DATE: February 1968

ID CODE: BNV

DRAWING: 390941 Rev E

LABEL: SYMEDB

AUTHOR: GENE

SOURCE: SYM I

OBJECT: Absolute Binary

PURPOSE

The Symbolic Program Editor provides a means for generating a modified version of a Raytheon 703 symbolic language program without repunching the entire program.

Once a user has determined what changes need to be made to a program he relates those changes to the editor in the form of specially formatted instructions called directives. Only the changes need to be specified -- unchanged instructions will be punched exactly as they appear in the old version of the program.

Three types of changes may be made to a program.

1) Statements may be inserted between existing lines.
2) Existing lines may be deleted.
3) Statements may be input to replace existing lines.

A program is modified in two phases. During the first phase, which is called "directive time" all directives and new statements are input. During the second (edit) phase the old source text is read in, it is changed as specified by the directives which have been input, and a new source program is then punched.

SYMEDB is designed to edit SYM I, SYM II or 703 FORTRAN IV source paper tapes. Off-line tapes must be prepared per the alphabetic format set forth in the INPUT/OUTPUT SOFTWARE section of the reference manual. Tapes prepared by SYM I/PREP are in the correct format for editing.

OPERATION OF THE EDITOR

The Symbolic Editor operates under the control of the XRAY EXEC monitor. The editor is distributed in the form of an absolute object tape and is loaded using the XRAY directive "AL" (see AL directive, XRAY EXEC Manual).

Once loaded, control is transferred to the editor by the XRAY directive "ET". The editor will respond by printing 'BE' (begin editor) on the LIST device and will wait for directives and new statements to be input on the SYSI device. These two logical units (LIST and SYSI) are normally assigned to the teletype, however, they may be reassigned through XRAY directives (see IO directive, XRAY EXEC Manual).

If core is exhausted at directive time the editor will print 'OV' (overflow) on the LIST device and control will be returned to XRAY. If an incorrect editor directive is input or if an incorrect sequence of directives and statements is used, the editor will respond by printing 'Q?' on the LIST device. All input back to and including the last directive will be deleted and the editor will wait for another directive.

After all directives for insertions, deletions, and replacements have been input the directive "+E" is issued. This directive signifies the end of directive time and the start of the edit phase. The editor will then go to the PRIN device to begin inputting the symbolic program being edited.

Normally, reading of the source language text will continue until the END statement is read; however, if core is exhausted before the END statement is reached, the editor will stop inputting and begin editing the portion of the program which has been read.

If the input device (PRIN) is the teletype reader, it must be stopped manually. Stopping the reader quickly is essential because after editing is complete the tape must be restarted without missing any statements (see the section on PAPER TAPE FORMAT).

When reading stops (whether because core was exhausted or because an END statement was reached) editing will begin. When editing is complete the computer will pause with bit 14 on in the ACR. This is the signal to turn the punch on. Clearing the ACR will cause the punching of output statements to occur on the BOUT unit.

After punching the computer will pause again. This time with bits 14 and 15 on. This is the signal to turn the punch off. Clearing the ACR now will allow the computer to continue.

If editing was initiated by exhaustion of core, the editor will go back to read more source data. As soon as the reader is turned on the editor will resume the input of source text.

If editing was initiated by reading an END statement in the source text, the editor will return to look for more directives. At this time the editor directive "+X", may be input to return to the XRAY EXEC monitor, or additional insertions, deletions, and replacements may be specified for the edit of another source program.

The symbolic editor can use for its input devices (PRIN) all paper tape devices, magnetic tape and a card reader. For its output devices it can use all paper tape devices, magnetic tape and a card punch. If the output device is not the teletype, that is, if the BOUT and LIST device are not the same, listing will occur on the list device and may be suppressed by setting sense switch two true.

DESCRIPTION OF SYMBOLIC EDITOR DIRECTIVES

The following general statements apply to all Symbolic Editor directives:

1) They must be preceded by a line feed (LF, 8A) and followed by a carriage return (C/R, 8D)

2) They must begin with a plus sign (+, AB)
3) All characters in a directive line are ignored after the first blank encountered. (Thus, the directive line may contain a comments field if it is separated from the directive by a blank)

These general statements apply to the symbolic source statements which are typed in with the directives:

1) They must be preceded by a line feed and followed by a carriage return.
2) They must not begin with a plus sign. (The editor uses + to identify an editor directive.
3) They must be no more than 54 characters long. (All additional characters will be ignored.

INSERTION

This directive is used to insert statements into the program. The format is:

```
+M
S1
S2
.
.
.
Si
```

where: S_1, $S_2 \ldots S_i$ are the statements to be inserted following line M.

To insert a halt instruction between lines 4 and 5:

```
+4
   HLT
```

DELETION

This directive deletes the specified lines from the old source.

The format is:

```
+M, N
```

where lines M to N, inclusively, are to be deleted. To delete lines 7, 8, 9 and 10:

```
+7, 10
```

REPLACEMENT

This directive replaces the specified lines in the old source text with the statements typed in.

The format is:

```
+M, N
S1
S2
.
.
.
Si
```

where M, N are the numbers of the first and last lines to be replaced

S_1, $S_1 \ldots S_i$ are the statements which will replace the lines specified.

To replace lines 4 and 5 by three data statements:

```
+4, 5
      DATA    10
      DATA    15
      DATA    X'7'
```

Note that deletion is actually a special case of replacement. Deleting is actually replacing the specified lines with no instructions.

EDIT

This directive is used to signal the Symbolic Editor that all insertions, deletions and replacements have been completed and editing should begin.

The format is:

```
+E
```

After this directive is input the editor will begin reading the source text which is to be modified.

RETURN TO XRAY

This directive is used to signify that all symbolic editing is complete.

The format is:

```
+X
```

The editor will return control to the XRAY EXEC monitor.

PAPER TAPE FORMAT

The paper tape containing source text to be edited by the Symbolic Editor should be in the standard SYM I/PREP format (see SYM I PREP Manual). The output tape generated by the editor will also be in this format.

The format is as follows:

Statement i-1	C R	Null	Line No. (i-1)	b l a n k	L F	Statement i	C R	Null	Line No. (i)	b l a n k	L F	Statement i+1

Since the editor uses the I/O MONITOR for input and output, each line must start with a line feed. It is for this reason that care must be taken when the editor stops reading paper tape on the teletype because core was full.

If the editor stops inputting with line i-1, it will already have read the carriage return that follows line i-1.

If the tape is being read from the teletype, the reader will continue to run, and the teletype keyboard will begin to chatter. This is a signal that the information is not being read into core. At this point the reader must be turned off manually.

If possible the reader should be turned off within the next seven character (3 null, 3 Line No., and 1 blank). If this is done, when the reader is turned on again to read statement i, it will be able to read the line feed preceding statement i.

If the reader is allowed to go more than 7 characters, when it is turned on again it will not read a line feed until the one preceding statement i+1. Thus, statement i will have been totally ignored.

To read statement i in this case the tape must be manually repositioned into the seven character "gap" preceding statement i, before the reader is turned on.

OPERATING INSTRUCTIONS

1) Load Symbolic Editor with XRAY "AL" directive
2) Type "ET"; Editor will type 'BE'
3) Input directives and statements for addition, deletion, and replacement.
4) Type "+E" to signify end of directive time
5) Turn on teletype reader
6) When teletype chatters turn reader off immediately.
7) When computer halts (with bit 14 on) turn punch on.
8) Clear ACR to continue.
9) When computer halts (with bits 14 and 15 on) turn teletype punch off.
10) If END statement has not been read, check to see paper tape is positioned correctly.
11) Clear ACR to continue.
12) a. Return to instruction 5 if END statement has not been reached.
    b. Return to instruction 3 if another program is to be edited.
    c. Type "+X" if return to XRAY is desired.

Standard systems (Standard I/O Monitor) will load and execute SYMEDB with the ":AL" directive. This removes the necessity of step 2) in the above operating instructions.

If the teletype is not used for source input and output all steps in the operating instructions concerning the ACR and the turning on and off of the reader and punch may be ignored.

EXAMPLE OF PROGRAM MODIFICATION

On the following page is a sample program before and after modification along with the Symbolic Editor directives to make the modifications.

Figure 1 is a listing of the program which is to be modified. The changes to be made have been typed in the right hand column (similar to the way a programmer would pencil changes onto a listing).

Figure 2 is a copy of the directives that were input on the teletype to make the modifications.

Figure 3 is a listing of the new version of the program with the changes incorporated.

```
                        *       BLINKER PROGRAM
                        *           SET A BIT ON IN THE
                        *           ACR AND WATCH IT GO.
 1        ORIG   22
 2        LDX    CNT     STRT   LDX    CNT
 3        JMP    S-1             DXS    1
 4        LDX    CNT
 5        DXS    X'3F'
 6        SRC    1
 7        SLC    1
 8        STX    CNT
 9        JMP    22              JMP    STRT
10 CNT    D      X'7000'
          END
```

Figure 1

```
ET
BE
+0
*     BLINKER PROGRAM
*         SET A BIT ON IN THE
*         ACR AND WATCH IT GO.
+2,2
STRT LDX    CNT
     DXS    1
+7,7
+9,9
     JMP    STRT
+E

  BE
```

Figure 2

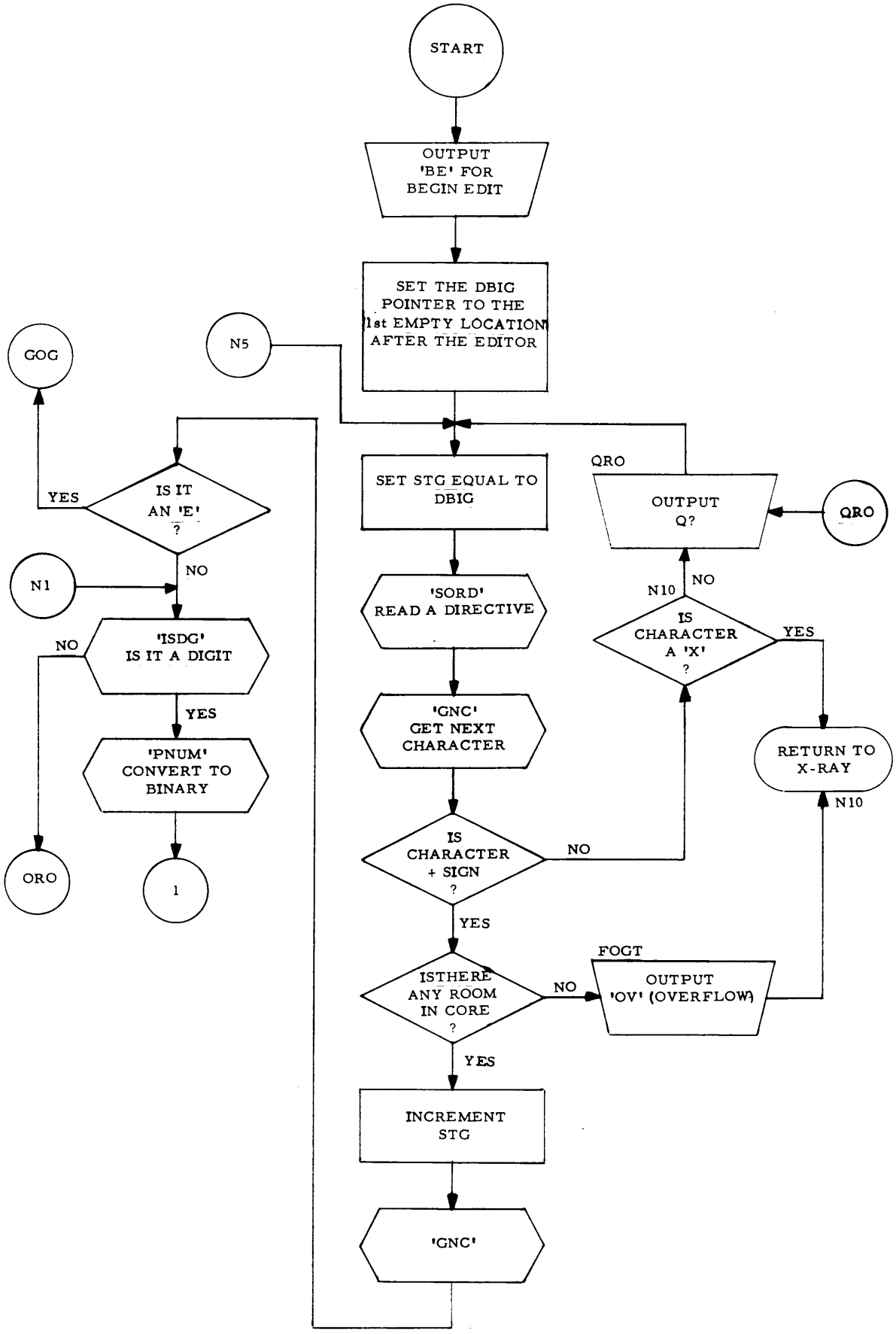
```
 1 *     BLINKER PROGRAM
 2 *         SET A BIT ON IN THE
 3 *         ACR AND WATCH IT GO.
 4       ORIG   22
 5 STRT  LDX    CNT
 6       DXS    1
 7       JMP    S-1
 8       LDX    CNT
 9       DXS    X'3F'
10       SRC    1
11       STX    CNT
12       JMP    STRT
13 CNT   D      X'7000'
         END
```

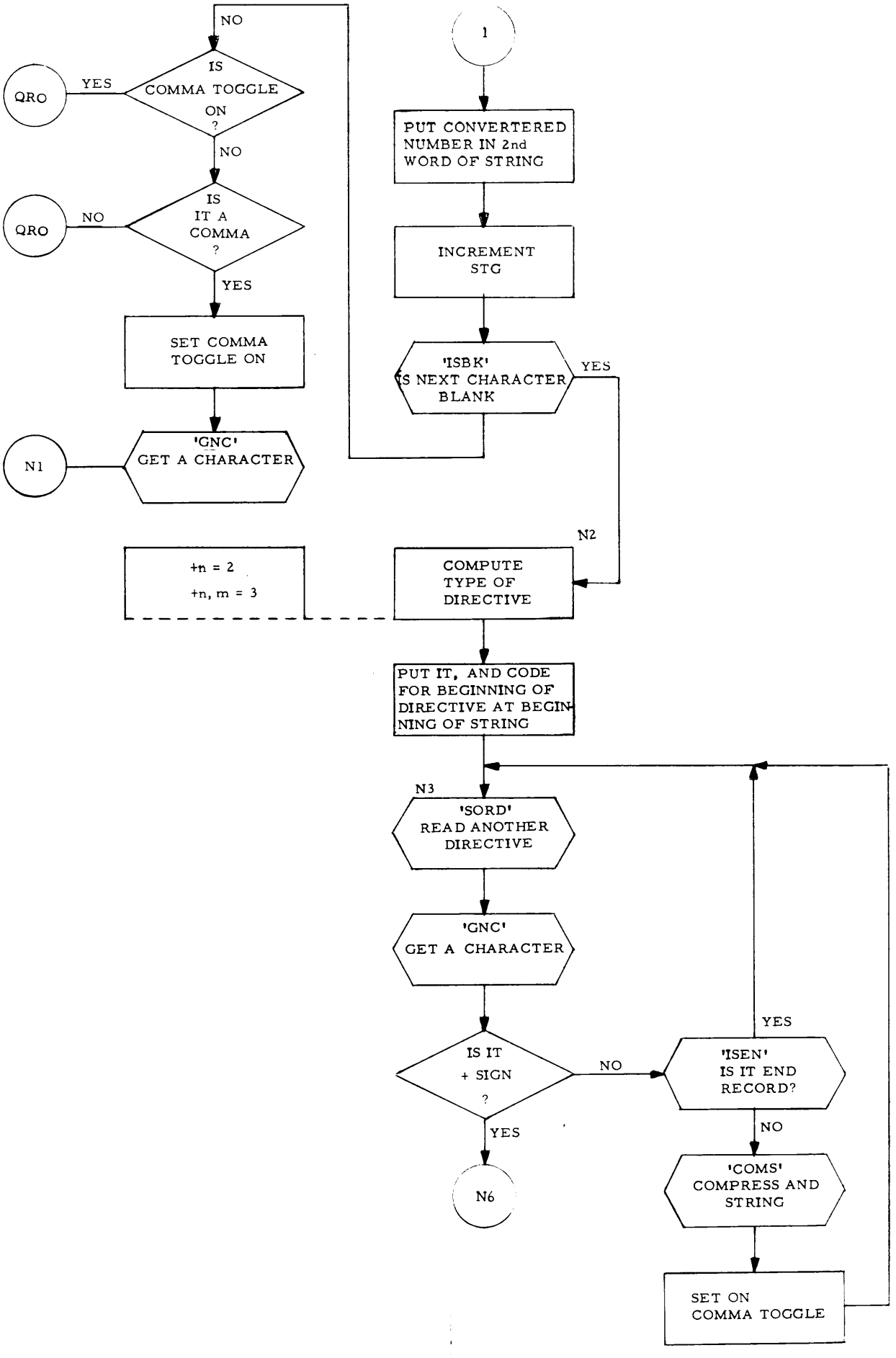
Figure 3

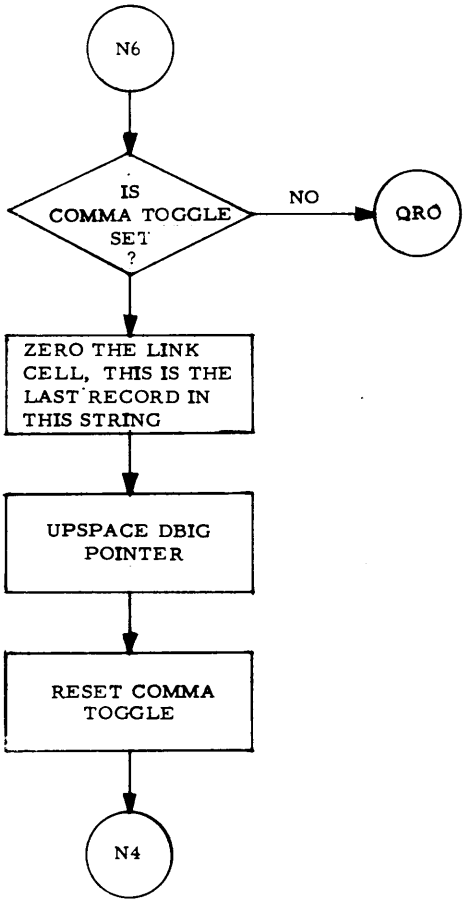
SUBROUTINES USED BY SYMBOLIC EDITOR:

SORD	reads both edit record from PRIN and source records from BIN
GNC	gets next character in input buffer
ISDG	is character digit?
PNUM	converts ASCII to binary
ISBK	is character blank?
ISEN	is record an END record?
COMS	compresses text and strings in core.
DEBK	skips through blanks in read buffer
PAUS	pauses with code in ACR
DCOM	de-compresses text in core and moves it to punch buffer
PO	punch routine
MOVE	moves bytes any where in core
R10	puts statement numbers in punch buffer
RM1O	converts binary to ASCII

