RAYTHEON

QUALITY SOFTWARE

700 PROGRAMMING SYSTEMS

X-RAY EXEC - BASIC

DATE: February 1968

ID CODE: BLD - B

DRAWING: 390779

LABEL: X-RAY

AUTHOR: JMMC

SOURCE: SYM II

OBJECT: Absolute

Abs Loading
[illegible]

PURPOSE

X-RAY is designed to aid the user in preparation, execution, and debugging of programs.

USAGE

X-RAY is entered by starting execution at location 40_{16}. X-RAY consists of a group of subroutines which process operator directives. Each directive is defined separately in the following sections; however, below is a list of characteristics common to all directives:

1. Directives are always two characters in length; i.e. DA, AL, etc.

2. Directives are received through logical unit SYIN (the system input unit) by the I/O Monitor system; therefore, all directives must be preceded by a line feed and followed by a carriage return; e.g., L/F AL C/R

3. All directive arguments are hexadecimal.

4. Leading zeroes need not be typed. Only the last 4 hex digits of any argument are used as input.

5. If the operator makes a mistake and types in something other than a legal directive, two question marks will be typed out (? ?) and device SYIN selected for another input.

DIRECTIVES

Punch

Loc STR [illegible]

The punch directive outputs onto paper tape the contents of a series of consecutive memory locations. The directive input format is:

Ausstanzen

PΛNNNN, XXXX

where: NNNN is the beginning memory location, inclusive
XXXX is one greater than the last location punched

Λ is a space

The space following the P is necessary since each X-RAY directive must be two characters in length.

The punch directive produces a tape format exactly like that output by an absolute assembly, except no program checksum is output by punch. See the SYM I/PREP reference manual for the paper tape format.

After the punch directive has been input and the carriage return hit, the computer will come to a halt, allowing the operator to turn the paper tape punch on. When this has been done, the run button should be pushed to continue with the punch operation. When the operation is complete, the SYIN unit will be selected for another directive. Below is an example to punch cells 300_{16} through $3FF_{16}$.

P 300, 400

Absolute Load

The absolute load directive loads an absolute program from paper tape into memory. The directive input format is as follows:

AL

The binary tape format consists of two standard records input from logical unit BIN (the binary input unit). The program load location is read from record 1. Record 2 is absolute program text, which is read into memory beginning at load location. Absolute load does not check the checksum; however, the checksum is read into the first cell following the program.

If BIN is assigned to the teletype, the paper tape reader must be turned on manually. This should be done after the absolute load directive has been typed. After the program has been loaded, the computer will come to a halt, allowing the operator to turn off the reader. When the run button is pushed, the SYIN unit will be selected for another directive.

Dump

[illegible]

The dump directive prints the contents of an area of memory. The directive input format is as follows:

```
DΛNNNN, XXXX
```

where: NNNN is the beginning memory location, inclusive
XXXX is the ending memory location, inclusive

Λ is a space

The dump directive produces a tabulation on the system logical list unit (LIST). Each line consists of an address A, and the contents, in hexadecimal, of locations A through A+7. A complete line is always output. Below is an example of a dump beginning at location 300_{16}.

```
D 300,  310
0300    0000   90D6    7804   80D6   22E7   90D6   8800   E381
0308    7800   8806    0800   130F   903E   00B0   2800   803E
0310    9806   00B0    2800   903E   9800   1303   731D   631E
```

The DUMP subroutine also provides the user with a dynamic dump capability. The dump output format is exactly as described above, but the dump subroutine which is resident in X-RAY is called from the users program. The calling sequence is as follows:

```
JSX     DUMP
DATA    NNNN
DATA    XXXX
```

The program sequence causes the contents of memory location NNNN through XXXX to output on LIST. The users program then continues execution following the DUMP calling sequence. I/O Monitor cell 56_{16} is the linkage to DUMP. The user must equivalence DUMP to cell 56_{16} in his program. For more details see the I/O Monitor documentation.

Hex Correction

[illegible]

The hex correction directive stores different hex numbers into consecutive memory cells.

The directive input format is as follows:

```
                    HΛNNNN, XXXX, YYYY, ZZZZ, ---

    where:          NNNN is the beginning location
                    XXXX is data to be stored
                    YYYY is data to be stored
                    ZZZZ is data to be stored
                    etc.

                    Λ is a space
```

XXXX is stored into location NNNN, YYYY is stored into location NNNN+1, etc. When NNNN is negative (a hex number from 8000 to FFFF) the program will begin storing the new data in the location following the last data word in the previous H directive. The directive cannot be longer than 54 characters, including the H, spaces, and commas. Below is an example of a 53 character input to store data starting at cell 400_{16}. The input character count starts with the H and ends with the last number typed.

```
H 400, 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19
```

<u>Blank Buffer</u>

The blank buffer directive stores a single data value into an area of memory. The input format is as follows:

```
                    BBNNNN, XXXX, YYYY

    where:          NNNN is the beginning memory location
                    XXXX is the data to be stored
                    YYYY is the number of times to store the data
```

Below is an example to store 0003 into 100_{16} cells beginning at location 300_{16}.

```
BB300, 3, 100
```

<u>Date</u>

The date directive stores the 8 characters following 'DA' into the monitor date locations. See the monitor documentation for the exact location of DATE. The directive format is as follows:

```
DAXXXXXXXX
```

DA WO 1-3

where: X's will be stored into cells DATE through DATE+3

Below is an example to store 11/28/67 into DATE to DATE+3:

```
DA11/28/67
```

Identification

The identification directive stores the first 8 characters following 'ID' into the monitor program name locations. The directive input format is as follows:

```
IDXXXXXXXX
```

where: X's will be stored in NAME to NAME+3

Below is an example to store COMP PRO into cells NAME to NAME+3:

```
IDCOMP PROG
```

Transfer

The transfer directive transfers execution to a location in memory. The directive input format is as follows:

```
T∧XXXX
```

where: XXXX is the location to begin execution

∧is a space

Below is an example to start execution at cell 300_{16}:

```
T 300
```

Reassign I/O Device

The I/O directive reassigns devices in the Peripheral Equipment Assignment Table (PEAT). (See I/O Monitor documentation). The directive input format is as follows:

```
IOXX, YY
```

where: XX is the first Logical Unit Number (LUN)
YY is the second Logical Unit Number

XX must always be less than 12_{10}. The I/O directive assigns XX to YY. Below is an example assigning LUN #2 to the same device as LUN #12:

```
IO2,12
```

RELOCATABLE LOADER DIRECTIVES

The following three directives (IL, CL, and ET) can be used only when the relocating loader is in memory.

Initialize Load

This directive is used to begin a relocatable loading operation. The directive input format is as follows:

```
IL
```

There are no input arguments for IL.

The operator places the text to be loaded in the BIN device, types the directive IL, and then turns the reader on. The loader clears the entry name table, resets the storage map and loads the text. As entry names are encountered in loading they are placed into the entry names table. Loading ceases when an END statement is detected in the text. If sense switch 0 is true the loader will load another program from BIN. If sense switch 0 is false control will be returned to X-RAY for further directives.

Continue Load

This directive is used to continue loading relocatable programs without destroying the entry names table or programs already loaded.

The directive input format is as follows:

```
CL
```

There are no input arguments for CL.

The operation and functions of the CL directive are identical to those of the IL directive with the exceptions that the entry names table is not cleared and the storage map is not reset.

Entry Names Table Printout (Storage Map)

This directive is used to print the contents of the entry names table which has been generated by the loading of programs.

The input format is as follows:

```
ET
```

There are no input arguments for ET.

Each entry name which has been encountered since the last IL directive will be listed along with its location in core.

Undefined names will be given a location of zero. Names referenced only by a LOAD pseudo-op but not loaded will be printed with a location value of 3FFF and flagged by an arrow.

If a name is defined more than once the location value of the first encounter will be used to fill all references to that name. All subsequent definitions of that name will be printed, with their locations, but flagged by an arrow.

The Directive ET is also used to initiate execution of the Symbolic Program Editor and the Trace package. The use of the directive is determined by which program (Loader, Editor, or Trace) has been loaded.

For the alternative uses of the ET directive refer to the respective manusl for the Editor or Trace.

Notes

X-RAY is coded for the 703 computer using the SYM II Assembler. The package is located after the I/O Monitor in memory block 0. See the attached listing for the exact beginning location of X-RAY. X-RAY may be overlayed by a program and not affect the I/O Monitor.

The subroutines that make up X-RAY are listed below:

1. XRAY - main control program.
2. IORE - processes the IO directive.
3. DATR - processes the DA directive.
4. ID - processes the ID directive.
5. DUMP - processes the D directive.
6. DMP - processes a dump call from a program.
7. UNPK - unpacks teletype input arguments.
8. S.TRANS - processes the T directive.
9. PXCH - processes the P directive.
10. HX - processes the H directive.
11. BB - processes the BB directive.
12. S.FILL - processes the AL directive.
13. S.PACK - converts data from binary to ASCII characters.

SUBROUTINE

TITLE: X-RAY Main Control Program

LABEL: XRAY

PURPOSE

XRAY is the main control program for BASIC X-RAY EXEC. It receives directives from the teletype and branches to the appropriate directive service routines.

USAGE

XRAY is entered by starting execution at location 40_{16}. The teletype is selected for input and the program waits for a directive to be typed. If the directive cannot be found in the array of legal directives, XRAY types two question marks (? ?) and selects the teletype for another directive.

RESTRICTIONS

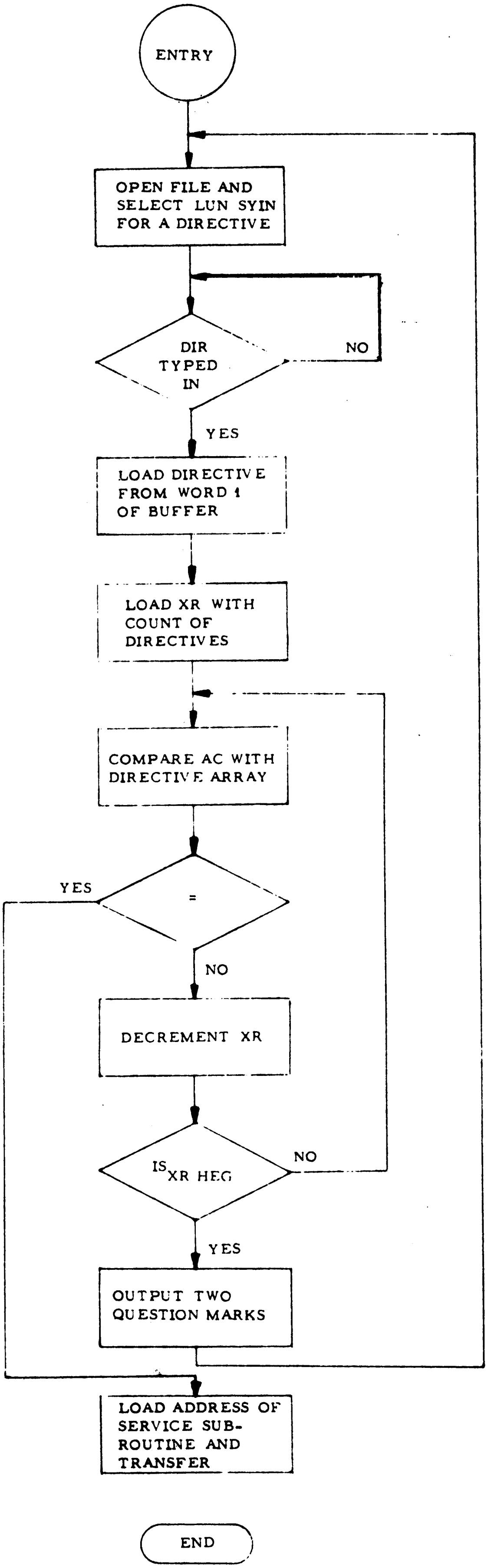
XRAY is written for the 703 computer, using SYM II assembly language.

Subroutines used are listed below:

1. IORE
2. DATR
3. ID
4. DUMP
5. S.TRANS
6. PXCH
7. HX
8. BB
9. S.FILL

Cells 2045, 2046, and 2047 are used as linkage to the relocating loader directives IL, CL, and ET.

SUBROUTINE X-RAY


ENTRY
OPEN FILE AND SELECT LUN SYIN FOR A DIRECTIVE
DIR TYPED IN
NO
YES
LOAD DIRECTIVE FROM WORD 1 OF BUFFER
LOAD XR WITH COUNT OF DIRECTIVES
COMPARE AC WITH DIRECTIVE ARRAY
=
YES
NO
DECREMENT XR
IS XR NEG
NO
YES
OUTPUT TWO QUESTION MARKS
LOAD ADDRESS OF SERVICE SUB-ROUTINE AND TRANSFER
END

SUBROUTINE

TITLE: Reassign I/O Device

LABEL: IORE

PURPOSE

IORE is a BASIC X-RAY EXEC subroutine that reassigns devices in the Peripheral Equipment Assignment Table (PEAT).

USAGE

IORE is called by the main control program XRAY. The I/O directive assigns XX to YY, the directive input format being IOXX, YY.

RESTRICTIONS

IORE is written for the 703 computer using SYM II assembly language.

SUBROUTINE

TITLE: Date and Program Identification

LABEL: DATR and ID

PURPOSE

Subroutines DATR and ID are BASIC X-RAY EXEC subroutines used to process the DA and ID directives.

USAGE

DATR is called by the main control program XRAY to move the typed-in date to the I/O Monitor cells for the date, $5D_{16}$ through 60_{16}.

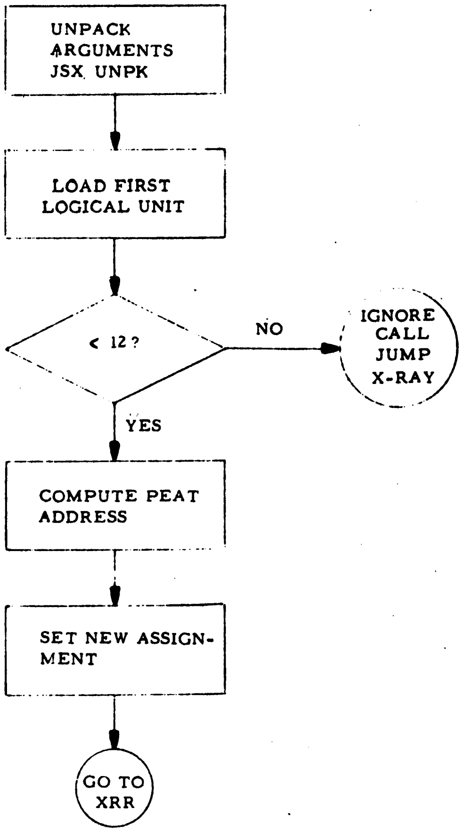
ID is called by the main control program XRAY to move the typed-in program identification to the I/O Monitor cells for the program name, 61_{16} through 64_{16}.

DATR and ID return to XRAY after the information has been moved.

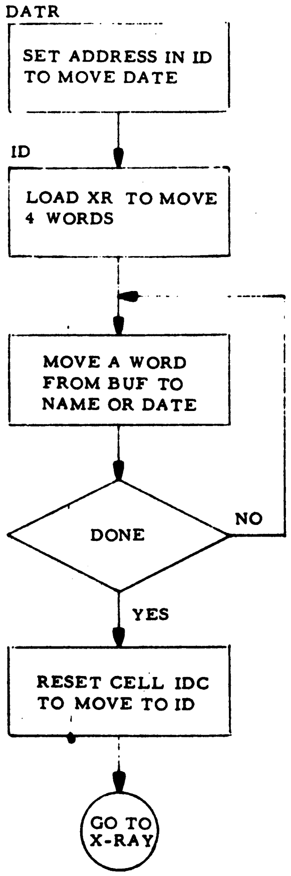
RESTRICTIONS

DATR and ID are written for the 703 computer using SYM II assembly language. Both subroutines take the first 8 characters following the input directive as tne date or identification. Any excess input information is ignored.

SUBROUTINE IORE



SUBROUTINE DATR AND ID


DATR
SET ADDRESS IN ID TO MOVE DATE
ID
LOAD XR TO MOVE 4 WORDS
MOVE A WORD FROM BUF TO NAME OR DATE
DONE
NO
YES
RESET CELL IDC TO MOVE TO ID
GO TO X-RAY

SUBROUTINE

TITLE: Memory Dump

LABEL: DUMP

PURPOSE

DUMP is a BASIC X-RAY EXEC subroutine that prints a section of memory on the teletype.

USAGE

DUMP is called by the main control program XRAY to service the D directive. There are two arguments; LOC1 and LOC2. LOC1 the initial memory location to print and LOC2 is the last. DUMP returns to XRAY after the output is complete.

DUMP has an entry point and can be called by a user program through this cell which is linked to I/O monitor cell 56_{16}. The calling sequence is shown below:

```
JSX     DUMP
DATA    LOC1
DATA    LOC2
```

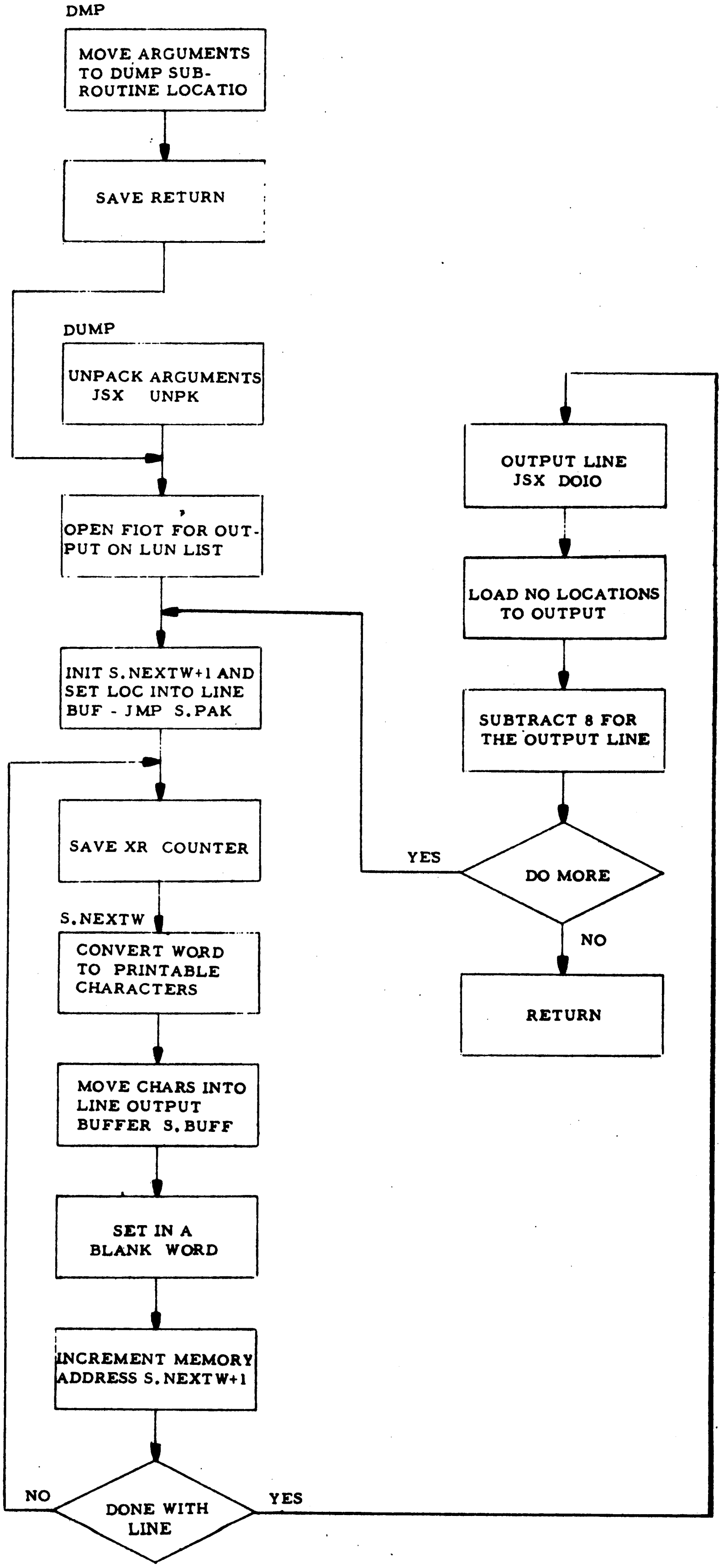
LOC1 and LOC2 are locations as defined above. The user program continues after the dump has been completed.

RESTRICTIONS

DUMP is written for the 703 computer using SYM II assembly language.

Subroutine UNPK is used to convert LOC1 and LOC2.

SUBROUTINE DMP


DMP
MOVE ARGUMENTS TO DUMP SUB-ROUTINE LOCATIO
SAVE RETURN
DUMP
UNPACK ARGUMENTS JSX UNPK
OPEN FIOT FOR OUTPUT ON LUN LIST
INIT S.NEXTW+1 AND SET LOC INTO LINE BUF - JMP S.PAK
SAVE XR COUNTER
S.NEXTW
CONVERT WORD TO PRINTABLE CHARACTERS
MOVE CHARS INTO LINE OUTPUT BUFFER S.BUFF
SET IN A BLANK WORD
INCREMENT MEMORY ADDRESS S.NEXTW+1
NO
DONE WITH LINE
YES
OUTPUT LINE JSX DOIO
LOAD NO LOCATIONS TO OUTPUT
SUBTRACT 8 FOR THE OUTPUT LINE
YES
DO MORE
NO
RETURN

SUBROUTINE

TITLE: Unpack

LABEL: UNPK

PURPOSE

UNPK is a BASIC X-RAY EXEC subroutine used to unpack teletype input arguments and convert them to binary.

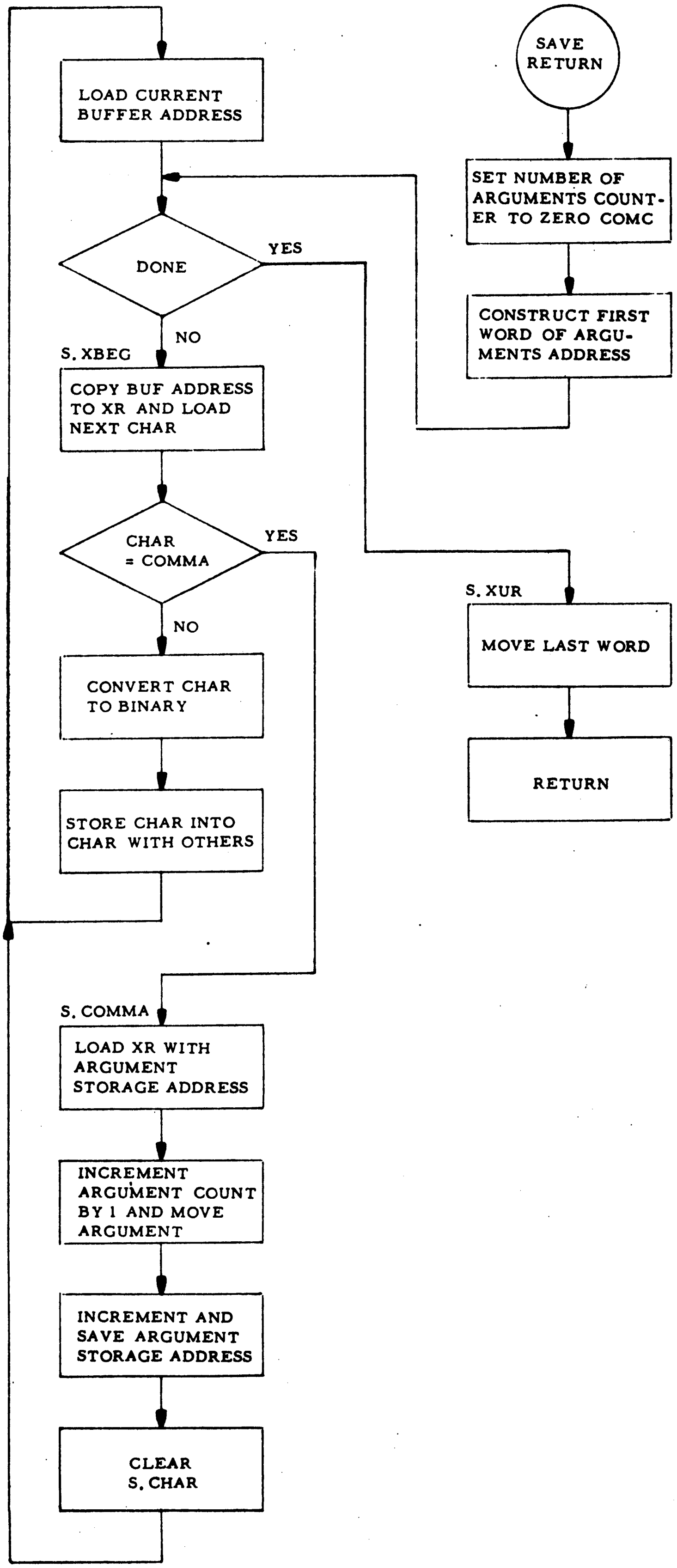
USAGE

UNPK is called by the various X-RAY directive service routines that have teletype input arguments. Commas (,) must separate each argument. The arguments to be converted are taken from the XRAY input buffer. The converted arguments are stored in to array S. ARG.

RESTRICTIONS

UNPK is written for the 703 computer using SYM II assembly language.

SUBROUTINE UNPK


SAVE RETURN
SET NUMBER OF ARGUMENTS COUNTER TO ZERO COMC
CONSTRUCT FIRST WORD OF ARGUMENTS ADDRESS
LOAD CURRENT BUFFER ADDRESS
DONE
YES
NO
S. XBEG
COPY BUF ADDRESS TO XR AND LOAD NEXT CHAR
CHAR = COMMA
YES
NO
CONVERT CHAR TO BINARY
STORE CHAR INTO CHAR WITH OTHERS
S. XUR
MOVE LAST WORD
RETURN
S. COMMA
LOAD XR WITH ARGUMENT STORAGE ADDRESS
INCREMENT ARGUMENT COUNT BY 1 AND MOVE ARGUMENT
INCREMENT AND SAVE ARGUMENT STORAGE ADDRESS
CLEAR S. CHAR

SUBROUTINE

TITLE: Transfer

LABEL: S.TRANS

PURPOSE

S.TRANS is a BASIC X-RAY EXEC subroutine used to process the T directive.

USAGE

S.TRANS is called by the main control program, XRAY, to process the transfer directive. There is one argument, LOC. If LOC is zero, the transfer is to a program whose beginning address is in RBEG (55_{16}). If LOC is not zero, S.TRANS transfers to address LOC.

RESTRICTIONS

S.TRANS is written for the 703 computer using SYM II assembly language.

Subroutine UNPK is called to unpack and convert LOC to binary.

SUBROUTINE

TITLE: Output Absolute Paper Tape

LABEL: PXCH

PURPOSE

PXCH is a BASIC X-RAY EXEC subroutine used to punch the contents of an area of memory onto paper tape.

USAGE

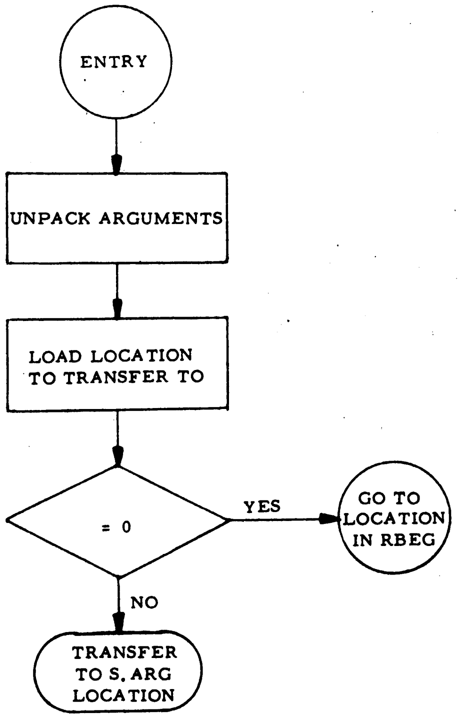
PXCH is called by the main control program XRAY to service the punch directive. There are two arguments input to PXCH; LOC1 and LOC2. LOC1 is the first memory location to punch on paper tape. LOC2 is the last. There is one halt in PXCH. This is executed before anything is punched to give the operator time to turn on the teletype punch. When the punch has been turned on, the operator should push the compute run button to continue. PXCH returns to X-RAY after the program has been punched.

