)≠0 THEN                           03019000
     LX:            BEGIN JUMPOUT←ERRSTREAM(J); GO TO LE END;          03020000
                    IF IFX≠DFX+15 THEN GO TO LX;                       03021000
                    IF NOT GENERATE THEN STARTGEN;                     03022000
                    IF (J←CHECKNEXT(1))=2 THEN                         03023000
                    BEGIN                                              03024000
     L1:              IF NXT.[36:6]=";" THEN                           03025000
     L2:              BEGIN EV[0]←"JUMP "; LST←L; FST←0;  EDITING(1,5); 03026000
                        EV[0]←"OUT  "; ERROR; EDITING(1,3);            03027000
                        IF E≠0 THEN                                    03028000
                        BEGIN EV[0]←E; EDITING(1,E,[12:6]) END;        03029000
                        JUMPOUT←J;  GO TO LE;                          03030000
                      END;                                             03031000
                      IF NXT.[36:6]=")" THEN GO TO L2;                 03032000
                      IF E≠0 THEN GO TO LX;                            03033000
                      IF NXT.[42:6]≠0 THEN GO TO LX;                   03034000
                      IF SCAN(0) THEN BEGIN J←0; GO TO LX END;         03035000
                      IF NOT GENERATE THEN STARTGEN;                   03036000
                      E←EV[0]&NCR[12:42:6];                            03037000
                      IF (J←CHECKNEXT(1))=2 THEN GO TO L1;             03038000
                    END;                                               03039000
                    IF J=5 THEN GO TO L2;  IF J≠0 THEN GO TO LX;       03040000
                    IF IFX=DFX+9 THEN BEGIN J←6; GO TO L2 END;         03041000
                    IF IFX≠DFX+23 THEN GO TO LX;                       03042000
                    IF NOT GENERATE THEN STARTGEN;                     03043000
                    EV[0]←"GO TO"; LST←L; FST←0;  EDITING(1,5);        03044000
                    IF (J←CHECKNEXT(1))≠0 THEN GO TO LX;               03045000
                    IF IFX=BLK OR IFX<LFX THEN GO TO LX;               03046000
                    IF GENERATE THEN EDITING(1,NCR);                   03047000
     LE:  END       JUMPOUT;                                           03048000
REAL PROCEDURE      IFSTATEMENT;  % ENTER WITH "IF".                   03049000
          BEGIN                   % 0: NEXT UNKNOWN.  2,4,6: "ERRSTREAM". 03050000
        REAL        I,J;          % 1,3,5: EOF, "BEGIN", "END".       03051000
        ARRAY       E[0:8];                                            03052000
        LABEL       L0,L1,L2,L3,L4,LX,LE;                              03053000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"IFSTMT",NXT);                   03054000
                    IF GENERATE THEN EDITING(1,2);  % THE WORD "IF".   03055000
                    IF BOOLEAN(I←CHECKNEXT(1)) THEN                    03056000
     LX:            BEGIN IFSTATEMENT←ERRSTREAM(I); GO TO LE END;      03057000
                    IF I=2 THEN                                        03058000
                    IF NXT.[42:6]=0 THEN                               03059000
                    BEGIN                                              03060000
```

```
                IF SCAN(0) THEN GO TO LX;                                   03061000
                E[0]←EV[0]&NCR[1:31:17];                                    03062000
                IF NCR>5 THEN TRNSFWDS(E[1],EV[1],(NCR+2),[36:9]);          03063000
LO:             IF NOT GENERATE THEN STARTGEN;                              03064000
                IF (I←CHECKNEXT(1))≠0 THEN GO TO LX;                        03065000
                IF NCR≠2 THEN GO TO LX ELSE                                 03066000
                BEGIN J←EV[0].[18:12]; GO TO L2 END;                        03067000
              END ELSE GO TO LX;                                            03068000
              IF I≥10 THEN                                                  03069000
              BEGIN  IF I<14 THEN ERROR;                                    03070000
                E[0]←-I&IFX[30:35:13];  GO TO LO;                           03071000
              END;                                                          03072000
              IF I≠0 THEN GO TO LX;                                         03073000
              IF IFX≠BLK THEN GO TO LX;                                     03074000
              IF NCR=6 THEN                                                 03075000
              IF EV[0].[18:30]≠"TOGGL" THEN GO TO LX ELSE                   03076000
              BEGIN  J←"E";                                                 03077000
                IF COMPAREA(EV[1],J,0,7,1)≠0 THEN GO TO LX;                 03078000
L1:             ERROR;  IF GENERATE THEN EDITING(1,NCR);                    03079000
                GO TO L3;                                                   03080000
              END ELSE                                                      03081000
              IF NCR≠2 THEN GO TO LX;                                       03082000
              IF J←EV[0].[18:12]="SB" THEN GO TO L1;                        03083000
L2:           IF J≠"SC" THEN GO TO LX;                                      03084000
              IF NOT GENERATE THEN STARTGEN;                                03085000
              IF (I←CHECKNEXT(1))≠2 THEN GO TO LX;                          03086000
              IF J←NXT.[36:6]≠"<" THEN  IF J≠"≤" THEN                       03087000
              IF J≠"=" THEN  IF J≠"≥" THEN  IF J≠">" THEN                   03088000
              IF J≠"≠" THEN GO TO LX;                                       03089000
              IF NOT SCAN(1) THEN                                           03090000
              IF NOT GENERATE THEN STARTGEN;                                03091000
              IF BOOLEAN(1←CHECKNEXT(1)) THEN GO TO LX;                     03092000
              IF NOT GENERATE THEN STARTGEN;                                03093000
              IF I=2 THEN                                                   03094000
              IF NXT.[36:6]≠"""" THEN GO TO LX ELSE                         03095000
              BEGIN % STRING.                                               03096000
                IF E[0]≠0 THEN GO TO LX;                                    03097000
                EV[0]←"SIJ  "&J[30:42:6];  FST←0;  EDITING(1,3);            03098000
                STRING;  GO TO L3;                                          03099000
              END;                                                          03100000
              IF I≠0 THEN GO TO LX;                                         03101000
              IF IFX=17 THEN                                                03102000
              BEGIN  % "ALPHA".                                             03103000
                IF E[0]≠0 THEN GO TO LX;  % BAD ANY WAY.                    03104000
                IF J≠"=" THEN GO TO LX;                                     03105000
                EV[0]←"REAL(";  FST←0;  EDITING(1,5);                       03106000
                EV[0]←"SI,1)";  EDITING(1,5);                               03107000
                EV[0]←" IN  ";  EDITING(1,3);                               03108000
                EV[0]←"ALPHA";  FST←0;  EDITING(1,5);                       03109000
                GO TO L3;                                                   03110000
              END;                                                          03111000
              IF NCR≠2 THEN GO TO LX;                                       03112000
              IF EV[0].[18:12]≠"DC" THEN GO TO LX;                          03113000
              EV[0]←"SI:SI";  FST←0;  EDITING(1,5);                         03114000
              EV[0]←0&J[18:42:6];  FST←4;  EDITING(1,1);                    03115000
              EV[0]←"DI:DI";  FST←0;  EDITING(1,5);                         03116000
              EV[0]←"FOR  ";  EDITING(1,3);                                 03117000
              IF E[0]<0 THEN                                                03118000
              BEGIN                                                         03119000
                IF E[0].[43:5]<14 THEN                                      03120000
```

```
                    BEGIN                                                    03121000
                      IF J←(EV[0]←-INFO[(I←E[0]).[30:5],I.[35:8]]),           03122000
                      [12:6]>5 THEN                                          03123000
                      TRNSFWDS(EV[1],INFO[I.[30:5],I.[35:8]+1],              03124000
                            (J+2).[36:9]);                                   03125000
                    END ELSE                                                 03126000
                    BEGIN REPEATFIELD(E[0].[30:13]); GO TO L3 END;           03127000
                  END ELSE                                                   03128000
                  IF E[0]=0 THEN EV[0]←0&(J←1)[12:42:6]&1[18:42:6] ELSE      03129000
                  IF (J←(EV[0]←E[0]).[12:6])>5 THEN                          03130000
                  TRNSFWDS(EV[1],E[1],(J+2).[36:9]);                         03131000
                  EDITING(1,J);                                              03132000
        L3:       IF (I←CHECKNEXT(1))≠0 THEN GO TO LX;                       03133000
                  IF IFX≠DFX+19 THEN GO TO LX;                               03134000
                  IF GENERATE THEN EDITING(1,NCR);                           03135000
                  IF (I←STATEMENT(CHECKNEXT(1),0,E))=2 THEN                  03136000
        L4:       BEGIN IFSTATEMENT←I; GO TO LE END ELSE                     03137000
                  IF I=5 THEN GO TO L4 ELSE IF I≠6 THEN GO TO LX;            03138000
                  IF GENERATE THEN EDITING(1,NCR);                           03139000
                  GO TO IF (I←STATEMENT(CHECKNEXT(1),0,E))=2 THEN L4         03140000
                       ELSE IF I=5 OR I=6 THEN L4 ELSE LX;                   03141000
        LE: END   IFSTATEMENT;                                               03142000
REAL PROCEDURE    TRANSFER;                                                  03143000
                  BEGIN                                                      03144000
STREAM PROCEDURE  ADJUST(0,NCR,NMR);                                         03145000
     VALUE        NCR,NMR;                                                   03146000
                  BEGIN                                                      03147000
                  DI←0;  DI←DI+3; DI←DI+NCR;                                 03148000
                  SI←0;  SI←SI+3;                                            03149000
                  NMR(DS←CHR; NCR←DI; DI←NCR; 0←SI; SI←0);                   03150000
                  END   ADJUST;                                              03151000
                  REAL  I,J,K;                                               03152000
                  ARRAY E[0:8];                                              03153000
                  LABEL L1,L2,L3,L4,LX,LE;                                   03154000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"TRNSFR",NXT);                         03155000
                  IF (I←CHECKNEXT(4&"←"[36:42:6]))≠8 THEN                    03156000
        LX:       BEGIN TRANSFER←ERRSTREAM(I); GO TO LE END;                 03157000
                  IF NOT GENERATE THEN STARTGEN;                             03158000
                  EV[0]←"REPLA"; EV[1]←0&"CE"[1:37:11];  EDITING(1,7);       03159000
                  EV[0]←"DI:DI";  FST←0;  EDITING(1,5);                      03160000
                  EV[0]←"BY   ";  EDITING(1,2);                              03161000
                  IF SCAN(1) THEN GO TO LX;                                  03162000
                  IF NOT GENERATE THEN STARTGEN;                             03163000
                  IF (I←CHECKNEXT(1))=2 THEN                                 03164000
                  IF NXT.[42:6]≠0 THEN GO TO LX ELSE                         03165000
                  IF SCAN(0) THEN GO TO LX ELSE                              03166000
                  BEGIN  IF NOT GENERATE THEN STARTGEN;                      03167000
                    IF NCR>8 THEN                                            03168000
                    IF (NCR←LEADING0(EV[0],NCR))>8 THEN GO TO LX;            03169000
                    IOCVRT(J,EV[0],3,NCR,1);                                 03170000
                    IF J>63 THEN J←J.[42:6];  GO TO L1;                      03171000
                  END;                                                       03172000
                  IF I≥10 THEN                                               03173000
                  BEGIN  IF NOT GENERATE THEN STARTGEN;                      03174000
                    IF I<14 THEN ERROR;                                      03175000
                    J←-IFX&REAL(I<14)[30:47:1];                              03176000
        L1:         I←CHECKNEXT(1);                                          03177000
                  END ELSE J←1;                                              03178000
                  IF I≠0 THEN GO TO LX;                                      03179000
                  IF IFX≠BLK THEN GO TO LX;                                  03180000
```

```
                    IF NOT GENERATE THEN STARTGEN;                          03181000
                    IF NCR≠3 THEN                                           03182000
          L2:       BEGIN  ERROR;                                           03183000
                      E[0]←EV[0]&NCR[12:42:6];                              03184000
                      IF NCR>5 THEN TRNSFWDS(E[1],EV[1],(NCR+2),[36:9]);    03185000
                    END ELSE                                                03186000
                    IF K←EV[0].[18:18]="LIT" THEN                           03187000
                    IF J<0 THEN GO TO LX ELSE                               03188000
                    IF (I←CHECKNEXT(4&""""[36:42:6]))≠8 THEN GO TO LX ELSE  03189000