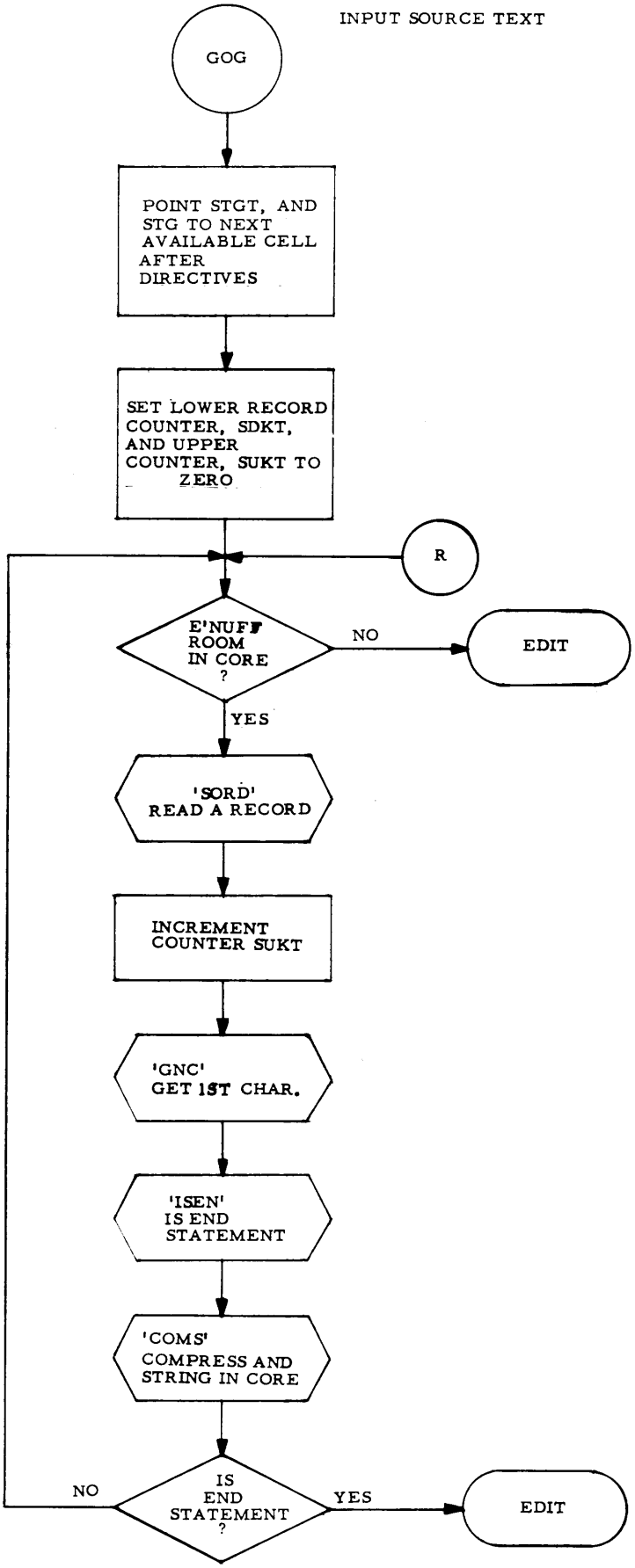
READ AND PROCESS EDIT DIRECTIVES

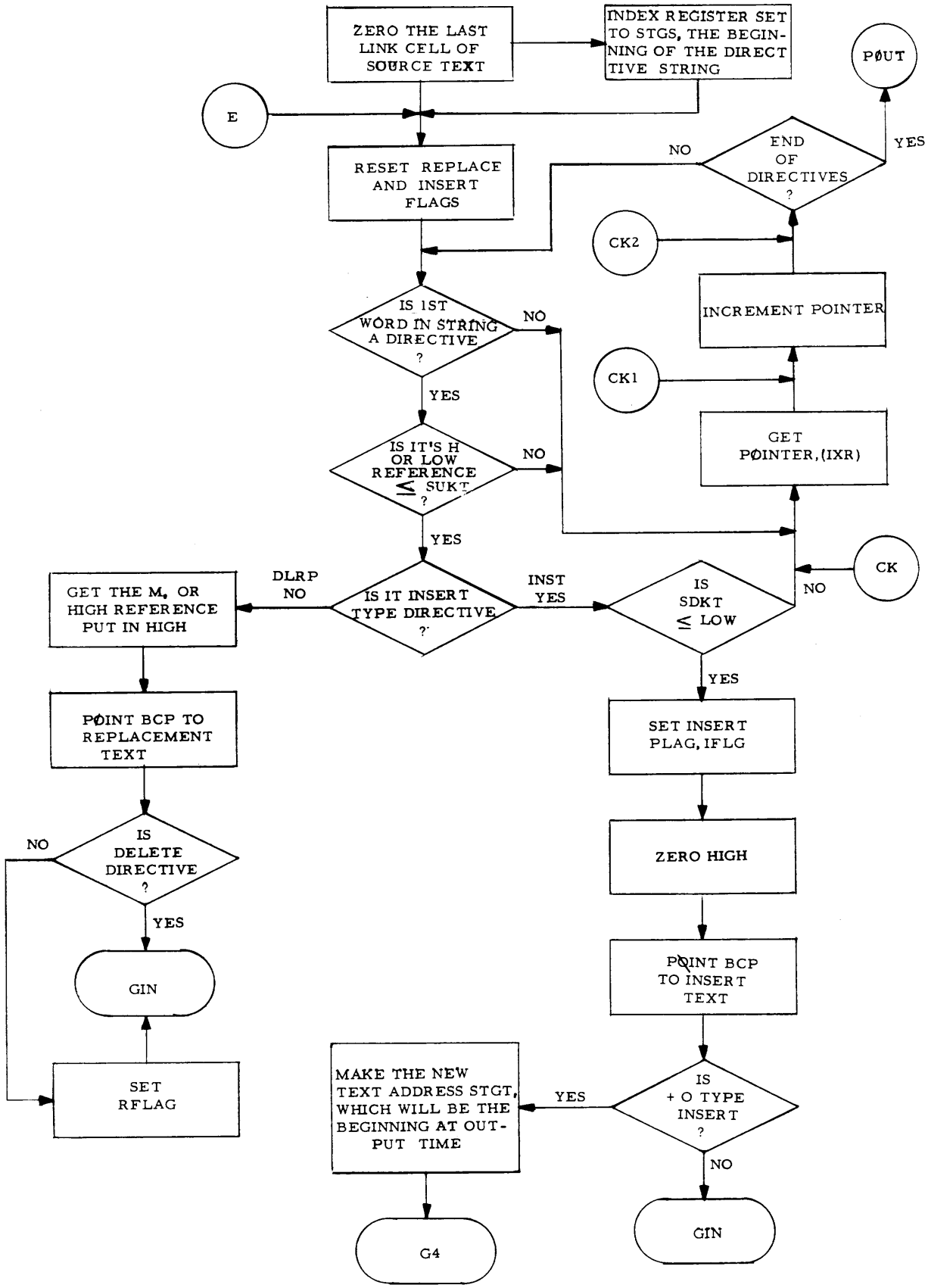


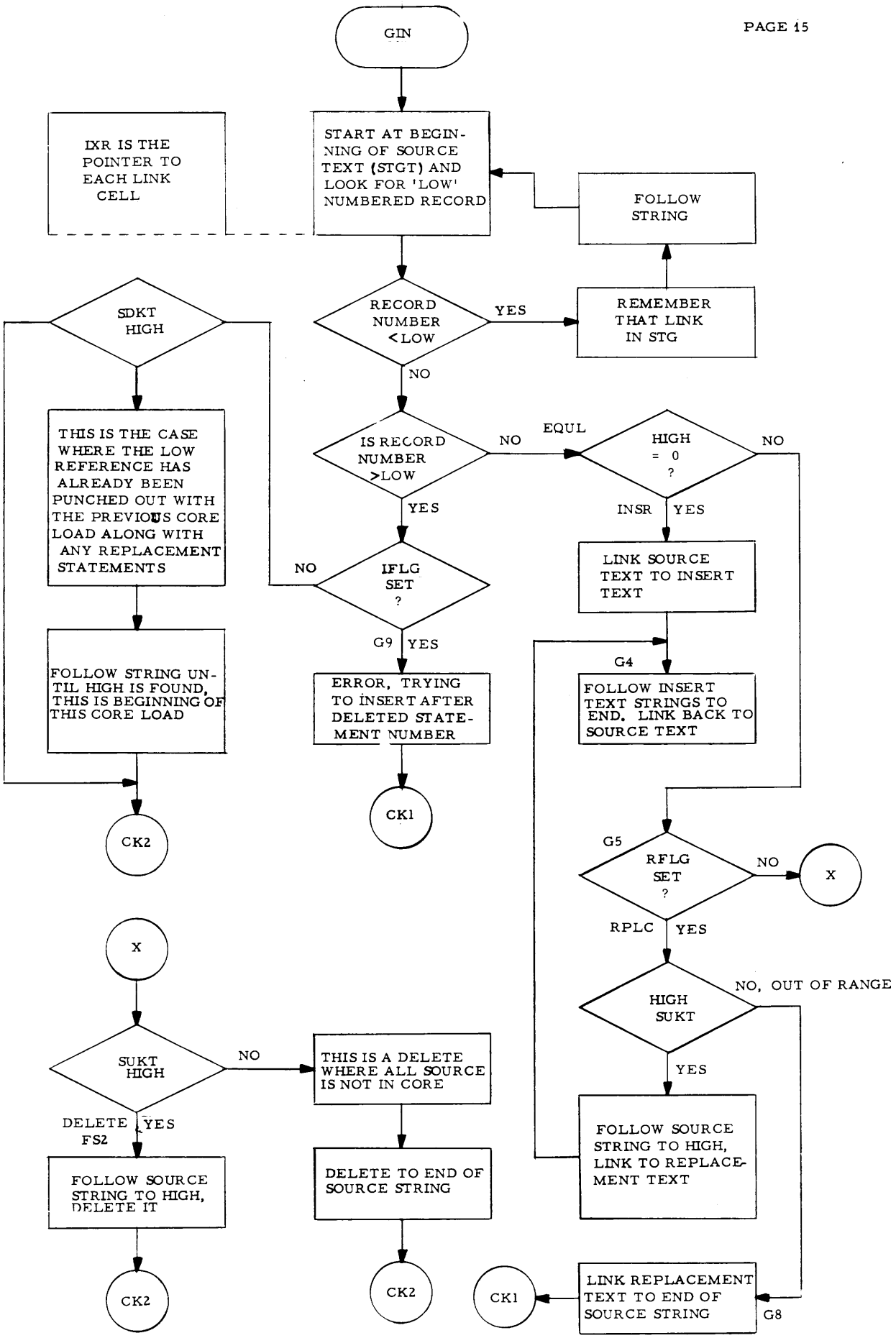

NO
IS COMMA TOGGLE ON ?
YES
QRO
NO
IS IT A COMMA ?
QRO
NO
YES
SET COMMA TOGGLE ON
'GNC' GET A CHARACTER
N1
1
PUT CONVERTERED NUMBER IN 2nd WORD OF STRING
INCREMENT STG
'ISBK' IS NEXT CHARACTER BLANK
YES
N2
+n = 2
+n, m = 3
COMPUTE TYPE OF DIRECTIVE
PUT IT, AND CODE FOR BEGINNING OF DIRECTIVE AT BEGINNING OF STRING
N3
'SORD' READ ANOTHER DIRECTIVE
'GNC' GET A CHARACTER
IS IT + SIGN ?
NO
YES
N6
'ISEN' IS IT END RECORD?
YES
NO
'COMS' COMPRESS AND STRING
SET ON COMMA TOGGLE


N6
IS COMMA TOGGLE SET ?
NO
QRO
ZERO THE LINK CELL, THIS IS THE LAST RECORD IN THIS STRING
UPSPACE DBIG POINTER
RESET COMMA TOGGLE
N4

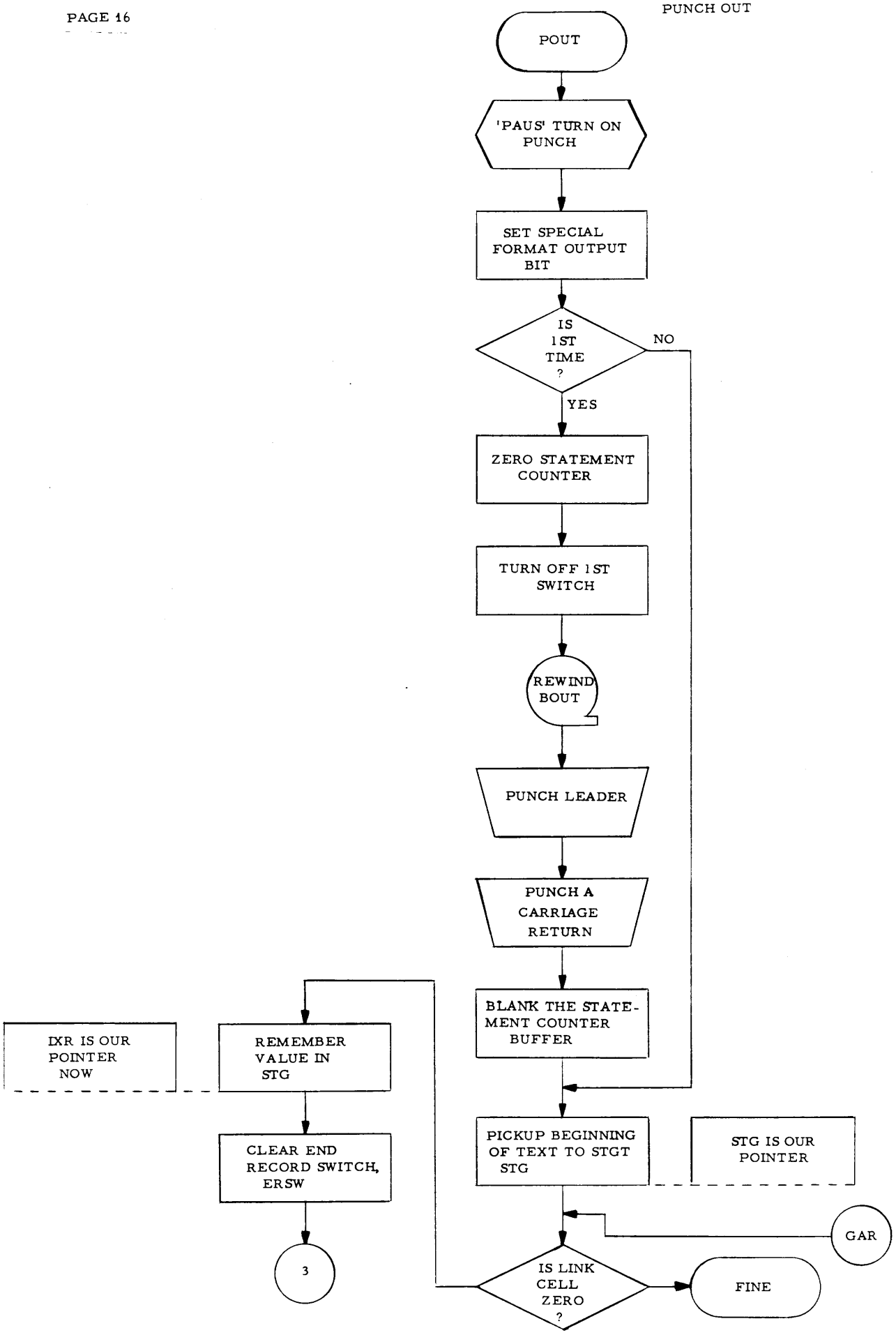
INPUT SOURCE TEXT

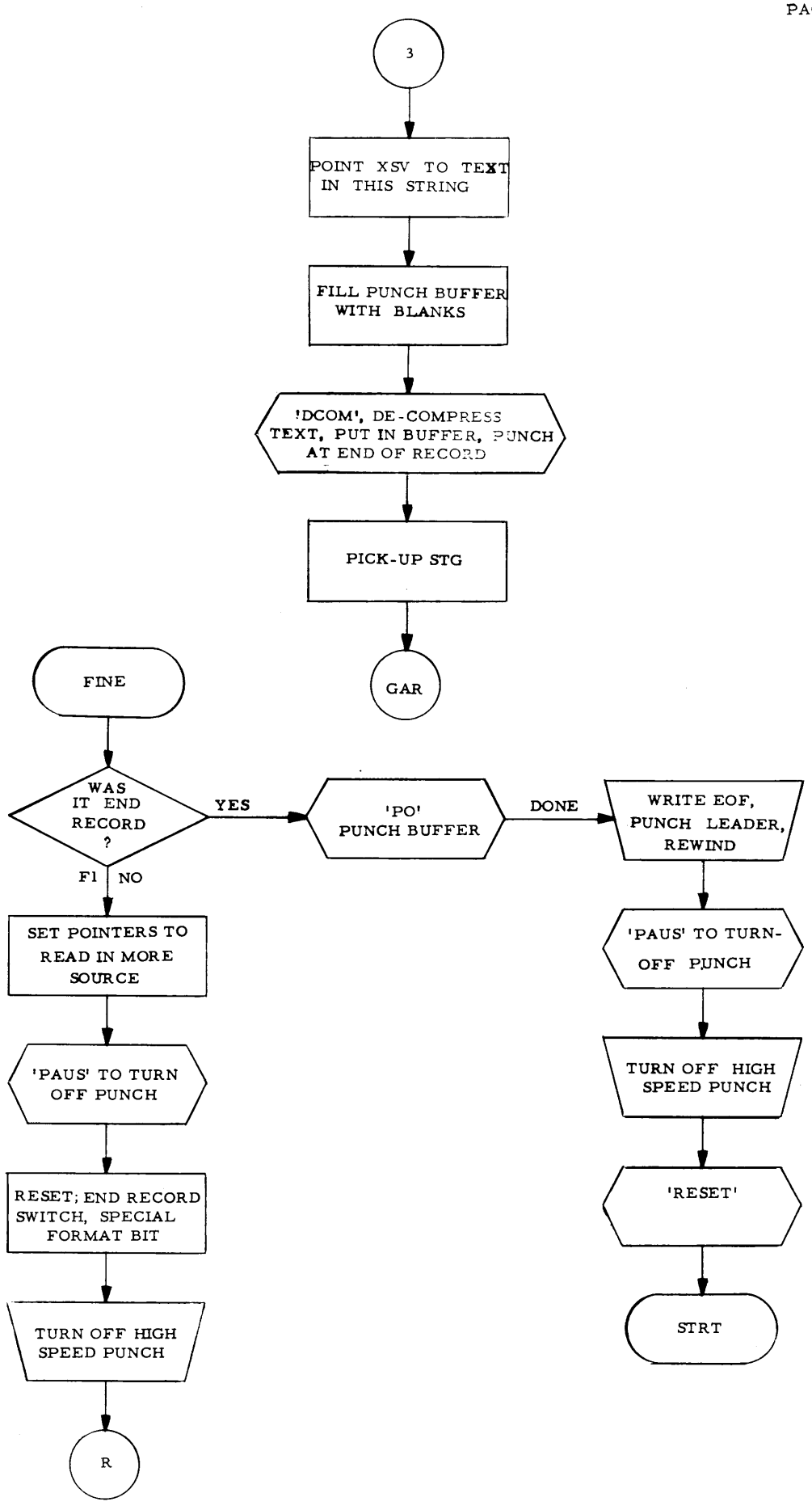



ZERO THE LAST LINK CELL OF SOURCE TEXT
INDEX REGISTER SET TO STGS, THE BEGINNING OF THE DIRECTIVE STRING
PØUT
E
RESET REPLACE AND INSERT FLAGS
END OF DIRECTIVES ?
NO
YES
CK2
INCREMENT POINTER
IS 1ST WORD IN STRING A DIRECTIVE ?
NO
YES
CK1
GET PØINTER,(IXR)
IS IT'S H OR LOW REFERENCE ≤ SUKT ?
NO
YES
CK
NO
IS IT INSERT TYPE DIRECTIVE ?
DLRP NO
INST YES
IS SDKT ≤ LOW
GET THE M, OR HIGH REFERENCE PUT IN HIGH
PØINT BCP TO REPLACEMENT TEXT
SET INSERT PLAG, IFLG
YES
IS DELETE DIRECTIVE ?
NO
YES
ZERO HIGH
GIN
PØINT BCP TO INSERT TEXT
SET RFLAG
MAKE THE NEW TEXT ADDRESS STGT, WHICH WILL BE THE BEGINNING AT OUTPUT TIME
YES
IS + O TYPE INSERT ?
NO
GIN
G4