RESTRICTIONS

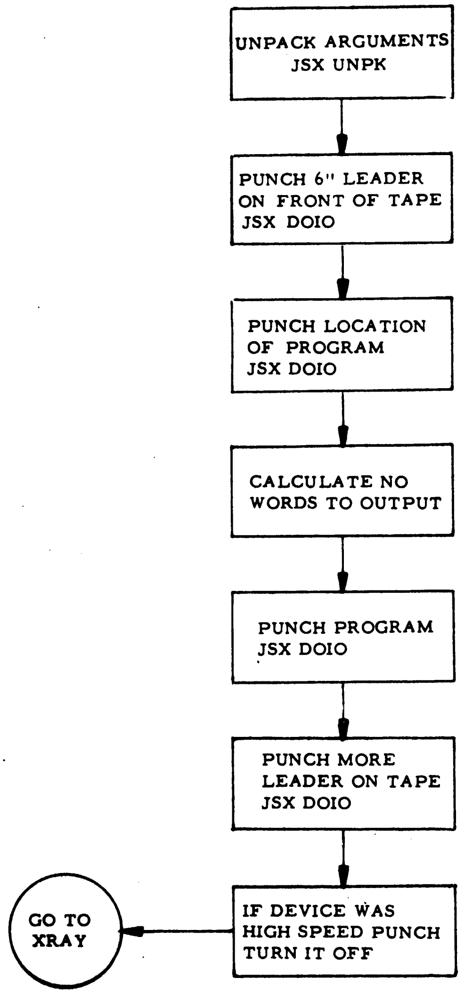
PXCH is written for the 703 computer using SYM II assembly language.

The paper tape output is punched on the teletype punch by the I/O Monitor subroutines OPEN, DOIO, and STAT. Subroutine UNPK is called to unpack and convert LOC1 and LOC2 to binary.

SUBROUTINE S.TRANS



SUBROUTINE PXCH


UNPACK ARGUMENTS JSX UNPK
PUNCH 6" LEADER ON FRONT OF TAPE JSX DOIO
PUNCH LOCATION OF PROGRAM JSX DOIO
CALCULATE NO WORDS TO OUTPUT
PUNCH PROGRAM JSX DOIO
PUNCH MORE LEADER ON TAPE JSX DOIO
IF DEVICE WAS HIGH SPEED PUNCH TURN IT OFF
GO TO XRAY

SUBROUTINE

TITLE: Hexadecimal Correction

LABEL: HX

PURPOSE

HX is a BASIC X-RAY EXEC subroutine used to store data into absolute memory addresses.

USAGE

HX is called by the main control program, XRAY, to process the H directive. The input format is shown below:

H LOC, D1, D2, D3, D4, ...

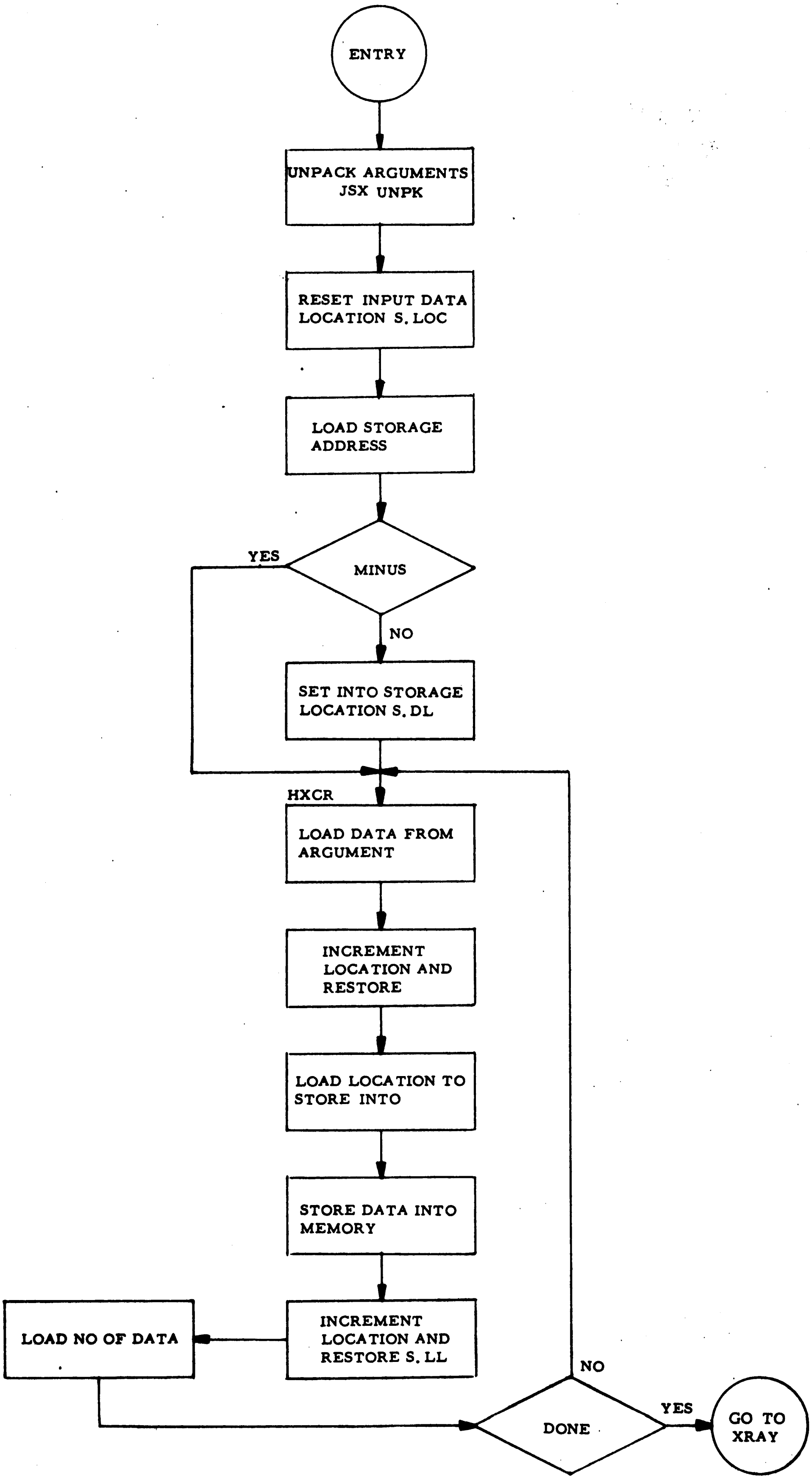
LOC is the memory location to store data D1. Data D2, E3, . . . is stored into consecutive memory locations following LOC. The maximum number of input characters is 54 -- this is counting the H through the last digit of the last data value and including the commas. If LOC is a negative number, the memory location following the last data of the last H directive will be used for the initial location of the new data. The subroutine HX returns to XRAY after the operation is complete.

RESTRICTIONS

HX is written for the 703 computer using SYM II assembly language.

Subroutine UNPK is used to unpack the input arguments.

SUBROUTINE HX


ENTRY
UNPACK ARGUMENTS JSX UNPK
RESET INPUT DATA LOCATION S. LOC
LOAD STORAGE ADDRESS
MINUS
YES
NO
SET INTO STORAGE LOCATION S. DL
HXCR
LOAD DATA FROM ARGUMENT
INCREMENT LOCATION AND RESTORE
LOAD LOCATION TO STORE INTO
STORE DATA INTO MEMORY
INCREMENT LOCATION AND RESTORE S. LL
LOAD NO OF DATA
NO
DONE
YES
GO TO XRAY

SUBROUTINE

TITLE: Blank Buffer

LABEL: BB

PURPOSE

BB is a BASIC X-RAY EXEC subroutine that sets a constant into consecutive cells of memory.

USAGE

BB is called by the main control program, XRAY, to process the BB directive. There are three arguments:

1. LOC is the initial address.
2. DATA is the hex constant to be stored.
3. NBR is the number oftimes to store DATA.

After execution of the above BB directive locations LOC through LOC + NBR -1 would contain DATA. BB returns to XRAY after the operation is complete.

RESTRICTIONS

BB is written for the 703 computer using SYM II assembly language.

Subroutine UNPK is called to unpack and convert LOC, DATA, and NBR to binary.

SUBROUTINE

TITLE: Absolute Load

LABEL: S. FILL

PURPOSE

S. FILL is a BASIC X-RAY EXEC subroutine used to load an absolute program from paper tape.

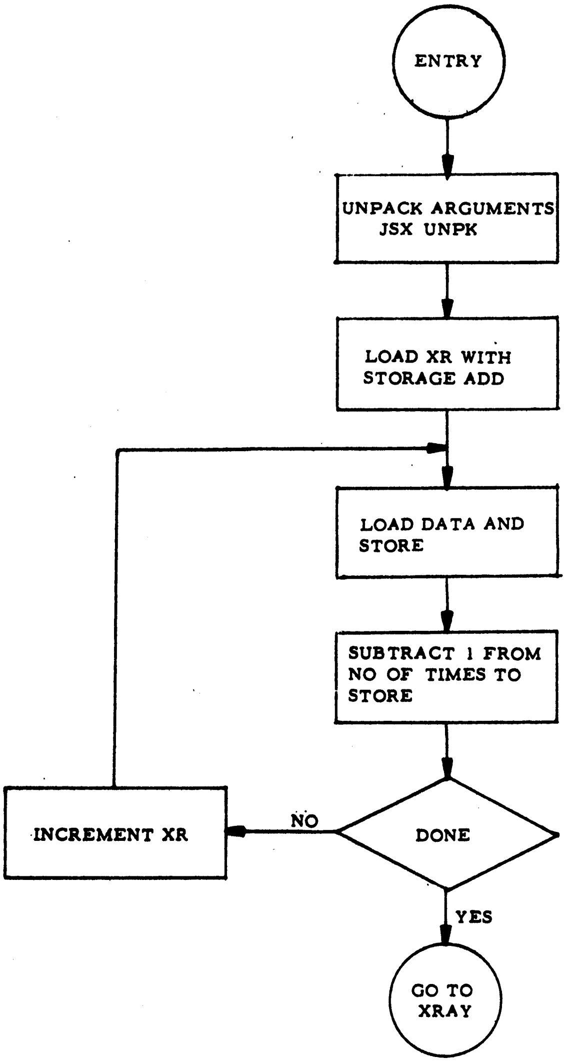
USAGE

S. FILL is called by the main control program, XRAY, to service the AL directive. There are no arguments. The initial program location is read from the first record on the paper tape. The program is then read into memory beginning at that location. When the program has been loaded, the computer will halt, giving the operator time to turn off the teletype reader. When he pushes the run button, S. FILL returns to XRAY.

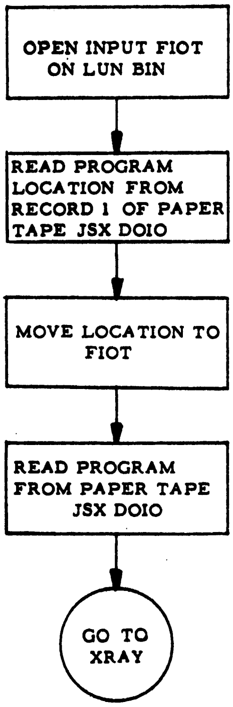
RESTRICTIONS

S. FILL is written for the 703 computer using SYM II assembly language. It requires a paper tape reader for program input.

SUBROUTINE BB



SUBROUTINE S. FILL


OPEN INPUT FIOT ON LUN BIN
READ PROGRAM LOCATION FROM RECORD 1 OF PAPER TAPE JSX DOIO
MOVE LOCATION TO FIOT
READ PROGRAM FROM PAPER TAPE JSX DOIO
GO TO XRAY

SUBROUTINE

TITLE: Convert Binary Data to Teletype Characters

LABEL: S. PACK

PURPOSE

S. PACK is a BASIC X-RAY EXEC subroutine used by DUMP to convert binary data to teletype characters.

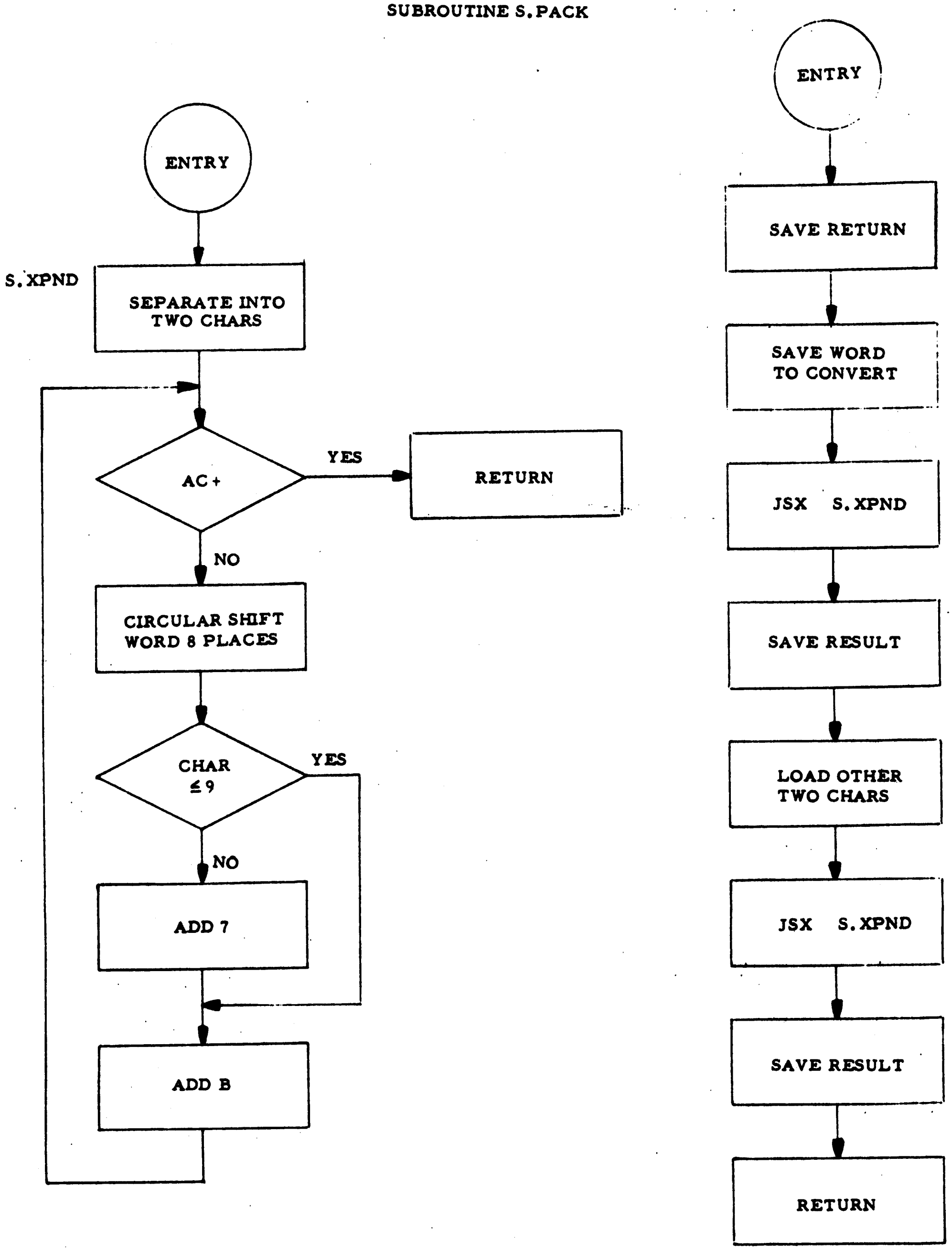
USAGE

The data to be converted is input in the AC register and output in S. SAVE1 and S. SAVE2. Only one number is converted with each call to S. PACK.