                    BEGIN  K←CC&NCD[9:27:21];                               03190000
                      CC←IF (I←CC.[30:3])=7 THEN CC.[33:15]+1 ELSE          03191000
                         CC&(I+1)[30:45:3];                                 03192000
                      IF SCAN(7) THEN GO TO LX;                             03193000
                      IF NEWCARD THEN                                       03194000
                      BEGIN  IF GENERATE THEN CV[9].[47:1]←1;               03195000
                        BBB←0;  NEWCARD←FALSE;  NCE←NCD;                    03196000
                        IF REAL(RESQ)≠1 THEN TRNSFWDS(ENQ,CV[11],1);        03197000
                      END;                                                  03198000
                      IF NXT.[36:6]="" THEN                                 03199000
                      BEGIN  EET.[30:3]←4;                                  03200000
                        CC←IF (I←CC.[30:3])=7 THEN CC.[33:15]+1 ELSE        03201000
                           CC&(I+1)[30:45:3];                               03202000
                        IF SCAN(6) THEN BEGIN EET←EST; GO TO LX END;        03203000
                        EET←EST;                                            03204000
                      END ELSE                                              03205000
                      IF SCAN(6) THEN GO TO LX;                             03206000
                      IF J>NCR THEN                                         03207000
                      IF NCR≠1 AND NCR≠2 AND NCR≠4 AND NCR≠8 THEN           03208000
                      BEGIN  ADJUST(EV[0],NCR,J-NCR);  NCR←J;               03209000
                        IF NOT GENERATE THEN                                03210000
                        BEGIN CCO←K.[30:18]; NCO←K.[9:21]; STARTGEN END;    03211000
                      END;  LST←FST←0;                                      03212000
                      IF GENERATE THEN EDITING(2,NCR);                      03213000
                      IF J=NCR THEN GO TO LE;                               03214000
                      K←"CHR";  FST←LST←0;  GO TO L3;                       03215000
                    END ELSE                                                03216000
                    IF K≠"CHR" THEN IF K≠"WDS" THEN GO TO L2;               03217000
                    EV[0]←"S1:SI"; FST←0; EDITING(1,5);                     03218000
          L3:       EV[0]←"FOR  "; EDITING(1,3);                          03219000
                    IF J<0 THEN                                             03220000
                    BEGIN                                                   03221000
                      IF BOOLEAN(J,[30:1]) THEN                             03222000
                      BEGIN                                                 03223000
                        IF I←(EV[0]←-INFO[(J←-J).[35:5],J.[40:6]]).[12:6]    03224000
                        >5 THEN                                             03225000
                        TRNSFWDS(EV[1],INFO[J.[35:5],J.[40:8]+1],           03226000
                        (I+2).[36:9]);                                      03227000
                        EDITING(1,I);                                       03228000
                      END ELSE REPEATFIELD(-J);  LST←0; GO TO L4;           03229000
                    END;                                                    03230000
                    EV[0]←IF J≤9 THEN 0&J[18:42:6] ELSE                     03231000
                         0&(J DIV 10)[18:42:6]&ENTIER(J MOD 10)[24:42:6];   03232000
                    EDITING(1,IF J≤9 THEN 1 ELSE 2);                        03233000
          L4:       IF K="WDS" THEN                                       03234000
                    BEGIN EV[0]←"WORDS"; FST←0; EDITING(1,5) END ELSE       03235000
                    IF K≠"CHR" THEN                                         03236000
                    BEGIN                                                   03237000
                      IF K←(EV[0]←E[0]).[12:6]>5 THEN                       03238000
                      TRNSFWDS(EV[1],E[1],(K+2).[36:9]);                    03239000
                      FST←0; EDITING(1,K);                                  03240000
```

```
                    END;                                                    03241000
          LE:  END  TRANSFER;                                               03242000
REAL PROCEDURE      RELEASTATEMENT;                                         03243000
                BEGIN                                                       03244000
          REAL      I,J;                                                    03245000
          LABEL     L1,LE;                                                  03246000
                    ERROR;                                                  03247000
                    IF GENERATE THEN EDITING(1,NCR);                        03248000
                    IF (I←CHECKNEXT(4&"("[36:42:6]))≠8 THEN                 03249000
          L1:       BEGIN RELEASTATEMENT←ERRSTREAM(-I); GO TO LE END;        03250000
                    J←LFX; LFX←NFX;  STRM←FALSE;                            03251000
                    I←BRACKET(")",1);  LFX←J;  STRM←TRUE;                   03252000
                    IF I=0 THEN                                             03253000
                    IF NXT.[36:6]≠";" THEN BEGIN I←-2; GO TO L1 END ELSE    03254000
                    I←2;                                                    03255000
                    IF I≠4 THEN RELEASTATEMENT←I;                           03256000
          LE:  END  RELEASTATEMENT;                                         03257000
REAL PROCEDURE      STATEMENT(J,B,BND);                                     03258000
        VALUE       J,B;                                                    03259000
        REAL        J,B;                                                    03260000
        ARRAY       BND[0];                                                 03261000
                BEGIN                                                       03262000
PROCEDURE           SETYPE(X,I);                                            03263000
        VALUE       X,I;                                                    03264000
        REAL        X,I;                                                    03265000
                BEGIN                                                       03266000
          BOOLEAN   ND;                                                     03267000
          ARRAY     E[0:8];                                                 03268000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"SETYPE",NXT,X,I,NEWCD);              03269000
                    IF ND←(NEWCD AND NOT BOOLEAN(I)) THEN                   03270000
                    BEGIN                                                   03271000
                      NEWCD.[27:9]←BOOLEAN(BB);  BB←REAL(NEWCD).[36:9];     03272000
                    END;                                                    03273000
                    IF NOT GENERATE THEN                                    03274000
                    BEGIN STARTGEN; IF ND THEN CIVALID←FALSE END;           03275000
                    TRNSFWDS(E[0],EV[0],(NCR+10).[36:9]);                   03276000
                    IF I≠0 THEN                                             03277000
                    BEGIN  EV[0]←0&";"[18:42:6]; LST←4;                     03278000
                      EDITING(1,1);                                         03279000
                      IF NEWCD AND BOOLEAN(I) THEN EDITING(0,AVC) ELSE      03280000
                      LST←FST←0;                                            03281000
                    END;                                                    03282000
                    IF (I←(EV[0]←INFO[X.[35:5],X.[40:8]]).[12:6])>5 THEN    03283000
                    TRNSFWDS(EV[1],INFO[X.[35:5],X.[40:8]+1],               03284000
                          (I+2).[36:9]);                                    03285000
                    EDITING(1,I);                                           03286000
                    EV[0]←0&"←"[18:42:6];  LST←4;  EDITING(1,1);            03287000
                    IF X>6 THEN LOCAL(X) ELSE                               03288000
                    BEGIN  EV[0]←"BOOLE"; EV[1]←0&"AN("[1:31:17];           03289000
                      EDITING(1,8);  LOCAL(X);                              03290000
                      EV[0]←0&")"[18:42:6];  EDITING(1,1);                  03291000
                    END;  EV[0]←0&";"[18:42:6];  EDITING(1,1);              03292000
                    IF ND THEN                                              03293000
                    BEGIN BB←REAL(NEWCD).[27:9]; EDITING(0,AVC) END ELSE    03294000
                    LST←FST←0;                                              03295000
                    TRNSFWDS(EV[0],E[0],(NCR+10).[36:9]);                   03296000
                END SETYPE;                                                 03297000
        REAL        I;                                                      03298000
        ARRAY       BGG[0:1];                                               03299000
        DEFINE      BGN=BOOLEAN(B)#;                                        03300000
```

```
          LABEL     LC,L1,L2,L3;                                                    03301000
          LABEL     B0,B1,B12,B2,B3;                                                03302000
          LABEL     S0,S1,S2,S3;                                                    03303000
          LABEL     LX,LE;                                                          03304000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"STATMT",J,B);                                03305000
          IF BGN THEN TRNSFWDS(BGG[0],BND[0],1); GO TO L1;                        03306000
     L0:  J←CHECKNEXT(1);                                                         03307000
     L1:  IF J=0 THEN                                                             03308000
          IF IFX=BLK THEN                                                         03309000
          BEGIN                                                                   03310000
            IF NCR=2 THEN                                                         03311000
            IF J←EV[0].[18:12]="S1" THEN GO TO L2 ELSE                            03312000
            IF J="DI" THEN                                                        03313000
     L2:    GO TO IF (J←SETPOINTER)=5 THEN S3 ELSE                                03314000
                IF BOOLEAN(J) THEN B0 ELSE                                        03315000
                IF J=0 THEN S0 ELSE S1  ELSE                                      03316000
            IF J="DS" THEN                                                        03317000
            GO TO IF (J←TRANSFER)=5 THEN S3 ELSE                                  03318000
                IF BOOLEAN(J) THEN B0 ELSE                                        03319000
                IF J=0 THEN S0 ELSE S1  ELSE                                      03320000
            BEGIN J←0; GO TO LX END;                                              03321000
            IF NCR=5 THEN                                                         03322000
            IF EV[0].[18:30]="TALLY" THEN                                         03323000
            GO TO IF (J←TALLY)=5 THEN S3 ELSE                                     03324000
                IF BOOLEAN(J) THEN B0 ELSE                                        03325000
                IF J=0 THEN S0 ELSE S1;                                           03326000
            IF NCR=4 THEN                                                         03327000
            IF EV[0].[18:24]="JUMP" THEN                                          03328000
            GO TO IF (J←JUMPOUT)=5 THEN S3 ELSE                                   03329000
                IF BOOLEAN(J) THEN B0 ELSE                                        03330000
                IF J=0 THEN S0 ELSE S1;                                           03331000
     LX:    GO TO IF (J←ERRSTREAM(J))=5 THEN S3 ELSE                              03332000
                IF BOOLEAN(J) THEN B0 ELSE                                        03333000
                IF J=0 THEN S0 ELSE S1;                                           03334000
          END ELSE                                                                03335000
          IF IFX=DFX+17 THEN  % THE WORD "IF".                                    03336000
          GO TO IF (J←IFSTATEMENT)=5 THEN S3 ELSE                                 03337000
                IF BOOLEAN(J) THEN B0 ELSE                                        03338000
                IF J=0 THEN S0 ELSE S1  ELSE                                      03339000
          IF IFX=DFX+21 THEN  % THE WORD "GO".                                    03340000
          GO TO IF (J←GOTO)=5 THEN S3 ELSE                                        03341000
                IF BOOLEAN(J) THEN B0 ELSE                                        03342000
                IF J=0 THEN S0 ELSE S1  ELSE                                      03343000
          IF IFX=DFX+28 THEN  % THE WORD "RELEASE".                               03344000
          GO TO IF (J←RELEASTATEMENT)=5 THEN S3 ELSE                              03345000
                IF BOOLEAN(J) THEN B0 ELSE                                        03346000
                IF J=0 THEN S0 ELSE S1  ELSE                                      03347000
          IF IFX>LFX THEN                                                         03348000
          BEGIN                                                                   03349000
            IF GENERATE THEN EDITING(1,NCR);                                      03350000
            GO TO IF (J←CHECKNEXT(48":"[36:42:6]))≠8 THEN LX                      03351000
            ELSE S2;                                                              03352000
          END;                                                                    03353000
          IF J=2 THEN GO TO IF NXT.[42:6]=0 THEN L3 ELSE S1;                      03354000