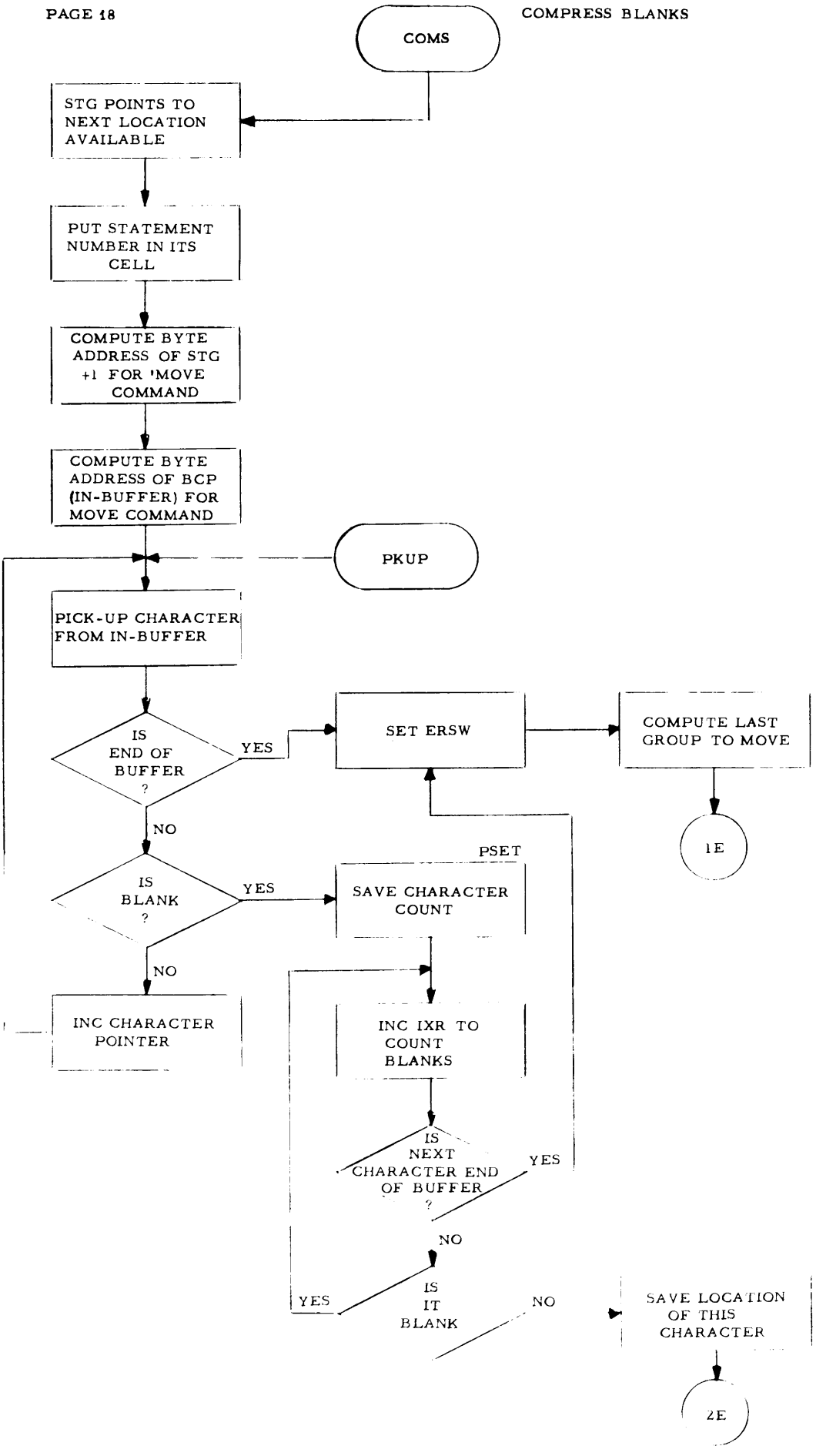

GIN
IXR IS THE POINTER TO EACH LINK CELL
START AT BEGINNING OF SOURCE TEXT (STGT) AND LOOK FOR 'LOW' NUMBERED RECORD
FOLLOW STRING
RECORD NUMBER <LOW
YES
REMEMBER THAT LINK IN STG
NO
SDKT HIGH
IS RECORD NUMBER >LOW
NO
EQUL
HIGH = 0 ?
NO
INSR
YES
YES
THIS IS THE CASE WHERE THE LOW REFERENCE HAS ALREADY BEEN PUNCHED OUT WITH THE PREVIOUS CORE LOAD ALONG WITH ANY REPLACEMENT STATEMENTS
NO
IFLG SET ?
LINK SOURCE TEXT TO INSERT TEXT
G9
YES
G4
FOLLOW STRING UNTIL HIGH IS FOUND, THIS IS BEGINNING OF THIS CORE LOAD
ERROR, TRYING TO INSERT AFTER DELETED STATEMENT NUMBER
FOLLOW INSERT TEXT STRINGS TO END. LINK BACK TO SOURCE TEXT
CK1
CK2
G5
RFLG SET ?
NO
X
RPLC
YES
X
HIGH SUKT
NO, OUT OF RANGE
SUKT HIGH
NO
THIS IS A DELETE WHERE ALL SOURCE IS NOT IN CORE
YES
DELETE
FS2
YES
FOLLOW SOURCE STRING TO HIGH, LINK TO REPLACEMENT TEXT
FOLLOW SOURCE STRING TO HIGH, DELETE IT
DELETE TO END OF SOURCE STRING
CK2
CK2
CK1
LINK REPLACEMENT TEXT TO END OF SOURCE STRING
G8

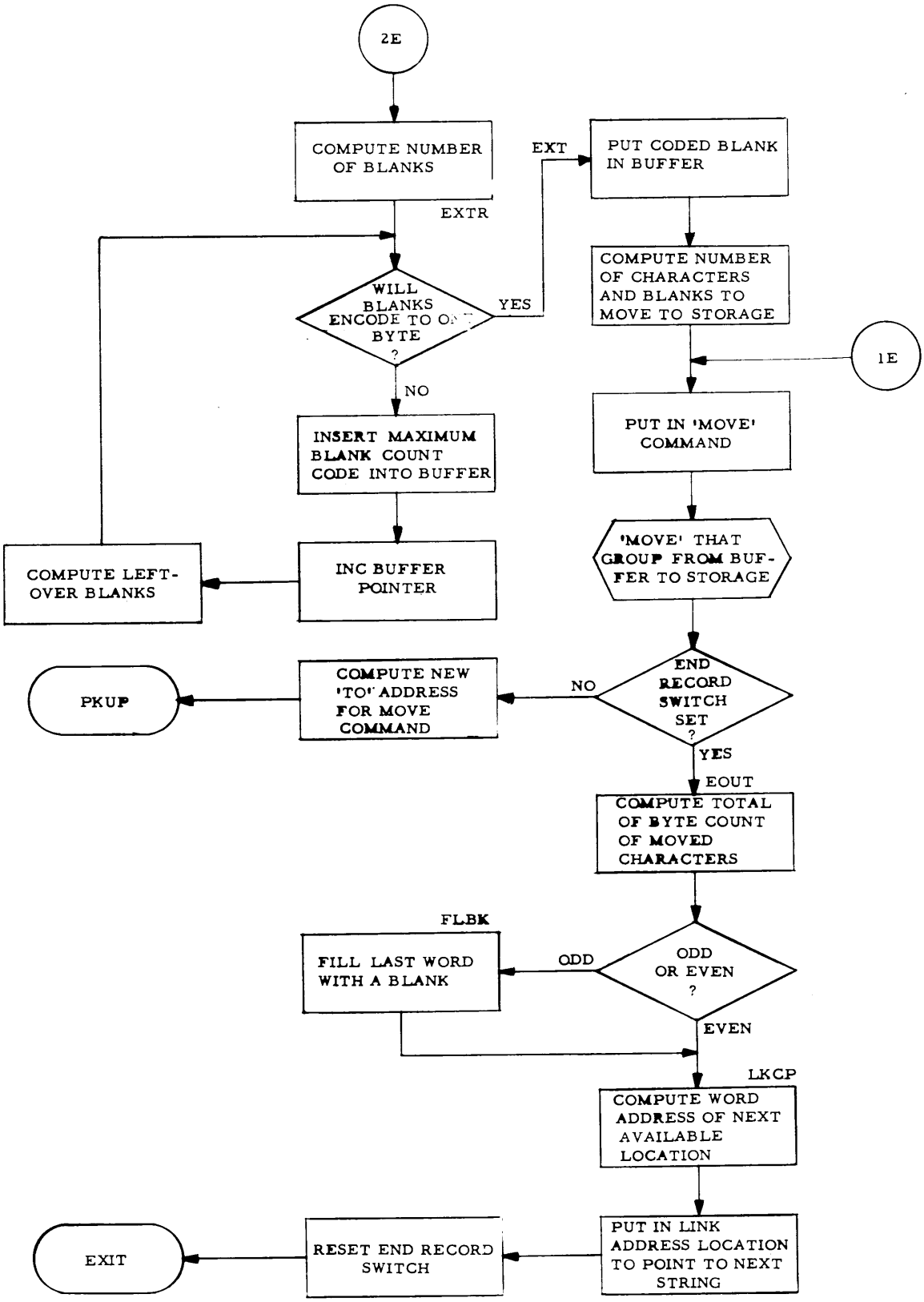
PUNCH OUT

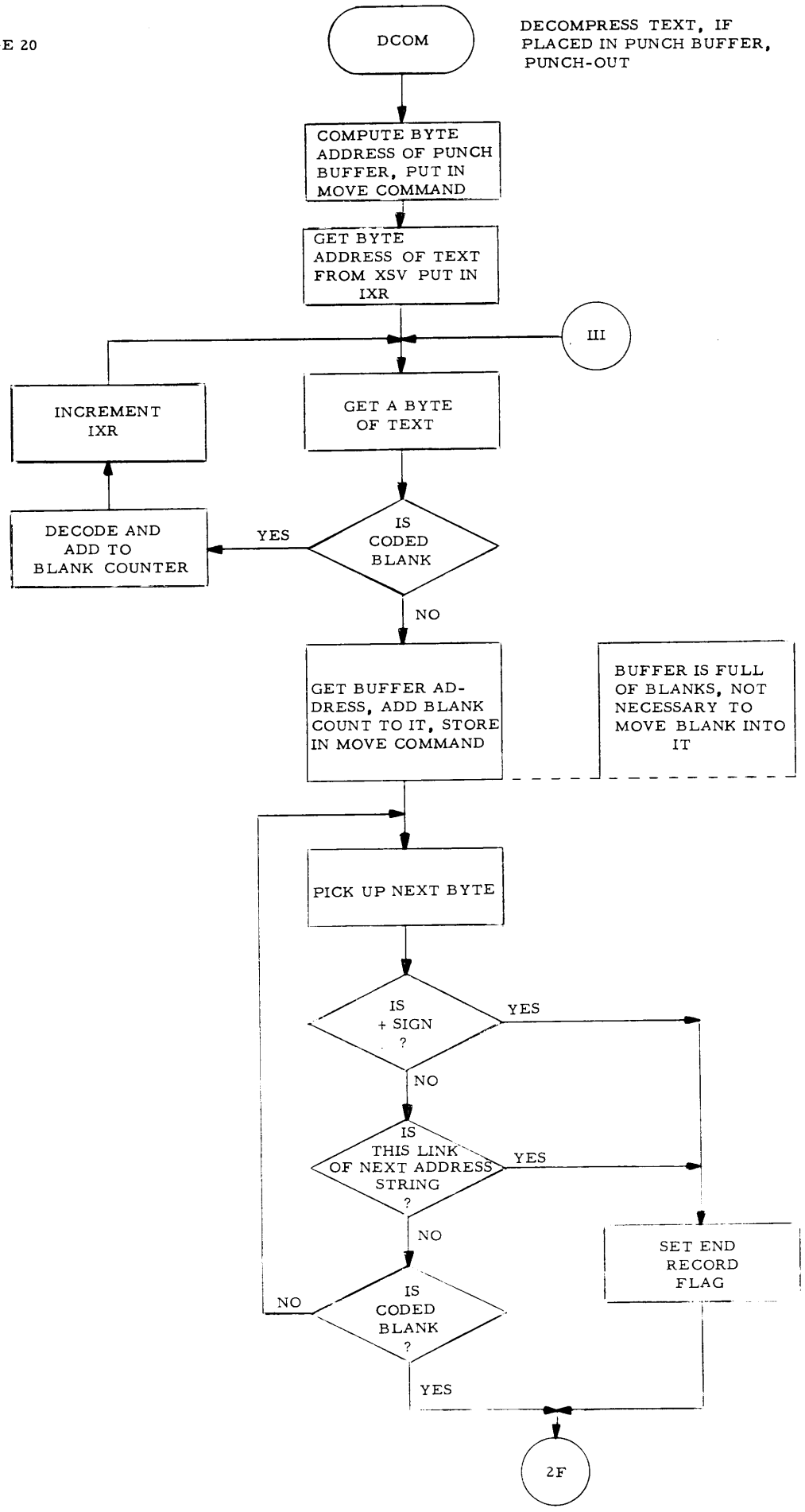

POUT
'PAUS' TURN ON PUNCH
SET SPECIAL FORMAT OUTPUT BIT
IS 1ST TIME ?
NO
YES
ZERO STATEMENT COUNTER
TURN OFF 1ST SWITCH
REWIND BOUT
PUNCH LEADER
PUNCH A CARRIAGE RETURN
BLANK THE STATEMENT COUNTER BUFFER
PICKUP BEGINNING OF TEXT TO STGT STG
STG IS OUR POINTER
GAR
IS LINK CELL ZERO ?
FINE
REMEMBER VALUE IN STG
IXR IS OUR POINTER NOW
CLEAR END RECORD SWITCH, ERSW
3

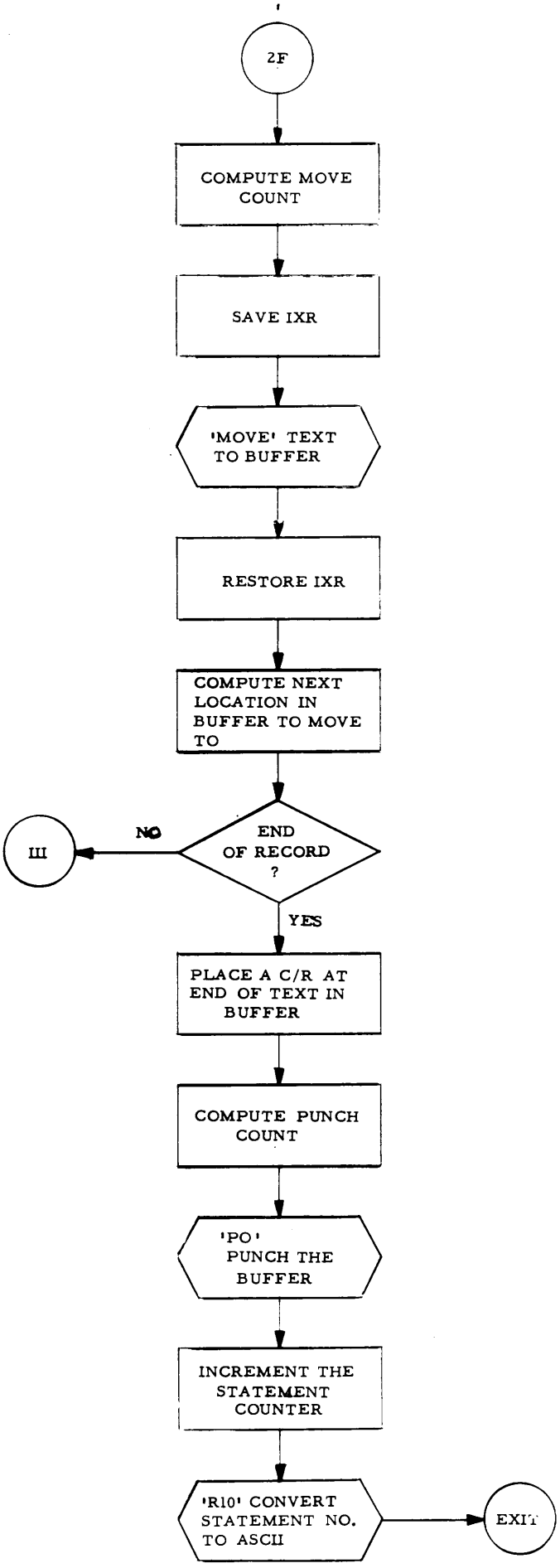

3
POINT XSV TO TEXT IN THIS STRING
FILL PUNCH BUFFER WITH BLANKS
'DCOM', DE-COMPRESS TEXT, PUT IN BUFFER, PUNCH AT END OF RECORD
PICK-UP STG
GAR
FINE
WAS IT END RECORD ?
YES
'PO' PUNCH BUFFER
DONE
WRITE EOF, PUNCH LEADER, REWIND
F1
NO
SET POINTERS TO READ IN MORE SOURCE
'PAUS' TO TURN OFF PUNCH
RESET; END RECORD SWITCH, SPECIAL FORMAT BIT
TURN OFF HIGH SPEED PUNCH
R
'PAUS' TO TURN-OFF PUNCH
TURN OFF HIGH SPEED PUNCH
'RESET'
STRT

