IDENTIFICATION

Product Code:	DEC-12-ZR2B-D
Product Name:	DIAL-MS PIP Program Description
Date Created:	December 1, 1970
Maintainer:	Software Services

LAP6-DIAL is an editor, filing system and assembler for use with the PDP-12 computer. The editor and filing portions are derived from the basic LINC program LAP6[1] by Mary Allen Wilkes of Washington University. The assembly portion is derived from several programs used for the PDP-8 computer including PAL-D[2].

The Digital Equipment Corporation wishes to express to the author, Mary Allen Wilkes (Clark), and the Computer Research Laboratory of Washington University, St. Louis, Missouri, its appreciation for the development set forth in LAP6 as well as its thanks for permission to use parts of the LAP6 program.

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[1] M. A. Wilkes, LAP6 Handbook, Computer Research Laboratory Tech. Rep. No. 2, Washington University, St. Louis, May 1, 1967.

[2] PAL-D Assembler Programmer's Reference Manual DEC-D8-ASAA-D.

1.0 PROGRAM OVERVIEW

PIP is basically an I/O device manipulator. It transfers data from one device to another, perhaps doing some conversion on the way. PIP works with two types of I/O: sequential and file oriented. File oriented merely means that the entire file resides on some device (DECTAPE, DISK, etc.) from which any part of the file may be retrieved at any time. On such a device there exists an index which has the file names, the record numbers and lengths of each file. Sequential input is defined as a string of one data word after another, where generally the length of the input and/or output is unknown and where it is generally impossible to "backspace" the input device to retrieve characters once they are read in or written out. PIP can transfer files to files, files to sequential, sequential to sequential, and sequential to files.

PIP is composed of several "handlers". Each handler does one conversion task (binary, source, etc.). The initial display chooses which handler to use. The handler does not do any I/O; rather it sets flags which tell the low level I/O routines what to do. This is done by two "flags" called BFLAG1 and BFLAG2 (for exact values see the system routine descriptions at the end of this manual). If either BFLAG1 or BFLAG2 is zero, then file oriented I/O is to be used instead of sequential. If an input or output is sequential, the handler gives an AUXIN to get a character or AUXOUT to output a character. Thus, from a high level point of view, the handler does not know or care what sequential device it is using; all it knows is that when it gives an AUXIN, the I/O routine will return with a character in the AC (the AUXIN also checks for CTRL/D, CTRL/P, and CTRL/Z). For file to file operations a "FILEC" call looks up the output file using "DIRECT" and then uses "COPY" to transfer all the data. (These routines are described in system subroutine calls, section 2.0.) For file to sequential or sequential to file operations, separate "mini-handlers" are often required. For example, the binary handler has two handlers, BINTAP for input from tape and BTAPE for output. Note that these cannot both be in use at the same time because file to file operations are done by "FILEC". Thus, PIP is merely a grouping of subroutines, with a very small main loop. This modularity makes PIP fairly big, but it also makes it easy to understand and to modify. Most of the key subroutines are described in the back of the next section.

2.0 PIP SUBROUTINES

PIP is basically a set of general purpose low level subroutines and a master coordinating loop which calls them. This section describes what these routines do and how to call them. Instead of using a JMS NAME type of call, the equal sign is used as follows:

```
PNAME = JMS NAME
```

Thus, by just stating PNAME, the subroutine call is obtained. In almost all cases all the tags defined in a subroutine begin with the same letter as the subroutine name.

TAPE — Sets up the index information area (locations INDEX through CUPPER) to use tape rather than disk. Sets the unit to between 0 and 7.

DISC — Same as TAPE except the unit is set between 10 and 47,

PUSH — Takes the "FBLOCK" area (FSIZE through PNAME+3) and moves it to an area called the "lower save" area.

POP — Transfers the lower save area back to the FBLOCK area.

HPUSH — Transfers the FBLOCK area to the "high save" area.

HPOP — Transfers the high save area to the FBLOCK area.

LEADER — Generates about 120 characters of leader-trailer on the chosen output device (BFLAG2).

FILEC — Copies a named file from one unit to another. The input unit was already "looked up" and exists in the high save region. The output file name and unit are still in FBLOCK. FILEC will do the rest and return to PIP.

PUTL — Puts a character on the TTY. AC=character on entry; AC=0 on return.

DISPLAY

```
DISPLAY
XYZ       XYZ , Horizontal coordinate (1 word)
                Vertical coordinate (1 word)
                Text/F  Q and A type
                H text......
                end\/.
```

Display will display the message pointed to by the next word. The first and second words are the starting horizontal and vertical positions on the screen. The text is standard Q and A type text, but no replies are permitted. This routine displays the message once and then returns. To refresh you must go back and redisplay it.

PIP — Restarts PIP.

DIAL — Returns to the DIAL monitor.

COPY — Copies blocks from one unit to another. INBLOCK contains the first input block number, OUTPUT contains the output unit. OUTNUM contains the two's complement of the number of copies to make.

CHECKIO — Checks to see if a CTRL/D or CTRL/P was typed.

GETL
xxxx — comes here if no character typed (1st word).
xxxx — comes here with typed character in the AC (2nd word).

DYRECT — Looks up the name of a file on a device index. The index information is contained in INDEX and ILEN and the unit in FUNIT. The name of the file is in FNAME and the type of file (source or binary) in FTYPE (1 or 2). There are two types of files: input and output. If FWHAT=1, then it is an input file. If the file exists, then the starting block number is left in FBNUM and the length in FSIZE. If the file does not exist, the routine issues a "NO" display. If the file is output, you

supply the length in FSIZE and the routine will return the block number in FBNUM. The routine handles the "REPLACE" and the "NO" messages.

DECODE
XYZ

This routine will get a line from the Teletype, check its syntax, and then return. It will display the user's message at XYZ (see DISPLAY) in addition to displaying a "REPLY". The reply is of the form:

X	1234	;	ABCDEFGH	,	4321
single letter	octal number		8 six bit characters		octal number

The first letter goes in the location "FTYPE" in 8 bit ASCII, the first octal number goes into FUNIT, the 8 character name goes into FNAME through FNAME+2 (filled by 77's), and the last number goes into FSIZE. Any missing numbers go to 0, any characters missing from the FNAME go to 77.

MOVE
FROMLOC
TOLOC
NUMBER

The move subroutine will move NUMBER number of words from FROMLOC to TOLOC.

NOO

Displays the word "NO" on the screen. It never returns.

REPLACE

Displays the word "REPLACE" on the screen and waits for an R. If an R is typed, it returns. Replace does a PUSH on entry and a POP on exits.

READ (or WRITE)
UNIT #
Core Loc. (starting loc of transfer)
Number of blocks to transfer
First block of transfer

These are the calls to the Mass Storage I/O Handler. UNIT # is the device number (0-7 = tapes 0 -7; 10-17 are disk units; 20-77 are unassigned yet; 100-7777 an error condition occurs). If you overflow from location 7777, the routines will automatically read into location 0 of field 1, and so on. PIP uses essentially the same RF08 and RK08 routines as BUILD. For a detailed description see DEC -12-ZR5A-D.

SEARCH
CHECKLIST
GOTOLIST

```
CHECKLIST,  301
            302
            303
            320
            307
           4215

           bit 0 on = end of list

GOTOLIST,   AFOUND
            BFOUND
            CFOUND
            PFOUND
            GFOUND
            CARRET
```

This routine checks the contents of FTYPE with the list pointed to by the first argument and, if found, goes indirectly to the corresponding position on the second list. If not found, it returns. Note that bit 0 is the end of list indicator. Therefore, only values between 0 and 3777 may be checked using this routine.

AUXIN Gets a character from the device specified by BFLAG1.

BFLAG1 = 1 Teletype
= 2 High speed reader
= 3 Card reader

Any other values should not be used.

AUXOUT This puts a character on the specified device.

BFLAG = 1 Teletype
= 2 High speed punch
= 3 Line printer

Important lower core locations:

0000 is used by JMP's in LMODE
0001 is used for displaying characters

AUTO 1-AUTO 8 (10-17)

Used for auto registers.

TEMP
TEMP1 thru TEMP4

These may be used as temporary locations at any time. Remember that as a routine is called, that routine is also free to use them.

KEYCHAR Last character typed on the TTY.

BNUM Number of 400_8 word blocks that can be used for buffers.

INBLOCK through OUTNUM See COPY.

INDEX Contains starting block number of the DIAL index (normally 346).

ILEN Contains the blocks length of the index (normally 2).

ELOWER Lowest block on the device.

EUPPER Highest block on the device.

CLOWER Lowest block the system uses on the device.

CUPPER Last block the system uses on the device.

FBLOCK AREA
FSIZE thru FNAME 3

FSIZE generally the length of the file (in blocks).

FUNIT unit on which the file sits.

FTYPE 1 = source
2 = binary
anything else = wrong

FWHAT 1 = input
2 = output
anything else = wrong

FBNUM starting block of the file.

FNAME name of the file (8 characters = 4 words).

3.0 ADDING OR DELETING DEVICES TO PIP

3.1 MASS STORAGE

Mass storage I/O is all done by calling the system read and write routines. By looking at the mass storage routine (approximate location 1400) the reader can see the general call is:

```
READ (or WRITE)
unit number
first core location of transfer
number of blocks to transfer
first block number of transfer
```

The key to selecting the type of device lies in bits 6-8 of the unit number word. There are, therefore, a maximum of 8 possible types of mass storage devices which PIP may use. At present, only device type 0 (units 0-7) is implemented as LINC tape. Type 1 (units 10-17) is now the RF08 or the RK08. Type 2, 3, and 4 (devices 20-47) are used for additional RK08 drives. Slots 5-7 (units 40-77) are free and there are no plans to use any of these in the immediate future. These slots have a "NOSUCH" in them so that if they are referenced, they will merely JMS to NOSUCH. NOSUCH will display an error message. Note that this should not happen in practice, because PIP should not try to address imaginary units.

Assume the reader wants to add a new mass storage device (for example, a drum) to be called device "7". At location 1411 (the last word of the input slots) put the address of your read routine. Then, whenever PIP attempts to read from a unit on device 7 (units 70-77), it will call this read routine in the manner just discussed. The write routine uses the same principle, with the exception that the address routine goes at location 1423 (the last write slot).

All that now remains is to tell the particular handler about the new device now made available for it to use. You would probably want to add it to the scope message; because that is merely adding one line in the middle of the desired text statement, it will not be discussed further. Assuming that you wish to tell the COPY handler about the new device, consider the following sequence. At location ACOPY (approximately 5626) the COPY routine calls DECODE to get the unit. It then checks for an "L" for LINC tape (314) and for a "D" for drum. Notice that the LINC tape unit number is ANDed with 0007. This ensures a unit between 0 and 7, which is device 0, which is the LINC tape routines. For this device 7, AND the unit with 0007 and then add 0070. This ensures the unit as being between 70 and 77. COPY logic will do the rest, including calling the mass storage routines with the unit selected, which in turn will call the

particular handler. That is basically all there is to adding another device.

3.2 SEQUENTIAL DEVICES

Sequential devices are selected by program switches (BFLAG1 and BFLAG2). To insert or remove a sequential device, add a BFLAG test in SEQIN or SEQOUT, the input and output routines. The exact nature of the device is then unimportant, as is the actual testing of the BFLAG switch. As an example of this, a brief description of the card read routine is in order.

The card reader is at present the most complicated sequential device on PIP. It differs from most other devices in that it has a limited amount of time to read in a mass of data. For this reason, it has its own buffer. The card routine is initialized by call CDINIT. This sets certain flags and stores the limits on the card columns to be read in. The main entry point is CDREAD. This routine actually checks BFLAG1 and then returns to the third address after the call if BFLAG1≠3. It returns to the first location if the data is not yet ready. It returns to the second location if the data is ready with a character in the AC. The routine reads in an entire 80 column card into CDBUF. The buffer is 40_{10} words long because BCD is only 6 bit. After an entire card is read in, it then translates it to 6 bit ASCII. This is done by using the CDTAB which is a table of the 6 bit ASCII characters. The characters are arranged positionally to correspond to the values of the BCD. As an example, the translation of the character "A" follows.

A has the numerical value 61 in BCD from the card reader. The table CDTAB is packed two characters to a word. Therefore 61/2 = 30+ Remainder. This may be taken as meaning the 30th character from the table CDTAB, right, as opposed to left if the remainder was 0. The contents of CDTAB+30 is 01, which is indeed the ASCII value of "A". It then stores this correct value back in the card buffer CDBUF until it translates the entire card. Then it will give the characters back to the user on an individual basis. When it has exhausted CDBUF, it reads in another card and translates it. The translation table CDTAB is set up for the IBM-029 Keypunch code. This table may be reshuffled or changed in any way, as long as blank is always the only character to have the 00 value.

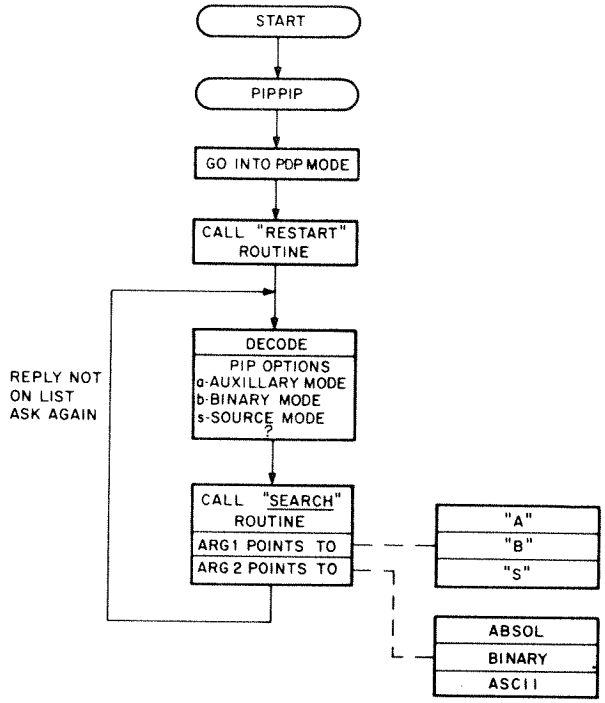
4.0 FLOWCHARTS (Attached)

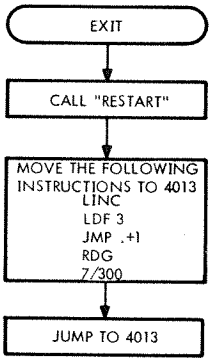
PIP FLOWCHART CONVENTIONS

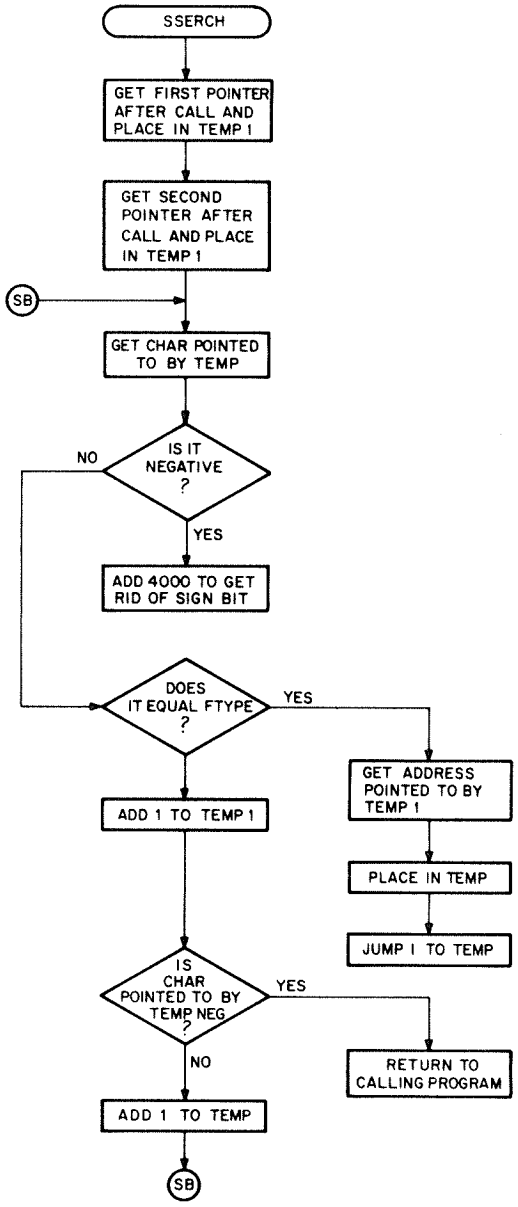
An underlined name means that routine has been called. A name in quotes ("F") means that is the message now being displayed. A subdivided box means that the rest of the box is the argument to the subroutine which is being called. RETURN at the end of a subroutine means return to the calling program.

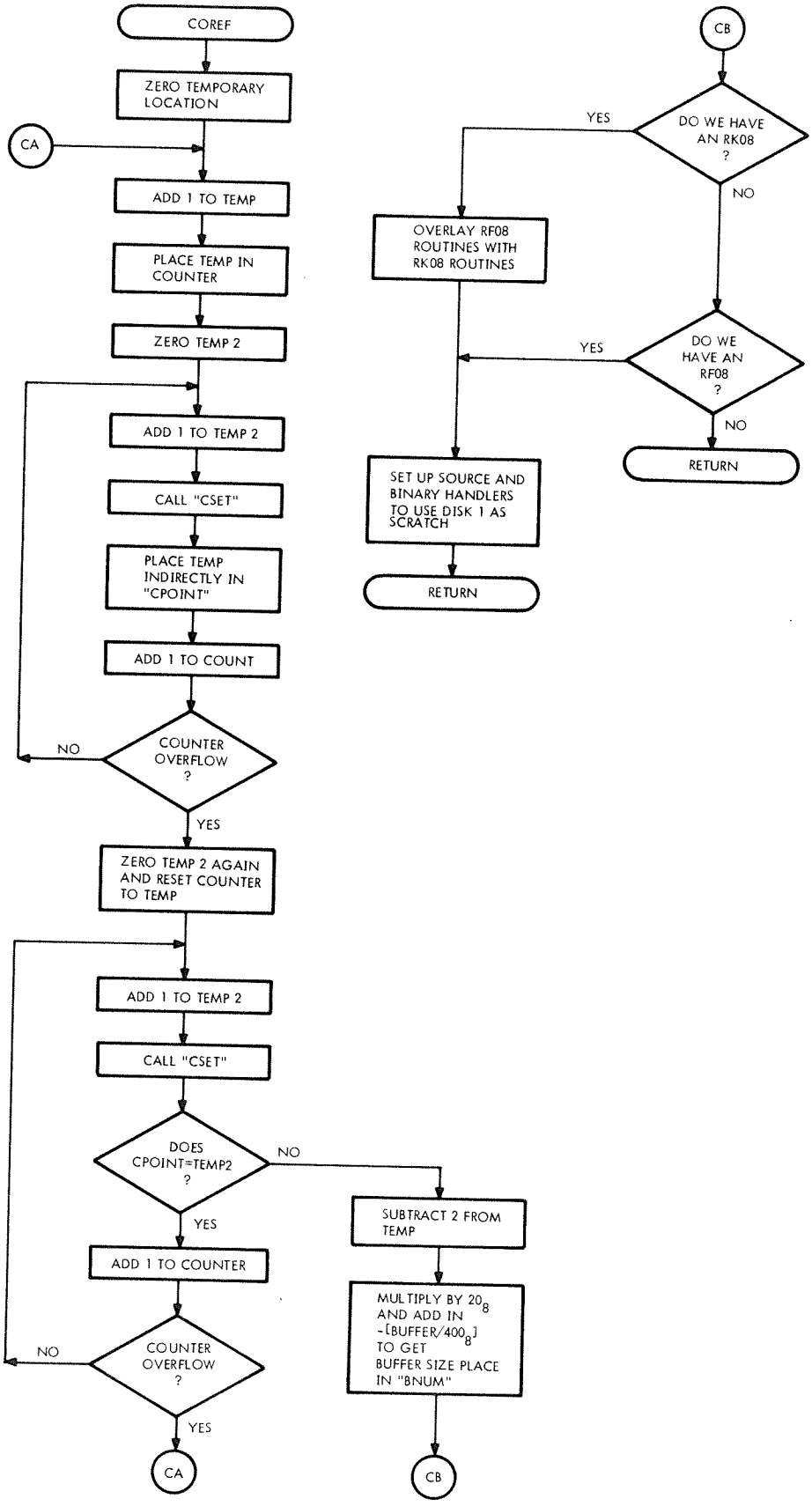
5.0 LISTINGS (Attached)

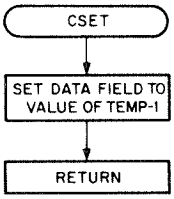
The Disk I/O routines are functionally the same as the DIAL-MS routines. For a more detailed description and flowchart, refer to DEC-12-ZR5B-D.

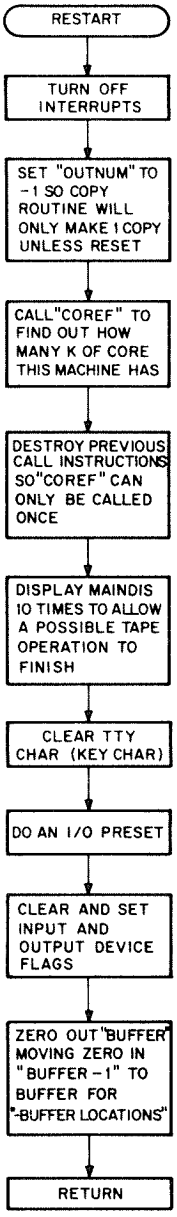

START
PIPPIP
GO INTO PDP MODE
CALL "RESTART" ROUTINE
DECODE
PIP OPTIONS
a-AUXILLARY MODE
b-BINARY MODE
s-SOURCE MODE
?
REPLY NOT ON LIST ASK AGAIN
CALL "SEARCH" ROUTINE
ARG1 POINTS TO
ARG 2 POINTS TO
"A"
"B"
"S"
ABSOL
BINARY
ASCII

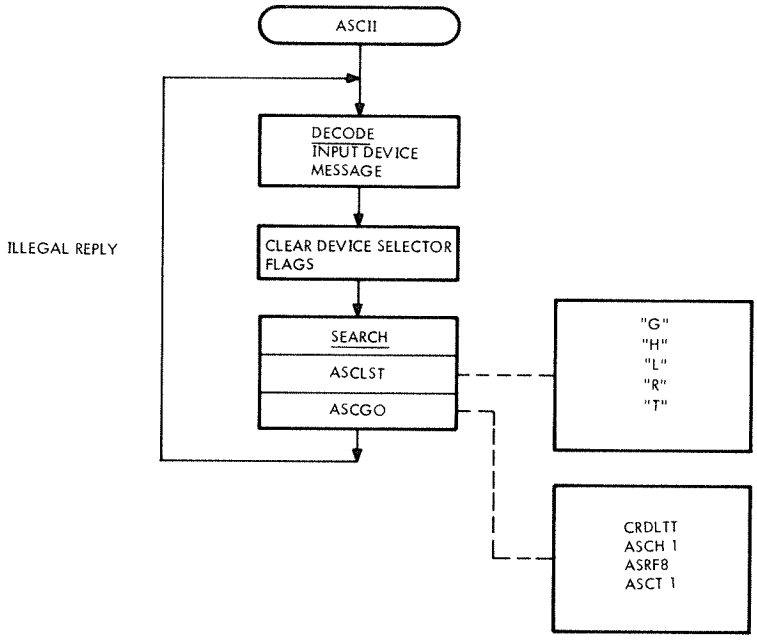

EXIT
CALL "RESTART"
MOVE THE FOLLOWING INSTRUCTIONS TO 4013
LINC
LDF 3
JMP .+1
RDG
7/300
JUMP TO 4013

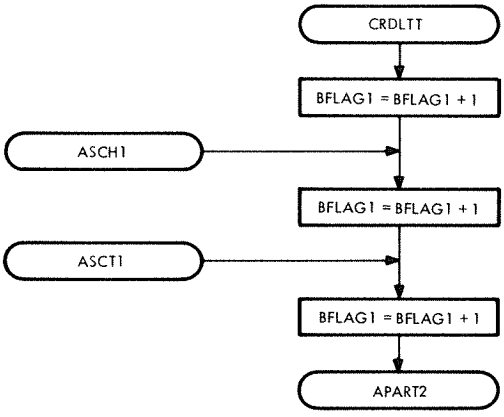

SSERCH
GET FIRST POINTER AFTER CALL AND PLACE IN TEMP 1
GET SECOND POINTER AFTER CALL AND PLACE IN TEMP 1
SB
GET CHAR POINTED TO BY TEMP
IS IT NEGATIVE ?
NO
YES
ADD 4000 TO GET RID OF SIGN BIT
DOES IT EQUAL FTYPE ?
YES
GET ADDRESS POINTED TO BY TEMP 1
PLACE IN TEMP
JUMP I TO TEMP
ADD 1 TO TEMP 1
IS CHAR POINTED TO BY TEMP NEG ?
YES
NO
RETURN TO CALLING PROGRAM
ADD 1 TO TEMP
SB

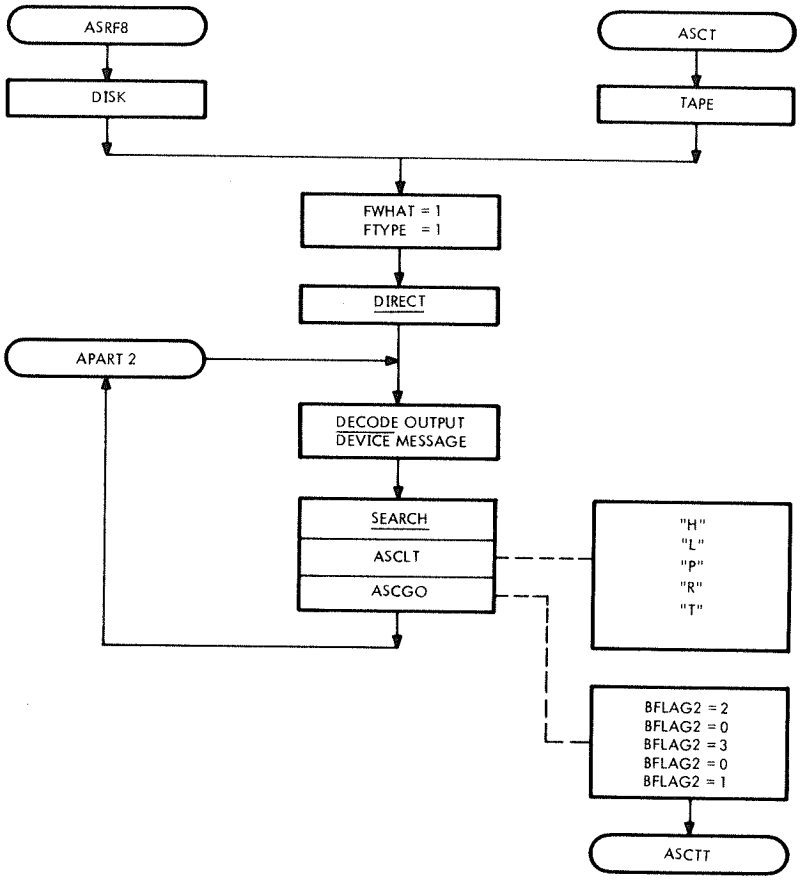

COREF
ZERO TEMPORARY LOCATION
CA
ADD 1 TO TEMP
PLACE TEMP IN COUNTER
ZERO TEMP 2
ADD 1 TO TEMP 2
CALL "CSET"
PLACE TEMP INDIRECTLY IN "CPOINT"
ADD 1 TO COUNT
COUNTER OVERFLOW ?
NO
YES
ZERO TEMP 2 AGAIN AND RESET COUNTER TO TEMP
ADD 1 TO TEMP 2
CALL "CSET"
DOES CPOINT=TEMP2 ?
NO
YES
ADD 1 TO COUNTER
COUNTER OVERFLOW ?
NO
YES
CA
SUBTRACT 2 FROM TEMP
MULTIPLY BY 20_8 AND ADD IN $-[BUFFER/400_8]$ TO GET BUFFER SIZE PLACE IN "BNUM"
CB
CB
DO WE HAVE AN RK08 ?
YES
NO
OVERLAY RF08 ROUTINES WITH RK08 ROUTINES
DO WE HAVE AN RF08 ?
YES
NO
RETURN
SET UP SOURCE AND BINARY HANDLERS TO USE DISK 1 AS SCRATCH
RETURN

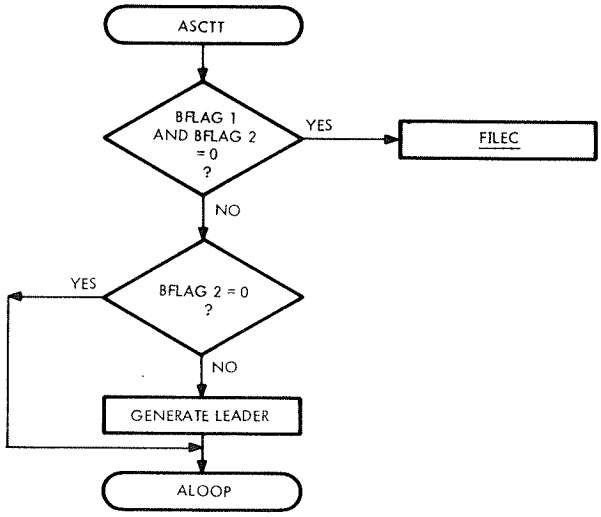

CSET
SET DATA FIELD TO VALUE OF TEMP-1
RETURN

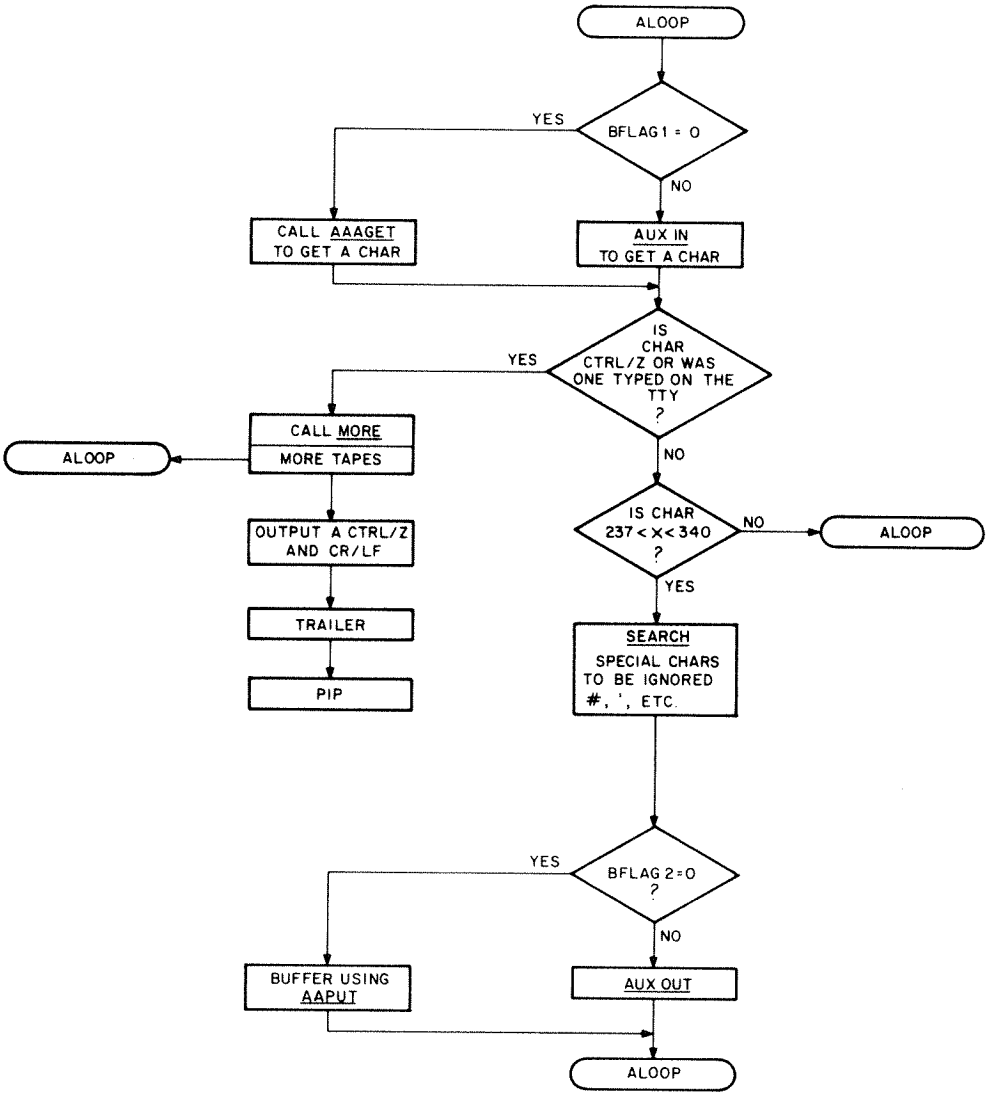

RESTART
TURN OFF INTERRUPTS
SET "OUTNUM" TO -1 SO COPY ROUTINE WILL ONLY MAKE 1 COPY UNLESS RESET
CALL"COREF" TO FIND OUT HOW MANY K OF CORE THIS MACHINE HAS
DESTROY PREVIOUS CALL INSTRUCTIONS SO"COREF" CAN ONLY BE CALLED ONCE
DISPLAY MAINDIS 10 TIMES TO ALLOW A POSSIBLE TAPE OPERATION TO FINISH
CLEAR TTY CHAR (KEY CHAR)
DO AN I/O PRESET
CLEAR AND SET INPUT AND OUTPUT DEVICE FLAGS
ZERO OUT "BUFFER" MOVING ZERO IN "BUFFER-1" TO BUFFER FOR "-BUFFER LOCATIONS"
RETURN