RESTRICTIONS

S. PACK is written for the 703 computer, using SYM II assembly language.

SUBROUTINE S.PACK



APPENDIX A

ASSEMBLY LISTING

of

X-RAY EXEC - BASIC

<u>Drawing No.</u>	<u>ID Code</u>
390779	BLD -(Revision B)

```
                                2     ' X-RAY EXEC - BASIC    DN 390779                                BLD 0005
```

```
                     3     *       GENERAL MONITOR PARAMETERS              BLD 0006
000C   000C          4     DUM     EQU    12                               BLD 0007
000D   000D          5     TTY     EQU    13                               BLD 0008
000E   000E          6     MAG0    EQU    14                               BLD 0009
000F   000F          7     MAG1    EQU    15                               BLD 0010
0010   0010          8     MAG2    EQU    16                               BLD 0011
0011   0011          9     MAG3    EQU    17                               BLD 0012
0012   0012         10     DSK0    EQU    18                               BLD 0013
0013   0013         11     PCH0    EQU    19                               BLD 0014
0014   0014         12     PTR0    EQU    20                               BLD 0015
0015   0015         13     CDR0    EQU    21                               BLD 0016
0016   0016         14     CPC0    EQU    22                               BLD 0017
0019   0019         15     DSK1    EQU    25                               BLD 0018
0017   0017         16     LPR0    EQU    23                               BLD 0019
0001   0001         17     MASS    EQU    1                                BLD 0020
0000   0000         18     NMAS    EQU    0                                BLD 0021
0000   0000         19     NO      EQU    0                                BLD 0022
0001   0001         20     YES     EQU    1                                BLD 0023
```

```
  21   *        SYSTEM DESCRIPTION                                          HLD 0024
  22   *        UNIT NAME CONSTRUCTION                                      BLD 0025
  23   *  PHYSICAL UNITS ARE IDENTIFIED BY THREE LETTER                     HLD 0026
  24   *  MNEMONICS, AS FOLLOWS                                             BLD 0027
  25   *        DSK   DISK UNITS                                            BLD 0028
  26   *        MAG   MAG TAPE UNITS                                        BLD 0029
  27   *        TTY   TELETYPE ASR 33 OR 35                                 BLD 0030
  28   *        PTR   HIGH SPEED PAPER TAPE READER                          BLD 0031
  29   *        PCH   HIGH SPEED PAPER TAPE PUNCH                           BLD 0032
  30   *        CDR   CARD READER                                           BLD 0033
  31   *        CPC   CARD PUNCH                                            BLD 0034
  32   *        LPR   LINE PRINTER                                          BLD 0035
  33   *  THE NUMBER OF UNITS OF A PARTICULAR TYPE IS                       BLD 0036
  34   *  ASSIGNED A SYMBOL OF THE FORM NXXX, WHERE XXX IS                  BLD 0037
  35   *  THE UNIT MNEMONIC.  THUS NDSK REPRESENTS THE                      BLD 0038
  36   *  NUMBER OF DISK UNITS IN A PARTICULAR SYSTEM.                      BLD 0039
  37   *                                                                    BLD 0040
  38   *  THE INTERRUPT CHANNEL TO WHICH A PARTICULAR                       BLD 0041
  39   *  DEVICE HAS BEEN ASSIGNED IS DESIGNATED XXXI. THUS                 BLD 0042
  40   *  TTYI IS THE INTERRUPT CHANNEL FOR THE TELETYPE.                   BLD 0043
  41   *                                                                    BLD 0044
  42   *                                                                    BLD 0045
  43   *                                                                    BLD 0046
  44   *   SYSTEM DESCRIPTION SECTION                                       BLD 0047
  45   *  TO DESCRIBE A PARTICULAR SYSTEM THE FOLLOWING                     BLD 0048
  46   *  PARAMETERS MUST BE DEFINED, USING EQUATE CARDS                    BLD 0049
  47   *                                                                    BLD 0050
  48   *   STATE CORESIZE                                                   BLD 0051
  49   *CORESIZE EQU  NUMBER OF WORDS OF CORE                               BLD 0052
  50                                                                        BLD 0053
  51   *   STATE NUMBER OF INTERRUPT CHANNELS, ICHN                         BLD 0054
  52   *ICHN     EQU  NUMBER OF CHANNELS                                    BLD 0055
  53   *                                                                    BLD 0056
  54   *   STATE NUMBER OF MAG TAPE UNITS, NMAG                             BLD 0057
  55   *NMAG     EQU  NUMBER OF UNITS                                       BLD 0058
  56   *  IS THE TAPE UNIT A CHAINING UNIT                                  BLD 0059
  57   *CHAIN   EQU   YES OR NO                                             BLD 0060
  58   *                                                                    BLD 0061
  59   *   STATE NUMBER OF DISK UNITS, NDSK                                 BLD 0062
  60   *NDSK     EQU  NUMBER OF DISKS                                       BLD 0063
  61   *                                                                    BLD 0064
  62   *   IS THERE A HIGH SPEED READER                                     BLD 0065
  63   *NPTR     EQU  YES OR NO                                             BLD 0066
  64   *                                                                    BLD 0067
  65   *   IS THERE A HIGH SPEED PUNCH                                      BLD 0068
  66   *NPCH     EQU  YES OR NO                                             BLD 0069
  67   *                                                                    BLD 0070
  68   *   IS THERE A CARD READER                                           BLD 0071
  69   *NCDR     EQU  YES OR NO                                             BLD 0072
  70   *                                                                    BLD 0073
  71   *   IS THERE A CARD PUNCH                                            BLD 0074
  72   *NCPC     EQU  YES OR NO                                             BLD 0075
  73   *                                                                    BLD 0076
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                74   *  IS THERE A LINE PRINTER                                              BLD 0077
                75   *NLPR     EQU  NUMBER OF LINE PRINTERS                                  BLD 0078
                76   *                                                                       BLD 0079
                77   *  DEFINE INTERRUPT CHANNEL NUMBER FOR ALL DEVICES                      BLD 0080
                78   *  PRESENT IN THE SYSTEM                                                BLD 0081
                79   *TTYI    EQU   NUMBER                                                   BLD 0082
                80   *MAGI    EQU   NUMBER                                                   BLD 0083
                81   *  AND SO ON                                                            BLD 0084
                82   *                                                                       BLD 0085
                83   *        SYSTEM DESCRIPTION PARAMETERS                                  BLD 0086
                84   *****************************DN390779-000*******************************BLD 0087
                85   *****************************DN390779-000*******************************BLD 0088
                86   *****************************DN390779-000*******************************BLD 0089
                87   *****************************DN390779-000*******************************BLD 0090
                88   *****************************DN390779-000*******************************BLD 0091
                89   *****************************DN390779-000***********                    BLD 0092
1000  1000      90   CORESIZE EQU   4096          DN390779-000                                   BLD 0093
0001  0001      91   ICHN     EQU   1             DN390779-000                                   BLD 0094
0000  0000      92   NMAG     EQU   0             DN390779-000                                   BLD 0095
0000  0000      93   CHAIN    EQU   NO            DN390779-000                                   BLD 0096
0000  0000      94   NDSK     EQU   0             DN390779-000                                   BLD 0097
0000  0000      95   NPCH     EQU   NO            DN390779-000                                   BLD 0098
0000  0000      96   NPTR     EQU   NO            DN390779-000                                   BLD 0099
0000  0000      97   NCDR     EQU   NO            DN390779-000                                   BLD 0100
0000  0000      98   NCPC     EQU   NO            DN390779-000                                   BLD 0101
0000  0000      99   NLPR     EQU   NO            DN390779-000                                   BLD 0102
0000  0000     100   TTYI     EQU   0             DN390779-000                                   BLD 0103
               101   *****************************DN390779-000***********                    BLD 0104
               102   *****************************DN390779-000*******************************BLD 0105
               103   *****************************DN390779-C0'*******************************BLD 0106
               104   *****************************DN390779-)0(*******************************BLD 0107
               105   *****************************DN390779-)0(*******************************BLD 0108
               106   *  SOFTWARE SYSTEM TYPE SELECTION,                                      BLD 0109
0000  0000     107   BASIC    EQU   0                                                        BLD 0110
0001  0001     108   STANDARD EQU   1                                                        BLD 0111
               109   *  IF EXTENDED IS SELECTED A DISK MUST BE PRESENT IN                    BLD 0112
               110   *  THE SYSTEM,                                                          BLD 0113
               111            TRUE  NDSK=0                                                   BLD 0114
0001  0001     112   EXTENDED EQU   STANDARD                                                 BLD 0115
               113            ENDC                                                           BLD 0116
               114            FALS  NDSK=0                                                   BLD 0117
               115   EXTENDED EQU   2                                                        BLD 0118
               116            ENDC                                                           BLD 0119
               117   *  IF CORESIZE EQUALS 4096 BASIC SOFTWARE IS                            BLD 0120
               118   *  AUTOMATICALLY GENERATED,                                             BLD 0121
               119            TRUE  CORESIZE=4096                                            BLD 0122
0000  0000     120   SOFTWARE EQU   BASIC                                                    BLD 0123
               121            ENDC                                                           BLD 0124
               122            FALS  CORESIZE=4096                                            BLD 0125
               123   *        INSERT SOFTWARE SELECTION CARD HERE                            BLD 0126
               124   *****************************************************                   BLD 0127
               125   SOFTWARE EQU   BASIC                                                    BLD 0128
               126   *****************************************************                   BLD 0129
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                                127         ENDC                                                         BLD 0130
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                     128   '          UNIT ASSIGNMENT PARAMETER COMPUTATION          BLD 0131
0000   0000          129   NUNITS     EQU    NMAG+NDSK+NPTR+NCDR+NCPC+NPCH+NLPR      BLD 0132
0000   0000          130   PNCH       EQU    NPCH                                    BLD 0133
                     131   * SELECT HIGHEST LEVEL DEVICE OF EACH TYPE                BLD 0134
                     132   * 1. NON-MASS INPUT                                       BLD 0135
                     133              TRUE   NCDR>0                                  BLD 0136
                     134   NMI        EQU    CDR0                                    BLD 0137
                     135              ENDC                                           BLD 0138
                     136              TRUE   NCDR=0                                  BLD 0139
                     137              TRUE   NPTR>0                                  BLD 0140
                     138   NMI        EQU    PTR0                                    BLD 0141
                     139              ENDC                                           BLD 0142
                     140              TRUE   NPTR=0                                  BLD 0143
000D   000D          141   NMI        EQU    TTY                                     BLD 0144
                     142              ENDC                                           BLD 0145
                     143              ENDC                                           BLD 0146
                     144   *                                                         BLD 0147
                     145   * 2. NON-MASS OUTPUT                                      BLD 0148
                     146              TRUE   NCPC>0                                  BLD 0149
                     147   NMO        EQU    CPC0                                    BLD 0150
                     148              ENDC                                           BLD 0151
                     149              TRUE   NCPC=0                                  BLD 0152
                     150              FALS   NPCH=0                                  BLD 0153
                     151   NMO        EQU    PCH0                                    BLD 0154
                     152              ENDC                                           BLD 0155
                     153              TRUE   NPCH=0                                  BLD 0156
000D   000D          154   NMO        EQU    TTY                                     BLD 0157
                     155              ENDC                                           BLD 0158
                     156              ENDC                                           BLD 0159
                     157   * 3. MASS STORAGE                                         BLD 0160
                     158              TRUE   NDSK+NMAG=0                             BLD 0161
000C   000C          159   MASU       EQU    DUM                                     BLD 0162
                     160              ENDC                                           BLD 0163
                     161              FALS   NDSK=0                                  BLD 0164
                     162   MASU       EQU    DSK0                                    BLD 0165
                     163              ENDC                                           BLD 0166
                     164              TRUE   NDSK=0                                  BLD 0167
                     165              FALS   NMAG=0                                  BLD 0168
                     166   MASU       EQU    MAG0                                    BLD 0169
                     167              ENDC                                           BLD 0170
                     168              ENDC                                           BLD 0171
                     169              FALS   NDSK=0                                  BLD 0172
                     170   NDSK0      EQU    1                                       BLD 0173
                     171              ENDC                                           BLD 0174
                     172              TRUE   NDSK=0                                  BLD 0175
0000   0000          173   NDSK0      EQU    0                                       BLD 0176
                     174              ENDC                                           BLD 0177
0000   0000          175   NMSU       EQU    NDSK+NMAG                               BLD 0178
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                         176   *         LOGICAL UNIT ASSIGNMENTS                                           BLD 0179
                         177   *  ASSIGN SYSTEM FILF UNIT                                                   BLD 0180
                         178             FALS  MASU=DUM                                                     BLD 0181
                         179   ASYSF     EQU   MASU                                                         BLD 0182
                         180             ENDC                                                               BLD 0183
                         181             TRUE  MASU=DUM                                                     BLD 0184
0000  0000               182   ASYSF     EQU   NMI                                                          BLD 0185
                         183             ENDC                                                               BLD 0186
                         184   *                                                                            BLD 0187
                         185   *  ASSIGN SYSTEM INPUT UNIT                                                  BLD 0188
000D  000D               186   ASYSI     EQU   TTY                                                          BLD 0189
                         187   *                                                                            BLD 0190
                         188   *  ASSIGN PRINCIPAL INPUT UNIT                                               BLD 0191
000D  000D               189   APRIN     EQU   NMI                                                          BLD 0192
                         190   *                                                                            BLD 0193
                         191   *  ASSIGN LISTING UNIT                                                       BLD 0194
                         192             TRUE  NLPR=0                                                       BLD 0195
000D  000D               193   ALIST     EQU   TTY                                                          BLD 0196
                         194             ENDC                                                               BLD 0197
                         195             FALS  NLPR=0                                                       BLD 0198
                         196   ALIST     EQU   LPR0                                                         BLD 0199
                         197             ENDC                                                               BLD 0200
                         198   *                                                                            BLD 0201
                         199   *  ASSIGN RINARY OUTPUT UNIT                                                 BLD 0202
000D  000D               200   ABOUT     EQU   NMO                                                          BLD 0203
                         201   *  ASSIGN BINARY INPUT UNIT                                                  BLD 0204
                         202             TRUE  ABOUT=CPC0                                                   BLD 0205
                         203   ABIN      EQU   NMI                                                          BLD 0206
                         204             ENDC                                                               BLD 0207
                         205             FALS  ABOUT=CPC0                                                   BLD 0208
                         206             TRUE  NPTR=0                                                       BLD 0209
000D  000D               207   ABIN      EQU   TTY                                                          BLD 0210
                         208             ENDC                                                               BLD 0211
                         209             FALS  NPTR=0                                                       BLD 0212
                         210   ABIN      EQU   PTR0                                                         BLD 0213
                         211             ENDC                                                               BLD 0214
                         212             ENDC                                                               BLD 0215
                         213   *  ASSIGN SCRATCH UNIT                                                       BLD 0216
                         214             TRUE  NMAG>1                                                       BLD 0217
                         215             FALS  MASU=DSK0                                                    BLD 0218
                         216   ASCR      EQU   MAG1                                                         BLD 0219
                         217             ENDC                                                               BLD 0220
                         218             TRUE  MASU=DSK0                                                    BLD 0221
                         219   ASCR      EQU   MASU                                                         BLD 0222
                         220             ENDC                                                               BLD 0223
                         221             ENDC                                                               BLD 0224
                         222             FALS  NMAG>1                                                       BLD 0225
000C  000C               223   ASCR      EQU   MASU                                                         BLD 0226
                         224             ENDC                                                               BLD 0227
                         225   *  ASSIGN UNCOMMITTED LOGICAL UNITS                                          BLD 0228
                         226   *                                                                            BLD 0229
000D  000D               227   ALOGA     EQU   NMI                                                          BLD 0230
000D  000D               228   ALOGB     EQU   NMO                                                          BLD 0231
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000C  000C    229  ALOGC   EQU   MASU                                  BLD 0232
              230          TRUE  MASU=MAG0                             BLD 0233
              231          TRUE  NMAG>1                                BLD 0234
              232  ALOGD   EQU   MAG1                                  BLD 0235
              233          ENDC                                        BLD 0236
              234          TRUE  NMAG>2                                BLD 0237
              235  ALOGE   EQU   MAG2                                  BLD 0238
              236          ENDC                                        BLD 0239
              237          ENDC                                        BLD 0240
              238          TRUE  MASU=DSK0                             BLD 0241
              239          FALS  NMAG=0                                BLD 0242
              240  ALOGD   EQU   MAG0                                  BLD 0243
              241          ENDC                                        BLD 0244
              242          TRUE  NMAG>1                                BLD 0245
              243  ALOGE   EQU   MAG1                                  BLD 0246
              244          ENDC                                        BLD 0247
              245          ENDC                                        BLD 0248
              246          TRUE  NMSU<2                                BLD 0249
000C  000C    247  ALOGE   EQU   DUM                                   BLD 0250
              248          ENDC                                        BLD 0251
              249          TRUE  NMSU<1                                BLD 0252
000C  000C    250  ALOGD   EQU   DUM                                   BLD 0253
              251          ENDC                                        BLD 0254
              252          TRUE  NMSU=0                                BLD 0255
0000  0000    253  SYS     EQU   NMAS                                  BLD 0256
              254          ENDC                                        BLD 0257
              255          FALS  NMSU=0                                BLD 0258
              256  SYS     EQU   MASS                                  BLD 0259
              257          ENDC                                        BLD 0260
              258  *  ASSIGN DUMMY VALUES TO INTERRUPT CHANNEL NUMBERS  BLD 0261
              259  *  FOR ARSENT DEVICES                               BLD 0262
              260          TRUE  NPTR=0                                BLD 0263
0011  0011    261  PTRI    EQU   17                                    BLD 0264
              262          ENDC                                        BLD 0265
              263          TRUE  NPCH=0                                BLD 0266
0012  0012    264  PCHI    EQU   18                                    BLD 0267
              265          ENDC                                        BLD 0268
              266          TRUE  NMAG=0                                BLD 0269
0013  0013    267  MAGI    EQU   19                                    BLD 0270
              268          ENDC                                        BLD 0271
              269          TRUE  NDSK=0                                BLD 0272
0014  0014    270  DSKI    EQU   20                                    BLD 0273
              271          ENDC                                        BLD 0274
              272          TRUE  NCDR=0                                BLD 0275
0015  0015    273  CDRI    EQU   21                                    BLD 0276
              274          ENDC                                        BLD 0277
              275          TRUE  NCPC=0                                BLD 0278
0016  0016    276  CPCI    EQU   22                                    BLD 0279
              277          ENDC                                        BLD 0280
              278          TRUE  NLPR=0                                BLD 0281
0017  0017    279  LPRI    EQU   23                                    BLD 0282
              280          ENDC                                        BLD 0283
              281  *  TEST FOR MORE THAN ONE DEVICE ON AN INTERRUPT CHANNEL  BLD 0284
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                     282             FALS  PTRI=TTYI                                    BLD 0285
                     283             FALS  PCHI=TTYI                                    BLD 0286
                     284             FALS  PTRI=PCHI                                    BLD 0287
0000   0000          285    ISHARE   EQU   0                                            BLD 0288
                     286             ENDC                                               BLD 0289
                     287             ENDC                                               BLD 0290
                     288             ENDC                                               BLD 0291
                     289             TRUE  PTRI=TTYI                                    BLD 0292
                     290    ISHARE   EQU   1                                            BLD 0293
                     291             ENDC                                               BLD 0294
                     292             TRUE  PCHI=TTYI                                    BLD 0295
                     293    ISHARE   EQU   1                                            BLD 0296
                     294             ENDC                                               BLD 0297
                     295             TRUE  PCHI=PTRI                                    BLD 0298
                     296    ISHARE   EQU   1                                            BLD 0299
                     297             ENDC                                               BLD 0300
001C   001C          298    MAXP     EQU   ENDP-PEAT+12                                 BLD 0301
                     299    *  CONSTRUCT SYSTEM TYPE WORD PARAMETERS                    BLD 0302
                     300             TRUE  NMSU=0                                       BLD 0303
0000   0000          301    SYL0     EQU   0                                            BLD 0304
                     302             ENDC                                               BLD 0305
                     303             TRUE  NMSU>0                                       BLD 0306
                     304    SYL0     EQU   X'80'                                        BLD 0307
                     305             ENDC                                               BLD 0308
                     306             TRUE  CHAIN=YES                                    BLD 0309
                     307    SYL1     EQU   X'40'                                        BLD 0310
                     308             ENDC                                               BLD 0311
                     309             TRUE  CHAIN=NO                                     BLD 0312
0000   0000          310    SYL1     EQU   0                                            BLD 0313
                     311             ENDC                                               BLD 0314
                     312             TRUE  NPCH>0                                       BLD 0315
                     313    SYL6     EQU   2                                            BLD 0316
                     314             ENDC                                               BLD 0317
                     315             TRUE  NPCH=0                                       BLD 0318
0000   0000          316    SYL6     EQU   0                                            BLD 0319
                     317             ENDC                                               BLD 0320
                     318             TRUE  NPTR>0                                       BLD 0321
                     319    SYL7     EQU   1                                            BLD 0322
                     320             ENDC                                               BLD 0323
                     321             TRUE  NPTR=0                                       BLD 0324
0000   0000          322    SYL7     EQU   0                                            BLD 0325
                     323             ENDC                                               BLD 0326
                     324             TRUE  NCPC>0                                       BLD 0327
                     325    SYR0     EQU   X'80                                         BLD 0328
                     326             ENDC                                               BLD 0329
                     327             TRUE  NCPC=0                                       BLD 0330
0000   0000          328    SYR0     EQU   0                                            BLD 0331
                     329             ENDC                                               BLD 0332
                     330             TRUE  NCDR>0                                       BLD 0333
                     331    SYR1     EQU   X'40'                                        BLD 0334
                     332             ENDC                                               BLD 0335
                     333             TRUE  NCDR=0                                       BLD 0336
0000   0000          334    SYR1     EQU   0                                            BLD 0337
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                                   335            ENDC                                                         BLD 0338
                                   336            TRUE  NLPR=0                                                 BLD 0339
                  0000   0000      337   SYR2     EQU   0                                                      BLD 0340
                                   338            ENDC                                                         BLD 0341
                                   339            TRUE  NLPR=1                                                 BLD 0342
                                   340   SYR2     EQU   X'10'                                                  BLD 0343
                                   341            ENDC                                                         BLD 0344
                                   342            TRUE  NLPR=2                                                 BLD 0345
                                   343   SYR2     EQU   X'30'                                                  BLD 0346
                                   344            ENDC                                                         BLD 0347
                                   345            TRUE  NDSK>3                                                 BLD 0348
                                   346   SYR4     EQU   X'C'                                                   BLD 0349
                                   347            ENDC                                                         BLD 0350
                                   348            FALS  NDSK>3                                                 BLD 0351
                  0000   0000      349   SYR4     EQU   NDSK+NDSK+NDSK+NDSK                                    BLD 0352
                                   350            ENDC                                                         BLD 0353
                                   351            TRUE  NMAG>3                                                 BLD 0354
                                   352   SYR6     EQU   3                                                      BLD 0355
                                   353            ENDC                                                         BLD 0356
                                   354            FALS  NMAG>3                                                 BLD 0357
                  0000   0000      355   SYR6     EQU   NMAG                                                   BLD 0358
                                   356            ENDC                                                         BLD 0359
                  0000   0000      357   LBSTYP   EQU   SYL0+SYL1+SYL6+SYL7                                    BLD 0360
                  0000   0000      358   RBSTYP   EQU   SYR0+SYR1+SYR2+SYR4+SYR6                               BLD 0361
                                   359            TRUE  SOFTWARE=BASIC                                         BLD 0362
                                   360            ORIG  24                                                     BLD 0363
         0 018 0  0080   0080      361            SMB   XRAY                                                   BLD 0364
326.7    0 019 0  2266   2 0 266   362            JSX   XRAY                                                   BLD 0365
         0 01A 0  D8D2   D8D2      363            DATA  'XR','AY'                                              BLD 0366
         0 01B 0  C1D9   C1D9
                                   364            ENDC                                                         BLD 0367
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                                  365    '                  STATUS SUBROUTINE                               BLD 0368
                                  366    *          LDX    =STAT                                            BLD 0369
                                  367    *          JSX  * 0                                                BLD 0370
                                  368    *          DATA   FIOT                                             BLD 0371
                                  369    *          DATA   ERR                                              BLD 0372
0 01C 0   00A0   00A0             370    STAT       MSK                   SET MASK OFF                      BLD 0373
0 01D 0   603F   6 0 03F          371               STX    M.SRET                                           BLD 0374
0 01E 0   9800   9 1 000          372               LDX  * 0              LOAD FIOT ADD                     BLD 0375
0 01F 0   8800   8 1 000          373               LDW  * 0              LOAD BB                           BLD 0376
0 020 0   0810   0810             374               SAP                   BB ON                             BLD 0377
0 021 0   102C   1 0 02C          375               JMP    M.SM1R         YES                               BLD 0378
0 022 0   0400   04 00            376               IXS    0              NO IS FIOT ONLY ARG               BLD 0379
0 023 0   102F   1 0 02F          377               JMP    M.SP1R         YES                               BLD 0380
0 024 0   8803   8 1 003          378               LDW  * 3              LOAD STATUS WORD                  BLD 0381
0 025 0   0830   0830             379               SAO                   NO IS ERR BIT ON                  BLD 0382
0 026 0   1032   1 0 032          380               JMP    M.SP2R         ERROR BIT NOT ON                  BLD 0383
0 027 0   903F   9 0 03F          381               LDX    M.SRET         YES                               BLD 0384
0 028 0   9801   9 1 001          382               LDX  * 1              GO TO ERROR ROUTINE               BLD 0385
0 029 0   803F   8 0 03F          383               LDW    M.SRET         WITH A REG= TO STAT RETURN        BLD 0386
0 02A 0   0080   0080             384               UNM                                                     BLD 0387
0 02B 0   2800   2 1 000          385               JSX  * 0                                                BLD 0388
0 02C 0   903F   9 0 03F          386    M.SM1R     LDX    M.SRET         GO BACK AND TRY AGAIN             BLD 0389
0 02D 0   0080   0080             387               UNM                   ALLOW IRS                         BLD 0390
0 02E 0   101C   1 0 01C          388               JMP    STAT                                             BLD 0391
0 02F 0   903F   9 0 03F          389    M.SP1R     LDX    M.SRET                                           BLD 0392
0 030 0   0080   0080             390               UNM                                                     BLD 0393
0 031 0   2801   2 1 001          391               JSX  * 1                                                BLD 0394
0 032 0   903F   9 0 03F          392    M.SP2R     LDX    M.SRET                                           BLD 0395
0 033 0   0080   0080             393               UNM                                                     BLD 0396
0 034 0   2802   2 1 002          394               JSX  * 2                                                BLD 0397
0 035 0   0010   0010             395    X10        D      X'10'                                            BLD 0398
0 036 0   0020   0020             396    X20        D      X'20'                                            BLD 0399
0 037 0   0040   0040             397    X40        D      X'40'                                            BLD 0400
0 038 0   0080   0080             398    X80        D      X'80'                                            BLD 0401
0 039 0   000F   000F             399    XF         D      X'F'                                             BLD 0402
0 03A 0   00F0   00F0             400    XF0        D      X'F0'                                            BLD 0403
0 03B 0   00FF   00FF             401    XFF        D      X'FF'                                            BLD 0404
0 03C 0   01FF   01FF             402    X1FF       D      X'1FF'                                           BLD 0405
0 03D 0   0200   0200             403    X200       D      X'200'                                           BLD 0406
0 03E 0   A0A0   A0A0             404    XA0A       D      X'A0A0'                                          BLD 0407
0 03F 0   0000   0000             405    M.OPENR    DATA   0                                                BLD 0408
                                  406               FALS   SOFTWARE=BASIC                                   BLD 0409
                                  407    'NO SYSTEM JUMP TABLE FOR STANDARD OR EXTENDED SYSTEMS             BLD 0410
                                  408               ENDC                                                    BLD 0411
                                  409               TRUE   SOFTWARE=BASIC                                   BLD 0412
```