          IF J≥10 THEN                                                            03355000
     L3:  GO TO IF (J←PARAMETER(IFX,J))=5 THEN S3 ELSE                            03356000
                IF BOOLEAN(J) THEN B0 ELSE                                        03357000
                IF J=0 THEN S0 ELSE S1;                                           03358000
          IF NOT BOOLEAN(J) THEN GO TO LX;                                        03359000
     B0:  IF J=1 THEN                                                             03360000
```

```
B1:     BEGIN STATEMENT←J; GO TO LE END;                                  03361000
        IF J=3 THEN                                                       03362000
        BEGIN  % THE WORD "BEGIN".                                        03363000
          BLKCNT←BLKCNT+1;  TRNSFWDS(BGG[1],BGG[0],1);                    03364000
          IF DFINE THEN                                                   03365000
          BGNEND(FOU(0),1,BLKCNT,STR[0,48],1,STR[0,17],                   03366000
                BGG[0]) ELSE                                              03367000
          IF NCO=NCD-2 THEN                                               03368000
          BGNEND(FOU(0),1,BLKCNT,PPC[11],0,BGG[1],BGG[0])ELSE             03369000
          IF NCO=NCD-1 THEN                                               03370000
          BGNEND(FOU(0),1,BLKCNT,PC[11],0,BGG[1],BGG[0]) ELSE             03371000
          BGNEND(FOU(0),1,BLKCNT,CV[11],0,BGG[1],BGG[0]);                 03372000
          RELEASE(FOU);                                                   03373000
          IF GENERATE THEN EDITING(1,NCR);                                03374000
          J←STATEMENT(CHECKNEXT(1),1,BGG);                                03375000
          TRNSFWDS(BGG[0],BGG[1],1);                                      03376000
          GO TO IF BOOLEAN(J) THEN B0 ELSE S1;                            03377000
        END;                                                              03378000
        IF BGN THEN                                                       03379000
        BEGIN  J←0;                                                       03380000
B12:      IF I←B.[34:13]≠0 THEN SETYPE(I&B[1:1:1],J);                     03381000
          IF DFINE THEN                                                   03382000
          BGNEND(FOU(0),0,BLKCNT,STR[0,48],1,STR[0,17],                   03383000
                BGG[0]) ELSE                                              03384000
          IF NCO=NCD-2 THEN                                               03385000
          BGNEND(FOU(0),0,BLKCNT,PPC[11],0,BGG[1],BGG[0])ELSE             03386000
          IF NCO=NCD-1 THEN                                               03387000
          BGNEND(FOU(0),0,BLKCNT,PC[11],0,BGG[1],BGG[0]) ELSE             03388000
          BGNEND(FOU(0),0,BLKCNT,CV[11],0,BGG[1],BGG[0]);                 03389000
          RELEASE(FOU);                                                   03390000
          BLKCNT←BLKCNT-1;                                                03391000
B2:       IF GENERATE THEN EDITING(1,NCR);                                03392000
B3:       I←LFX; LFX←NFX;  ENDCMMT←TRUE;                                  03393000
          J←CHECKNEXT(1);  LFX←I;  ENDCMMT←FALSE;                         03394000
          IF BOOLEAN(J) THEN                                              03395000
          GO TO IF J=3 THEN B2 ELSE B1;                                   03396000
          IF J=2 THEN                                                     03397000
          GO TO IF I←NXT.[36:6]=";" THEN B1 ELSE                          03398000
                IF I=")" THEN B1 ELSE IF I="." THEN B1 ELSE               03399000
                IF SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN               03400000
                B3 ELSE B2;                                               03401000
          IF J=0 THEN                                                     03402000
          IF IFX=DFX+9 THEN BEGIN J←6; GO TO B1 END;                      03403000
          GO TO B2;                                                       03404000
        END ELSE GO TO B1;                                                03405000
S0:     J←CHECKNEXT(1);                                                   03406000
        IF J=6 THEN GO TO LX ELSE                                         03407000
        IF J=0 THEN IF IFX=DFX+9 THEN J←6;                                03408000
S1:     IF J=2 THEN                                                       03409000
        BEGIN                                                             03410000
          IF I←NXT.[30:6]=";" THEN                                        03411000
          IF BGN THEN                                                     03412000
          BEGIN                                                           03413000
S2:         IF NOT SCAN(1) THEN                                           03414000
            IF GENERATE THEN EDITING(1,1);  GO TO LO;                     03415000
          END ELSE                                                        03416000
          BEGIN                                                           03417000
            IF I←B.[34:13]≠0 THEN                                         03418000
            BEGIN NCO←NCD; CCO←CC; SETYPE(I&B[1:1:1],1) END;              03419000
            GO TO B1;                                                     03420000
```

```
                    END;  GO TO IF NXT.[36:6]=")" THEN B1 ELSE LX;          03421000
                  END;                                                      03422000
                  IF J=6 THEN GO TO B1;                                     03423000
                  IF J=5 THEN                                               03424000
          S3:     IF BGN THEN BEGIN J←2; GO TO B12 END ELSE GO TO B1;       03425000
                  GO TO LX;                                                 03426000
          LE:  END  STATEMENT;                                              03427000
        INTEGER     I,J,K,L,V,X,Y,NP,                                       03428000
        ARRAY       BGG[0:1],A[0:14];                                       03429000
        LABEL       L1,L2,L3,L4,L5,L6;                                      03430000
        LABEL       B1,B2,B3,B4,B5,B6,B7,B8,B9;                             03431000
        LABEL       G0,G1,G2,G3,G4,G5;                                      03432000
        LABEL       P0,P1;                                                  03433000
        LABEL       LX,LX1,LX2,LX3;                                         03434000
        LABEL       LE,LEX;                                                 03435000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"STREAM",NXT,TP);                     03436000
                  IF DFINE THEN                                             03437000
                  BEGIN I←CHECKNEXT(1); GO TO LX END;                       03438000
COMMENT   SKIP THE WORD "STREAM" WHICH HAS BEEN ALREADY SCANNED BEFORE      03439000
          THE ENTRY TO THIS PROCEDURE, AND CHECK THE WORD "PROCEDURE";      03440000
                  IF NOT GENERATE THEN BEGIN STARTGEN; BBK←FALSE END;       03441000
                  IF BOOLEAN(I←CHECKNEXT(1)) THEN                           03442000
          LX:     BEGIN                                                     03443000
                    IF DFINE THEN ERRORN←1 ELSE                             03444000
                    IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE                     03445000
                    BEGIN ERROR; C[9].[36:6]←1 END;                         03446000
                    IF BOOLEAN(I) THEN GO TO LX1;                           03447000
                    LFX←NFX;  I←REAL(SKIPUNTIL(";"));  LFX←1;               03448000
                    IF NOT BOOLEAN(I) THEN                                  03449000
                    IF NOT SCAN(1) THEN                                     03450000
                    IF GENERATE THEN EDITING(1,1);  % EDIT ";".             03451000
          LX1:      STREAMPROCEDURE←IF I=3 THEN BLOCK(1) ELSE               03452000
                    IF BOOLEAN(I) THEN I ELSE BLOCK(0);  GO TO LEX;         03453000
                  END;                                                      03454000
                  IF I≠0 THEN GO TO LX;                                     03455000
                  IF IFX≠6 THEN GO TO LX;                                   03456000
COMMENT   CHECK THE STREAM PROCEDURE IDENTIFIER AND THE "(" MUST BE ALSO    03457000
          IMMEDIATELY FOLLOWING.  THE PROCEDURE ID IS TEMPORARILY STORED    03458000
          IN A[*];                                                          03459000
                  CV[9].[36:6]←ERX←1;  % FLAG ERROR ON PROCEDURE ID.        03460000
                  LFX←NFX;  I←CHECKNEXT(1);  LFX←1;                         03461000
                  IF I≠0 THEN GO TO LX;                                     03462000
                  IF IFX≤RFX THEN GO TO LX;                                 03463000
                  A[1]←EV[0]&NCR[1:31:17];                                  03464000
                  IF NCR≤5 THEN J←0 ELSE                                    03465000
                  TRNSFWDS(A[2],EV[1],J←(NCR+2).[39:6]);                    03466000
                  IF (I←CHECKNEXT(4&"("[36:42:6]))≠8 THEN GO TO LX;         03467000
                  IF NOT SCAN(1) THEN                                       03468000
                  IF GENERATE THEN EDITING(1,1);  % EDIT "(".               03469000
COMMENT   FROM NOW ON AND AS LONG AS WITHIN THE STREAM PROCEDURE, NO        03470000
          DEFINE IS PERMITTED.  ALL THE DEFINE IDENTIFIERS ARE TREATED      03471000
          AS UNDECLARED INDENTIFIER.  ********* IMPORTANT NOTE ********    03472000
          MARK INFO[*,*] BY SETTING "LFX" TO "NFX".  STORE THE PROCEDURE    03473000
          IDENTIFIER TO INFO[*,*] IF IT IS DECLARED WITH A TYPE;            03474000
                  IF DFINE THEN GO TO LX;                                   03475000
                  A[0]←(J+1)&1[1:45:3];  A[J+2]←0;  STRM←TRUE;              03476000
                  LFX←IF TP THEN INFOENTRY(A,J+3)  % ENTER TYPD PRO ID.     03477000
                       ELSE NFX;                                            03478000
COMMENT   START TO SCAN FOR THE FORMAL PARAMETERS AND ENTER THEM TO         03479000
          INFO[*,*] AS CALLED BY NAME FIRST;                                03480000
```

```
L1:     IF (I←CHECKNEXT(1))≠0 THEN                                      03481000
LX2:    BEGIN  STRM←FALSE;                                              03482000
          IF I=9 THEN I←0 ELSE                                          03483000
          IF I≠2 AND NOT BOOLEAN(I) THEN                                03484000
          IF GENERATE THEN EDITING(1,NCR);                              03485000
          IF LFX≤NFX THEN INFOREMOVE(LFX); LFX←1; GO TO LX;             03486000
        END;                                                            03487000
        IF IFX≠BLK THEN GO TO LX2;                                      03488000
        IF GENERATE THEN EDITING(1,NCR);                                03489000
        B[1]←EV[0]&NCR[1:31:17];                                        03490000
        IF NCR≤5 THEN I←0 ELSE                                          03491000
        TRNSFWDS(B[2],EV[1],I←(NCR+2),[39:6]);                          03492000
        B[0]←(I+1)&3[1:45:3];  B[I+2]←0;                                03493000
        I←INFOENTRY(B,I+3);                                             03494000
        IF (NP←NP+1)=1 THEN IF NOT IP THEN LFX←I;                       03495000
        IF (I←CHECKNEXT(4&",",[36:42:6]))=8 THEN                        03496000
        BEGIN                                                           03497000
          IF NOT SCAN(1) THEN                                           03498000
          IF GENERATE THEN EDITING(1,1);  GO TO L1;                     03499000
        END;                                                            03500000
        IF BOOLEAN(I) THEN GO TO LX2;                                   03501000
        IF NXT,[36:6]≠")" THEN GO TO LX2;                               03502000
        IF NOT SCAN(1) THEN                                             03503000
        IF GENERATE THEN EDITING(1,1);                                  03504000
        IF (I←CHECKNEXT(4&""")[36:42:6])) = 8 THEN                      03504100
        IF NOT SCAN(6) THEN                                             03504200
        IF NOT SCAN(6) THEN                                             03504250
        BEGIN EDITING(2,NCR);                                           03504270
        IF (I←CHECKNEXT(4&"("[36:42:6]))=8 THEN                         03504300
        BEGIN IF NOT SCAN(1) THEN                                       03504400
              IF GENERATE THEN EDITING(1,1);                            03504500
              GO TO L1;                                                 03504600
        END;      END;                                                  03504700
        IF (I←CHECKNEXT(4&";"[36:42:6]))≠8 THEN GO TO LX2;              03505000
        B[5]←X←0;                                                       03506000
        IF NOT SCAN(1) THEN                                             03507000
        IF GENERATE THEN EDITING(X←1,1);  % EDIT ";".                   03508000
COMMENT SCAN FOR VALUE DECLARATIONS AND MODIFY THE VALUE LIST TO         03509000
        INCLUDE ALL THE FORMAL PARAMETERS.  ALSO CHANGE THE ORIGINAL    03510000
        VALUE LIST INTO THE REAL SPECIFICATION;                         03511000
        B[0]←REAL(NEWCARD);  TRNSFWDS(B[1],ENO,1);  B[2]←NCE;           03512000
        IF (I←CHECKNEXT(1))≠0 OR IFX≠28 THEN                            03513000
        BEGIN  % NO VALUE IS SPECIFIED ORIGINALLY.                      03514000
          IF GENERATE THEN B[0]←0 ELSE                                  03515000
          BEGIN                                                         03516000
            IF BOOLEAN(B[0]) THEN                                       03517000