COMPRESS BLANKS

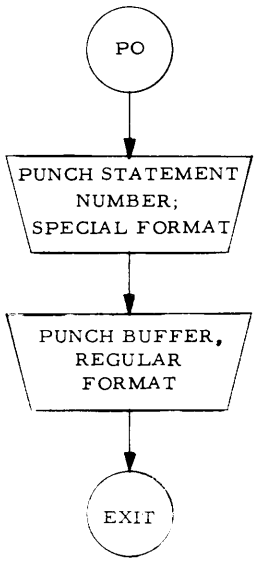



2E
COMPUTE NUMBER OF BLANKS
EXTR
EXT
PUT CODED BLANK IN BUFFER
COMPUTE NUMBER OF CHARACTERS AND BLANKS TO MOVE TO STORAGE
1E
WILL BLANKS ENCODE TO ONE BYTE ?
YES
NO
INSERT MAXIMUM BLANK COUNT CODE INTO BUFFER
PUT IN 'MOVE' COMMAND
'MOVE' THAT GROUP FROM BUFFER TO STORAGE
COMPUTE LEFT-OVER BLANKS
INC BUFFER POINTER
END RECORD SWITCH SET ?
NO
YES
PKUP
COMPUTE NEW 'TO' ADDRESS FOR MOVE COMMAND
EOUT
COMPUTE TOTAL OF BYTE COUNT OF MOVED CHARACTERS
FLBK
ODD
ODD OR EVEN ?
FILL LAST WORD WITH A BLANK
EVEN
LKCP
COMPUTE WORD ADDRESS OF NEXT AVAILABLE LOCATION
EXIT
RESET END RECORD SWITCH
PUT IN LINK ADDRESS LOCATION TO POINT TO NEXT STRING

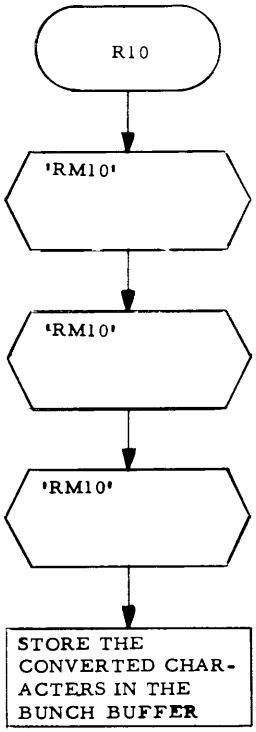

DCOM
DECOMPRESS TEXT, IF PLACED IN PUNCH BUFFER, PUNCH-OUT
COMPUTE BYTE ADDRESS OF PUNCH BUFFER, PUT IN MOVE COMMAND
GET BYTE ADDRESS OF TEXT FROM XSV PUT IN IXR
III
INCREMENT IXR
GET A BYTE OF TEXT
DECODE AND ADD TO BLANK COUNTER
YES
IS CODED BLANK
NO
GET BUFFER ADDRESS, ADD BLANK COUNT TO IT, STORE IN MOVE COMMAND
BUFFER IS FULL OF BLANKS, NOT NECESSARY TO MOVE BLANK INTO IT
PICK UP NEXT BYTE
IS + SIGN ?
YES
NO
IS THIS LINK OF NEXT ADDRESS STRING ?
YES
NO
SET END RECORD FLAG
NO
IS CODED BLANK ?
YES
2F


2F
COMPUTE MOVE COUNT
SAVE IXR
'MOVE' TEXT TO BUFFER
RESTORE IXR
COMPUTE NEXT LOCATION IN BUFFER TO MOVE TO
END OF RECORD ?
NO
III
YES
PLACE A C/R AT END OF TEXT IN BUFFER
COMPUTE PUNCH COUNT
'PO' PUNCH THE BUFFER
INCREMENT THE STATEMENT COUNTER
'R10' CONVERT STATEMENT NO. TO ASCII
EXIT

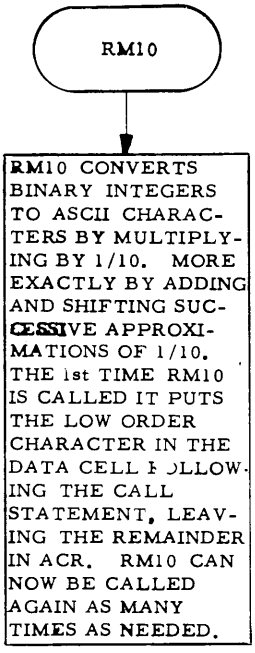
PUNCH OUT SUBROUTINE



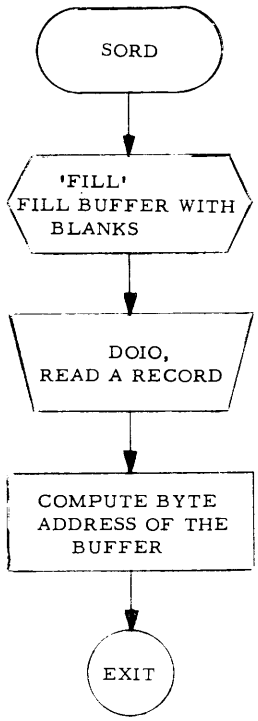
SPECIAL FORMAT PUNCHES WITHOUT C/R OR /F, THIS PLACES THE STATEMENT NUMBER BETWEEN THE RECORDS.

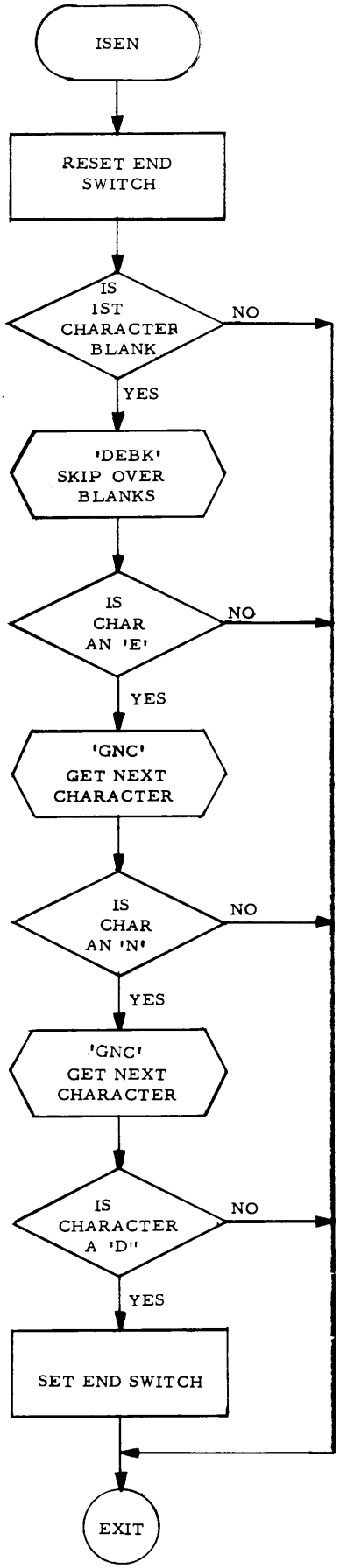


RM10 IS CALLED AS MANY TIMES AS CHARACTERS ARE NEEDED. THE FIRST CALL GETS THE UNITS CHARACTER, THE NEXT THE HUNDREDS AND SO ON.

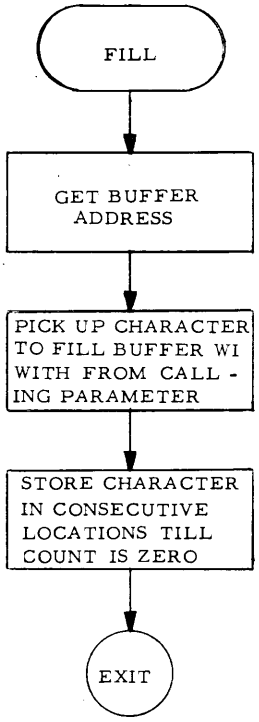


READ A RECORD

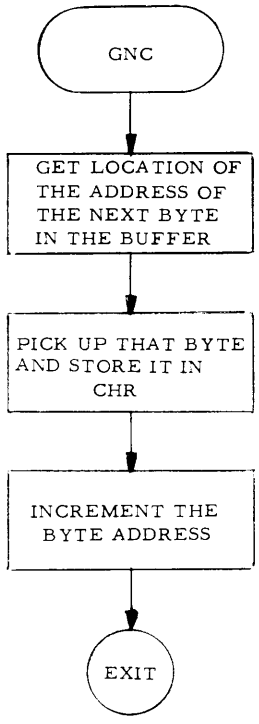



ISEN
RESET END SWITCH
IS 1ST CHARACTER BLANK
NO
YES
'DEBK' SKIP OVER BLANKS
IS CHAR AN 'E'
NO
YES
'GNC' GET NEXT CHARACTER
IS CHAR AN 'N'
NO
YES
'GNC' GET NEXT CHARACTER
IS CHARACTER A 'D'
NO
YES
SET END SWITCH
EXIT

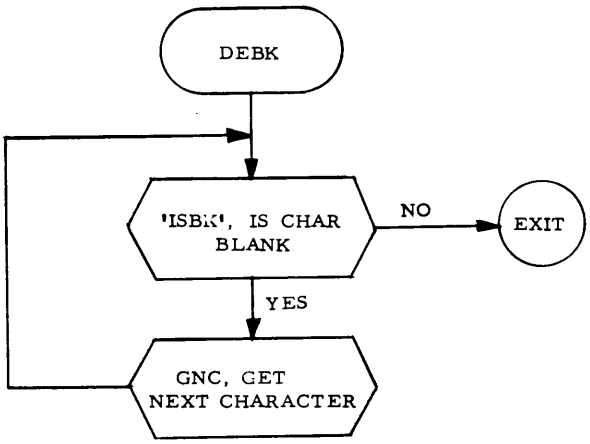
FILL, FILLS BUFFER
WITH WHATEVER
CHARACTER IS NEEDED



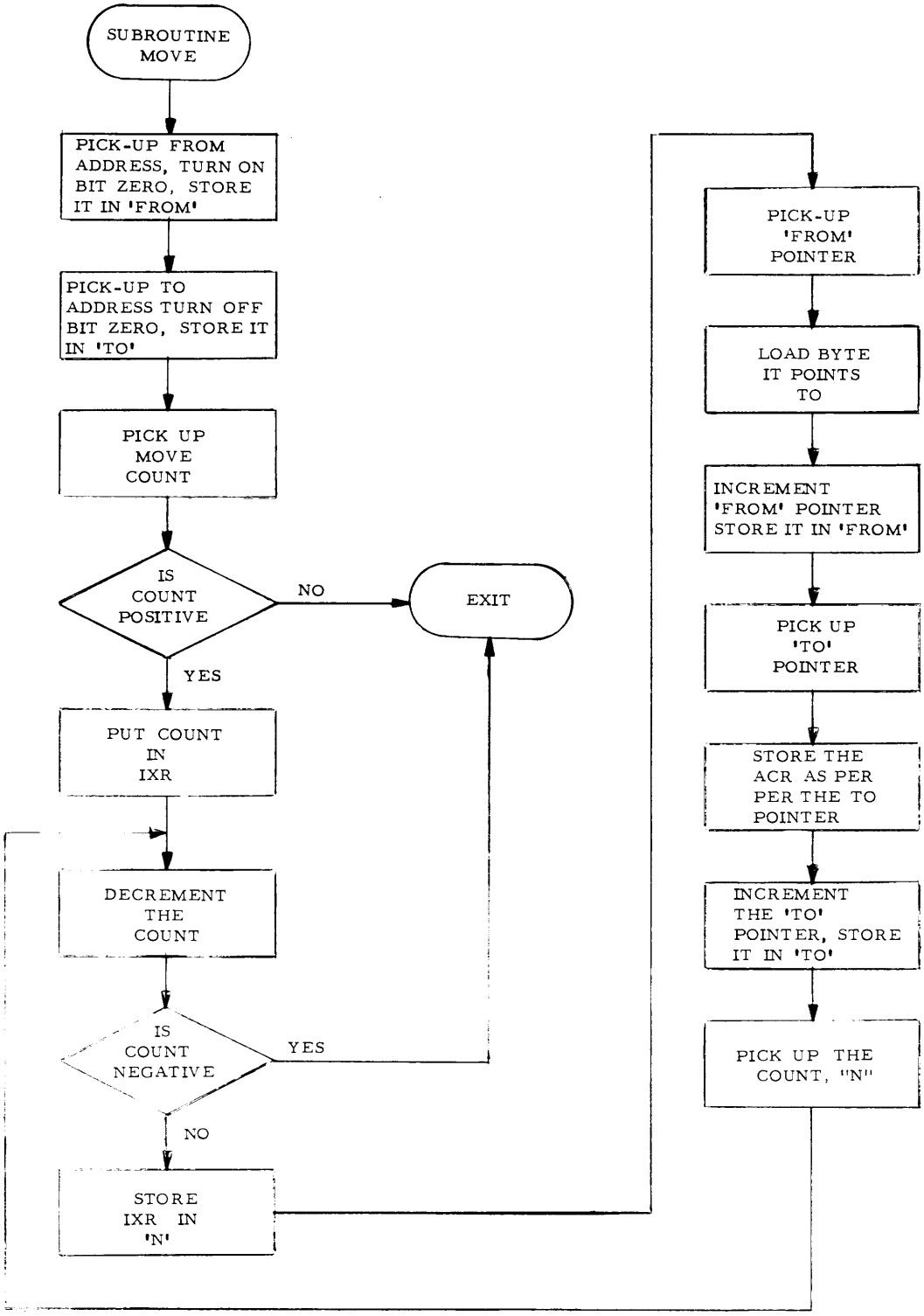
GNC, GET NEXT
CHARACTER



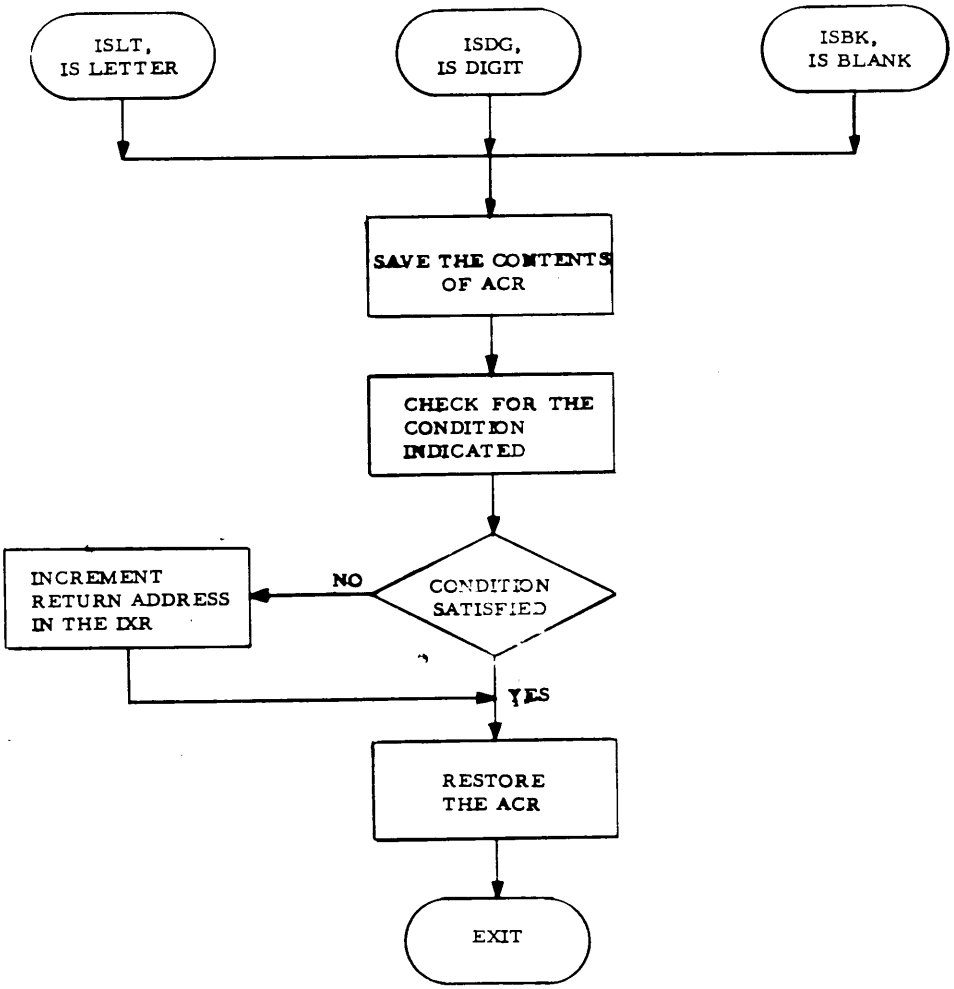
DEBK, DE-BLANK,
SCAN OVER BLANKS



MOVE
BYTES


SUBROUTINE MOVE
PICK-UP FROM ADDRESS, TURN ON BIT ZERO, STORE IT IN 'FROM'
PICK-UP TO ADDRESS TURN OFF BIT ZERO, STORE IT IN 'TO'
PICK UP MOVE COUNT
IS COUNT POSITIVE
NO
EXIT
YES
PUT COUNT IN IXR
DECREMENT THE COUNT
IS COUNT NEGATIVE
YES
NO
STORE IXR IN 'N'
PICK-UP 'FROM' POINTER
LOAD BYTE IT POINTS TO
INCREMENT 'FROM' POINTER STORE IT IN 'FROM'
PICK UP 'TO' POINTER
STORE THE ACR AS PER PER THE TO POINTER
INCREMENT THE 'TO' POINTER, STORE IT IN 'TO'
PICK UP THE COUNT, "N"

ISIT SUBROUTINE



APPENDIX A

ASSEMBLY LISTING

of

SYMBOLIC PROGRAM EDITOR - BASIC

Drawing No.