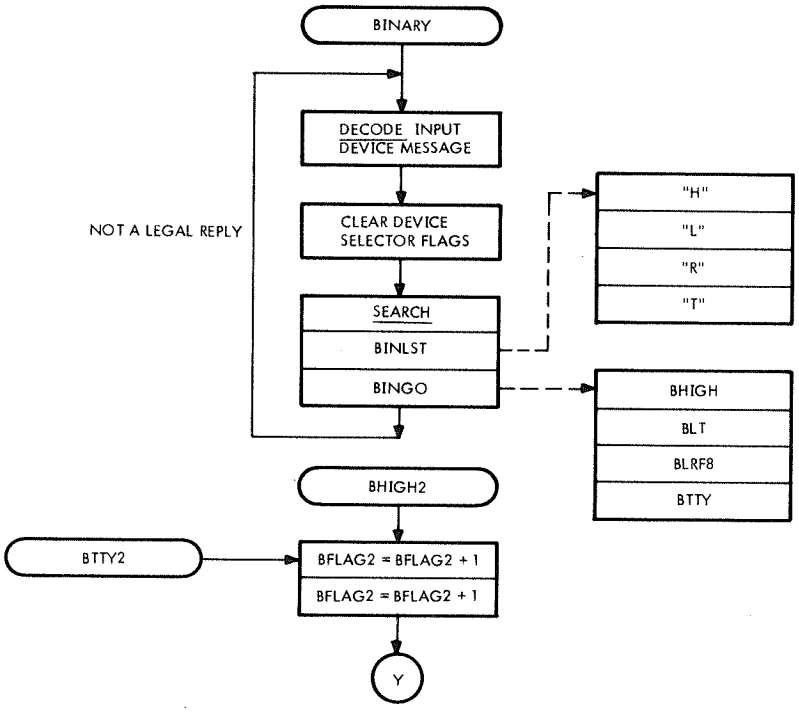

ASCII
DECODE
INPUT DEVICE
MESSAGE
ILLEGAL REPLY
CLEAR DEVICE SELECTOR
FLAGS
SEARCH
ASCLST
ASCGO
"G"
"H"
"L"
"R"
"T"
CRDLTT
ASCH 1
ASRF8
ASCT 1

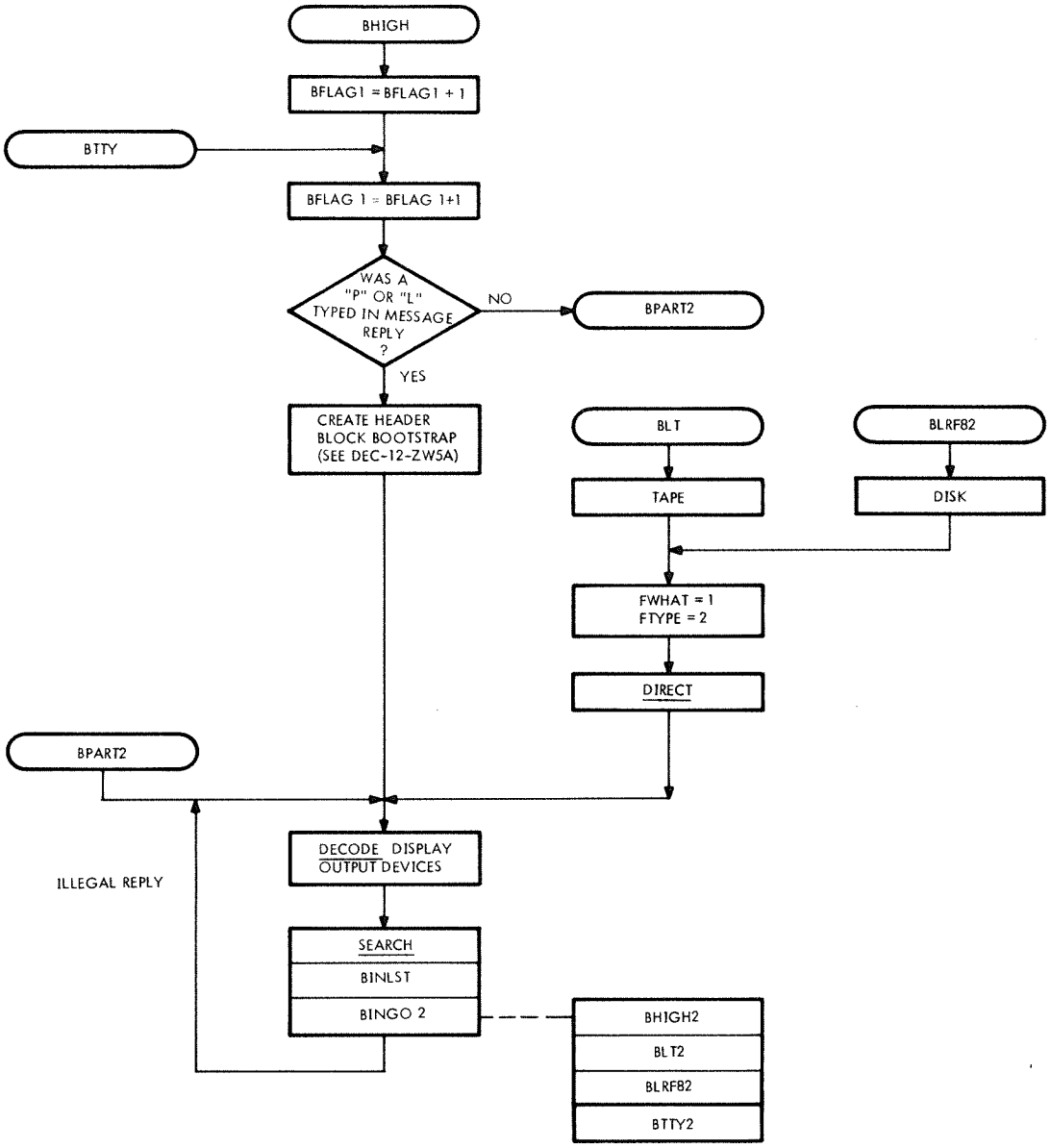

CRDLTT
BFLAG1 = BFLAG1 + 1
ASCH1
BFLAG1 = BFLAG1 + 1
ASCT1
BFLAG1 = BFLAG1 + 1
APART2

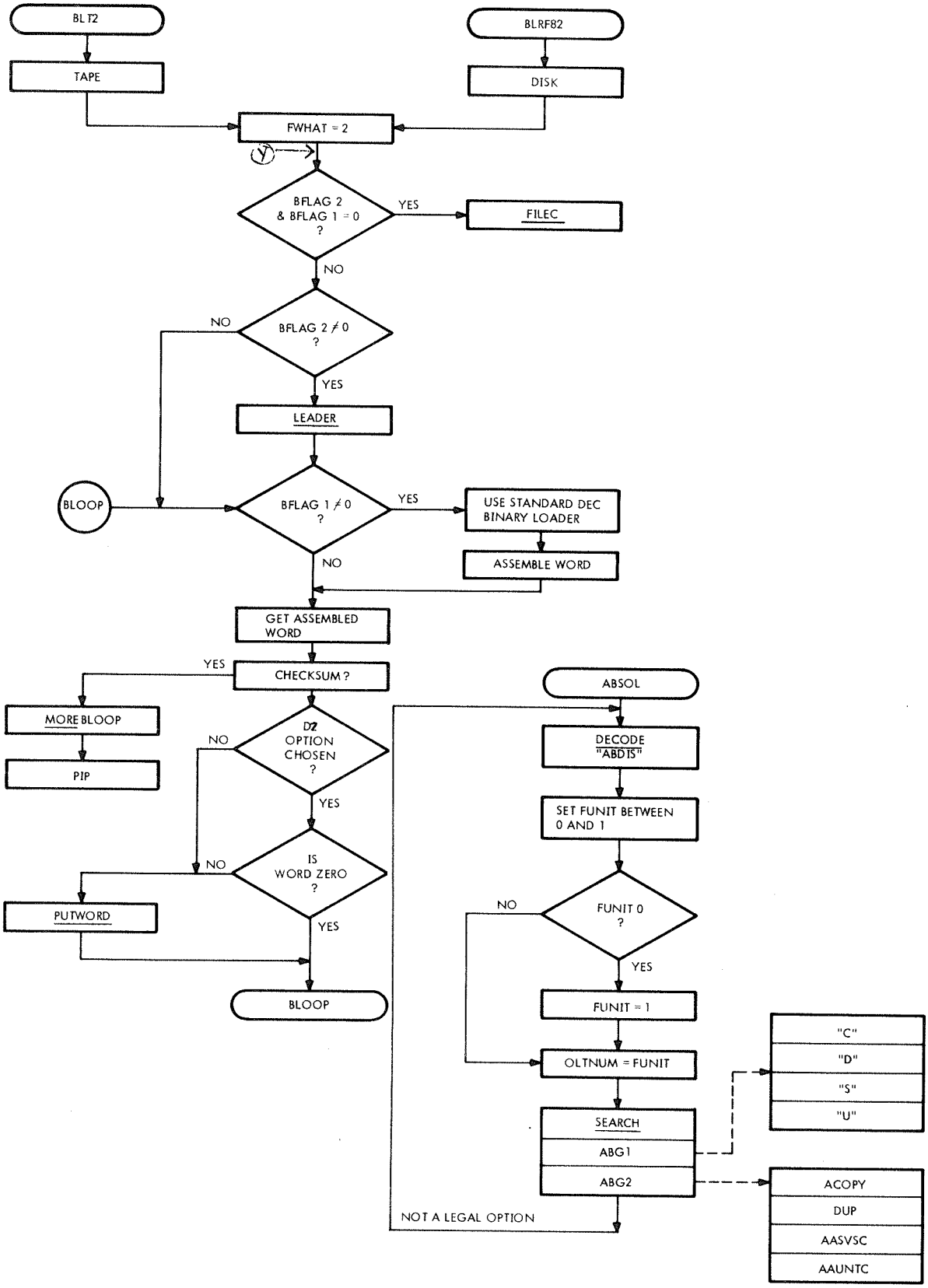

ASRF8
DISK
ASCT
TAPE
FWHAT = 1
FTYPE = 1
DIRECT
APART 2
DECODE OUTPUT
DEVICE MESSAGE
SEARCH
ASCLT
ASCGO
"H"
"L"
"P"
"R"
"T"
BFLAG2 = 2
BFLAG2 = 0
BFLAG2 = 3
BFLAG2 = 0
BFLAG2 = 1
ASCTT

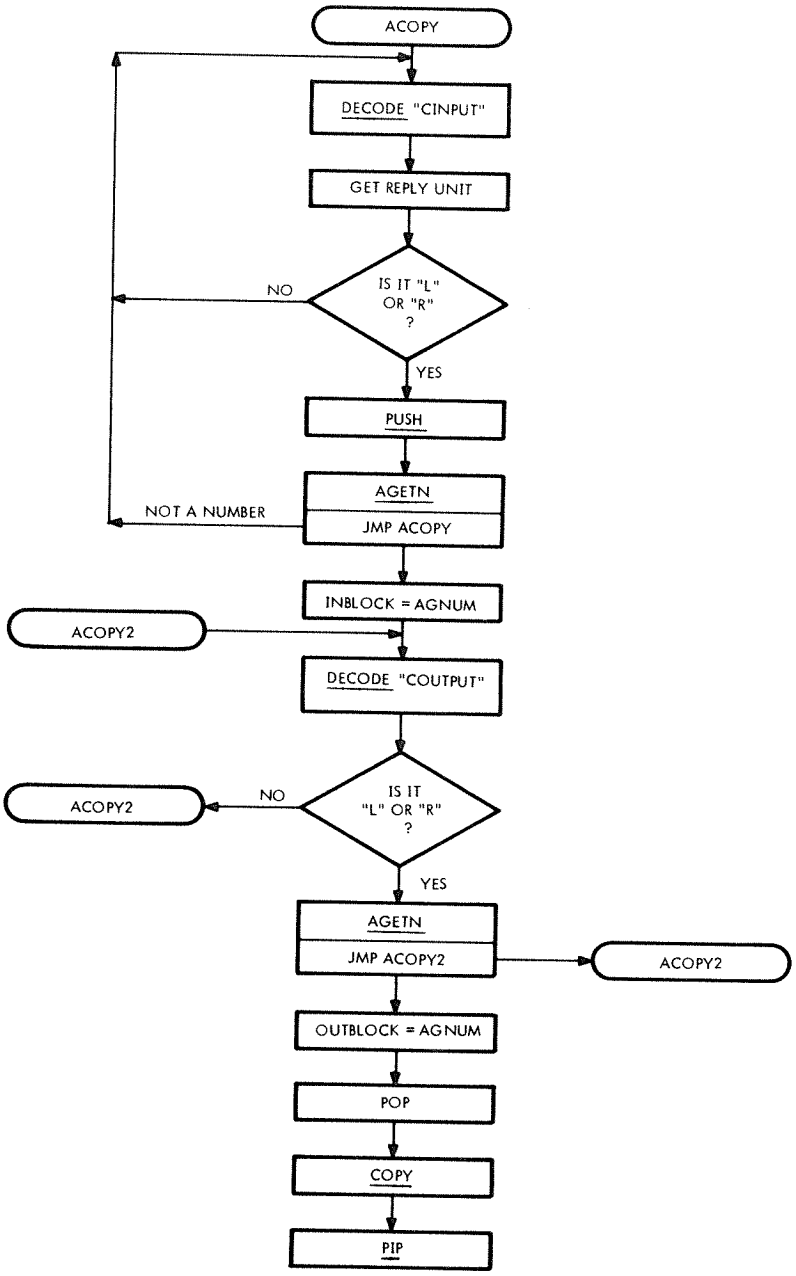

ASCTT
BFLAG 1
AND BFLAG 2
= 0
?
YES
FILEC
NO
BFLAG 2 = 0
?
YES
NO
GENERATE LEADER
ALOOP

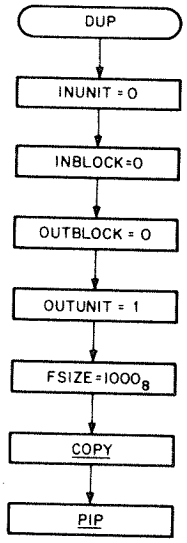

ALOOP
BFLAG1 = 0
YES
NO
CALL AAGET TO GET A CHAR
AUX IN TO GET A CHAR
IS CHAR CTRL/Z OR WAS ONE TYPED ON THE TTY ?
YES
NO
CALL MORE MORE TAPES
ALOOP
OUTPUT A CTRL/Z AND CR/LF
TRAILER
PIP
IS CHAR 237 < X < 340 ?
NO
ALOOP
YES
SEARCH SPECIAL CHARS TO BE IGNORED #, ', ETC.
BFLAG 2=0 ?
YES
NO
BUFFER USING AAPUT
AUX OUT
ALOOP


BINARY
DECODE INPUT
DEVICE MESSAGE
CLEAR DEVICE
SELECTOR FLAGS
NOT A LEGAL REPLY
SEARCH
BINLST
BINGO
"H"
"L"
"R"
"T"
BHIGH
BLT
BLRF8
BTTY
BHIGH2
BTTY2
BFLAG2 = BFLAG2 + 1
BFLAG2 = BFLAG2 + 1
Y


BHIGH
BFLAG1 = BFLAG1 + 1
BTTY
BFLAG 1 = BFLAG 1+1
WAS A "P" OR "L" TYPED IN MESSAGE REPLY ?
NO
BPART2
YES
CREATE HEADER BLOCK BOOTSTRAP (SEE DEC-12-ZW5A)
BLT
BLRF82
TAPE
DISK
FWHAT = 1
FTYPE = 2
DIRECT
BPART2
DECODE DISPLAY OUTPUT DEVICES
ILLEGAL REPLY
SEARCH
BINLST
BINGO 2
BHIGH2
BLT2
BLRF82
BTTY2


BLT2
TAPE
BLRF82
DISK
FWHAT = 2
BFLAG 2 & BFLAG 1 = 0 ?
YES
FILEC
NO
BFLAG 2 ≠ 0 ?
NO
YES
LEADER
BLOOP
BFLAG 1 ≠ 0 ?
YES
USE STANDARD DEC BINARY LOADER
ASSEMBLE WORD
NO
GET ASSEMBLED WORD
CHECKSUM ?
YES
MORE BLOOP
PIP
DZ OPTION CHOSEN ?
NO
YES
IS WORD ZERO ?
NO
PUTWORD
YES
BLOOP
ABSOL
DECODE "ABDIS"
SET FUNIT BETWEEN 0 AND 1
FUNIT 0 ?
NO
YES
FUNIT = 1
OLTNUM = FUNIT
SEARCH
ABG1
ABG2
"C"
"D"
"S"
"U"
ACOPY
DUP
AASVSC
AAUNTC
NOT A LEGAL OPTION


ACOPY
DECODE "CINPUT"
GET REPLY UNIT
IS IT "L" OR "R" ?
NO
YES
PUSH
AGETN
JMP ACOPY
NOT A NUMBER
INBLOCK = AGNUM
ACOPY2
DECODE "COUTPUT"
IS IT "L" OR "R" ?
ACOPY2
NO
YES
AGETN
JMP ACOPY2
ACOPY2
OUTBLOCK = AGNUM
POP
COPY
PIP