            BEGIN  GENERATE←TRUE;  CIVALID←FALSE;                       03518000
              TRNSFWDS(CI[10],B[1],2);  LST←4;                          03519000
              SQ1ST←BOOLEAN(X);                                         03520000
              TRNSFWDS(B[1],ENO,1);  B[2]←NCE;                          03521000
              TRNSFWDS(ENO,CI[10],1);  NCE←CI[11];                      03522000
            END ELSE STARTGEN;                                          03523000
          END;                                                          03524000
          IF I≠2 THEN                                                   03525000
          TRNSFWDS(B[6],EV[0],((B[5]←NCR)+10),[39:6]);                  03526000
          EV[0]←"VALUE";  FST←0;  EDITING(1,5);                         03527000
          K←HFX;  GO TO L2;                                             03528000
        END;                                                            03529000
        IF NOT GENERATE THEN                                            03530000
        BEGIN  STARTGEN;                                                03531000
```

```
                IF BOOLEAN(B[0]) THEN                                   03532000
                BEGIN  TRNSFWDS(B[1],END,1);  B[2]←NCE;                 03533000
                  TRNSFWDS(CI[10],B[1],2);                              03534000
                END;                                                    03535000
              END;                                                      03536000
              EDITING(1,NCR);  % THE WORD "VALUE".                      03537000
              K←HFX;  FST←0;  GO TO L2;                                 03538000
              DO BEGIN                                                  03539000
                EV[0]←0&",","[18:42:6];  FST←4;  EDITING(1,1);          03540000
L2:             EV[0]←(P←INFO[X←K.[35:5],Y←K.[40:8]]);                  03541000
                IF (P←P.[12:6])>5 THEN                                  03542000
                TRNSFWDS(EV[1],INFO[X,Y+1],(P+2),[39:6]);               03543000
                EDITING(1,F);                                           03544000
              END UNTIL (K←K-INFO[X,Y-1],[25:8])<(IF TP THEN LFX+1      03545000
                        ELSE LFX);                                      03546000
              EV[0]←0&";"[18:42:6];  FST←4;  EDITING(1,1);              03547000
              IF BOOLEAN(B[0]) THEN EDITING(0,AVC) ELSE LST←FST←0;      03548000
              IF I≠0 OR IFX≠28 THEN                                     03549000
              BEGIN B[4]←V←0; INF[1]←BB; GO TO L4 END;                  03550000
              EV[0]←"REAL ";  EDITING(1,4);  BBK←TRUE;                  03551000
L3:           IF (I←CHECKNEXT(1))<10 THEN GO TO LX2;                    03552000
              IF GENERATE THEN EDITING(1,NCR);  V←V+1;                  03553000
              INFO[IFX.[35:5],IFX.[40:8]-1].[1:3]←1;                    03554000
              IF (I←CHECKNEXT(4&",","[36:42:6]))≠8 THEN                 03555000
              BEGIN                                                     03556000
                IF NOT SCAN(1) THEN                                     03557000
                IF GENERATE THEN EDITING(1,1);  GO TO L3;               03558000
              END;                                                      03559000
              IF I≠2 THEN GO TO LX2;                                    03560000
              IF NXT.[36:6]≠";" THEN GO TO LX2;                         03561000
              IF NOT SCAN(1) THEN                                       03562000
              IF GENERATE THEN EDITING(1,1);                            03563000
              IF BOOLEAN(B[0]←REAL(NEWCARD)) THEN                       03564000
              IF GENERATE THEN                                          03565000
              BEGIN                                                     03566000
                IF CIVALID THEN EDITING(0,AVC);  GENERATE←FALSE;        03567000
              END;                                                      03568000
              TRNSFWDS(B[1],END,1);  B[2]←NCE;                          03569000
              Y←REAL(GENERATE); GENERATE←FALSE; X←CBX;CBX←-1; K←BB;     03570000
              I←CHECKNEXT(1);  CBX←X;  GENERATE←BOOLEAN(Y);             03571000
              INF[1]←BB;  BB←K;                                         03572000
              IF BOOLEAN(I) THEN                                        03573000
              IF I≠3 THEN GO TO LX2;                                    03574000
              IF NP<V THEN GO TO LX2;                                   03575000
              IF NP=(B[4]←V) THEN GO TO L5;                             03576000
COMMENT  ADD TO THE PROCEDURE THE POINTER SPECIFICATION PART.  ALL THE  03577000
         FORMAL PARAMETERS WHICH ARE NOT CALLED BY VALUE WILL BE LISTED 03578000
         IN THE POINTER LIST;                                           03579000
              IF I≠2 THEN                                               03580000
              TRNSFWDS(B[6],EV[0],((B[5]←NCR)+10),[39:6]);              03581000
              IF GENERATE THEN B[0]←0 ELSE                              03582000
              BEGIN                                                     03583000
                IF BOOLEAN(B[0]←REAL(NEWCARD)) THEN                     03584000
                BEGIN  GENERATE←TRUE;  CIVALID←FALSE;                   03585000
                  TRNSFWDS(CI[10],B[1],2);  LST←4;                      03586000
                  TRNSFWDS(B[1],END,1);  B[2]←NCE;                      03587000
                  TRNSFWDS(END,CI[10],1);  NCE←CI[11];                  03588000
                END ELSE STARTGEN;                                      03589000
              END;                                                      03590000
              IF NP≠V THEN                                              03591000
```

```
L4:     BEGIN                                                          03592000
          EV[0]←"POINT"; EV[1]←0&"ER"[1:37:11]; EDITING(1,7);          03593000
          FST←0;                                                       03594000
        END;                                                           03595000
L5:     A[J←((B[3]←NP)+7).[36:9]+A[0].[40:8]]←0;                       03596000
        A[0].[4:8]←J+1;  % NO. OF WORDS IN THE ENTRY.                  03597000
        K←HFX;  V←NP←V;  NP←NP×6+3;                                    03598000
        DO BEGIN                                                       03599000
          IF (P←INFO[X←K.[35:5],(Y←K.[40:8])=1]).[1:3]=3 THEN          03600000
          BEGIN                                                        03601000
            IF L←(EV[0]←INFO[X,Y]).[12:6]>5 THEN                       03602000
            TRNSFWDS(EV[1],INFO[X,Y+1],(L←2).[39:6]);                  03603000
            EDITING(1,L);                                              03604000
            EV[0]←0&(IF V←V=1=0 THEN ";" ELSE ",")[18:42:6];           03605000
            FST←4;  EDITING(1,1);                                      03606000
            IF V=0 THEN EDITING(0,AVC);                                03607000
          END;                                                         03608000
          IF NP←NP-6<3 THEN BEGIN NP←45; A[J←J-1]←0 END;               03609000
          TRNSFBTS(A[J],P,NP,1,3);                                     03610000
        END UNTIL (K←K-P.[25:8])<(IF TP THEN LFX+1 ELSE LFX);          03611000
COMMENT CHECK THE WORD "BEGIN".  IF THE ORIGINAL STREAM PROCEDURE DOES  03612000
        NOT HAVE ONE, ADD ONE TO IT;                                   03613000
        NP←B[3];  V←B[4];  L←0;                                        03614000
        IF I=3 THEN                                                    03615000
        BEGIN                                                          03616000
          IF BOOLEAN(B[0]) THEN                                        03617000
          BEGIN                                                        03618000
            IF GENERATE THEN                                           03619000
            BEGIN  IF CIVALID THEN EDITING(0,AVC);                     03620000
              GENERATE←FALSE;                                          03621000
            END;  TRNSFWDS(END,B[1],1);                                03622000
            X←NCE; NCE←B[2];  Y←REAL(NEWCARD); NEWCARD←TRUE;           03623000
            TRNSFWDS(INF[0],CV[11],1);TRNSFWDS(CV[11],END,1);          03624000
            OUTPUTNEW(X);                                              03625000
            NEWCARD←BOOLEAN(Y);  TRNSFWDS(CV[11],INF[0],1);            03626000
          END;                                                         03627000
          BLKCNT←BLKCNT+1,                                             03628000
          IF DFINE THEN                                                03629000
          BGNEND(FOU(0),1,BLKCNT,STR[0,48],1,STR[0,17],                03630000
                BGG[0]) ELSE                                           03631000
          IF NCO=NCO-2 THEN                                            03632000
          BGNEND(FOU(0),1,BLKCNT,PPC[11],0,BGG[1],BGG[0])ELSE          03633000
          IF NCO=NCO-1 THEN                                            03634000
          BGNEND(FOU(0),1,BLKCNT,PC[11],0,BGG[1],BGG[0]) ELSE          03635000
          BGNEND(FOU(0),1,BLKCNT,CV[11],0,BGG[1],BGG[0]);              03636000
          RELEASE(FOU);                                                03637000
          IF NOT BOOLEAN(B[0]←REAL(NEWCARD)) THEN                      03638000
          BEGIN                                                        03639000
            IF NOT GENERATE THEN STARTGEN;                             03640000
            EV[0]←"BEGIN";  EDITING(1,5);                              03641000
          END;  BB←INF[1];  GO TO B5;                                  03642000
        END ELSE                                                       03643000
        BEGIN                                                          03644000
          IF I=0 AND IFX=DFX+25 THEN                                   03645000
          BEGIN  % THIS IS A FORWARD DECLARATION.                      03646000
            IF BOOLEAN(B[0]) THEN                                      03647000
            BEGIN                                                      03648000
              IF GENERATE THEN                                         03649000
              BEGIN  IF CIVALID THEN EDITING(0,AVC);                   03650000
                GENERATE←FALSE;                                        03651000
```

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                    END;  TRNSFWDS(END,B[1],1);  X←NCE; NCE←B[2];                03652000
                    Y←REAL(NEWCARD);  NEWCARD←TRUE;                             03653000
                    TRNSFWDS(INF[0],CV[11],1);                                  03654000
                    TRNSFWDS(CV[11],END,1);  OUTPUTNEW(X);                      03655000
                    NEWCARD←BOOLEAN(Y);  TRNSFWDS(CV[11],INF[0],1);             03656000
                  END;                                                          03657000
                  IF GENERATE THEN                                              03658000
                  BEGIN  TRNSFWDS(EV[0],B[6],(B[5]+10).[39:6]);                 03659000
                    EDITING(1,7);                                               03660000
                  END;                                                          03661000
                  IF (J←CHECKNEXT(4&";"[36:42:6]))≠8 THEN GO LX3;               03662000
                  IF NOT SCAN(1) THEN                                           03663000
                  IF GENERATE THEN EDITING(1,1);  GO TO LE;                     03664000
                END;                                                            03665000
                IF BOOLEAN(B[0]) THEN EDITING(0,AVC)ELSE LST←FST←0;             03666000
                EV[0]←"BEGIN";  EDITING(1,5);                                   03667000
                IF BOOLEAN(B[0]) THEN EDITING(0,AVC);                           03668000
                J←I;  B[4]←BB;  BB←INF[1];  GO TO B8;                           03669000
              END;                                                              03670000
COMMENT  PROCESS THE LABEL DECLARATIONS IF THERE ARE ANY.  ALSO MODIFY          03671000
         THE LOCAL-DECLARATIONS INTO THE POINTER-DECLARATIONS;                  03672000
B1:           IF X="LABEL" THEN                                                03673000
              BEGIN                                                            03674000
                IF GENERATE THEN EDITING(1,NCR);                               03675000
B2:             K←LFX; STRM←FALSE; J←DONTCARE(1); LFX←K; STRM←TRUE;            03676000
                IF J≠8 THEN                                                    03677000
LX3:            IF (J←ERRSTREAM(-J))=1 THEN                                    03678000
                BEGIN STREAMPROCEDURE←1; GO TO LE END ELSE                     03679000
                GO TO IF BOOLEAN(J) THEN B7 ELSE B4;                           03680000
                IF (J←CHECKNEXT(4&",""[36:42:6]))=8 THEN                       03681000
                BEGIN                                                          03682000
                  IF NOT SCAN(1) THEN                                          03683000
                  IF GENERATE THEN EDITING(1,1);  GO TO B2;                    03684000
                END;                                                           03685000
                IF J=2 THEN                                                    03686000
                IF NXT.[36:6]=";" THEN GO TO B4;  GO TO LX3;                   03687000
              END;                                                             03688000
              IF NOT GENERATE THEN STARTGEN;                                   03689000
              EV[0]←"POINT"; EV[1]←0&"ER"[1:37:11];  EDITING(1,7);             03690000
B3:           IF J←CHECKNEXT(1)≠0 THEN GO TO LX3;                              03691000