390941 B

ID Code

BNV

Listing and Tape not affected by Revision C

```
                    1 'SYMBOLIC EDITOR BASIC REV E 06/15/70
          0000      2 NOTBASIC EQU   0                                    NVD00000
          0001      3 BASIC    EQU   1                                    NVD00010
                    4 *  FOLLOWING CARDS ARE NOT A PERMANENT              NVE00020
                    5 *  PART OF THE DECK AND ARE THEREFORE               NVE00030
                    6 *  NOT SEQUENCED                                    NVE00040
                    7 *                                                   NVE00050
          0001      8 SYSTEM   IS    BASIC                                NVD00060
                    9          ORIG  X'80'                                NVE00070
          0000     10 ALPH     EQU   0                                    NVB00080
          0009     11 READ     EQU   9                                    NVB00090
          000B     12 REAK     EQU   X'B'                                 NVB00100
          000E     13 WRIT     EQU   X'E'                                 NVB00110
          0001     14 SYSI     EQU   1                                    NVB00120
          0002     15 PRIN     EQU   2                                    NVB00130
          0003     16 LIST     EQU   3                                    NVB00140
          0004     17 BIN      EQU   4                                    NVB00150
          0005     18 BOUT     EQU   5                                    NVB00160
          0040     19 XRAY     EQU   X'40'                                NVB00170
          004E     20 RWND     EQU   X'4E'                                NVB00180
          005A     21 ULIM     EQU   X'5A'                                NVB00190
          0046     22 STAT     EQU   X'46'                                NVB00200
          0044     23 DCIO     EQU   X'44'                                NVB00210
          0042     24 OPEN     EQU   X'42'                                NVB00220
          0050     25 WEOF     EQU   X'50'                                NVB00230
0080 90D8 0026     26 PATCH    LDX   STGT                                 NVB00240
0081 8085 0027                 LDW   STP                                  NVB00250
0082 70D7 0028                 STW   STG                                  NVB00260
0083 11AF 0029                 JMP   G1                                   NVB00270
0084 C2C5 0030 BE              D     'BE'                                 NVB00280
0085 00D8 0031 STP             D     STGT                                 NVB00290
0086 8000 0032 BIT0            D     X'8000'                              NVB00300
0087 008D 0033 CR              D     X'8D'                                NVB00310
0088 000F 0034 M4              D     X'F'                                 NVB00320
0089 CFD6 0035 OV              D     'OV'                                 NVB00330
008A 001F 0036 ONFF            D     X'1F'                                NVB00340
008B D1BF 0037 Q               D     X'D1BF'                              NVB00350
008C 0097 0038 INAD            D     INBF                                 NVB00360
008D 0028 0039 WC              D     40                                   NVB00370
008E 048F 0040 STGS            D     ENDE+1                               NVE00380
008F A0A0 0041 BK              D     X'A0A0'                              NVB00390
0090 0002 0042 TWO             D     2                                    NVB00400
0091 0003 0043 THRE            D     3                                    NVB00410
0092 00E0 0044 EZRO            D     X'E0'                                NVB00420
0093 00DF 0045 DF              D     X'DF'                                NVB00430
0094 00FF 0046 FF              D     X'FF'                                NVB00440
0095 0000 0047 II              D     0                                    NVB00450
0096 00A0 0048 KK              D     X'00A0'                              NVB00460
0097      0049 INBF            RES   40                                   NVB00470
00BF FFFF 0050 ENBF            D     X'FFFF'                              NVB00480
00C0      0051 FIT             RES   8                                    NVB00490
00C8      0052 FIT2            RES   8                                    NVB00500
00D0 0000 0053 PKNT            D     0                                    NVB00510
00D1 0000 0054 SQSV            D     0                                    NVB00520
00D2 0000 0055 ENSW            D     0                                    NVB00530
00D3 0000 0056 ERSW            D     0                                    NVB00540
```

```
00D4 0000    57 BIGE     D    0                                          NVB00550
00D5 0000    58 DBIG     D    0                                          NVB00560
00D6 0000    59 CTRG     D    0                                          NVB00570
00D7 0000    60 STG      D    0                                          NVB00580
00D8 0000    61 STGT     D    0                                          NVB00590
00D9 0000    62 BCP      D    0                                          NVB00600
00DA 0000    63 FSSW     D    0                                          NVB00610
00DB 0000    64 FITS     D    0                                          NVD00620
00DC 0000    65 SKTR     D    0                                          NVB00630
00DD 0000    66 SDKT     D    0                                          NVB00640
00DE 0000    67 RFLG     D    0                                          NVB00650
00DF 0000    68 IFLG     D    0                                          NVB00660
00E0 0000    69 LOW      D    0                                          NVB00670
00E1 0000    70 HIGH     D    0                                          NVB00680
00F2 0000    71 STR      D    0                                          NVB00690
00E3 0000    72 POFLG    D    0                                          NVB00700
00E4 0000    73 ENS1     D    0                                          NVB00710
```

```
                    74 '        BEGINNING                                          NVB00720
00E5                75 START    RES    0                                           NVB00730
00E5 237F           76          JSX    RESET                                       NVB00740
00E6                77 STRT     RES    0                                           NVB00750
                    78          TRUE   SYSTEM=BASIC                               NVE00760
00E6 247B           79          JSX    OPEN2                                       NVE00770
00E7 0084           80          D      8E                                          NVE00780
00E8 03F6           81          D      ONE                                         NVE00790
00E9 003E           82          D      X'3E'          LIST UNIT                    NVE00800
                    83          ENDC                                               NVE00810
00EA 2044           87          JSX    DCIO,FIT2                                   NVB00850
00EB 80C8
00EC 2046           88          JSX    STAT,FIT2                                   NVB00860
00ED 80C8
```

```
                    89 *        READ AND PROCESS EDIT DIRECTIVES                                NVB00870
                    90 *                                                                        NVB00880
                    94          TRUE  SYSTEM=BASIC                                              NVE00920
00FE 2485           95          JSX   OPEN1                                                     NVE00930
00FF 0097           96          D     INBF                                                      NVE00940
00F0 008D           97          D     WC                                                        NVE00950
00F1 001B           98          D     X'1B'                                                     NVE00960
                    99          ENDC                                                            NVE00970
00F2 808E          100          LDW   STGS         BEGIN STRING AT                            NVB00980
00F3 70D5          101          STW   DBIG         END OF EDITOR                              NVB00990
00F4 83F6          102          SUB   ONE                                                      NVE01000
00F5 70D1          103          STW   SGSV                                                     NVE01010
00F6 80D5          104 N5       LDW   DBIG         UP-SPACE POINTERS                          NVB01020
00F7 70D7          105          STW   STG                                                      NVB01030
00F8 23C5          106          JSX   SORD         READ A DIRECTIVE                           NVB01040
00F9 23EC          107          JSX   GNC          GET 1ST CHAR                               NVB01050
00FA 07AB          108          CLB   X'AB'        IS PLUS                                    NVB01060
00FB 0860          109          SEQ                SIGN ?                                     NVB01070
00FC 113E          110          JMP   QRO          NO                                         NVB01080
00FD 80D7          111 N4       LDW   STG          ANY ROOM ?                                 NVB01090
00FE A08D          112          ADD   WC           IN CORE ?                                  NVB01100
00FF B05A          113          SUB   ULIM                                                    NVB01110
0100 0820          114          SAM                                                            NVB01120
0101 1147          115          JMP   FOGT         NO                                         NVB01130
0102 90D7          116          LDX   STG          YES, UP STRING                             NVB01140
0103 0401          117          IXS   1            POINTER                                    NVB01150
0104 0A10          118          NOP                                                            NVD01160
0105 60D7          119          STX   STG                                                      NVB01170
0106 23EC          120          JSX   GNC          WHAT DIRECTIVE ?                           NVB01180
0107 07C5          121          CLB   'E'          END OF DIRECTIVES ?                        NVB01190
0108 0870          122          SNE                                                            NVB01200
0109 114E          123          JMP   GOG          YES                                        NVB01210
010A 07D8          124          CLB   'X'          NO,RETURN TO XRAY ?                        NVB01220
010B 0870          125          SNE                                                            NVB01230
010C 1040          126          JMP   XRAY         YES                                        NVB01240
010D 240C          127 N1       JSX   ISDG         NO,SHOULD BE DIGIT                         NVB01250
010E 1110          128          JMP   $+2          YES,GOOD                                   NVB01260
010F 113E          129          JMP   QRO          NO,BAD                                     NVB01270
0110 23B2          130          JSX   PNUM         CONVERT IT,                                NVB01280
0111 814D          131          LDW   VALU         PUT CONVERTED                              NVB01290
0112 90D7          132          LDX   STG          DIGITS IN                                  NVB01300
0113 7800          133          STW * 0            STRING,                                    NVB01310
0114 0401          134          IXS   1            UP POINTER                                 NVB01320
0115 0A10          135          NOP                                                            NVD01330
0116 60D7          136          STX   STG                                                      NVB01340
0117 2415          137          JSX   ISBK         END OF DIRECTIVE                           NVB01350
0118 1124          138          JMP   N2           YES                                        NVB01360
0119 80D6          139          LDW   CTOG         NO,HAVE WE READ                            NVB01370
011A 0800          140          SAZ                A COMMA YET ?                              NVB01380
011B 113E          141          JMP   QRO          YES, BAD                                   NVB01390
011C 840B          142          LDW   CHR          NO, WHAT IS IT ?                           NVB01400
011D 07AC          143          CLB   X'AC'        COMMA ?                                    NVB01410
011E 0860          144          SEQ                                                            NVB01420
011F 113E          145          JMP   QRO          NO,BAD                                     NVB01430
0120 0140          146          CXA                YES,SET COMMA                              NVB01440
0121 70D6          147          STW   CTOG         TOGGLE                                     NVB01450
```

```
0122 23EC  148          JSX   GNC          GET A CHAR                          NVB01460
0123 110D  149          JMP   N1           AND GO                              NVB01470
0124 80D7  150 N2       LDW   STG          COMPUTE                             NVB01480
0125 80D5  151          SUB   DBIG         DIRECTIVE                           NVB01490
0126 90D5  152          LDX   DBIG         FLAG AND                            NVB01500
0127 C14C  153          ORI   NA           PLACE IT                            NVB01510
0128 7800  154          STW * 0                                                NVB01520
0129 23C5  155 N3       JSX   SORD         READ A CORRECTION                   NVB01530
012A 23EC  156          JSX   GNC          STATEMENT ?                         NVB01540
012B 07AB  157          CLB   X'AB'        PLUS SGIN ?                         NVB01550
012C 0870  158          SNE                                                    NVB01560
012D 1132  159          JMP   N6           YES                                 NVB01570
012E 23D2  160          JSX   ISEN         NO, IS END REC ?                    NVB01580
012F 229C  161          JSX   COMS         NO,COMPRESS AND STRING              NVB01590
0130 60D6  162          STX   CTOG         STE COMMA TOGGLE                    NVB01600
0131 1129  163          JMP   N3           MORE                                NVB01610
0132 80D6  164 N6       LDW   CTOG         COMMA TOGGLE SET ?                  NVB01620
0133 0800  165          SAZ                                                    NVB01630
0134 1136  166          JMP   $+2          YES                                 NVB01640
0135 113E  167          JMP   QRO          NO, BAD                             NVB01650
0136 90D1  168          LDX   SOSV         END STRING                          NVB01660
0137 0100  169          CLR                BY ZEROING                          NVB01670
0138 7800  170          STW * 0            LAST LINK                           NVB01680
0139 80D7  171          LDW   STG          RESET                               NVB01690
013A 70D5  172          STW   DBIG         POINTERS                            NVB01700
013B 0100  173          CLR                RESET                               NVB01710
013C 70D6  174          STW   CTOG         TOGGLE                              NVB01720
013D 10FD  175          JMP   N4                                               NVB01730
013E       176 QRO      RES   0                                                NVB01740
           180          TRUE  SYSTEM=BASIC                                     NVE01780
013E 8476  181          LDW   AQ           STUFF                               NVE01790
013F 70C8  182          STW   FIT2               ERROR MESSAGE                 NVE01800
0140 2044  183          JSX   DOIO,FIT2            OUTPUT A Q                  NVE01810
0141 80C8
           184          ENDC                                                   NVE01820
0142 2046  185          JSX   STAT,FIT2                                        NVB01830
0143 80C8
0144 0100  186          CLR                                                    NVB01840
0145 70D6  187          STW   CTOG                                             NVB01850
0146 10F6  188          JMP   N5           BEGINNING                           NVB01860
           189 *                                                               NVB01870
0147       190 FOQT     RES   0                                                NVB01880
           194          TRUE  SYSTEM=BASIC                                     NVE01920
0147 8477  195          LDW   AOV          STUFF                               NVE01930
0148 70C8  196          STW   FIT2               ERROR MESSAGE                 NVE01940
0149 2044  197          JSX   DOIO,FIT2            OUTPUT AN OV                NVE01950
014A 80C8
           198          ENDC                                                   NVE01960
014B 1040  199          JMP   XRAY         MESSAGE, XRAY                       NVB01970
014C 9A00  200 NA       D     X'9A00'                                          NVD01980
014D 0000  201 VALU     D     0                                                NVD01990
```

```
                202 '         INPUT SOURCE TEXT                                    NVB02000
014E 80D7       203 GOG       LDW   STG                                            NVB02010
014F B3F6       204           SUB   ONE                                            NVB02020
0150 70D7       205           STW   STG                                            NVB02030
0151 70D8       206           STW   STGT                                           NVB02040
0152 70D6       207           STW   CTOG                                           NVB02050
0153 0100       208           CLR                                                  NVB02060
0154 70DD       209           STW   SDKT                                           NVB02070
0155 716C       210           STW   SUKT                                           NVB02080
                211           TRUE  SYSTEM*BASIC                                   NVE02090
0156 2485       212 R         JSX   OPEN1                                          NVE02100
0157 0097       213           D     INBF                                           NVE02110
0158 008D       214           D     WC                                             NVE02120
0159 0029       215           D     X'29'                                          NVE02130
                216           ENDC                                                 NVE02140
015A 80D7       222 AGAN      LDW   STG           ADD OF NEXT STRING               NVB02200
015B A08D       223           ADD   WC            PLUS 40                          NVB02210
015C B05A       224           SUB   ULIM                                           NVB02220
015D 0820       225           SAM                 OK THERE'S ROOM                  NVB02230
015E 116D       226           JMP   EDIT          NO ROOM                          NVB02240
015F 23C5       227           JSX   SORD          GET A RECORD                     NVB02250
0160 916C       228           LDX   SUKT                                           NVB02260
0161 0401       229           IXS   1                                              NVB02270
0162 0A10       230           NOP                                                  NVD02280
0163 616C       231           STX   SUKT                                           NVB02290
0164 23EC       232           JSX   GNC           PICK UP 1ST CHAR                 NVB02300
0165 23D2       233           JSX   ISEN          IS END REC? SET ENSW             NVB02310
0166 229C       234           JSX   COMS          COMPRESS AND STRING              NVB02320
0167 80D2       235           LDW   ENSW                                           NVB02330
0168 70E4       236           STW   ENS1                                           NVB02340
0169 0800       237           SAZ                                                  NVB02350
016A 116D       238           JMP   EDIT          END OF SOURCE                    NVB02360
016B 115A       239           JMP   AGAN                                           NVB02370
016C 0000       240 SUKT      D     0                                              NVD02380
```

```
                    241 '       EDIT                                                    NVB02390
016D                242 EDIT    RES   0                                                 NVB02400
016D 90D1           243         LDX   SGSV       ZERO THE LAST                          NVB02410
016E 0100           244         CLR               LINK                                  NVB02420
016F 7800           245         STW * 0                                                 NVB02430
0170 908E           246         LDX   STGS       BEGINNING OF                           NVB02440
0171 0100           247 E       CLR               DIRECTIVES,                           NVB02450
0172 70DE           248         STW   RFLG       RESET REPLACE                          NVB02460
0173 70DF           249         STW   IFLG       AND INSERT FLAGS.                      NVB02470
0174 8800           250         LDW * 0          A DIRECTIVE ?                          NVB02480
0175 0A48           251         SRC   8                                                 NVB02490
0176 079A           252         CLB   X'9A'                                             NVB02500
0177 0860           253         SEQ                                                     NVB02510
0178 11A7           254         JMP   CK         NO,FIND ONE                            NVB02520
0179 8801           255         LDW * 1          YES,GET LOW                            NVB02530
017A 70E0           256         STW   LOW        REFERENCE,                             NVB02540
017B F16C           257         CMW   SUKT       IN RANGE OF                            NVB02550
017C 0890           258         SLE              SOURCE ?                               NVB02560
017D 11A7           259         JMP   CK         NO                                     NVB02570
017E 8800           260         LDW * 0          YES,INSERT                             NVB02580
017F 0702           261         CLB   2          TYPE DIR ?                             NVB02590
0180 0860           262         SEQ                                                     NVB02600
0181 1195           263         JMP   DLRP       NO,DELETE-REPLACE                      NVB02610
0182 80DD           264 INST    LDW   SDKT       IS LOW IN                              NVB02620
0183 F0E0           265         CMW   LOW        RANGE ?                                NVB02630
0184 0890           266         SLE                                                     NVB02640
0185 11A7           267         JMP   CK         NO                                     NVB02650
0186 60DF           268         STX   IFLG       YES, SET INSERT FLAG                   NVB02660
0187 0100           269         CLR               ZERO HIGH                             NVB02670
0188 70E1           270         STW   HIGH       REFERENCE,                             NVB02680
0189 0140           271         CXA               POINT BCP AT                          NVB02690
018A A090           272         ADD   TWO        INFO TO BE                             NVB02700
018B 70D9           273         STW   BCP        INSERTED,                              NVB02710
018C 80E0           274         LDW   LOW        IS PLUS ZERO                           NVB02720
018D 0800           275         SAZ               TYPE INSERT ?                         NVB02730
018E 11AE           276         JMP   GIN        NO,MAKE INSERT,                        NVB02740
                    277 *                        YES,+0 INSERT,                         NVB02750
018F 80D8           278         LDW   STGT       MAKE THE INSERT                        NVB02760
0190 70E2           279         STW   STR        STRING THE 1ST                         NVB02770
0191 9085           280         LDX   STP        STRING,                                NVB02780
0192 80D9           281         LDW   BCP                                               NVB02790
0193 7800           282         STW * 0                                                 NVB02800
0194 11D3           283         JMP   G4                                                NVB02810
                    284 *                                                               NVB02820
                    285 *                                                               NVB02830
0195 8802           286 DLRP    LDW * 2          PICK UP HIGH                           NVB02840
0196 70E1           287         STW   HIGH       REFERENCE,                             NVB02850
0197 80E0           288         LDW   LOW        IS LOW LESS THAN                       NVB02860
0198 F0E1           289         CMW   HIGH       OR EQUAL TO                            NVB02870
0199 0890           290         SLE              HIGH [                                 NVB02880
019A 11A7           291         JMP   CK         NO, BAD                                NVB02890
019B 0140           292         CXA               POINT BCP AT                          NVB02900
019C A091           293         ADD   THRE       INFO TO BE                             NVB02910
019D 70D9           294         STW   BCP        INSERTED                               NVB02920
019E F0D5           295         CMW   DBIG       IS LAST DIRECTIVE ?                    NVB02930
019F 0840           296         SLS                                                     NVB02940
```

```
01A0 11AE  297          JMP   GIN          YES, MUST BE DELETE                NVB02950
01A1 8803  298          LDW * 3            NO                                 NVB02960
01A2 0A48  299          SRC   8            IS NEXT AN EDIT                    NVB02970
01A3 079A  300          CLB   X'9A'        DIRECTIVE B,                       NVB02980
01A4 0860  301          SEQ                                                   NVB02990
01A5 60DE  302          STX   RFLG         NO, MUST BE REPLACE                NVB03000
01A6 11AE  303          JMP   GIN          YES                                NVB03010
           304 *                                                              NVB03020
01A7 0140  305 CK       CXA                MOVE THROUGH                       NVB03030
01A8 A3F6  306 CK1      ADD   ONE          DIRECTIVES TO                      NVB03040
01A9 F0D5  307 CK2      CMW   DBIG         THE NEXT LOGICAL                   NVB03050
01AA 0840  308          SLS                ONE,                               NVB03060
01AB 1206  309          JMP   POUT         FINISHED                           NVB03070
01AC 0130  310          CAX                                                   NVB03080
01AD 1171  311          JMP   E                                               NVB03090
```

```
                    312 '       GIN   SOURCE STATEMENT STRINGS                    NVB03100
    01AE            313 GIN     RES   0                                          NVB03110
    01AE 1080       314         JMP   PATCH                                      NVB03120
    01AF 8801       315 G1      LDW * 1             STATEMENT NUMBER,            NVB03130
    01B0 F0E0       316         CMW   LOW           LOOP TILL LOW REF            NVB03140
    01B1 0840       317         SLS                 IS FOUND,                    NVB03150
    01B2 11B6       318         JMP   G2                                         NVB03160
                    319 *                                                        NVB03170
    01B3 60D7       320         STX   STG                                        NVB03180
    01B4 9800       321         LDX * 0                                          NVB03190
    01B5 11AF       322         JMP   G1                                         NVB03200
                    323 *                                                        NVB03210
    01B6 0880       324 G2      SGR                                              NVB03220
    01B7 11CC       325         JMP   EQUL          FOUND IT,                    NVB03230
    01B8 80DF       326         LDW   IFLG          ARE ABOVE IT,                NVB03240
    01B9 0800       327         SAZ                 INSERTING ?                  NVB03250
    01BA 1204       328         JMP   G9            YES,ERROR,SKIP IT,           NVB03260
    01BB 80DD       329         LDW   SDKT          NO,IN RANGE ?                NVB03270
    01BC F0E1       330         CMW   HIGH                                       NVB03280
    01BD 0890       331         SLE                                              NVB03290
    01BE 11CA       332         JMP   G3            NO,GET MORE                  NVB03300
    01BF 8801       333 FS1     LDW * 1                                          NVB03310
    01C0 0840       334         SLS                 NOT THERE ?                  NVB03320
    01C1 1204       335         JMP   G9            MISSED IT,GO ON              NVB03330
    01C2 F0E1       336         CMW   HIGH                                       NVB03340
    01C3 0870       337         SNE                                              NVB03350
    01C4 11C7       338         JMP   $+3                                        NVB03360
    01C5 9800       339         LDX * 0                                          NVB03370
    01C6 11BF       340         JMP   FS1                                        NVB03380
    01C7 8800       341         LDW * 0             NEW BEGINNING FOR            NVB03390
    01C8 9085       342         LDX   STP           SOURCE STRING                NVB03400
    01C9 7800       343         STW * 0                                          NVB03410
    01CA 80D9       344 G3      LDW   BCP                                        NVB03420
    01CB 11A9       345         JMP   CK2                                        NVB03430
                    346 *                                                        NVB03440
    01CC 80E1       347 EQUL    LDW   HIGH          INSERTING ?                  NVB03450
    01CD 0800       348         SAZ                                              NVB03460
    01CE 11DA       349         JMP   G5            NO                           NVB03470
    01CF 8800       350 INSR    LDW * 0             YES                          NVB03480
    01D0 70E2       351         STW   STR           STRING IT IN                 NVB03490
    01D1 80D9       352         LDW   BCP                                        NVB03500
    01D2 7800       353         STW * 0                                          NVB03510
    01D3 0130       354 G4      CAX                 LOOK FOR END                 NVB03520
    01D4 8800       355         LDW * 0             OF STRING,                   NVB03530
    01D5 0800       356         SAZ                                              NVB03540
    01D6 11D3       357         JMP   G4                                         NVB03550
    01D7 80E2       358         LDW   STR           FOUND IT                     NVB03560
    01D8 7800       359         STW * 0                                          NVB03570
    01D9 11A7       360         JMP   CK            DONE                         NVB03580
    01DA 80DE       361 G5      LDW   RFLG                                       NVB03590
    01DB 0800       362         SAZ                                              NVB03600
    01DC 11F0       363         JMP   RPLC          YES,REPLACE                  NVB03610
    01DD 816C       364         LDW   SUKT          NO                           NVB03620
    01DE F0E1       365         CMW   HIGH                                       NVB03630
    01DF 0880       366         SGR                                              NVB03640
    01E0 11EC       367         JMP   G6            NO                           NVB03650
```

```
01E1 8801   368 FS2     LDW * 1                                          NVB03660
01E2 F0E1   369         CMW   HIGH                                       NVB03670
01E3 0870   370         SNE                                              NVB03680
01E4 11E7   371         JMP   $+3                                        NVB03690
01E5 9800   372         LDX * 0                                          NVB03700
01E6 11E1   373         JMP   FS2                                        NVB03710
01E7 8800   374         LDW * 0          DELETE                          NVB03720
01E8 90D7   375         LDX   STG                                        NVB03730
01E9 7800   376         STW * 0                                          NVB03740
01EA 80D9   377 G7      LDW   BCP                                        NVB03750
01EB 11A9   378         JMP   CK2        DONE                            NVB03760
01EC 90D7   379 G6      LDX   STG        DELETE OVERLAP,                 NVB03770
01ED 0100   380         CLR              DELETE TO END OF                NVB03780