DUP
INUNIT = 0
INBLOCK=0
OUTBLOCK = 0
OUTUNIT = 1
FSIZE=1000$_8$
COPY
PIP

```
0015                    /
0016                    /       DIAL PERIPERAL INTERCHANGE PROGRAM FOR THE PDP-12 COMPUTER.
0017                    /       COPYRIGHT 1969; DIGITAL EQUIPMENT CORPORATION, MAYNARD MASS.,01754
0020                    /       WRITTEN BY JACK BURNESS
0021                    /       RELEASED NOVEMBER, 1969.
0022                    /       UPDATED TO DIAL-MS MARCH, 1970.
0023                    /       UPDATED FOR CHAINING MAY 14,1970
0024                    /       UPDATED FOR MULTIPLE RK28S 8/12/70
0025                    /
0026                    /
0027                    /       PIP WILL RUN ON A PDP-12 B OR HIGHER.
0030                    /
0031                    /
0032                    /
0033                    /
0034                    /
0035                    /
0036                    /
0037                    /
0040                    /
0041                    /
0042                    /
0043                    /
0044                    /
0045                    /
0046                    /
0047                    /
0050                    /
0051                    /
0052                    /
0053                    /          PPPPPPPPP          IIIIIIIIIII       PPPPPPPPP
0054                    /          P       PP             II           P       PP
0055                    /          P       PPP            II           P       PPP
0056                    /          P       PP             II           P       PP
0057                    /          PPPPPPPPP              II           PPPPPPPPP
0060                    /          P                      II           P
0061                    /          P                      II           P
0062                    /          P                      II           P
0063                    /          P                      II           P
0064                    /          P                   IIIIIIIIIII     P
0065                    /
0066                    /
0067                    /
0070                    /
0071                    /
0072                    /
0073                    /
0074                    /
0075                    /
0076                    /
0077                    /
0100                    /
0101                    /
0102                            EJECT
-
```

```
0103                                *0                      /MAJOR PAGE 0 LOCATIONS.
0104                    /
0105                    /
0106                    /
0107                    /
0110    0000    0000                0                       /RESERVED FOR JMP S IN L MODE.
0111    0001    0000    LOC1,       0                       /USED BY DISPLAY ROUTINE.
0112                                TAPE=JMS I .
0113    0002    3340                TTAPE
0114                                HPOP=JMS I .
0115    0003    3321                HHPOP
0116                                HPUSH=JMS I .
0117    0004    3313                HHPUSH
0120                                LEADER=JMS I .
0121    0005    3303                LLEDER
0122                                FILEC=JMP I .
0123    0006    1515                FFILEC
0124                                PUTL=JMS I .
0125    0007    3361                TTYPUT
0126                    /
0127                    /
0130                                *10
0131    0010    0000    AUTO1,      0                       /AUTO REGISTER 1
0132    0011    0000    AUTO2,      0
0133    0012    0000    AUTO3,      0
0134    0013    0000    AUTO4,      0
0135    0014    0000    AUTO5,      0
0136    0015    0000    AUTO6,      0
0137    0016    0000    AUTO7,      0
0140    0017    0000    AUTO8,      0
0141                    /
0142                    /
0143                    /
0144                    /
0145                    /
0146                    /
0147                    /
0150                                RF08=1                  /SET THIS SWITCH TO 1 IF YOU WANT
0151                                                        /THE RF08 DISK HANDLER ASSEMBLED INTO PIP.
0152                                                        /ELSE SET THE SWITCH "RF08" TO 0.
0153                    /
0154                    /
0155                                DISKWORK=0001           /SET THIS SWITCH TO 0 IF YOU DO NOT WANT PIP TO
0156                                                        /AUTOMATICALLY USE THE RF08 DISK FOR
0157                                                        /THE BINARY AND SOURCE SCRATCH AREAS; IF AN RF08 DISK IS PRESENT.
0160                    /
0161                    /
0162                    /
0163                    /
0164                    /
0165                    /
0166                    /
0167                    CARD=1                              /SET THE CARD=1 TO CARD READER AND LINE PRINTER.
0170                    /                                    ELSE SET CARD TO 0.
0171                    /
0172                    /
0173                    TERMC=00                            /SET TO LOOK  OR A 00 AS THE EOF CHAR.
0174                    /
0175                    REMAKE=0                            /DO NOT LOAD IN THE SOURCE FILE CONVERTER.
0176                    /                                   REMAKE WAS ORIGINALLY 1 BUT THE CONVERT ROUTINES NO LONGER ARE NEEDED.
0177                    /
0200                    ECHO=1                              /SET THIS SWITCH TO 0 TUPPRESS ECHOING.
0201                    /
-
```

```
0202                    /
0203                    /
0204                    PFLICK=1                        /SET THIS SWITCH TO ONE TO CAUSE DISPLAY
0205                                                    /CHARACTERS TO ALTERNATE RANDOMLY BETWEEN
0206                                                    /CHANNELS 1&2. MAY BE SET TO ZERO
0207                                                    /TO PICK UP SPACE ON PAGES IF NEEDED, WITH
0210                                                    /NO ILL EFFECTS NOTED. A FRILL ONLY.
0211                    /
0212                    /
0213                    /
0214                    /
0215                    /
0216                    /
0217                    /
0220                    STAR20=1                        /SET TO 1 IF YOU WANT TO HAVE A "*20" AT THE BEGINNING OF EVERY FILE.
0221                    /                                ELSE SET STAR22 TO 0000/
0222                    /
0223                    /
0224                    /
0225                    /
0226                    /
0227                    /
0230                    /
0231                            DIALBOOT=300            /WHERE TO REREAD IN DIAL FROM
0232                            DIALSYS=300             /START OF FIRST BLOCK OF SYSTEM ABOVE FREE BLOCKS.
0233                            SYSWT=467               /LAST BLOCK OF DIAA WORK AREA.
0234                            TINDEX=346                      /TAPE INDEX BLOCK
0235                            TILEN=2                 /NUMBER OF BLOCKS IN INDEX
0236                            TLOWER=0                /FIRST BLOCK TO USE
0237                            TUPPER=777              /LAST BLOCK TO USE
0240                            TSYSLOWER=270           /START OF SYSTEM
0241                            TSYSUPPER=467           /LAST BLOCK OF SYSTEM.
0242                            SYSBBLOCK=370           /START OF BINARY WORK AREA.
0243                            SYSBIN=0001             /BINARY SCRATCH UNIT.
0244                            ASMIFZ  RF08&DISKWORK   /WHAT IS SPECIAL DISK UNIT
0245                            SYSBSP=0001             /NO SPECIAL SCRATCH UNITS.
0246                            ASMIFN  RF08&DISKWORK   /HOW ABOUT NOW???
0247                            SYSBSP=0011             /DEFINE PRIMARY SCRATCH AS DISK (INIT WILL DECIDE REST OF STORY)
0250                            SYSSBLOCK=370           /START OF ASCII WORK AREA.
0251                            SYSHDR=447              /BINARY HEADER BLOCK FOR "SB"2 COMMAND"
0252                    /
0253                    /
0254                    /
0255                    /
0256                    /
0257                    /
0260                    /               SOME BASIC DEFINITIONS
0261                    /
0262                    /
0263                    /
0264                    /
0265                    ZERO=CLA
0266                    PONE=ZERO+1                     /(AWWWW)
0267                    PTWO=PONE+4+100                 /CLA CLL IAC RAL
0270                    PTHREE=PTWO+20                  /CML
0271                    PFOUR=PTWO+2                    /(AWWW)
0272                    PSIX=PTHREE+2                   /RTL
0273                    MONE=CLA CMA
0274                    MTWO=CLA CLL CMA RAL
0275                    MTHREE=CLA CLL CMA RTL
0276                    LEFT=000                        /POINTER TO STARTING LEFT OF SCREEN
0277                    TOP=340                         /POINTER TO TOP OF SCREEN
0300                    BOTTOM=-400                     /SCREEN BOTTOM
-
```

```
0301                    /
0302                    /
0303                            ASMIFZ  CARD-1          /IF CARD READER IS IN
0304                    BUFFER=6400                     /SET THE BUFFER TO 6400
0305                            ASMIFN  CARD-1          /IF NO CARD READER
0306                    BUFFER=6000                     /THEN SET IR TO 6000
0307                    /                                IN ANY EVENT BUFFER MUST BE A MULTIPLE OF 400 OCTAL WORDS.
0310                    /
0311                    /
0312    0020    0020    L20,    20
0313    0021    7772    M16,    -16
0314                    L7772=M16
0315    0022    7774    M4,     -4
0316    0023    7760    M20,    -20
0317    0024    0077    L77,    77
0320    0025    0100    L100,   100
0321    0026    0200    L200,   200
0322    0027    7456    M322,   -322
0323    0030    4000    L4000,  4000
0324    0031    5000    L5000,  5000
0325    0032    6000    L6000,  6000
0326    0033    7000    L7000,  7000
0327    0034    7757    L7757,  7757
0330    0035    0060    L60,    60
0331    0036    0700    L700,   700
0332    0037    7766    M12,    -12
0333    0040    0400    L400,   400
0334    0041    0054    L54,    54
0335    0042    7724    M54,    -54
0336    0043    7720    M60,    -60
0337    0044    7710    M70,    -70
0340    0045    7705    M73,    -73
0341    0046    7701    M77,    -77
0342    0047    7777    L7777,  7777
0343    0050    7746    M32,    -32
0344    0051    0333    L333,   333
0345    0052    7744    M34,    -34
0346    0053    7700    L7700,  7700
0347    0054    0010    L10,    10
0350    0055    0004    L4,     4
0351    0056    7740    L7740,  7740
0352                    M40=L7740
0353    0057    2021    M5757,  -5757
0354    0060    0007    L7,     7
0355    0061    0030    L30,    30
0356    0062    7735    M43,    -43
0357    0063    7772    M6,     -6
0360    0064    7400    L7400,  7400
0361                    M400=L7400
0362                    /
0363                    /
0364    0065    0000    TEMP,   0
0365    0066    0000    TEMP1,  0
0366    0067    0000    TEMP2,  0
0367    0070    0000    TEMP3,  0
0370    0071    0000    TEMP4,  0
0371                    /
0372    0072    0000    KEYCHAR,0                       /CONTAINS THE CONTROL Z SWITCH.
0373    0073    0000    CNTRLZ, 0
0374    0074    0000    BNUM,   0
0375    0075    0000    DFIRST, 0
0376    0076    4413    PMORE,  MORE
0377    0077    0000    BWORD1, 0
-
```

```
0400    0100  0000  BWORD2, 0
0401    0101  0000  BDELZ,  Z                    /0=DONT DELETE ZEROS; NOT ZERO=DELETE ZEROS FROM BINARY OUTPUT
0402                /
0403    0102  0000  INBLOCK,Z
0404    0103  0000  INUNIT, Z
0405    0104  0000  OUTBLOCK,Z
0406    0105  0000  OUTUNIT,Z
0407    0106  0000  OUTNUM, Z
0410                /
0411                BFLAG1=INBLOCK
0412                BFLAG2=OUTBLOCK
0413                BOLDP=INUNIT
0414                BCHAR=OUTUNIT
0415                /
0416                /
0417                /
0420                /
0421                        ASMIFZ  RF08-1          /IF RF08 [RK08] DESIRED
0422    0107  0000  RKDRIV, Z                      /INSERT WORD FOR  UNIT NUMBER IN PAGE 0
0423                /
0424                /
0425                /
0426    0110  0346  INDEX,  TINDEX
0427    0111  0002  ILEN,   TILEN
0430    0112  0000  ELOWER, TLOWER
0431    0113  0777  EUPPER, TUPPER
0432    0114  0270  CLOWER, TSYSLOWER
0433    0115  0467  CUPPER, TSYSUPPER
0434                /
0435    0116  5757  L5757,  5757
0436    0117  0000  FSIZE,  0
0437    0120  0000  FUNIT,  0
0440    0121  0000  FTYPE,  0
0441    0122  0000  FBNUM,  0
0442    0123  0000  FWHAT,  0
0443    0124  7777  FNAME,  7777
0444    0125  7777          7777
0445    0126  7777          7777
0446    0127  7777          7777
0447                /
0450                /
0451    0130  0000  ORIGIN, 0
0452    0131  0000  DATA,   0
0453    0132  0000  BTEMP1, 0
0454    0133  0000  BTEMP2, 0
0455    0134  0000  BTEMP3, 0
0456    0135  0000  BFIELD, 0
0457    0136  0000  BOLDO,  0
0460    0137  0000  BOFIELD,0
0461    0140  0000  BCOUNT, 0
0462                /
0463                /
0464    0141  0000  COUNT,  0
0465    0142  0177  L177,   177
0466    0143  7563  M215,   -215
0467    0144  7566  M212,   -212
0470    0145  7401  M377,   -377
0471    0146  7540  M240,   -240
0472    0147  7440  M340,   -340
0473                /
0474                /
0475                /
0476                        ROR6=JMS I .            /SUBROUTINE ROTATES AC RIGHT 6 PLACES
-
```

```
0477    0150  0770          RSIX
0500                        DISPLAY=JMS I .
0501    0151  0600          PPDIS
0502                        PIP=JMP I .
0503    0152  0200          PIPPIP
0504                        DIAL=JMP I .
0505    0153  0246          EXIT
0506                        COPY=JMS I .
0507    0154  3214          CCOPY
0510                        SETA=JMS I .
0511    0155  1502          ASET
0512                        GETA=TAD I AUTO8
0513                        CHECKIO=JMS I .
0514    0156  0743          IOCHECK
0515                        ASMIFZ  ECHO            /ECHOING DESIRED?
0516                        ASMSKP  2               /NOPE. DON T ASSEMBLE CRLF PROCESS IN.
0517                        CRLF=JMS I .
0520    0157  0364          TTYCR
0521                        GETL=JMS I .
0522    0160  1105          TTYGET
0523                        LINE=JMS I .
0524    0161  1000          GLINE
0525                        DECODE=JMS I ,
0526    0162  2222          DDCODE
0527                        SYSERR=HLT
0530                        DIRECTORY=JMS I .
0531    0163  2400          DYRECT
0532                        MOVE=JMS I .
0533    0164  1527          MMOVE
0534                        POP=JMS I .
0535    0165  1560          PPOP
0536                        PUSH=JMS I .
0537    0166  1552          PPUSH
0540                        NO=JMS I .
0541    0167  3151          NODIS
0542                        REPLACE=JMS I .
0543    0170  3161          REPDIS
0544                        READ=JMS I .
0545    0171  1400          TREAD
0546                        WRITE=JMS I .
0547    0172  1412          TWRITE
0550                        SEARCH=JMS I .
0551    0173  0334          SSERCH
0552                        AUXIN=JMS I .
0553    0174  3711          SEQIN
0554                        AUXOUT=JMS I .
0555    0175  3747          SEQOUT
0556                        PUTWORD=JMS I .
0557    0176  4273          BBOUT
0560                        ASMIFZ  RF08            /DO WE WANT THE RF08 ROUTINES LOADED?
0561                        ASMSKP  2               /NO, SKIP PAST THE DEFINITIONS.
0562                        DISC=JMS I      .
0563    0177  1540          RFDISK
0564                /
0565                /
0566                /
0567                /
0570                /
0571                /
0572                /
0573                        EJECT
-
```

```
0574                    /
0575                    /
0576                    /
0577                    /
0600                    /
0601                    /
0602                    /                       P   I   P       C   E   N   T   R   A   L       L   O   O   P
0603                    /
0604                    /
0605                    /
0606                    /
0607                            *200
0610                    /
0611                    /
0612                    /
0613                    /
0614                    /
0615    0200    4216    PIPPIP, JMS     RESTART         /RESTART I-O DEVICES, CLEAN UP SYSTEM, ETC.
0616                            ASMIFN  ECHO            /DO A CRLF ONLY IF ECHOING.
0617    0201    4557            CRLF                    /GIVE INITIAL CARRIGE RETURN LINE FEED.
0620    0202    4562    PIPL,   DECODE                  /DISPLAY OPTIONS
0621    0203    0263            MAINDIS                 /FROM MY LIST OF GOODIES.
0622    0204    4573            SEARCH                  /LOOK FOR LEAGAL OPTIONS
0623    0205    0210            PIPLST                  /LIST OF PIP OPTIONS
0624    0206    0213            PIPGO                   /WHERE TO GO IF FOUND
0625    0207    5202            JMP     PIPL            /NOT A LEGAL REQUEST.
0626                    /
0627                    /
0630                    /
0631    0210    0301    PIPLST, 301                     /A=ABSOLUTE MODE
0632    0211    0302            302                     /B=BINARY MODE
0633    0212    4323            4323                    /S=SOURCE MODE, 4000=END LIST
0634                    /
0635    0213    5600    PIPGO,  ABSOL                   /ABSOLUTE HANDLER.
0636    0214    3400            BINARY                  /POINTER TO BINARY HANDLER
0637    0215    5000            ASCII                   /SOURCE HANDLER
0640                    /
0641                    /
0642                    /
0643                    /
0644                    /
0645    0216    0000    RESTART,0
0646    0217    4660            JMS I   SAVEST          /SAVE RK08STATUS BEFORE ZAPPER.
0647    0220    7240            MONE                    /SET UP COPIER FOR 1 COPY
0650    0221    3106            DCA     OUTNUM          /-NUMBER OF OUTPUT TAPES FOR COPY
0651    0222    4662    INITOV, JMS I   FCORE           /ALLOCATE CORE NOW, THIS IS LATER A "TAD 440".
0652    0223    3000            DCA     0
0653    0224    4551            DISPLAY                 /JUST WAIT A SECOND.
0654    0225    0263            MAINDIS
0655    0226    2000            ISZ     0
0656    0227    5224            JMP     .-3             /NOT DONE YET
0657    0230    3072            DCA     KEYCHAR         /NO NEW CHAR.
0660    0231    6141            LINC                    /ENTER LINC MODE
0661                            LMODE
0662    0232    2020            ADD     L20             /GET THE I/O PRESET BIT
0663    0233    0004            ESF                     /AND DO AA I/O PRESET
0664    0234    0002            PDP
0665                            PMODE
0666    0235    6026            6026
0667    0236    4661            JMS I   RESTST          /FIX UP RK08 NOW, IF NECESSARY.
0670    0237    6046            TLS                     /FIX UP THE TELEPUNCH NOW BY GIVING A PHOONEY CHARACTER.
0671                    /
0672                    LP0801, ASMIFZ  CARD-1          /SHOULD WE INITIALIZE PRINTER???
-
```

```
0673    0240  6662          LCB                     /YEP. CLEAR THE PRINTER BUFFER AND SET THE FLAG SO IT LL BE READY IF WE NEED
                             IT.
0674                       /
0675    0241  4564          MOVE                    /ZERO UPPER CORE BY A HIDEOUS MOVE.
0676    0242  6377          BUFFER-1
0677    0243  6400          BUFFER
0700                       ASMIFZ  RF08            /IF NO RF08 ZERO ALL OF CORE
0701                       -BUFFER
0702                       ASMIFN  RF08            /IF AN RF08 PRESENT ZERO ONLY BUFFER-7377
0703    0244  1000          -BUFFER-400
0704    0245  5616          JMP I   RESTART
0705                       /
0706                       /
0707                       /
0710    0246  4216  EXIT,   JMS     RESTART         /RESTART DIAL
0711    0247  4564  OVEREX, MOVE                    /PLACE DIAL RESTART INSTRUCTIONS
0712    0250  0254          READIN
0713    0251  4014  EXITLOC,4020-READEN+READIN      /IN PROPER PLACE FOR REBOOTSTRAP.
0714    0252  0004          READEN-READIN           /BOOTSTRAP IS 4 WORDS LONG
0715    0253  5651          JMP I   EXITLOC         /RETURN TO DIAL
0716                       /
0717                       /
0720    0254  6141  READIN, LINC                    /MAIN BOOTSTRAP.
0721                       LMODE                   /GET INTO LINC MODE FOR REBOOTSTRAP
0722    0255  0643          LDF     3               /MAKE SURE DATA FIELD IS SET AT 3
0723    0256  0701          RCG                     /READ GROUP
0724    0257  /300          7\DIALBOOT              /FROM 300.
0725                       PMODE                   /RESUME 8 MODE DEFINITIONS
0726                       READEN=.
0727                       /
0730                       /
0731                       /
0732                       /
0733                       /
0734                       /
0735    0260  4600  SAVEST, STATSV                  /POINTER TO RK08 SAVER
0736    0261  4562  RESTST, STATRS                  /POINTER TO THE RK08 FIXER.
0737                       /
0740                       /
0741                       /
0742                       /
0743                       /
0744                       /
0745                       /
0746                       /
0747                       /
0750                       /
0751                       /
0752                       /
0753    0262  6400  FCORE,  COREF                   /POINTER TO CORE INITIALIZER ROUTINE.
0754                       /
0755                       /
0756                       /
0757                       /
0760                       /
0761                       /
0762                       /
0763                       /
0764                       /
0765                       /
0766                       /
0767                       /
0770                       /
-
```

```
0771                    /
0772    0263    0240    MAINDIS,LEFT+240
0773    0264    0140            TOP=140
0774    0265    0620
0774    0266    1120
0774    0267    4017
0774    0270    2024
0774    0271    1117
0774    0272    1623
0774                    TEXT    "FPIP OPTIONS:
0775    0273    7243
0775
0776    0274    4043
0776
0777    0275    4043
0777    0276    1001
0777    0277    4055
0777    0300    5555
0777    0301    4001
0777    0302    2530
0777    0303    1114
0777    0304    1101
0777    0305    2231
0777    0306    4015
0777    0307    1704
0777                    HA --- AUXILIARY MODE
1000    0310    0543
1000    0311    1002
1000    0312    4055
1000    0313    5555
1000    0314    4002
1000    0315    1116
1000    0316    0122
1000    0317    3140
1000    0320    1517
1000                    HB --- BINARY MODE
1001    0321    0405
1001    0322    4310
1001    0323    2340
1001    0324    5555
1001    0325    5540
1001    0326    2317
1001    0327    2522
1001    0330    0305
1001    0331    4015
1001    0332    1704
1001    0333    0534
1001                    HS --- SOURCE MODE\"
1002                    /
1003                    /
1004                    /
1005                    /
1006                    /
1007                    /
1010                    /
1011    0334    0000    SSERCH, 0                       /COMPARES "FTYPE" AGAINST GIVEN LIST.
1012    0335    7300            CLA CLL                 /CLEAR AC TO BE SURE
1013    0336    1734            TAD I   SSERCH          /GET POINTER TO USER LIST
1014    0337    3065            DCA     TEMP            /AND STOORE AWAY
1015    0340    2334            ISZ     SSERCH          /BOP PAST FIRST ARG.
1016    0341    1734            TAD I   SSERCH          /GET JMP LIST
1017    0342    3066            DCA     TEMP1           /STORE POINTER N TEMP1
1020    0343    2334            ISZ     SSERCH          /BOP PAST SECOND ARG FOR RETRUN.
-
```

```
1021                    /
1022    0344    1465    SSLOOP, TAD I   TEMP            /GET NEXT WORD TO COAMPARE
1023    0345    7510            SPA                     /IF POSIITIVE SKIP
1024    0346    1030            TAD     L4000           /NEGATIVE. LAST CHAR. MAKE POSIITIVE FOR CHECK.
1025    0347    7041            CIA
1026    0350    1121            TAD     FTYPE           /DOES IT EQUAL CONTENTS O F  FTYPE
1027    0351    7640            SZA CLA
1030    0352    5356            JMP     SSNO            /NO. TEST FOR END
1031    0353    1466            TAD I   TEMP1           /YES. GET FOUND RETURN ADDRESS
1032    0354    3065            DCA     TEMP
1033    0355    5465            JMP I   TEMP            /AND GO THERE
1034                    /
1035    0356    2066    SSNO,   ISZ     TEMP1           /BOP UP JUMP TABLE POINTER
1036    0357    1465            TAD I   TEMP            /WAS THIS LAST CHARACTER?
1037    0360    7710            SPA CLA
1040    0361    5734            JMP I   SSERCH          /YEP. IT S   NEGATVIE
1041    0362    2065            ISZ     TEMP            /NOP. BOP UP CHAR POINTER AND TRY AGAIN
1042    0363    5344            JMP     SSLOOP          /BACK UP TO TRY NEXT.
1043                    /
1044                    /
1045                    /
1046                    /
1047                    /
1050                    /
1051                    /
1052                    /
1053                    /
1054                    /
1055                            ASMIFZ  ECHO            /DO WE WANT ECHOING???
1056                            ASMSKP  12              /NOPE. CR NEVER CALLED, SO DO NOT PUT IT IN.
1057                    /
1060    0364    0000    TTYCR,  0
1061    0365    1143            TAD     M215            /GET A C.R. IN THE AC.
1062    0366    7041            CIA
1063    0367    4407            PUTL                    /AND AWAY IT GOES
1064    0370    1144            TAD     M212            /N THE L.F.
1065    0371    7041            CIA
1066    0372    4407            PUTL                    /AND AWAY IT GOES
1067    0373    5764            JMP I   TTYCR           /AND RETURN TO CALLER.
1070                    /
1071                    /
1072                    /
1073                    /
1074                    /
1075                    /
1076                    /
1077                    /
1100                    /
1101                    /
1102                    /
1103                            EJECT
-
```

```
1104                            *400
1105                    /       DISPLAY CHARACTER TABLE.
1106                    /
1107                    TABLED=.
1110                    /
1111        0400  7777            7777            /00=ILLEGAL
1112        0401  7777            7777
1113        0402  4477            4477            /01=A
1114        0403  7744            7744
1115        0404  5177            5177            /02=B
1116        0405  2651            2651
1117        0406  4136            4136            /03=C
1120        0407  2241            2241
1121        0410  4177            4177            /04=D
1122        0411  3641            3641
1123        0412  4577            4577            /05=E
1124        0413  4145            4145
1125        0414  4477            4477            /06=F
1126        0415  4044            4044
1127        0416  4136            4136            /07=G
1130        0417  2645            2645
1131        0420  1077            1077            /10=H
1132        0421  7710            7710
1133        0422  7741            7741            /11=I
1134        0423  0041            0041
1135        0424  4142            4142            /12=J
1136        0425  4076            4076
1137        0426  1077            1077            /13=K
1140        0427  4324            4324
1141        0430  0177            0177            /14=L
1142        0431  0301            0301
1143        0432  3077            3077            /15=M
1144        0433  7730            7730
1145        0434  3077            3077            /16=N
1146        0435  7706            7706
1147        0436  4177            4177            /17=O
1150        0437  7741            7741
1151        0440  4477            4477            /20=P
1152        0441  3044            3044
1153        0442  4276            4276            /21=Q
1154        0443  0376            0376
1155        0444  4477            4477            /22=R
1156        0445  3146            3146
1157        0446  5121            5121            /23=S
1160        0447  4651            4651
1161        0450  4040            4040            /24=T
1162        0451  4077            4077
1163        0452  0177            0177            /25=U
1164        0453  7701            7701
1165        0454  0176            0176            /26=V
1166        0455  7402            7402
1167        0456  0677            0677            /27=W
1170        0457  7701            7701
1171        0460  1463            1463            /30=X
1172        0461  6314            6314
1173        0462  0770            0770            /31=Y
1174        0463  7007            7007
1175        0464  4543            4543            /32=Z
1176        0465  6151            6151
1177        0466  4177            4177            /33=[
1200        0467  0000            0000
1201        0470  7777            7777            /34=ILLEGAL
1202        0471  7777            7777
```

```
1203    0472  0000        0000        /35=]
1204    0473  7741        7741
1205    0474  2000        2000        /36=↑
1206    0475  2076        2076
1207    0476  7777        7777        /37=ILLEGAL
1210    0477  7777        7777
1211    0500  0000        0000        /40=SPACE
1212    0501  0000        0000
1213    0502  7500        7500        /41=!
1214    0503  0000        0000
1215    0504  7000        7000        /42="
1216    0505  0070        0070
1217    0506  7777        7777        /43=ILLEGAL
1220    0507  7777        7777
1221    0510  5721        5721        /44=DOLLAR SIGN
1222    0511  4671        4671
1223    0512  6661        6661        /45=PER CENT SIGN
1224    0513  4333        4333
1225    0514  5166        5166        /46=&
1226    0515  0526        0526
1227    0516  0000        0000        /47=TAB
1230    0517  0000        0000
1231    0520  3600        3600        /50=(
1232    0521  0041        0041
1233    0522  4100        4100        /51=)
1234    0523  0036        0036
1235    0524  2050        2050        /52=*
1236    0525  0050        0050
1237    0526  0404        0404        /53=+
1240    0527  0437        0437
1241    0530  0500        0500        /54=,
1242    0531  0006        0006
1243    0532  0404        0404        /55=-
1244    0533  0404        0404
1245    0534  0001        0001        /56=.
1246    0535  0000        0000
1247    0536  0601        0601        /57=/
1250    0537  4030        4030
1251    0540  4536        4536        /60=0
1252    0541  3651        3651
1253    0542  2101        2101        /61=1
1254    0543  0177        0177
1255    0544  4523        4523        /62=2
1256    0545  2151        2151
1257    0546  4122        4122        /63=3
1260    0547  2651        2651
1261    0550  2414        2414        /64=4
1262    0551  0477        0477
1263    0552  5172        5172        /65=5
1264    0553  0651        0651
1265    0554  1506        1506        /66=6
1266    0555  4225        4225
1267    0556  4443        4443        /67=7
1270    0557  6050        6050
1271    0560  5126        5126        /70=8
1272    0561  2651        2651
1273    0562  5122        5122        /71=9
1274    0563  3651        3651
1275    0564  2200        2200        /72=:
1276    0565  0000        0000
1277    0566  4601        4601        /73=;
1300    0567  0000        0000
1301    0570  1000        1000        /74=<
-
```

```
1302      0571  4224          4224
1303      0572  1212          1212            /75==
1304      0573  1212          1212
1305      0574  2442          2442            /76=>
1306      0575  0010          0010
1307      0576  4020          4020            /77=?
1310      0577  2055          2055
1311                /
1312                /
1313                /
1314                      EJECT
-
```

```
1315                            *600
1316                    /
1317                    /
1320                    /               DISPLAY ROUTINE
1321                    /
1322                    /               GENERAL CALL:
1323                    /
1324                    /       DISPLAY
1325                    /       PTEXT
1326                    /               WHERE PTEXT POINTS TO THE FOLLOWING:
1327                    /
1330                    /PTEXT, XCOOR.
1331                    /       YCOOR
1332                    /       TEXT    "F THIS IS MY MESSAGE\"
1333                    /
1334                    /
1335    0600    0000    PPDIS,  0                       /MAIN ENTRY
1336    0601    7300    PINST1, CLA CLL                 /CLEAR AC.
1337    0602    4556            CHECKIO                 /CHECKIO FOR IO NOW AND AFTER EVERY C,R.
1340    0603    1600            TAD I   PPDIS           /GET MAIN POINTER
1341    0604    3331            DCA     PDIS            /AND PLACE IN TEMP POINTER.
1342    0605    2200            ISZ     PPDIS           /PAST POINTER ON RETURN.
1343    0606    1731            TAD I   PDIS            /GET POINTER
1344    0607    3332            DCA     PHOR            /X POS
1345    0610    2331            ISZ     PDIS            /BOP UP
1346    0611    1731            TAD I   PDIS            /GET VERTICAL
1347    0612    3333    PDCAVR, DCA     PVER            /AND STASH AWAY.
1350    0613    1331            TAD     PDIS            /START OF TEXT
1351    0614    3334            DCA     PSTART          /BOP DOWN BY 1
1352    0615    7240            MONE                    /SET SWITHC TO LEFT OF NEXT WORD.
1353    0616    3335            DCA     PSWITCH
1354    0617    1201            TAD     PINST1          /GET A CLA FOR FIRST TIME THROUGH.
1355    0620    3251            DCA     PNOT1           /AND STORE SO NO VERTICAL BOP.
1356                    /
1357    0621    4302    PPSTART,JMS     PGETL           /GET NEXT CHAR FROM TEXT.
1360    0622    7240            MONE                    /SET CHAR SIZE TO HALFWORD
1361    0623    3337            DCA     PCSW            /IN CASE OF NO F OR H.
1362    0624    1336            TAD     PCHAR           /GET IN AC.
1363    0625    1021            TAD     M10             /IS IT AN "H"
1364    0626    7650            SNA     CLA             /IF IT IS,SKIP PAST AND IGNORE.
1365    0627    5235            JMP     PPAST           /ITS AN "H"
1366    0630    1336            TAD     PCHAR
1367    0631    1063            TAD     M6              /IS IT AN "F"
1370    0632    7640            SZA     CLA
1371    0633    5236            JMP     PDO             /NOT AN "F" OR AN "H", USE IT AS A CHAR IN HALFWORD.
1372    0634    3337            DCA     PCSW            /SET SIZE TO FULL.
1373    0635    4302    PPAST,  JMS     PGETL           /GET FIRST CHAR TO BE DISPLAYED.
1374    0636    1337    PDO,    TAD     PCSW            /GET SIZE.
1375    0637    7650            SNA     CLA             /IS IT FULL SIZE.
1376    0640    1022            TAD     M4              /YES, SET BACK LEFT BY 8.
1377    0641    1022            TAD     M4              / IF HALF SET IT BACK BY 4.