              IF IFX≠BLK THEN GO TO LX3;                                       03692000
              IF GENERATE THEN EDITING(1,NCR);                                 03693000
              INF[1]←EV[0]&NCR[1:31:17];                                       03694000
              IF NCR≤5 THEN J←0 ELSE                                           03695000
              TRNSFWDS(INF[2],EV[1],J←(NCR+2).[39:6]);                         03696000
              INF[0]←(J+1)&3[1:45:3];  INF[J+2]←0;                             03697000
              J←INFOENTRY(INF,J+3);  L←L+1;                                    03698000
              IF (J←CHECKNEXT(4&",""[36:42:6]))≠8 THEN                         03699000
              BEGIN                                                            03700000
                IF NOT SCAN(1) THEN                                            03701000
                IF GENERATE THEN EDITING(1,1);  GO TO B3;                      03702000
              END;                                                             03703000
              IF J=1 THEN GO TO LX3;                                           03704000
              IF NXT.[36:6]=";" THEN                                           03705000
              BEGIN                                                            03706000
B4:             IF NOT SCAN(1) THEN                                            03707000
                IF GENERATE THEN BEGIN T←0; EDITING(1,1) END ELSE              03708000
                T←1;                                                           03709000
B5:             IF NEWCARD THEN                                                03710000
                IF GENERATE THEN                                               03711000
```

```
                    BEGIN  IF CIVALID THEN EDITING(0,AVC);                    03712000
                      GENERATE←FALSE;                                        03713000
                    END;                                                     03714000
                    B[0]←REAL(NEWCARD);                                      03715000
                    Y←REAL(GENERATE);  GENERATE←FALSE;  X←CBX; CBX←-1;       03716000
                    K←BB;  J←CHECKNEXT(1);  B[4]←BB;  BB←K;                  03717000
                    CBX←X;  GENERATE←BOOLEAN(Y);                             03718000
                    IF J=1 THEN GO TO LX3;                                   03719000
          B6:       IF J≠0 THEN GO TO B7;                                    03720000
                    IF NCR≠5 THEN GO TO B7;                                  03721000
                    IF X←EV[0].[18:30]≠"LABEL" THEN                          03722000
                    IF X≠"LOCAL" THEN GO TO B7;                              03723000
                    OUTPUTNEW(NCE);                                          03724000
                    TRNSFWDS(B[1],END,1);  B[2]←NCE;  BB←B[4];               03725000
                    GO TO B1;                                                03726000
                  END;                                                       03727000
          B7:       IF J≠2 THEN                                            03728000
                    TRNSFWDS(B[6],EV[0],((B[5]←NCR)+10),[39:6]);             03729000
                    IF GENERATE THEN B[0]←0 ELSE                             03730000
                    BEGIN                                                    03731000
                      IF BOOLEAN(B[0]) THEN                                  03732000
                      BEGIN  GENERATE←TRUE;  CIVALID←FALSE;                  03733000
                        TRNSFWDS(CI[10],B[1],2); LST←4; SQ1ST←BOOLEAN(T);    03734000
                        TRNSFWDS(B[1],END,1);  B[2]←NCE;                     03735000
                        TRNSFWDS(END,CI[10],1);  NCE←CI[11];                 03736000
                      END ELSE STARTGEN;                                     03737000
                    END;                                                     03738000
          COMMENT   ADD TO THE PROCEDURE THE POINTER DECLARATIONS OF "DI" & "SI";  03739000
          B8:       EV[0]←"POINT"; EV[1]←0&"ER"[1:37:11];  EDITING(1,7);     03740000
                    EV[0]←";DI,SI";  TRNSFCHR(EV[1],EV[0],0,2,1);            03741000
                    FST←0;  EDITING(1,6);                                    03742000
                    IF BOOLEAN(B[0]) THEN EDITING(0,AVC) ELSE LST←FST←0;     03743000
          COMMENT   ADD TO THE PROCEDURE THE REAL DECLARATION OF "TALLY";    03744000
                    EV[0]←"REAL ";  EDITING(1,4);                            03745000
                    EV[0]←";TALLY";  TRNSFCHR(EV[1],EV[0],0,2,1);            03746000
                    EDITING(1,6);                                            03747000
                    IF BOOLEAN(B[0]) THEN EDITING(0,AVC) ELSE LST←FST←0;     03748000
          COMMENT   ADD TO THE PROCEDURE THE ARRAY DECLARATION OF "LOCAL[*]";  03749000
                    EV[1]←NP←(IF TP THEN L ELSE L-1);                        03750000
                    EV[0]←"ARRAY";  EDITING(1,5);  FST←0;                    03751000
                    EV[0]←"LOCAL";  EDITING(1,5);  FST←4;                    03752000
                    EV[0]←"[0:  ";  EDITING(1,3);  FST←EV[0]←0;              03753000
                    IF EV[1]=0 THEN EV[0]←K←1 ELSE                           03754000
                    BEGIN  X←K←5;  IOCVRT(X,EV[1],3,5,0);  GO TO B9;         03755000
                      DO BEGIN                                               03756000
                        K←K-1;  X←0&X[18:24:24];                             03757000
          B9:         END UNTIL X.[18:6]≠0;  EV[0]←X;                        03758000
                    END;                                                     03759000
                    EDITING(1,K);  FST←4;                                    03760000
                    EV[0]←"];  ";  EDITING(1,2);                             03761000
                    IF BOOLEAN(B[0]) THEN EDITING(0,AVC) ELSE LST←FST←0;     03762000
          COMMENT   ASSIGN THE INDEX OF LOCAL[*] TO ALL THE VARIABLE IN INFO[*,*].  03763000
                    AND GENERATE THE ASSIGNMENT STATEMENTS TO ASSIGN THOSE FORMAL  03764000
                    PARAMETERS WHICH ARE CALLED BY VALUE INTO "LOCAL[*]";    03765000
          GO:       T←R←0;  K←HFX;  BB←B[4];                               03766000
                    IF (NP←L)≠0 THEN                                         03767000
          G1:       DO BEGIN                                               03768000
                      IF (P←INFO[X←K.[35:5],(Y←K.[40:8])-1]).[1:3]=1 THEN   03769000
                      IF BOOLEAN(R) THEN                                     03770000
                      BEGIN                                                  03771000
```

```
                    EV[0]←"LOCAL"; EV[1]←0&"["[1:43:5]; EDITING(1,6);03772000
                    IF T=0 THEN Z←EV[0]←1 ELSE                       03773000
                    BEGIN Z←EV[0]←5; IOCVRT(EV[0],T,3,5,0); GO TO G2;03774000
                      DO BEGIN                                       03775000
                        Z←Z-1;  EV[0]←0&EV[0][18:24:24];             03776000
G2:                     END UNTIL EV[0].[18:6]≠0;                    03777000
                    END;  EDITING(1,Z);                              03778000
                    INFO[X,Y-1].[1:3]←5;                             03779000
                    INFO[X,Y+P.[40:8]]←EV[0]&Z[12:42:6];             03780000
                    EV[0]←"]←   "; FST←4;  EDITING(1,2);             03781000
                    IF (Z←(EV[0]←INFO[X,Y]).[12:6])>5 THEN           03782000
                    TRNSFWDS(EV[1],INFO[X,Y+1],(Z+2).[39:6]);        03783000
                    EDITING(1,Z);                                    03784000
                    EV[0]←0&";"[18:42:6]; EDITING(1,1); LST←FST←0;   03785000
                    T←T-1;  NP←NP-1;                                 03786000
                  END ELSE GO TO G3  ELSE                            03787000
                  IF P.[1:3]=3 THEN                                  03788000
G3:               BEGIN  INFO[X,Y-1].[1:3]←P.[1:3]+4;                03789000
                    IF T=0 THEN Z←EV[0]←1 ELSE                       03790000
                    BEGIN Z←EV[0]←5; IOCVRT(EV[0],T,3,5,0); GO TO G4;03791000
                      DO BEGIN                                       03792000
                        Z←Z-1;  EV[0]←0&EV[0][18:24:24];             03793000
G4:                   END UNTIL EV[0].[18:6]≠0;                      03794000
                    END;  INFO[X,Y+P.[40:8]]←EV[0]&Z[12:42:6];       03795000
                    T←T+(IF R≠0 THEN -1 ELSE 1);                     03796000
                    NP←NP-1;                                         03797000
                  END;  K←K-P.[25:8];                                03798000
                END UNTIL NP≤0;                                      03799000
                IF (R←R+1)=1 THEN                                    03800000
                BEGIN T←(NP←B[3])+(IF TP THEN T ELSE T-1); GO G1 END;03801000
                IF R=2 THEN                                          03802000
                IF TP THEN BEGIN NP←1; GO TO G1 END;                 03803000
                NP←B[3];                                             03804000
G5:             IF BOOLEAN(B[0]) THEN                                03805000
                BEGIN  EDITING(0,AVC);  TRNSFWDS(END,B[1],1);        03806000
                  X←NCE; NCE←B[2];  NEWCARD←TRUE;                    03807000
                  TRNSFWDS(INF[0],CV[11],1); TRNSFWDS(CV[11],END,1); 03808000
                  OUTPUTNEW(X);  TRNSFWDS(CV[11],INF[0],1);          03809000
                  GENERATE←FALSE;                                    03810000
                END ELSE                                             03811000
                BEGIN LST←FST←0; TRNSFWDS(END,B[1],1); NCE←B[2] END; 03812000
                IF J≠2 THEN                                          03813000
                TRNSFWDS(EV[0],B[6],((NCR←B[5])+10).[39:6]);         03814000
P0:             IF (J←STATEMENT(J,IF TP THEN REAL(I=3)&LFX[34:35:13] 03815000
                    &REAL(TP)[1:45:1] ELSE REAL(I=3),BGG))≠2 THEN    03816000
P1:             BEGIN STREAMPROCEDURE←ERRSTREAM(J); GO TO LE END;    03817000
                IF NXT.[36:6]≠";" THEN GO TO P1;                     03818000
                IF NOT BOOLEAN(I) THEN                               03819000
                BEGIN                                                03820000
                  IF GENERATE THEN                                   03821000
                  BEGIN IF CIVALID THEN EDITING(0,AVC) END ELSE      03822000
                  BEGIN STARTGEN; EDITING(0,AVC) END;                03823000
                  EV[0].[18:18]←"END";  EDITING(1,3);                03824000
                END;                                                 03825000
                IF NOT SCAN(1) THEN                                  03826000
                IF GENERATE THEN EDITING(1,1);                       03827000
LE:             INFOREMOVE(LFX);  LFX←1;  STRM←FALSE;                03828000
                I←INFOENTRY(A,A[0].[4:8]);                           03829000
LEX: END        STREAMPROCEDURE;                                     03830000
REAL PROCEDURE  FILENAME;                                            03831000
```

```
COMMENT ..........................................................................03832000
;    THIS PROCEDURE ADDS A "/" IN BETWEEN THE TWO SYMBOLIC FILE NAMES  ;03833000
;IF THERE ARE ANY.                                                     ;03834000
;    VALUE OF RESULT:  0:  STOPPED AT AN ABSOLUTE RESERVED WORD,       ;03835000
;                      1:  STOPPED AT END-OF-FILE,                     ;03836000
;                      2:  STOPPED AT A DIGIT OR A SPECIAL CHARACTER,  ;03837000
;                      3:  STOPPED AT "BEGIN",                         ;03838000
;                      5:  STOPPED AT "END",                           ;03839000
;                      8:  SUCCESSFULLY PROCESSED,                     ;03840000
;                          --------  J. C. PAO   05/06/68  --------    ;03841000
;..........................................................................;03842000
            BEGIN                                                       03843000
        REAL        I;                                                  03844000
        LABEL       L0,L1,LX,LE;                                        03845000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,D3G,"FILENM",NXT);                    03846000
          L0:       IF (I←DONTCARE(1))≠8 THEN                           03847000
                    BEGIN                                               03848000
                      IF I=0 THEN                                       03849000
                      IF IFX=DFX+13 THEN GO TO L0 ELSE                  03850000
                      IF IFX=DFX+15 THEN GO TO L0;                      03851000
                      FILENAME←I;  GO TO LE;                            03852000
                    END;                                                03853000
          L1:       IF (I←CHECKNEXT(4&";"[36:42:6]))=8 THEN             03854000
                    BEGIN                                               03855000
                      IF NOT SCAN(1) THEN                               03856000
                      IF GENERATE THEN EDITING(1,1);                    03857000
                      FILENAME←8;  GO TO LE;                            03858000
                    END;                                                03859000
                    IF BOOLEAN(I) THEN GO TO LX;                        03860000
                    IF I≠2 THEN GO TO L1;                               03861000
                    IF I←NXT.[36:6]="""" THEN                           03862000
                    BEGIN  STRING;                                      03863000
                      IF BOOLEAN(I←CHECKNEXT(1)) THEN GO TO LX;         03864000