01EE 7800   381         STW * 0          SOURCE STRING,                  NVB03790
01EF 11EA   382         JMP   G7                                         NVB03800
            383 *                                                        NVB03810
01F0 80E1   384 RPLC    LDW   HIGH       IS HIGH REFERENCE               NVB03820
01F1 F16C   385         CMW   SUKT       IN RANGE ?                      NVB03830
01F2 0890   386         SLE                                              NVB03840
01F3 1200   387         JMP   G8         NO                              NVB03850
01F4 8801   388 FS3     LDW * 1                                          NVB03860
01F5 F0E1   389         CMW   HIGH                                       NVB03870
01F6 0870   390         SNE                                              NVB03880
01F7 11FA   391         JMP   $+3                                        NVB03890
01F8 9800   392         LDX * 0                                          NVB03900
01F9 11F4   393         JMP   FS3                                        NVB03910
01FA 8800   394         LDW * 0          STRING TO THE                   NVB03920
01FB 70E2   395         STW   STR        NEW TEXT,                       NVB03930
01FC 90D7   396         LDX   STG                                        NVB03940
01FD 80D9   397         LDW   BCP                                        NVB03950
01FE 7800   398         STW * 0                                          NVB03960
01FF 11D3   399         JMP   G4                                         NVB03970
0200 90D7   400 G8      LDX   STG        ATTACH NEW TEXT                 NVB03980
0201 80D9   401         LDW   BCP        TO END OF SOURCE                NVB03990
0202 7800   402         STW * 0          TEXT.                           NVB04000
0203 11A8   403         JMP   CK1                                        NVB04010
            404 *                                                        NVB04020
0204 80D9   405 G9      LDW   BCP                                        NVB04030
0205 11A8   406         JMP   CK1                                        NVB04040
```

```
                407 *         PUNCH OUT                                                    NVB04050
      0206      408 POUT      EQU   $                                                      NVE04060
                409           TRUE  SYSTEM=BASIC                                           NVE04070
0206 2485       410           JSX   OPEN1                                                  NVE04080
0207 0097       411           D     INBF                                                   NVE04090
0208 008D       412           D     WC                                                     NVE04100
0209 005E       413           D     X'5E'                                                  NVE04110
020A 247B       414           JSX   OPEN2                                                  NVE04120
020B 0095       415           D     II                                                     NVE04130
020C 0090       416           D     TWO                                                    NVE04140
020D 005E       417           D     X'5E'         FUNCTION CODE AND LOGICAL UNIT NUMBER    NVE04150
                418           ENDC                                                         NVE04160
                430           TRUE  SYSTEM=BASIC                                           NVE04280
020E 5005       431           LDB   5             SEE WHAT BOUT IS ASSIGNED TO             NVE04290
020F 07E0       432           CLB   X'E0'                                                  NVE04300
                433           ENDC                                                         NVE04310
0210 0860       434           SEQ                 BOUT=TTY ?                               NVB04320
0211 1216       435           JMP   POUT1         NO, HSP                                  NVB04330
0212 0100       436           CLR                 YES                                      NVB04340
0213 70E3       437           STW   POFLG                                                  NVB04350
0214 2420       438           JSX   PAUS,2                                                 NVB04360
0215 8002
0216 80CE       439 POUT1     LDW   FIT2+6         SET SPECIAL                              NVB04370
0217 C086       440           ORI   BIT0          FORMAT                                   NVB04380
0218 70CE       441           STW   FIT2+6        BIT                                      NVB04390
0219 80DA       442           LDW   FSSW          IS 1ST TIME ?                            NVB04400
021A 0800       443           SAZ                 YES                                      NVB04410
021B 1246       444           JMP   A             NO                                       NVB04420
021C 70DC       445           STW   SKTR          ZERO STATE, COUNT                        NVE04430
021D 60DA       446           STX   FSSW          TURN OFF 1ST SW,                         NVE04440
                450           TRUE  SYSTEM=BASIC                                           NVE04480
021E 5005       451           LDB   5             CHECK BOUT UNIT                          NVE04490
021F 0AA4       452           SRL R 4                                                      NVE04500
0220 0709       453           CLB   9             DO WE HAVE CASSETTES                     NVE04510
0221 0860       454           SEQ                 YES                                      NVE04520
0222 122A       455           JMP   BOUTPT        BYPASS REWIND                            NVE04530
0223 0100       456           CLR                                                          NVE04540
0224 065D       457           LLB   X'5D'         SETUP FIOT FOR REWIND                    NVE04550
0225 70C2       458           STW   FIT+2         SET FIOT                                 NVE04560
0226 2044       459           JSX   DOIO,FIT      REWIND THE LITTLE DEVIL                  NVE04570
0227 80C0
0228 2046       460           JSX   STAT,FIT                                               NVE04580
0229 80C0
                461           ENDC                                                         NVE04590
                462           TRUE  SYSTEM=BASIC                                           NVE04600
022A 5005       463 BOUTPT    LDB   5             GET BOUT UNIT                            NVE04610
022B 0AA4       464           SRL R 4             FORMAT IT                                NVE04620
022C 741E       465           STW   PTFLG         SET PAPERTAPE FLAG                       NVE04630
022D 070E       466           CLB   X'E'          HARDWARE DEVICE CODE FOR TTY             NVE04640
022E 0870       467           SNE                                                          NVE04650
022F 1233       468           JMP   PAS                                                    NVE04660
0230 070D       469           CLB   X'D'          HARDWARE DEVICE CODE FOR HS READER       NVE04670
                470           ENDC                                                         NVE04680
0231 0860       481           SEQ                                                          NVE04790
0232 1243       482           JMP   POUT2         NO                                       NVE04800
0233 0100       483 PAS       CLR                 YES, SET FLAG TO ZERO                    NVE04810
```

```
0234 741E  484          STW   PTFLG                                        NVE04820
           485          TRUE  SYSTEM=BASIC                                 NVE04830
0235 2441  486          JSX   FILL,ZRMW                                    NVE04840
0236 8479
0237 2485  487          JSX   OPEN1          STUFF FIOT WITH APPROPRIATE DATA NVE04850
0238 0097  488          D     INBF           BUFFER                         NVE04860
0239 008D  489          D     WC             WORD COUNT                     NVE04870
023A 005E  490          D     X'5E'          LOGICAL UNIT                   NVE04880
023B 2044  491          JSX   DOIO,FIT                                     NVE04890
023C 80C0
           492          ENDC                                               NVE04900
           500          TRUE  SYSTEM=BASIC                                 NVE04980
023D 247B  501          JSX   OPEN2                                        NVE04990
023E 0087  502          D     CR                                           NVE05000
023F 03F6  503          D     ONE                                          NVE05010
0240 005E  504          D     X'5E'                                        NVE05020
0241 2044  505          JSX   DOIO,FIT2                                    NVE05030
0242 80C8
           506          ENDC                                               NVE05040
0243 808F  507 POUT2    LDW   BK                                           NVD05050
0244 7095  508          STW   II                                           NVB05060
0245 312C  509          STB   KK                                           NVB05070
0246 80D8  510 A        LDW   STGT           PICK UP BEGINNING             NVB05080
0247 70D7  511          STW   STG            OF TEXT TO PUNCH,             NVB05090
           512 *                                                           NVB05100
           513 *        GET A RECORD                                       NVB05110
0248 0800  514 GAR      SAZ                  END OF STRING ?               NVB05120
0249 124B  515          JMP   $+2            NO                            NVB05130
024A 1261  516          JMP   FINE           YES                           NVB05140
024B 0130  517          CAX                  IS LINK TO                    NVB05150
024C 8800  518          LDW   * 0            NEXT STRING,                  NVB05160
024D 70D7  519          STW   STG            SAVE IT                       NVB05170
024E 0100  520          CLR                  RESET END RECORD              NVB05180
024F 70D3  521          STW   ERSW           SWITCH,                       NVB05190
0250 0402  522          IXS   2              FIND TEXT                     NVB05200
0251 0A10  523          NOP                                                NVD05210
0252 6300  524          STX   XSV                                          NVB05220
0253 2441  525          JSX   FILL,BK                                      NVB05230
0254 808F
0255 2303  526          JSX   DCOM           EXPAND TEXT REC, PUNCH        NVB05240
0256 808C  527          LDW   INAD                                         NVB05250
0257 0911  528          SLA   1                                            NVB05260
0258 70D4  529          STW   BIGB                                         NVB05270
0259 23EC  530          JSX   GNC                                          NVB05280
025A 23D2  531          JSX   ISEN                                         NVB05290
025B 80D2  532          LDW   ENSW                                         NVB05300
025C 0800  533          SAZ                                                NVB05310
025D 1261  534          JMP   FINE                                         NVB05320
025E 80D7  535          LDW   STG                                          NVB05330
025F 1248  536          JMP   GAR                                          NVB05340
0260 0000  537 TSAV     D     0                                            NVD05350
           538 *                                                           NVB05360
           539 *        FINISH                                             NVB05370
0261 80E4  540 FINE     LDW   ENS1                                         NVB05380
0262 0800  541          SAZ                                                NVB05390
0263 1274  542          JMP   DONE           YES                           NVB05400
```

```
0264 80D5   543 F1      LDW   DBIG          RESET TEXT                    NVB05410
0265 70D7   544         STW   STG           POINTER,                      NVB05420
0266 70D8   545         STW   STGT                                        NVB05430
0267 816C   546         LDW   SUKT          SET TEXT COUNTERS             NVB05440
0268 A3F6   547         ADD   ONE                                         NVB05450
0269 80E3   548         LDW   POFLG                                       NVB05460
026A 0800   549         SAZ                                               NVB05470
026B 126F   550         JMP   $+4                                         NVE05480
026C 70DD   551         STW   SDKT                                        NVB05490
026D 2420   552         JSX   PAUS,3        TUTN OFF PUNCH                NVB05500
026E 8003
026F 0100   553         CLR                                               NVB05510
0270 70D3   554         STW   ERSW                                        NVB05520
0271 70C6   555         STW   FIT+6                                       NVB05530
0272 03C3   556         DOT   X'C',3        TURN OFF HSP                  NVB05540
0273 1156   557         JMP   R             READ IN MORE SOURCE           NVB05550
            558 *                                                         NVB05560
      0274  559 DONE    EQU   $                                           NVB05570
0274 2046   560         JSX   STAT,FIT                                    NVB05580
0275 80C0
0276 2050   561         JSX   WEOF,FIT                                    NVB05590
0277 80C0
0278 2046   562         JSX   STAT,FIT                                    NVB05600
0279 80C0
027A 841E   563         LDW   PTFLG                                       NVD05610
027B 0800   564         SAZ                 IS BOUT PAPER TAPE            NVE05620
            565         TRUE  SYSTEM=BASIC                                NVE05630
027C 127F   566         JMP   $+3           NO                            NVE05640
            567         ENDC                                              NVB05650
            572         TRUE  SYSTEM=BASIC                                NVE05700
027D 2441   573         JSX   FILL,ZROW     LEADER CALL=ZERO BUFFER       NVE05710
027E 8479
027F 2485   574         JSX   OPEN1                                       NVE05720
0280 0097   575         D     INBF                                        NVE05730
0281 008D   576         D     WC                                          NVE05740
0282 005E   577         D     X'5E'                                       NVE05750
0283 2044   578         JSX   DOIO,FIT                                    NVE05760
0284 80C0
            579         ENDC                                              NVE05770
0285 2046   580         JSX   STAT,FIT                                    NVB05780
0286 80C0
            584         TRUE  SYSTEM=BASIC                                NVE05820
0287 5005   585         LDB   5             GET BOUT                      NVE05830
0288 0AA4   586         SRL R 4                                           NVE05840
0289 0709   587         CLB   9             IS IT CASSESSETTES            NVE05850
028A 0860   588         SEQ                 YES                           NVE05860
028B 1291   589         JMP   $+6           DON'T REWIND PAPERTAPE        NVE05870
028C 0100   590         CLR                                               NVE05880
028D 065D   591         LLB   X'5D'         SEND FUNCTION CODE            NVE05890
028E 70C2   592         STW   FIT+2         STUFF FIOT                    NVE05900
028F 2044   593         JSX   DOIO,FIT      REWIND                        NVE05910
0290 80C0
            594         ENDC                                              NVE05920
0291 2046   595         JSX   STAT,FIT                                    NVE05930
0292 80C0
0293 80E3   596         LDW   POFLG                                       NVB05940
```

```
0294 0800   597        SAZ
0295 1299   598        JMP    $+4                                        NVB05950
0296 2420   599        JSX    PAUS,3       TUTN OFF PUNCH                NVD05960
0297 8003                                                                NVB05970
0298 03C3   600        DOT    X'C1,3       TURN OFF HSP                  NVB05980
0299 237F   601        JSX    RESET                                      NVB05990
029A 10E6   602        JMP    STRT         EDIT MORE ?                   NVB06000
```

```
                603 '       SUBROUTINE TO COMPRESS BLANKS,                                  NVB06010
                604 *       AND STRING SOURCE RECORD IN MEM,                                NVB06020
                605 *                                                                       NVB06030
029B 0000
029C 629B       606 COMS    SUBR                                                            NVB06040
029D 80D7       607         LDW   STG           WORD ADD OF NEXT LOC                        NVB06050
029E A3F6       608         ADD   ONE           IN STRING                                   NVB06060
029F 0130       609         CAX                 PUT RECORD                                  NVB06070
02A0 816C       610         LDW   SUKT          COUNT IN                                    NVB06080
02A1 7800       611         STW * 0             STRING                                      NVB06090
02A2 0140       612         CXA                                                             NVB06100
02A3 A3F6       613         ADD   ONE                                                       NVB06110
02A4 0911       614         SLA   1             MAKE BYTE ADD                               NVB06120
02A5 72DA       615         STW   MOV+3         STORE IN MOVE COMMD,                        NVB06130
02A6 808C       616         LDW   INAD          WORD ADD OF IN BUFF                         NVB06140
02A7 0911       617         SLA   1             MAKE BYTE ADD PUT IN                        NVB06150
02A8 70D4       618         STW   BIGE          BUFF POINTER,                               NVB06160
02A9 0130       619         CAX                                                             NVB06170
02AA 62D9       620         STX   MOV+2         SET MOVE COMMD,                             NVB06180
02AB 60D9       621 PKUP    STX   BCP           ANOTHER BUFF POINTER                        NVB06190
02AC 5800       622         LDB * 0             PICK UP A CHAR,                             NVB06200
02AD 07FF       627         CLB   X'FF'         IS END OF                                   NVB06250
02AE 0870       628         SNE                 BUFF?                                       NVB06260
02AF 12E4       629         JMP   ENRC          YES                                         NVB06270
02B0 07A0       630         CLB   ' '           NO, IS BLANK ?                              NVB06280
02B1 0860       631         SEQ                                                             NVB06290
02B2 0401       632         IXS   1             NO                                          NVB06300
02B3 12B5       633         JMP   PSET          YES,PROCESS THEM                            NVB06310
02B4 12AB       634         JMP   PKUP          GET ANOTHER CHAR,                           NVB06320
02B5 60D9       635 PSET    STX   BCP           SET POINTER AT BLANKS                       NVB06330
02B6 0401       636 KBKS    IXS   1                                                         NVB06340
02B7 0A10       637         NOP                                                             NVD06350
02B8 5800       638         LDB * 0             PICK UP NEXT CHAR,                          NVB06360
02B9 07FF       643         CLB   X'FF'         IS END OF BUFF ?                            NVB06410
02BA 0870       644         SNE                                                             NVB06420
02BB 12E4       645         JMP   ENRC          YES                                         NVB06430
02BC 07A0       646         CLB   ' '           NO, IS BLANK                                NVB06440
02BD 0870       647         SNE                                                             NVB06450
02BE 12B6       648         JMP   KBKS          YES                                         NVB06460
02BF 0140       649 ER      CXA                 NO,PUT POSITION IN ACR                      NVB06470
02C0 6300       650         STX   XSV           SAVE POSITION,                              NVB06480
02C1 B0D9       651         SUB   BCP           TO GET BLANK COUNT                          NVB06490
02C2 A093       652         ADD   DF            ENCODE BLANK COUNT                          NVB06500
02C3 F094       653 EXTR    CMW   FF            IS CODE TO LARGE                            NVB06510
02C4 0880       654         SGR                 FOR ONE BYTE ?                              NVB06520
02C5 12D1       655         JMP   EXT           NO                                          NVB06530
02C6 7301       656         STW   ASV           YES,MORE ENCODING                           NVB06540
02C7 8094       657         LDW   FF                                                        NVB06550
02C8 90D9       658         LDX   BCP                                                       NVB06560
02C9 3800       659         STB * 0                                                         NVB06570
02CA 0401       660         IXS   1                                                         NVB06580
02CB 0A10       661         NOP                                                             NVD06590
02CC 60D9       662         STX   BCP                                                       NVB06600
02CD 8301       663         LDW   ASV                                                       NVB06610
02CE E094       664         AND   FF                                                        NVB06620
02CF A092       665         ADD   ERR0                                                      NVB06630
```

```
02D0 12C3   666          JMP   EXTR                                    NVB06640
02D1 90D9   667 EXT      LDX   BCP          PUT CODED BLANK COUNT -     NVB06650
02D2 3800   668          STR * 0            IN BUFFER,                 NVB06660
02D3 0140   669          CXA                COMPUTE BYTE LENGTH OF -   NVB06670
02D4 B0D4   670          SUB   BIGE         CHAR'S AND BLANKS,         NVB06680
02D5 A3F6   671          ADD   ONE                                     NVB06690
02D6 72D8   672          STW   MOV+1                                   NVB06700
02D7 2456   673 MOV      JSX   MOVE,0,0,0   MOV COMMD                 NVB06710
02D8 0000
02D9 0000
02DA 8000
02DB B0D3   674          LDW   ERSW         END RECORD SWITCH          NVB06720
02DC 0800   675          SAZ                SET?                       NVB06730
02DD 12E8   676          JMP   EOUT         YES                        NVB06740
02DE 82DA   677          LDW   MOV+3        NO,COMPUTE NEW ADDRESS     NVB06750
02DF A2D8   678          ADD   MOV+1        TO MOVE TO                 NVB06760
02E0 72DA   679          STW   MOV+3                                   NVB06770
02E1 9300   680          LDX   XSV          PICK-UP BUFF POINTER       NVB06780
02E2 60D4   681          STX   BIGE         RESET                      NVB06790
02E3 12AA   682          JMP   PKUP-1       GET SOMORE                 NVB06800
02E4 60D3   683 ENRC     STX   ERSW         END OF RECORD SECTION      NVB06810
02E5 B0D9   684          LDW   BCP          COMP.LAST GROUP TO         NVB06820
02E6 B0D4   685          SUB   BIGE        MOVE,NO TRAILING           NVB06830
02E7 12D5   686          JMP   MOV-2        BLANKS,                    NVD06840
02E8 82DA   687 EOUT     LDW   MOV+3        COMP TOTAL BYTE            NVB06850
02E9 A2D8   688          ADD   MOV+1        COUNT OF STRING            NVB06860
02EA B3F6   689          SUB   ONE                                     NVB06870
02EB 0830   690          SAO                END OF WORD BOUNDRY?       NVB06880
02EC 12F9   691          JMP   FLBK         NO                         NVB06890
02ED 0901   692 LKCP     SRA   1            YES,COMP WORD              NVB06900
02EE A3F6   693          ADD   ONE          ADDRESS OF STRING          NVB06910
02EF 90D7   694          LDX   STG          LINK,                      NVB06920
02F0 7800   695          STW * 0            PLACE IN FRONT OF STRING   NVB06930
02F1 60D1   696          STX   SGSV                                    NVB06940
02F2 70D7   697          STW   STG                                     NVB06950
02F3 0130   698          CAX                                           NVB06960
02F4 0100   699          CLR                                           NVB06970
02F5 7800   700          STW * 0                                       NVB06980
02F6 70D3   701          STW   ERSW         END REC SWITCH             NVB06990
02F7 929B   702          EXIT  COMS                                    NVB07000
02F8 2800
02F9 A3F6   703 FLBK     ADD   ONE          FILL OUT                   NVB07010
02FA 0130   704          CAX                LAST                       NVB07020
02FB B08F   705          LDW   BK           WORD                       NVB07030
02FC 3800   706          STB * 0            WITH A                     NVB07040
02FD 82DA   707          LDW   MOV+3        BLANK,                     NVB07050
02FE A2D8   708          ADD   MOV+1                                   NVB07060
02FF 12ED   709          JMP   LKCP                                    NVB07070
0300 0000   710 XSV      D     0                                       NVD07080
0301 0000   711 ASV      D     0                                       NVD07090
```

```
                712 '       DE-COMPRESS TEXT                                        NVB07100
                713 *       PLACE IN PUNCH BUFFER                                   NVB07110
                714 *       PUNCH OUT                                               NVB07120
0302 0000
0303 6302       715 DCOM    SUBR                                                    NVB07130
0304 808C       716         LDW   INAD          BYTE ADDRESS                        NVB07140
0305 0911       717         SLA   1             OF BUFFER                           NVB07150
0306 7336       718         STW   MOV+3         IN MOVE COMMAND,                    NVB07160
0307 8300       719         LDW   XSV           BYTE ADDRESS OF                     NVB07170
0308 0911       720         SLA   1             TEXT,                               NVB07180
0309 0130       721         CAX                                                     NVB07190
030A 0100       722         CLR                                                     NVB07200
030B 734B       723         STW   BLKT                                              NVB07210
030C 5800       724 III     LDB * 0             LOOK FOR BLANKS                     NVB07220
030D 0A45       725         SRC   5             CODE,                               NVB07230
030E 0707       726         CLB   X'7'                                              NVB07240
030F 0860       727         SEQ                                                     NVB07250
0310 131A       728         JMP   JJJ           FOUND A CHAR,                       NVB07260
0311 0A55       729         SLC   5             FOUND BLANKS                        NVB07270
0312 E08A       730         AND   ONEF          DECODE,                             NVB07280
0313 A3F6       731         ADD   ONE           THIS IS BLANK                       NVB07290
0314 A34B       732         ADD   BLKT          COUNT                               NVB07300
0315 734B       733         STW   BLKT                                              NVB07310
0316 0100       734         CLR                                                     NVB07320
0317 0401       735         IXS   1                                                 NVB07330
0318 0A10       736         NOP                                                     NVD07340
0319 130C       737         JMP   III           LOOK AGAIN,                         NVB07350
031A 8336       738 JJJ     LDW   MOV+3         BUFFER ADDRESS                      NVB07360
031B A34B       739         ADD   BLKT          PLUS BLANKS,                        NVB07370
031C 7336       740         STW   MOV+3         AS NEW LOC TO MOVE TO,              NVB07380
031D 6335       741         STX   MOV+2         FROM                                NVB07390
031E 0401       742 KKK     IXS   1             PICK UP                             NVB07400
031F 0A10       743         NOP                                                     NVD07410
0320 0100       744         CLR                                                     NVB07420
0321 5800       745         LDB * 0             NEXT CHAR,                          NVB07430
0322 079A       746         CLB   X'9A'         A DIRECTIVE ?                       NVB07440
0323 0870       747         SNE                 SIGN ?                              NVB07450
0324 1329       748         JMP   PCH           YES,END OF RECORD                   NVB07460
0325 0700       749         CLB   0             NO,IS IT A STRING                   NVB07470
0326 0840       750         SLS                 ADDRESS?                            NVB07480
0327 1329       751         JMP   PCH           YES,END OF RECORD                   NVB07490
0328 132B       752         JMP   $+3           NO                                  NVB07500
0329 60D3       753 PCH     STX   ERSW          YES                                 NVB07510
032A 132F       754         JMP   PUN                                             NVB07520
032B 0A45       755         SRC   5                                                 NVB07530
032C 0707       756         CLB   X'7'          IS IT A BLANK ?                     NVB07540
032D 0860       757         SEQ                                                     NVB07550
032E 131E       758         JMP   KKK           NO,NEXT CHAR,                       NVB07560
032F 0140       759 PUN     CXA                 YES                                 NVB07570
0330 B335       760         SUB   MOV+2         COMPUTE                             NVB07580
0331 7334       761         STW   MOV+1         MOVE COUNT                          NVB07590
0332 6300       762         STX   XSV                                               NVB07600
0333 2456       763 MOV     JSX   MOVE,0,0,0                                        NVB07610
0334 0000
0335 0000
0336 8000
```

```
0337 9300   764          LDX   XSV          COMPUTE NEXT                    NVB07620
0338 8336   765          LDW   NOV+3        LOC IN BUFFER                   NVB07630
0339 A334   766          ADD   NOV+1        TO MOVE                         NVB07640
033A 7336   767          STW   NOV+3        TO.                             NVB07650
033B 80D3   768          LDW   ERSW         WAS IT END                      NVB07660
033C 0800   769          SAZ                OF RECORD ?                     NVB07670
033D 133F   770          JMP   $+2          YES                             NVB07680
033E 130A   771          JMP   III-2        NO,LOOK AT NEXT CHAR.           NVB07690
033F 8336   772          LDW   NOV+3        COMPUTR                         NVB07700
0340 A3F6   773          ADD   ONE                                          NVB07710
0341 0901   774          SRA   1            PUNCH                           NVB07720
0342 808C   775          SUB   INAD         COUNT                           NVB07730
0343 70D0   776          STW   PKNT                                         NVB07740
0344 234E   777          JSX   PO                                           NVB07750
0345 80DC   778          LDW   SKTR         INCREMENT                       NVB07760
0346 A3F6   779          ADD   ONE          STATEMENT COUNTER               NVB07770
0347 70DC   780          STW   SKTR                                         NVB07780
0348 2389   781          JSX   R10          CONVERT IT,                     NVB07790
0349 9302   782          EXIT  DCOM                                         NVB07800
034A 2800
034B 0000   783 BLKT     D     0                                            NVD07810
034C 0000   784 ZERO     D     0                                            NVD07820
034D 0000
034E 634D   785 PO       SUBR                                               NVB07830
034F 841E   786          LDW   PTFLG                                        NVD07840
0350 0800   787          SAZ                                                NVD07850
0351 1358   788          JMP   P01                                          NVD07860
            792          TRUE  SYSTEM=BASIC                                 NVE07900
0352 247B   793          JSX   OPEN2                                        NVE07910
0353 0095   794          D     II                                           NVE07920
0354 0090   795          D     TWO                                          NVE07930
0355 005E   796          D     X'5E'                                        NVE07940
0356 2044   797          JSX   DOIO,FIT2                                   NVE07950
0357 80C8
            798          ENDC                                               NVE07960