1400    0642    1332            TAD     PHOR
1401    0643    3001            DCA     LOC1            /THIS IS A REAL LOC1(0001)
1402    0644    1337            TAD     PCSW            /GET SIZE
1403    0645    7650            SNA     CLA             /FULL?
1404    0646    1023            TAD     M20             /YES. BOP DOWN BY 40, NOT 20
1405    0647    1023            TAD     M20             /M20 IF HALF SIZE
1406    0650    1333            TAD     PVER
1407    0651    3333    PNOT1,  DCA     PVER            /MADE A CLA FOR THE FIRST TIME THROUGH
1410    0652    1212            TAD     PDCAVR          /GET CORRECT INST.
1411    0653    3251            DCA     PNOT1           /SET UP FOR FUTURE CALLS.
1412    0654    1337            TAD     PCSW            /CHAR SIZE.
1413    0655    7040            CMA                     /COMPLEMENT BIT.
-
```

```
1414    0656  0026          AND     L200          /BIT4 OF ESF
1415    0657  6141          LINC
1416                        LMODE                 /GET INTO LINC MODE
1417    0660  0004          ESF                   /SET CHARS TO CORRECT SIZE
1420    0661  0002          POP                   /BACK OVER INTO 8 MODE
1421                        PMODE
1422    0662  7200          CLA                   /CLEAR THE AC BECAUSE THE SIZE IS STILL IN THE AC
1423                /
1424    0663  1336  PLOOP,  TAD     PCHAR         /GET THE CHAR IN THE AC,
1425    0664  7104          CLL RAL               /MULTIPLY BY 2.
1426    0665  1347          TAD     PTABLE        /POINTER TO DISPLAY TABLE.
1427    0666  3016          DCA     AUTO7         /AUTO FOR PICKING UP THE DISPLAY CHARS.
1430    0667  1333          TAD     PVER          /GET THE VERTICAL IN THE AC.
1431    0670  6141          LINC                  /GO OVER TO LMODE AND START TO DISPLAY.
1432                        LMODE
1433    0671  1776          DSC I   AUTO7         /FIRST PART OF CHAR
1434    0672  1776          DSC I   AUTO7         /SECOND PART OF CHAR.
1435    0673  0002          POP
1436                        PMODE                 /BACK INTO 8 MODE
1437    0674  7305          PTWO                  /GET A +2 IN THE AC
1440    0675  1001          TAD     LOC1          /GET NEXT DISPLAY POINT.
1441    0676  3001          DCA     LOC1          /AND BOP BY 1/2 CHAR.
1442                        ASMIFN  PFLICK        /DO WE WANT TO ALTERNATE CHANNELS?
1443    0677  4730          JMS I   PALT          /YES. ADD IN RANDOM CHANNEL BITS NOW.
1444    0700  4302          JMS     PGETL         /GET ANOTHER CHARACTER.
1445    0701  5263          JMP     PLOOP         / AND DISPLAY IT.
1446                /
1447    0702  0000  PGETL,  0                     /CHAR GETTER ROUTINE
1450    0703  2335          ISZ     PSWITCH       /IS IT LEFT HALF?
1451    0704  5311          JMP     PRIGHT        /GET CHARACTER
1452    0705  2334          ISZ     PSTART        /GET NEXT WORD
1453    0706  1734          TAD I   PSTART        /IN THE AC
1454    0707  4550          ROR6                  /ROTATE LEFT HALF TO THE RIGHT HALF.
1455    0710  5314          JMP     PCOM          /GO DO THE AND.
1456    0711  7240  PRIGHT, MONE                  /RESET SWITCH
1457    0712  3335          DCA     PSWITCH       /FOR NEW WORD NEXT TIME.
1460    0713  1734          TAD I   PSTART        /WORD IN AC
1461    0714  0024  PCOM,   AND     L77           /JUST THE LOW ORDER BITS.
1462    0715  3336          DCA     PCHAR         /SAVE FOR LATTER USE.
1463    0716  1336          TAD     PCHAR         /BACK IN AC.
1464    0717  1052          TAD     M34           /IS IT "\"
1465    0720  7650          SNA     CLA
1466    0721  5600          JMP I   PPDIS         /YES!  E X I T.
1467    0722  1336          TAD     PCHAR         /GET IT AGAIN
1470    0723  1062          TAD     M43           /IS IT A CR.
1471    0724  7640          SZA     CLA
1472    0725  5702          JMP I   PGETL         /NO. RETURN.
1473    0726  4556          CHECKIO               /CHECK I/O FLAGS AND SERVICE.
1474    0727  5221          JMP     PPSTART       /RESET TO START NEXT LINE.
1475                /
1476                /
1477                        ASMIFN  PFLICK        /IF ALTERNATING CHANNELS STICK IN POINTER NOW
1500    0730  3372  PALT,   POTHER                /POINTER TO THE FLICKERER
1501    0731  0000  PDIS,   0                     /TEMPORARY POINTER
1502    0732  0000  PHOR,   0                     /HORIZONTAL COORDINATE
1503    0733  0000  PVER,   0                     /VERTICAL COORDINATE
1504    0734  0000  PSTART, 0                     /POINTS TO NEXT TEXT WORD.
1505    0735  0000  PSWITCH,0                     /0=GET RIGHT HALF,-1=GET LEFT HALF OF NEXT WORD.
1506    0736  0000  PCHAR,  0                     /CONTAINS NEXT TEXT CHARACTER.
1507                /
1510                /
1511                /
1512                /
-
```

```
1513    0737  0000  DOCOM,  0                       /DECODE CALLS THIS ROUTINE TO GET A CHAR FROM PGETL
1514    0740  4302          JMS     PGETL           /GET A CHAR.
1515    0741  1336          TAD     PCHAR           /PLACE IN AC.
1516    0742  5737          JMP I   DOCOM           /RETURN.
1517                  /
1520                  /
1521    0743  0000  IOCHECK,0                       /CHECKS IO DEVICES.
1522    0744  7300          CLA CLL
1523    0745  6031          KSF                     /IS IT KEYBOARD?
1524    0746  5743          JMP I   IOCHECK         /NOPE. RETURN.
1525    0747  0377  PTABLE, TABLED-1                /POINTS TO THE DISPLAY TABLE-1
1526                                                /
1527                                                /NOW CHECK TO SEE IF PREVIOUS INSTRUCTION
1530                                                /WAS AN "AND" SO THAT ITS EFFECTIVELY A NOP.
1531                                                /IT IS NECESSARY BECAUSE DOUBLE IOTS
1532                                                /CAN SCREW UP THE DATA BREAK TRANSFER.
1533                                                /SINCE THE AC IS ZERO, AN AND CAN BE NO WRONG
1534                                                /
1535                    ASMIFN  TABLED-1&7000       /CHECK FOR AN AND CONDITION.
1536                    ERROR HAS OCCURRED          /AND IF NOT AN AND, THEN GIVE AN ASSEMBLY ERROR MESSAGE
1537                                                /THE ASSEMBLY ERROR MESSAGE WILL LET THE GUY KNOW SOMETHINGS WRONG
1540                                                /
1541    0750  6034  RKBTST, KRS                     /READ IN THE FLAG BUT DON T TURN OFF THE FLAG.
1542    0751  1366          TAD     IOCD            /IS IT A CONTROL D
1543    0752  7450          SNA                     /????
1544    0753  5553          DIAL                    /YEP. RESTART DIAL
1545    0754  1367          TAD     IOCP            /HOW ABOUT A CONTROL P
1546    0755  7650          SNA CLA                 /????
1547    0756  5552          PIP                     /YEP. RESTART PIP.
1550    0757  1072          TAD     KEYCHAR         /DO WE HAVE A CHARACTER IN BUFFER?????
1551    0760  7500          SMA
1552    0761  6036          KRB                     /READ IN NEW CHAR IF NONE THERE
1553    0762  7004          RAL
1554    0763  7130          CLL CML RAR             /TURN ON SIGN BIT.
1555    0764  3072          DCA     KEYCHAR         /STASH AWAY.
1556    0765  5743          JMP I   IOCHECK         /ALL DONE, RETURN TO CALLER
1557                  /
1560                  /
1561                  /
1562    0766  7574  IOCD,   -204                     /CONTROL D
1563    0767  7764  IOCP,   -220+204                /CONTROL P MINUS CONTROL D
1564                  /
1565                  /
1566                  /
1567                  /
1570                  /
1571                  /
1572                  /
1573                  /
1574                  /
1575                  /
1576    0770  0000  RSIX,   0                       /THIS LITTLE ROUTINE ROTATES THE AC SIX PLACES RIGHT
1577    0771  7012          RTR
1600    0772  7012          RTR
1601    0773  7012          RTR
1602    0774  5770          JMP I   RSIX            /RETURN.
1603                  /
1604                  /
1605                  /
1606                  /
1607                  /
1610                  /
1611                  /
-
```

```
1612                    /
1613                    /
1614                    /
1615                    /
1616                    /
1617                    /
1620                    /
1621                            PUSH=0000M              /A GOOD PLACE FOR THIS LOCATION
1622                    /
1623                    /
1624                    /
1625                    /
1626                    /
1627                    /
1630                    /
1631                    /
1632                    /
1633                    /
1634                    /
1635                    /
1636                    /
1637                            EJECT
-
```

```
1640                        *1000
1641                /
1642                /
1643                /               ROUTINE TO GET A LINE FROM TTY.
1644                /
1645                /               GENERAL CALL:
1646                /
1647                /       LINE
1650                /       PDIS
1651                /
1652                /                       WHERE PDIS POINTS TO THE STUFF TO BE DISPLAYED WHILE WAITING FOR A LINE OF INPUT.
1653                /
1654                /
1655                /
1656                /
1657    1000  0000  GLINE,  0                       /MAIN ENTRY FPR LINE GETTER ROUTINE.
1660    1001  1600        TAD I   GLINE           /GET POINTER TO DISPLAY
1661    1002  3222        DCA     G1              /AND SAVE IT.
1662    1003  2200        ISZ     GLINE           /SET UP RETURN.
1663    1004  1222        TAD     G1              /GET POINTER
1664    1005  3241        DCA     G2              /AND STASH IT IN THE SECOND LOOP.
1665    1006  3700  GCLEAR, DCA I  GGNUM          /CLEAR NUMBER OF CHARS TO ZERO.
1666    1007  7201  GMAIN,  PONE                  /GET A +1 IN THE AC.
1667    1010  1700        TAD I   GGNUM           /GNUM+1, NEXT SPOT IN BUFFER.
1670    1011  4252        JMS     GIN             /STICKS NEXT CHARACTER INTO GNUM+1
1671    1012  0000        0                       /0=ILLEGAL=A SOLID BLOCK.
1672    1013  7305        PTWO                    /GET A PTWO INTO THE AC.
1673    1014  1700        TAD I   GGNUM           /NUMBER OF CHARS+2
1674    1015  4252        JMS     GIN             /PUT A 34 AT END FOR DISPLAY ROUTINE.
1675    1016  0034        34                      / FORM.
1676    1017  1303        TAD     GCOUNT          /AN OSCILLATING NUMBER.
1677    1020  3141        DCA     COUNT           /GENERAL COUNT LOCATION.
1700                /
1701    1021  4551  GLOOP1, DISPLAY               /DISPLAY CALLERS MESSAGE.
1702    1022  0000  G1,     0                     /HIS POINTER HERE
1703    1023  4551        DISPLAY                 /NOW DO OUR LINE OF CRAP.
1704    1024  1120        GTEXT                   /POINTER TO OUR BUFFER.
1705    1025  4560        GETL                    /IS THERE A TTY CHAR?
1706    1026  7410        SKP                     /NO!
1707    1027  4702        JMS I   GGINSERT        /YES. PLACE IN BUFFER.
1710    1030  2141        ISZ     COUNT           /BOP UP FLICKER COUNT.
1711    1031  5221        JMP     GLOOP1          /STILL GOOD, DISPLAY AGAIN.
1712    1032  1303        TAD     GCOUNT          /GET FLICKER COUNTER
1713    1033  3141        DCA     COUNT           /AND RESET TEMPORARY COUNTER.
1714    1034  7201        PONE                    /+1
1715    1035  1700        TAD I   GGNUM           /SET A "\" AT END WITH NO BLOCK FLICKER.
1716    1036  4252        JMS     GIN             /PLACE IN BUFFER
1717    1037  0034        34
1720    1040  4551  GLOOP2, DISPLAY               /NOW DISPLAY USERS MESSAGE.
1721    1041  0000  G2,     0                     /HIS POINTER.
1722    1042  4551        DISPLAY                 /NOW OUR BUFFER
1723    1043  1120        GTEXT                   /BUFFER POINTER.
1724    1044  4560        GETL                    /TEST LOW READER.
1725    1045  7410        SKP                     /NO CHAR THERE
1726    1046  4702        JMS I   GGINSERT        /INSERT INTO BUFFER
1727    1047  2141        ISZ     COUNT           /DONE YET???
1730    1050  5240        JMP     GLOOP2          /NO. DISPLAY AGAIN.
1731    1051  5207        JMP     GMAIN           /RESET FLICKER POINTER.
1732                /
1733                /
1734                /
1735    1052  0000  GIN,    0                     /PUTS A CHAR IN BUFFER
1736    1053  1301        TAD     GMLEN           /BASIC MESSAGE BEFORE USER DOES ANYTHING.
```

```
1737    1054  3065          DCA     TEMP            /SAVE CHARACTER NUMBER.
1740    1055  1065          TAD     TEMP            /GET CHARACTER NUMBER.
1741    1056  7110          CLL RAR                 /DIVIDE BY 2 TO GET WORD NUMBER.
1742    1057  1304          TAD     GGTEXT          /POINTER TO ACTUAL TEXT.
1743    1060  3067          DCA     TEMP2           /AND STASH AWAY.
1744    1061  1065          TAD     TEMP            /REGET CHAR NUMBER.
1745    1062  7010          RAR                     /IS IT ODD OR EVEN.
1746    1063  7620          SNL CLA
1747    1064  5273          JMP     GLEFT           /EVEN. GET LEFT HALF.
1750    1065  1467          TAD I   TEMP2           /GET RIGHT HALF
1751    1066  0053          AND     L7700           /BLAH OUT RIGHT 6 BITS
1752    1067  1652          TAD I   GIN             /GET DESIRED SAVE CHAR.
1753    1070  2252  GINTO,  ISZ     GIN             /BOP PAST CALLING CHAR.
1754    1071  3467          DCA I   TEMP2           /AND STASH AWAY.
1755    1072  5652          JMP I   GIN             /RETURN.
1756                  /
1757    1073  1652  GLEFT,  TAD I   GIN             /GET THE DESIRED CHARACTER TO BE INSERTED
1760    1074  7106          CLL RTL                 /ROTATE TO BITS 0-5. CANNOT INSERT
1761    1075  7006          RTL                     /IN THE MIDDLE OF THE BUFFER.
1762    1076  7006          RTL
1763    1077  5270          JMP     GINTO           /AND GO STORE AWAY THE WORD.
1764                  /
1765                  /
1766    1100  1276  GGNUM,  GNUM
1767    1101  0005  GMLEN,  LBNUM-1                 /LEN OF MESS ALREADY IN BUFF -1 TO COMPENSATE FOR 0 CHAR.
1770    1102  1200  GGINSERT,GINSERT                       /POINTER TO INSERT ROUTINE.
1771    1103  7770  GCOUNT, -10                     /FLICKER COUNTER
1772    1104  1122  GGTEXT, GTEXT+2                 /ACTUAL TEXT POINTER.
1773                  /
1774                  /
1775                  /
1776                  /
1777    1105  0000  TTYGET, 0                       /ROOM FOR NON-OVERLAPPED TTY ROUTINE HERE
2000    1106  4556          CHECKIO                 /CHECK IO DEVICES NOW.
2001    1107  1072          TAD     KEYCHAR         /GET SAVED CHAR.
2002    1110  7450          SNA                     /IS THERE REALLY ONE THERE???
2003    1111  5705          JMP I   TTYGET          /NO, RETURN
2004    1112  2305          ISZ     TTYGET          /YES, BUP UP RETURN ADDRESS,
2005    1113  1030          TAD     L4000           /CHOP OFF STUCK ON BIT,
2006    1114  3000          DCA     0               /0 CAN BE USED RIGHT ONW.
2007    1115  3072          DCA     KEYCHAR         /ZAP OUT OLD CHAR.
2010    1116  1000          TAD     0               /RETRIEVE CHAR.
2011    1117  5705          JMP I   TTYGET          /EXIT TO SECOND LOCATION WITH CHAR IN THE AC.
2012                  /
2013                  /
2014    1120  0000  LINEB,  LEFT                    /START AT BOTTOM LEFT FOR DISPLAY.
2015                GTEXT=LINEB
2016    1121  7400          BOTTOM                  /BOTTOM OF SCREEN.
2017    1122  2205
2017    1123  2014
2017    1124  3172
2017    1125  3400
2017                  TEXT    "REPLY:\"           /HALFWORD ASSUMED.
2020                LBNUM=6                         /NUMBER OF PREVIOUS CHARS IN BUFFER.
2021                LBMAX=62-LBNUM                  /MAXIMUM NUMBER OF USER CHARACTERS.
2022                /                               FOUND BY GETTING MAX ON LINE(62) AND SUBTRACTING THOSE IN BUFFER(LBNUM).
2023                /
2024                /
2025                /
2026                /
2027                /
2030                /
2031                /
-
```

```
2032                    /
2033                            *LINEB+2+31-1+1         /ALLOW SPACE FOR THE BUFFER
2034    1153    0000            0000                    /LAST WORD OF THE CHARACTER BUFFER
2035                    /
2036                    /
2037                    /
2040                    /
2041                    /
2042                    /
2043                    /
2044                    /
2045                    /
2046                    /
2047    1154    1375    LUNOAD, TAD     UL320           /FOR A *T SET TO POSITIN BLOCK TO 300
2050                    /
2051                    /
2052                    /                               /FOR A *U SET TO OSITION BLOCK TO 0
2053                    /
2054    1155    3373    UNLOAD, DCA     UNPOS           /STORE THE BLOCK TO POSITION UNIT 0 TO (0 OR 300)
2055                    /
2056    1156    6141            LINC                    /THIS ROUTINE UNLOADS ALL THE TAPES
2057                            LMODE                   /EXCEPT FOR TAPE 0. IT IS SO SIMPLE
2060    1157    0076            SET I   AUTO7           /AND YET SO ELEGANT IT NEEDS
2061    1160    7773            -4                      /NO COMMENTS. SO GAZE UPON IT AND BE THANKFUL.
2062    1161    2020            ADD     L20
2063    1162    1120    UNLOOP, ADA I
2064    1163    7776            -1
2065    1164    0001            AXO
2066    1165    0737            CHK I   U
2067    1166    0727            CHK I
2070    1167    7166            JMP     .-1
2071    1170    0236            XSK I   AUTO7
2072    1171    7162            JMP     UNLOOP
2073    1172    0707            CHK
2074    1173    0300    UNPOS,  300
2075    1174    0002            POP
2076                            PMODE
2077    1175    7300    UL300,  CLA CLL                 /CLEAR THE AC AND JMP TO MIDDLE OF MESSASGE DISPLAY
2100    1176    5207            JMP     GMAIN           /KEEP MESSAGE GOING
2101                    /
2102                    /
2103                    /
2104                    /
2105                    /
2106                    /
2107                    /
2110                    /
2111                    /
2112                    /
2113                    /
2114                    /
2115                    /
2116                    /
2117                    /
2120                    /
2121                    /
2122                    /
2123                    /
2124                            EJECT
-
```

```
2125                    /
2126                    /
2127                    /
2130                            *1200
2131                    /               SECOND PAGE OF LINE GETTER ROUTINE.
2132                    /
2133                    /
2134                    /
2135                    /
2136    1200    0000    GINSERT,0                       /CHECKS CHAR AND STICKS IN BUFFER.
2137    1201    0142            AND     L177            /CHOP OFF THE PARITY BIT.
2140    1202    1026            TAD     L200            /AND FORCE 200 BIT ON FOR TESTS TO FOLLOW.
2141    1203    3121            DCA     FTYPE           /NOW STASH AWAY IN FTYPE FOR SEARCH TO FOLLOW.
2142    1204    4573            SEARCH                  /SEARCH LIST FOR FTYPE MATCH
2143    1205    1303            GSPL1                   /SPECIAL CHARS AND EXCEPTIONS.
2144    1206    1315            GSPG1                   /WHERE TO GO IF FOUND.
2145    1207    4253            JMS     GGLIMC          /CHECK FOR BETWEEN 240 AND 340
2146    1210    5600    GNXIT,  JMP I   GINSERT         /NOPE. IT ISN T A 37. RETURN TO CALLER.
2147    1211    1276            TAD     GNUM            /GET NUMBER OF CHARS.
2150    1212    7040            CMA                     /TEST TO SEE IF THIS OVERFLOWS THE BUFFER
2151    1213    1277            TAD     GLIMIT          /NUMBOER OF SPACES IN BUFFER.
2152    1214    7650            SNA CLA
2153    1215    5702            JMP I   GGCLEAR         /TOO MANY. RESTART.
2154                            ASMIFN  ECHO            /LOAD THE CHAR IN AC TO ECHO IF ECHOING CHARS!
2155    1216    1121            TAD     FTYPE           /GET THE CHAR.
2156                            ASMIFN  ECHO            /ECHO CHAR ONLY IF SWITCH IS SET.
2157    1217    4407            PUTL                    /ECHO ON TTY.
2160    1220    1121            TAD     FTYPE           /GET CHAR.
2161    1221    0024            AND     L77             /MAKE INTO A SIXBITTER
2162    1222    3226            DCA     GPUT
2163    1223    2276            ISZ     GNUM            /BOP UP COUNT
2164    1224    1276            TAD     GNUM            /PLACE IN AC.
2165    1225    4700            JMS I   GGIN            /PLACE CHAR IN BUFFER
2166    1226    0000    GPUT,   0                       /HERE IS CHAR.
2167    1227    5701            JMP I   GGMAIN          /ALRIGHT, GO BACK AND DO NEXT
2170                    /
2171                    /
2172                    /
2173                    /
2174                    /
2175                    /
2176                    GNLF,   ASMIFN  ECHO            /LINEFEED WAS TYPED. GIVE C.R.L.F.
2177    1230    4557            CRLF                    /IF ECHOING IS DESIRED.
2200    1231    5702            JMP I   GGCLEAR         /AND RESTART THE INPUT BUFFER.
2201                    /
2202                    /
2203                    /
2204                    /
2205    1232    7240    GNRUB,  NONE                    /RUBOUT TYPED. -1 TO AC.
2206    1233    1276            TAD     GNUM            /SUBTRACT ONE FROM THE NUMBER OF CHARS IN THE BUFER.
2207    1234    7500            SMA                     /HAVE WE BACKSPACED TOO FAR?
2210    1235    3276            DCA     GNUM            /NOPE. STORE AWAY.
2211                    /
2212                            ASMIFZ  ECHO            /DO WE WANT ECHOING?
2213                            ASMSKP  4               /NO. DO NOT ASSEMBLE IN TTY ECHO CHAR.
2214    1236    7640            SZA CLA                 /WAS BACKSPACE SUCCESFULL?
2215    1237    5242            JMP     GNRNO           /NO. DO NOT PRINT "\".
2216    1240    1307            TAD     GNL334          /FORM CHAR.
2217    1241    4407            PUTL                    /OUTPUT IT TO SHOW DELETE WAS SUCCESFULL.
2220                    /
2221                    GNRNO,  ASMIFZ  ECHO            /DO WE HAVE ECHOING?
2222                            CLA                     /NO, WE DON T. AC MIGHT BE NON-ZERO. CLEAR TO E SURE.
2223    1242    5701            JMP I   GGMAIN          /NOW GO BACK AND START DISPLAYING LINE AGAIN.
```

```
2224                    /
2225                    /
2226                    /
2227                    /
2230                    GALL,   ASMIFN  ECHO            /DO A CRLF ONLY IF  SWITCH IS SET.
2231        1243  7201          PONE                    /SPACE TO NEXT SPOT IN THE BUFFER
2232        1244  1276          TAD     GNUM            /WHICH IS 1+GNUM
2233        1245  4700          JMS I   GGIN            /AND INSERT A 0000 AS A TERMINATOR
2234        1246  0000          0000                    /IN IT GOES.
2235        1247  4557          CRLF                    /DO A CAR RET AND LIN FED.
2236        1250  1675          TAD I   GGLINE
2237        1251  3200          DCA     GINSERT
2240        1252  5600          JMP I   GINSERT
2241                    /
2242                    /
2243                    /
2244                    /
2245                    /
2246                    /
2247                    /
2250                    /
2251                    /
2252        1253  0000  GGLIMC, 0                       /THIS TESTS TO SEE IF TYPE IS BETWEEN 240 AND 337
2253        1254  1121          TAD     FTYPE           /GET THE CHAR IN QUESTION
2254        1255  1147          TAD     M340            /SEE IF ITS GREATER THAN 340
2255        1256  7510          SPA                     /?
2256        1257  1257          TAD     .               /IT ISNT, SO MAKE IT A BIG NUM FOR SECOND TEST
2257        1260  1274          TAD     GGM33           /SEE IF ITS GREATER THEN 372
2260        1261  7710          SPA CLA                 /?
2261        1262  1056          TAD     M40             /ITS GREATER THEN 337 BUT LESS THEN 373
2262        1263  1121          TAD     FTYPE           /NOW EITHER UPDATE FTYPE OR LEAVE IT ALONE
2263        1264  3121          DCA     FTYPE           /THE UPDATE CONVERTS A 37 CHAR TO A 35 CHAR
2264        1265  1121          TAD     FTYPE           /NOW GET THE MODIFIED OR UNMODIFED CHAR
2265        1266  1147          TAD     M340            /SUBTRACT OFF 340 FOR LIMIT TEST
2266        1267  7100          CLL                     /CLEAR THE LIC FOR THE FOLLOWING TEST
2267        1270  1025          TAD     L100            /NOW ADD IN 100 FOR LOWER LIMIT TEST
2270        1271  7630          SZL CLA                 /IF GOOD LINC IS NOW A 1
2271        1272  2253          ISZ     GGLIMC          /THEN GO TO SECONDRETURN IF OK
2272        1273  5653          JMP I   GGLIMC          /ELSE GO TO THE FIRST RETURN
2273                    /
2274                    /
2275                    /
2276                    /
2277                    /
2300                    /
2301                    /
2302                    /
2303                    /
2304        1274  7745  GGM33,  -33
2305                    /
2306                    /
2307        1275  1000  GGLINE, GLINE                   /COMMUNICATION.
2310        1276  0000  GNUM,   0                       /NUMBER OF CHARS IN BUFFER
2311        1277  0054  GLIMIT, LBMAX                   /MAX NUM OF USER CHARS IN BUFFER.
2312        1300  1052  GGIN,   GIN
2313        1301  1007  GGMAIN, GMAIN
2314        1302  1006  GGCLEAR,GCLEAR                  /CROSS PAGE REFEREENCES.
2315                    /
2316                    /
2317                    /
2320                    /
2321                    /
2322        1303  0212  GSPL1,  212
```

```
2323      1304  0215          215
2324      1305  0377          377
2325                          ASMIFZ  TERMC-44        /EOF CHAR=DOLLAR SIGN?
2326                          244                     /YEP. PLACE IT ON THE EXCEPTION TABLE
2327      1306  0247          247
2330      1307  0334  GNL334, 334
2331      1310  0300          300
2332      1311  0337          337
2333      1312  0224          224
2334      1313  0225          225                     /CONTROL U CHARACTER
2335      1314  4243          4243
2336                  /
2337                  /
2340                  /
2341      1315  1230  GSPG1,  GNLF                    /LINE FEED
2342      1316  1243          GALL                    /C.R.
2343      1317  1232          GNRUB                   /RUB OUT
2344                          ASMIFZ  TERMC-44        /DO WE WANT DOLLAR SIGN IN LIST?
2345                          GNXIT                   /YEP. DOLLAR SIGN ILLEGAL
2346      1320  1210          GNXIT
2347      1321  1210          GNXIT
2350      1322  1210          GNXIT
2351      1323  1210          GNXIT
2352      1324  1154          LUNOAD
2353      1325  1155          UNLOAD                  /POINTER TO THE UNLOAD ROUTINE.
2354      1326  1210          GNXIT
2355                  /
2356                  /
2357                  /
2360                  /
2361                  /
2362                  /
2363      1327  0000  MMOVE,  0
2364      1330  7240          MONE
2365      1331  1327          TAD     MMOVE
2366      1332  3012          DCA     AUTO3
2367      1333  7240          MONE
2370      1334  1412          TAD I   AUTO3
2371      1335  3013          DCA     AUTO4
2372      1336  7240          MONE
2373      1337  1412          TAD I   AUTO3
2374      1340  3014          DCA     AUTO5
2375      1341  1412          TAD I   AUTO3
2376      1342  7040          CMA
2377      1343  3141          DCA     COUNT
2400      1344  5347          JMP     MMEXIT-2
2401      1345  1413          TAD I   AUTO4
2402      1346  3414          DCA I   AUTO5
2403      1347  2141          ISZ     COUNT
2404      1350  5345          JMP     .-3
2405      1351  5412  MMEXIT, JMP I   AUTO3
2406                  /
2407                  /
2410      1352  0000  PPUSH,  0
2411      1353  4564          MOVE
2412      1354  0117          FSIZE
2413      1355  1366          PPTEMP
2414      1356  0011          FNAME+3-FSIZE+1
2415      1357  5752          JMP I   PPUSH
2416                  /
2417      1360  0000  PPOP,   0
2420      1361  4564          MOVE
2421      1362  1366          PPTEMP
```

```
2422    1363  0117          FSIZE
2423    1364  0011          FNAME+3-FSIZE+1
2424    1365  5760          JMP I   PPOP
2425                  /
2426                  /
2427    1366  0000  PPTEMP,Z
2430                        *PPTEMP+FNAME+3-FSIZE
2431    1376  0000          3000                    /JUST TO SEE WHERE IT IS. NEXT LOCATION IS COMPLETELY FREE.
2432                  /
2433                  /
2434                  /
2435                        EJECT
-
```

```
2436                    /
2437                    /
2440                    /
2441                    /
2442                    /
2443                    /
2444                    /               EVOKE PIP2 NOW
2445                    /
2446                    /
2447                    /
2450                    /
2451                    /
2452                            CHAIN   "PIP2"
```

```
0000                    *20
0001                            PMODE
0002                            EJECT
-
```

```
0003                    /
0004                    /
0005                    /
0006                    /               THIS IS THE SECOND PART OF PIP.   IT S CALLED    P  I  P  2.
0007                    /
0010                    /
0011                    /
0012                    /
0013                    /
0014                    /
0015                    /
0016                    /
0017                    /
0020                    /
0021                    /
0022                    /
0023                    /
0024                    /
0025                    /
0026                    /
0027                    /
0030                    /
0031                    /
0032                    /
0033                    /
0034                    /
0035                    /
0036                    /
0037                            EJECT
-
```

```
0040                        *1400
0041                /                       GENERAL MASS STORAGE I/O ROUTINES.
0042                /
0043                /
0044                /
0045                /
0046                /               CALLING SEQUENCE:
0047                /
0050                /
0051                /       READ     (OR WRITE)
0052                /       UNIT NUMBER
0053                /       FIRST CORE LOCATION OF TRANSFER
0054                /       NUMBER OF BLOCKS TO BE TRANSFERRED.
0055                /       FIRST BLOCK OF TRANSFER.
0056                /
0057                /
0060                /               ROUTINE HAS THE ABILITY TO GO INTO EXTENED CORE.
0061                /               IF HIS NUMBER OF BLOCKS MAKES THE LOCATION COUNTER "WRAP AROUND".
0062                /
0063                /
0064                /
0065                /
0066                /
0067    1400  0000  TREAD,  0                       /MAIN READ ROUTINE
0070    1401  4224          JMS     TWHERE        /GET CORRECT MASS DEVICE
0071    1402  1453          TAPER                 /00-07 = TAPE READ
0072                        ASMIFN  RF08          /DO WE WANT THE RF08 ROUTINES ASSEMBLED?
0073                        ASMSKP  4             /YEP BYPASS NON-UNIT ASSIGNMENTS.
0074                        NOSUCH
0075                        NOSUCH
0076                        NOSUCH
0077                        NOSUCH                /UNITS 10-47 NOT PRESENT
0100                /
0101                        ASMIFZ  RF08          /ARE THEY NOT THERE?
0102                        ASMSKP  4             /NOT THERE. DO NOT ASSEMBLE IN POINTERS.
0103    1403  7501          RF08R
0104    1404  7501          RF08R
0105    1405  7501          RF08R
0106    1406  7501          RF08R                 /UNITS  0-47 INCASE OF RK08S
0107                /
0110    1407  4560          NOSUCH                /UNITS 50-77 FREE FOR NOW.
0111    1410  4560          NOSUCH
0112    1411  4560          NOSUCH
0113                /
0114                /
0115                /
0116                /
0117    1412  0000  TWRITE, 0                       /MAIN WRITEE.
0120    1413  4224          JMS     TWHERE        /GET COORRECT MASS STORAGE DEVICE.
0121    1414  1464          TAPEW                 /FIRST IS LINC TAPE.
0122                        ASMIFZ  RF08          /DISK DESIRED?
0123                        ASMSKP  4             /NOPE. BYPASS POIITERS
0124    1415  7505          RF08W                 /UNITS 10-47 ARE DISK UNITS NOW.
0125    1416  7505          RF08W
0126    1417  7505          RF08W
0127    1420  7505          RF08W
0130                /
0131                        ASMIFN  RF08          /TEST AGAIN.
0132                        ASMSKP  4             /SKIP NOSUCH UNITS IF DISK DESIRED.
0133                        NOSUCH                /UNITS 10-17 NOT YET ASSIGNED.
0134                        NOSUCH                /UNITS 20-77 FREE FOR NOW.
0135                        NOSUCH
0136                        NOSUCH
```

```
0137                        /
0140        1421    4560            NOSUCH                  /UNITS 50-77 FREE FOR NOW.
0141        1422    4560            NOSUCH
0142        1423    4560            NOSUCH
0143                        /
0144                        /
0145                        /
0146                        /
0147                        /
0150        1424    0000    TWHERE, 0                       /GETS CORRECT MASS STORAGE DEVICE.
0151        1425    7344            MTWO                    /-2
0152        1426    1224            TAD     TWHERE          /GET CALLING.
0153        1427    3065            DCA     TEMP            /GET ORIGINAL CALLING.
0154        1430    1465            TAD I   TEMP
0155        1431    3065            DCA     TEMP            /GET USER CALLING.
0156                        /
0157                        /
0160                        ASMIFE  RF08            /DISK
0161                        ASMSKP  6               /NOPE
0162                        /
0163        1432    1465            TAD I   TEMP            /GET USERS UNIT.
0164        1433    1356            TAD     RK70            /SUBTRACT ONE FROM THE DRIVE NUMBER
0165        1434    0061            AND     L30             /CHOP OFF RANDOM CRAP.
0166        1435    7112            CLL RTR                 /SHIFT TO CONTROLLER BITS 9-10
0167        1436    3107            DCA     RKDRIV          /SAVE AWAY
0170                        /
0171                        /
0172        1437    1465            TAD I   TEMP            /GET THE USERS UNIT AGAIN.
0173        1440    7012            RTR
0174        1441    7010            RAR                     /GET BITS 6-8
0175        1442    0060            AND     L7
0176        1443    1224            TAD     TWHERE          /GET START OF LIST.
0177        1444    3224            DCA     TWHERE          /AND STORE AWAY.