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                                   410   'SYSTEM JUMP TABLE                                  BLD 0413
      0 040 0                      411            RES   64-$                                 BLD 0414
      0 040 0  0080  0080          412            SMB   XRAY                                 BLD 0415
      0 041 0  1266  1 0 266       413            JMP   XRAY                                 BLD 0416
      0 042 0  0080  0080          414            SMB   OPEN                                 BLD 0417
      0 043 0  1065  1 0 065       415            JMP   OPEN          MONITOR ROUTINES       BLD 0418
      0 044 0  0080  0080          416            SMB   DOIO                                 BLD 0419
      0 045 0  1083  1 0 083       417            JMP   DOIO                                 BLD 0420
      0 046 0  0080  0080          418            SMB   STAT                                 BLD 0421
      0 047 0  101C  1 0 01C       419            JMP   STAT                                 BLD 0422
                                   420            TRUE  SYS=NMAS                             BLD 0423
      0 048 0  2801  2 1 001       421            JSX * 1           RETURN FOR THESE CELLS BLD 0424
      0 049 0  2801  2 1 001       422            JSX * 1                                    BLD 0425
      0 04A 0  2801  2 1 001       423            JSX * 1                                    BLD 0426
      0 04B 0  2801  2 1 001       424            JSX * 1                                    BLD 0427
      0 04C 0  2801  2 1 001       425            JSX * 1                                    BLD 0428
      0 04D 0  2801  2 1 001       426            JSX * 1                                    BLD 0429
      0 04E 0  2801  2 1 001       427            JSX * 1                                    BLD 0430
      0 04F 0  2801  2 1 001       428            JSX * 1                                    BLD 0431
      0 050 0  0080  0080          429            SMB   WEOF                                 BLD 0432
      0 051 0  11F3  1 0 1F3       430            JMP   WEOF                                 BLD 0433
      0 052 0  2801  2 1 001       431   S.STUS   JSX * 1                                    BLD 0434
      0 053 0  2801  2 1 001       432            JSX * 1                                    BLD 0435
                                   433            ENDC                                       BLD 0436
                                   434            TRUE  SYS=MASS                             BLD 0437
                                   435            SMB   S.BKSP                               BLD 0438
                                   436            JMP   S.BKSP                               BLD 0439
                                   437            SMB   S.WKSP                               BLD 0440
                                   438            JMP   S.WKSP                               BLD 0441
                                   439            SMB   S.SEOF                               BLD 0442
                                   440            JMP   S.SEOF                               BLD 0443
                                   441            SMB   S.RWND                               BLD 0444
                                   442            JMP   S.RWND                               BLD 0445
                                   443            SMB   WEOF                                 BLD 0446
                                   444            JMP   WEOF                                 BLD 0447
                                   445            SMB   S.STUS                               BLD 0448
                                   446            JMP   S.STUS                               BLD 0449
                                   447            ENDC                                       BLD 0450
03BD  0 054 0  0389  0389          448   END      D     ENDA                                 BLD 0451
      0 055 0  0000  0000          449   RBEG     DATA  0                                    BLD 0452
      0 056 0  0080  0080          450            SMB   DMP                                  BLD 0453
12E3  0 057 0  12DF  1 0 2DF       451            JMP   DMP                                  BLD 0454
                                   452   *  SYSTEM TYPE WORD                                 BLD 0455
      0 058 0        00            453   STYPE    BYTE  LBSTYP,RBSTYP                        BLD 0456
      0 058 1                  00
                                   454   *                                                   BLD 0457
                                   455   *     THIS WORD IDENTIFIES THE PRESENCE OF PHYSICAL BLD 0458
                                   456   *     DEVICES IN THE SYSTEM. THE BITS OF THIS WORD HAVE BLD 0459
                                   457   *     THE FOLLOWING MEANINGS                        BLD 0460
                                   458   *          0      TRUE FOR MASS SYSTEMS             BLD 0461
                                   459   *          2      TRUE FOR CHAINING TAPE UNIT       BLD 0462
                                   460   *          3-5    NOT USED                          BLD 0463
                                   461   *          6      HIGH SPEED TAPE PUNCH             BLD 0464
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                                462   *      7       HIGH SPEED TAPE READER                        BLD 0465
                                463   *      8       CARD PUNCH                                    BLD 0466
                                464   *      9       CARD READER                                   BLD 0467
                                465   *      10      LINE PRINTER 1                                BLD 0468
                                466   *      11      LINE PRINTER 0                                BLD 0469
                                467   *      12-13   NUMBER OF DISKS                               BLD 0470
                                468   *      14-15   NUMBER OF MAG TAPE UNITS                      BLD 0471
0 059 0   0000   000 0          469          HLT                   DONT USE THIS ONE               BLD 0472
0 05A 0   0FFF   0FFF           470   ULIM   D       CORESIZE-1                                    BLD 0473
0 05B 0   0266   0266           471   ENDM   D       XRAY                                          BLD 0474
0 05C 0   0FFF   0FFF           472   CORE   D       CORESIZE-1                                    BLD 0475
0 05D 0   0000   0000           473   DATE   RES     4             DATE                            BLD 0476
0 061 0   0000   0000           474   NAME   RES     4             ID NAME                         BLD 0477
0 064 0   0000   0000           475          ENDC                                                  BLD 0478
          032D   032D           476   S.TBUFF EQU    S.TEMP4       UNPACKED WORD SAVE HERE         BLD 0479
          0331   0331           477   S.SAVE1 EQU    S.TEMP8       PACKED WORDS SAVED HERE         BLD 0480
          0332   0332           478   S.SAVE2 EQU    S.TEMP9                                       BLD 0481
          032C   032C           479   S.XSAVE EQU    S.TEMP3               X SAVED HERE            BLD 0482
          032C   032C           480   S.NBR  EQU     S.TEMP3       NBR OF WORD (LOCATIONS) SAVED HERE BLD 0483
          032A   032A           481   S.LOC  EQU     S.TEMP1       LOCATION TO STORE INTO SAVED HERE BLD 0484
          032B   032B           482   S.NBR1 EQU     S.TEMP2               NBR WORDS TO OUTPUT     BLD 0485
          032A   032A           483   S.LOC1 EQU     S.TEMP1               LOCATION TO OUTPUT FROM BLD 0486
          0334   0334           484   BUF    EQU     S.BUFF                                        BLD 0487
          032A   032A           485   ARG    EQU     S.TEMP1                                       BLD 0488
          032A   032A           486   S.ARG  EQU     S.TEMP1                                       BLD 0489
          0257   0257           487   S.SX   EQU     M.OBUF                                        BLD 0490
          032B   032B           488   S.DATA EQU     S.TEMP2       DATA WORD TO STORE SAVED HERE   BLD 0491
          017B   017B           489   S.XACNT EQU    M.PA                                          BLD 0492
          017B   017B           490   TMP1   EQU     M.PA                                          BLD 0493
          0238   0238           491   S.CHAR EQU     M.OTMNW                                       BLD 0494
          0001   0001           492   SYSI   EQU     1                                             BLD 0495
          0003   0003           493   LIST   EQU     3                                             BLD 0496
          0005   0005           494   BOUT   EQU     5                                             BLD 0497
          0004   0004           495   BIN    EQU     4                                             BLD 0498
          000B   000B           496   RTTK   EQU     X'000B'                                       BLD 0499
          0009   0009           497   RTTP   EQU     X'0009'                                       BLD 0500
          000E   000E           498   WTTY   EQU     X'000E'                                       BLD 0501
          0000   0000           499   ALPH   EQU     X'0000'                                       BLD 0502
          0001   0001           500   BINT   EQU     1                                             BLD 0503
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                                  *                                SUBROUTINE OPEN                BLD 0504
                                  *   SUBROUTINE OPEN                                             BLD 0505
                                  *          JSX    OPEN                                          BLD 0506
                                  *          DATA   FIOT                                          BLD 0507
                                  *          DATA   BUF                                           BLD 0508
                                  *          DATA   WC                                            BLD 0509
                                  *          DATA   UNIT                                          BLD 0510
                                  *          DATA   OPER                                          BLD 0511
                                  *          DATA   MODE                                          BLD 0512
                                  *                                                               BLD 0513
                   003F  003F         M.SRET   EQU    M.OPENR                                     BLD 0514
                   003F  003F         M.DR     EQU    M.OPENR                                     BLD 0515
                   0083  0083         M.DF     EQU    M.TFA                                       BLD 0516
          0 065 0  00A0  00A0         OPEN     MSK                     SET MASK OFF               BLD 0517
          0 066 0  603F  6 0 03F               STX    M.OPENR          SAVE RETURN                BLD 0518
          0 067 0  8239  8 0 239               LDW    ARH0                                        BLD 0519
          0 068 0  7001  7 0 001               STW    1                                           BLD 0520
                                               TRUE   ICHN=4                                      BLD 0521
                                               LDW    ARH1                                        BLD 0522
                                               STW    5                                           BLD 0523
                                               LDW    ARH2                                        BLD 0524
                                               STW    9                                           BLD 0525
                                               LDW    ARH3                                        BLD 0526
                                               STW    13                                          BLD 0527
                                               ENDC                                               BLD 0528
          0 069 0  8805  8 1 005               LDW  * 5                LOAD MODE                  BLD 0529
          0 06A 0  0A1F  0A1 F                 SLL    15               MOVE MODE AROUND           BLD 0530
          0 06B 0  C802  C 1 002               ORI  * 2                MERG MODE AND NO WORDS     BLD 0531
          0 06C 0  7238  7 0 238               STW    M.OTMNW                                     BLD 0532
          0 06D 0  8801  8 1 001               LDW  * 1                LOAD BUFFER ADDRESS        BLD 0533
          0 06E 0  7257  7 0 257               STW    M.OBUF                                      BLD 0534
    725B  0 06F 0  8803  8 1 003               LDW  * 3                LOAD UNIT                  BLD 0535
    225B  0 070 0  7258  7 0 258               STW    M.OUNIT                                     BLD 0536
          0 071 0  8804  8 1 004               LDW  * 4                LOAD OPERATION             BLD 0537
          0 072 0  9800  9 1 000               LDX  * 0                LOAD FIOT ADD              BLD 0538
          0 073 0  7802  7 1 002               STW  * 2                STORE OPERATION            BLD 0539
    823B  0 074 0  8238  8 0 238               LDW    M.OTMNW          SET MODE AND NO WORDS      BLD 0540
          0 075 0  7801  7 1 001               STW  * 1                                           BLD 0541
    825B  0 076 0  8257  8 0 257               LDW    M.OBUF           SET BUFFER ADDRESS         BLD 0542
          0 077 0  7800  7 1 000               STW  * 0                                           BLD 0543
    825C  0 078 0  8258  8 0 258               LDW    M.OUNIT                                     BLD 0544
          0 079 0  0A14  0A1 4                 SLL    4                POSITION                   BLD 0545
          0 07A 0  C802  C 1 002               ORI  * 2                PACK ACTUAL UNIT           BLD 0546
          0 07B 0  7802  7 1 002               STW  * 2                AND STORE IN FIOT          BLD 0547
          0 07C 0  0100  0100                  CLR                                                BLD 0548
          0 07D 0  7803  7 1 003               STW  * 3                                           BLD 0549
          0 07E 0  0140  0140                  CXA                     FIOT ADDR TO A FOR FDA     BLD 0550
    2085  0 07F 0  2085  2 0 065 B             JSX    FDA              FORCE CORRECT LUN INTO FIOT BLD 0551
          0 080 0  903F  9 0 03F               LDX    M.OPENR          RETURN ALL DONE            BLD 0552
          0 081 0  0080  0080                  UNM                                                BLD 0553
          0 082 0  1806  1 1 006               JMP  * 6                                           BLD 0554
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                                552  *               DOIO SUBROUTINE                               BLD 0555
                                553  *                                                             BLD 0556
                                554  *         LDX   =DOIO                                         BLD 0557
                                555  *         JSX * 0                                             BLD 0558
                                556  *         DATA  FIOT                                          BLD 0559
                                557  *         DATA  BUF                                           BLD 0560
                                558  *         DATA  WC           BUF AND WC ARE OPTIONAL ARGS     BLD 0561
0 083 0  0140  0140             559  DOIO      CXA                SAVE RETURN IN A                 BLD 0562
0 084 0  0130  0130             560            CAX                FOR LOOP                         BLD 0563
0 085 0  9800  9 1 000          561            LDX * 0            GET FIOT ADDRESS                 BLD 0564
0 086 0  9800  9 1 000          562            LDX * 0            GET FIRST WORD                   BLD 0565
0 087 0  0400  0400             563            SXP                BUSY?                            BLD 0566
0 088 0  1084  1 0 084          564            JMP   $-4          YES, WAIT                        BLD 0567
0 089 0  00A0  00A0             565  DORS      MSK                NO GO                            BLD 0568
0 08A 0  703F  7 0 03F          566            STW   M,DR         SAVE RETURN                      BLD 0569
0 08B 0  0130  0130             567            CAX                                                 BLD 0570
0 08C 0  8800  8 1 000          568            LDW * 0              GET FIOT ADDRESS FROM ARGS     BLD 0571
0 08D 0  0130  0130             569            CAX                  TO XREG                        BLD 0572
0 08E 0  8806  8 1 006          570            LDW * 6              GET FIOT(6)                    BLD 0573
0 08F 0  0A6F  0A6 F            571            SRC D 15                                            BLD 0574
0 090 0  0A41  0A4 1            572            SRC   1              A15 TO A0, FLAG SPEC FORMAT    BLD 0575
0 091 0  7083  7 0 083          573            STW   M,DF           SAVE IT                        BLD 0576
0 092 0  803F  8 0 03F          574            LDW   M,DR         LOAD RETURN                      BLD 0577
0 093 0  0850  0850             575            SXE                  LAST ARG OR NOT  X15WAS A0     BLD 0578
0 094 0  10A7  1 0 0A7          576            JMP   M,DG0        YES                              BLD 0579
0 095 0  903F  9 0 03F          577            LDX   M,DR           FIND CALLING SEQUENCE          BLD 0580
0 096 0  8801  8 1 001          578            LDW * 1              GET NEXT ARG                   BLD 0581
0 097 0  F23E  F 0 23E          579            CMW   NM1            REMEMBER IF IT IS LAST ARG     BLD 0582
0 098 0  9083  9 0 083          580            LDX   M,DF                                          BLD 0583
0 099 0  7800  7 1 000          581            STW * 0            STORE NEW BUFFER                 BLD 0584
0 09A 0  803F  8 0 03F          582            LDW   M,DR         RECOVER RETURN                   BLD 0585
0 09B 0  0880  0880             583            SGR                  WAS IT LAST ARG                BLD 0586
0 09C 0  10A5  1 0 0A5          584            JMP   M,DG01                                        BLD 0587
0 09D 0  8801  8 1 001          585            LDW * 1              GET FIOT(1)                    BLD 0588
0 09E 0  C252  C 0 252          586            ORI   X7FF           BLACK OUT ALL BUT MODE         BLD 0589
0 09F 0  903F  9 0 03F          587            LDX   M,DR           GET CALLING STRING             BLD 0590
0 0A0 0  E802  E 1 002          588            AND * 2              PACK IN SIGN BIT OF WORD       BLD 0591
0 0A1 0  9083  9 0 083          589            LDX   M,DF           2 IS ON THIS SAVES MODE        BLD 0592
0 0A2 0  7801  7 1 001          590            STW * 1              PUT IT BACK                    BLD 0593
0 0A3 0  803F  8 0 03F          591            LDW   M,DR                                          BLD 0594
0 0A4 0  A242  A 0 242          592            ADD   N1                                            BLD 0595
0 0A5 0  A242  A 0 242          593  M,DG01    ADD   N1                                            BLD 0596
0 0A6 0  703F  7 0 03F          594            STW   M,DR                                          BLD 0597
0 0A7 0  9083  9 0 083          595  M,DG0     LDX   M,DF           NOW SET BUSY BIT               BLD 0598
0 0A8 0  8800  8 1 000          596            LDW * 0                                             BLD 0599
0 0A9 0  C254  C 0 254          597            ORI   SIGB         SET BB                           BLD 0600
0 0AA 0  7800  7 1 000          598            STW * 0                                             BLD 0601
0 0AB 0  F23E  F 0 23E          599            CMW   NM1          WAS BUF ADD =0                   BLD 0602
0 0AC 0  0140  0140             600            CXA                  FIOT ADDRESS TO A              BLD 0603
0 0AD 0  0870  0870             601            SNE                                                 BLD 0604
0 0AE 0  C254  C 0 254          602            ORI   SIGB           YES SET SPECIAL FORMAT         BLD 0605
0 0AF 0  7083  7 0 083          603            STW   M,DF           AND PUT BACK ADDRESS           BLD 0606
0 0B0 0  2085  2 0 085          604            JSX   FDA                                           BLD 0607
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        0 081 0   9238   9 0 238    605            LDX    M,OTMNW       LOAD DRIVER ADDRESS                 BLD 0608
        0 082 0   2800   2 1 000    606            JSX  * 0                                                  BLD 0609
        0 083 0   0000   0000       607    M.TFA   D      0                                                  BLD 0610
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                            608   *              SUBROUTINE M.FDA  FIND DRIVER ADDRESS          BLD 0611
0 0B4 0  0000  0000         609
0 0B5 0  60B4  6 0 0B4            FDA      SUBR                                                  BLD 0612
0 0B6 0  0130  0130         610            CAX                                                   BLD 0613
0 0B7 0  7238  7 0 238      611            STW    M,OTMNW     SAVE THE FIOT ADDRESS              BLD 0614
0 0B8 0  8802  8 1 002      612            LDW  * 2           CLEAN LOG UNIT,FC                  BLD 0615
0 0B9 0  E03C  E 0 03C      613   M.OSDEV  AND    X1FF        MASK TRASH                         BLD 0616
0 0BA 0  7802  7 1 002      614            STW  * 2                                              BLD 0617
0 0BB 0  0A04  0A0 4        615            SRL    4                                              BLD 0618
0 0BC 0  070C  07 0C        616            CLB    12          IS IT A PHYSICAL UNIT NUMBER       BLD 0619
0 0BD 0  0880  0880         617            SGR                                                   BLD 0620
0 0BE 0  10C4  1 0 0C4      618            JMP    NGTR                                           BLD 0621
0 0BF 0  0A11  0A1 1        619            SLL    1           DOUBLE                             BLD 0622
0 0C0 0  071C  07 1C        620            CLB    MAXP        TEST FOR TO LARG ADDRESS           BLD 0623
0 0C1 0  0840  0840         621            SLS                                                   BLD 0624
0 0C2 0  10CD  1 0 0CD      622            JMP    NYET-1                                         BLD 0625
0 0C3 0  B23C  B 0 23C      623            SUB    N12                                            BLD 0626
0 0C4 0  A23A  A 0 23A      624   NGTR     ADD    AP                                             BLD 0627
0 0C5 0  0130  0130         625            CAX                                                   BLD 0628
0 0C6 0  8800  8 1 000      626            LDW  * 0           GET UNIT                           BLD 0629
0 0C7 0  0820  0820         627            SAM                                                   BLD 0630
0 0C8 0  10CE  1 0 0CE      628            JMP    NYET                                           BLD 0631
0 0C9 0  9801  9 1 001      629            LDX  * 1           GET DRIVER ADDRESS                 BLD 0632
0 0CA 0  6238  6 0 238      630            STX    M,OTMNW     AND SAVE IT FOR OTHERS             BLD 0633
0 0CB 0  90B4  9 0 0B4      631            EXIT   FDA                                            BLD 0634
0 0CC 0  2800  2 1 000
0 0CD 0  8250  8 0 250      632            LDW    XC00        CHANGE LUN TO DUMMY                BLD 0635
0 0CE 0  0A04  0A0 4        633   NYET     SRL    4           POSITION FOR FIOT                  BLD 0636
0 0CF 0  7258  7 0 258      634            STW    M.OUNIT     AS GOOD A TEMP AS ANY              BLD 0637
0 0D0 0  9238  9 0 238      635            LDX    M.OTMNW     GET SAVED FIOT ADDRESS             BLD 0638
0 0D1 0  8039  8 0 039      636            LDW    XF          MASK ALL BUT FUNCTION CODE         BLD 0639
0 0D2 0  E802  E 1 002      637            AND  * 2                                              BLD 0640
0 0D3 0  C258  C 0 258      638            ORI    M.OUNIT     PLUG IN NEW UNIT DESIGNATION       BLD 0641
0 0D4 0  10B9  1 0 0B9      639            JMP    M.OSDEV                                        BLD 0642
0 0D5 0  0000  0000         640
0 0D6 0  60D5  6 0 0D5            SFIOT    SUBR               SUBROUTINE TO STORE AWAY THE FIOT ADD    BLD 0643
0 0D7 0  80B3  8 0 0B3      641            LDW    M.TFA                                          BLD 0644
0 0D8 0  20B5  2 0 0B5      642            JSX    FDA         FIND DRIVER ADDRESS                BLD 0645
0 0D9 0  0A08  0A0 8        643            SRL    8           POSITION                           BLD 0646
0 0DA 0  E039  E 0 039      644            AND    XF          WIPE ALL BUT IRL                   BLD 0647
0 0DB 0  0130  0130         645            CAX                CALC IR ADDRESS FOR FIOT           BLD 0648
0 0DC 0  823E  8 0 23E      646            LDW    NM1         CALC ADD OF FIOT ADDRESS           BLD 0649
0 0DD 0  A23B  A 0 23B      647            ADD    N10                                            BLD 0650
0 0DE 0  0501  05 01        648            DXS    1                                              BLD 0651
0 0DF 0  10DD  1 0 0DD      649            JMP    $-2                                            BLD 0652
0 0E0 0  A239  A 0 239      650            ADD    ARH0                                           BLD 0653
0 0E1 0  0130  0130         651            CAX                                                   BLD 0654
0 0E2 0  80B3  8 0 0B3      652            LDW    M.DF        RELOCATE FIOT                      BLD 0655
0 0E3 0  7800  7 1 000      653            STW  * 0                                              BLD 0656
0 0E4 0  90D5  9 0 0D5      654            EXIT   SFIOT       RETURN                             BLD 0657
0 0E5 0  2800  2 1 000
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                          655   *                SETUP AREA FOR TTY AND HSPT DRIVERS            BLD 0658
         0257  0257       656   M.TSD    EQU    M.OBUF                                          BLD 0659
         017B  017B       657   M.TT     EQU    M.PA                                            BLD 0660
0 0E6 0  21D8  2 0 1D8    658   M.THSPT  JSX    NABL           ENABLE IR FOR DEVICE             BLD 0661
0 0E7 0  0138  0138       659            D      TIRS                                            BLD 0662
0 0E8 0  2260  2 0 260    660            JSX    ST             GET STATUS                       BLD 0663
0 0E9 0  0820  0820       661            SAM                   IS THE PUNCH READY               BLD 0664
0 0EA 0  10EE  1 0 0EE    662            JMP    PCHN           YES                              BLD 0665
0 0EB 0  803F  8 0 03F    663            LDW    M.DR           NO, GO BACK TO DOIO              BLD 0666
0 0EC 0  0080  0080       664            UNM                                                    BLD 0667
0 0ED 0  1089  1 0 089    665            JMP    DORS                                            BLD 0668
0 0EE 0  20D6  2 0 0D6    666   PCHN     JSX    SFIOT          STORE FIOT AWAY                  BLD 0669
0 0EF 0  90B3  9 0 0B3    667            LDX    M.DF           LOAD FIOT TO X REG               BLD 0670
0 0F0 0  8802  8 1 002    668            LDW  * 2          RELOAD FC                            BLD 0671
                          669            TRUE   NPTR>0                                          BLD 0672
                          670            CLB    X'4B'          DID WE END UP WITH READ          BLD 0673
                          671            SNE                   KEYBOARD ON THE PHOTOREADER?     BLD 0674
                          672            LLB    X'49'          YES, THAT'S STUPID, FIX IT       BLD 0675
                          673            ENDC                                                   BLD 0676
0 0F1 0  E039  E 0 039    674            AND    XF             CLEAN FC                         BLD 0677
0 0F2 0  903F  9 0 03F    675            LDX    M.OPENR        FORCE WRITE MODE IF WEOF         BLD 0678
0 0F3 0  0400  0400       676            SXP                                                    BLD 0679
0 0F4 0  060E  06 0E      677            LLB    X'E'                                            BLD 0680
0 0F5 0  90B3  9 0 0B3    678            LDX    M.DF           RELOAD FIOT ADDRESS              BLD 0681
0 0F6 0  070E  07 0E      679            CLB    X'E'           IS IT WRITE                      BLD 0682
0 0F7 0  C24C  C 0 24C    680            ORI    X300           WRITE                            BLD 0683
0 0F8 0  0860  0860       681            SEQ                                                    BLD 0684
0 0F9 0  D256  D 0 256    682            ORE    X81            READ 8100                        BLD 0685
0 0FA 0  C257  C 0 257    683            ORI    M.TSD                                           BLD 0686
0 0FB 0  7803  7 1 003    684            STW  * 3              STORE  DOT OR DIN   DEVANDFC     BLD 0687
0 0FC 0  0860  0860       685            SEQ                                                    BLD 0688
0 0FD 0  D255  D 0 255    686            ORE    X84            READ                             BLD 0689
0 0FE 0  710C  7 0 10C    687            STW    NSPEC                                           BLD 0690
0 0FF 0  803F  8 0 03F    688            LDW    M.OPENR        GET RETURN                       BLD 0691
0 100 0  068A  06 8A      689            LLB    X'8A'          LOAD L/F                         BLD 0692
0 101 0  0810  0810       690            SAP                   IS WEOF FLAG SET                 BLD 0693
0 102 0  0687  06 87      691            LLB    X'87'          IT'S END OF FILE                 BLD 0694
0 103 0  0870  0870       692            SNE                   IS IT READ                       BLD 0695
0 104 0  0500  0500       693            SXM                   IS IT SPECIAL                    BLD 0696
0 105 0  110C  1 0 10C    694            JMP    NSPEC          READ NO OUTPUT CHAR NEEDED       BLD 0697
0 106 0  9800  9 1 000    695            LDX  * 0              WRITE LOAD CHAR1                 BLD 0698
0 107 0  8800  8 1 000    696            LDW  * 0              GET FIRST WORD                   BLD 0699
0 108 0  0401  04 01      697            IXS    1              WAS BUF ADR 7FFF (FFFF)          BLD 0700
0 109 0  0130  0130       698            CAX                   NO, POSITION SO SHIFT WILL       BLD 0701
0 10A 0  0A38  0A3 8      699            SLL D  8              SHIFT IN CORRECT CHARACTER       BLD 0702
0 10B 0  90B3  9 0 0B3    700            LDX    M.DF                                            BLD 0703
0 10C 0  0000  0000       701   NSPEC    D      0              SELECT THE DEVICE                BLD 0704
0 10D 0  803F  8 0 03F    702            LDW    M.OPENR        GET WEOF FLAG BIT 0              BLD 0705
0 10E 0  0810  0810       703            SAP                   IS IT WEOF                       BLD 0706
0 10F 0  1134  1 0 134    704            JMP    DREOF          YES FIX JUMP TODISCONNECT        BLD 0707
                          705   *  COMPUTE THE CORRECT JUMP COUNT                               BLD 0708
0 110 0  0100  0100       706            CLR                   NOW SET JMP COUNTER FOR READ     BLD 0709
0 111 0  0400  0400       707            SXP                   TEST FOR SPECIAL FORMAT          BLD 0710
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XRAY                 SETUP AREA FOR TTY AND HSPT DRIVERS                   02/07/68        PASS B     PAGE 20
  0 112 0  0606  06 06       708                LLB   X'6'           SKIP READ FORMAT CHARACTERS           BLD 0711
  0 113 0  0860  0860        709                SEQ                  BUT IS IT WRITE                       BLD 0712
  0 114 0  111B  1 0 11B     710                JMP   M,TSCR         NO,SET JUMP COUNT                     BLD 0713
  0 115 0  060E  06 0E       711                LLB   X'E'           SKIP WRITE BYTE COUNT                 BLD 0714
  0 116 0  0400  0400        712                SXP                  IF IT IS SPECIAL FORMAT               BLD 0715
  0 117 0  111B  1 0 11B     713                JMP   M,TSCR         IT IS                                 BLD 0716
  0 118 0  9801  9 1 001     714                LDX * 1              IT ISN'T, GET MODE                    BLD 0717
  0 119 0  0400  0400        715                SXP                  IS IT ALPHA, IF NOT X'E' IS OK        BLD 0718
  0 11A 0  060A  06 0A       716                LLB   X'A'           NO, SET PUNCH BYTE COUNT              BLD 0719
  0 11B 0  0A18  0A1 8       717       M.TSCR   SLL   8              REPOSITION JUMP COUNT LEFT            BLD 0720
  0 11C 0  9083  9 0 083     718                LDX   M.DF           LOAD FIOT ADD                         BLD 0721
  0 11D 0  C802  C 1 002     719                ORI * 2                                                    BLD 0722
  0 11E 0  7802  7 1 002     720                STW * 2              STORE JUMP COUNTER                    BLD 0723
                             721       *  STUFF STARTING AND ENDING BYTE ADDRESS AND COUNT                 BLD 0724
  0 11F 0  8800  8 1 000     722                LDW * 0                                                    BLD 0725
  0 120 0  0A11  0A1 1       723                SLL   1                                                    BLD 0726
  0 121 0  0500  0500        724                SXM                  TEST FOR SPECIAL FORMAT               BLD 0727
  0 122 0  1125  1 0 125     725                JMP   NS1            NO                                    BLD 0728
  0 123 0  0870  0870        726                SNE                  ADD 1 IF WRITE                        BLD 0729
  0 124 0  A242  A 0 242     727                ADD   N1             FIRST CHAR ALREADY GONE               BLD 0730
  0 125 0  7804  7 1 004     728       NS1      STW * 4              STORE INITIAL BYTE ADDRESS            BLD 0731
  0 126 0  F23E  F 0 23E     729                CMW   NM1            WAS IT ZERO BEFORE 1 WAS ADDED        BLD 0732
  0 127 0  9801  9 1 001     730                LDX * 1                                                    BLD 0733
  0 128 0  823D  8 0 23D     731                LDW   N27            DUMMY WORD COUNT FOR LEADER           BLD 0734
  0 129 0  0860  0860        732                SEQ                  AND USE IT IF LEADER CALL             BLD 0735
  0 12A 0  8800  8 1 000     733                LDW * 0                                                    BLD 0736
  0 12B 0  9083  9 0 083     734                LDX   M.DF           STORE END BYTE ADDRESS - DONE WITH SETUP  BLD 0737
  0 12C 0  0A11  0A1 1       735                SLL   1                                                    BLD 0738
  0 12D 0  7807  7 1 007     736                STW * 7              SET BYTE COUNT FOR SPECIAL FMAT       BLD 0739
  0 12E 0  A800  A 1 000 0082 737               ADD * 0              COMPUTE END BYTE                      BLD 0740
  0 12F 0  A800  A 1 000 1580 738               ADD * 0              ADDRESS                               BLD 0741
  0 130 0  7805  7 1 005     739                STW * 5              STORE END BYTE ADDRESS-DONE WITH SETUP  BLD 0742
           0131  0131        740       DRRET    EQU   $                                                    BLD 0743
                             741                TRUE  ISHARE=YES                                           BLD 0744
                             742                LDW   WEE            LOAD STATUS WORD                      BLD 0745
                             743                SRL   4                                                    BLD 0746
                             744                AND   N3                                                   BLD 0747
                             745                EXCH                                                       BLD 0748
                             746                SLM                                                        BLD 0749
                             747                STW * FIOTS          STORE AWAY FIOT ADDRESS               BLD 0750
                             748                ENDC                                                       BLD 0751
  0 131 0  903F  9 0 03F     749                LDX   M,OPENR        RETURN AND WAIT FOR IRS               BLD 0752
  0 132 0  0080  0080        750                UNM                                                        BLD 0753
  0 133 0  2801  2 1 001     751                JSX * 1                                                    BLD 0754
  0 134 0  8253  8 0 253     752       DREOF    LDW   X1200          JUMP TO DISC                          BLD 0755
  0 135 0  C802  C 1 002     753                ORI * 2                                                    BLD 0756
  0 136 0  7802  7 1 002     754                STW * 2                                                    BLD 0757
  0 137 0  1131  1 0 131     755                JMP   DRRET                                                BLD 0758
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                               756   *                   INTERRUPT SERVICE AREA FOR TTY AND HSPT DRIVERS   BLD 0759
0 138 0   603F   6 0 03F       757   TIRS      STX    M.OPENR          SAVE XR                           BLD 0760
                               758             TRUE   ISHARE=NO                                          BLD 0761
0 139 0   9805   9 1 005       759             LDX  * 5                RELOCATE FIOT ADDRESS             BLD 0762
0 13A 0   60B3   6 0 0B3       760             STX    M.TFA                                              BLD 0763
                               761             ENDC                                                      BLD 0764
                               762             TRUE   ISHARE=YES                                         BLD 0765
                               763             SLM                                                       BLD 0766
                               764             LDX    N3               LOAD COUNT OF DEVICES             BLD 0767
                               765   BL        DXS    1                COUNT DOWN NO, DEVICES            BLD 0768
                               766   SLOOP     LDW  * DINS             MOVE STATUS INSTRUCTION           BLD 0769
                               767             STW    $+1                                                BLD 0770
                               768             DATA   0                AQUIRE STATUS                     BLD 0771
                               769             SRL    8                                                  BLD 0772
                               770             SAO                     IR OR NO                          BLD 0773
                               771             JMP    BL               NO LOOK FOR ANOTHER               BLD 0774
                               772             LDX  * FIOTS            LOAD FIOT ADDRESS                 BLD 0775
                               773             STX    M.TFA                                              BLD 0776
                               774             SGM                                                       BLD 0777
                               775             ENDC                                                      BLD 0778
0 13B 0   8802   8 1 002       776             LDW  * 2                                                  BLD 0779
0 13C 0   0A09   0A0 9         777             SRL    9                                                  BLD 0780
0 13D 0   A155   A 0 155       778             ADD    M.TJMPA                                            BLD 0781
0 13E 0   9803   9 1 003       779             LDX  * 3                LOAD OPERATION                    BLD 0782
0 13F 0   0A78   0A78          780             EXCH                    A=OPERATION , X=JUMP ADD          BLD 0783
0 140 0   0A78   0A78
0 141 0   71CF   7 0 1CF       781             STW    M.TDOT2          STORE IN CASE OF OUTPUT           BLD 0784
0 142 0   0820   0820          782             SAM                     READ OR WRITE                     BLD 0785
0 143 0   1800   1 1 000       783             JMP  * 0                WRITE                             BLD 0786
0 144 0   D255   D 0 255       784             ORE    X84              READ                              BLD 0787
0 145 0   7146   7 0 146       785             STW    $+1                                                BLD 0788
0 146 0   0000   0000          786   M.TDIN    DATA   0                DIN CHAR                          BLD 0789
0 147 0   1800   1 1 000       787             JMP  * 0                GO SERVICE CHAR                   BLD 0790
                               788   * FOLLOWING IS THE JUMP TABLES                                      BLD 0791
0 148 0   1156   1 0 156       789   M.TJMP    JMP    M.TLFI           INPUT JUMP TABLE                  BLD 0792
0 149 0   115E   1 0 15E       790             JMP    M.1CHAR                                            BLD 0793
0 14A 0   11AB   1 0 1AB       791             JMP    M.TNWI                                             BLD 0794
0 14B 0   116A   1 0 16A       792             JMP    M.TDATAI                                           BLD 0795
0 14C 0   11A3   1 0 1A3       793             JMP    DNWR                                               BLD 0796
                               794   *                                                                   BLD 0797
0 14D 0   11D3   1 0 1D3       795             JMP    M.TNWO            OUTPUT JUMP TABLES               BLD 0798
0 14E 0   11D3   1 0 1D3       796             JMP    M.TNWO                                             BLD 0799
0 14F 0   11C4   1 0 1C4       797             JMP    M.TDATAO                                           BLD 0800
0 150 0   11D1   1 0 1D1       798             JMP    M.TCRO                                             BLD 0801
0 151 0   11CE   1 0 1CE       799             JMP    M.TBLK                                             BLD 0802
0 152 0   11CE   1 0 1CE       800             JMP    M.TBLK                                             BLD 0803
0 153 0   11CE   1 0 1CE       801             JMP    M.TBLK                                             BLD 0804
0 154 0   1194   1 0 194       802             JMP    M.TDISC2         DISC UNIT NOW                     BLD 0805
0 155 0   0148   0148          803   M.TJMPA   DATA   M.TJMP           JUMP TABLE ADDRESS                BLD 0806
0 156 0   078A   07 8A         804   M.TLFI    CLB    X'8A'            SEARCH FOR L/F CHAR               BLD 0807
0 157 0   0870   0870          805             SNE                                                       BLD 0808
0 158 0   1184   1 0 184       806             JMP    M.TIJR                                             BLD 0809
0 159 0   0787   07 87         807             CLB    X'87'            IS IT END OF FILE                 BLD 0810
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0 15A 0  0860  0860      808            SEQ               DID WE FIND IT                                 BLD 0811
0 15B 0  1188  1 0 188   809            JMP    M.TIRR     NO TRY AGAIN LATER                             BLD 0812
0 15C 0  8035  8 0 035   810            LDW    X10        YES SET EOF BIT HA HA                          BLD 0813
0 15D 0  118F  1 0 18F   811            JMP    M.TDISC+1                                                 BLD 0814
                         812   *                                                                         BLD 0815
                         813   *THIS ROUTINE EXCEPTS FIRST CHARACTER AFTER LINE FEED                     BLD 0816
0 15E 0  0700  07 00     814   M.1CHAR  CLB    0          TEST FOR ALPHA CHAR                            BLD 0817
0 15F 0  0840  0840      815            SLS                                                              BLD 0818
0 160 0  11AB  1 0 1AB   816            JMP    M.TNWI     NO, SET WORD COUNT                             BLD 0819
0 161 0  717B  7 0 17B   817            STW    M.TT       SAVE IT                                        BLD 0820
0 162 0  9083  9 0 083   818            LDX    M.DF       GET FIOT ADDRESS                               BLD 0821
0 163 0  8802  8 1 002   819            LDW *  2          GET JUMP COUNT                                 BLD 0822
0 164 0  A24E  A 0 24E   820            ADD    X400       SKIP 2                                         BLD 0823
0 165 0  7802  7 1 002   821            STW *  2          PUT BACK                                       BLD 0824
0 166 0  8801  8 1 001   822            LDW *  1          GET MODE WORD                                  BLD 0825
0 167 0  E252  E 0 252   823            AND    X7FF       SET ALPHA MODE                                 BLD 0826
0 168 0  7801  7 1 001   824            STW *  1          PUT BACK                                       BLD 0827
0 169 0  817B  8 0 17B   825            LDW    M.TT       GET THIS ALPHA CHARACTER                       BLD 0828
                         826   * THIS REOUTINE SERVICES RECEIVING OF DATA TO BE STORED IN USER BUFFER    BLD 0829
                         827   *                                                                         BLD 0830
0 16A 0  9083  9 0 083   828   M.TDATAI LDX    M.TFA      LOAD MODE                                      BLD 0831
0 16B 0  9801  9 1 001   829            LDX *  1          BIN OR ALPHA                                   BLD 0832
0 16C 0  0400  04 00     830            IXS    0                                                         BLD 0833
0 16D 0  1177  1 0 177   831            JMP    TLWA                                                      BLD 0834
0 16E 0  07DF  07 DF     832            CLB    X'DF'      IS CHAR A DELETE RECORD                        BLD 0835
0 16F 0  0870  0870      833            SNE                                                              BLD 0836
0 170 0  11BA  1 0 1BA   834            JMP    DELR       YES                                            BLD 0837
0 171 0  F03B  F 0 03B   835            CMW    DELE       IS CH DELETE CHER                              BLD 0838
0 172 0  0870  0870      836            SNE                                                              BLD 0839
0 173 0  11BF  1 0 1BF   837            JMP    DELC       YES                                            BLD 0840
0 174 0  078D  07 8D     838            CLB    X'8D'      IS CHAR A C/R                                  BLD 0841
0 175 0  0870  0870      839            SNE                                                              BLD 0842
0 176 0  118E  1 0 18E   840            JMP    M.TDISC    YES DISCONNECT UNIT                            BLD 0843
0 177 0  9083  9 0 083   841   TLWA     LDX    M.TFA      LOAD FIOT                                      BLD 0844
0 178 0  9804  9 1 004   842            LDX *  4                                                         BLD 0845
0 179 0  3800  3 1 000   843            STB *  0          DO DIRTY DEED                                  BLD 0846
0 17A 0  0401  04 01     844            IXS    1          INC WA                                         BLD 0847
0 17B 0  0000  0000      845   M.PA     D      0                                                         BLD 0848
0 17C 0  0140  0140      846            CXA                                                              BLD 0849
0 17D 0  9083  9 0 083   847            LDX    M.TFA                                                     BLD 0850
0 17E 0  7804  7 1 004   848            STW *  4          RESTORE WORK ADD                               BLD 0851
0 17F 0  F805  F 1 005   849            CMW *  5          TEST FOR EOBUFFER                              BLD 0852
0 180 0  0860  0860      850            SEQ               WA ET END ADDRESS (EA)                         BLD ( 53
0 181 0  119D  1 0 19D   851            JMP    M.TDMD     NO                                             BLD 0854
0 182 0  0400  0400      852            SXP               TEST FOR SPECIAL FORMAT                        BLD 0855
0 183 0  1188  1 0 188   853            JMP    M.TDISC3                                                  BLD 0856
0 184 0  8803  8 1 003   854            LDW *  3          LOAD OPERATION                                 BLD 0857
0 185 0  0820  0820      855            SAM               READ OR WRITE                                  BLD 0858
0 186 0  1184  1 0 184   856            JMP    M.TIJR     WRITE                                          BLD 0859
0 187 0  8802  8 1 002   857            LDW *  2          READ PREPARE TO                                BLD 0860
0 188 0  A03D  A 0 03D   858            ADD    X200       SKIP THE REMAINING RECORD                      BLD 0861
0 189 0  7802  7 1 002   859            STW *  2          INC JC                                         BLD 0862
0 18A 0  11A3  1 0 1A3   860            JMP    DNWR                                                      BLD 0863
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                                861  *                                                                      BLD 0864
                                862  * THIS ROUTINE WILL DISCONNECT THE DEVICE BEING USED                  BLD 0865
                                863  *                                                                      BLD 0866
0 18B 0   8802   8 1 002        864  M.TDISC3 LDW * 2          INC JUMP COUNTER BY 4 TO DISC UNIT          BLD 0867
0 18C 0   A24F   A 0 24F        865           ADD   X800       ADD 4 TO JUMP COUNTER                        BLD 0868
0 18D 0   7802   7 1 002        866           STW * 2                                                       BLD 0869
0 18E 0   0100   0100           867  M.TDISC  CLR              CLEAR STATUS WORD                            BLD 0870
0 18F 0   90B3   9 0 0B3        868           LDX   M.TFA      LOAD FOIT ADDRESS                            BLD 0871
0 190 0   7807   7 1 007        869           STW * 7                                                       BLD 0872
0 191 0   8803   8 1 003        870           LDW * 3          MASK OFF FUNCTION                            BLD 0873
0 192 0   0820   0820           871           SAM                                                           BLD 0874
0 193 0   11B4   1 0 1B4        872           JMP   M.TIJR     OUT DISC NEXT IR TIME                        BLD 0875
0 194 0   90B3   9 0 0B3        873  M.TDISC2 LDX   M.TFA      LOAD FIOT AGAIN                              BLD 0876
0 195 0   8803   8 1 003        874           LDW * 3          LOAD WORD 3 AGAIN ALSO                       BLD 0877
0 196 0   E251   E 0 251        875           AND   X7F        7FF0                                         BLD 0878
0 197 0   C24C   C 0 24C        876           ORI   X300       MAKE DOT                                     BLD 0879
0 198 0   7199   7 0 199        877           STW   $+1                                                     BLD 0880
0 199 0   0000   0000           878           DATA  0                                                       BLD 0881
0 19A 0   8807   8 1 007        879           LDW * 7          MOVE STATUS WORD                             BLD 0882
0 19B 0   7803   7 1 003        880           STW * 3                                                       BLD 0883
0 19C 0   120A   1 0 20A        881           JMP   M.DDR      GO TO DRIVER DONE                            BLD 0884
0 19D 0   8801   8 1 001        882  M.TDMD   LDW * 1          LOAD MODE                                    BLD 0885
0 19E 0   0820   0820           883           SAM              BIN OR ALPHA                                 BLD 0886
0 19F 0   11B8   1 0 1B8        884           JMP   M.TIRR     ALPHA                                        BLD 0887
0 1A0 0   8803   8 1 003        885           LDW * 3          INPUT OR OUTPUT                              BLD 0888
0 1A1 0   0820   0820           886           SAM                                                           BLD 0889
0 1A2 0   11B8   1 0 1B8        887           JMP   M.TIRR     OUTPUT SKIP DEC NO BYTES                     BLD 0890
0 1A3 0   90B3   9 0 0B3        888  DNWB     LDX   M.TFA      LOAD FIOT ADDRESS                            BLD 0891
0 1A4 0   8807   8 1 007        889           LDW * 7          BIN DEC NO. WORDS IN RECORD                  BLD 0892
0 1A5 0   B242   B 0 242        890           SUB   N1                                                      BLD 0893
0 1A6 0   F241   F 0 241        891           CMW   N0                                                      BLD 0894
0 1A7 0   0870   0870           892           SNE                                                           BLD 0895
0 1A8 0   118E   1 0 18E        893           JMP   M.TDISC     YES DISC UNIT                               BLD 0896
0 1A9 0   7807   7 1 007        894           STW * 7          NO RESTORE DECREM BYTE COUNT                 BLD 0897
0 1AA 0   11B8   1 0 1B8        895           JMP   M.TIRR                                                  BLD 0898
                                896  *                                                                      BLD 0899
                                897  * THIS ROUTINE STORES AWAY THE NO. BYTES IN THE BINARY RECORD         BLD 0900
                                898  *                                                                      BLD 0901
0 1AB 0   90B3   9 0 0B3        899  M.TNWI   LDX   M.TFA      LOAD FIOT ADDRESS                            BLD 0902
0 1AC 0   717B   7 0 17B        900           STW   M.TT                                                    BLD 0903
0 1AD 0   8807   8 1 007        901           LDW * 7          LOAD NO. BYTES                               BLD 0904
0 1AE 0   0A18   0A1 8          902           SLL   8                                                       BLD 0905
0 1AF 0   C17B   C 0 17B        903           ORI   M.TT       MERG IN NEW CHAR                             BLD 0906
0 1B0 0   7807   7 1 007        904           STW * 7                                                       BLD 0907
0 1B1 0   8801   8 1 001        905           LDW * 1          GET MODE WORD                                BLD 0908
0 1B2 0   C254   C 0 254        906           ORI   SIGR       AFFIRM BINARY MODE                           BLD 0909
0 1B3 0   7801   7 1 001        907           STW * 1          AND REPLACE IT                               BLD 0910
0 1B4 0   90B3   9 0 0B3        908  M.TIJR   LDX   M.TFA      LOAD FIOT ADDRESS                            BLD 0911
0 1B5 0   8802   8 1 002        909           LDW * 2          YES INC JUMP COUNTER AND RETURN              BLD 0912
0 1B6 0   A03D   A 0 03D        910           ADD   X200       AND GO TO IRR                                BLD 0913
0 1B7 0   7802   7 1 002        911           STW * 2                                                       BLD 0914
0 1B8 0   903F   9 0 03F        912  M.TIRR   LDX   M.OPENR                                                 BLD 0915
0 1B9 0   1800   1 1 000        913           JMP * 0                                                       BLD 0916
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0 1BA 0  9083  9 0 083    914   DELR    LDX    M,TFA        LOAD FIOT ADDRRESS              BLD 0917
0 1BB 0  8802  8 1 002    915           LDW  * 2                                            BLD 0918
0 1BC 0  E03C  E 0 03C    916           AND    X1FF                                         BLD 0919
0 1BD 0  7802  7 1 002    917           STW  * 2                                            BLD 0920
0 1BE 0  10EE  1 0 0EE    918           JMP    PCHN                                         BLD 0921
0 1BF 0  9083  9 0 083    919   DELC    LDX    M,TFA        DELETE CHAR                     BLD 0922
0 1C0 0  8804  8 1 004    920           LDW  * 4            LOAD WORKING ADDRESS            BLD 0923
0 1C1 0  B242  B 0 242    921           SUB    N1                                           BLD 0924
0 1C2 0  7804  7 1 004    922           STW  * 4            RESTORE                         BLD 0925
0 1C3 0  11B8  1 0 1B8    923           JMP    M,TIRR       RETURN                          BLD 0926
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                                924  *                         TTY AND HSPT OUTPUT DRIVER AREA          BLD 0927
0 1C4 0   71CC   7 0 1CC        925  M.TDATAO STW   M.TDOT        A = OPERATION                      BLD 0928
0 1C5 0   9083   9 0 083        926           LDX   M.TFA                                            BLD 0929
0 1C6 0   8800   8 1 000        927           LDW * 0             GET BUFFER ADDRESS                 BLD 0930
0 1C7 0   F23E   F 0 23E        928           CMW   NM1           IS IT LEADER CALL                  BLD 0931
0 1C8 0   0100   0100           929           CLR                 OUTPUT BLANKS                      BLD 0932
0 1C9 0   9804   9 1 004        930           LDX * 4             LOAD WA                            BLD 0933
0 1CA 0   0860   0860           931           SEQ                 SEE IF THATS WHAT I SHOULD DO      BLD 0934
0 1CB 0   5800   5 1 000 0      932           LDB * 0             LOAD NEW BYTE                      BLD 0935
0 1CC 0   0000   0000           933  M.TDOT   DATA  0                                                BLD 0936
0 1CD 0   117A   1 0 17A        934           JMP   M.PA-1                                           BLD 0937
0 1CE 0   0100   0100           935  M.TBLK   CLR                 OUTPUT A ZERO                      BLD 0938
0 1CF 0   0000   0000           936  M.TDOT2  DATA  0                                                BLD 0939
0 1D0 0   1184   1 0 184        937           JMP   M.TIJR                                           BLD 0940
0 1D1 0   068D   06 8D          938  M.TCRO   LLB   X'8D'         LOAD C/R FOR OUTPUT                BLD 0941
0 1D2 0   11CF   1 0 1CF        939           JMP   M.TDOT2                                          BLD 0942
0 1D3 0   9083   9 0 083        940  M.TNWO   LDX   M.TFA         LOAD FIOT ADDRESS                  BLD 0943
0 1D4 0   8807   8 1 007        941           LDW * 7                                                BLD 0944
0 1D5 0   0A48   0A4 8          942           SRC   8             SHIFT AROUND THE NO WORDS          BLD 0945
0 1D6 0   7807   7 1 007        943           STW * 7             RESTORE NEW NO WORDS               BLD 0946
0 1D7 0   11CF   1 0 1CF        944           JMP   M.TDOT2                                          BLD 0947
          003B   003B           945  DELE     EQU   XFF                                              BLD 0948
                                946           TRUE  ISHARE=YES                                       BLD 0949
                                947  DINS     DATA  X'2C0',X'2D0',X'2E0'                             BLD 0950
                                948  FIOTS    RES   3                                                BLD 0951
                                949  SETIRI   DIN   X'C',0                                           BLD 0952
                                950           ENDC                                                   BLD 0953
                                951           TRUE  SYS=NMAS                                         BLD 0954
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                        952   'NOT ASSEMBLED FOR NON-MASS SYSTEMS                                BLD 0955
         0218  0218     953   M.DMD    EQU   M.DUM                                               BLD 0956
                        954            ENDC                                                      BLD 0957
                        955            TRUE  SYS=MASS                                            BLD 0958
                        956   '                         DISK AND MAGT DRIVER AREA                BLD 0959
                        957   M.DMD    STW   TMP1                                                BLD 0960
                        958            AND   XFF             CLEAN DEV, UNIT                     BLD 0961
                        959            ORI   X200                                                BLD 0962
                        960            STW   M.DSTAT+1                                           BLD 0963
                        961            STW   M.SMT                                               BLD 0964
                        962            STW   DS2                                                 BLD 0965
                        963            AND   X7F             7FF0                                BLD 0966
                        964            ORI   X301            MERGE IN DOT AND A 1                BLD 0967
                        965            STW   M.DMA           STORE  DOT  DEV,1                   BLD 0968
                        966            ADD   N1                                                  BLD 0969
                        967            STW   M.DTS           STORE     DOT   DEV,2               BLD 0970
                        968            AND   XMBG            FFF0                                BLD 0971
                        969            STW   M.OBUF                                              BLD 0972
                        9/0            TRUE  CHAIN=YES                                           BLD 0973
                        9/1            LDX   M.TFA                                               BLD 0974
                        9/2            LDW * 6               TEST FOR SPECIAL FORMAT             BLD 0975
                        9/3            SAP                                                       BLD 0976
                        9/4            JMP   M.DDR                                               BLD 0977
                        9/5            LDW * 0               TEST FOR LEADER CALL                BLD 0978
                        9/6            CMW   NM1                                                 BLD 0979
                        977            SNE                                                       BLD 0980
                        978            JMP   M.DDR                                               BLD 0981
                        979            LDW * 2                                                   BLD 0982
                        980            AND   XF                                                  BLD 0983
                        981            CLB   2                                                   BLD 0984
                        982            SGR                   IS IT A CHAIN CODE                  BLD 0985
                        983            JMP   CH.CHAIN        YES                                 BLD 0986
                        984            LDW   MISA                                                BLD 0987
                        985            STW   ISRA                                                BLD 0988
                        986            ENDC                                                      BLD 0989
                        987            LDX   M.TFA           GET FIOT ADR                        BLD 0990
                        988            LDW * 2               GET FUNCTION CODE                   BLD 0991
                        989            AND   XF              REDUCE TO SAME                      BLD 0992
                        990            CLB   7               CHECK VERIFY CODE                   BLD 0993
                        991            SNE                   IS IT VERIFY DATA ON DISK           BLD 0994
                        992            JMP   DSDT            YES IT IS OK THEN                   BLD 0995
                        993            CLB   X'E'            IS IT WRITE                         BLD 0996
                        994   M.MTCOM  LDW   N4                                                  BLD 0997
                        995            SEQ                   BUT IS IT REALLY WRITE              BLD 0998
                        996            LDW   N6              YES                                 BLD 0999
                        997   DSDT     ORI   M.OBUF          STORE     DOT   DEV,FC              BLD 1000
                        998            STW   M.DNW                                               BLD 1001
                        999            CLR                   SET WA TO ZERO FOR LAST IR          BLD 1002
                        1000           STW * 4                                                   BLD 1003
                        1001  M.MTORD  LDW   M.DSTAT+1       IS DEV DISK OR MAGT                 BLD 1004
                        1002           AND   XF0                                                 BLD 1005
                        1003           CMW   X20             COMPARE TO MAG DEV                  BLD 1006
                        1004           SEQ                                                       BLD 1007
```