                      IF I=2 THEN                                       03865000
                      IF NXT.[36:6]="""" THEN                           03866000
                      IF DFINE THEN                                     03867000
                      BEGIN IF LLF<0 THEN STR[0,0].[47:1]←1 END ELSE    03868000
                      BEGIN                                             03869000
                        CCO←CC;  NCO←NCO;                               03870000
                        IF NOT GENERATE THEN STARTGEN;                  03871000
                        EV[0]←0&"/"[18:42:6];  EDITING(1,1);            03872000
                        STRING;                                         03873000
                      END;  GO TO L1;                                   03874000
                    END;                                                03875000
                    IF I="(" THEN                                       03876000
                    GO TO IF (I←BRACKET(")",1))=4 THEN L1 ELSE LX;      03877000
                    IF I="[" THEN                                       03878000
                    GO TO IF (I←BRACKET("]",1))=4 THEN L1 ELSE LX;      03879000
                    IF I="," THEN                                       03880000
                    BEGIN                                               03881000
                      IF NOT SCAN(1) THEN                               03882000
                      IF GENERATE THEN EDITING(1,1);  GO TO L0;         03883000
                    END;                                                03884000
                    IF NOT SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN     03885000
                    IF GENERATE THEN EDITING(1,NCR);  GO TO L1;         03886000
          LX:       FILENAME←IF I=0 THEN 2 ELSE I;                      03887000
          LE:  END  FILENAME;                                           03888000
REAL PROCEDURE      DECLARATION(BGN);                                   03889000
COMMENT ..........................................................................03890000
;    THIS PROCEDURE PROCESSES THE DECLARATIONS INSIDE A BLOCK.  IF THE ;03891000
```

```
:DECLARATION IS A SUBSCRIPTED IDENTIFIER, A SIMPLE IDENTIFIER OR A      :03892000
:DEFINE, IT IS ENTERED INTO INFO[*,*].                                  :03893000
:    "BGN" INDICATES THAT THE DECLARATIONS BELONG TO A BLOCK OR JUST    :03894000
:THE SPECIFICATION PART BELONG TO A PROCEDURE HEADING.                  :03895000
:    VALUE OF RESULT:  0: NOMRE DECLARATIONS.                           :03896000
:                      1: STOPPED AT END-OF-FILE.                       :03897000
:                      3: STOPPED AT "BEGIN".                           :03898000
:                      5: STOPPED AT "END".                             :03899000
:                         -------- J. C. PAC   05/01/68 --------       :03900000
:.....:03901000
      VALUE         BGN;                                                03902000
      REAL          BGN;                                                03903000
            BEGIN                                                       03904000
        REAL        I,X;                                                03905000
        DEFINE      NB=BOOLEAN(BGN)#;                                   03906000
        LABEL       L1,L2,L3,L4,L5,L6,L7,L8,L9;                         03907000
        LABEL       LL,LC,LF,LO,LT,LA,LX1,LX,LE;                        03908000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG,"DECLAR",NXT,BGN);                03909000
                    BGN←REAL(NOT BOOLEAN(BGN));                         03910000
          L1:       IF BOOLEAN(I←CHECKNEXT(1)) THEN                     03911000
                    GO TO IF I≠1 THEN LX1 ELSE LX;                      03912000
                    IF I=2 THEN                                         03913000
                    IF NXT.[36:6]=";" THEN GO TO LE ELSE                03914000
          LX:       BEGIN  % THE NEXT IS A SPECIAL CHR OR A DIGIT.      03915000
                      IF DFINE THEN ERRDFN←1 ELSE                       03916000
                      IF I=2 THEN CV[9].[36:6]←ERX←1 ELSE               03917000
                      BEGIN ERROR; C[9].[36:6]←1 END;                   03918000
                      IF BOOLEAN(I) THEN GO TO LX1;                     03919000
          LL:         LFX←NFX;  I←REAL(SKIPUNTIL(";"));  LFX←1;         03920000
                      IF BOOLEAN(I) THEN                                03921000
          LX1:        BEGIN DECLARATION←I; GO TO LE END;                03922000
                      IF NOT SCAN(1) THEN                               03923000
                      IF GENERATE THEN EDITING(1,NCR);  GO TO L1;       03924000
                    END;                                                03925000
                    IF I≠0 THEN  % DECLARATION EXHAUSTED, START STATEMNT.03926000
                    GO TO IF BOOLEAN(I←BALABALA(I)) THEN LX1 ELSE LE;   03927000
                    IF IFX>DFX THEN GO TO LE;  % DECLARATION EXHAUSTED. 03928000
                    IF IFX≤9 THEN GO TO L7;  IF IFX≤19 THEN GO TO LT;   03929000
                    IF IFX=43 THEN  % "DUMP" IS AT 43 IN INFO[*,*].     03930000
                    IF NB THEN GO TO LX ELSE                            03931000
          L2:       GO TO IF BOOLEAN(I←STATEMENT) THEN LX ELSE L1;      03932000
                    IF IFX=40 THEN  % "MONITOR" IS AT 40 IN INFO[*,*].  03933000
                    IF NB THEN GO TO LX ELSE                            03934000
                    BEGIN  X←1;                                         03935000
          L3:         LFX←NFX;  RFX←RFX+11;  % CHECK FAULT DECLARATIONS. 03936000
                      I←CHECKNEXT(1);  LFX←1;  RFX←RFX-11;              03937000
                      IF BOOLEAN(I) THEN GO TO LX;                      03938000
                      IF I≠0 THEN GO TO LX;  IF IFX≤RFX THEN GO TO LX;  03939000
                      IF IFX>RFX+11 THEN                                03940000
                      GO TO IF BOOLEAN(X) THEN L2 ELSE LX;              03941000
                      I←DONTCARE(0);                                    03942000
                      IF BOOLEAN(I←CHECKNEXT(1)) THEN GO TO LX;         03943000
                      IF I≠2 THEN GO TO LX;                             03944000
                      IF NXT.[36:6]≠"," THEN GO TO L2;                  03945000
                      IF NOT SCAN(1) THEN                               03946000
                      IF GENERATE THEN EDITING(1,1);  GO TO L3;         03947000
                    END;                                                03948000
                    IF IFX=37 THEN  % "SWITCH" IS AT 37 IN INFO[*,*].   03949000
                    BEGIN                                               03950000
                      IF BOOLEAN(I←DONTCARE(1)) THEN GO TO LX;          03951000
```

```
                IF I=8 THEN GO TO IF NB THEN LC ELSE L2;                03952000
                IF I≠0 THEN GO TO LX;                                   03953000
                IF IFX=35 THEN  % SWITCH LIST.                          03954000
L4:             GO TO IF (I←DONTCARE(1))≠8 THEN LX ELSE                 03955000
                     IF NB THEN LC ELSE L2;                             03956000
                IF IFX=32 THEN  % SWITCH FORMAT.                        03957000
                GO TO IF (I←DONTCARE(1))≠8 THEN LX ELSE                 03958000
                     IF NB THEN LC ELSE LL;                             03959000
                GO TO IF IFX≠24 THEN LX ELSE  % SWITCH FILE.            03960000
                     IF NB THEN L6 ELSE L4;                             03961000
              END;                                                      03962000
              IF IFX=35 THEN  % "LIST" IS AT 35 IN INFO[*,*].           03963000
              IF NB THEN GO TO L6 ELSE                                  03964000
              BEGIN  X←0;                                               03965000
L5:             IF (I←DONTCARE(1))≠8 THEN                               03966000
                BEGIN                                                   03967000
                  IF BOOLEAN(X) THEN                                    03968000
                  IF I=0 THEN                                           03969000
                    IF IFX=DFX+13 THEN GO TO L5 ELSE                    03970000
                    IF IFX=DFX+15 THEN GO TO L5;  GO TO LX;             03971000
                END;                                                    03972000
                IF (I←CHECKNEXT(4&"("[36:42:6]))≠8 THEN GO TO LX;       03973000
                IF BOOLEAN(X) THEN LFX←NFX;                             03974000
                I←BRACKET(")",1);                                       03975000
                IF BOOLEAN(X) THEN LFX←1;                               03976000
                IF I≠4 THEN GO TO LX;                                   03977000
                IF (I←CHECKNEXT(1))≠2 THEN GO TO LX;                    03978000
                IF NXT.[36:6]=";" THEN GO TO L2;                        03979000
                IF NXT.[36:6]≠"," THEN GO TO LX;                        03980000
                IF NOT SCAN(1) THEN                                     03981000
                  IF GENERATE THEN EDITING(1,1);  GO TO L5;             03982000
              END;                                                      03983000
              IF IFX=32 THEN  % "FORMAT" IS AT 32 INFO[*,*].            03984000
              IF NB THEN GO TO L6 ELSE BEGIN X←1; GO TO L5 END;         03985000
              IF IFX=30 THEN  % "LABEL" IS AT 30 INFO[*,*].             03986000
              BEGIN                                                     03987000
L6:             IF (I←DONTCARE(1))≠8 THEN GO TO LX;                     03988000
LC:             IF (I←CHECKNEXT(4&",","[36:42:6]))=8 THEN               03989000
                BEGIN                                                   03990000
                  IF NOT SCAN(1) THEN                                   03991000
                  IF GENERATE THEN EDITING(1,1);  GO TO L6;             03992000
                END;                                                    03993000
                IF I=2 THEN                                             03994000
                IF NXT.[36:6]=";" THEN GO TO L2;  GO TO LX;             03995000
              END;                                                      03996000
              IF IFX=28 THEN  % "VALUE" IS AT 28 IN INFO[*,*].          03997000
              GO TO IF NB THEN LL ELSE LX;                              03998000
              IF IFX=26 THEN  % "SAVE" IS AT 26 IN INFO[*,*].           03999000
              IF NB THEN GO TO LX ELSE                                  04000000
              BEGIN                                                     04001000
                IF (I←CHECKNEXT(1))≠0 THEN GO TO LX;                    04002000
                GO TO IF IFX=24 THEN LF ELSE IF IFX=22 THEN LO ELSE     04003000
                     IF IFX=4 THEN LA ELSE IF IFX≤9 THEN LX ELSE        04004000
                     IF IFX>22 THEN LX ELSE LT;                         04005000
              END;                                                      04006000
              IF IFX=24 THEN  % "FILE" IS AT 24 IN INFO[*,*].           04007000
              IF NB THEN GO TO L6 ELSE                                  04008000
LF:           GO TO IF (I←FILENAME)=8 THEN L1 ELSE LX;                  04009000
              IF IFX=22 THEN  % "OWN" IS AT 22 IN INFO[*,*].            04010000
              IF NB THEN GO TO LX ELSE                                  04011000
```

```
L0:     BEGIN  X←0;                                                    04012000
         IF (I←CHECKNEXT(1))≠0 THEN GO TO LX;                          04013000
         IF IFX≤12 THEN GO TO IF IFX=4 THEN LA ELSE LX;                04014000
         IF IFX≥19 THEN GO TO LX;                                      04015000
        END;                                                           04016000
L1:     X←IF IFX=17 THEN 3 ELSE  % TYPE OF "ALPHA".                    04017000
         IF IFX=19 THEN 5 ELSE  % TYPE OF "BOOLEAN".                   04018000
         1;  % TYPE OF "INTEGER" OR "REAL".                            04019000
        LFX←NFX;  I←CHECKNEXT(1);  LFX←1;                              04020000
        IF I≠0 THEN GO TO LX;                                          04021000
        IF IFX>RFX THEN                                                04022000
        GO TO IF BOOLEAN(I←DCLARTYPE(0)) THEN LX ELSE L1;              04023000
        IF IFX=24 THEN                                                 04024000
        GO TO IF X≠3 THEN LX ELSE                                      04025000
        IF NB THEN L6 ELSE LF;                                         04026000
        IF NB THEN GO TO IF IFX=4 THEN LA ELSE LX;                     04027000
        GO TO IF IFX=9 THEN L8 ELSE IF IFX=6 THEN L9 ELSE              04028000
        IF IFX=4 THEN LA ELSE LX;                                      04029000
L7:     X←0;                                                           04030000
        IF IFX=9 THEN  % "STREAM" IS AT 9 IN INFO[*,*].                04031000
        IF NB THEN GO TO LX ELSE                                       04032000
L8:     GO TO IF BOOLEAN(I←STREAMPROCEDURE(BOOLEAN(X))) THEN           04033000
        LX ELSE L1;                                                    04034000
        IF IFX=6 THEN  % "PROCEDURE" IS AT 6 IN INFO[*,*].             04035000
        IF NB THEN                                                     04036000
        IF BOOLEAN(X) THEN                                             04037000
        BEGIN  LFX←NFX;  I←CHECKNEXT(1);  LFX←1;                       04038000
          GO TO IF I≠0 THEN LX ELSE IF IFX≤RFX THEN LX ELSE            04039000
               IF BOOLEAN(I←DCLARTYPE(0)) THEN LX ELSE L1;              04040000
        END ELSE GO TO L6 ELSE                                         04041000
L9:     GO TO IF BOOLEAN(I←PROCEDUR(BOOLEAN(X))) THEN LX               04042000
        ELSE L1;                                                       04043000