0200        1445    1624            TAD I   TWHERE          /GET CALLING ADDRESS.
0201        1446    3224            DCA     TWHERE          /AND STASH AWAY.
0202        1447    1065            TAD     TEMP            /GET USERS CALLING ADDRESS.
0203        1450    3624            DCA I   TWHERE          /AND SET UP PHONNEY CALL.
0204        1451    2224            ISE     TWHERE          /GO TO SECOND LOC.
0205        1452    5624            JMP I   TWHERE          /PHONNEY CALL ALL DONE.
0206                        /
0207                        /
0210                        /
0211                        /
0212        1453    0000    TAPER,  0                       /MAIN LINC TAPE READ ROUTINE.
0213        1454    1200            TAD     TREAD           /GET READ ADDRESS.
0214        1455    3212            DCA     TWRITE          /AND SAVE FOR READ.
0215        1456    1312            TAD     TERENT          /SET TO RETRY READ IF ERROR
0216        1457    3713            DCA I   TEERNT          /SAVE IN RETRY LOCATION
0217        1460    3707            DCA I   TTSKP           /DO A CHECK OF CHECKSUM.
0220        1461    4711            JMS I   TTBLAH          /GO PERFORM FOLLOWING OPERATION.
0221                                LMODE                   /NEXT INSTRUCTION IS EXECUTED BY TBLAH IN LMODE
0222        1462    0722            RDE I                   /READ AND LEAVE GOING.
0223                                PMODE                   /JUST FOR ASSEMBLER.
0224        1463    5276            JMP     TEXIT           /AND EXIT
0225                        /
0226                        /
0227        1464    0000    TAPEW,  0                       /GENERAL LINC TAPE WRITE ROUTINE.
0230        1465    1310            TAD     TTTSKP          /SET UP TO IGNORE BAD CHECKSUM.
0231        1466    3707            DCA I   TTSKP           /AND STASH AWAY.
0232        1467    1314            TAD     TTAPEW          /FOR WRITE ERROR REWRITE ENTIRE BLOCK
0233        1470    3713            DCA I   TEERNT
0234        1471    4711            JMS I   TTBLAH          /DO WRITE NOW.
0235                                LMODE
```

```
0236      1472  0726          WRI I
0237                          PMODE                   /BACK INTO PMODE
0240      1473  3707          DCA I   TTSKP           /SET TO CHECK CHECKSUM.
0241      1474  4711          JMS I   TTBLAH          /NOW DO CHECK OF WHAT WE JUST WROTE.
0242                          LMODE
0243      1475  0727          CHK I
0244                          PMODE
0245                /
0246      1476  7307  TEXIT,  PFOUR                   /GENERAL EXIT.
0247      1477  1212          TAD     TWRITE          /GET WRITE
0250      1500  3212          DCA     TWRITE          /GO PAST ARGUEMENTS.
0251      1501  5612          JMP I   TWRITE          /PAST ARGUEMENTS.
0252                /
0253                /
0254      1502  0000  ASET,   0                       /INITIALIZES ARGUEMENT GETTER FOR AMSS STORAGE DEVICES.
0255      1503  7240          MONE
0256      1504  1212          TAD     TWRITE          /FIRST AGR.
0257      1505  3017          DCA     AUTO8           /ARG REGISTER.
0260      1506  5702          JMP I   ASET            /EXIT
0261                /
0262                /
0263                /
0264                /
0265                /
0266                /
0267                /
0270      1507  1750  TTSKP,  TSKP                    /CHECKSUM SKIP
0271      1510  7410  TTTSKP, SKP                     /INSTRUCTION TO IGNORE CHECKSUM
0272      1511  1600  TTBLAH, TBLAH                   /POINTER TO I/O DOER
0273      1512  1627  TERENT, TREENT                  /RETRY LOCATION
0274      1513  2032  TEERNT, TTRENT                  /RETRY SWITCH
0275      1514  1413  TTAPEW, TWRITE+1                /RETRY ENTRIE WRITE ON ERROR
0276                /
0277                /
0300                /
0301                /
0302                /
0303      1515  7240  FFILEC, MONE                    /COPIES A NAMED FILE TO ANOTHER NAMED FILE.
0304      1516  3106          DCA     OUTNUM          /SET COUNTER TO 1
0305      1517  7305          PTWO                    /SET UP SECOND DIRECTORY LOOKUP
0306      1520  3123          DCA     FWHAT           /IT S AN OUTPUT FILE
0307      1521  1737          TAD I   FFTEMP          /GET THE ORIGINAL SIZE
0310      1522  3117          DCA     FSIZE           /PLACE IN THE SIZE NOW.
0311      1523  4563          DIRECT                  /NOW ALLOCATE SPACE.
0312      1524  1120          TAD     FUNIT           /GET THE NEW OUTPUT UNIT
0313      1525  3105          DCA     OUTUNIT         /AND SET UP OUTPUT UNIT
0314      1526  1122          TAD     FBNUM           /GET OUTPUT BLOCK
0315      1527  3104          DCA     OUTBLOCK                /AND SET UP.
0316      1530  4403          HPOP                    /POP IN UPPER SAVED FBLOCK
0317      1531  1120          TAD     FUNIT           /SAVE THE INPUT UNIT
0320      1532  3103          DCA     INUNIT
0321      1533  1122          TAD     FBNUM           /GET THE INPUT STARTING BLOCK
0322      1534  3102          DCA     INBLOCK         /AND SET UP
0323      1535  4554          COPY                    /NOW COPY THE FILE
0324      1536  5552          PIP                     /AND RETURN TO PIP.
0325                /
0326                /
0327                /
0330      1537  3327  FFTEMP, HHTEMP
0331                /
0332                /
0333                /
0334                /
```

```
0335                    /
0336                    /
0337                    /
0340                    /
0341                    /
0342                    /
0343                    /
0344                    /
0345                    /
0346                    /
0347    1540    0000    RFDISK, 0
0350    1541    1120            TAD     FUNIT           /GET THE USERS UNIT
0351    1542    3200            DCA     TREAD           /AND SAVE FOR A SECOND
0352    1543    4402            TAPE                    /DO THE NECESSARY STUFF.
0353    1544    1200            TAD     TREAD           /REGET THE USERS UNIT
0354    1545    0356            AND     RK70            /JUST MAJOR DEVICE BITS.
0355    1546    7450            SNA                     /ZERO?
0356    1547    1054            TAD     L10             /YEP. ADD IN 10 TO FORCE CONTROLLER SHIFT.
0357    1550    1356            TAD     RK70            /THIS IS TO FORCE BETWEEN 10-37
0360    1551    0356            AND     RK70
0361    1552    1054            TAD     L10
0362    1553    1120            TAD     FUNIT
0363    1554    3120            DCA     FUNIT           /FUNIT IS ALL SET NOW.
0364    1555    5740            JMP I   RFDISK
0365                    /
0366                    /
0367                    /
0370    1556    0070    RK70,   70
0371                    /
0372                    /
0373                    /
0374                    /
0375                    /
0376                    /
0377                    /
0400                    /
0401                    /
0402                    /
0403                    /
0404                    /
0405                    /
0406                    /
0407                    /
0410                            ASMIFZ  RF08            /RF08 DESIRED?
0411                            ASMSKP  4               /NO. DON T PUT MESSAGE HERE.
0412                    /
0413    1557    0614
0413    1560    1116
0413    1561    0340
0413    1562    2401
0413                    TMESS2, TEXT    "FLINC TAPE
0414    1563    2005
0414    1564    4306
0414    1565    0310
0414    1566    0503
0414    1567    1323
0414    1570    2515
0414    1571    4005
0414    1572    2222
0414    1573    1722
0414    1574    4040
0414    1575    4040
0414                    FCHECKSUM ERROR
-
```

```
0415      1576  4043
0415                  "                                   /TAPE ERROR MESSAGE HERE TO LEA
                      VE ROOM LATTER ON.
0416                  /
0417                  /
0420                  /
0421                  /
0422                  /
0423                  /
0424                  /
0425                  /
0426                        EJECT
-
```

```
0427                        *1600
0430                  /
0431                  /
0432                  /                          MAIN GENERAL TAPE I/O LOOP.
0433                  /
0434                  /
0435                  /
0436      1600  0000  TBLAH,  0                        /PERFORMS A FUNCTION, THEN EXITS.
0437      1601  4555          SETA                     /SET UP ARGUEMENT GETTER.
0440      1602  1417          GETA                     /GET UNIT NUMBER
0441      1603  7110          CLL RAR                  /MOVE INTO CORRECT PLACE
0442      1604  1061          TAD       L30            /SET UP EXTENED UNITS BITS.
0443      1605  3304          DCA       TAXO           /AND STORE AWAY. NO-PAUSE AND EXTENEDED ADDRESSING ALSO SET.
0444      1606  7206          CLA RTL                  /NOW MOVE BACK TO BIT 8
0445      1607  7006          RTL
0446      1610  1600          TAD I     TBLAH          /ADD IN DESIRED FUNCTION.
0447      1611  3317          DCA       TOPR           /AND STORE AWAY TO BE EXECUTED.
0450      1612  1317          TAD       TOPR           /GET THE OPERATION AGAIN.
0451      1613  3307          DCA       TSTOPR         /SET UP SELECT-WRITE LOCK CHECK.
0452      1614  2200          ISZ       TBLAH          /SKIP PAST CRAP.
0453      1615  1417          GETA                     /GET STARTING ADDRESS.
0454      1616  3315          DCA       TLOC1          /AND STORE AWAY.
0455      1617  1417          GETA                     /GET WORD COUNT.
0456      1620  7450          SNA                      /IS IT ZERO?
0457      1621  5600          JMP I     TBLAH          /YEP. EXIT.
0460      1622  7041          CIA                      /NOPE. COMPLEMETN IT.
0461      1623  3361          DCA       TCOUNT         /STASH AWAY.
0462      1624  1417          GETA                     /GET BLOCK NUMBER
0463      1625  7001          IAC                      /FOR UPCOMING SUBRACTION ERROR.
0464      1626  3320          DCA       TBLOCK         /AND OPLACE IN FIRST BLOCK.
0465                  /
0466                  /
0467                  /
0470      1627  7240  TREENT, MONE                     /TO RETRY SAME BLCOK AFTER ERROR.
0471      1630  1320          TAD       TBLOCK         /RESET BLOCK NUMBER TO CORRECT ONE.
0472      1631  3320          DCA       TBLOCK
0473      1632  1315          TAD       TLOC1          /GET THE FIRST LOC
0474      1633  7440          SZA                      /IT S ZERO. CORRECT FOR FIELD CHANGE
0475      1634  5244          JMP       TDOWN          /NOT ZERO OK.
0476      1635  1033          TAD       L7000          /BOP DOWN FIELD.
0477      1636  1304          TAD       TAXO           /IN EXTENDED REGISTER
0500      1637  3304          DCA       TAXO
0501                          ASMIFZ    RF08           /DISK ROUTINES THERE.
0502                          ASMSKP    4              /NO. DO NOT ASSEMBLE IN CODE TO PROTECT 7400-7777 OF FIELD 0.
0503      1640  1304          TAD       TAXO           /REGET THE NEXT AXO REGISTER.
0504      1641  0033          AND       L7000
0505      1642  7650          SNA CLA                  /ARE WE CROSSING BOUNDARY TO LOWER CORE?
0506      1643  1064          TAD       M400           /YES. BOP DOWN BY AN EXTRA 400 SO WE DON T BASH DATA BREAK
0507                                                   /AND THE READ ROUTINES THERE.
0510                  /
0511      1644  1064  TDOWN,  TAD       M400           /400= LENGTH OF 1 RECORD.
0512      1645  3315          DCA       TLOC1          /LOC ALL SET TO GO.
0513                  /
0514      1646  1143  TRENT2, TAD       M215           /ENTERS HERE IF A SKIP OVER RECORD. M215=LENGTH OF TAPE+10 SECONDS.
0515      1647  3363          DCA       TERRC2         /SET UP WAIT COUNT.
0516      1650  1031          TAD       L5000          /SET MAINANCE MODE
0517      1651  6151          6151                     /FOR TESING WHETHER OR NOT UNIT OK
0520                  /
0521                  /
0522                  /
0523      1652  7201  TLOOP,  PONE                     /MAIN LOOP TO DO NEXT RECORD. IS THIS LAST RECORD?
0524      1653  1361          TAD       TCOUNT         /GET THE NUMBER OF RECORDS TO GO
0525      1654  7640          SZA CLA
```

```
0526    1655  5261          JMP     .+4             /NO, STILL MORE TO GO.
0527    1656  1317          TAD     TOPR            /LAST ONE, TURN OFF MOTION BIT.
0530    1657  0034          AND     L7757
0531    1660  3317          DCA     TOPR
0532                        ASMIFZ  RF0B            /RF0B DESIRED?
0533                        ASMSKP  14              /NOPE. DON T ASSEMBLE IN CODE TO PROTECT 7400.
0534    1661  1315          TAD     TLOC1           /GET THE LAST LOCATION.
0535    1662  1040          TAD     L400
0536    1663  1040          TAD     L400            /SEE IF NEXT IS GOING TO READ INTO 7400.
0537    1664  7640          SZA CLA                 /??
0540    1665  5275          JMP     TLP1            /NO. IT ISN T.
0541    1666  1304          TAD     TAXO            /GET THE TAXO TO SEE IF
0542    1667  0033          AND     L7000           /IT S 7400 OF FIELD 0
0543    1670  7640          SZA CLA
0544    1671  5275          JMP     TLP1            /NOT FIELD 0
0545    1672  1040          TAD     L400            /WE RE GOING TO BASH 7400, SO SKIP PAST IT.
0546    1673  1315          TAD     TLOC1
0547    1674  3315          DCA     TLOC1
0550                  /
0551    1675  7300  TLP1,   CLA CLL                 /LINC MUST BE CLEAR
0552    1676  1040          TAD     L400            /BOP UP LOCATION
0553    1677  1315          TAD     TLOC1
0554    1700  3315          DCA     TLOC1
0555    1701  6141          LINC                    /GO OVER INTO LMODE
0556                        LMODE
0557    1702  0323          ROR I   3               /MOVE OVERFLOW BIT INTO CORRECT TAPE POSITION.
0560    1703  1160          ADM I                   /UPDATE TAXO AND AXO ALL AT ONCE.
0561    1704  0000  TAXO,   0
0562    1705  0001          AXO                     /SEND TO CONTROLER
0563    1706  0011          CLR                     /CLEAR AC FOR TEST TO FOLLOW DUMMY OPERTION.
0564    1707  0000  TSTOPR, 0                       /PERFORM USERS OPERATION ONCE. BLOCK NUMBER=0 INSURES SUCCESS.
0565    1710  0000          0000                    /BECAUSE BLOCK NUMBER IS ADDED TO SPECIAL REGISTER WHICH IS READ IN.
0566    1711  0500          IOB                     /DO 8 IOT TO GET SPECIAL REGISTER.
0567    1712  6154          6154                    /IF TAPE OK(SELECT AND WRITE-LOCK OFKAY
0570    1713  4071          STC     TEMP4           /THEN BIT10=1; NOW DO REAL USER OPERATION.
0571    1714  1020          LDA I                   /GET ADDRESS
0572    1715  0000  TLOC1,  0
0573    1716  0023          TMA                     /AND SEND IT TO CONTROLLER
0574    1717  0000  TOPR,   0                       /ACTUAL TAPE INSTRUCTION
0575    1720  0000  TBLOCK, 0                       /ACTUAL BLOCK NUMBER.
0576    1721  1000          LDA                     /RECALL PAST SPECIAL FUCTION
0577    1722  0071          TEMP4                   /REGISTER AND CHECK WHETER UNIT OK
0600    1723  0002          PDP                     /GET BACK INTO 8 MODE
0601                        PMODE
0602    1724  2320          ISZ     TBLOCK          /BOP UP BLOCK NUMBER
0603    1725  7012          RTR                     /PLACE BIT 10 IN LINC
0604    1726  7620          SNL CLA                 /IS UNIT OK WITH WRITE LOCK OFF IF NECESSARY.
0605    1727  5357          JMP     TSELER          /UNIT NOT OK. DISPLAY MESSAGE.
0606                        LMODE                   /TELL ASSEM WE LL BE IN LMODE.
0607    1730  0002  TLOOP2, PDP                     /GET INTO 8 MODE. IF IN 8 MODE ITS JUST A NOP.
0610                        PMODE
0611    1731  4556          CHECKIO                 /CHECKIO I/O DEVICES WHILE WAITING IN LOOP.
0612    1732  2362          ISZ     TERRC1          /BOP UP FIRST WAIT COUNT
0613    1733  5340          JMP     TNT2LG          /DIDN T OVERFLOW YET. GO DOWN
0614    1734  2363          ISZ     TERRC2          /OUTER SKIP OK?
0615    1735  5340          JMP     TNT2LG          /BIG COUNT STILL OK, GO DOWN.
0616                  /
0617    1736  4764          JMS I   TEMAIN          /WE VE WAITED TOO LONG. GIVE MESSAGE.
0620    1737  2202          TMESS1                  /TO LONG MESSAGE
0621                  /
0622    1740  6141  TNT2LG, LINC                    /GET INTO LINC MODE FOR FLAG TESTING.
0623                        LMODE                   /GET INTO L MODE TO TEST TAPE.
0624    1741  0416          STD
-
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0625    1742  7730          JMP     TLOOP2          /NOT YET DONE. GO BACK AND WAIT.
0626    1743  0003          TAC                     /DONE. GET CHECKSUM INTO AC.
0627    1744  0002          PDP
0630                        PMODE                   /AND GET BACK INTO B MODE
0631    1745  7040          CMA                     /MAKE INTO ZERO IF 7777
0632    1746  7650          SNA CLA                 /GOOD CHECKSUM
0633    1747  5352          JMP     TDOC            /YEP. TRY NEXT RECORD.
0634    1750  7410  TSKP,   SKP                     /SWITCH FOR ERROR IF BAD CHECKSUM.
0635    1751  5355          JMP     TCHEKE          /BAD CHECKSUM. GIVE MESSAGE
0636    1752  2361  TDOC,   ISZ     TCOUNT          /OK. IS ALL DONE?
0637    1753  5252          JMP     TLOOP           /NOPE. DO NEXT
0640    1754  5600  TBEXIT, JMP I   TBLAH           /YEP. EXIT
0641                /
0642                /
0643                /
0644                /
0645    1755  4764  TCHEKE, JMS I   TEMAIN
0646    1756  1557          TMESS2                  /CHECKSUM ERROR
0647    1757  4764  TSELER, JMS I   TEMAIN
0650    1760  1765          TMESS3                  /BLOCK NUMBER OR TIMING ERROR
0651                /
0652                /
0653                /
0654                /
0655                /
0656    1761  0000  TCOUNT, 0
0657    1762  0000  TERRC1, 0
0660    1763  0000  TERRC2, 0
0661    1764  2005  TEMAIN, TMAINE
0662                /
0663                /
0664                /
0665                /
0666                /
0667                /
0670                /
0671                /
0672                /
0673                        ASMIFN  RF08            /RF08 DESIRED?
0674                        ASMSKP  4               /YEP, DON T ASSEMBLE MESSAGE HERE
0675                /
0676                TMESS2, TEXT    "FLINC TAPE
0677                FCHECKSUM ERROR
0700                "
0701                /
0702    1765  0623
0702    1766  0514
0702    1767  0503
0702    1770  2440
0702                TMESS3, TEXT "FSELECT OR
0703    1771  1722
0703    1772  4306
0703    1773  2722
0703    1774  1124
0703    1775  0555
0703    1776  1417
0703    1777  0313
0703    2000  4005
0703    2001  2222
0703    2002  1722
0703    2003  4040
0703                FWRITE-LOCK ERROR
0704    2004  4043
-
```

```
0704                    "
0705                    /
0706                    /
0707                    /
0710                    /
0711                    /
0712                            EJECT
-
```

```
0713                    /
0714                    /
0715                    /
0716                    /
0717                    /                       LOCATED AROUND 2027. PREVIOUS PAGE OVERLAPS A LITTLE BIT.
0720                    /
0721                    /
0722                    /
0723                    /                                       TAPE ROUTINES CONTINUED.
0724    2025    0020    TMAINE, 2                               /MAIN ERROR WAIT
0725    2026    7330            CLA CLL CML RAR                 /4022+6152=TAPE PRESET.
0726    2027    6152            6152                            /STOP ANY STRAY TAPE OPERATIONS.
0727    2030    7300            CLA CLL
0730    2031    1625            TAD I   TMAINE                  /GET ERROR MESSAGE
0731    2032    3214            DCA     .+2
0732    2033    4564            MOVE                            /AND MOVE TO MAIN MESSAGE.
0733    2034    0002            2
0734    2035    2141            TMAIND
0735    2036    0020            20                              /40 CHARACTER NAME.
0736    2037    7240            MONE
0737    2040    1633            TAD I   TBLOKK                  /GET CORRECT BLOCK NUMBER FOR DISPLAY OF ERROR MESSAGE.
0740    2041    4237            JMS     TTRC                    /CALL ERROR MESSAGE DISPLAYER
0741    2042    2023            TTEG1                           /WITH LIST OF WHERE TO GO ON REPLY.
0742                    /
0743                    /
0744                    /
0745                    /
0746                    /
0747    2043    2026    TTEG1,  TRENT3                          /ACCEPT LOCATION
0750    2044    2031            TERROT                          /RETRY LOCATION
0751    2045    2026            TRENT3                          /SKIP LOCATION (INTERNALLY SAME AS ACCEPT)
0752                    /
0753                    /
0754                    /
0755                    /
0756                    /
0757                    /
0760                    /
0761    2046    2634    TRENT3, ISZ I   TKOUNT                  /IS THIS LAST RECORD?
0762    2047    5635            JMP I TTRNT2                    /NOPE. GO BACK AND SKIP
0763    2050    5636            JMP I   TBLAHT                  /YEP. EXIT
0764                    /
0765                    /
0766                    /
0767                    /
0770                    /
0771    2051    5632    TERROT, JMP I   TTRENT
0772                    /
0773                    /
0774                    /
0775                    /
0776                    /
0777                    /
1000    2052    1627    TTRENT, TREENT
1001    2053    1720    TBLOKK, TBLOCK
1002    2054    1761    TKOUNT, TCOUNT
1003    2055    1646    TTRNT2, TRENT2
1004    2056    1754    TBLAHT, TBEXIT
1005                    /
1006                    /
1007                    /
1010                    /
1011                    /
-
```

```
1012                    /
1013                    /
1014                    /
1015                    /
1016                    /
1017                    /
1020                    /
1021                    /
1022                    /
1023    2037    0000    TTBC,   0                       /ERROR MESSAGE DISPLAYER
1024    2040    6141            LINC                    /GET OVER TO LINC SIDE
1025                            LMODE
1026                            TBREG=TMAIN&1777        /ASSIGN A BETA REGISTER
1027    0041    4046            STC     TTEBLK          /SAVE THE BLOCK NUMBER
1030    0042    0065            SET I   TBREG           /SET THE B REG TO POINT TO
1031    0043    4131            TOUT1&1777-1+4000       /WHERE THE BLOCK NUMBER SHOULD GO.
1032                    /
1033    0044    0006    TTBLP,  DJR                     /DON T CLOBBER 0
1034    0045    1020            LDA I
1035    0046    0000    TTEBLK, 0                       /GET THE B,OCK NUMBER
1036    0047    0243            ROL     3               /ROTATE TO GET DIGIT
1037    0050    1040            STA
1040    0051    0046            TTEBLK                  /AND STORE BACK FOR NEXT TIME
1041    0052    1560            BCL I
1042    0053    7770            -7
1043    0054    1620            BSE I
1044    0055    0060            60                      /CONVERT TO TRIMMED ASCII
1045    0056    1365            STH I   TBREG           /AND STORE AWAY.
1046    0057    1520            SRO I
1047    0060    3567            3567                    /ALL DONE WITH 4 DIGITS?
1050    0061    6044            JMP     TTBLP           /NOPE. DISPLAY MORE.
1051    0062    0002            PDP
1052                            PMODE                   /GET BACK INTO 8 MODE
1053    2063    7200            CLA
1054    2064    1637            TAD I   TTBC           /GET THE GO TO LIST
1055    2065    3272            DCA     TTS2            /AND SAVE IN SEARCH CALL
1056    2066    4562            DECODE                  /DISPLAY MESSAGE AND GET REPLY
1057    2067    2077            TMAIND-2
1060    2070    4573            SEARCH                  /LOOK-UP REPLY
1061    2071    2074            TTS1
1062    2072    0000    TTS2,   0                       /CALLERS LIST.
1063    2073    5266            JMP     .-5             /NOT A LEGAL REPLY.
1064                    /
1065                    /
1066                    /
1067    2074    0301    TTS1,   301
1070    2075    0322            322
1071    2076    4323            4323
1072                    /
1073                    /
1074                    /
1075                    /
1076                    /
1077                    /
1100                    /
1101                    /
1102    2077    0140            LEFT+140
1103    2100    0240            TOP=100                 /LOCATED ON TOP,LEFT OF SCREEN
1104    2101    0000    TMAIND, 0                       /OVERLAYED BY EXACT MESSGE
1105                            *TMAIND+20              /A 40 CHAR MESSAGE FROM CORRECT ERROR ROUTINE.
1106    2121    0601
1106    2122    2440
1106    2123    0214
-
```

```
1106       2124  1703
1106       2125  1340
1106       2126  1625
1106       2127  1502
1106       2130  0522
1106       2131  4040
1106                     TEXT     "FAT BLOCK NUMBER  "
1107       2132  0000  TOUT1,   0
1110       2133  0000  TOUT2,   0
1111                     TEXT     "
1112
1113       2134  4340
1113
1114       2135  4340
1114       2136  4301
1114       2137  4055
1114       2140  5555
1114       2141  4001
1114       2142  0303
1114       2143  0520
1114       2144  2440
1114       2145  0123
1114       2146  4011
1114                     A --= ACCEPT AS IS
1115       2147  2343
1115       2150  2240
1115       2151  5555
1115       2152  5540
1115       2153  2422
1115       2154  3140
1115       2155  0107
1115       2156  0111
1115                     R --= TRY AGAIN
1116       2157  1643
1116       2160  2340
1116       2161  5555
1116       2162  5540
1116       2163  2422
1116       2164  3140
1116       2165  2417
1116       2166  4023
1116       2167  1311
1116       2170  2040
1116       2171  2001
1116       2172  2324
1116       2173  4006
1116       2174  0125
1116       2175  1424
1116       2176  3140
1116       2177  0214
1116       2200  1703
1116       2201  1334
1116                     S --= TRY TO SKIP PAST FAULTY BLOCK\"
1117       2202  0602
1117       2203  1417
1117       2204  0313
1117       2205  4016
1117       2206  2515
1117       2207  0205
1117                     TMESS1, TEXT     "FBLOCK NUMBER
1120       2210  2243
1120       2211  0617
1120       2212  2240
```

```
1120        2213  2411
1120        2214  1511
1120        2215  1607
1120        2216  4005
1120        2217  2222
1120        2220  1722
1120                    FOR TIMING ERROR
1121        2221  4043
1121                    "
1122                    /
1123                    /
1124                    /
1125                    /
1126                            EJECT
-
```

```
1127                    /                                   LOCATED AROUND 2200. PREVIOUS PAGE OVERLAPS A LITTLE BIT.
1130                    /
1131                    /
1132                    /                   GENERAL CALL:
1133                    /
1134                    /           DECODE
1135                    /           YOUR DISPLAY
1136                    /
1137                    /
1140                    /
1141                    /                               WILL DECODE A STRING AS FOLLOWS:
1142                    /
1143                    /           <SINGLE LETTER><OCTAL NUMBER>;<8 CHARACTER NAME>,<OCTAL NUMBER>
1144                    /
1145                    /           ANY PART MAY BE MISSING WITH THE EXCEPTION OF THE FIRST LETTER.
1146                    /
1147                    /           IT S BROKEN DOWN AS FOLLOWS. THE FIRST LETTER GOES INTO "FTYPE", THE NUMBER INTO "FUNIT",
1150                    /           THE 8 CHARACTER NAME INTO "FNAME" FOLLWED BY
1151                    /           "7/" S  TO FILL IT OUT, AND THE LAST NUMBER INTO
1152                    / "FSIZE". ANY MISSING NUMBERS GO TO 0, A MISSING NAME GOES TO 7777777777777.
1153                    /
1154                    /
1155    2222    0000    DDCODE, 0                           /GETS AND DECODES A LINE FROM THE TTY WHILE DISPLAYING SOMETHING.
1156    2223    7300            CLA CLL                     /CLEAR AC.
1157    2224    1622            TAD I   DDCODE              /GET LOCATION OF DISPLAY.
1160    2225    3243            DCA     DDDIS               /AND PLACE HERE.
1161    2226    2222            ISZ     DDCODE              /SKIP PAST CALLING ARG.
1162    2227    7240    DDAGIN, MONE                        /RESTART OF DISPLAY.
1163    2230    3124            DCA     FNAME               /SET NAME TO 7777
1164    2231    7240            MONE
1165    2232    3125            DCA     FNAME+1
1166    2233    7240            MONE
1167    2234    3126            DCA     FNAME+2
1170    2235    7240            MONE
1171    2236    3127            DCA     FNAME+3             /NAME NOW CONTAINS A 7777
1172    2237    3120            DCA     FUNIT               /ZAP OUT UNIT NUMBER.
1173    2240    3121            DCA     FTYPE               /ZAP OUT CHAR.
1174    2241    3117            DCA     FSIZE               /AND SIZE.
1175    2242    4561            LINE                        /GET A LINE FROM THE TTY.
1176    2243    0000    DDDIS,  0                           /WHILE DISPLAYING THE CALLERS CRAP.
1177    2244    1373            TAD     DDGTEXT             /POINTER TO BUFFER-1
1200    2245    3774            DCA I   DPSTART             /WE LL USE "PGETL" TO GET
1201    2246    7240            MONE                        /THE CHARS SO I M  SETTING IT UP NOW.
1202    2247    3775            DCA I   DPSWITCH            /SET SWITCH TO LEFT CHAR.
1203    2250    1376            TAD     DSIZE               /NUMBER OF CHARS ALREADY IN BUFFER.
1204    2251    3141            DCA     COUNT               /PLACE IN TEMP COUNT.
1205    2252    4771            JMS I   DPGETL              /GO GET A CHAR.
1206    2253    2141            ISZ     COUNT               /BOP UP COUNT. IS THTA ALL?
1207    2254    5252            JMP     .-2                 /NO. GET NEXT.
1210    2255    7200            CLA                         /YES. CLEAR AC OF CHAR.
1211    2256    4771            JMS I   DPGETL              /GET NEXT CHAR.
1212    2257    1047            TAD     L7777               /TEST TO SEE IF A LETTER
1213    2260    7510            SPA                         /IS IT <"A"
1214    2261    5227            JMP     DDAGIN              /YES. NOT A LET. TRY AGAIN.
1215    2262    1050            TAD     M32                 /IS IT TOO BIG???
1216    2263    7500            SMA
1217    2264    5227            JMP     DDAGIN              /YEP. TOO BIG. TRY AGAIN.
1220    2265    1051            TAD     L336                /OK. MAKE INTO A GOOD LETTER.
1221    2266    3121            DCA     FTYPE               /AND STASH AWAY.
1222    2267    4634            JMS     DGETNUM             /GET A NUMBER NEXT.
1223    2270    1065            TAD     TEMP                /GET THE VALUE.
1224    2271    3120            DCA     FUNIT               /AND STASH AWAY.
1225    2272    1066            TAD     TEMP1               /GET CHARACTER WHICH WAS NON NUM.
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1226    2273  7450          SNA                     /IS IT TERMINATING 0000
1227    2274  5622          JMP I   DDCODE          /YES. EXIT.
1230    2275  1045          TAD     M73             /IS IT A ";"
1231    2276  7640          SZA CLA
1232    2277  5227          JMP     DDAGIN          /NOT ANYONE. BAD CHAR. TRY AGAIN.
1233    2300  1372          TAD     DFNAME          /POINTER TO "FNAME"
1234    2301  3070          DCA     TEMP3           /AND STORE AWAY
1235    2302  1022          TAD     M4              /4 *2 CHARS PER WORD=8
1236    2303  3141          DCA     COUNT
1237    2304  4360  DLOOP,  JMS     DDCHEK          /GET A CHAR AND CHECK IT.
1240    2305  7006          RTL
1241    2306  7006          RTL
1242    2307  7006          RTL                     /ROTATE INTO LEFT SPOT.
1243    2310  0053          AND     L7700           /ZAP OUT RIGHT
1244    2311  1024          TAD     L77             /NAME TERMINATES WITH A 77
1245    2312  3470          DCA I   TEMP3           /PLACE IT AWAY.
1246    2313  4360          JMS     DDCHEK          /GET ANOTHER
1247    2314  0024          AND     L77             /JUST RIGHT 6 BITS
1250    2315  1470          TAD I   TEMP3           /GET BACK OLD 1
1251    2316  1046          TAD     M77             /CHOP OFF L77 WE ADDED BEFORE.
1252    2317  3470          DCA I   TEMP3           /AND PLACE BACK IN THING.
1253    2320  2070          ISZ     TEMP3           /BOP UP NAME POINTER.
1254    2321  2141          ISZ     COUNT           /4 WORDS FILLED UP YET?
1255    2322  5304          JMP     DLOOP           /NO.
1256    2323  4360          JMS     DDCHEK          /YES. GET NEXT JUST FOR HELL OF IT.
1257    2324  5227          JMP     DDAGIN          /NAME TOO LOONG. RESTART/
1260                  /
1261    2325  4334  DCOMMA, JMS     DGETNUM         /EVALUATE NUM AFTER COMMA.
1262    2326  1065          TAD     TEMP            /GET VALUE
1263    2327  3117          DCA     FSIZE           /AND STASH AWAY
1264    2330  1066          TAD     TEMP1           /GET TERMINATING CHAR.
1265    2331  7640          SZA CLA                 /IS IT 0000
1266    2332  5227          JMP     DDAGIN          /NO. RETRY AGAIN.
1267    2333  5622          JMP I   DDCODE          /YEP. ALL DONE.   E X I T !
1270                  /
1271    2334  0000  DGETNUM,0                      /FORMS A NUMBER
1272    2335  3065          DCA     TEMP            /ZERO SUM
1273    2336  4771          JMS I   DPGETL          /GET A CHAR.
1274    2337  3066          DCA     TEMP1           /STASH IT AWAY.
1275    2340  1066          TAD     TEMP1           /GET IT BACK
1276    2341  1043          TAD     M60             /IS IT <60
1277    2342  7710          SPA CLA
1300    2343  5734          JMP I   DGETNUM         / <60.  RETURN.
1301    2344  1066          TAD     TEMP1           /GET AGAIN
1302    2345  1044          TAD     M70             /IS IT TOOOOO BBBIIIGGGG??????
1303    2346  7700          SMA CLA
1304    2347  5734          JMP I   DGETNUM         /YEP. RETURN
1305    2350  1065          TAD     TEMP            /GET OLD TOTAL
1306    2351  7104          CLL RAL
1307    2352  7104          CLL RAL
1310    2353  7104          CLL RAL                 /MULTIPLY BY 8
1311    2354  1066          TAD     TEMP1           /ADD IN TEMP1
1312    2355  1043          TAD     M60             /GET RID OF ASCII BITS.
1313    2356  3065          DCA     TEMP            /AND STASH AWAY.
1314    2357  5336          JMP     DGETNUM+2       /GO GET NEXT CHAR.
1315                  /
1316    2360  0000  DDCHEK, 0                       /CHECKS FOR 0 OR ,
1317    2361  4771          JMS I   DPGETL
1320    2362  7450          SNA                     /IS GOTTEN CHAR 0?
1321    2363  5622          JMP I   DDCODE          /YES.    EX I T
1322    2364  1042          TAD     M54             /IS IT A ,
1323    2365  7450          SNA
1324    2366  5325          JMP     DCOMMA          /YES. END OF NAME.
```