0358 2046   799 P01      JSX   STAT,FIT2                                    NVB07970
0359 80C8
            800          TRUE  SYSTEM=BASIC                                 NVE07980
035A 2485   801          JSX   OPEN1                                        NVE07990
035B 0097   802          D     INBF                                         NVE08000
035C 00D0   803          D     PKNT                                         NVE08010
035D 005E   804          D     X'5E'                                        NVE08020
035E 2044   805          JSX   DOIO,FIT                                     NVE08030
035F 80C0
            806          ENDC                                               NVE08040
0360 2046   810          JSX   STAT,FIT                                     NVB08080
0361 80C0
0362 80E3   811          LDW   POFLG                                        NVB08090
0363 0800   812          SAZ                BOUT=TTY ?                      NVB08100
0364 1367   813          JMP   PAL          NO                              NVB08110
0365 934D   814 LEAV     EXIT  PO           YES                             NVB08120
0366 2800
0367 08E0   815 PAL      SS2                WANT LIST ?                     NVB08130
0368 1365   816          JMP   LEAV         NO                              NVB08140
0369 837C   817          LDW   X003E        YES, CHANGE FIOT LUN            NVB08150
036A 70C2   818          STW   FIT+2        TO LIST DEVICE                  NVB08160
```

```
036B 80D0   823          LDW   PKNT                                  NVB08210
036C A090   824          ADD   TWO                                   NVB08220
036D 70D0   825          STW   PKNT                                  NVB08230
036E 80DC   826          LDW   SKTR                                  NVD08240
036F A3F6   827          ADD   ONE                                   NVD08250
0370 2389   828          JSX   R10                                   NVD08260
                 832     TRUE  SYSTEM*BASIC                          NVE08300
0371 8478   833          LDW   AII                                   NVE08310
0372 70C0   834          STW   FIT                                   NVE08320
0373 2044   835          JSX   DOIO,FIT                              NVE08330
0374 80C0
                 836     ENDC                                        NVE08340
0375 2046   837          JSX   STAT,FIT                              NVB08350
0376 80C0
0377 837D   838          LDW   X005E          CHANGE IT BACK         NVB08360
0378 70C2   839          STW   FIT+2          TO BOUT                NVB08370
0379 1365   844          JMP   LEAV                                  NVB08420
                 845 *                                               NVB08430
037A 03F0   846 X3F0     D     X'3F0'                                NVB08440
037B 0130   847 X130     D     X'130'                                NVB08450
037C 003E   848 X003E    D     X'3E'                                 NVB08460
037D 005E   849 X005E    D     X'5E'                                 NVB08470
037E 2000   850 X2000    D     X'2000'                               NVD08480
```

```
                    851 *       RESET                                    NVB08490
                    852 *                                                NVB08500
                    853 *                                                NVB08510
                    854 *                                                NVB08520
                    855 *                                                NVB08530
                    856 *                                                NVB08540
                    857 *                                                NVB08550
                    858 *                                                NVB08560
                    859 *                                                NVB08570
                    860 *                                                NVB08580
037F 0100           861 RESET   CLR
0380 70CE           862         STW     FIT2+6
0381 716C           863         STW     SUKT
0382 70D1           864         STW     SGSV
0383 70D3           865         STW     ERSW
0384 70DA           866         STW     FSSW
0385 70D6           867         STW     CTOG
0386 60E3           868         STX     PAFLG
0387 1800           869         JMP     *
```

```
                    861 '       CONVERT BINARY TO ASCII                                  NVB08590
0388 0000
0389 6388           862 R10     SUBR                                                     NVB08600
038A 2398           863         JSX    RM10                                              NVB08610
038B 0000           864 UNIT    D      0                                                 NVB08620
038C 2398           865         JSX    RM10                                              NVB08630
038D 0000           866 TENS    D      0                                                 NVB08640
038E 2398           867         JSX    RM10                                              NVB08650
038F 0000           868 HUND    D      0                                                 NVB08660
0390 571F           869         LDB    HUND+1                                            NVB08670
0391 312A           870         STB    II                                                NVB08680
0392 571B           871         LDB    TENS+1                                            NVB08690
0393 3128           872         STB    II+1                                              NVB08700
0394 5717           873         LDB    UNIT+1                                            NVB08710
0395 312C           874         STB    KK                                                NVB08720
0396 9388           875         EXIT   R10                                               NVB08730
0397 2800
0398 7301           876 RM10    STW    ASV                                               NVB08740
0399 0800           877         SAZ                                                      NVB08750
039A 139D           878         JMP    $+3                                               NVB08760
039B 808F           879         LDW    BK                                                NVB08770
039C 13AD           880         JMP    LVK                                               NVB08780
039D 0901           881         SRA    1                                                 NVB08790
039E A301           882         ADD    ASV                                               NVB08800
039F 7260           883         STW    TSAV                                              NVB08810
03A0 0904           884         SRA    4                                                 NVB08820
03A1 A260           885         ADD    TSAV                                              NVB08830
03A2 0904           886         SRA    4                                                 NVB08840
03A3 A260           887         ADD    TSAV                                              NVB08850
03A4 A3F6           888         ADD    ONE                                               NVB08860
03A5 0904           889         SRA    4                                                 NVB08870
03A6 7260           890         STW    TSAV                                              NVB08880
03A7 0A13           891         SLL    3                                                 NVB08890
03A8 A260           892         ADD    TSAV                                              NVB08900
03A9 A260           893         ADD    TSAV                                              NVB08910
03AA 0110           894         CMP                                                      NVB08920
03AB A301           895         ADD    ASV                                               NVB08930
03AC C3B0           896         ORI    FORM                                              NVB08940
03AD 7800           897 LVK     STW * 0                                                  NVB08950
03AE 8260           898         LDW    TSAV                                              NVB08960
03AF 1801           899         JMP * 1                                                  NVB08970
03B0 A0B0           900 FORM    D      X'A0B0'                                           NVB08980
```

```
                    901 '       CONVERT ASCII TO BINARY                                  NVB08990
03B1 0000
03B2 63B1           902 PNUM    SUBR                                                     NVB09000
03B3 0100           903         CLR             TO CONTAIN                               NVB09010
03B4 714D           904         STW     VALU    THE BINARY VALUE                         NVB09020
03B5 240C           905 NUM2    JSX     ISDG    IS DIGIT ?                               NVB09030
03B6 13B9           906         JMP     NUM1    YES                                      NVB09040
03B7 93B1           907         EXIT    PNUM    NO, RETURN                               NVB09050
03B8 2800
03B9 840B           908 NUM1    LDW     CHR                                              NVB09060
03BA E088           909         AND     M4                                               NVB09070
03BB 740B           910         STW     CHR                                              NVB09080
03BC 814D           911         LDW     VALU                                             NVB09090
03BD 0913           912         SLA     3                                                NVB09100
03BE A14D           913         ADD     VALU                                             NVB09110
03BF A14D           914         ADD     VALU                                             NVB09120
03C0 A40B           915         ADD     CHR                                              NVB09130
03C1 714D           916         STW     VALU                                             NVB09140
03C2 23EC           917         JSX     GNC             GET NEXT CHAR,                   NVB09150
03C3 13B5           918         JMP     NUM2                                             NVB09160
```

```
                    919 '       READ A SOURCE RECORD                                    NVB09170
                    920 *                                                               NVB09180
03C4 0000
03C5 63C4   921 SORD    SUBR                                                            NVB09190
03C6 2441   922         JSX   FILL,BK       FILL BUFFER W/ BLANKS                       NVB09200
03C7 808F
03C8 2044   923         JSX   DOIO,FIT                                                  NVB09210
03C9 80C0
03CA 2046   924         JSX   STAT,FIT                                                  NVB09220
03CB 80C0
03CC 808C   925         LDW   INAD            BUF WORD ADD                              NVB09230
03CD 0911   926         SLA   1               INTO                                      NVB09240
03CE 70D4   927         STW   BIGE            BYTE ADD                                  NVB09250
03CF 93C4   928         EXIT  SORD                                                      NVB09260
03D0 2800
```

```
                929 *         IDENTIFY END RECORDS                                  NVB09270
03D1 0000
03D2 63D1       930 ISEN      SUBR                CHECK FOR END STST,               NVB09280
03D3 0100       931           CLR                                                   NVB09290
03D4 70D2       932           STW     ENSW                                          NVB09300
03D5 2415       933           JSX     ISBK        IS IT BLANK?                      NVB09310
03D6 13D8       934           JMP     $+2         YES, COULD BE                     NVB09320
03D7 13E7       935           JMP     GO          NO                                NVB09330
03D8 23F8       936           JSX     DEBK        NO TAB OVER                       NVB09340
03D9 07C5       937           CLB     'E'         ISIT E                            NVB09350
03DA 0860       938           SEQ                                                   NVB09360
03DB 13E7       939           JMP     GO          NO,NOPOSSABLE END                 NVB09370
03DC 23EC       940           JSX     GNC         YES,POSSABLE                      NVB09380
03DD 07CE       941           CLB     'N'         ISIT N                            NVB09390
03DE 0860       942           SEQ                                                   NVB09400
03DF 13E7       943           JMP     GO          NO                                NVB09410
03E0 23EC       944           JSX     GNC         YES                               NVB09420
03E1 07C4       945           CLB     'D'         IS IT D                           NVB09430
03E2 0860       946           SEQ                                                   NVB09440
03E3 13E7       947           JMP     GO          NO                                NVB09450
03E4 23EC       948           JSX     GNC         YES                               NVB09460
03E5 2415       949           JSX     ISBK        IS IT BLANK                       NVB09470
03E6 13E9       950           JMP     ES          YES, SET END SWITCH               NVB09480
03E7 93D1       951 GO        EXIT    ISEN        NO, GO                            NVB09490
03E8 2800
03E9 70D2       952 ES        STW     ENSW                                          NVB09500
03EA 13E7       953           JMP     GO                                            NVB09510
```

```
                954 '         GNC, GET NEXT CHARCTER                                    NVB09520
                955 *                                                                   NVB09530
03EB 0000
03EC 63EB       956 GNC       SUBR                                                      NVB09540
03ED 90D4       957           LDX   BIGE          LOC OF ADD OF BYTE                  NVB09550
03EE 0100       958           CLR                                                       NVB09560
03EF 5800       959           LDB * 0             GET NEXT CHAR                       NVB09570
03F0 740B       960           STW   CHR                                               NVB09580
03F1 0401       961           IXS   1             INCREMENT                           NVB09590
03F2 0A10       962           NOP                                                       NVD09600
03F3 60D4       963           STX   BIGE                                              NVB09610
03F4 93EB       964           EXIT  GNC                                               NVB09620
03F5 2800
03F6 0001       965 ONE       D     1                                                 NVD09630
```

```
                966 *       DEBLNK,SCAN OVER BLANKS                          NVB09640
                967 *                        JSX   DEBK                      NVB09650
 03F7 0000
 03F8 63F7      968 DEBK    SUBR                                             NVB09660
 03F9 2415      969         JSX   ISBK          IS IT BLANK ?                NVB09670
 03FA 13FD      970         JMP   $+3           YES                          NVB09680
 03FB 93F7      971         EXIT  DEBK          NO                           NVB09690
 03FC 2800
 03FD 23EC      972         JSX   GNC                                        NVB09700
 03FE 13F9      973         JMP   DEBK+1                                     NVB09710
```

```
                    974 '         ISIT SUBROUTINE                                                  NVB09720
                    975 *         ENTRY POINTS  ISLT,IS THIS CHAR, A LETTER                        NVB09730
                    976 *                       ISDG,IS THIS CHAR, A DIGIT                         NVB09740
                    977 *                       ISBK,IS THIS CHAR, BLANK                           NVB09750
                    978 *               CALL WITH, JSX  ENTRY POINT                                NVB09760
                    979 *               RETURNS   (MATCH)                                          NVB09770
                    980 *                         (NO MATCH)                                       NVB09780
                    981 *                                                                          NVB09790
03FF 7301           982 ISLT      STW   ASV           SAVE ACR                                     NVB09800
0400 840B           983           LDW   CHR           GET THIS CHAR                                NVB09810
0401 07C0           984           CLB   X'C0'        LOWER LIMIT OF                               NVB09820
0402 0880           985           SGR                 LTRS                                         NVB09830
0403 1407           986           JMP   NOMH                                                       NVB09840
0404 07DA           987           CLB   'Z'          UPPER LIMIT OF                               NVB09850
0405 0880           988           SGR                 LTRS                                         NVB09860
0406 1409           989           JMP   MH                                                        NVB09870
0407 0401           990 NOMH      IXS   1             SET RETURN                                   NVB09880
0408 0A10           991           NOP                                                              NVD09890
0409 8301           992 MH        LDW   ASV           RESTORE ACR                                  NVB09900
040A 1800           993           JMP * 0             LEAVE                                        NVB09910
040B 0000           994 CHR       D     0                                                          NVD09920
                    995 *                                                                          NVB09930
040C 7301           996 ISDG      STW   ASV           SAVE ACR                                     NVB09940
040D 840B           997           LDW   CHR           GET THIS CHAR                                NVB09950
040E 07AF           998           CLB   '/'          LOWER LIMIT OF                               NVB09960
040F 0880           999           SGR                 DIGITS                                       NVB09970
0410 1407          1000           JMP   NOMH                                                       NVB09980
0411 0789          1001           CLB   '9'          UPPER LIMIT OF                               NVB09990
0412 0890          1002           SLE                 DIGITS                                       NVB10000
0413 1407          1003           JMP   NOMH                                                       NVB10010
0414 1409          1004           JMP   MH                                                        NVB10020
                   1005 *                                                                          NVB10030
0415 7301          1006 ISBK      STW   ASV           SAVE ACR                                     NVB10040
0416 840B          1007           LDW   CHR                                                        NVB10050
0417 07A0          1008           CLB   ' '                                                        NVB10060
0418 0870          1009           SNE                                                              NVB10070
0419 1409          1010           JMP   MH                                                        NVB10080
                   1011           TRUE  SYSTEM=BASIC                                             NVE10090
041A 078D          1012           CLB   X'8D'         IS IT A CARRIAGE RETURN                      NVE10100
041B 0870          1013           SNE                                                              NVE10110
041C 1409          1014           JMP   MH                                                        NVE10120
                   1015           ENDC                                                           NVE10130
041D 1407          1016           JMP   NOMH                                                       NVB10140
                   1017 *                                                                         NVD10150
041E 0000          1018 PTFLG     D     0                                                          NVD10160
                   1019 *                                                                         NVD10170
```

```
                    1020 *          PAUSE  SUBROUTINE                                                    NVB10180
 041F 0000
 0420 641F  1021 PAUS       SUBR                                                                        NVB10190
 0421 8800  1022            LDW  * 0          PICK UP N                                                 NVB10200
 0422 943D  1023 REPTK      LDX    FLASHER    FLASH BITS TO IRX (F0F0)                                  NVB10210
 0423 0A14  1024            SLL    4          SHIFT A TO RECEIVE FLASH BITS                             NVB10220
 0424 0A64  1025            SRC D  4          SHIFT FLASH BITS IN WITH N                                NVB10230
 0425 743F  1026            STW    ASVG       SAVE IT FOR THE MOMENT                                    NVD10240
 0426 843D  1027            LDW    FLASHER    PICK UP FLASHER BITS                                      NVB10250
 0427 0A54  1028            SLC    4          SHIFT THEM TO ALTERNATE                                   NVB10260
 0428 743D  1029            STW    FLASHER                                                              NVB10270
 0429 843F  1030            LDW    ASVG       PICK UP SAVED A-REG                                       NVD10280
 042A 943E  1031            LDX    LPCNTK     ONE MILI-SECOND COUNT TO X                                NVB10290
 042B 0501  1032            DXS    1          DECREMENT IT AND TEST                                     NVB10300
 042C 142B  1033            JMP    $-1        NOT ZERO, AGAIN                                           NVB10310
 042D 08F0  1034            SSS                CK FOR SSW                                                NVD10320
 042E 143A  1035            JMP    PAUS2      TOGGLE                                                    NVD10330
 042F 0800  1036            SAZ                IS A=0,DRPRESSED A CLEAR,                                 NVB10340
 0430 1422  1037            JMP    REPTK      DO IT AGAIN                                               NVB10350
 0431 843D  1038 PAUS1      LDW    FLASHER    NON ZERO DATA TO A                                        NVD10360
 0432 0800  1039            SAZ                A ZERO (HAS HE RELEASED CLEAR BUTTON)                     NVB10370
 0433 1435  1040            JMP    $+2        YES, RETURN                                               NVB10380
 0434 1431  1041            JMP    $-3        NO, WAIT FOR HIM                                          NVB10390
 0435 943E  1042            LDX    LPCNTK      HALF SEC DELAY                                           NVB10400
 0436 0501  1043            DXS    1                                                                    NVB10410
 0437 1436  1044            JMP    $-1                                                                  NVB10420
 0438 941F  1045            EXIT   PAUS,1                                                               NVB10430
 0439 2801
 043A 08F0  1046 PAUS2      SSS                                                                         NVD10440
 043B 143A  1047            JMP    $-1                                                                  NVD10450
 043C 1431  1048            JMP    PAUS1                                                                NVD10460
 043D F0F0  1049 FLASHER    DATA   X'F0F0'                                                              NVB10470
 043E 7FFF  1050 LPCNTK     D      X'7FFF'                                                              NVB10480
 043F 0000  1051 ASVG       D      0                                                                    NVD10490
                    1052 *                                                                              NVB10500
 0440 0000
 0441 6440  1053 FILL       SUBR               FILL THE                                                 NVB10510
 0442 808C  1054            LDW    INAD        BUFFER                                                   NVB10520
 0443 7452  1055            STW    XCN         WITH                                                     NVB10530
 0444 9800  1056            LDX  * 0           WHATEVER                                                 NVB10540
 0445 8800  1057            LDW  * 0                                                                    NVB10550
 0446 9453  1058            LDX    T9                                                                   NVB10560
 0447 6454  1059 RESK       STX    CNTK                                                                 NVB10570
 0448 9452  1060            LDX    XCN                                                                  NVB10580
 0449 7800  1061            STW  * 0                                                                    NVB10590
 044A 0401  1062            IXS    1                                                                    NVB10600
 044B 0A10  1063            NOP                                                                         NVD10610
 044C 6452  1064            STX    XCN                                                                  NVB10620
 044D 9454  1065            LDX    CNTK                                                                 NVB10630
 044E 0501  1066            DXS    1                                                                    NVB10640
 044F 1447  1067            JMP    RESK                                                                 NVB10650
 0450 9440  1068            EXIT   FILL,1                                                               NVB10660
 0451 2801
 0452 0000  1069 XCN        D      0                                                                    NVD10670
 0453 0027  1070 T9         D      39                                                                   NVB10680
 0454 0000  1071 CNTK       D      0                                                                    NVB10690
```

```
                1072 '                                  MOVE SUBROUTINE ,BYTES                          NVD10700
                1073 *                                    MOVE  N,FROMADD,TOADD                         NVD10710
                1074 *                                       OR                                         NVD10720
                1075 *                                    JSX   MOVE,N,FROMADD,TOAD                     NVD10730
                1076 *          THIS WILL MAKE OVERLAPPING MOVES IN THE                                 NVD10740
                1077 *          HIGH-TO-LOW CORE DIRECTION                                              NVD10750
                1078 *                                                                                  NVD10760
0455 0000
0456 6455       1079 MOVE       SUBR                                                                    NVD10770
0457 8801       1080            LDW * 1             FETCH SOURCE ADDRESS                                NVD10780
0458 7472       1081            STW   FROM          STORE IT                                            NVD10790
0459 8802       1082            LDW * 2             FETCH TARGET ADDRESS                                NVD10800
045A E473       1083            AND   MO            TURN OFF BIT ZERO                                   NVD10810
045B 7475       1084            STW   TO            STORE IT ITS NEG ALREADY                            NVD10820
045C 8800       1085            LDW * 0                                                                 NVD10830
045D 0810       1086            SAP                                                                     NVD10840
045E 1470       1087            JMP   OUT                                                               NVD10850
045F 0130       1088            CAX                                                                     NVD10860
                1089 *                                                                                  NVD10870
                1090 *                                                                                  NVD10880
0460 0501       1091 MLOP       DXS   1             IS COUNT NEG YET                                     NVD10890
0461 1463       1092            JMP   $+2           NO, CONTINUE MOVE                                   NVD10900
0462 1470       1093            JMP   OUT           YES                                                 NVD10910
0463 6474       1094            STX   N             PUT IT BACK                                         NVD10920
0464 9472       1095            LDX   FROM          SOURCE POINTER                                      NVD10930
0465 5800       1096            LDB * 0             GET CONTENTS                                        NVD10940
0466 0401       1097            IXS   1                                                                 NVD10950
0467 0A10       1098            NOP                                                                     NVD10960
0468 6472       1099            STX   FROM                                                              NVD10970
0469 9475       1100            LDX   TO            TARGET POINTER                                      NVD10980
046A 3800       1101            STB * 0             MOVE WORD                                           NVD10990
046B 0401       1102            IXS   1                                                                 NVD11000
046C 0A10       1103            NOP                                                                     NVD11010
046D 6475       1104            STX   TO                                                                NVD11020
046E 9474       1105            LDX   N                                                                 NVD11030
046F 1460       1106            JMP   MLOP          AGAIN                                               NVD11040
0470 9455       1107 OUT        EXIT  MOVE,3                                                            NVD11050
0471 2803
0472 0000       1108 FROM       DATA  0                                                                 NVD11060
0473 7FFF       1109 MO         D     X'7FFF'                                                           NVD11070
0474 0000       1110 N          D     0                                                                 NVD11080
0475 0000       1111 TO         D     0                                                                 NVD11090
                1112            TRUE  SYSTEM*BASIC                                                      NVE11100
                1113 * ADDRESS'S OF FOLLOWING CONSTANTS                                                 NVE11110
0476 008B       1114 AQ         D     Q                                                                 NVE11120
0477 0089       1115 AOV        D     OV                                                                NVE11130
0478 0095       1116 AII        D     II                                                                NVE11140
0479 0000       1117 ZROW       D     0                                                                 NVE11150
047A 0000
047B 647A       1118 OPEN2      SUBR                                                                    NVE11160
047C 8800       1119            LDW * 0             STUFF                                               NVE11170
047D 70C8       1120            STW   FIT2              BUFFER ADDRESS                                  NVE11180
047E 8801       1121            LDW * 1             STUFF                                               NVE11190
047F 70C9       1122            STW   FIT2+1            WORD COUNT                                      NVE11200
0480 8802       1123            LDW * 2             STUFF                                               NVE11210
0481 70CA       1124            STW   FIT2+2            FUNCTION CODE AND LOGICAL UNIT                  NVE11220
```

```
0482 947A  1125          EXIT  OPEN2,3       DONE                    NVE11230
0483 2803
0484 0000
0485 6484  1126 OPEN1    SUBR                                        NVE11240
0486 8800  1127          LDW * 0                                     NVE11250
0487 70C0  1128          STW   FIT                                   NVE11260
0488 8801  1129          LDW * 1                                     NVE11270
0489 70C1  1130          STW   FIT+1                                 NVE11280
048A 8802  1131          LDW * 2                                     NVE11290
048B 70C2  1132          STW   FIT+2                                 NVE11300
048C 9484  1133          EXIT  OPEN1,3                               NVE11310
048D 2803
           1134          ENDC                                        NVE11320
048E       1135 ENDE     RES   0                                     NVE11330
     00E5  1136          END START                                   NVE11340
```