        IF IFX=4 THEN  % "ARRAY" IS AT 4 IN INFO[*,*].                 04044000
LA:     GO TO IF BOOLEAN(I←DCLARTYPE(1)) THEN LX ELSE L1;              04045000
        IF NB THEN GO TO LX;                                           04046000
        BUILDEFINE;  GO TO L1;                                         04047000
LE:  END  DECLARATION;                                                 04048000
REAL PROCEDURE  BLOCK(BGN);                                            04049000
COMMENT ..........................................................     04050000
;    THIS PROCEDURE PROCESSES A BLOCK.  "BGN" IS A SWITCH TO TELL IF   :04051000
:THERE IS A "BEGIN" TO BE EDITED FIRST OR THE "BEGIN" WILL COME LATER  :04052000
:IN CASE OF A PROCEDURE.                                               :04053000
;    VALUE OF RESULT:  0:  THE BLOCK IS COMPLETE.                      :04054000
;                      1:  STOPPED AT END-OF-FILE.                     :04055000
;                      5:  STOPPED AT "END".  (ONLY WHEN BGN=0).       :04056000
;                          --------  J. C. PAO   05/01/68  --------     :04057000
:..............................................................        ;04058000
    VALUE          BGN;                                                04059000
    REAL           BGN;                                                04060000
          BEGIN                                                        04061000
      ARRAY        BGG[0:1];                                           04062000
      REAL         T,I,STIFX,STDX;                                     04063000
      LABEL        L1,L12,L2,L3,L31,L30,L32,L33,L34,L4,L5,LE;          04064000
IF BOOLEAN(DEBUGN) THEN WRITE(FOU,DBG," BLOCK",NXT,BGN,NFX,DX);        04065000
                   STIFX←NFX;  STDX←DX;                                04066000
                   IF BOOLEAN(BGN) THEN                                04067000
      L1:          BEGIN  BLKCNT←BLKCNT+1;                             04068000
                     IF NOT LSTO THEN GO TO L12;                       04069000
                     IF FRSTPRNT THEN                                  04070000
                     BEGIN  FRSTPRNT←FALSE;                            04071000
```

```
                    IF (T←T1 DIV 3600)<12 THEN I←"A" ELSE                  04072000
                    BEGIN IF T>12 THEN T←T-12; I←"P" END;                  04073000
                    WRITE(FOU[DBL],HONG,TO,[6:24],TO,[42:6],               04074000
                          TO,[30:12],T,(T1 MOD 3600) DIV 60,I);            04075000
                  END;                                                     04076000
                  IF DEINE THEN                                            04077000
                  BGNEND(FOU(0),1,BLKCNT,STR[0,48],1,STR[0,17],            04078000
                         BGG[0]) ELSE                                      04079000
                  IF NCO=NCD-2 THEN                                        04080000
                  BGNEND(FOU(0),1,BLKCNT,PPC[11],0,BGG[1],BGG[0])ELSE      04081000
                  IF NCO=NCD-1 THEN                                        04082000
                  BGNEND(FOU(0),1,BLKCNT,PC[11],0,BGG[1],BGG[0]) ELSE      04083000
                  BGNEND(FOU(0),1,BLKCNT,CV[11],0,BGG[1],BGG[0]);          04084000
                  RELEASE(FOU);                                            04085000
L12:              IF GENERATE THEN EDITING(1,NCR);                         04086000
                END;                                                       04087000
                IF BOOLEAN(I←DECLARATION(BGN)) THEN                        04088000
L2:             IF I=1 THEN                                                04089000
L3:             BEGIN BLOCK←1; GO TO LE END ELSE                           04090000
                IF I=3 THEN                                                04091000
                BEGIN                                                      04092000
                  IF BOOLEAN(BGN) THEN                                     04093000
                  GO TO IF BOOLEAN(I←BLOCK(1)) THEN L2 ELSE L5;            04094000
                  BGN←1;  GO TO L1;  % THIS IS FOR PROCEDURES.             04095000
                END ELSE                                                   04096000
                BEGIN  % AN "END" IS ENCOUNTERED.                          04097000
                  IF BOOLEAN(BGN) THEN                                     04098000
                  BEGIN  % SKIP COMMENT AFTER THE WORD "END".              04099000
                    IF NOT LSTO THEN GO TO L3I;                            04100000
                    IF DEINE THEN                                          04101000
                    BGNEND(FOU(0),0,BLKCNT,STR[0,48],1,STR[0,17],          04102000
                           BGG[0]) ELSE                                    04103000
                    IF NCO=NCD-2 THEN                                      04104000
                    BGNEND(FOU(0),0,BLKCNT,PPC[11],0,BGG[1],BGG[0])        04105000
                    ELSE                                                   04106000
                    IF NCO=NCD-1 THEN                                      04107000
                    BGNEND(FOU(0),0,BLKCNT,PC[11],0,BGG[1],BGG[0])         04108000
                    ELSE                                                   04109000
                    BGNEND(FOU(0),0,BLKCNT,CV[11],0,BGG[1],BGG[0]);        04110000
                    RELEASE(FOU);                                          04111000
L3I:                BLKCNT←BLKCNT-1;                                       04112000
L30:                IF GENERATE THEN EDITING(1,NCR);  % "END" IS 1ST.      04113000
L32:                LFX←NFX;  ENDCMMT←TRUE;                                04114000
                    I←CHECKNEXT(1);  LFX←1;  ENDCMMT←FALSE;                04115000
                    IF BOOLEAN(I) THEN                                     04116000
                    IF I=3 THEN GO TO L30 ELSE                             04117000
                    BEGIN BLOCK←I; GO TO L33 END;                          04118000
                    IF I=2 THEN                                            04119000
                    GO TO IF I←NXT.[36:6]=";" THEN L33 ELSE                04120000
                          IF I="." THEN L33 ELSE                           04121000
                          IF SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0)           04122000
                          THEN L32 ELSE L30;                               04123000
                    GO TO IF I≠0 THEN L32 ELSE                             04124000
                          IF IFX=DFX+9 THEN L33 ELSE  % WORD "ELSE".       04125000
                          IF IFX=DFX+11 THEN L33 ELSE L32; % "UNTIL".      04126000
                  END ELSE BLOCK←5;                                        04127000
L33:              IF NFX>STIFX THEN                                        04128000
                  BEGIN INFOREMOVE(STIFX); DX←STDX END;  GO TO LE;         04129000
                END;                                                       04130000
                IF BOOLEAN(BGN) THEN GO TO L5;                             04131000
```

```
                L34:    IF BOOLEAN(1←BALABALA(0)) THEN                          04132000
                L4:     GO TO IF I≠3 THEN L2 ELSE                               04133000
                        IF BOOLEAN(1←BLOCK(1)) THEN L4 ELSE L34 ELSE            04134000
                        IF NXT.[36:6]=";" THEN GO TO L33 ELSE                   04135000
                        BEGIN                                                   04136000
                          IF DFINE THEN ERRDFN←1 ELSE CV[9].[36:6]←ERX←1;       04137000
                          IF NOT SCAN(1) THEN                                   04138000
                          IF GENERATE THEN EDITING(1,1);  GO TO L34;            04139000
                        END;                                                    04140000
                L5:     DO UNTIL BOOLEAN(I←STATEMENT);  GO TO L2;               04141000
                LE:  END BLOCK;                                                 04142000
            LABEL       L1,L2,L3,L9,LE;                                         04143000
                        TC←DATE(TIME(0));                                       04144000
                        T1←TIME(1) DIV 60;                                      04145000
                        T2←TIME(2) DIV 60;                                      04146000
                        BLK←"     ";                                            04147000
                        EITNINES←99999999;                                      04148000
                        IOCVRT(A89,EITNINES,0,8,0);                             04149000
                        FRSTPRNT←TRUE;                                          04150000
                        INV←0&12[1:43:5],                                       04151000
                        ADDSS(CST,CV[0]);                                       04152000
                        ADDSS(CED,CV[9]);                                       04153000
                        ADDSS(EST,EV[0]);  EST←EET←EST&3[30:45:3];              04154000
                        ADDSS(IST,CI[0]);                                       04155000
                        ADDSS(DST,DC[0]);                                       04156000
                        NCD←OUTN←CBX←LDF←BLKCNT←-1;                             04157000
                        HEX←LEX←NEX←1;                                          04158000
            COMMENT     INITIALLY CREATE THE INFO[*,*] WITH ALL THE RESERVED WORDS,  04159000
                        FIRST CATAGORY IS THE RESERVED WORDS FOR DECLARATIONS;   04160000
                        FILL INFO[1,*] WITH                                     04161000
                          "6DEFIN","E0000000",  % 0, [ 1],  2,                  04162000
                          "5ARRAY",             % 3, [ 4],                      04163000
                          "9PROCE","DURE0000",  % 5, [ 6],  7,                  04164000
                          "6STREA","M0000000",  % 8, [ 9], 10,                  04165000
                          "4REAL ",             % 11, [12],                     04166000
                          "7INTEG","ER000000",  % 13, [14], 15,                 04167000
                          "5ALPHA",             % 16, [17],                     04168000
                          "7BOOLE","AN000000",  % 18, [19], 20,                 04169000
                          "3OWN  ",             % 21, [22],                     04170000
                          "4FILE ",             % 23, [24],                     04171000
                          "4SAVE ",             % 25, [26],                     04172000
                          "5VALUE",             % 27, [28],                     04173000
                          "5LABEL",             % 29, [30],                     04174000
                          "6FORMA","T0000000",  % 31, [32], 33,                 04175000
                          "4LIST ",             % 34, [35];                     04176000
                          "6SWITC","H0000000",  % 36, [37], 38,                 04177000
                          "7MONIT","OR000000",  % 39, [40], 41,                 04178000
                          "4DUMP ",             % 42, [43],                     04179000
                          "000000","00000000";                                  04180000
                        EV[0]←I←0;                                              04181000
                        DO BEGIN                                                04182000
                          IF J←((EV[1]←INFO[1,I]).[12:6]+2).[39:6]>0 THEN       04183000
                          TRNSFWDS(EV[2],INFO[1,I+1],J);                        04184000
                          DFX←INFOENTRY(EV,J+2);                                04185000
                        END UNTIL INFO[1,I←I+J+1]=0;                            04186000
            COMMENT     SECOND CATAGORY IS THE ABSOLUTLY RESERVED WORDS;        04187000
                        FILL INFO[1,*] WITH                                     04188000
                          "5BEGIN",             % DFX+ 2.                       04189000
                          "3END  ",             % DFX+ 4.                       04190000
                          "7COMME","NT000000",  % DFX+ 6.                       04191000
```

```
                "4ELSE ",              % DFX+ 9.                    04192000
                "5UNTIL",              % DFX+11.                    04193000
                "2IN   ",              % DFX+13.                    04194000
                "3OUT  ",              % DFX+15.                    04195000
                "2IF   ",              % DFX+17.                    04196000
                "4THEN ",              % DFX+19.                    04197000
                "2GO   ",              % DFX+21.                    04198000
                "2TO   ",              % DFX+23.                    04199000
                "7FORWA","RD000000",   % DFX+25.                    04200000
                "7RELEA","SE000000",   % DFX+28.                    04201000
                "4FILL ",              % DFX+31.                    04202000
                "4WITH ",              % DFX+33.                    04203000
                "2DO   ",                                          04204000
                "2OR   ",                                          04205000
                "3AND  ",                                          04206000
                "3DIV  ",                                          04207000
                "3EQV  ",                                          04208000
                "3EOR  ",                                          04209000
                "3IMP  ",                                          04210000
                "3MOD  ",                                          04211000
                "3NOT  ",                                          04212000
                "4LOCK ",                                          04213000