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1325    2367  1041          TAD     L54             /CORRECT FOR SUBTRACTION.
1326    2370  5760          JMP I   DDCHEK          /RETURN IWTH CHAR IN AC.
1327                  /
1330                  /
1331                  /
1332    2371  0737  DPGETL, DDCOM                   /POINTER TO UNPACK ROUTINE CHAR GETTER.
1333    2372  0124  DFNAME, FNAME                   /POINTER TO FNAME
1334    2373  1121  DDGTEXT,GTEXT+1                 /POINTER TO START OF MESSAGE-1
1335    2374  0734  DPSTART,PSTART                  /POINTER TO GETCHAR POINTER
1336    2375  0735  DPSWITCH,PSWITCH                /POINTER TO SWITCH (LEFT OR RIGHT CHAR)
1337    2376  7772  DSIZE,  -LBNUM                  /NUMBER OF SYSTEM CHARS ALREADY IN BUFFER.
1340                  /
1341                  /
1342                  /
1343                  /
1344                  /
1345                  /
1346                  /
1347                          EJECT
-
```

```
1350                    *2400
1351                /
1352                /                       MAIN DIRECTORY SEARCHER.
1353                /
1354                /       GENREAL CALL:
1355                /
1356                /
1357                /               DIRECT
1360                /
1361                /
1362                /       NO ARGUEMENTS. ALL COMMUNICATION IS DONE THROUGH "FBLOCK AREA [FSIZE-FNAME+3]"
1363                /
1364                /
1365                /
1366                /
1367                /
1370                /
1371    2400  0000  DYRECT, 0                       /MAIN ENTRY
1372    2401  7300          CLA CLL                 /CLEAR AC TO BE SURE.
1373    2402  1110          TAD     INDEX           /GET START OF INDEX
1374    2403  3215          DCA     DINDEX          /AND PLACE AWAY HERE
1375    2404  1111          TAD     ILEN            /GET LENGTH OF INDEX
1376    2405  3214          DCA     DLEN            /AND PLACE AWAY.
1377    2406  4566          PUSH                    /SAVE FBLOCK. I/O MIGHT DESTROY IT.
1400    2407  1120          TAD     FUNIT           /GET DESIRED UNIT.
1401    2410  3212          DCA     .+2             /AND FINISH SETTING UP READ.
1402    2411  4571          READ                    /READ IN INDEX.
1403    2412  0000          0                       /UNIT
1404    2413  6400  DPOINT, BUFFER                  /INTO START OF BUFFER AREA.
1405    2414  0000  DLEN,   0                       /LENGTH OF INDEX.
1406    2415  0000  DINDEX, 0                       /STARTING BLOCK OF INDEX.
1407    2416  4565          POP                     /RESTORE FBLOCK
1410    2417  4763          JMS I   DDNAME          /LOOKUP NAME.
1411    2420  5764          JMP I   DDFOUND         /NAME EXISTS. GO ELSEWHERE.
1412    2421  4765          JMS I   DYGLEN          /NO NAME. GET D LEN.
1413    2422  2141          ISZ     COUNT           /BOP BY 1 TO OFFSET FOR FIRST ENTRY
1414    2423  1213          TAD     DPOINT          /SET UP AUTO1
1415    2424  3010          DCA     AUTO1           /TO POOINT TO DIRECTORY.
1416    2425  4766  DYLOOP, JMS I   DYPAST          /GO TO NEXT ENTRY.
1417    2426  1410          TAD I   AUTO1           /GET FIRST LETTERS OF NAME.
1420    2427  1057          TAD     M5757           /IS IT FREE
1421    2430  7650          SNA CLA
1422    2431  5235          JMP     DYGOOD          /YEP. PLACE IT HERE
1423    2432  2141          ISZ     COUNT           /NO GOOD, ANY MORE TO CHACK?
1424    2433  5225          JMP     DYLOOP          /YEP. GO BACK
1425    2434  4567          NO                      /NO ROOM FOR NEW NAME.
1426    2435  1010  DYGOOD, TAD     AUTO1           /SET UP MOVE TO DIRECOTRY OF NAME
1427    2436  3241          DCA     .+3             /NAME PLACE IN DIRECTORY.
1430    2437  4564          MOVE                    /MOVE NEW NAME INTO DIRECTORY.
1431    2440  0124          FNAME
1432    2441  0000          0
1433    2442  0004          4
1434    2443  7307          PFOUR                   /NOW FILL IN SPACES WITH 5757S
1435    2444  1010          TAD     AUTO1           /POINTER TO SOURCE BLOCKS
1436    2445  3250          DCA     .+3
1437    2446  4564          MOVE                    /NOW MOVE IN 5757 S
1440    2447  2570          DL5757
1441    2450  0000          0
1442    2451  0004          4
1443    2452  4767          JMS I   DYBACK          /POINT TO START OF NAME
1444                /
1445                /
1446    2453  1123  DREENT, TAD     FWHAT           /DFOUND ALSO COMES HERE. IS IT INPUT OR OUTPUT???
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1447    2454  1047          TAD     L7777           /1=INPUT,2=OUTPUT
1450    2455  7450          SNA                     /IS IT INPUT
1451    2456  4567          NO                      /YES. NO NAME. DISPLAY "NO"
1452    2457  1047          TAD     L7777           /IS IT "2"
1453    2460  7440          SZA
1454    2461  7402          SYSERR                  /NO. INTERNAL PIP ERROR. FOR DEBUGGING ONLY.
1455    2462  1121          TAD     FTYPE           /SOURCE=1,BINARY=2
1456    2463  1047          TAD     L7777           /IS IT A 1
1457    2464  7450          SNA
1460    2465  5272          JMP     DSOURCE         /YES. SOURCE
1461    2466  1047          TAD     L7777           /IS IT2. (BINARY)
1462    2467  7440          SZA
1463    2470  7402          SYSERR                  /NEITHER. SYSTEM ERROR
1464    2471  7305          PTWO                    /BINARY. BOP PAST SOURCE.
1465    2472  1055  DSOURCE,TAD     L4              /GO PAST NAME.
1466    2473  1010          TAD     AUTO1           /SET AUTO2 TO BLOCK NUMBER POINTER.
1467    2474  3011          DCA     AUTO2
1470                  /
1471                  /
1472                  /
1473                  /               ROUTINE TO FIND VACANT SPACE IN THE DIRECTORY
1474                  /
1475                  /
1476                  /
1477                  /
1500    2475  1114  DLOOK,  TAD     CLOWER          /GET LOWER LIMIT OF SYSTEM.
1501    2476  3075          DCA     DFIRST          /THATS WHERE WE LL START CHECKING.
1502    2477  1075  DLOOP1, TAD     DFIRST          /GET START OF BLOCKS WE RE NOW CHECKING
1503    2500  1117          TAD     FSIZE           /FIND OUT HOW BIG WE WANT THEM.
1504    2501  7141          CLL CMA IAC             /13 BIT NEGATE, EXCEPT FOR LINK.
1505    2502  1114          TAD     CLOWER          /DO WE GO OVER INTO SYSTEM?
1506    2503  7660          SZA SNL CLA             /NOW REASON FOR NO CML ABOVE.
1507    2504  5316          JMP     DN01            /YEP. GO DOWN AND TRY NEXT.
1510    2505  4761          JMS I   DDCHECK         /CHECK TO SEE IF ANY OF THESE BLOCKS ARE OCCUPIED.
1511    2506  5316          JMP     DN01            /YEP, THEY ARE. GO DOWN AND TRY NEXT.
1512    2507  1075          TAD     DFIRST          /FOUND ROOM.
1513    2510  1117          TAD     FSIZE           /GET DISTANCE FROM INDEX.
1514    2511  7041          CIA
1515    2512  1110          TAD     INDEX
1516    2513  7001          IAC                     /1 MORE FOR ADDITION OVERSHOOT.
1517    2514  3357          DCA     DDIS1           /DISTANCE FROM INDEX.
1520    2515  5331          JMP     DD02            /NOW CHECK OTHER SIDE.
1521    2516  1075  DN01,   TAD     DFIRST          /BLOCKS WON T FIT.
1522    2517  7041          CIA                     /CAN WE TRY FARTHER FROM SYSTEM.
1523    2520  1112          TAD     ELOWER          /ADD LOWER LIMIT OF DEVICE.
1524    2521  7650          SNA CLA                 /ARE WE AT BOTTOM NOW?
1525    2522  5327          JMP     DBAD1           /YEP. NO ROOM HERE IN THIS SIDE.
1526    2523  7240          MONE                    /ROOM LEFT. BOP DOWN DFIRST AND TRY AGAIN.
1527    2524  1075          TAD     DFIRST
1530    2525  3075          DCA     DFIRST          /A LITTLE FARTHER FROM SYSTEM THIS TIME.
1531    2526  5277          JMP     DLOOP1          /GO BACK AND TRY AGAIN.
1532                  /
1533    2527  7240  DBAD1,  MONE                    /NO ROOM ON BOTTOM . SET DISTANCE TO MAX.
1534    2530  3357          DCA     DDIS1
1535                  /
1536    2531  7300  DD02,   CLA CLL                 /NOW EW LL CHECK TO UPPER TO SEE IF IT FITS.
1537    2532  1115          TAD     CUPPER          /GET UPPER PART OF SYSTEM.
1540    2533  3075          DCA     DFIRST          /FOR FIRST ISZ CORRECTION.
1541                  /
1542    2534  2075  DLOOP2, ISZ     DFIRST          /WE LL TRY NEXT BLOCK.
1543    2535  7410          SKP                     /WOW.QUITE A DEVICE HE S GOT THERE. 4 RF08 S IT MUST BE.
1544    2536  5354          JMP     DBAD2           /BUT STILL NO ROOM ON TOP.
1545    2537  1113          TAD     EUPPER          /GET THE UPPER LIMIT OF THE DEVICE.
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1546    2540  7160          CLL CML CMA           /13 BIT COMP , -1
1547    2541  1075          TAD     DFIRST        /WILL WE OVERFLOW DEVICE LIMITS,
1550    2542  1117          TAD     FSIZE         /WHEN WE ADD IN LENGTH.
1551    2543  7660          SZA SNL CLA
1552    2544  5354          JMP     DBAD2         /NO ROOM LEFT ON TOP END.
1553    2545  4761          JMS I   DDCHECK       /CHECK TO SEE IF BLOCKS ARE FREE.
1554    2546  5334          JMP     DLOOP2        /NOT FREE. GO BACK AND TRY AGAIN.
1555    2547  1110          TAD     INDEX         /FREE. GET DISTANCE.
1556    2550  7041          CIA
1557    2551  1075          TAD     DFIRST
1560    2552  3360          DCA     DDIS2         /AND SAVE IT.
1561    2553  5762          JMP I   DDFIG         /GO CALCULATE WHICHONE IS CLOSER [LOWER HALF OR UPPER HALF]
1562                  /
1563                  /
1564    2554  7240  DBAD2,  MONE                  /NO ROOM ON UPPER HALF.
1565    2555  3360          DCA     DDIS2         /SET DISTANCE TO A MAXIMUM.
1566    2556  5762          JMP I   DDFIG         /GO FIGURE OUT WHICH ONE IS CLOSER.
1567                  /
1570                  /
1571    2557  0000  DDIS1,  0                     /LOWER DEVICE DISTANCE
1572    2560  0000  DDIS2,  0                     /UPPER DEVICE DISTANCE FROM DESIRED FILE.
1573    2561  2653  DDCHECK,DCHECK               /POINTER
1574    2562  2600  DDFIG,  DFIG
1575    2563  3064  DDNAME, DNAME
1576    2564  3000  DDFOUND,DFOUND
1577    2565  2706  DYGLEN, DGLEN
1600    2566  2717  DYPAST, DPAST
1601    2567  2725  DYBACK, DBACK
1602    2570  5757  DL5757, 5757
1603    2571  5757          5757
1604    2572  5757          5757
1605    2573  5757          5757
1606                  /
1607                  /
1610                  /
1611                  /
1612                  /
1613                  /
1614                  /
1615                  /
1616                  /
1617                  EJECT
-
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1620                        *2600
1621                /
1622                /                                   MORE OF THE DIRECTORY LOOKUP ROUTINES.
1623                /
1624                /
1625                /
1626                /
1627                /
1630                /
1631    2600  1765  DFIG,   TAD I   DDDIS1
1632    2601  7001          IAC                       /IS LOWER HALF OK??
1633    2602  7650          SNA CLA
1634    2603  5245          JMP     D1NOG             /NO ROOM IN LOWER HALF.
1635    2604  1766          TAD I   DDDIS2            /HOW ABOUT THE UPPER HALF?
1636    2605  7001          IAC
1637    2606  7650          SNA CLA
1640    2607  5215          JMP     D1CLOSE           /LOWER HALF IS CLOSER BECAUSE NO UPPER HALF.
1641    2610  1765          TAD I   DDDIS1            /BOTH THERE. GET LOWER DISTANCE.
1642    2611  7161          CLL CML CMA IAC           /13 BIT NEGATE
1643    2612  1766          TAD I   DDDIS2            /GET UPPER DISTANCE.
1644    2613  7630          SZL CLA                   /WHICH IS CLOSER.
1645    2614  5251          JMP     D2CLOSE           /UPPER IS CLOSER.
1646                /
1647    2615  7240  D1CLOSE,MONE                      /-1 FOR ADDITION ERROR
1650    2616  1117          TAD     FSIZE             /RECREATE ORIGINAL BLOCK NUMBER
1651    2617  1765          TAD I   DDDIS1
1652    2620  7041          CIA
1653    2621  1110          TAD     INDEX             /WE VE GOT THE ORGINAL BLOCK NUMBER NOW.
1654    2622  3122  DCOM,   DCA     FBNUM             /TELL CALLING PROGRAM ABOUT IT.
1655    2623  1122          TAD     FBNUM             /NOW PLACE IT IN DIRECTORY.
1656    2624  3411          DCA I   AUTO2
1657    2625  1117          TAD     FSIZE             /ALSO THE SIZE IN THE DIRECOTRY.
1660    2626  3411          DCA I   AUTO2
1661    2627  4564          MOVE                      /NOW SET UP THE WRITING OF THE DIRECTORY.
1662    2630  2412          DPOINT-1
1663    2631  2635          DWRITE+1
1664    2632  0004          4
1665    2633  4566          PUSH                      /PUSH DOWN F BLOCK
1666    2634  4572  DWRITE, WRITE                     /WRITE DIRECTORY, WITH MOVED IN  ARGUEMENTS.
1667    2635  0000          Ø
1670    2636  0000          Ø
1671    2637  0000          Ø
1672    2640  0000          Ø
1673    2641  4565          POP                       /POP UP FBLOCK
1674    2642  1767  DDEXIT, TAD I   DDYRECT           /GET CALLING ADDRESS
1675    2643  3065          DCA     TEMP              /STORE IT
1676    2644  5465          JMP I   TEMP              /EXIT TO USER.
1677                /
1700    2645  1766  D1NOG,  TAD I   DDDIS2            /CHECK IF ROOM ON TOP HALF.
1701    2646  7001          IAC
1702    2647  7650          SNA CLA                   /ROOM?
1703    2650  4567          NO                        /NO ROOM ON DEVICE FOR FILE.
1704    2651  1075  D2CLOSE,TAD     DFIRST            /GET THE LAST BLOCK CHECKED.
1705    2652  5222          JMP     DCOM              /AND THATS IT. PLACE IN DIRECTORY.
1706                /
1707                /
1710                /
1711                /
1712    2653  0000  DCHECK, Ø                         /CHECKS TO SEE IF BLOCKS OCCUPIED BY DFIRSR ARE FREE
1713    2654  7240          MONE
1714    2655  1770          TAD I   DDPOINT           /SET AUTO1 TO POINT TO START OF DIRECTORY
1715    2656  3010          DCA     AUTO1             /IN CORE.
1716    2657  4771          JMS I   DDGLEN            /GET LEN OF DIRECTORY
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1717    2660  1410  DLOOP3, TAD I   AUTO1           /GET FIRST WORD OF A NAME IN THE DIRECTORY.
1720    2661  1057          TAD     M5757           /IS IT A GOOD NAME???
1721    2662  7650          SNA CLA
1722    2663  5301          JMP     DBLANK          /NO. SKIP PAST IT.
1723    2664  2010          ISZ     AUTO1
1724    2665  2010          ISZ     AUTO1
1725    2666  2010          ISZ     AUTO1           /SKIP PAST REST OF NAME.
1726    2667  2010          ISZ     AUTO1           /AND ALSO STARTING BLOCK OF SOURCE
1727    2670  1410          TAD I   AUTO1           /IS THERE ANY SOURCE(LENGTH=POSITIVE)
1730    2671  7710          SPA CLA
1731    2672  5274          JMP     DNOS            /NO SOURCE
1732    2673  4772          JMS I   DOTHERE         /YEP. CHECK IT OUT.
1733    2674  2010  DNOS,   ISZ     AUTO1           /SKIP PAST BINARY BLOCK
1734    2675  1410          TAD I   AUTO1           /GET BINARY LENGTH
1735    2676  7710          SPA CLA                 /BINARY THERE?
1736    2677  5301          JMP     DBLANK          /NO BINARY
1737    2700  4772          JMS I   DOTHERE         /BINARY THERE. CHECK FOR INTERFERENCE.
1740                /
1741    2701  4773  DBLANK, JMS I   DOPAST          /SKIP TO NEXT DIRECTORY ENTRY
1742    2702  2141          ISZ     COUNT           /ARE WE ALL DONE WITH THE DIRECTORY?
1743    2703  5260          JMP     DLOOP3          /NO. GET NEXT ENTRY
1744    2704  2253          ISZ     DCHECK          /YES. SKIP PAST NEXT CALLING STATEMENT AND EXIT.
1745    2705  5653          JMP I   DCHECK          /GOODBYE. AND GOOD LUCK.
1746                /
1747                /
1750                /
1751                /
1752                /
1753    2706  0000  DGLEN,  0                       /ROUTINE GETS LENGTH OF DIRECTORY AND STORES IT IN -COUNT.
1754    2707  1111          TAD     ILEN            /GET INDEX LENGTH.
1755    2710  7006          RTL
1756    2711  7006          RTL
1757    2712  7004          RAL                     /MULTIPLY BY 32 (32 ENTRIES PER BLOCK.
1760    2713  0056          AND     L7740           /CHOP AWAY CRAP.
1761    2714  7041          CIA
1762    2715  3141          DCA     COUNT           /AND STORE NEGATED IN COUNT.
1763    2716  5706          JMP I   DGLEN           /RETURN TO CALLER.
1764                /
1765    2717  0000  DPAST,  0                       /ROUTINE SETS AUTO1 TO POINT TO NEXT NAME IN DIRECTORY.
1766    2720  1010          TAD     AUTO1
1767    2721  0021          AND     L7770           /LOGICAL OPERATION----    AUTO1.OR.7
1770    2722  1060          TAD     L7
1771    2723  3010          DCA     AUTO1           /AND PUT BACK.
1772    2724  5717          JMP I   DPAST
1773                /
1774    2725  0000  DBACK,  0                       /ROUTINE BACKSPACES 1 DIRECTORY ENTRY.
1775    2726  4717          JMS     DPAST           /MOVE TO END OF THIS NAME
1776    2727  1010          TAD     AUTO1
1777    2730  1021          TAD     M10
2000    2731  3010          DCA     AUTO1           /AND DOP DOWN BY 10 (1 DIRECTORY ENTRY)
2001    2732  5725          JMP I   DBACK
2002                /
2003                /
2004                /
2005    2733  0000  DTHERE, 0                       /CHECKS JUST ONE DIRECTORY ENTRY FOR BEING WITHIN THE SPECIFIED LIMITS.
2006    2734  7240          MONE
2007    2735  1010          TAD     AUTO1           /BOP BACK THE AUTO REG.
2010    2736  3070          DCA     TEMP3           /AND PLACE IT AWAY
2011    2737  1470          TAD I   TEMP3           /RETRIEVE STARTING BLOCK NUMBER
2012    2740  7161          CLL CML CMA IAC         /13 BIT NEGATE.
2013    2741  1075          TAD     DFIRST          /ADD IN DESIRED STARTING BLOCK.
2014    2742  7450          SNA
2015    2743  5653          JMP I   DCHECK          /SAME. BLOCK IS TAKEN. EXIT.
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2016    2744  7620          SNL CLA               /ARE WE PAST DFIRST.
2017    2745  5355          JMP     DFBIGR        /NO. DFIRST IS BIGGER.
2020    2746  1470          TAD I   TEMP3          /YEP.  LETS SEE IF WE MISS IT.
2021    2747  7162          CLL CML CMA
2022    2750  1075          TAD     DFIRST        /DOES DFIRST+FSIZE INCROACH ON OUR TERRITORY.
2023    2751  1117          TAD     FSIZE
2024    2752  7620          SNL CLA               /????
2025    2753  5653          JMP I   DCHECK        /YEP. CAN T PUT IT HERE.
2026    2754  5733          JMP I   DTHERE        /IT FITS.
2027                  /
2030    2755  1470  DFBIGR, TAD I   TEMP3         /WE RE BEFORE DFIRST.
2031    2756  2070          ISZ     TEMP3         /POINT TO FILE LENGTH NOW.
2032    2757  1470          TAD I   TEMP3         /ADD OUR LENGTH IN
2033    2760  7141          CLL CMA IAC
2034    2761  1075          TAD     DFIRST        /DO WE OVERFLOW INTO DFIRST???
2035    2762  7660          SZA SNL CLA
2036    2763  5653          JMP I   DCHECK        /WE CERTAINLY DO.
2037    2764  5733          JMP I   DTHERE        / NOPE. WE RE  CLEAR.  RETURN TO CHECK AGAIN.
2040                  /
2041                  /
2042                  /
2043    2765  2557  DDDIS1, DDIS1                 /POINTER TO LOWER DISTANCE FROM SYSTEM
2044    2766  2560  DDDIS2, DDIS2                 /POINTER TO UPPER DISTANCE FROM SYSTEM
2045    2767  2400  DDYRECT,DYRECT                /POINTER TO ENTRY
2046    2770  2413  DDPOINT,DPOINT                /POINTER TO BUFFERS
2047    2771  2706  DDGLEN, DGLEN                 /POINTER TO GET NUMBER OF DIRECTORY ENTRIES ROUTINE.
2050    2772  2733  DDTHERE,DTHERE                /POINTER TO BLOCK CHECKER
2051    2773  2717  DDPAST, DPAST                 /POINTER TO ROUTINE TO GO TO NEXT ENTRY.
2052                  /
2053                  /
2054                  /
2055                  /
2056                  /
2057                  /
2060                  /
2061                  /
2062                  /
2063                          EJECT
-
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2064                        *3000
2065                /
2066                /                                   SOME MORE OF THE DIRECTORY LOOKUP ROUTINES.
2067                /
2070                /
2071                /
2072                /
2073                /
2074    3000  1123  DFOUND, TAD     FWHAT           /NAME ALREADY IN DIRECTORY. GET WHETHER INPUT OR OUTPUT FILE.
2075    3001  1047        TAD     L7777           /1=INPUT,2=OUTPUT
2076    3002  7450        SNA
2077    3003  5241        JMP     DDIN            /IT S INPUT.
2100    3004  1047        TAD     L7777           /IS IT OUTPUT?
2101    3005  7440        SZA
2102    3006  7402        SYSERR                  /NOT 1 OR 2. SOMETHING HAS BLOWN.
2103    3007  1121        TAD     FTYPE           /1=SOURCE,2=BINARY
2104    3010  1047        TAD     L7777           /IS IT SOURCE
2105    3011  7450        SNA
2106    3012  5217        JMP     DZAP            /YEP. ZAP OUT BLOCKS FROM DIRECTORY.
2107    3013  1047        TAD     L7777           /BINARY???
2110    3014  7440        SZA
2111    3015  7402        SYSERR
2112    3016  7305        PTWO                    /BINARY FILE. ADD TWO TO BYPASS SOURCE
2113    3017  1055  DZAP, TAD     L4              /BOP PAST NAME
2114    3020  1010        TAD     AUTO1           /GET POINTER NOW
2115    3021  3010        DCA     AUTO1
2116    3022  1116        TAD     L5757           /BLANK OUT THE BLOCK NUMBER
2117    3023  3410        DCA I   AUTO1           /       (EITHER TO POINTER TO SOURCE OR BINARY)
2120    3024  4566        PUSH                    /PUSH DOWN FBLOCK SO "REPLACE" WONT BLOW IT.
2121    3025  1010        TAD     AUTO1           /NOW GET THE AUTO LENGTH POINTER.
2122    3026  3012        DCA     AUTO3           /AND PLACE IN A TEMPORARY AUTO.
2123    3027  1412        TAD I   AUTO3           /IF SIGN BIT OF LENGTH ON THEN NO SOURCE OR BINARY.
2124    3030  7700        SMA CLA                 /DO WE WANT TO REPLACE????
2125    3031  4570        REPLACE                 /YEP. DISPLAY REPLACE MESSAGE.
2126    3032  4565        POP                     /HE S ANSWERED AN "R". NOW REPLACE FBLOCK.
2127    3033  1116        TAD     L5757           /NOW ZAP OUT THE LENGTH.
2130    3034  3410        DCA I   AUTO1           /BY PLACING IN SOME 5757 S.
2131    3035  4566        PUSH                    /NOW PUSH DOWN SO THAT WE WILL REMEMBER IT.
2132    3036  4745        JMS I   DDBACK          /BACKSPACE TO BEGINNING OF NAME.
2133    3037  5640        JMP I   .+1             /WE WANTS IT REPLACED.
2134    3040  2453        DREENT                  /REENTRY FOR REPLACING THE FILE
2135                /
2136                /
2137    3041  1121  DDIN, TAD     FTYPE           /IT AN INPUT FILE. GET THE MODE.
2140    3042  1047        TAD     L7777           /1=SOURCE,2=BINARY
2141    3043  7450        SNA
2142    3044  5251        JMP     DDT             /IT SOURCE
2143    3045  1047        TAD     L7777           /MAYBE IT S BINARY
2144    3046  7440        SZA
2145    3047  7402        SYSERR                  /UGH. PIP HAS BLOWN.
2146    3050  7305        PTWO                    /IT S BINARY. MOVE PAST SOURCE.
2147    3051  1055  DDT,  TAD     L4              /PUSH PAST NAME.
2150    3052  1010        TAD     AUTO1           /RESET POINTER
2151    3053  3010        DCA     AUTO1
2152    3054  1410        TAD I   AUTO1           /GET BLOCK NUMBER
2153    3055  3122        DCA     FBNUM           /AND STORE AWAY.
2154    3056  1410        TAD I   AUTO1           /GET SIZE OF FILE
2155    3057  7510        SPA                     /IS IT OK?
2156    3060  4567        NO                      /NO.  DISPLAY "NO" MESSAGE.
2157    3061  3117        DCA     FSIZE           /YEP. ITS THERE. STASH AWAY.
2160    3062  5663        JMP I   .+1             /NOW EXIT FROM DYRECT.
2161    3063  2642        DDEXIT
2162                /
-
```

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2163                    /
2164                    /
2165                    /
2166    3064    0000    DNAME,  0                       /LOOKS UP NAME IN THE DIRECTORY.
2167    3065    1746            TAD I   DNPOINT        /GET STARTING ADDRESS FOR THE NAME LOOKUP.
2170    3066    1047            TAD     L7777           /AC MAY NOT CONTAIN ZERO FOR SOME SPECIAL CALLS.
2171    3067    3010            DCA     AUTO1           /PLACE IN AUTO1
2172    3070    4747            JMS I   DNGLEN          /GET LENGTH
2173    3071    1746            TAD I   DNPOINT        /GET STARTING ADDRESS OF DIRECTORY
2174    3072    3071            DCA     TEMP4           /STORE AWAY.
2175    3073    1471            TAD I   TEMP4           /GET FIRST WORD. IS IT "5757"
2176    3074    1057            TAD     M5757
2177    3075    7650            SNA CLA
2200    3076    5312            JMP     DOK             /IT S THERE. ALL IS WELL
2201    3077    2264            ISZ     DNAME           /DESIRED NAME NOT THERE BECAUSE NO DIRECTORY.
2202    3100    1141            TAD     COUNT           /MULTIPLY COUNT BY 8
2203    3101    7006            RTL
2204    3102    7004            RAL                     /BECAUSE THERE ARE 8 WORDS PER
2205    3103    0021            AND     L7770           /DIRECTORY ENTRY
2206    3104    3141            DCA     COUNT
2207    3105    1116            TAD     L5757           /MAKE IT A GOOD DIRECOTORY.
2210    3106    3410            DCA I   AUTO1           /FILL IT UP
2211    3107    2141            ISZ     COUNT           /ALL DONE?
2212    3110    5305            JMP     .-3             /NOPE
2213    3111    5664            JMP I   DNAME           /YEP. ALL DONE.
2214                    /
2215                    /
2216                    /
2217    3112    4750    DOK,    JMS I   DNPAST          /PUSH PAST PRESENT NAME.
2220    3113    1410            TAD I   AUTO1           /GET FIRST WORD OF NEW NAME.
2221    3114    7041            CIA
2222    3115    1124            TAD     FNAME           /A MATCH?
2223    3116    7640            SZA CLA
2224    3117    5341            JMP     DNOT            /NO. TRY NEXT
2225    3120    1410            TAD I   AUTO1           /AND SO ON DOWN UNTIL IT FAILS OR A MATCH IS MADE.
2226    3121    7041            CIA
2227    3122    1125            TAD     FNAME+1
2230    3123    7640            SZA CLA
2231    3124    5341            JMP     DNOT
2232    3125    1410            TAD I   AUTO1
2233    3126    7041            CIA
2234    3127    1126            TAD     FNAME+2
2235    3130    7640            SZA CLA
2236    3131    5341            JMP     DNOT
2237    3132    1410            TAD I   AUTO1
2240    3133    7041            CIA
2241    3134    1127            TAD     FNAME+3
2242    3135    7640            SZA CLA
2243    3136    5341            JMP     DNOT
2244    3137    4745            JMS I   DNBACK          /A MATCH SET AUTO1 AND EXIT.
2245    3140    5664            JMP I   DNAME
2246                    /
2247                    /
2250    3141    2141    DNOT,   ISZ     COUNT           /FINISHED CHECKING ALL?
2251    3142    5312            JMP     DOK             /NO. MORE TO GO.
2252    3143    2264            ISZ     DNAME           /NOT THERE. PUSH BACK EXIT LOCATION
2253    3144    5664            JMP I   DNAME           /AND EXIT.
2254                    /
2255                    /
2256                    /
2257                    /
2260                    /
2261    3145    2725    DDBACK, DBACK                   /POINTER TO BACKSPACE ROUTINE
-
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2262                    DNBACK=DOBACK                   /A SLIGHT OVERSIGHT.
2263    3146    2413    DNPOINT,DPOINT                  /POINTER TO BUFFERS
2264    3147    2706    DNGLEN, DGLEN                   /GET NUMBER OF ENTRIES ROUTINE
2265    3150    2717    DNPAST, DPAST                   /ADVANCE POINTER TO NEXT NAME ROUTINE
2266                    /
2267                    /
2270                    /
2271                    /
2272                    /
2273    3151    0000    NODIS,  0
2274    3152    4551            DISPLAY                 /ISSUE DISPLAY COMMAND
2275    3153    3155            NONODI                  /MYOUTPUT CRAP
2276    3154    5352            JMP     .-2             /HANG AROUND UNTIL A ^D OR ^P IS TYPED.
2277                    /
2300    3155    0340    NONODI, LEFT+340                /ABOUT CENTER OF THE SCREEN
2301    3156    7740            BOTTOM+340
2302    3157    0616
2302    3160    1734
2302                    TEXT    "FNO\"                  /A SIMPLE MESSAGE.
2303                    /
2304                    /
2305                    /
2306    3161    0000    REPDIS, 0
2307    3162    4566            PUSH                    /STORE AWAY FBLOCK
2310    3163    4562            DECODE                  /GET A LINE
2311    3164    3173            DISREP                  /REPLACE MESSAGE
2312    3165    1121            TAD     FTYPE           /GET REPLY
2313    3166    1027            TAD     M322            /IS IT AN "R"
2314    3167    7640            SZA CLA
2315    3170    5363            JMP     REPDIS+2        /NOPE. TRY AGAIN.
2316    3171    4565            POP                     /RESTORE FBLOCK
2317    3172    5761            JMP I   REPDIS          /AND RETURN.
2320                    /
2321                    /
2322    3173    0260    DISREP, LEFT+260                /ABOUT THE CENTER
2323    3174    0040            TOP=300                 /GOOD ENOUGH
2324    3175    0622
2324    3176    0520
2324    3177    1401
2324    3200    0305
2324                    TEXT    "FREPLACE?
2325    3201    7743
2325
2326    3202    4043
2326
2327    3203    4043
2327    3204    1022
2327    3205    4055
2327    3206    5555
2327    3207    4022
2327    3210    0520
2327    3211    1401
2327    3212    0305
2327    3213    3400
2327                    HR -=- REPLACE\"
2330                    /
2331                    /
2332                    /
2333                    /
2334                    /
2335                    /
2336                    /
2337                    /
-
```

```
2340                    /
2341                    /
2342                    /
2343                            EJECT
-
```

```
2344                    /
2345                    /
2346                    /
2347                    /
2350                    /                       COPY ROUTINE:
2351                    /                               OVERLAPS IN 3200 FROM PREVIOUS PAGE.
2352                    /
2353                    /
2354                    /
2355                    /
2356                    /
2357                    /               GENERAL CALL:
2360                    /
2361                    /
2362                    /       COPY
2363                    /
2364                    /
2365                    /
2366                    /               COPIES FSIZE BLOCKS FROM  INUNIT,INBLOCK
2367                    /                       TO OUTUNIT,OUTBLOCK
2370                    /                       AND TO MORE UNITS DEPENDING ON THE VALUE OF "OUTNUM".
2371                    /                       OUTNUM SHOULD BE 7777 FOR 1 TAPE COPY.
2372                    /
2373                    /
2374                    /
2375                    /
2376                    /
2377    3214    0000    CCOPY,  0                       /MAIN ENTRY
2400    3215    1103            TAD     INUNIT          /GET INPUT UNIT
2401    3216    3252            DCA     CINU            /AND PLACE IN READ CALL
2402    3217    1102            TAD     INBLOCK         /GET INPUT STARTING BLOCK
2403    3220    3255            DCA     CINB            /AND STORE IN READ BLCOK
2404    3221    1104            TAD     OUTBLOCK        /GET THE OUTPUT STARTING BLOCK
2405    3222    3262            DCA     COUTB           /AND LEAVE THAT IN WRITE
2406    3223    1117            TAD     FSIZE           /GET THE NUMBER OF BLOCKS TO COPY
2407    3224    3301            DCA     CSIZE           /AND STORE THAT AWAY.
2410                    /
2411    3225    1105    CPLOOP, TAD     OUTUNIT         /GET THE ORIGINAL OUTPUT UNIT.
2412    3226    3257            DCA     COUTU           /AND PLACE I N  WIRTE OUT UNIT.
2413    3227    1106            TAD     OUTNUM          /GET NUMBER OF UNITS ITS GOING TO
2414    3230    3302            DCA     CCOUNT          /PLACE IN TEMPORARY COUNTER.
2415    3231    1301            TAD     CSIZE           /GET NUMBER OF BLOCKS LEFT.
2416    3232    7450            SNA                     /ALL DONE???
2417    3233    5614            JMP I   CCOPY           /YES
2420    3234    7161            CLL CML CMA IAC         /13 BIT NEGATE.
2421    3235    1074            TAD     BNUM            /NUMBER OF BUFFERS AVAILABLE.
2422    3236    7660            SNL SZA CLA             /MORE TO GO THEN BUFFERS ALOLOW?
2423    3237    5245            JMP     CSMALL          /NO. BUFFERS BIGGER.
2424    3240    1074            TAD     BNUM            /GET BUFFER SIZE.
2425    3241    3254            DCA     CINS            /STASH IN READ.
2426    3242    1074            TAD     BNUM
2427    3243    3261            DCA     COUTS           /STASH IN WRITE.
2430    3244    5251            JMP     CCOM            /GO DO READ-WRITE
2431                    /
2432    3245    1301    CSMALL, TAD     CSIZE           /GET NUMBER LEFT.
2433    3246    3254            DCA     CINS            /STASH IN INPUT SIZE.
2434    3247    1301            TAD     CSIZE
2435    3250    3261            DCA     COUTS           /AND OUTPUT SIZE.
2436                    /
2437    3251    4571    CCOM,   READ                    /READ IN CORECT NUMBER OF BLOCKS.
2440    3252    0000    CINU,   0                       /INPUT UNIT.
2441    3253    6400            BUFFER                  /POINTER TO BUFFERS.
2442    3254    0000    CINS,   0                       /NUMBER OF RECORDS TO BE READ IN.
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2443    3255  0000  CINB,   0                       /STARTING BLOCK NOW OF READ.
2444    3256  4572  CCMORE, WRITE                   /NOW WRITE IT OUT.
2445    3257  0000  COUTU,  0                       /OUTPUT UNIT
2446    3260  6400          BUFFER                  /BUFFER POINTER
2447    3261  0000  COUTS,  0                       /NUMBER OF RECORDS.
2450    3262  0000  COUTB,  0                       /0STARTING RECORD NUMBER.
2451    3263  2257          ISZ     COUTU           /BOP UP TO NEXT OUTPUT UNIT
2452    3264  2302          ISZ     CCOUNT          /MORE UNITS TO WRITE ON??
2453    3265  5256          JMP     CCMORE          /YEP. GO BACK AND WRITE ON NEXT.
2454                  /
2455                  /
2456                  /
2457    3266  1254          TAD     CINS            /GET THE INPUT SIZE
2460    3267  1255          TAD     CINB            /AUD  THE BLOCK NUMBER
2461    3270  3255          DCA     CINB            /AND UPDATE BLOCK NUMBER.
2462    3271  1261          TAD     COUTS           /GET THE OUTPUT SIZE.
2463    3272  1262          TAD     COUTB           /ADD THE COUTPUT SIZE.
2464    3273  3262          DCA     COUTB           /AND UPDATE IT.
2465    3274  1254          TAD     CINS            /GET THE NUMBER OF RECORDS JUST TRANSFERRED.
2466    3275  7041          CIA                     /AND SUBTRACT IT FROM
2467    3276  1301          TAD     CSIZE           /THE TOTAL TRANSFERR
2470    3277  3301          DCA     CSIZE           /AND STORE AWAY.
2471    3300  5225          JMP     CPLOOP          /GO BACK AND DO SOME MORE.
2472                  /
2473                  /
2474                  /
2475                  /
2476    3301  0000  CSIZE,  0                       /CURENT NUMBER OF BLOCKS GOING.
2477    3302  0000  CCOUNT, 0                       /TEMPORAY COUNTER FOR THE UNITS.
2500                  /
2501                  /
2502                  /
2503    3303  0000  LLEDER, 0                       /GENERATES LEADER OR TRAILER
2504    3304  1144          TAD     M212            /ABOUT 130 CHARACTERS OF LEADER
2505    3305  3141          DCA     COUNT
2506    3306  1026          TAD     L200
2507    3307  4575          AUXOUT                  /PUT OUT LEADER
2510    3310  2141          ISZ     COUNT           /ALL DONE?
2511    3311  5306          JMP     .-3             /NOPE, DO MORE.
2512    3312  5703          JMP I   LLEDER          /ALL DONE. EXIT
2513                  /
2514                  /
2515                  /
2516    3313  0000  HHPUSH, 0                       /HIGH FBLOCK SAVE.
2517    3314  4564          MOVE                    /MOVE FBLOCK TO A SAFE PLACE
2520    3315  0117          FSIZE
2521    3316  3327          HHTEMP
2522    3317  0011          FNAME+3-FSIZE+1
2523    3320  5713          JMP I   HHPUSH
2524                  /
2525                  /
2526    3321  0000  HHPOP,  0                       /RESTORES FBLOCK FROM HIGH PLACE
2527    3322  4564          MOVE
2530    3323  3327          HHTEMP
2531    3324  0117          FSIZE
2532    3325  0011          FNAME+3-FSIZE+1
2533    3326  5721          JMP I   HHPOP
2534                  /
2535                  /
2536    3327  0000  HHTEMP, 0/HIGH SAVE AREA
2537                        *HHTEMP+FNAME+3-FSIZE   /LEAVE ROOM FOR FBLOCK
2540    3337  0000          0000                    /LAST WORD OF SAVE AREA.
2541                  /
-
```

```
2542                    /
2543                    /
2544                    /
2545    3340    0000    TTAPE,  0                       /SETS UP TO USE TAPE LIMITS FOR DIRECTORY LOOKUP.
2546    3341    4564            MOVE                    /MOVE IN CORRECT POINTERS
2547    3342    3353            TTISET
2550    3343    0110            INDEX
2551    3344    0006            CUPPER=INDEX+1
2552    3345    1120            TAD     FUNIT           /GET THE UNIT
2553    3346    0060            AND     L7              /SET UP FOR LINC TAPE
2554    3347    3120            DCA     FUNIT
2555    3350    7240            NONE                    /SET FOR 1 COPY
2556    3351    3106            DCA     OUTNUM
2557    3352    5740            JMP I   TTAPE           /AND RETURN
2560                    /
2561                    /
2562    3353    0346    TTTSET, TINDEX                  /START OF TAPE INDEX BLOCK
2563    3354    0002            TILEN                   /LENGTH OF TAPE INDEX
2564    3355    0000            TLOWER                  /LOWEST BLOCK NUBMER ON DEVICE
2565    3356    0777            TUPPER                  /HIGHEST BLOCK NUMBER ON THE DEVICE
2566    3357    0270            TSYSLOWER               /LOWER LIMIT OF SYSTEM
2567    3360    0467            TSYSUPPER               /LAST BLOCK USED BY SYSTEM
2570                    /
2571                    /
2572                    /
2573                    /
2574    3361    0000    TTYPUT, 0                       /TTY OUTPUT ROUTINE
2575    3362    3340            DCA     TTAPE           /STASH AWAY WHILE DOING CHECK.
2576    3363    4556            CHECKIO                 /TEST FOR MAYBE A CONTROL Z
2577    3364    6041            6041                    /IS IT FREE?
2600    3365    5363            JMP     .-2             /NOPE, CHECK AGAIN.
2601    3366    1340            TAD     TTAPE           /GET IT AGAIN.
2602    3367    6046            6046                    /YEP. GOOD BYE.
2603    3370    7200            CLA
2604    3371    5761            JMP I   TTYPUT          /THATS ALL
2605                    /
2606                    /
2607                    /
2610                    /
2611                    /
2612                    /
2613                    /
2614                    /
2615                    /
2616                    /
2617                    /
2620                            ASMIFZ  PFLICK          /DO WE WANT THE FLICKER FACTOR ADDED?
2621                            ASMSKP  10              /NOPE. DONT ASSEMBLE THEM IN
2622                    /
2623    3372    0000    POTHER, 0                       /FLICKER.
2624    3373    1415            TAD I   AUTO6          /PICK A RANDOM LOCATION
2625    3374    0030            AND     L4000           /JUST GET THE HIGH ORDER BIT
2626    3375    1001            TAD     LOC1            /NOW ADD IN THE TABLE POINTER
2627    3376    3001            DCA     LOC1            /AND THE CHANNEL SELECTIO WORD
2630    3377    5772            JMP I   POTHER          /STASH BACK AND RETURN TO THE CALLER
2631                    /
2632                    /
2633                    /
2634                    /
2635                    /
2636                    /
2637                    /
2640                    /
```

```
2641                    /
2642                    /
2643                    /
2644                    /
2645                    /
2646                    /
2647                    /
2650                    /
2651                    /
2652                            EJECT
-
```

```
2653                /
2654                /
2655                /
2656                /
2657                /
2660                /                       END OF    P  I  P  2.
2661                /
2662                /
2663                /
2664                /               CALL PIP3
2665                /
2666                /
2667                /
2670                /
2671                /
2672                /
2673                /
2674                        CHAIN   "PIP3"
```

```
0000                    *20
0001                            PMODE
0002                            EJECT
-
```

```
0003                    /
0004                    /
0005                    /
0006                    /
0007                    /
0010                    /
0011                    /                       THIS IS THE THIRD PART OF PIP. IT S  CALLED:
0012                    /
0013                    /
0014                    /
0015                    /
0016                    /                               P     I     P     3
0017                    /
0020                    /
0021                    /
0022                    /
0023                    /
0024                    /
0025                    /
0026                    /
0027                    /
0030                    /
0031                    /
0032                            EJECT
-
```

```
0033                        *3422
0034                  /
0035                  /
0036                  /              B I N A R Y   H A N D L E R
0037                  /
0040                  /
0041                  /
0042      3400  4562  BINARY, DECODE                 /GET THE CORRECT INPUT DEVICE.
0043      3401  4610        BININP                   /WHILE DISPLAYING INPUT MESSAGE.
0044      3402  7344        MTWO                     /SET BFIELD TO GO A NEW ONE.
0045      3403  3137        DCA     BOFIELD
0046      3404  3130        DCA     ORIGIN           /SET ORIGIN TO ZERO
0047      3405  3103        DCA     BOLDP            /SET BASE TO ZERO
0050      3406  3135        DCA     BFIELD           /SET FIELD TO ZERO
0051      3407  3136        DCA     BOLDO            /SET OLD ORIGIN TO ZERO
0052      3410  3140        DCA     BCOUNT           /SET SIZE TOZERO
0053      3411  3102        DCA     BFLAG1           /CLEAR THE INPUT AND OUTPUT DEVICE FLAGS.
0054      3412  3104        DCA     BFLAG2
0055      3413  4573        SEARCH                   /CHECK IF A LEGAL OPTION WAS GIVEN
0056      3414  4377        BINLST
0057      3415  4403        BINGO                    /AND IF IT WAS, GO TO CORRECT PLACE.
0060      3416  5200        JMP     BINARY           /NOT A LEGAL DEVICE.
0061                  /                                                  input from HSR
0062                  /
0063                  /
0064                  /
0065      3417  2102  BHIGH,  ISZ     BFLAG1           /SET FLAG TOREADER
0066      3420  2102  BTTY,   ISZ     BFLAG1           /SET FLAG TO LOW READER, MORE DEVICE MAY COME
0067                                                   /BEFORE THE HIGH READER
0070      3421  1124        TAD     FNAME            /TEST TO SEE IF MODE GIVEN
0071      3422  7040        CMA
0072      3423  7650        SNA CLA
0073      3424  5304        JMP     BPART2           /NO LETTERS. NOO AUTO START.
0074      3425  1124        TAD     FNAME            /GET LEFT CHARACTER OF NAME.
0075      3426  0053        AND     L7700            /ONLY P OR L NEEDED
0076      3427  3121        DCA     FTYPE            /AND STASH AWAY
0077      3430  4573        SEARCH                   /CHECK FOR P OR L
0100      3431  3555        BGOLST
0101      3432  3557        BSTGO
0102      3433  5200        JMP     BINARY           /ILLEGAL
0103                  /
0104                  /
0105      3434  1117  BPODE,  TAD     FSIZE            /GET STARTING ADDRESS
0106      3435  7450        SNA                      /ONE GIVEN?
0107      3436  1026        TAD     L200             /NOPE, SET IT TO 200.
0110      3437  3117        DCA     FSIZE            /AND STASH AWAY.
0111      3440  7305        PTWO                     /GET A "PDP" INSTRUCTION INTHE AC
0112      3441  5252        JMP     BSCOMM           /AND STORE AWAY.
0113                  /
0114      3442  1117  BLODE,  TAD     FSIZE            /GET THE STARTING ADDRESS.
0115      3443  7450        SNA                      /ONE GIVEN?
0116      3444  1350        TAD     L4020            /NO. ASSUME 4020
0117      3445  3117        DCA     FSIZE            /SAVE BACK STARTING ADDRESS.
0120      3446  1032        TAD     L6000            /GET .NOT. 10 BIT MASK IN AC.
0121      3447  7040        CMA                      /MKAE IT A GOOD 10 BIT AN D  MASK
0122      3450  0117        AND     FSIZE            /JUST 10 BITS.
0123      3451  1032        TAD     L6000            /NOW MAKE IT A GOOD JMP IN LMODE INSTRUCTION.
0124                  /                              I NEEDED A PAGE 0 LOCATION, SO I DID IT THAT WAY
0125                  /
0126      3452  3752  BSCOMM, DCA I   BBOOT+1
0127      3453  1117        TAD     FSIZE            /GET STARTING ADDRESS
0130      3454  3754        DCA I   BBOOT+3          /PLACE AWAY IN HEADER.
0131      3455  7352        CLA CLL CMA RTR          /PLACE A JMP I 7777 IN THE AC(5777)
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0132    3456  3753          DCA I   BBOOT+2         /AND PLACE AWAY.
0133    3457  1120          TAD     FUNIT           /GET THE FIELD
0134    3460  0060          AND     L7              /MAKE IT REASONABLE
0135    3461  7106          CLL RTL                 /SHIFT TO CORRECT PLACES.
0136    3462  1026          TAD     L200
0137    3463  1040          TAD     L400            /SAVE A PAGE 0 LITTERAL
0140    3464  3120          DCA     FUNIT           /PLACE BACK
0141    3465  1117          TAD     FSIZE           /GET STARTING ADDRESS.
0142    3466  0032          AND     L6000           /JUST LMODE FIELD BITS.
0143    3467  7106          CLL RTL
0144    3470  7004          RAL                     /INTO CORRECT POSITION.
0145    3471  1120          TAD     FUNIT           /ADD BACK IN CORRECT "LIF"
0146    3472  3751          DCA I   BBOOT           /AND SAVE AWAY.
0147    3473  5304          JMP     BPART2          /GO TO COMMON.
0150                /
0151                /
0152                /
0153                        ASMIFZ  RF08            /DISK THERE?
0154                        ASMSKP  2               /NOPE. DON T ASSEMBLE THE FOLLOWING IN.
0155    3474  4577  BLRF8,  DISC                    /SET UP DISK INPUT
0156    3475  7410          SKP                     /SKP OVER TAPE SETUP.
0157    3476  4402  BLT,    TAPE                    /SET UP TAPE OPERATION.
0160    3477  7305          PTWO                    /TELL DIRECTORY LOOKUP ITS BIANRY
0161    3500  3121          DCA     FTYPE           /FTYPE=2 MEANS A BINARY FILE.
0162    3501  7345  BL7345, CLA CLL CIA RAL         /+1=BINARY, 7345=-433=-("DZ")-1 FOR DELETE ZERO
0163                                                /IN OTHER WORDS, ITS ALSO A LITTERAL, SO DONT MESS.
0164    3502  3123          DCA     FWHAT           /SET INPUT SWITCH
0165    3503  4563          DIRECT                  /GO DO IT.
0166                /
0167    3504  4404  BPART2, HPUSH                   /PUSH DOWN THE FBLOCK REGION.
0170    3505  4562          DECODE                  /GET THE OUTPUT DEVICE
0171    3506  4703          BINOUT                  /BINARY OUTPUT DISPLAY CMESSAGE
0172    3507  4573          SEARCH                  /CHECK NAEM FOR LEGAL OPTION
0173    3510  4377          BINLST                  /SAME INPUT AS OUTPUT FORR NOW
0174    3511  4407          BING02                  /JMP LIST
0175    3512  5305          JMP     BPART2+1        /NOT A LEGAL REQUEST.
0176                /
0177                /
0200    3513  2104  BHIGH2, ISZ     BFLAG2          /SET THE OUTPUT FLAG
0201    3514  2104  BTTY2,  ISZ     BFLAG2          /FOR THE CORRECT DEVICE
0202    3515  2124          ISZ     FNAME           /PREPARE TO CHECK FOR "DZ", BOP UP FNAME
0203    3516  1301          TAD     BL7345          /ADD IN -DZ-1.(IF NOT 7777)
0204    3517  3101          DCA     BDELZ           /NOW STASH AWAY IN DELETE SWITCH (0 OR -DZ-1)
0205    3520  1124          TAD     FNAME           /NOW GET THE CORRECT NAME+1
0206    3521  1101          TAD     BDELZ           /COMPARE AGAINST WHAT WE PUT THERE
0207    3522  7640          SZA CLA                 /DO THEY MATCH.
0210    3523  5305          JMP     BPART2+1        /THEY DONT MATCH, ASK AGAIN.
0211                                                /NOW BDELZ CONTAINS 0 FOR NO DELETE OR 7345 FOR DELETE.
0212                /
0213                /
0214                        ASMIFZ  RF08            /DISK THERE????
0215                        ASMSKP  2               /NOPE, NO DISK CODE NOW.
0216    3524  4577  BLRF82, DISC                    /SET FOR DISC NOW
0217    3525  7410          SKP
0220    3526  4402  BLT2,   TAPE                    /SET FOR LINC TAPE, NOT DISC
0221    3527  4566          PUSH                    /SAVE FBLOCK IN LOW SAVE AREA.
0222    3530  7305          PTWO                    /SET BINARY MODE AGAIN.
0223    3531  3121          DCA     FTYPE           /IN CASE OF COPY
0224    3532  7240          MONE                    /IS IT A MASS STORAGE DEVICE OPERATION
0225    3533  1102          TAD     BFLAG1
0226    3534  1104          TAD     BFLAG2          /IF NEGATIVE IT IS.
0227    3535  7710          SPA CLA                 /THE TEST!
0230    3536  5406          FILEC                   /YEP, COPY CHOSEN FILES.
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0231    3537  1104          TAD     BFLAG2          /GET OUTPUT FLAG
0232    3540  7640          SZA CLA                 /TAPE OUTPUT?
0233    3541  4405          LEADER                  /NO, PUNCH LEADER.
0234    3542  1102          TAD     BFLAG1          /IS IT LINC TAPE INPUT???
0235    3543  7650          SNA CLA
0236    3544  5746          JMP I   BBTAPE          /YEP. GO TO LINC TAPE ROUTINE
0237    3545  5747          JMP I   BLODYR          /NOPE. USE STANDARD BINARY LOADER.
0240                  /
0241                  /
0242                  /
0243                  /
0244    3546  4003  BBTAPE, BINTAP
0245    3547  3600  BLODYR, BNFILE
0246    3550  4020  L4020,  4020                   /NORMAL STARTING ADDRESS IN LINC MODE.
0247                  /
0250    3551  7000  BBOOT,  BUFFER+400            /HEADER BLOCK SELF STARTING POINTERS.
0251    3552  7001          BUFFER+401
0252    3553  7002          BUFFER+402
0253    3554  7003          BUFFER+403
0254                  /
0255    3555  1400  BGOLST, 1400                   /L*100
0256    3556  6000          6000                    /P*100+4000
0257                  /
0260    3557  3442  BSTGO,  BLODE
0261    3560  3434          BPODE
0262                  /
0263                  /
0264                  /
0265                  /
0266                  /
0267                  /
0270                  /
0271                  /
0272                  /     ASMIFN  CARD-1          /DO WE WANT CARD READER CRAP LOADERED????
0273                  /     ASMSKP  30              /GUESS NOT. DON T ASSEMBLE THEM.
0274                  /
0275                  /
0276    3561  0000  CRDLTT, 0                       /CARD READER CHECKER AND INITIALIZER.
0277    3562  1121          TAD     FTYPE           /GET THE REPLY .
0300    3563  1376          TAD     CRM303          /IS IT A "C"
0301    3564  7640          SZA CLA                 /?
0302    3565  5761          JMP I   CRDLTT          /NOPE. RETURN TO CHECK MORE.
0303    3566  1120          TAD     FUNIT           /YEP. GET THE STARTING COLUMN
0304    3567  3136          DCA     BOLDO           /AND STASH AWAY.
0305    3570  1117          TAD     FSIZE           /AND GET THE LAST COLUMN
0306    3571  3131          DCA     DATA            /AND STORE IT AWAY.
0307    3572  4777          JMS I   CRINIT          /ITIALIZE CARD READER.
0310    3573  2102          ISZ     BFLAG1          /PREPARE TO SET THE INPUT FLAG TO 3
0311    3574  5775          JMP I   .+1             /NOW ADD TWO TO THE INPUT FLAG
0312    3575  5017          ASCH1                   /HIGH SPEED READER=2
0313                  /
0314    3576  7475  CRM303, -303                   /A - "C"
0315    3577  6005  CRINIT, CDINIT                 /POINTE TO CARD READER INITIALIZE ROUTINE.
0316                  /
0317                  /
0320                  /
0321                  /
0322                  /
0323                  /
0324                  /
0325                  /
0326                  /
0327                  /
-
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0330                    /
0331                    /
0332                    /
0333                    /
0334                    /
0335                    /
0336                    /
0337                            EJECT
-
```