NO ERRORS

A	0246	AGAN	015A	AII	0478	ALPH	0000
AOV	0477	AQ	0476	ASV	0301	ASVG	0436
BASIC	0001	BCP	00D9	BE	0084	BIGE	00D4
BIN	0004	BITO	0086	BK	008F	BLKT	034B
BOUT	0005	BOUTPT	022A	CHR	040B	CK	01A7
CK1	01A8	CK2	01A9	CNTK	0454	COMS	029C
CR	0087	CTOG	00D6	DBIG	00D5	DCOM	0303
DEBK	03F8	DF	0093	DLRP	0195	DOIO	0044
DONE	0274	E	0171	EDIT	016D	ENBF	00BF
ENDE	048E	ENRC	02E4	ENS1	00E4	ENSW	00D2
EOUT	02E8	EQUL	01CC	ER	02AF	ERSW	00D3
ES	03F9	EXT	02D1	EXTR	02C3	EZRO	0092
F1	0264	FF	0094	FILL	0441	FINE	0261
FIT	00C0	FIT2	00C8	FIT5	00D8	FLASHER	043D
FLAK	02F9	FOGT	0147	FORM	03A0	FROM	0472
FS1	018F	FS2	01E1	FS3	01F4	FSSW	00DA
G1	01AF	G2	01B6	G3	01CA	G4	01D3
G5	01DA	G6	01EC	G7	01FA	G8	0200
G9	0204	GAR	0248	GIN	01AE	GNC	03EC
GO	03E7	GOG	014E	HIGH	00E1	HUND	038F
IFLG	00DF	II	0095	III	030C	INAD	008C
INBF	0097	INSR	01CF	INST	0182	ISBK	0415
ISOG	040C	ISEN	03D2	ISLT	03FF	JJJ	031A
KBKS	02B6	KK	0096	KKK	031E	LEAV	0365
LIST	0003	LKCP	02ED	LOW	00E0	LPCNTK	043E
LVK	03AD	M4	0088	MH	0409	MLOP	0460
MO	0473	MOV	02D7	MOVE	0456	N	0474
N1	010D	N2	0124	N3	0129	N4	00FD
N5	00F6	N6	0132	NA	014C	NOMH	0407
NOTBASIC	0000	NOV	0333	NUM1	03B9	NUM2	03B5
ONE	03F6	ONEF	008A	OPEN	0042	OPEN1	0485
OPEN2	0478	OUT	0470	OV	0089	PAL	0367
PAS	0233	PATCH	0080	PAUS	0420	PAUS1	0431
PAUS2	043A	PCH	0329	PKNT	00D0	PKUP	02AB
PNUM	03B2	PO	034E	PO1	0358	POFLG	00E3
POUT	0206	POUT1	0216	POUT2	0243	PRIN	0002
PSET	02B5	PTFLG	041E	PUN	032F	Q	008B
QRO	013E	R	0156	R10	0389	READ	0009
REAK	000B	REPTK	0422	RESET	037F	RESK	0447
RFLG	00DE	RM10	0398	RPLC	01F0	RWND	004E
SDKT	00DD	SGSV	00D1	SKTR	00DC	SORD	03C5
START	00E5	STAT	0046	STG	00D7	STGS	008E
STGT	00D8	STP	0085	STR	00E2	STRT	00E6
SUKT	016C	SYSI	0001	SYSTEM	0001	T9	0453
TENS	038D	THRE	0091	TO	0475	TSAV	0260
TWO	0090	ULIM	005A	UNIT	038B	VALU	014D
WC	008D	WEOF	0050	WRIT	000E	X003E	037C
X005E	037D	X130	037B	X2000	037E	X3F0	037A
XCN	0452	XRAY	0040	XSV	0300	ZERO	034C
ZROW	0479						