```
1005           JMP    M.DOIT          NO                                 BLD 1008
1006  M.SMT    DATA   0                 DIN  MT,UNIT                     BLD 1009
1007           SLL    10                ARE WE STILL WITHIN CONTINUE     BLD 1010
1008           SAM                                                       BLD 1011
1009           JMP    M.DOIT                                             BLD 1012
1010           LDW *  2               CHECK FOR CONTINUE FC              BLD 1013
1011           AND    XF                                                 BLD 1014
1012           STW    LSR             SAVE NEW FC                        BLD 1015
1013           LDW    M.DSTAT+1       LOAD UNIT NO                       BLD 1016
1014           AND    XF                                                 BLD 1017
1015           CAX                    X=UNIT                             BLD 1018
1016           LDW *  M.OFC           LOAD OLD FC                        BLD 1019
1017           CMW    LSR                                                BLD 1020
1018           SNE                                                       BLD 1021
1019           JMP    FCEQ            FCODES =                           BLD 1022
1020           LDW    LSR             SET NEW OLD FC                     BLD 1023
1021           STW *  M.OFC                                              BLD 1024
1022           JMP    M.DOIT                                             BLD 1025
1023  FCEQ     LDW    M.DNW           = FCS                              BLD 1026
1024           AND    X7F             7FF0                               BLD 1027
1025           ORI    N3                                                 BLD 1028
1026           STW    M.DNW                                              BLD 1029
1027           JMP    NDIT            DO OPERATION                       BLD 1030
1028  M.DOIT   JSX    M.DSTAT         GO GET STATUS                      BLD 1031
1029  NDIT     LDW    TMP1                                               BLD 1032
1030           JSX    NABL                                               BLD 1033
1031  ISRA     D      M.IDDR                                             BLD 1034
1032           JSX    SFIOT           SET FIOT ADDRESS                   BLD 1035
1033           LDX    M.TFA           GET FIOT ADDRESS                   BLD 1036
1034           LDW *  5                                                  BLD 1037
1035           SLL    1               CALC TRACK AND SECTOR              BLD 1038
1036           SRL R  1                                                  BLD 1039
1037           SLL L  2                                                  BLD 1040
1038  M.DTS    DATA   0               OUTPUT TRACK AND SECTOR            BLD 1041
1039           LDW *  1               SET MAG) SPEED                     BLD 1042
1040           AND    SIGB                                               BLD 1043
1041           STW    M.DTS                                              BLD 1044
1042           LDW *  0                                                  BLD 1045
1043           ORE    SIGB            MASK OFF BB                        BLD 1046
1044           ORI    M.DTS                                              BLD 1047
1045  M.DMA    DATA   0               OUTPUT MEMORY ADDRESS              BLD 1048
1046           LDX *  1                                                  BLD 1049
1047           LDW    M.DSTAT+1                                          BLD 1050
1048           SLL    14                                                 BLD 1051
1049           ORI *  0                                                  BLD 1052
1050  M.DNW    DATA   0               OUTPUT NO. WORDS                   BLD 1053
1051           SUB    N1              A REG=NO. WORDS                    BLD 1054
1052           CAX                                                       BLD 1055
1053           CLR                                                       BLD 1056
1054           ADD    N1                                                 BLD 1057
1055           DXS    47              CALC NO NFW SSECTORS               BLD 1058
1056           JMP    $-2                                                BLD 1059
1057           LDX    M.TFA           LOAD FIOT ADDRESS                  BLD 1060
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                    1058          ADD * 5                                            BLD 1061
                    1059          STW * 5          RESTORE NEW SECTOR NO             BLD 1062
                    1060          LDX   M.OPENR                                      BLD 1063
                    1061          UNM                                                BLD 1064
                    1062          JSX * 1          RETURN                            BLD 1065
                    1063 M.DSTAT  STX   LSR        SAVE RETURN                       BLD 1066
                    1064          DATA  0          STUFFED WITH STAT CALL            BLD 1067
                    1065          SAM              CONTROLLER BUSY                   BLD 1068
                    1066          JMP   LS         NO LETS GO                        BLD 1069
                    1067          SLL   1                                            BLD 1070
                    1068          SAM              IS DEVICE BUSY                    BLD 1071
                    1069          JMP   M.DSTAT+1  NO WAIT FOR CONTROLLER            BLD 1072
                    1070          LDX   FORK       NO DELAY  10 ML SEC.              BLD 1073
                    1071          DXS   1                                            BLD 1074
                    1072          JMP   $-1        TARRY A WHILE                     BLD 1075
                    1073 DS2      DATA  0          DIN DEV,UNIT                      BLD 1076
                    1074          SLL   1          STILL NOT READY                   BLD 1077
                    1075          SAM                                                BLD 1078
                    1076          JMP   M.DSTAT+1  OK                                BLD 1079
                    1077          LDW   M.DSTAT+1  DELAY AND DISPLAY                 BLD 1080
                    1078          LDX   X7FF                                         BLD 1081
                    1079          AND   XFF                                          BLD 1082
                    1080          DXS   1                                            BLD 1083
                    1081          JMP   $-2                                          BLD 1084
                    1082          CLR                                                BLD 1085
                    1083          LDX   X7FF       DELAY AGAIN                       BLD 1086
                    1084          DXS   1                                            BLD 1087
                    1085          JMP   $-1                                          BLD 1088
                    1086          JMP   M.DSTAT+1  GO TRY AGAIN                      BLD 1089
                    1087 LS       LDX   LSR        LOAD RETURN                       BLD 1090
                    1088          JMP * 0                                            BLD 1091
                    1089 LSR      D     0                                            BLD 1092
                    1090          TRUE  CHAIN=YES                                    BLD 1093
                    1091 '   CHAIN DEVICE DRIVER AND ITS SUBROUTINES                 BLD 1094
                    1092 * THIS IS THE CHAIN DRIVER FOR  CHAINING MAG TAPE UNIT      BLD 1095
                    1093 CH,CHAIN JSX   M.DSTAT    GET STATUS BEFORE START           BLD 1096
                    1094          LDW   M.DSTAT+1  HAS DEVICE NO IN IT               BLD 1097
                    1095          JSX   STUF+3     SO STUF DOESN'T HAVE TO FIND SAME BLD 1098
                    1096          LDX   M.TFA      FIND FIOT                         BLD 1099
                    1097          LDW * 7          GET NEXT IOT ADDRESS              BLD 1100
                    1098          JSX   CHDT       GO SEND CHAIN DATA                BLD 1101
                    1099          LDW   CISA                                         BLD 1102
                    1100          STW   ISRA                                         BLD 1103
                    1101          LDX   M.TFA      RECOVER FIOT ADDRESS              BLD 1104
                    1102          LDW * 2          GET FUNCTION                      BLD 1105
                    1103          AND   XF                                           BLD 1106
                    1104          CLB   1          IS IT WRITE (OR READ)             BLD 1107
                    1105          JMP   M.MTCOM    COMMON SEQUENCE WILL KNOW         BLD 1108
                    1106 STUF     SUBR             STUFFS THE DINS AND DOTS          BLD 1109
                    1107          JSX   FDA        GET THE UNIT                      BLD 1110
                    1108          LDX   STUF-1     RESET RETURN                      BLD 1111
                    1109          AND   XFF        CLEAN OT IRL                      BLD 1112
                    1110          ORI   X200       MAKE DIN STAT                     BLD 1113
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     1111            STW   CH,STAT1                                        BLD 1114
     1112            STW   CH,STAT2                                        BLD 1115
     1113            AND   XF0                                             BLD 1116
     1114            ORI   X308          DOT CHAIN BUF ADR                 BLD 1117
     1115            STW   DBFA                                            BLD 1118
     1116            ADD   N1            MAKES DOT CHAIN WORD CT           BLD 1119
     1117            STW   DWCT                                            BLD 1120
     1118            ADD   N1            MAKE DOT STOP CHAIN               BLD 1121
     1119            STW   CSTP                                            BLD 1122
     1120            STW   M,RATERR                                        BLD 1123
     1121            JMP * 0             ALL OD                            BLD 1124
     1122   CHDT     SUBR                EXECUTES CHAIN DOTS               BLD 1125
     1123            CAX                 ADDR OF FIOT TO X                 BLD 1126
     1124            LDW * 0             GFT BUFF ADR                      BLD 1127
     1125            AND   X7FF          DITCH EXTRANEOUS                  BLD 1128
     1126   DBFA     D     0             STUFFED BY STUF                   BLD 1129
     1127            LDX * 1             GET WORD COUNT ADRR               BLD 1130
     1128            LDW * 0.            GET TYE WORD COUNT                BLD 1131
     1129            AND   X3FF          8K MAXIMUM                        BLD 1132
     1130            ORI   SIGB          SET CHAIN FLAG                    BLD 1133
     1131   DWCT     D     0             STUFFED BY STUF                   BLD 1134
     1132            EXIT  CHDT          ALL DONE                          BLD 1135
     1133   CISA     D     CH.IDDR                                         BLD 1136
     1134   MISA     D     M.IDDR                                          BLD 1137
     1135            ENDC                                                  BLD 1138
     1136   .                  MISC MAGI AREA                              BLD 1139
     1137   S.BKSP   MSK                                                   BLD 1140
     1138            LDW   S,032C        LOAD BACKSPACE FC                 BLD 1141
     1139            JMP   M,MGEN        GO TO GENFRAL ROUTINE             BLD 1142
     1140   S.WKSP   MSK                                                   BLD 1143
     1141            LDW   S,0327        WRITE 3 INCH BLANK TAPE           BLD 1144
     1142            JMP   M,MGEN                                          BLD 1145
     1143   S.SEOF   MSK                                                   BLD 1146
     1144            LDW   S,032D        SEARCH FOR EOF FORWARD            BLD 1147
     1145            JMP   M,MGEN                                          BLD 1148
     1146   S,RWND   MSK                                                   BLD 1149
     1147            LDW   S,032B        REWIND TAPE                       BLD 1150
     1148            JMP   M,MGEN                                          BLD 1151
     1149   S,WEOF   LDW   S,0325        WRITE AN END OF FILE              BLD 1152
     1150   M,MGEN   STW   M,MFCDOT                                        BLD 1153
     1151            STX   M,OPENR                                         BLD 1154
     1152            LDW * 0             LOAD FIOT ADDRESS                 BLD 1155
     1153            JSX   FDA                                             BLD 1156
     1154            AND   XFF           CLEAN TO UNIT                     BLD 1157
     1155            ORI   X200          MAKE DIN STATUS                   BLD 1158
     1156            STW   M,MSTAT                                         BLD 1159
     1157            AND   XF            CLEAN OLD FUNCTION CODES          BLD 1160
     1158            CAX                                                   BLD 1161
     1159            SLL   14            SHIFT OVER UNIT NO FOR LATER      BLD 1162
     1160            STW * M,0FC                                           BLD 1163
     1161   M,MSTAT  DATA  0             GET STATUS FOR MISC MAG TAPE OPERATIONS  BLD 1164
     1162            SAM                                                   BLD 1165
     1163            JMP   M,MRUN        DEVICE NOT BUSY                   BLD 1166
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1164              LDX    M.OPENR        DEVICE BUSY                            BLD 1167
1165              LDW    M.MFCDOT       ALLOW IRS                              BLD 1168
1166              UNM                                                          BLD 1169
1167              MSK                                                          BLD 1170
1168              JMP    M.MGEN         GO TRY AGAIN                           BLD 1171
1169  M.MRUN      LDW *  M.OFC          RESET UNIT NO                          BLD 1172
1170  M.MFCDOT    DATA   0              PERFORM OPERATION                      BLD 1173
1171  M.MRET      LDX    M.OPENR                                               BLD 1174
1172              UNM                                                          BLD 1175
1173              JSX *  1              RETURN                                 BLD 1176
1174  S.0325      DATA   X'0325'                                               BLD 1177
1175  S.0327      DATA   X'0327'                                               BLD 1178
1176  S.032D      DATA   X'032D'                                               BLD 1179
1177  S.032B      DATA   X'032B'                                               BLD 1180
1178  S.032C      DATA   X'032C'                                               BLD 1181
1179  M.OFC       RES    4                                                     BLD 1182
1180              TRUE   CHAIN=YES                                             BLD 1183
1181  '     CHAIN INTERRUPT SERVICE ROUTINE                                    BLD 1184
1182  CH.IDDR     MSK                   PREVENT INTERRUPTS                     BLD 1185
1183              STX    M.OPENR                                               BLD 1186
1184              LDW *  5              GET FIOT ADDRESS                       BLD 1187
1185              STW    TMP1           AND SAVE IT                            BLD 1188
1186              JSX    STUF           STUFF DINS AND DOTS                    BLD 1189
1187              LDX    TMP1           GET THE FIOT ADDRESS                   BLD 1190
1188              CLR                                                          BLD 1191
1189              STW *  3              CLEAR ANY LEFT OVER STATUS             BLD 1192
1190              STW *  4              AND END ADDRESS                        BLD 1193
1191  CH.STAT1    NOP                   STUFFED                                BLD 1194
1192              AND    XC1            C010                                   BLD 1195
1193              ORE    SIGB           REVERSE CONTROLLER BUSY                BLD 1196
1194              SAZ                   ANY TRUE                               BLD 1197
1195              JMP    CH.EOR                                                BLD 1198
1196              LDW *  7              ADDR OF NEXT FIOT                      BLD 1199
1197              ORI    SIGB           SET THE BUFFER PROTECT                 BLD 1200
1198              STW *  7              AND PUT IT BACK                        BLD 1201
1199              LDX *  2              GET THE UNIT NUMBER                    BLD 1202
1200              EXCH                                                         BLD 1203
1201              STW *  2              COPY IT TO NEW FIOT                    BLD 1204
1202              CXA                   FIOT ADDR TO ACC                       BLD 1205
1203              LDX    M.OPENR        POINTS TO INTERRUP SEQ                 BLD 1206
1204              STW *  5              SET TO NEXT FIOT                       BLD 1207
1205              CAX                   FIOT ADDRESS TO X                      BLD 1208
1206              LDW *  0              GET FIRST WORD                         BLD 1209
1207              ORI    SIGB           SET BUSY BIT                           BLD 1210
1208              STW *  0              PUT IT BACK                            BLD 1211
1209              LDW *  7              GET NEXT NEXT FIOT                     BLD 1212
1210              SAP                   IS BUFFER PROTECT BIT ON               BLD 1213
1211              JMP    RARE           YES, PUNISH                            BLD 1214
1212              SAZ                   IS THIS THE END OF CHAIN               BLD 1215
1213              JMP    GOON                                                  BLD 1216
1214  CSTP        D      0              YES, STUFFED WITH STOP                 BLD 1217
1215              LDW    TMP1           RECOVER FIOT POINTER                   BLD 1218
1216              JSX    FDA            GET THE DEVICE DATA                    BLD 1219
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          1217           SRL   8              POSITION THE INTERRUPT LEVEL                  BLD 1220
          1218           JSX   SSRA           CHANGE THE SERVICE ROUTINE                    BLD 1221
          1219           D     M,IDDR         TO THE STANDARD ONE                           BLD 1222
          1220           JMP   $+2            AND DEPART                                    BLD 1223
          1221  GOON     JSX   CHDT           GOT SET UP CHAIN                              BLD 1224
          1222           LDX   TMP1           RECOVER CURRENT IODT                          BLD 1225
          1223           JMP   M,DDR1         FINISH UP                                     BLD 1226
          1224  *  FOLLOWING PROCESSES END OF RECORD                                        BLD 1227
          1225  CH,EOR   LDX   M,OPENR        MAKE IT RECURSIVE                             BLD 1228
          1226           UNM                                                                BLD 1229
          1227           JMP   M,IDDR         LET IDDR FINISH UP                            BLD 1230
          1228  *  SEQUENCE FOR A SOFTWARE RATE ERROR                                       BLD 1231
          1229  RARE     AND   X7FF           DOUSE PROTECT BIT                             BLD 1232
          1230           STW * 7              PUT IT BACK                                   BLD 1233
          1231           LDX   TMP1           GET CURRENT FIOT                              BLD 1234
          1232           LDW * 0              GET ITS FIRST WORD                            BLD 1235
          1233           AND   X7FF           TURN OFF ITS BUSY BIT                         BLD 1236
          1234           STW * 0              THIS IS THE ONLY CHANCE                       BLD 1237
          1235  M.RATERR NOP                  STUFFED WITH STOP CHAIN                       BLD 1238
          1236           LDX   M,OPENR        SO WE WILL BE RECURSIVE                       BLD 1239
          1237  CH,STAT2 NOP                  STUFFED, STATUS DIN                           BLD 1240
          1238           SAM                  IS CONTROLLER BUSY                            BLD 1241
          1239           JMP   STPD           NO, IT HAS STOPPED                            BLD 1242
          1240           LDW   CH,STAT2       SAVE THE INSTRUCTION                          BLD 1243
          1241           UNM                  ALLOW AN INTERRUPT                            BLD 1244
          1242           MSK                  THIS ROUTINE CAN BE RECURSED                  BLD 1245
          1243           STW   CH,STAT2       PUT IT BACK NOW                               BLD 1246
          1244           JMP   CH,STAT2                                                     BLD 1247
          1245  STPD     STX   M,OPENR        SAVE RETURN                                   BLD 1248
          1246           LDX * 5              GET THE FIOT ADDRESS                          BLD 1249
          1247           LDW   X41            0041 MFG ERROR STATUS                         BLD 1250
          1248           STW * 3              SET SAME                                      BLD 1251
          1249           LDW * 0                                                            BLD 1252
          1250           STW * 4              MAKE WORKING ADDRESS                          BLD 1253
          1251           STX   M,TFA          FOR M.DDR                                     BLD 1254
          1252           JMP   M,DDR          FINISH UP                                     BLD 1255
          1253           ENDC                                                               BLD 1256
          1254           ENDC                                                               BLD 1257
          1255           ENDC                                                               BLD 1258
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                                 1256  '   NABL AND DISABL SUBROUTINES                                 BLD 1259
             003D  003D          1257  DINI      EQU   X200                                            BLD 1260
             0036  0036          1258  ENBI      EQU   X20                                             BLD 1261
 0 1D8 0     717B  7 0 17B       1259  NABL      STW   TMP1                                            BLD 1262
 0 1D9 0     0A08  0A0 8         1260            SRL   8           POSITION                            BLD 1263
 0 1DA 0     E039  E 0 039       1261            AND   XF          REDUCE TO INTERRUPT                 BLD 1264
 0 1DB 0     C036  C 0 036       1262            ORI   ENBI        CONSTRUCT ENB                       BLD 1265
 0 1DC 0     71DD  7 0 1DD       1263            STW   $+1         EXECUTE SAME                        BLD 1266
 0 1DD 0     0000  0000          1264            D     0           STUFFED WITH ENB                    BLD 1267
 0 1DE 0     61DD  6 0 1DD       1265  SSRA      STX   $-1         SET SERVICE ROUTINE                 BLD 1268
 0 1DF 0     E039  E 0 039       1266            AND   XF          JUST IRL NEEDED                     BLD 1269
 0 1E0 0     0A12  0A1 2         1267            SLL   2           MUP BY 4                            BLD 1270
 0 1E1 0     9800  9 1 000       1268            LDX * 0           GET ARGUMENT                        BLD 1271
 0 1E2 0     0A78  0A78          1269            EXCH                                              BLD 1272
 0 1E3 0     0A78  0A78
 0 1E4 0     7803  7 1 003       1270            STW * 3           SET SERVICE ADDRESS                 BLD 1273
 0 1E5 0     817B  8 0 17B       1271            LDW   TMP1                                            BLD 1274
 0 1E6 0     91DD  9 0 1DD       1272            EXIT  SSRA,1      GO BACK                             BLD 1275
 0 1E7 0     2801  2 1 001
 0 1E8 0     0000  0000          1273
 0 1E9 0     61E8  6 0 1E8             DSBL      SUBR              DISABLE AN INTERRUPT                BLD 1276
 0 1EA 0     2085  2 0 085       1274            JSX   FDA                                             BLD 1277
 0 1EB 0     0A08  0A0 8         1275            SRL   8           POSITION IR NUMBER                  BLD 1278
 0 1EC 0     E039  E 0 039       1276            AND   XF          REDUCE TO IRL ONLY                  BLD 1279
                                 1277            TRUE  ISHARE=YES                                      BLD 1280
                                 1278            SAZ               TEST TO ESE IF IRO IS DOING         BLD 1281
                                 1279            JMP   GODSIR      NO-ANY OTHER I/O                    BLD 1282
                                 1280            LDW   SETIRT      DIN    X'C',0                       BLD 1283
                                 1281  DTSM      CAX                                                   BLD 1284
                                 1282            STW   $+1         STORE DIN INST                      BLD 1285
                                 1283            D     0                                               BLD 1286
                                 1284            SAP                                                   BLD 1287
                                 1285            JMP   EDSBL       EXIT DO DISABLE IR                  BLD 1288
                                 1286            CXA                                                   BLD 1289
                                 1287            ADD   X10                                             BLD 1290
                                 1288            CLB   X'F0'       SEE IF WE ARE DONE                  BLD 1291
                                 1289            SEQ                                                   BLD 1292
                                 1290            JMP   DTSM                                            BLD 1293
                                 1291            CLR                                                   BLD 1294
                                 1292            ENDC                                                  BLD 1295
 0 1ED 0     C1F2  C 0 1F2       1293  GODSIR    ORI   DSBI                                            BLD 1296
 0 1EE 0     71EF  7 0 1EF       1294            STW   $+1         AND EXECUTE IT                      BLD 1297
 0 1EF 0     0000  0000          1295            D     0                                               BLD 1298
 0 1F0 0     91E8  9 0 1E8       1296  EDSBL     EXIT  DSBL        RETURN                              BLD 1299
 0 1F1 0     2800  2 1 000
 0 1F2 0     0030  003 0         1297  DSBI      DSB   0                                               BLD 1300
             01F3  01F3          1298  WEOF      EQU   $                                               BLD 1301
                                 1299            TRUE  SYS=MASS                                        BLD 1302
                                 1300            MSK                                                   BLD 1303
                                 1301            STX   M,DR                                            BLD 1304
                                 1302            LDW * 0           GET FIOT                            BLD 1305
                                 1303            JSX   FDA                                             BLD 1306
                                 1304            AND   XF0         MASK ALL BUT DEVICE CODE            BLD 1307
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                                  1305         CLB    X'20'        IS TI MAG TAPE?                              BLD 1308
                                  1306         LDX    M.OPENR                                                   BLD 1309
                                  1307         SNE                 HUH?                                         BLD 1310
                                  1308         JMP    S.WEOF       YES, HARDWARE WILL DO IT                     BLD 1311
                                  1309         UNM                                                              BLD 1312
                                  1310         SGR                 IS IT DISK                                   BLD 1313
                                  1311         JSX * 1             NOTHING WILL DO IT                           BLD 1314
                                  1312         ENDC                                                             BLD 1315
     0 1F3 0   0140   0140        1313         CXA                 RETURN TO ACC                                BLD 1316
     0 1F4 0   C254   C 0 254     1314         ORI    SIGB         SET SIGN FOR WEOF FLAG                       BLD 1317
     0 1F5 0   0130   0130        1315         CAX                 AND IMITATE JSX TO                           BLD 1318
     0 1F6 0   1083   1 0 083     1316         JMP    D010         D010                                         BLD 1319
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                                1317   '                 I/O DONE AREA                                   BLD 1320
0 1F7 0   00A0   00A0           1318   M.IDDR   MSK                                                      BLD 1321
0 1F8 0   603F   6 0 03F        1319            STX    M.OPENR       SAVE RETURN                         BLD 1322
0 1F9 0   8805   8 1 005        1320            LDW  * 5             LOAD FIOT ADDRESS                   BLD 1323
0 1FA 0   70B3   7 0 0B3        1321            STW    M.TFA                                             BLD 1324
0 1FB 0   225A   2 0 25A        1322            JSX    GST           GET STATUS                          BLD 1325
0 1FC 0   90B3   9 0 0B3        1323            LDX    M.TFA         GET FIOT ADDRESS                    BLD 1326
0 1FD 0   7803   7 1 003        1324            STW  * 3             STORE STATUS                        BLD 1327
0 1FE 0   8804   8 1 004        1325            LDW  * 4             TEST WA FOR DMA DEVICE              BLD 1328
0 1FF 0   0800   0800           1326            SAZ                                                      BLD 1329
0 200 0   120A   1 0 20A        1327            JMP    M.DDR         NOT DMA LEAVE ALONE                 BLD 1330
0 201 0   80B3   8 0 0B3        1328            LDW    M.TFA                                             BLD 1331
0 202 0   20B5   2 0 0B5        1329            JSX    FDA           FIND DEVICE NUMBER                  BLD 1332
0 203 0   E03A   E 0 03A        1330            AND    XF0                                               BLD 1333
0 204 0   C24B   C 0 24B        1331            ORI    X204          DIN DEV,4.,GET W.A.+1               BLD 1334
0 205 0   7206   7 0 206        1332            STW    $+1                                               BLD 1335
0 206 0   0000   0000           1333   M.WA     DATA   0                                                 BLD 1336
0 207 0   0A11   0A1 1          1334            SLL    1             MAKE BYTE ADDRESS                   BLD 1337
0 208 0   90B3   9 0 0B3        1335            LDX    M.TFA                                             BLD 1338
0 209 0   7804   7 1 004        1336            STW  * 4                                                 BLD 1339
0 20A 0   80B3   8 0 0B3        1337   M.DDR    LDW    M.TFA         GET FIOT ADR                        BLD 1340
0 20B 0   21E9   2 0 1E9        1338            JSX    DSBL          TURN OF THE INTERRUPT               BLD 1341
0 20C 0   90B3   9 0 0B3        1339            LDX    M.TFA         GET THE FIOT ADR                    BLD 1342
0 20D 0   8800   8 1 000        1340   M.DDR1   LDW  * 0                                                 BLD 1343
0 20E 0   E252   E 0 252        1341            AND    X7FF          7FFF                                BLD 1344
0 20F 0   7800   7 1 000        1342            STW  * 0                                                 BLD 1345
0 210 0   8806   8 1 006        1343            LDW  * 6             LOAD END ACTION                     BLD 1346
0 211 0   E252   E 0 252        1344            AND    X7FF               DO NOT TEST SIGN BIT           BLD 1347
0 212 0   0800   0800           1345            SAZ                                                      BLD 1348
0 213 0   1217   1 0 217        1346            JMP    M.EA                                              BLD 1349
0 214 0   903F   9 0 03F        1347            LDX    M.OPENR       NO END ACTION                       BLD 1350
0 215 0   0080   0080           1348            UNM                                                      BLD 1351
0 216 0   2800   2 1 000        1349            JSX  * 0                                                 BLD 1352
0 217 0   803F   8 0 03F        1350   M.EA     LDW    M.OPENR       LOAD RETURN FOR END ACTION          BLD 1353
0 218 0   9806   9 1 006        1351            LDX  * 6             GO TO END ACTION                    BLD 1354
0 219 0   0080   0080           1352            UNM                                                      BLD 1355
0 21A 0   2800   2 1 000        1353            JSX  * 0                                                 BLD 1356
0 21B 0   903F   9 0 03F        1354   M.DUM    LDX    M.OPENR       SET BB OFF                          BLD 1357
0 21C 0   9800   9 1 000        1355            LDX  * 0             LOAD FIOT ADDRESS                   BLD 1358
0 21D 0   120A   1 0 20A        1356            JMP    M.DDR                                             BLD 1359
```