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0340                    /
0341                            *3600
0342                    /                       MORE BINARY LOADER ROUTINES AND CRAP.
0343                    /
0344                    /
0345                    /
0346                    /
0347    3600    6016    BNFILE, 6216                    /NON FILE ORIENTED ROUUTINES.
0350    3601    6032            6232                    /INITIATE AND CLEAR ALL POSSIBLE DEVICES.
0351    3602    3135            DCA     BFIELD          /SET FIELD TO ZERO.
0352    3603    3372            DCA     BFEILD          /AND SET NEXT FIELD TO ZERO ALSO.
0353    3604    4243            JMS     BEGG            /GET A CHARACTER
0354    3605    5204            JMP     .-1             /LEADER-TRAILER. IGNORE IT.
0355                    /
0356    3606    3371    BGO,    DCA     BCHECK          /UPDATE CHECKSUM
0357    3607    1105            TAD     BCHAR           /GET THE CHARACTER
0360    3610    3077            DCA     BWORD1          /STORE AWAY
0361    3611    4574            AUXIN                   /LOOKUP FOR NEXT CHAR
0362    3612    3100            DCA     BWORD2          /AND SAVE
0363    3613    4243            JMS     BEGG            /LOOK AHEAD ONE NOW.
0364    3614    5276            JMP     BEND            /TRAILER FOUND. CHECK CHECKSUM.
0365    3615    4234            JMS     BASSEM          /ASSEMBLE A WORD
0366    3616    7420            SNL                     /ORIGIN?
0367    3617    5227            JMP     BBBPUT          /NO. PLACE IN DATA WORD
0370    3620    3130            DCA     ORIGIN          /YES. STORE IN ORIGIN.
0371    3621    1372    BCHEX,  TAD     BFEILD          /GET THE NEXT FIELD
0372    3622    3135            DCA     BFIELD          /AND STORE IT IN THE PRESENT FIELD FOR NEXT TIME
0373    3623    1077            TAD     BWORD1
0374    3624    1100            TAD     BWORD2
0375    3625    1371            TAD     BCHECK          /UPDATE CHECKSUM
0376    3626    5206            JMP     BGO             /AND GO GET NEXT WORD.
0377                    /
0400    3627    3131    BBBPUT, DCA     DATA            /PLACE IN DATA FOR OUTPUT ROUTINE TO USE.
0401    3630    4576            PUTWORD                 /GO OUTPUT IT.
0402    3631    2130            ISZ     ORIGIN          /GO TO NEXT LOC.
0403    3632    7600    M200,   -200                    /NOP IN CASE OF SKIP
0404    3633    5221            JMP     BCHEX           /AND UPDATE CHECKSUM
0405                    /
0406    3634    0000    BASSEM, 0
0407    3635    1077            TAD     BWORD1          /GET THE FIRST WORD
0410    3636    7106            CLL RTL
0411    3637    7006            RTL
0412    3640    7006            RTL                     /NOW PLACE IN SECOND PART
0413    3641    1100            TAD     BWORD2
0414    3642    5634            JMP I   BASSEM          /NOW EXIT
0415                    /
0416    3643    0000    BEGG,   0                       /GETS AND CHECKS A CHARACTER FROM GIVEN SEQUENTIAL DEVICE.
0417    3644    3071            DCA     TEMP4           /SET SWITCH
0420    3645    4574            AUXIN                   /GET A CHARACTER.
0421    3646    1145            TAD     M377            /CHECK FOR RUBOUT
0422    3647    7640            SZA CLA                 /?
0423    3650    5254            JMP     .+4             /NO RUBOUT
0424    3651    2071            ISZ     TEMP4           /YES. COMPLEMENT SWITCH
0425    3652    7040            CMA
0426    3653    5244            JMP     BEGG+1          /GO BACK AGAIN.
0427    3654    1071            TAD     TEMP4           /SWITCH SET?
0430    3655    7640            SZA CLA
0431    3656    5245            JMP     BEGG+2          /YEP. STILL IN RUBOUTS
0432    3657    1105            TAD     BCHAR           /GET THE CHAR
0433    3660    0036            AND     L700            /HIGH ORDER BITS ON?
0434    3661    1232            TAD     M200            /GET TYPE
0435    3662    7510            SPA                     /IS IT JUST LEADER
0436    3663    2243            ISZ     BEGG            /NO HIGH ORDER BITS ON.
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0437    3664  7750          SPA SNA CLA          /TEST NOW FOR ORIGIN AN D  LEADER-TRAILER
0440    3665  5643          JMP I   BEGG        /DATA,ORIGIN, OR LEADER TRAILER
0441    3666  1105          TAD     BCHAR        /FIELD CHARACTER
0442    3667  0374          AND     L7Ø          /JUST GET FIELD
0443    3670  3372          DCA     BFEILD       /SAVE IN NEXT FIELD
0444    3671  1372          TAD     BFEILD       /GET BACK
0445    3672  1023          TAD     M2Ø          /MORE TEHN 8 K?
0446    3673  7700          SMA CLA
0447    3674  4567          NO                   /YEP. TOOOO BBBIIGGG!!!
0450    3675  5245          JMP     BEGG+2
0451                  /
0452                  /
0453    3676  4234  BEND,   JMS     BASSEM
0454    3677  7041          CIA
0455    3700  1371          TAD     BCHECK       /CHECK CHECKSUM
0456    3701  7640          SZA CLA              /GOOD?
0457    3702  5775          JMP I   BCERR        /GIVE CHECKSUM MESSAGE, IT BAD
0460    3703  4476          JMS I   PMORE        /ASK IF ANY MORE TAPES?
0461    3704  5200          JMP     BNFILE
0462    3705  7240          MONE                 /CLOSE THE OUTPUT FILE
0463    3706  3135          DCA     BFIELD
0464    3707  4576          PUTWORD              /SEND T O  BLAHS.
0465    3710  5552          PIP                  /RETURN TO PIP
0466                  /
0467                  /
0470                  /
0471                  /
0472                  /
0473    3711  0000  SEQIN,  Ø                    /SEQ INPUT UNIT.
0474    3712  4556          CHECKIO              /CHECKIO AND LEAVE AC Ø
0475    3713  3073          DCA     CNTRLŻ       /CLEAR THE CONTROLŻ FLAG
0476    3714  1102          TAD     BFLAG1       /GET INPUT FLAG.
0477    3715  1047          TAD     L7777        /SUBTRACT1
0500    3716  7650          SNA CLA
0501    3717  5336          JMP     SEQTTY
0502    3720  4560  SEQTST, GETL                 /TEST LOW READER FOR A CHAR
0503    3721  5327          JMP     SEQN1
0504    3722  1373          TAD     M232
0505    3723  7450          SNA
0506    3724  2073          ISZ     CNTRLŻ
0507    3725  7650          SNA CLA
0510    3726  5711          JMP I   SEQIN        /EXIT
0511                  /
0512                  SEQN1,  ASMIFN  CARD-1       /DO WE WANT CARD READER CHECK LOADED?????
0513                          ASMSKP  5            /NOPE. DONT ASSEMBLE THEM IN
0514                  /
0515    3727  4776          JMS I   SEQCIN       /CHECK FOR CARD READER AND GET CHAR.
0516    3730  5320          JMP     SEQTST       /CHAR NOT READY YET.
0517    3731  5340          JMP     SEQCOM       /CHAR READY.
0520                  /
0521                  /
0522    3732  6011          6011                 /DEVICE IS HIGH SPEED READER, FLAG READY???
0523    3733  5320          JMP     SEQTST       /GO INTO BIG WAIT LOOP
0524    3734  6016          6016
0525    3735  5340          JMP     SEQCOM
0526    3736  4560  SEQTTY, GETL                 /GET A CHARACTER
0527    3737  5336          JMP     .-1          /WAIT FOR IT
0530    3740  3105  SEQCOM, DCA     BCHAR        /STASH AWAY
0531    3741  1105          TAD     BCHAR
0532    3742  1373          TAD     M232
0533    3743  7650          SNA CLA
0534    3744  2073          ISZ     CNTRLŻ
0535    3745  1105          TAD     BCHAR
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0536    3746  5711          JMP I   SEQIN
0537                  /
0540                  /
0541                  /
0542    3747  0000  SEQOUT, 0                      /SEQUNETIAL OUTPUT BLOP.
0543    3750  3311          DCA     SEQIN         /SAVE THE CHAR
0544    3751  4556          CHECKIO               /CHECKIO
0545    3752  1104          TAD     BFLAG2        /GET THE OTPUT FLAG
0546    3753  1047          TAD     L7777
0547    3754  7640          SZA CLA
0550    3755  5361          JMP     SEQ02         /HIGH PUNCH OUTPUT
0551    3756  1311          TAD     SEQIN
0552    3757  4407          PUTL
0553    3760  5747          JMP I   SEQOUT        /OUT IT GOES.
0554                  /
0555                  SEQ02,  ASMIFZ  CARD-1      /DO WE CHECK FOR LINE PRINTER???
0556    3761  4777          JMS I   SEQLP         /YEP. GO CHECK
0557                  /
0560    3762  4556          CHECKIO               /LINE PRINTER ISN T THE ONE.
0561    3763  6021          6021                  /WAIT FOR OK.
0562    3764  5362          JMP     .-2           /WAIT TILL DONE.
0563    3765  1311          TAD     SEQIN         /GET THE CHAR.
0564    3766  6026          6026                  /SEND IT OUT
0565    3767  7200  SEQEXT, CLA                   /CLEAR THE AC.
0566    3770  5747          JMP I   SEQOUT        /ALL DONE.
0567                  /
0570                  /
0571                  /
0572                  /
0573    3771  0000  BCHECK, 0
0574    3772  0000  BFEILD, 0
0575    3773  7546  M232,   -232
0576    3774  0070  L70,    70
0577    3775  4477  BCERR,  CERR
0600                  /
0601                  /
0602                  /
0603                  /
0604                  ASMIFN  CARD-1              /CARD READER AND LINE PRINTER THERE????
0605                  ASMSKP  3                   /NOPE. DONT ASSEMBLE IN POINTERS.
0606                  /
0607    3776  6025  SEQCIN, CDREAD               /POINTER TO CARD READER ROUTINE.
0610    3777  6275  SEQLP,  LPTEST              /POINTER TO LINE PRINTER ROUTINE.
0611                  /
0612                  /
0613                  /
0614                  /
0615                  /
0616                  /
0617                  EJECT
```

paper tape output