                "4READ ",                                          04214000
                "4STEP ",                                          04215000
                "5CLOSE",                                          04216000
                "5SPACE",                                          04217000
                "5WHILE",                                          04218000
                "5WRITE",                                          04219000
                "6DOUBL","E0000000",                               04220000
                "6REWIN","D0000000",                               04221000
                "000000","00000000";                              04222000
              I←0;                                                 04223000
              DO BEGIN                                             04224000
                IF J←((EV[1]←INFO[1,I]).[12:6]+2).[39:6]>0 THEN    04225000
                TRNSFWDS(EV[2],INFO[1,I+1],J);                     04226000
                RFX←INFOENTRY(EV,J+2);                             04227000
              END UNTIL INFO[1,1←I+J+1]=0;                         04228000
              BB←2;  INF[0]←0&3[1:46:2];                           04229000
              INF[1]←"4TRUE ";  RFX←INFOENTRY(INF,2);              04230000
              INF[1]←"5FALSE";  RFX←INFOENTRY(INF,2);              04231000
COMMENT  TIRD CATAGORY IS THE RESERVED WORDS BUT CAN BE REDECLARED; 04232000
              FILL INFO[1,*] WITH                                  04233000
                "4FLAG ",              % RFX+ 2.                   04234000
                "4ZERO ",              % RFX+ 4.                   04235000
                "5INDEX",              % RFX+ 6.                   04236000
                "6EXPOV","R0000000",   % RFX+ 8.                   04237000
                "6INTOV","R0000000",   % RFX+11.                   04238000
                "3ZIP  ",                                          04239000
                "2LN   ",                                          04240000
                "2NG   ",                                          04241000
                "3ABS  ",                                          04242000
                "3COS  ",                                          04243000
                "3EXP  ",                                          04244000
                "3SIN  ",                                          04245000
                "3DBL  ",                                          04246000
                "4DISK ",                                          04247000
                "4SEEK ",                                          04248000
                "4SORT ",                                          04249000
                "4SIGN ",                                          04250000
                "4SQRT ",                                          04251000
```

```
                    "4TIME ",                                                  04252000
                    "4PAGE ",                                                  04253000
                    "4WAIT ",                                                  04254000
                    "4WHEN ",                                                  04255000
                    "5BREAK",                                                  04256000
                    "5MERGE",                                                  04257000
                    "5PRINT",                                                  04258000
                    "5PUNCH",                                                  04259000
                    "5PURGE",                                                  04260000
                    "6ARCTA","N0000000",                                       04261000
                    "6ENTIE","R0000000",                                       04262000
                    "6RANDO","M0000000",                                       04263000
                    "6REVER","S0000000",                                       04264000
                    "6SEARC","M0000000",                                       04265000
                    "6SERIA","L0000000",                                       04266000
                    "6UPDAT","E0000000",                                       04267000
                    "000000","00000000";                                      04268000
                  I←0;                                                         04269000
                  DO BEGIN                                                     04270000
                    IF J←((EV[1]←INFO[1,I]).[12:6]+2).[39:6]>0 THEN            04271000
                    TRNSEWDS(EV[2],INFO[1,I+1],J);                             04272000
                    CFX←INFOENTRY(EV,J+2);                                     04273000
                  END UNTIL INFO[1,I←I+J+1]=0;                                 04274000
COMMENT  CREATE PSEUDO DEFINES FOR LB,RB,EQL,NEQ,LSS,LEQ,GEQ,GTR,TIMES;        04275000
                  INF[0]←-1;                                                   04276000
                  EV[0]←" [ # ";  EDITING(1,5);                                04277000
                  WRITE(DFSK[INF[2]←0],12,CI[*]);  CIVALID←FALSE;              04278000
                  INF[1]←BLK&"2LB"[12:30:18];  CFX←INFOENTRY(INF,3);           04279000
                  EV[0].[24:6]←"]";  EDITING(1,5);                             04280000
                  WRITE(DFSK[INF[2]←1],12,CI[*]);  CIVALID←FALSE;              04281000
                  INF[1].[18:6]←"R";  CFX←INFOENTRY(INF,3);                    04282000
                  EV[0].[24:6]←"=";  EDITING(1,5);                             04283000
                  WRITE(DFSK[INF[2]←2],12,CI[*]);  CIVALID←FALSE;              04284000
                  INF[1].[12:24]←"3EQL";  CFX←INFOENTRY(INF,3);                04285000
                  EV[0].[24:6]←"≠";  EDITING(1,5);                             04286000
                  WRITE(DFSK[INF[2]←3],12,CI[*]);  CIVALID←FALSE;              04287000
                  INF[1].[18:18]←"NEQ";  CFX←INFOENTRY(INF,3);                 04288000
                  EV[0].[24:6]←"<";  EDITING(1,5);                             04289000
                  WRITE(DFSK[INF[2]←4],12,CI[*]);  CIVALID←FALSE;              04290000
                  INF[1].[18:18]←"LSS";  CFX←INFOENTRY(INF,3);                 04291000
                  EV[0].[24:6]←"≤";  EDITING(1,5);                             04292000
                  WRITE(DFSK[INF[2]←5],12,CI[*]);  CIVALID←FALSE;              04293000
                  INF[1].[18:18]←"LEQ";  CFX←INFOENTRY(INF,3);                 04294000
                  EV[0].[24:6]←"≥";  EDITING(1,5);                             04295000
                  WRITE(DFSK[INF[2]←6],12,CI[*]);  CIVALID←FALSE;              04296000
                  INF[1].[18:18]←"GEQ";  CFX←INFOENTRY(INF,3);                 04297000
                  EV[0].[24:6]←">";  EDITING(1,5);                             04298000
                  WRITE(DFSK[INF[2]←7],12,CI[*]);  CIVALID←FALSE;              04299000
                  INF[1].[18:18]←"GTR";  CFX←INFOENTRY(INF,3);                 04300000
                  EV[0].[24:6]←"x";  EDITING(1,5);                             04301000
                  WRITE(DFSK[INF[2]←DX←8],12,CI[*]);  CIVALID←FALSE;           04302000
                  INF[1].[12:36]←"5TIMES";  CFX←INFOENTRY(INF,3);              04303000
                   FILL XALG[*] WITH                                           04303010
                     "BY   ","00000000",                                       04303020
                     "SCAN ","00000000",                                       04303030
                     "WORDS","00000000",                                       04303040
                     "REPLA","CE000000",                                       04303050
                     "POINT","ER000000",                                       04303060
                     "BYQ  ","00000000",                                       04303070
                     "SCANQ","00000000",                                       04303080
```

```
                "WORDS","QOOOOOOO",                                    04303090
                "REPLA","CEQOOOOO",                                    04303100
                "POINT","ERQOOOOO",                                    04303110
                "OOOOO","OOOOOOOO";                                    04303120
              READ(PACH[NO])[LE];  TRNSFWDS(PNO,PACH(9),1);            04304000
              CV[9]←CNO←INV;  CC←CED;                                  04305000
              DOLLAR←-(ACT[1]←ACT[2]←1);                               04306000
              LST←4;  R←REAL(SCAN(3));                                 04307000
              OUTPUTNEW(-1);  % IF THE 1ST CARD IS $-CARD, START       04308000
                              % TO FUNCTION IMMEDIATELY.               04309000
L1:           IF (I←CHECKNEXT(1))=2 THEN                               04310000
              BEGIN                                                    04311000
                IF NXT.[36:6]="" THEN BEGIN STRING; GO TO L1 END;      04312000
                IF NOT SCAN(IF NXT.[42:6]=4 THEN 1 ELSE 0) THEN        04313000
L2:             IF GENERATE THEN EDITING(1,NCR);  GO TO L1;            04314000
              END ELSE                                                 04315000
              IF I=5 THEN GO TO L2 ELSE                                04316000
              IF I=1 THEN BEGIN Z←3; GO TO L9 END;                     04317000
              IF I≠3 THEN GO TO L1;                                    04318000
              IF BOOLEAN(I←BLOCK(1)) THEN                              04319000
              IF I=1 THEN BEGIN Z←3; GO TO L9 END ELSE GO TO L3;       04320000
              IF EOF THEN GO TO L3;                                    04321000
              IF NXT=4&","[36:42:6] THEN                               04322000
              BEGIN  Z←0;                                              04323000
                IF NOT SCAN(1) THEN                                    04324000
                IF GENERATE THEN EDITING(1,1);                         04325000
              END ELSE                                                 04326000
L3:           BEGIN  Z←1;                                              04327000
                IF DFINE THEN                                          04328000
                DO DFINEOUT UNTIL NOT DFINE ELSE                       04329000
                BEGIN                                                  04330000
                  IF NOT GENERATE THEN STARTGEN;                       04331000
                  EV[0]←0&","[18:42:6];  EDITING(1,1);                 04332000
                END;                                                   04333000
              END;                                                     04334000
L9:           IF CIVALID THEN EDITING(0,AVC);                          04335000
              IF OUTN<NCD-2 THEN                                       04336000
              BEGIN OUTPUT(PPC); OUTN←OUTN+1; OUTPUTNEW(NCD-2) END;    04337000
              IF OUTN=NCD-2 THEN                                       04338000
              BEGIN OUTPUT(PC); OUTN←OUTN+1; OUTPUTNEW(NCD-1) END;     04339000
              IF Z=3 THEN                                              04340000
              BEGIN  FILL A[*] WITH                                    04341000
                "XXXXXXXX","  END OF"," FILE BL","T NOT EN",          04342000
                "D OF PRO","GRAM     ","XXXXXXXX","XXXXXXXX",          04343000
                "XXXXXXXX","XXXXXXXX","XXXXXXXX","XXXXXXXX",          04344000
                "XXXXXXXX","         ","XXXXXXXX";                     04345000
                WRITE(FOU,15,A[*]);                                    04346000
              END ELSE                                                 04347000
              IF OUTN=NCD-1 THEN                                       04348000
              BEGIN OUTPUT(CV); OUTN←OUTN+1; OUTPUTNEW(NCD) END;       04349000
              IF Z=1 THEN                                              04350000
              BEGIN  FILL A[*] WITH                                    04351000
                "XXXXXXXX","  END OF"," PROGRAM"," WITHOUT",          04352000
                " A PERIO","D  XXXXX","XXXXXXXX","XXXXXXXX",          04353000
                "XXXXXXXX","XXXXXXXX","XXXXXXXX","XXXXXXXX",          04354000
                "XXXXXXXX","         ","XXXXXXXX";                     04355000
                WRITE(FOU,15,A[*]);                                    04356000
              END;                                                     04357000
              IF FRSTPRNT THEN GO TO LE;                               04358000
              IF (T1←TIME(1)/60-T1)<0 THEN T1←T1+86400;                04359000
```

```
                    IF (T2+TIME(2)/60-T2)<0 THEN T2+T2+86400;                  04360000
                    WRITE(FOO[DBL],TAIL,NE,ND,NR+NN,NR,NN,T2 DIV 60,           04361000
                         T2 MOD 60,T1 DIV 60,T1 MOD 60);                       04362000
          LE:       IF NEWTPED OR PNCHED THEN                                  04363000
                    BEGIN                                                      04364000
                      FILL A[*] WITH "END;END.","  L A S T","  C A R ",       04365000
                          "D  C R E","  A T E D","  B Y  F","  I L T E",       04366000
                          " R      ","          ","99999999";                 04367000
                      IF NEWTPED THEN WRITE(NTP,10,A[*]);                      04368000
                      IF PNCHED THEN WRITE(PUNCH,10,A[*]);                     04368500
                    END;                                                       04369000
     END OF THE PROGRAM BLOCK;                                                 04370000
     END OF THE OUTERMOST BLOCK.                                               04371000
     END;END.        LAST CARD ON OCRDING TAPE                                 99999999
     000000030RJE                                                              13264117
```

LABEL 000000000PRINTER0017509CC EX OBJECT/READ;FILE SOURCEFILE=SYMBOL/AFILTER;END←

OBJECT /READ