```
                                    1357  *                    INTERRUPT HERE AREA                      BLD 1360
0 21E 0   7225   7 0 225           1358  IRH0      STW   $+7                                            BLD 1361
0 21F 0   6226   6 0 226           1359            STX   $+7                                            BLD 1362
0 220 0   9003   9 0 003           1360            LDX   3           FOR TY AND HSPT                    BLD 1363
0 221 0   2800   2 1 000           1361            JSX * 0                                              BLD 1364
0 222 0   8225   8 0 225           1362            LDW   $+3                                            BLD 1365
0 223 0   9226   9 0 226           1363            LDX   $+3                                            BLD 1366
0 224 0   0010   001 0             1364            INR   0                                              BLD 1367
0 225 0   0000   0000              1365            DATA  0                                              BLD 1368
0 226 0   0000   0000              1366            DATA  0                                              BLD 1369
0 227 0   0000   0000              1367            DATA  0           THIS CELL FOR FIOT ADDRESS         BLD 1370
                                    1368            TRUE  ICHN=4                                         BLD 1371
                                    1369  IRH1      STW   $+7                                            BLD 1372
                                    1370            STX   $+7                                            BLD 1373
                                    1371            LDX   7           SPARE                              BLD 1374
                                    1372            JSX * 0                                              BLD 1375
                                    1373            LDW   $+3                                            BLD 1376
                                    1374            LDX   $+3                                            BLD 1377
                                    1375            INR   1                                              BLD 1378
                                    1376            DATA  0                                              BLD 1379
                                    1377            DATA  0                                              BLD 1380
                                    1378            DATA  0           THIS CELL FOR FIOT ADDRESS         BLD 1381
                                    1379  IRH2      STW   $+7                                            BLD 1382
                                    1380            STX   $+7                                            BLD 1383
                                    1381            LDX   11          MAGT                               BLD 1384
                                    1382            JSX * 0                                              BLD 1385
                                    1383            LDW   $+3                                            BLD 1386
                                    1384            LDX   $+3                                            BLD 1387
                                    1385            INR   2                                              BLD 1388
                                    1386            DATA  0                                              BLD 1389
                                    1387            DATA  0                                              BLD 1390
                                    1388            DATA  0           THIS CELL FOR FIOT ADDRESS         BLD 1391
                                    1389  IRH3      STW   $+7                                            BLD 1392
                                    1390            STX   $+7                                            BLD 1393
                                    1391            LDX   15          DISK                               BLD 1394
                                    1392            JSX * 0                                              BLD 1395
                                    1393            LDW   $+3                                            BLD 1396
                                    1394            LDX   $+3                                            BLD 1397
                                    1395            INR   3                                              BLD 1398
                                    1396            DATA  0                                              BLD 1399
                                    1397            DATA  0                                              BLD 1400
                                    1398            DATA  0           THIS CELL FOR FIOT ADDRESS         BLD 1401
                                    1399            ENDC                                                 BLD 1402
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                                 1400  '                    PEAT TABLE                                       BLD 1403
                                 1401  *                             NAME     UNIT                           BLD 1404
                                 1402  *  THE PHYSICAL UNIT ASSIGNMENT TABLE IS GENERATED                    BLD 1405
                                 1403  *  UP TO THE HIGHEST NUMBERED UNIT PRESENT IN THE                     BLD 1406
                                 1404  *  SYSTEM                                                             BLD 1407
                                 1405  *  PETE TABLE FORMAT IS AS FOLLOWS                                    BLD 1408
                                 1406  *                  ******************                                BLD 1409
                                 1407  *          PETE(0) *P   INH* DEV* UN *     WORD 1                    BLD 1410
                                 1408  *                  ******************                                BLD 1411
                                 1409  *          PETE(1) * DRIVER ADDRESS  *     WORD 2                    BLD 1412
                                 1410  *                  ******************                                BLD 1413
0 228 0         0D               1411  PEAT     BYTE  ASYSF,0       SYSF     0                               BLD 1414
0 228 1                 00
0 229 0         0D               1412           BYTE  ASYSI,0       SYSI     1                               BLD 1415
0 229 1                 00
0 22A 0         0D               1413           BYTE  APRIN,0       PRIN     2                               BLD 1416
0 22A 1                 00
0 22B 0         0D               1414           BYTE  ALIST,0       LIST     3                               BLD 1417
0 22B 1                 00
0 22C 0         0D               1415           BYTE  ABIN,0        BIN      4                               BLD 1418
0 22C 1                 00
0 22D 0         0D               1416           BYTE  ABOUT,0       BOUT     5                               BLD 1419
0 22D 1                 00
0 22E 0         0C               1417           BYTE  ASCR,0        SCR      6                               BLD 1420
0 22E 1                 00
0 22F 0         0D               1418           BYTE  ALOGA,0                                                BLD 1421
0 22F 1                 00
0 230 0         0D               1419           BYTE  ALOGB,0                                                BLD 1422
0 230 1                 00
0 231 0         0C               1420           BYTE  ALOGC,0                                                BLD 1423
0 231 1                 00
0 232 0         0C               1421           BYTE  ALOGD,0                                                BLD 1424
0 232 1                 00
0 233 0         0C               1422           BYTE  ALOGE,0                                                BLD 1425
0 233 1                 00
0 234 0         80               1423           BYTE  X'80',0       DUMMY    12                              BLD 1426
0 234 1                 00
0 235 0  021B   021B             1424           DATA  M,DUM                                                  BLD 1427
0 236 0         80               1425           BYTE  X'80'+TTYI,X'E0'       TTY      13                     BLD 1428
0 236 1                 E0
0 237 0  00E6   00E6             1426           DATA  M,THSPT                                                BLD 1429
                                 1427           FALS  NUNITS=0                                               BLD 1430
                                 1428           BYTE  X'80'+MAGI,X'20'       MAG0     14                     BLD 1431
                                 1429           DATA  M,DMD                                                  BLD 1432
                                 1430           BYTE  X'80'+MAGI,X'21'       MAG1     15                     BLD 1433
                                 1431           DATA  M,DMD                                                  BLD 1434
                                 1432           BYTE  X'80'+MAGI,X'22'       MAG2     16                     BLD 1435
                                 1433           DATA  M,DMD                                                  BLD 1436
                                 1434           BYTE  X'80'+MAGI,X'23'       MAG3     17                     BLD 1437
                                 1435           DATA  M,DMD                                                  BLD 1438
                                 1436           FALS  NUNITS-NMAG=0                                          BLD 1439
                                 1437           BYTE  X'80'+DSKI,X'10'       DSK0     18                     BLD 1440
                                 1438           DATA  M,DMD                                                  BLD 1441
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                   1439         FALS  NUNITS-NMAG-NDSK0=0                                  BLD 1442
                   1440         BYTE  X'80'+PCHI,X'C0'        PNCH        19               BLD 1443
                   1441         DATA  M,THSPT                                              BLD 1444
                   1442         FALS  NUNITS-NMAG-NDSK0-NPCH=0                             BLD 1445
                   1443         BYTE  X'80'+PTRI,X'D0'        REDR        20               BLD 1446
                   1444         DATA  M,THSPT                                              BLD 1447
                   1445         FALS  NUNITS-NMAG-NDSK0-NPCH-NPTR=0                        BLD 1448
                   1446         BYTE  DUM,0                   CARD RDR    21               BLD 1449
                   1447         D     0                                                    BLD 1450
                   1448         FALS  NUNITS-NMAG-NDSK0-NPTR-NCDR-NPCH=0                   BLD 1451
                   1449         BYTE  DUM,0                   CARD PCH    22               BLD 1452
                   1450         D     0                                                    BLD 1453
                   1451         FALS  NUNITS-NMAG-NDSK0-NPTR-NCDR-NCPC-NPCH=0              BLD 1454
                   1452         BYTE  DUM,0                   LN PRTR 0 23                 BLD 1455
                   1453         D     0                                                    BLD 1456
                   1454         BYTE  DUM,0                   LN PRTR 1 24                 BLD 1457
                   1455         D     0                                                    BLD 1458
                   1456         FALS  NUNITS-NMAG-NDSK0-NPTR-NCDR-NCPC-NPCH-NLPR=0         BLD 1459
                   1457         BYTE  X'80'+DSKI,X'11'        DSK1        25               BLD 1460
                   1458         D     M,DMD                                                BLD 1461
                   1459         BYTE  X'80'+DSKI,X'12'        DSK2        26               BLD 1462
                   1460         D     M,DMD                                                BLD 1463
                   1461         BYTE  X'80'+DSKI,X'13'        DSK3        27               BLD 1464
                   1462         D     M,DMD                                                BLD 1465
                   1463         ENDC                                                       BLD 1466
                   1464         ENDC                                                       BLD 1467
                   1465         ENDC                                                       BLD 1468
                   1466         ENDC                                                       BLD 1469
                   1467         ENDC                                                       BLD 1470
                   1468         ENDC                                                       BLD 1471
                   1469         ENDC                                                       BLD 1472
                   1470         ENDC                                                       BLD 1473
                   1471         ENDC                                                       BLD 1474
0238   0238        1472  ENDP   EQU   $                                                    BLD 1475
```

```
                                  1473  *              CONSTANTS AREA                                          BLD 1476
  0 238 0   0000   0000           1474  M.OTMNW  DATA  0                                                       BLD 1477
  0 239 0   021E   021E           1475  ARH0     D      IRH0                                                   BLD 1478
                                  1476           TRUE   ICHN=4                                                 BLD 1479
                                  1477  ARH1     D      IRH1                                                   BLD 1480
                                  1478  ARH2     D      IRH2                                                   BLD 1481
                                  1479  ARH3     D      IRH3                                                   BLD 1482
                                  1480           ENDC                                                          BLD 1483
  0 23A 0   0228   0228           1481  AP       D      PEAT                                                   BLD 1484
  0 23B 0   000A   000A           1482  N10      D      10                                                     BLD 1485
  0 23C 0   000C   000C           1483  N12      D      12                                                     BLD 1486
  0 23D 0   001B   001B           1484  N27      D      27                                                     BLD 1487
  0 23E 0   FFFF   FFFF           1485  NM1      D      -1                                                     BLD 1488
  0 23F 0   FFFC   FFFC           1486  NM4      D      -4                                                     BLD 1489
  0 240 0   FFE5   FFE5           1487  NM27     D      -27                                                    BLD 1490
                                  1488           TRUE   SYS=MASS                                               BLD 1491
                                  1489  FORK     DATA   4096                                                   BLD 1492
                                  1490  N6       DATA   6                                                      BLD 1493
                                  1491  N15H     D      1500                                                   BLD 1494
                                  1492  X41      D      X'41'                                                  BLD 1495
                                  1493  X301     D      X'301'                                                 BLD 1496
                                  1494  X308     D      X'308'                                                 BLD 1497
                                  1495  X3FF     D      X'3FFF'                                                BLD 1498
                                  1496  X4       D      X'4000'                                                BLD 1499
                                  1497  XC0      D      X'C000'                                                BLD 1500
                                  1498  XC1      D      X'C010'                                                BLD 1501
                                  1499  XMBG     D      X'FFF0'                                                BLD 1502
                                  1500           ENDC                                                          BLD 1503
  0 241 0   0000   0000           1501  N0       D      0                                                      BLD 1504
  0 242 0   0001   0001           1502  N1       DATA   1                                                      BLD 1505
  0 243 0   0002   0002           1503  N2       DATA   2                                                      BLD 1506
  0 244 0   0003   0003           1504  N3       D      3                                                      BLD 1507
  0 245 0   0004   0004           1505  N4       DATA   4                                                      BLD 1508
  0 246 0   0005   0005           1506  N5       DATA   5                                                      BLD 1509
  0 247 0   0007   0007           1507  N7       DATA   7                                                      BLD 1510
  0 248 0   0008   0008           1508  N8       D      8                                                      BLD 1511
  0 249 0   0009   0009           1509  N9       D      9                                                      BLD 1512
  0 24A 0   000B   000B           1510  XB       D      X'B'                                                   BLD 1513
  0 24B 0   0204   0204           1511  X204     D      X'204'                                                 BLD 1514
  0 24C 0   0300   0300           1512  X300     D      X'300'                                                 BLD 1515
  0 24D 0   030E   030E           1513  X30E     D      X'30E'                                                 BLD 1516
  0 24E 0   0400   0400           1514  X400     D      X'400'                                                 BLD 1517
  0 24F 0   0800   0800           1515  X800     D      X'800'                                                 BLD 1518
  0 250 0   0C00   0C00           1516  XC00     DATA   X'C00'                                                 BLD 1519
  0 251 0   7FF0   7FF0           1517  X7F      D      X'7FF0'                                                BLD 1520
  0 252 0   7FFF   7FFF           1518  X7FF     D      X'7FFF'                                                BLD 1521
  0 253 0   1200   1200           1519  X1200    D      X'1200'                                                BLD 1522
  0 254 0   8000   8000           1520  SIGB     D      X'8000'                                                BLD 1523
  0 255 0   8004   8004           1521  X84      D      X'8004'                                                BLD 1524
  0 256 0   8100   8100           1522  X81      D      X'8100'                                                BLD 1525
  0 257 0   0000   0000           1523  M.OBUF   DATA   0                                                      BLD 1526
  0 258 0   0000   0000           1524  M.OUNIT  DATA   0                                                      BLD 1527
                                  1525           TRUE   SYS=MASS                                               BLD 1528
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                                      1526  S.STUS   LDW * 0          GET FIOT ARGUMENT           BLD 1529
                                      1527           MSK                                          BLD 1530
                                      1528           STX   LSR        SAVE RETURN                 BLD 1531
                                      1529           JSX   GST                                    BLD 1532
                                      1530           LDX   LSR        RECOVER RETURN              BLD 1533
                                      1531           UNM                                          BLD 1534
                                      1532           JMP * 1          AND GO BACK                 BLD 1535
                                      1533           ENDC                                         BLD 1536
0 259 0  0000  0000                   1534
0 25A 0  6259  6 0 259                      GST      SUBR                                         BLD 1537
0 25B 0  2085  2 0 085                1535           JSX   FDA                                    BLD 1538
0 25C 0  E038  E 0 038                1536           AND   XFF        REDUCE TO DEVICE ONLY       BLD 1539
0 25D 0  2261  2 0 261                1537           JSX   ST+1                                   BLD 1540
0 25E 0  9259  9 0 259                1538           EXIT  GST        RETURN                      BLD 1541
0 25F 0  2800  2 1 000
0 260 0  E03A  E 0 03A                1539  ST       AND   XF0          CLEAN                     BLD 1542
0 261 0  7257  7 0 257                1540           STW   M,TSD      SAVE DEVICE                 BLD 1543
                                      1541           TRUE  PNCH=1                                 BLD 1544
                                      1542           CLB   X'C0'                                  BLD 1545
                                      1543           SNE              SKIP IF NO PUNCH            BLD 1546
                                      1544           DOT   X'C',2     YES TURN IT ON              BLD 1547
                                      1545           ENDC                                         BLD 1548
0 262 0  C03D  C 0 03D                1546           ORI   X200       DUILD DIN STATUS            BLD 1549
0 263 0  7264  7 0 264                1547           STW   $+1                                    BLD 1550
0 264 0  0000  0000                   1548  WEE      DATA  0                                      BLD 1551
0 265 0  2800  2 1 000                1549           JSX * 0          RETURN                      BLD 1552
                                      1550           FALS  SOFTWARE=BASIC                         BLD 1553
                                      1551  'XRAY IS A PART OF THE MONITOR FOR BASIC SYSTEMS ONLY  BLD 1554
                                      1552           ENDC                                         BLD 1555
                                      1553           TRUE  SOFTWARE=BASIC                         BLD 1556
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                              1554  '                  X-RAY MAIN CONTROL SUBROUTINE              BLD 1557
                              1555  *          AL    ABSO LOAD      S.FILL                        BLD 1558
                              1556  *          RL    RELO LOAL      S.RLOAD                       BLD 1559
                              1557  *          RM    LOAD MAP       S.MAP                         BLD 1560
                              1558  *          DA    SET DATE                                     BLD 1561
                              1559  *          ID    SET ID NAME                                  BLD 1562
                              1560  *          D     DUMP           S.DUMP                        BLD 1563
                              1561  *          H     HEX CORRECT    S.HXCORR                      BLD 1564
                              1562  *          T     TRANSFER       S.TRANS                       BLD 1565
                              1563  *          BB    MULTIPLE INSERTION OF HEX DATA               BLD 1566
                              1564  *          P     PUNCH          S.PUNCH                       BLD 1567
                              1565  *          LL    LIB LOAD       S.LLIR                        BLD 1568
                              1566  *                                                           BLD 1569
0 266 0  2065  2 0 065        1567  XRAY     JSX   OPEN,FIOT,BUF,N27,SYSI,RTTK,ALPH             BLD 1570
0 267 0  0321  0321
0 268 0  0334  0334
0 269 0  023D  023D
0 26A 0  0001  0001
0 26B 0  0008  0008
0 26C 0  8000  8000
0 26D 0  2083  2 0 083        1568           JSX   DOIO,FIOT                                    BLD 1571
0 26E 0  8321  8321
0 26F 0  201C  2 0 01C        1569           JSX   STAT,FIOT                                    BLD 1572
0 270 0  8321  8321
0 271 0  8334  8 0 334        1570           LDW   BUF          LOAD DIRECTIVE CHAR             BLD 1573
0 272 0  924A  9 0 24A        1571           LDX   XR           LOOK FOR 12 DIRECTIVES          BLD 1574
0 273 0  FA87  F 1 287        1572  S.XSSM   CMW * S.XDA                                        BLD 1575
0 274 0  0870  0870           1573           SNE                                                BLD 1576
0 275 0  1283  1 0 283        1574           JMP   S.XFD                                        BLD 1577
0 276 0  0501  05 01          1575           DXS   1                                            BLD 1578
0 277 0  1273  1 0 273        1576           JMP   S.XSSM                                       BLD 1579
0 278 0  8323  8 0 323        1577           LDW   FIOT+2       GET READY TO OUTPUT             BLD 1580
0 279 0  D246  D 0 246        1578           ORE   N5           2 QUESTION MARKS                BLD 1581
0 27A 0  7323  7 0 323        1579           STW   FIOT+2                                       BLD 1582
0 27B 0  2083  2 0 083        1580           JSX   DOIO,FIOT,QMES,N1                            BLD 1583
0 27C 0  0321  0321
0 27D 0  0282  0282
0 27E 0  8242  8242
0 27F 0  201C  2 0 01C        1581           JSX   STAT,FIOT                                    BLD 1584
0 280 0  8321  8321
0 281 0  1266  1 0 266        1582           JMP   XRR          GET A BETTER DIR NEXT TIME      BLD 1585
0 282 0  BFBF  BFBF           1583  QMES     DATA  X'BFBF'                                      BLD 1586
0 283 0  9A93  9 1 293        1584  S.XFD    LDX * S.XDSUBS     LOAD ADDRESS OF ROUTINE         BLD 1587
0 284 0  8267  8 0 267        1585           LDW   XRAY+1       LOAD FIOT ADDRESS               BLD 1588
0 285 0  2800  2 1 000        1586           JSX * 0                                            BLD 1589
0 286 0  1266  1 0 266        1587           JMP   XRR          RETURN TO X-RAY                 BLD 1590
0 287 0  D0A0  D0A0           1588  S.XDA    DATA  'P '         PUNCH ABSO TAPE                 BLD 1591
0 288 0  C4C1  C4C1           1589           DATA  'DA'         DATE                            BLD 1592
0 289 0  D4A0  D4A0           1590           DATA  'T '         TRANSFER                        BLD 1593
0 28A 0  C2C2  C2C2           1591           DATA  'RB'                                         BLD 1594
0 28B 0  C8A0  C8A0           1592           DATA  'H '         HEX CORRECTION                  BLD 1595
0 28C 0  C4A0  C4A0           1593           DATA  'D '         DUMP                            BLD 1596
0 28D 0  C9C4  C9C4           1594           DATA  'ID'         NAME                            BLD 1597
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0 28E 0  C1CC   C1CC        1595          DATA  'AL'          ABSO LOAD                   BLD 1598
0 28F 0  C5D4   C5D4        1596          D     'ET'                                      BLD 1599
0 290 0  C3CC   C3CC        1597          D     'CL'                                      BLD 1600
0 291 0  C9CC   C9CC        1598          D     'IL'                                      BLD 1601
0 292 0  C9CF   C9CF        1599          D     'IO'           IO REASIGNMENT             BLD 1602
0 293 0  0352   0352        1600 S.XDSUBS DATA  PXCH          PUNCH ABSOLUTE TAPE         BLD 1603
0 294 0  02A0   02A0        1601          DATA  DATR                                      BLD 1604
0 295 0  0319   0319        1602          DATA  S.TRANS       TRANSFER                    BLD 1605
0 296 0  0386   0386        1603          DATA  BB                                        BLD 1606
0 297 0  036F   036F        1604          DATA  HX                                        BLD 1607
0 298 0  02E8   02E8        1605          DATA  DUMP                                      BLD 1608
0 299 0  02A3   02A3        1606          DATA  ID                                        BLD 1609
0 29A 0  03A6   03A6        1607          DATA  S.FILL              ABSO LOAD             BLD 1610
0 29B 0  07FD   07FD        1608 MMAP     D     2045                                      BLD 1611
0 29C 0  07FE   07FE        1609 LBLD     D     2046                                      BLD 1612
0 29D 0  07FF   07FF        1610 RELD     D     2047                                      BLD 1613
0 29E 0  029F   029F        1611          D     IORE                                      BLD 1614
         0266   0266        1612 XRR      EQU   XRAY                                      BLD 1615
                            1613          TRUE  SYS+NPCH+NPTR>0                           BLD 1616
                            1614 IORE     JSX   UNPK                                      BLD 1617
                            1615          LDW   S.TEMP1       GET LUN                     BLD 1618
                            1616          CLB   12            IS IT ASSIGNABLE            BLD 1619
                            1617          SLS                                             BLD 1620
                            1618          JMP   XRR           NO                          BLD 1621
                            1619          ADD   AP            COMPUTE PEAT ADDRESS        BLD 1622
                            1620          CAX                                             BLD 1623
                            1621          LDW   S.TEMP2       GET NEW ASSIGNMENT          BLD 1624
                            1622          SLL   8             POSITION                    BLD 1625
                            1623          STW * 0             SET ASSIGNMENT              BLD 1626
                            1624          JMP   XRR                                       BLD 1627
                            1625          ENDC                                            BLD 1628
                            1626          FALS  SYS+NPCH+NPTR>0                           BLD 1629
0 29F 0  1266   1 0 266     1627 IORE     JMP   XRR                                       BLD 1630
                            1628          ENDC                                            BLD 1631
0 2A0 0  82A7   8 0 2A7     1629 DATR     LDW   IDC           SET ADDRESS IN ID           BLD 1632
0 2A1 0  8245   8 0 245     1630          SUB   N4                                        BLD 1633
0 2A2 0  72A7   7 0 2A7     1631          STW   IDC                                       BLD 1634
0 2A3 0  0040   0040        1632 ID       SLM                 PREPARE TO MOVE DATA TO LOWER CORE  BLD 1635
0 2A4 0  923F   9 0 23F     1633          LDX   NM4           -4                          BLD 1636
0 2A5 0  8B39   8 1 339     1634          LDW * BUF+5                                     BLD 1637
0 2A6 0  0080   008 0       1635          SML   0                                         BLD 1638
0 2A7 0  7865   7 1 065     1636 IDC      STW * NAME+4                                    BLD 1639
0 2A8 0  0401   04 01       1637          IXS   1             DECREMENT COUNT IN XR       BLD 1640
0 2A9 0  12A5   1 0 2A5     1638          JMP   $-4           DO MORE                     BLD 1641
0 2AA 0  82AD   8 0 2AD     1639          LDW   $+3           RESET ADDRESS               BLD 1642
0 2AB 0  72A7   7 0 2A7     1640          STW   IDC                                       BLD 1643
0 2AC 0  1266   1 0 266     1641          JMP   XRR                                       BLD 1644
0 2AD 0  7865   7 1 065     1642          STW * NAME+4                                    BLD 1645
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                                   1643  '                         X-RAY SUBROUTINE UNPK              BLD 1646
0 2AE 0   0000   0000              1644
0 2AF 0   62AE   6 0 2AE                 UNPK      SUBR                                                BLD 1647
0 2B0 0   0100   0100              1645            CLR                 ZERO ARGUMENT COUNTER           BLD 1648
0 2B1 0   72DE   7 0 2DE           1646            STW     COMC        CLEAR COMMA COUNTER             BLD 1649
0 2B2 0   7238   7 0 238           1647            STW     S.CHAR      ZERO CHAR STORAGE               BLD 1650
0 2B3 0   717B   7 0 17B           1648            STW     S.XACNT                                     BLD 1651
0 2B4 0   8321   8 0 321           1649            LDW     FIOT                                        BLD 1652
0 2B5 0   A242   A 0 242           1650            ADD     N1                                          BLD 1653
0 2B6 0   0A11   0A1 1             1651            SLL     1           MAKE BYTE ADD                   BLD 1654
0 2B7 0   12BA   1 0 2BA           1652            JMP     $+3                                         BLD 1655
0 2B8 0   8257   8 0 257           1653  S.XBEG    LDW     S.SX                                        BLD 1656
0 2B9 0   A242   A 0 242           1654            ADD     N1                                          BLD 1657
0 2BA 0   F325   F 0 325           1655            CMW     FIOT+4      OMPARE TO END ADD               BLD 1658
0 2BB 0   0870   0870              1656            SNE                                                 BLD 1659
0 2BC 0   12D9   1 0 2D9           1657            JMP     S.XUR       DONE GO TO RETURN               BLD 1660
0 2BD 0   7257   7 0 257           1658            STW     S.SX        NOT DONE YET                    BLD 1661
0 2BE 0   0130   0130              1659            CAX                                                 BLD 1662
0 2BF 0   5800   5 1 000 0         1660            LDB  *  0           LOAD THE NEXT CHAR              BLD 1663
0 2C0 0   07AC   07 AC             1661            CLB     ','         IS CHAR A COMMA                 BLD 1664
0 2C1 0   0870   0870              1662            SNE                                                 BLD 1665
0 2C2 0   12CD   1 0 2CD           1663            JMP     S.COMMA     YES                             BLD 1666
0 2C3 0   A037   A 0 037           1664            ADD     X40                                         BLD 1667
0 2C4 0   0700   07 00             1665            CLB     0                                           BLD 1668
0 2C5 0   0840   0840              1666            SLS                                                 BLD 1669
0 2C6 0   A249   A 0 249           1667            ADD     N9                                          BLD 1670
0 2C7 0   0A1C   0A1 C             1668            SLL     12                                          BLD 1671
0 2C8 0   0130   0130              1669            CAX                                                 BLD 1672
0 2C9 0   8238   8 0 238           1670            LDW     S.CHAR      LOAD PREVIOUS CHARS             BLD 1673
0 2CA 0   0A74   0A7 4             1671            SLC D   4           SHIFT IN NEW CHARS              BLD 1674
0 2CB 0   7238   7 0 238           1672            STW     S.CHAR                                      BLD 1675
0 2CC 0   12B8   1 0 2B8           1673            JMP     S.XBEG      GO DO ANOTHER CHAR              BLD 1676
0 2CD 0   917B   9 0 17B           1674  S.COMMA   LDX     S.XACNT     COMMA FOUND MOVE DATA TO ARG ARRAY BLD 1677
0 2CE 0   82DE   8 0 2DE           1675            LDW     COMC        INC NO OF COMMAS                BLD 1678
0 2CF 0   A242   A 0 242           1676            ADD     N1          IE, NO OF DATA TO STORE         BLD 1679
0 2D0 0   72DE   7 0 2DE           1677            STW     COMC                                        BLD 1680
0 2D1 0   8238   8 0 238           1678            LDW     S.CHAR                                      BLD 1681
0 2D2 0   7B2A   7 1 32A           1679            STW  *  S.ARG                                       BLD 1682
0 2D3 0   0140   0140              1680            CXA                                                 BLD 1683
0 2D4 0   A242   A 0 242           1681            ADD     N1                                          BLD 1684
0 2D5 0   717B   7 0 17B           1682            STW     S.XACNT                                     BLD 1685
0 2D6 0   0100   0100              1683            CLR                                                 BLD 1686
0 2D7 0   7238   7 0 238           1684            STW     S.CHAR                                      BLD 1687
0 2D8 0   12B8   1 0 2B8           1685            JMP     S.XBEG                                      BLD 1688
0 2D9 0   917B   9 0 17B           1686  S.XUR     LDX     S.XACNT                                     BLD 1689
0 2DA 0   8238   8 0 238           1687            LDW     S.CHAR                                      BLD 1690
0 2DB 0   7B2A   7 1 32A           1688            STW  *  S.ARG                                       BLD 1691
0 2DC 0   92AE   9 0 2AE           1689            EXIT    UNPK                                        BLD 1692
0 2DD 0   2800   2 1 000
0 2DE 0   0000   0000              1690  COMC      DATA    0                                           BLD 1693
```

```
                              1691  '             X-RAY DUMP SUBROUTINE                                   BLD 1694
                              1692  *       DUMP  LOC1,LOC2                                               BLD 1695
                              1693  *             DYNAMIC DUMP FROM PROGRAMS                              BLD 1696
                                                                                                          BLD 1697
0 2DF 0  8800  8 1 000        1694  DMP     LDW * 0                                                       BLD 1698
0 2E0 0  732A  7 0 32A        1695          STW   S.LOC1         RELOCATE ADDRESSES                       BLD 1699
0 2E1 0  8801  8 1 001        1696          LDW * 1                                                       BLD 1700
0 2E2 0  732B  7 0 32B        1697          STW   S.NBR1                                                  BLD 1701
0 2E3 0  0402  04 02          1698          IXS   2                                                       BLD 1702
0 2E4 0  0000  000 0          1699          HLT                                                           BLD 1703
0 2E5 0  62E7  6 0 2E7        1700          STX   DUMP-1                                                  BLD 1704
0 2E6 0  12EA  1 0 2EA        1701          JMP   DUMP+2         GO DUMP NOW                              BLD 1705
                              1702  *  DUMP SUBROUTINE                J.R. NELSON    RAYTHEON    9/6/67   BLD 1706
                              1703  *                                                                     BLD 1707
                              1704          NTRY  DUMP
0 2E7 0  0000  0000           1705
0 2E8 0  62E7  6 0 2E7              DUMP    SUBR                                                          BLD 1708
0 2E9 0  22AF  2 0 2AF        1706          JSX   UNPK           UNPACK ARGUMENTS                         BLD 1709
0 2EA 0  2065  2 0 065        1707          JSX   OPEN,FIOT,S.BUFF,N27,LIST,WTTY,ALPH                     BLD 1710
0 2EB 0  0321  0321
0 2EC 0  0334  0334
0 2ED 0  023D  023D
0 2EE 0  0003  0003
0 2EF 0  000E  000E
0 2F0 0  8000  8000
0 2F1 0  832B  8 0 32B        1708          LDW   S.NBR1         CALC NO WORDS TO OUTPUT                  BLD 1711
0 2F2 0  832A  8 0 32A        1709          SUB   S.LOC1                                                  BLD 1712
0 2F3 0  732B  7 0 32B        1710          STW   S.NBR1                                                  BLD 1713
0 2F4 0  9240  9 0 240        1711  S.NEXTL LDX   NM27           -27                                      BLD 1714
0 2F5 0  632C  6 0 32C        1712          STX   S.XSAVE                                                 BLD 1715
0 2F6 0  8329  8 0 329        1713          LDW   S.LDWIO                                                 BLD 1716
0 2F7 0  72FC  7 0 2FC        1714          STW   S.NEXTW+1                                               BLD 1717
0 2F8 0  832A  8 0 32A        1715          LDW   S.LOC1                                                  BLD 1718
0 2F9 0  12FD  1 0 2FD        1716          JMP   S.PAK               GO PRINT(LOCATION)                  BLD 1719
0 2FA 0  632C  6 0 32C        1717          STX   S.XSAVE                                                 BLD 1720
0 2FB 0  932A  9 0 32A        1718  S.NEXTW LDX   S.LOC1                                                  BLD 1721
0 2FC 0  8800  8 1 000        1719          LDW * 0                   PICKUP VALUE FROM CORE LOCATION     BLD 1722
0 2FD 0  2392  2 0 392        1720  S.PAK   JSX   S.PACK              GO PACK WORD                        BLD 1723
0 2FE 0  932C  9 0 32C        1721          LDX   S.XSAVE                                                 BLD 1724
0 2FF 0  8331  8 0 331        1722          LDW   S.SAVE1                                                 BLD 1725
0 300 0  784F  7 1 34F        1723          STW * S.BUFF+27           SAVE PACKED WORD                    BLD 1726
0 301 0  8332  8 0 332        1724          LDW   S.SAVF2                                                 BLD 1727
0 302 0  7850  7 1 350        1725          STW * S.BUFF+28                                               BLD 1728
0 303 0  803E  8 0 03E        1726          LDW   XA0A           A0A0                                     BLD 1729
0 304 0  7851  7 1 351        1727          STW * S.BUFF+29                                               BLD 1730
0 305 0  82FC  8 0 2FC        1728          LDW   S.NEXTW+1           INCR                                BLD 1731
0 306 0  A242  A 0 242        1729          ADD   N1                                                      BLD 1732
0 307 0  72FC  7 0 2FC        1730          STW   S.NEXTW+1                                               BLD 1733
0 308 0  0403  04 03          1731          IXS   3              SEE IF ALL OUTPUT                        BLD 1734
0 309 0  12FA  1 0 2FA        1732          JMP   S.NEXTW-1          NO                                   BLD 1735
0 30A 0  2083  2 0 083        1733          JSX   DOIO,FIOT      OUTPUT LINE                              BLD 1736
0 30B 0  8321  8321
0 30C 0  201C  2 0 01C        1734          JSX   STAT,FIOT                                               BLD 1737
0 30D 0  8321  8321
```

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     0 30E 0   832B   8 0 328     1735              LDW    S.NBR1            YES                                  BLD 1738
     0 30F 0   B248   B 0 248     1/36              SUB    N8                                                     BLD 1739
     0 310 0   0810   0810        1/37              SAP                      SEE IF MORE LINES TO OUTPUT          BLD 1740
     0 311 0   1317   1 0 31/     1738              JMP    DEND          NO                                       BLD 1741
     0 312 0   /32B   7 0 32B     1739              STW    S.NBR1                                                 BLD 1742
     0 313 0   832A   8 0 32A     1740              LDW    S.LOC1            YES                                  BLD 1743
     0 314 0   A248   A 0 248     1741              ADD    N8                                                     BLD 1744
     0 315 0   732A   7 0 32A     1742              STW    S.LOC1                                                 BLD 1745
     0 316 0   12F4   1 0 2F4     1/43    S.JERRY   JMP    S.NEXTL                GO GET NEXT LINE                BLD 1746
     0 317 0   92E7   9 0 2E/     1/44    DEND      EXIT   DUMP                                                   BLD 1747
     0 318 0   2800   2 1 000
```

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                               1745  *                    TRANSFER                                                  BLD 1748
0 319 0  22AF  2 0 2AF         1746  S.TRANS    JSX    UNPK               UNPACK ARGUMENTS                          BLD 1749
0 31A 0  832A  8 0 32A         1747             LDW    S.ARG              IF S.ARG=0 THEN GO TO S.RBEGIN            BLD 1750
0 31B 0  F241  F 0 241         1748             CMW    NO                                                           BLD 1751
0 31C 0  9055  9 0 055         1749             LDX    RBEG                                                         BLD 1752
0 31D 0  0870  0870            1750             SNE                                                                 BLD 1753
0 31E 0  2800  2 1 000         1751             JSX *  0                                                            BLD 1754
0 31F 0  932A  9 0 32A         1752             LDX    S.ARG                                                        BLD 1755
0 320 0  2800  2 1 000         1753             JSX *  0                                                            BLD 1756
0 321 0  0000  0000            1754  FIOT       RES    8                                                            BLD 1757
0 329 0  87FF  87FF            1755  S.LDW10    DATA   X'87FF'                                                      BLD 1758
0 32A 0  0000  0000            1756  S.TEMP1    DATA   0                                                            BLD 1759
0 32B 0  0000  0000            1757  S.TEMP2    DATA   0                                                            BLD 1760
0 32C 0  0000  0000            1758  S.TEMP3    DATA   0                                                            BLD 1761
0 32D 0  0000  0000            1759  S.TEMP4    DATA   0                                                            BLD 1762
0 32E 0  0000  0000            1760  S.TEMP5    DATA   0                                                            BLD 1763
0 32F 0  0000  0000            1761  S.TEMP6    DATA   0                                                            BLD 1764
0 330 0  0000  0000            1762  S.TEMP7    DATA   0                                                            BLD 1765
0 331 0  0000  0000            1763  S.TEMP8    DATA   0                                                            BLD 1766
0 332 0  0000  0000            1764  S.TEMP9    DATA   0                                                            BLD 1767
0 333 0  0000  0000            1765  S.TEMP10   DATA   0                                                            BLD 1768
0 334 0  0000  0000            1766  S.BUFF     RES    30                                                           BLD 1769
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```
0 351 0  0000  0000      1767  '                   PUNCH                                                BLD 1770
0 352 0  22AF  2 0 2AF   1768  PXCH      JSX   UNPK            UNPACK ARGUMENTS                         BLD 1771
0 353 0  2065  2 0 065   1769            JSX   OPEN,FIOT,X'7FFF',N1,BOUT,WTTY,BINT                      BLD 1772
0 354 0  0321  0321
0 355 0  7FFF  7FFF
0 356 0  0242  0242
0 357 0  0005  0005
0 358 0  000E  000E
0 359 0  8001  8001
                         1770            TRUE  NPCH=NO                                                  BLD 1773
0 35A 0  0000  000 0     1771            HLT                   WAIT FOR TURN ON OF PUNCH                BLD 1774
                         1772            ENDC                                                           BLD 1775
0 35B 0  2083  2 0 083   1773            JSX   DOIO,FIOT       PUT LEADER ON TAPE                       BLD 1776
0 35C 0  8321  8321
0 35D 0  2083  2 0 083   1774            JSX   DOIO,FIOT,S.ARG        PUNCH LOCATION                    BLD 1777
0 35E 0  0321  0321
0 35F 0  832A  832A
0 360 0  832A  8 0 32A   1775            LDW   S.ARG           RELOCATE BUFFER ADDRESS                  BLD 1778
0 361 0  7367  7 0 367   1776            STW   S.PD+2                                                   BLD 1779
0 362 0  832B  8 0 32B   1777            LDW   S.ARG+1         CALC NO WORDS TO OUTPUT                  BLD 1780
0 363 0  B32A  B 0 32A   1778            SUB   S.ARG                                                    BLD 1781
0 364 0  732B  7 0 32B   1779            STW   S.ARG+1                                                  BLD 1782
0 365 0  2083  2 0 083   1780  S.PD      JSX   DOIO,FIOT,,S.ARG+1  PUNCH DATA OUT                       BLD 1783
0 366 0  0321  0321
0 367 0  0000  0000
0 368 0  832B  832B
0 369 0  2083  2 0 083   1781            JSX   DOIO,FIOT,X'7FFF' PUT LEADER ON TAPE                     BLD 1784
0 36A 0  0321  0321
0 36B 0  FFFF  FFFF
0 36C 0  201C  2 0 01C   1782            JSX   STAT,FIOT                                                BLD 1785
0 36D 0  8321  8321
                         1783            TRUE  NPCH=YES                                                 BLD 1786
                         1784            DOT   X'C',3          TURN OFF PUNCH                           BLD 1787
                         1785            ENDC                                                           BLD 1788
0 36E 0  1266  1 0 266   1786            JMP   XRR             RETURN TO X-RAY                          BLD 1789
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                                   1787  '                X-RAY  S.HXCORR SUBROUTINE                        BLD 1790
                                   1788  *  INSERT DATA IN CORE SUBROUTINE                                  BLD 1791
0 36F 0   22AF   2 0 2AF          1789  HX         JSX   UNPK          UNPACK ARGS                        BLD 1792
0 370 0   8385   8 0 385          1790             LDW   ADAT          RESET DATA LOC                     BLD 1793
0 371 0   7378   7 0 378          1791             STW   S.DL                                             BLD 1794
0 372 0   832A   8 0 32A          1792             LDW   S.LOC         SET STORAGE LOC                    BLD 1795
0 373 0   0820   0820             1793             SAM                 IF NEG CONT LAST ADD               BLD 1796
0 374 0   737D   7 0 37D          1794             STW   S.LL          SET STORAGE LOC                    BLD 1797
0 375 0   9378   9 0 378          1795  HXCR       LDX   S.DL                                             BLD 1798
0 376 0   8800   8 1 000          1796             LDW * 0             LOAD NEXT DATA                     BLD 1799
0 377 0   0401   04 01            1797             IXS   1             INC AND STORE NEXT DATA            BLD 1800
0 378 0   0000   0000             1798  S.DL       DATA  0             LOCATION                           BLD 1801
0 379 0   6378   6 0 378          1799             STX   S.DL                                             BLD 1802
0 37A 0   937D   9 0 37D          1800             LDX   S.LL          LOAD LOC TO STORE DATA             BLD 1803
0 37B 0   7800   7 1 000          1801             STW * 0                                                BLD 1804
0 37C 0   0401   04 01            1802             IXS   1             INC AND STORE NEXT LOC             BLD 1805
0 37D 0   0000   0000             1803  S.LL       DATA  0             TO STORE DATA                      BLD 1806
0 37E 0   637D   6 0 37D          1804             STX   S.LL                                             BLD 1807
0 37F 0   82DE   8 0 2DE          1805             LDW   COMC          DEC NO OF TIMES TO STORE           BLD 1808
0 380 0   B242   B 0 242          1806             SUB   N1                                               BLD 1809
0 381 0   72DE   7 0 2DE          1807             STW   COMC                                             BLD 1810
0 382 0   0800   0800             1808             SAZ                                                    BLD 1811
0 383 0   1375   1 0 375          1809             JMP   HXCR                                             BLD 1812
0 384 0   1266   1 0 266          1810             JMP   XRR           RETURN ALL DONE                    BLD 1813
0 385 0   032B   032B             1811  ADAT       DATA  S.DATA                                           BLD 1814
                                   1812  *                      BLANK BUFFER AREA                         BLD 1815
                                   1813  *                                                                BLD 1816
0 386 0   22AF   2 0 2AF          1814  BB         JSX   UNPK          UNPACK ARGS                        BLD 1817
0 387 0   932A   9 0 32A          1815             LDX   S.LOC          LOAD STORAGE LOCATION             BLD 1818
0 388 0   832B   8 0 32B          1816             LDW   S.DATA         LOAD DATA TO STORE                BLD 1819
0 389 0   7800   7 1 000          1817             STW * 0              STORE DATA                        BLD 1820
0 38A 0   832C   8 0 32C          1818             LDW   S.NBR         SUB 1 FROM NUMBER OF TIMES TO STORE BLD 1821
0 38B 0   B242   B 0 242          1819             SUB   N1                                               BLD 1822
0 38C 0   732C   7 0 32C          1820             STW   S.NBR                                            BLD 1823
0 38D 0   0800   0800             1821             SAZ                  TEST FOR DONE                     BLD 1824
0 38E 0   0401   04 01            1822             IXS   1                                                BLD 1825
0 38F 0   1266   1 0 266          1823             JMP   XRR           RETURN TO X-RAY                    BLD 1826
0 390 0   1388   1 0 388          1824             JMP   BB+2                                             BLD 1827
                                   1825  *  PACK TO OUTPUT TO TTL SUBROUTINE        J.R. NELSON   9/8/67   BLD 1828
                                   1826  *                                                                BLD 1829
0 391 0   0000   0000             1827                                                                    BLD 1830
0 392 0   6391   6 0 391                 S.PACK     SUBR                                                  BLD 1831
0 393 0   7332   7 0 332          1828             STW   S.SAVE2                                          BLD 1832
0 394 0   239C   2 0 39C          1829             JSX   S.XPND                                           BLD 1833
0 395 0   7331   7 0 331          1830             STW   S.SAVE1                                          BLD 1834
0 396 0   8332   8 0 332          1831             LDW   S.SAVE2                                          BLD 1835
0 397 0   0A18   0A1 8            1832             SLL   8                                                BLD 1836
0 398 0   239C   2 0 39C          1833             JSX   S.XPND                                           BLD 1837
0 399 0   7332   7 0 332          1834             STW   S.SAVE2                                          BLD 1838
0 39A 0   9391   9 0 391          1835             EXIT  S.PACK
0 39B 0   2800   2 1 000                                                                                  BLD 1839
0 39C 0                           1836  S.XPND     RES   0                                                BLD 1840
0 39C 0   0A04   0A0 4            1837             SRL   4
```

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0 39D 0  0AA4  0AA 4     1838            SRL R 4                                                        BLD 1841
0 39E 0                  1839  S.XPNC    RES   0                                                        BLD 1842
0 39E 0  0810  0810      1840            SAP                                                            BLD 1843
0 39F 0  2800  2 1 000   1841            JSX * 0                                                        BLD 1844
0 3A0 0  0A58  0A5 8     1842            SLC   8                                                        BLD 1845
0 3A1 0  0709  07 09     1843            CLB   9                                                        BLD 1846
0 3A2 0  0890  0890      1844            SLE                                                            BLD 1847
0 3A3 0  A247  A 0 247   1845            ADD   N7                                                       BLD 1848
0 3A4 0  A038  A 0 038   1846            ADD   X80                                                      BLD 1849
0 3A5 0  139E  1 0 39E   1847            JMP   S.XPNC                                                   BLD 1850
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                          1848  *              X-RAY SUBROUTINE S.FILL                     BLD 1851
0 3A6 0  2065  2 0 065    1849  S.FILL  JSX   OPEN,FIOT,S.ARG,X7F,BIN,RTTP,HINT            BLD 1852
0 3A7 0  0321  0321
0 3A8 0  032A  032A
0 3A9 0  0251  0251
0 3AA 0  0004  0004
0 3AB 0  0009  0009
0 3AC 0  8001  8001
0 3AD 0  2083  2 0 083    1850          JSX   DOIO,FIOT          READ PROGRAM LOCATION     BLD 1853
0 3AE 0  8321  8321
0 3AF 0  201C  2 0 01C    1851          JSX   STAT,FIOT                                    BLD 1854
0 3B0 0  8321  8321
0 3B1 0  832A  8 0 32A    1852          LDW   S.ARG                                        BLD 1855
0 3B2 0  7321  7 0 321    1853          STW   FIOT                                         BLD 1856
0 3B3 0  2083  2 0 083    1854          JSX   DOIO,FIOT     NOW READ PROGRAM               BLD 1857
0 3B4 0  8321  8321
0 3B5 0  201C  2 0 01C    1855          JSX   STAT,FIOT                                    BLD 1858
0 3B6 0  8321  8321
                          1856          TRUE  NPTR=NO                                      BLD 1859
0 3B7 0  0000  000 0      1857          HLT                                                BLD 1860
                          1858          ENDC                                               BLD 1861
0 3B8 0  1266  1 0 266    1859          JMP   XRR           RETURN TO X-RAY                BLD 1862
0 3B9 0  0000  0000       1860  ENDA    DATA  0                                            BLD 1863
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                                     1861  '      SYMBOL TABLE                                                                        BLD 1864
      0 389 0*******930              1862

X-REF

   000D      ABIN       0 000 0    0 22C 0
   000D      ABOUT      0 000 0    0 000 0    0 000 0    0 22D 0
   0 385 0   ADAT       0 370 0
   000D      ALIST      0 000 0    0 22B 0
   000D      ALOGA      0 000 0    0 22F 0
   000D      ALOGB      0 000 0    0 230 0
   000C      ALOGC      0 000 0    0 231 0
   000C      ALOGD      0 000 0    0 232 0
   000C      ALOGE      0 000 0    0 233 0
   0000      ALPH       0 065 0    0 26C 0    0 2F0 0
   0 23A 0   AP         0 0C4 0
   000D      APRIN      0 000 0    0 22A 0
   0 32A 0   ARG        0 065 0
   0 239 0   ARHO       0 067 0    0 0E0 0
   000C      ASCR       0 000 0    0 22E 0
   000D      ASYSF      0 000 0    0 228 0
   000D      ASYSI      0 000 0    0 229 0
   0000      BASIC      0 000 0    0 000 0    0 000 0    0 040 0    0 040 0    0 266 0    0 266 0
   0 386 0   BR         0 296 0    0 390 0
   0004      BIN        0 065 0    0 3AA 0
   0001      BINT       0 065 0    0 359 0    0 3AC 0
   0005      BOUT       0 065 0    0 357 0
   0 334 0   BUF        0 065 0    0 268 0    0 271 0    0 2A5 0
   0015      CDRI       0 000 0
   0015      CDRO       0 000 0
   0000      CHAIN      0 000 0    0 000 0    0 000 0
   0 2DE 0   COMC       0 2B1 0    0 2CF 0    0 2D0 0    0 37F 0    0 381 0
   0 05C 0   CORE
   1000      CORESIZE   0 000 0    0 000 0    0 000 0    0 05A 0    0 05C 0
   0016      CPCI       0 000 0
   0016      CPCO       0 000 0    0 000 0    0 000 0
   0 05D 0   DATE
   0 2A0 0   DATR       0 294 0
   0 1BF 0   DELC       0 173 0
   0 03B 0   DELE       0 171 0    0 1D8 0
   0 1BA 0   DELR       0 170 0
   0 317 0   DEND       0 311 0
   0 03D 0   DINI       0 1D8 0
   0 2DF 0   DMP        0 056 0    0 057 0
   0 1A3 0   DNWB       0 14C 0    0 18A 0
   0 083 0   DOIO       0 044 0    0 045 0    0 1F6 0    0 26D 0    0 27B 0    0 30A 0    0 358 0    0 35D 0
                        0 365 0    0 369 0    0 3AD 0    0 3B3 0
   0 089 0   DORS       0 0ED 0
   0 134 0   DREOF      0 10F 0
   0 131 0   DRRET      0 131 0    0 137 0
   0 1F2 0   DSBI       0 1ED 0
   0 1E9 0   DSBL       0 1F0 0    0 20B 0
   0014      DSKI       0 000 0
```

```
    0012      DSK0      0 000 0    0 000 0
    0019      DSK1      0 000 0
    000C      DUM       0 000 0    0 000 0    0 000 0    0 000 0    0 000 0    0 000 0
DEF 0 2E8 0   DUMP      0 298 0    0 2E5 0    0 2E6 0    0 317 0
    0 1F0 0   EDSBL
    0 036 0   ENBI      0 1D8 0    0 1DB 0
    0 054 0   END
    0 3B9 0   ENDA      0 054 0
    0 05B 0   ENDM
    0 238 0   ENDP      0 000 0    0 238 0
    0001      EXTENDED  0 000 0
    0 0B5 0   FDA       0 07F 0    0 0B0 0    0 0CB 0    0 0D8 0    0 1EA 0    0 202 0    0 25B 0
    0 321 0   FIOT      0 267 0    0 26E 0    0 270 0    0 278 0    0 27A 0    0 27C 0    0 280 0    0 284 0
                        0 2BA 0    0 2EB 0    0 30B 0    0 30D 0    0 354 0    0 35C 0    0 35E 0    0 366 0
                        0 36A 0    0 36D 0    0 3A7 0    0 3AE 0    0 3B0 0    0 3B2 0    0 3B4 0    0 3B6 0
    0 1ED 0   GMUSIR
    0 25A 0   GST       0 1FB 0    0 25E 0
    0 36F 0   HX        0 297 0
    0 375 0   HXCR      0 383 0
    0001      ICHN      0 000 0    0 069 0    0 228 0    0 23A 0
    0 2A3 0   ID        0 299 0
    0 2A7 0   IDC       0 2A0 0    0 2A2 0    0 2AB 0
    0 29F 0   IOHE      0 29E 0
    0 21E 0   IRHO      0 239 0
    0000      ISHARE    0 000 0    0 131 0    0 139 0    0 13B 0    0 1D8 0    0 1ED 0
    0 29C 0   LBLD
    0000      LBSTYP    0 000 0    0 058 0
    0003      LIST      0 065 0    0 2EE 0
    0017      LPHI      0 000 0
    0017      LPHO      0 000 0
    0 20A 0   M,DDR     0 19C 0    0 200 0    0 21D 0
    0 20D 0   M,DDR1
    0 0B3 0   M,DF      0 065 0    0 091 0    0 098 0    0 0A1 0    0 0A7 0    0 0AF 0    0 0E2 0    0 0EF 0
                        0 0F5 0    0 10B 0    0 11C 0    0 12B 0    0 162 0
    0 0A7 0   M,DG0     0 094 0
    0 0A5 0   M,DG01    0 09C 0
    0 21B 0   M,DMD     0 1D8 0
    0 03F 0   M,DR      0 065 0    0 08A 0    0 092 0    0 095 0    0 09A 0    0 09F 0    0 0A3 0    0 0A6 0
                        0 0EB 0
    0 21B 0   M,DUM     0 1D8 0    0 235 0
    0 217 0   M,EA      0 213 0
    0 1F7 0   M,IDDR
    0 257 0   M,OBUF    0 065 0    0 06E 0    0 076 0    0 0E6 0
    0 03F 0   M.OPENR   0 065 0    0 065 0    0 066 0    0 080 0    0 0F2 0    0 0FF 0    0 10D 0    0 131 0
                        0 138 0    0 1B8 0    0 1F8 0    0 214 0    0 217 0    0 21B 0
    0 0B9 0   M.OSDEV   0 0D4 0
    0 238 0   M,OTMNW   0 065 0    0 06C 0    0 074 0    0 0B1 0    0 0B7 0    0 0CA 0    0 0D0 0
    0 258 0   M,OUNIT   0 070 0    0 078 0    0 0CF 0    0 0D3 0
    0 178 0   M,PA      0 065 0    0 065 0    0 0F6 0    0 1CD 0
    0 02C 0   M,SM1R    0 021 0
    0 02F 0   M,SP1R    0 023 0
    0 032 0   M,SP2R    0 026 0
    0 03F 0   M,SRET    0 01D 0    0 027 0    0 029 0    0 02C 0    0 02F 0    0 032 0    0 065 0
```

```
  0 1CE 0  M.IBLK    0 151 0  0 152 0  0 153 0
  0 1D1 0  M.ICRD    0 150 0
  0 16A 0  M.IDATAI  0 14B 0
  0 1C4 0  M.IDATAO  0 14F 0
  0 146 0  M.IDIN
  0 18E 0  M.IDISC   0 15D 0  0 176 0  0 1A8 0
  0 194 0  M.IDISC2  0 154 0
  0 188 0  M.IDISC3  0 183 0
  0 19D 0  M.IDMD    0 181 0
  0 1CC 0  M.IDOT    0 1C4 0
  0 1CF 0  M.IDOT2   0 141 0  0 1D2 0  0 1D7 0
  0 0B3 0  M.IFA     0 065 0  0 0D7 0  0 13A 0  0 16A 0  0 177 0  0 17D 0  0 18F 0  0 194 0
                     0 1A3 0  0 1AB 0  0 1B4 0  0 1BA 0  0 1BF 0  0 1C5 0  0 1D3 0  0 1FA 0
                     0 1FC 0  0 201 0  0 208 0  0 20A 0  0 20C 0
  0 0E6 0  M.IHSPT   0 237 0
  0 1B4 0  M.IIJR    0 158 0  0 186 0  0 193 0  0 1D0 0
  0 1B8 0  M.IIRR    0 15B 0  0 19F 0  0 1A2 0  0 1AA 0  0 1C3 0
  0 148 0  M.IJMP    0 155 0
  0 155 0  M.IJMPA   0 13D 0
  0 156 0  M.ILFI    0 148 0
  0 1AB 0  M.INWI    0 14A 0  0 160 0
  0 1D3 0  M.INWO    0 14D 0  0 14E 0
  0 11B 0  M.ISCR    0 114 0  0 117 0
  0 257 0  M.ISD     0 0E6 0  0 0FA 0  0 261 0
  0 17B 0  M.IT      0 0E6 0  0 161 0  0 169 0  0 1AC 0  0 1AF 0
  0 206 0  M.WA
  0 15E 0  M.1CHAR   0 149 0
  0013     MAGI      0 000 0
  000E     MAGO      0 000 0  0 000 0
  000F     MAG1      0 000 0
  0010     MAG2      0 000 0
  0011     MAG3      0 000 0
  0001     MASS      0 000 0  0 054 0  0 1D8 0  0 1F3 0  0 241 0  0 259 0
  000C     MASU      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
  001C     MAXP      0 000 0  0 0C0 0
  0 29B 0  MMAP
  0 1D8 0  NABL      0 0E6 0
  0 061 0  NAME      0 2A7 0  0 2AD 0
  0000     NCUR      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
  0000     NCPC      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
  0000     NDSK      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                     0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                     0 000 0
  0000     NDSKO     0 000 0
  0 0C4 0  NGTR      0 0BE 0
  0000     NLPR      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
  0000     NMAG      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                     0 000 0  0 000 0  0 000 0
  0000     NMAS      0 000 0  0 000 0  0 048 0  0 1D8 0
  000D     NMI       0 000 0  0 000 0  0 000 0  0 000 0
  000D     NMO       0 000 0  0 000 0  0 000 0
  0000     NMSU      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
  0 23E 0  NM1       0 097 0  0 0AB 0  0 0DC 0  0 126 0  0 1C7 0
```

```
    0 240 0  NM27      0 2F4 0
    0 23F 0  NM4       0 2A4 0
    0000     N0        0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                       0 139 0  0 35A 0  0 3B7 0
    0000     NPCH      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                       0 29F 0  0 29F 0  0 35A 0  0 36E 0
    0000     NPIR      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
                       0 000 0  0 0F1 0  0 29F 0  0 29F 0  0 3B7 0
    0 10C 0  NSPEC     0 0FE 0  0 105 0
    0 125 0  NS1       0 122 0
    0000     NUNITS    0 000 0  0 238 0
    0 0CE 0  NYET      0 0C2 0  0 0C8 0
    0 241 0  N0        0 1A6 0  0 31B 0
    0 242 0  N1        0 0A4 0  0 0A5 0  0 124 0  0 1A5 0  0 1C1 0  0 27E 0  0 2B5 0  0 2B9 0
                       0 2CF 0  0 2D4 0  0 306 0  0 356 0  0 380 0  0 38B 0
    0 23B 0  N10       0 0DD 0
    0 23C 0  N12       0 0C3 0
    0 243 0  N2
    0 23D 0  N2/       0 128 0  0 269 0  0 2ED 0
    0 244 0  N3
    0 245 0  N4        0 2A1 0
    0 246 0  N5        0 279 0
    0 247 0  N7        0 3A3 0
    0 248 0  N8        0 30F 0  0 314 0
    0 249 0  N9        0 2C6 0
    0 065 0  OPEN      0 042 0  0 043 0  0 266 0  0 2EA 0  0 353 0  0 3A6 0
    0012     PCHI      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
    0 0EE 0  PCHN      0 0EA 0  0 1BE 0
    0013     PCHO      0 000 0
    0 228 0  PEAT      0 000 0  0 23A 0
    0000     PNCH      0 000 0  0 262 0
    0011     PTRI      0 000 0  0 000 0  0 000 0  0 000 0  0 000 0
    0014     PTRO      0 000 0
    0 352 0  PXCH      0 293 0
    0 282 0  QMES      0 27D 0
    0 055 0  RBEG      0 31C 0
    0000     RBSTYP    0 000 0  0 058 1
    0 29D 0  RELD
    000B     RTIK      0 065 0  0 268 0
    0009     RTIP      0 065 0  0 3AB 0
    0 32A 0  S.ARG     0 065 0  0 2D2 0  0 2DB 0  0 31A 0  0 31F 0  0 35F 0  0 360 0  0 362 0
                       0 363 0  0 364 0  0 368 0  0 3A8 0  0 3B1 0
    0 334 0  S.BUFF    0 065 0  0 2EC 0  0 300 0  0 302 0  0 304 0
    0 238 0  S.CHAR    0 065 0  0 2B2 0  0 2C9 0  0 2CB 0  0 2D1 0  0 2D7 0  0 2DA 0
    0 2CD 0  S.COMMA   0 2C2 0
    0 32B 0  S.DATA    0 065 0  0 385 0  0 388 0
    0 378 0  S.DL      0 371 0  0 375 0  0 379 0
    0 3A6 0  S.FILL    0 29A 0
    0 316 0  S.JERRY
    0 329 0  S.LDWIU   0 2F6 0
    0 37D 0  S.LL      0 374 0  0 37A 0  0 37E 0
    0 32A 0  S.LOC     0 065 0  0 372 0  0 387 0
    0 32A 0  S.LOC1    0 065 0  0 2E0 0  0 2F2 0  0 2F8 0  0 2FB 0  0 313 0  0 315 0
```

```
  0 32C 0  S,NBR     0 065 0  0 38A 0  0 3AC 0
  0 32B 0  S,NBR1    0 065 0  0 2E2 0  0 2F1 0  0 2F3 0  0 30E 0  0 312 0
  0 2F4 0  S,NEXTL   0 316 0
  0 2FB 0  S,NEXTW   0 2F7 0  0 305 0  0 307 0  0 309 0
  0 392 0  S,PACK    0 2FD 0  0 39A 0
  0 2FD 0  S,PAK     0 2F9 0
  0 365 0  S,PD      0 361 0
  0 331 0  S,SAVE1   0 065 0  0 2FF 0  0 395 0
  0 332 0  S,SAVE2   0 065 0  0 301 0  0 393 0  0 396 0  0 399 0
  0 052 0  S,STUS
  0 257 0  S,SX      0 065 0  0 2B8 0  0 2BD 0
  0 32D 0  S,TBUFF   0 065 0
  0 32A 0  S,TEMP1   0 065 0  0 065 0  0 065 0  0 065 0
  0 333 0  S,TEMP10
  0 32B 0  S,TEMP2   0 065 0  0 065 0
  0 32C 0  S,TEMP3   0 065 0  0 065 0
  0 32D 0  S,TEMP4   0 065 0
  0 32E 0  S,TEMP5
  0 32F 0  S,TEMP6
  0 330 0  S,TEMP7
  0 331 0  S,TEMP8   0 065 0
  0 332 0  S,TEMP9   0 065 0
  0 319 0  S,TRANS   0 295 0
  0 17B 0  S,XACNT   0 065 0  0 2B3 0  0 2CD 0  0 2D5 0  0 2D9 0
  0 2B8 0  S,XBEG    0 2CC 0  0 2D8 0
  0 287 0  S,XDA     0 273 0
  0 293 0  S,XDSUBS  0 283 0
  0 283 0  S,XFD     0 275 0
  0 39E 0  S,XPNC    0 3A5 0
  0 39C 0  S,XPND    0 394 0  0 398 0
  0 32C 0  S,XSAVE   0 065 0  0 2F5 0  0 2FA 0  0 2FF 0
  0 273 0  S,XSSM    0 277 0
  0 2D9 0  S,XUR     0 2BC 0
  0 0D6 0  SFIOT     0 0E4 0  0 0EE 0
  0 254 0  SIGB      0 0A9 0  0 0AE 0  0 1B2 0  0 1F4 0
  0000     SOFTWARE  0 000 0  0 000 0  0 040 0  0 040 0  0 266 0  0 266 0
  0 1DE 0  SSHA      0 1E6 0
  0 260 0  ST        0 0E8 0  0 25D 0
  0001     STANDARD  0 000 0  0 000 0
  0 01C 0  STAT      0 02E 0  0 046 0  0 047 0  0 26F 0  0 27F 0  0 30C 0  0 36C 0  0 3AF 0
                     0 3B5 0
  0 058 0 *STYPE
  0000     SYL0      0 000 0  0 000 0
  0000     SYL1      0 000 0  0 000 0
  0000     SYL6      0 000 0  0 000 0
  0000     SYL7      0 000 0  0 000 0
  0000     SYR0      0 000 0  0 000 0
  0000     SYR1      0 000 0  0 000 0
  0000     SYR2      0 000 0  0 000 0
  0000     SYR4      0 000 0  0 000 0
  0000     SYR6      0 000 0  0 000 0
  0000     SYS       0 000 0  0 048 0  0 054 0  0 1D8 0  0 1D8 0  0 1F3 0  0 241 0  0 259 0
                     0 29F 0  0 29F 0
```

```
     0001     SYSI      0 065 0    0 26A 0
     0 138 0  TIHS      0 0E7 0
     0 177 0  TLWA      0 16D 0
     0 178 0  TMP1      0 065 0    0 1D8 0    0 1E5 0
     000D     TTY       0 000 0    0 000 0    0 000 0    0 000 0    0 000 0    0 000 0
     0000     TTYI      0 000 0    0 000 0    0 000 0    0 000 0    0 000 0    0 236 0
     0 05A 0  ULIM
     0 2AF 0  UNPK      0 2DC 0    0 2E9 0    0 319 0    0 352 0    0 36F 0    0 386 0
     0 264 0  WEE
     0 1F3 0  WEOF      0 050 0    0 051 0    0 1F3 0
     000E     WTTY      0 065 0    0 2EF 0    0 358 0
     0 03E 0  XAUA      0 303 0
     0 24A 0  XB        0 272 0
     0 038 0  XB0       0 3A4 0
     0 250 0  XC00      0 0CD 0
     0 039 0  XF        0 0D1 0    0 0DA 0    0 0F1 0    0 1DA 0    0 1DF 0    0 1EC 0
     0 03B 0  XFF       0 1D8 0    0 25C 0
     0 03A 0  XF0       0 203 0    0 260 0
     0 266 0  XRAY      0 018 0    0 019 0    0 040 0    0 041 0    0 05B 0    0 284 0    0 29F 0
     0 266 0  XRH       0 281 0    0 286 0    0 29F 0    0 29F 0    0 2AC 0    0 36E 0    0 384 0    0 38F 0
                        0 3B8 0
     0 03C 0  X1FF      0 0B9 0    0 1BC 0
     0 035 0  X10       0 15C 0
     0 253 0  X1200     0 134 0
     0 036 0  X20       0 1D8 0
     0 03D 0  X200      0 188 0    0 1B6 0    0 1D8 0    0 262 0
     0 24B 0  X204      0 204 0
     0 24D 0  X30E
     0 24C 0  X300      0 0F7 0    0 197 0
     0 037 0  X40       0 2C3 0
     0 24E 0  X400      0 164 0
     0 251 0  X7F       0 196 0    0 3A9 0
     0 252 0  X7FF      0 09E 0    0 167 0    0 20E 0    0 211 0
     0 24F 0  X800      0 18C 0
     0 256 0  X81       0 0F9 0
     0 255 0  X84       0 0FD 0    0 144 0
     0001     YES       0 000 0    0 000 0    0 131 0    0 13B 0    0 1D8 0    0 1ED 0    0 36E 0

NO ERRORS

CARDS  SYMBOLS     LITR   STACK
1862   278    561  0      6
```