```
0620                    /
0621                    /
0622                            *4000
0623                    /
0624                    /
0625                    /                       MORE OF THE BINARY ROUTINES.
0626                    /
0627                    /
0630                    /
0631                    /
0632    4000    0000            0000                    /FIRST 3 LOCATION ARE RESERVED FOR A REGISTESR IN LMODE
0633    4001    0000            0000
0634    4002    0000            0000
0635                    /
0636                    /
0637                    /
0640                    /
0641    4003    4403    BINTAP, HPOP                    /INPUT FROM LINC TAPE.
0642    4004    1120            TAD     FUNIT           /GET THE UNIT
0643    4005    3211            DCA     .+4             /SET UP CONTROL BLOCK READ
0644    4006    1122            TAD     FBNUM           /GET THE STARTING BLOCK NUMBER
0645    4007    3214            DCA     .+5             /GET BLOCK NUMBER
0646    4010    4571            READ                    /READ IN HEADER BLOCK
0647    4011    0000            0                       /PLACED IN UNIT
0650    4012    7000            BUFFER+400              /READ HEADER BLOCK IN SECOND BLOCK OF BUFFER.
0651    4013    0001            1                       /1 RECOOD
0652    4014    0000            0                       /CORECT BLOCK NUMBER
0653    4015    4403            HPOP                    /ZAP IN FBLOCK AGAIN
0654    4016    2122            ISZ     FBNUM           /MOVE PAST HEADER BLOCK
0655    4017    4772            JMS I   BSETI           /SET UP WORD GETTER.
0656    4020    1056            TAD     M40             /SET UP NUMBER OF 400 WORD BLOCKS TO CHECK
0657    4021    3132            DCA     BTEMP1          /AND STASH AWAY.
0660    4022    1367            TAD     BMTAB           /GET START OF MEMORY MAP CONFIG.
0661    4023    3133            DCA     BTEMP2          /AND PLACE AWAY.
0662                    /
0663    4024    1064    BEILOP, TAD     M400            /400 WORDS PER RECORD
0664    4025    3134            DCA     BTEMP3          /SET UP COUNT
0665    4026    1132            TAD     BTEMP1          /GET THE BLOCK NUMBER
0666    4027    1371            TAD     L40             /GET BETWEEN 0-37
0667    4030    7112            CLL RTR
0670    4031    7012            RTR
0671    4032    7010            RAR                     /MOVE INTO 7400 POSITION
0672    4033    3130            DCA     ORIGIN          /SET UP INITIAL ORIGIN.
0673    4034    7006            RTL
0674    4035    7006            RTL                     /MOVE LINC TO FIELD POSITION.
0675    4036    3135            DCA     BFIELD          /AND PLACE IN BFIELD.
0676    4037    1533    BETLP2, TAD I   BTEMP2          /IS THIS BLOCK USED.
0677    4040    7650            SNA CLA                 /?
0700    4041    5245            JMP     BEOUT           /NOPE. WANDER DOWN.
0701    4042    4773            JMS I   BGETI           /GET A WORD FROM TAPE/
0702    4043    3131            DCA     DATA            /PLACE IN DATA WORD.
0703    4044    4576            PUTWORD                 /SEND IT DOWN THE LINE.
0704    4045    2130    BEOUT,  ISZ     ORIGIN          /BOP UP ORIGIN.
0705    4046    7000            NOP
0706    4047    2134            ISZ     BTEMP3          /BOP UP 400 COUNTER
0707    4050    5237            JMP     BETLP2          /NOT YET DONE. DO ANOTHER.
0710    4051    2133            ISZ     BTEMP2          /BOP UP MAP POINTER
0711    4052    7000            NOP                     /IT REALLY CAN SKIP(I FOUND OUT THE HARD WAY)
0712    4053    2132            ISZ     BTEMP1          /BOP UP BIGCOUNT POINTER
0713    4054    5224            JMP     BEILOP          /GO BACK AND GET NEXT FIELD AND ORIGIN.
0714    4055    7240            MONE                    /ALL DONE.
0715    4056    3135            DCA     BFIELD          /PLACE AN "EOF" ON BFIELD
0716    4057    4576            PUTWORD                 /END OF FILE CODE WORD.
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0717    4060  5552          PIP                 /RETURN TO PIP
0720                  /
0721                  /
0722                  /
0723                  /
0724    4061  0000  BTAPE,  0                   /MAIN TAPE OUTPUTER.
0725    4062  1135          TAD     BFIELD      /LAST TIME THROUGH?
0726    4063  7001          IAC
0727    4064  7652          SNA CLA             /?
0730    4065  5770          JMP I   BTEND       /YEP. CLOSE FILE.
0731    4066  1135          TAD     BFIELD      /GET THE FIELD
0732    4067  7041          CIA
0733    4070  1137          TAD     BOFIELD     /SAME AS LAST ONE?
0734    4071  7640          SZA CLA
0735    4072  5315          JMP     BIDIFF      /NOPE. SET TO CHANGE BANKS.
0736    4073  1130          TAD     ORIGIN      /GET THE ORIGIN
0737    4074  0064          AND     L7400       /JUST HIGH BITS.
0740    4075  7041          CIA                 /
0741    4076  1136          TAD     BOLDO       /ADD IN LAST ORIGIN
0742    4077  7640          SZA CLA             /SAME 400 WORD BANK??
0743    4100  5315          JMP     BIDIFF      /NOPE.. CHANGE BANKS.
0744                  /
0745    4101  1130  BINTRY, TAD     ORIGIN      /GET THE ORIGIN
0746    4102  0365          AND     L377        /GET IN 400 WORD BANK POSITION
0747    4103  1366          TAD     BPOINT      /GET START OF BUFFER LOCATION.
0750    4104  3065          DCA     TEMP        /STORE AWAY
0751    4105  1131          TAD     DATA        /GET THE DATA WORD
0752    4106  3465          DCA I   TEMP        /NOW PLACE IN BUFFER
0753    4107  1130          TAD     ORIGIN      /GET ORIGIN
0754    4110  0064          AND     L7400       /GET JUST BANK NUMBER
0755    4111  3136          DCA     BOLDO       /STASH AWAY.
0756    4112  1135          TAD     BFIELD      /RESET THE FIELD TOO
0757    4113  3137          DCA     BOFIELD     /AND AWAY IT GOES.
0760    4114  5661          JMP I   BTAPE       /GO BACK AND GET ANOTHER WORD.
0761                  /
0762                  /
0763    4115  1130  BIDIFF, TAD     ORIGIN      /GET THE ORIGIN
0764    4116  7006          RTL
0765    4117  7006          RTL
0766    4120  0060          AND     L7          /MUST MAKE IT BITS 8-11
0767    4121  1135          TAD     BFIELD      /PUT IN FIELD BIT NOW!
0770    4122  7004          RAL                 /AND ROTATE IN REST OF CRAP.
0771    4123  3132          DCA     BTEMP1      /STASH AWAY/
0772    4124  1137          TAD     BOFIELD     /GET THE OLD FIELD BITS.
0773    4125  7700          SMA CLA             /IF ITS MINUS, DONT DUMP BUFFERS.
0774    4126  4352          JMS     BIDUMP      /NOT THE FIRST TIME THROUGH. DUMP BUFFERS
0775    4127  1132          TAD     BTEMP1      /REGET NEW POSITION
0776    4130  3103          DCA     BOLDP       /AND PLACE I N OLD PLACE
0777    4131  1132          TAD     BTEMP1      /GET PLACE AGAIN
1000    4132  1367          TAD     BMTAB       /START OF POSITION THING
1001    4133  3133          DCA     BTEMP2      /CORE MAP
1002    4134  1533          TAD I   BTEMP2      /GET REFERNCE WORD
1003    4135  7650          SNA CLA             /IS IT TAKEN?
1004    4136  2140          ISZ     BCOUNT      /NOPE. ANOTHER RECORD TO WRITE OUT LATTER ON.
1005    4137  7240          NOP                 /MEANWHILE....
1006    4140  3533          DCA I   BTEMP2      /TELL SYSTEM IT S TAKEN NOW.
1007    4141  1132          TAD     BTEMP1      /REGET BASE POINTER
1010    4142  1364          TAD     BMBASE      /ADD IN STARTING BLOCK NUMBE
1011    4143  3350          DCA     .+5         /READ IN NEW CORE IMAGE FOR OVERLAYING.
1012    4144  4571          READ                /READ IT IN
1013    4145  0001  DSYS1,  SYSBIN              /FROM SYSTEM BINARY UNIT.
1014    4146  6400          BUFFER              /THIS IS THE GENERAL CORE WORKING AREA FOR THE BINARY.
1015    4147  0001          1
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```

```
1016    4150  0000          0                       /RECORD NUMBER GOES HERE.
1017    4151  5301          JMP     BINTRY          /RETURN TO MAIN PUTTER.
1020                /
1021                /
1022                /
1023    4152  0000  BIDUMP,  0                       /DUMPS THE PRESENT BUFFER INTO THE CORRECT POSITION.
1024    4153  1103          TAD     BOLDP           /GET OLD POINTER
1025    4154  1364          TAD     BMBASE          /ADD IN THE RECORD NUMBER BASE.
1026    4155  3362          DCA     .+5             /SAVE AWAY.
1027    4156  4572          WRITE                   /WRITE IT OUT.
1030    4157  0001  DSYS2,   SYSBIN
1031    4160  6400          BUFFER
1032    4161  0001          1
1033    4162  0000          0
1034    4163  5752          JMP I   BIDUMP          /RETURN
1035                /
1036                /
1037                /
1040                /
1041                /
1042    4164  0370  BMBASE,  SYSBBLOCK
1043    4165  0377  L377,    377
1044    4166  6400  BPOINT,  BUFFER                 /BINARY CORE WORKING AREA
1045    4167  7340  BMTAB,   BUFFER+740             /LOADING MAP.
1046    4170  4200  BTEND,   BTENT
1047    4171  0040  L40,     40
1050    4172  4514  BSETI,   SETI
1051    4173  4525  BGETI,   GETI
1052                /
1053                /
1054                /
1055                /
1056                /
1057                /
1060                /
1061                /
1062                      EJECT
-
```

```
1063                        *4200
1064                /
1065                /
1066                /                       MORE BINARY LOADER ROUTINES.
1067                /
1070                /
1071                /
1072    4200  4667  BTENT,  JMS I   BBDUMP          /DUMP THE BUFFER
1073    4201  1140          TAD     BCOUNT          /NUMBER OF RECORDS SAVED.
1074    4202  7450          SNA                     /ANY AT ALL?
1075    4203  4567          NO                      /NOPE.
1076    4204  3671          DCA I   BBOINT-1        /STASH IN HEADER BLOCK.
1077    4205  4572          WRITE                   /WRITE OUT HEADER BLOCK NOW.
1100    4206  0001  BSYS,   SYSBIN
1101    4207  7000          BUFFER+400
1102    4210  0001          1
1103    4211  0447  BBBHDR, SYSHDR                 /POSITION OF HEADER BLOCK ON SYSTEM.
1104                /
1105                DSYS3=BSYS
1106                /
1107    4212  4565          POP                     /BRING BACK FBLOCK FROM LOWER AREA NOW.
1110    4213  1140          TAD     BCOUNT          /REGET THE LENGTH.
1111    4214  7001          IAC                     /ADD 1 FOR HEADER BLOCK
1112    4215  3117          DCA     FSIZE           /SAVE IN CORRECT PLACE.
1113    4216  7305          PTWO                    /SET FOR OUTPUT FILE.
1114    4217  3123          DCA     FWHAT
1115    4220  7305          PTWO                    /SET FOR BINARY FILE
1116    4221  3121          DCA     FTYPE
1117    4222  4563          DIRECT                  /LOOKUP UP NAME AND ROOM.
1120    4223  4404          HPUSH                   /STASH AWAY.
1121    4224  1122          TAD     FBNUM           /GET THE STARTING BLOCK
1122    4225  3104          DCA     OUTBLOCK
1123    4226  1120          TAD     FUNIT           /STASH IN UNIT TOO.
1124    4227  3105          DCA     OUTUNIT         /SET UP OUTPUT UNIT.
1125    4230  1206          TAD     BSYS            /GET INPUT UNIT
1126    4231  3103          DCA     INUNIT          /SET UP INPUT UNIT
1127    4232  1211          TAD     BBBHDR          /POINTER TO HEADER BLOCK
1130    4233  3102          DCA     INBLOCK         /STASH IN INPUT BLOCK NUMBER
1131    4234  7201          PONE                    /SET THE SIZE TO 1 BLOCK
1132    4235  3117          DCA     FSIZE
1133    4236  4554          COPY                    /COPY THE HEADER BLOCK TO THE CORRECT LOCATION ON TAPE.
1134    4237  1270          TAD     BBBASE          /GET THE BINARY WORK AREA POINTER.
1135    4240  3102          DCA     INBLOCK         /SET THE INPUT UP AGAIN.
1136    4241  4564          MOVE                    /NOW MOVE THE HEADER BLOCK WHICH
1137    4242  6400          BUFFER                  /WE JUST READ INTO BUFFER BY COPY
1140    4243  7000          BUFFER+400              /BACK UP TO BUFFER+400 SO WE CAN USE THE HEADER
1141    4244  0400          400                     /BLOCK INFORMATION FOR THE COPYING OF THE BLOCKS.
1142    4245  1272          TAD     BBOINT          /START OF MEMORY BLOCK CONFIG.
1143    4246  3132          DCA     BTEMP1          /SET UP OUTCHECKER
1144    4247  1056          TAD     M40             /SET UP TO LOOK AT 40 BLOCKS
1145    4250  3134          DCA     BTEMP3          /BTEMP3 IS OUR COUNTER NOW.
1146    4251  2104          ISZ     OUTBLOCK        /SKIP PAST HEADER BLOCK
1147                /
1150    4252  1532  BELOOP, TAD I   BTEMP1          /GET THE MOMORY USAGE WORD
1151    4253  7650          SNA CLA                 /BLOCK USED?
1152    4254  5261          JMP     BEEND           /NOPE. GO DOWN
1153    4255  7201          PONE                    /SET TO MAKE A 1 BLOCK COPY
1154    4256  3117          DCA     FSIZE           /BY PLACING A "1" IN FSIZE
1155    4257  4554          COPY                    /YEP. COPY A BLOCK
1156    4260  2104          ISZ     OUTBLOCK        /GO TO NEXT OUTBLOCK.
1157    4261  2102  BEEND,  ISZ     INBLOCK         /GO TO NEXT INPUT BLOCK
1160    4262  2132          ISZ     BTEMP1          /BOP MEMORY POINTER
1161    4263  7000          NOP                     /THIS CAN SKIP IF BUFFER WAS SET TO 7000
```

```
1162    4264  2134          ISZ     BTEMP3          /HAVE WE FINISHED THE HEADER BLOCK?
1163    4265  5252          JMP     BELOOP          /NOT .YET DONE.
1164    4266  5552          PIP                     /ALL DOOE. RETURN TO PIP.
1165                /
1166                /
1167                /
1170    4267  4152  BBDUMP, BIDUMP
1171    4270  0570  BBBASE, SYSBBLOCK
1172    4271  7337          BUFFER+737              /POINTER TO HEADER BLOCK LENGTH. MUST BE AT BBOINT-1
1173    4272  7340  BBOINT, BUFFER+740            /POINTS TO START OF CORE MAP IN HEADER BLOCK
1174                /
1175                /
1176                /
1177                /
1200                /
1201    4273  0000  BBOUT,  0
1202    4274  1104          TAD     BFLAG2          /MASS STORAGE OUTPUT???
1203    4275  7640          SZA CLA
1204    4276  5301          JMP     .+3             /NO.
1205    4277  4776          JMS I   BBLT            /YEP. GO DO IT.
1206    4300  5673          JMP I   BBOUT           /AND RETURN.
1207    4301  7201          PONE                    /IS THIS END OF INPUT???
1210    4302  1135          TAD     BFIELD          /(BFIELD=7777?
1211    4303  7640          SZA CLA
1212    4304  5316          JMP     BBBBBJ          /NOT END. CHECK ORIGIN AND FIELD SETTINGS,%
1213    4305  1140          TAD     BCOUNT
1214    4306  4550          ROR6                    /ROTATE INTO LOW ORDER BITS OF AC.
1215    4307  0024          AND     L77
1216    4310  4575          AUXOUT
1217    4311  1140          TAD     BCOUNT
1220    4312  0024          AND     L77
1221    4313  4575          AUXOUT                  /OUTPUT CHECKSUM
1222    4314  4405          LEADER
1223    4315  5552          PIP                     /GIVE TRAILER AND RETURN TO PIP
1224                /
1225    4316  1101  BBBBBJ, TAD     BDELZ           /GET THE DELETE ZEROS SWITCH.
1226    4317  7650          SNA CLA                 /IS IT NON ZERO?
1227    4320  5324          JMP     .+4             /ITS ZERO. DONT DELETE ZEROS.
1230    4321  1131          TAD     DATA            /GET THE DATA WORD.
1231    4322  7650          SNA CLA                 /IS IT ZERO?
1232    4323  5673          JMP I   BBOUT           /YEP. RETURN TO THE CALLER NOW. ZERO DELETED.
1233    4324  1135          TAD     BFIELD          /SEE IF IN SAME DATA FIELD AS BEFORE.
1234    4325  7041          CIA
1235    4326  1137          TAD     BOFIELD         /?
1236    4327  7650          SNA CLA                 /?
1237    4330  5335          JMP     BBN1            /YEP. DON T OD A NEW FIELD
1240    4331  1135          TAD     BFIELD          /GET THE FIELD
1241    4332  1036          TAD     L700            /PLACE ON TWO HIGH ORDER BITS.
1242    4333  4575          AUXOUT                  /AND OUTPUT IT.
1243    4334  5342          JMP     BBNEWO          /AND GO OUTPUT ORIGIN.
1244                /
1245    4335  1136  BBN1,   TAD     BOLDO           /IS IS LOCATION+1?
1246    4336  7040          CMA
1247    4337  1130          TAD     ORIGIN          /SO THTA IT WOULD LOAD HERE ANYWAY.
1250    4340  7650          SNA CLA
1251    4341  5352          JMP     BBN2            /NEXT LOC. DON T  DO A NEW ORIGIN
1252    4342  1130  BBNEWO, TAD     ORIGIN          /NEW ORG. OUTPUT IT ON SEQ. DEVICE
1253    4343  4550          ROR6                    /NOW PLACE IN RIGHT HALF OF A.C.
1254    4344  0024          AND     L77             /JUST 6 BITS
1255    4345  1025          TAD     L100            /PLACE ON ORIGIN BIT
1256    4346  4366          JMS     BOADD           /AND PUT OUT WITH A CHECKSUM
1257    4347  1130          TAD     ORIGIN          /GET THE ORIGIN
1260    4350  0024          AND     L77             /JUST 6 BITS
-
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1261    4351  4366            JMS     BOADD           /AND OUTPUT IT TOO
1262                  /
1263    4352  1130  BBN2,     TAD     ORIGIN          /GET THE ORGIN
1264    4353  3136            DCA     BOLDD           /AND SAVE IT AWAY.
1265    4354  1135            TAD     BFIELD          /NOW RESET THE FILED TOO
1266    4355  3137            DCA     BOFIELD         /AND STAS AWAY
1267    4356  1131            TAD     DATA            /GET THE DATA
1270    4357  4552            RQR6                    /PLACE LEFT HALF IN RIGHT HALF FOR THE OUTPUT
1271    4360  0024            AND     L77
1272    4361  4366            JMS     BOADD           /AND PUT IT OUT
1273    4362  1131            TAD     DATA
1274    4363  0024            AND     L77             /NOW PUT IT OUT TOO
1275    4364  4366            JMS     BOADD
1276    4365  5673            JMP I   BBOUT           /NOW EXIT
1277                  /
1300                  /
1301                  /
1302    4366  0000  BOADD,     0
1303    4367  3070            DCA     TEMP3
1304    4370  1070            TAD     TEMP3
1305    4371  1140            TAD     BCOUNT
1306    4372  3140            DCA     BCOUNT          /UPDATE BCOUNT
1307    4373  1070            TAD     TEMP3
1310    4374  4575            AUXOUT                  /SEND IT ALONG
1311    4375  5766            JMP I   BOADD
1312                  /
1313    4376  4061  BBLT,     BTAPE
1314                  /
1315                  /
1316                  /
1317                  /
1320                  /
1321                  /
1322                  /
1323                  /
1324                          EJECT
-
```

```
1325                    /
1326                    /              COMMON ROUTINES USED BY BINARY AND ASCII HANDLERS.
1327                    /
1330                    /       THIS PAGE MAY OVERLAP OR UNDERLAP A LITTLE FROM THE PREVIOU PAGE.
1331                    /
1332                    /
1333                    /
1334                    /
1335                    /
1336                    /
1337                    /
1340                    /
1341                    /
1342                    /
1343                    /
1344    4377  0310  BINLST, 310                    /BINARY INPUT DEVICE LIST. "H"
1345    4400  0314         314                    /"L"
1346                       ASMIFN  RF08           /DO WE WANT THE RF08 PRESENT
1347    4401  0322         322                    /YES. "R"
1350    4402  4324         4324                   /"T"
1351                    /
1352                    /
1353                    /
1354    4403  3417  BINGO,  BHIGH                 /HIGH SPEED READER
1355    4404  3476         BLT                    /LINC TAPE
1356                       ASMIFN  RF08           /DISK?
1357    4405  3474         BLRF8                  /YES, RF08
1360    4406  3420         BTTY                   /TELETYPE.
1361                    /
1362                    /
1363                    /
1364    4407  3513  BINGO2, BHIGH2
1365    4410  3526         BLT2
1366                       ASMIFN  RF08
1367    4411  3524         BLRF82
1370    4412  3514         BTTY2
1371                    /
1372                    /
1373                    /
1374                    /
1375                    /
1376                    /
1377                    /
1400                    /
1401                    /
1402                    /
1403    4413  0000  MORE,   0                      /DISPLAYS A "MORE" MESSAGE.
1404    4414  4562         DECODE                 /DECODE A LINE
1405    4415  4432         MMORE                  /THATS OUR MESSAGE
1406    4416  4573         SEARCH                 /LOOK UP THE ANSWER
1407    4417  4424         MAORN
1410    4420  4427         MGOTO                  /JUMP TABLE
1411    4421  5214         JMP     MORE+1         /BAD REPLY.
1412    4422  2213  MANDM1, ISZ     MORE           /NO MORE TAPES
1413    4423  5613  MANDM2, JMP I   MORE           /EXIT.
1414                    /
1415                    /
1416    4424  0301  MAORN,  301
1417    4425  0316         316
1420    4426  4322         4322
1421                    /
1422    4427  4423  MGOTO,  MANDM2
1423    4430  4422         MANDM1
-
```

```
1424      4431  4423          MANDM2
1425                  /
1426                  /
1427      4432  0200  MMORE,  LEFT+200
1430      4433  0040          TOP=300
1431                  /
1432                  /
1433                  /
1434                  /
1435                          ASMIFN  CARD            /CARD MESSAGE
1436                          ASMSKP  10              /THERE. GIVE CARD MESSAGE
1437                  /
1440                  /
1441                          TEXT    "FMORE TAPES?
1442
1443
1444                  HN ~~= NO MORE TAPES
1445                  HR ~~= READ ANOTHER TAPE\"
1446                  /
1447                  /
1450                  /
1451                  /
1452                  /
1453                  /
1454                          ASMIFZ  CARD            /CARD READER NOT THERE?
1455                          ASKSKP  10              /SKIP OVER MESSAGE
1456                  /
1457                  /
1460      4434  0615
1460      4435  1722
1460      4436  0540
1460      4437  1116
1460      4440  2025
1460                          TEXT    "FMORE INPUT?
1461      4441  2477
1461
1462      4442  4340
1462
1463      4443  4340
1463      4444  4310
1463      4445  1640
1463      4446  5555
1463      4447  5540
1463      4450  1617
1463      4451  4015
1463      4452  1722
1463      4453  0540
1463      4454  1116
1463      4455  2025
1463                  HN ~~= NO MORE INPUT
1464      4456  2443
1464      4457  1022
1464      4460  4055
1464      4461  5555
1464      4462  4022
1464      4463  0501
1464      4464  0440
1464      4465  1517
1464      4466  2205
1464      4467  4003
1464      4470  0122
1464      4471  0423
1464      4472  4017
-
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1464      4473  2240
1464      4474  2401
1464      4475  2005
1464      4476  2334
1464                  HR -** READ MORE CARDS OR TAPES\"
1465                  /
1466                  /
1467                  /
1470                  /
1471                  /
1472                  /
1473                  /
1474                  /
1475                  /
1476                  /
1477                  /
1500                  /
1501                  /
1502      4477  4551  CERR,   DISPLAY                 /CHECKSUM ERROR DISPLAY.
1503      4500  4502          CCERR                   /DISPLAY MESSAGE
1504      4501  5277          JMP     .-2             /HANG AROUND UNTIL A +D OR +P IS TYPED.
1505                  /
1506                  /
1507                  /
1510      4502  0200  CCERR,  LEFT+200
1511      4503  0000          TOP=340
1512      4504  0603
1512      4505  1005
1512      4506  0313
1512      4507  2325
1512      4510  1540
1512      4511  0522
1512      4512  2217
1512      4513  2234
1512                  TEXT    "FCHECKSUM ERROR\"
1513                  /
1514                  /
1515                  /
1516                  /
1517                  /
1520                  /
1521      4514  0000  SETI,   0                       /SETS UP GETI
1522      4515  7240          MONE                    /BOP DOWN BY 1
1523      4516  1122          TAD     FBNUM           /GET FIRST BLOCK NUMBER
1524      4517  3342          DCA     GEENUM          /AND PLACE IN READ CALL.
1525      4520  1120          TAD     FUNIT           /GET THE UNIT
1526      4521  3337          DCA     GUNIT           /PLACE AWAY UNIT
1527      4522  7240          MONE                    /SET THE SWITCH
1530      4523  3347          DCA     GCUNT           /TO OVERFLOW FIRST TIME THROUGH
1531      4524  5714          JMP I   SETI            /RETURN
1532                  /
1533                  /
1534                  /
1535                  /
1536                  /
1537      4525  0000  GETI,   0                       /GETS A CHARACTER FROM THE SYSTEM BUFFER.
1540      4526  7200          CLA
1541      4527  2347          ISZ     GCUNT           /IS BUFFER EXHAUSED?
1542      4530  5343          JMP     GOK             /NOPE. GET NEXT.
1543      4531  1064          TAD     M400            /YEP. RESET COUNRTE FOR A NEW BLOCK.
1544      4532  3347          DCA     GCUNT           /COUNTER RESET.
1545      4533  1340          TAD     GPLACE          /GET START OF BUFFER
1546      4534  3346          DCA     GPLCE2          /STORE AWAY.
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1547    4535  2342          ISZ     GEENUM          /BOP UP TO NEXT RECORD.
1550    4536  4571          READ
1551    4537  0000  GUNIT,   0                       /AND READ IT IN.
1552    4540  6400  GPLACE,  BUFFER
1553    4541  0001          1
1554    4542  0000  GEENUM,  0
1555    4543  1746  GOK,     TAD I   GPLCE2          /GET WORD FROM BUFFER
1556    4544  2346          ISZ     GPLCE2          /BOP UP POINTER
1557    4545  5725          JMP I   GETI            /EXIT
1560                /
1561    4546  0000  GPLCE2,  0
1562    4547  0000  GCUNT,   0                       /GCOUNT ALREADY USED ELSEWHERE
1563                /
1564                /
1565                /
1566                /
1567                /
1570                /
1571                /
1572                /
1573                /
1574                /
1575                /
1576                /
1577                /
1600                        ASMIFZ  RF08            /RF08 THERE?
1601                        ASMSKP  15              /NOPE. DONT ASSEMLE THIS CRAP.
1602                /
1603                /
1604    4550  7417  ASUG01,  ASULP1                 /TRANSFER TABLES FOR SYS AND UNIT COPIES
1605    4551  7427           ASUTT1
1606    4552  7425           ASUDD1
1607    4553  7417           ASULP1
1610                /
1611                /
1612                /
1613    4554  7432  ASUG02,  ASULP2
1614    4555  7442           ASUTT2
1615    4556  7440           ASUDD2
1616    4557  7432           ASULP2
1617                /
1620                /
1621                /
1622                /
1623                /
1624                /
1625                /
1626                /
1627                /
1630                /
1631                /
1632    4560  0000  NOSUCH,  0                       /THIS ROUTINE DISPLAYS A DEVICE OVERFLOW MESSAGE
1633    4561  4567           NO                      /ON THE SCREEN CONSISTING OF THE LETTERS N AND O.
1634                /
1635                /
1636                /
1637                /
1640                /
1641                /
1642                /
1643                /
1644                /
1645                /
-
```

```
1646                    /
1647                    /
1650    4562    0000    STATRS, 0                       /THIS CALIBRATES DISK IF NOT OK.
1651    4563    6032            KCC                     /CLEAR AC AND TTY.
1652    4564    1376            TAD     RKSTAT          /REGET THE STATUS NOW.
1653    4565    7640            SZA CLA                 /IS IT ZERO? <NO EXTRA UNITS SELECTED>?
1654    4566    6751            DCLA                    /NOPE. DO A CALIBRATE.
1655                    /
1656    4567    4551    STATLP, DISPLAY                 /DO SOME MORE DISPLAYING WHILE WAITING.
1657    4570    0263            MAINDIS                 /FOR THE DISK TO BE READY.
1660    4571    6741            DROS                    /READ IN STATUS.
1661    4572    7010            RAR                     /ROTATE TO LINK.
1662    4573    7620            SNL CLA                 /DONE.
1663    4574    5762            JMP I   STATRS          /YEP. EXIT.
1664    4575    5367            JMP     STATLP          /NOPE. WAIT A WHILE.
1665                    /
1666                    /
1667                    /
1670    4576    0000    RKSTAT, 0                       /WORD FOR STATUS BEFORE I-O PRESET.
1671                    /
1672                    /
1673                    /
1674                    /
1675                    /
1676                    /
1677                    /
1700                            ASMIFN  .&100           /IF THE 300 BIT IS ON, ASSEMBLE IN THE PAGE PSEUDO-OP.
1701                            PAGE
1702                    /
1703                    /
1704                    /
1705                    /
1706                    /
1707                    /
1710                    /
1711                    /
1712                    /
1713    4600    0000    STATSV, 0
1714    4601    6032            KCC                     /CLEAR THE KEYBOARD AND THE AC.
1715    4602    6736            DRDC                    /READ IN THE OLD COMMAND REGISTER.
1716    4603    0206            AND     STL6            /LEAVE IN JUST EXTRA UNITS BITS.
1717    4604    3607            DCA I   RKSTTP          /AND SAVE AWAY THE DRIVE WE-RE ON.
1720    4605    5600            JMP I   STATSV          /RETURN NOW.
1721                    /
1722                    /
1723                    /
1724    4606    0006    STL6,   6
1725    4607    4576    RKSTTP, RKSTAT                  /ACCROSS PAGE POINTER.
1726                    /
1727                    /
1730                    /
1731                    /
1732                    /
1733                    /
1734                    /
1735                    /
1736                    /
1737                    /
1740                    /
1741                    /
1742                    /
1743                    /
1744                    /
-
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```
1745                    /
1746                    /
1747                    /
1750                    /
1751                    /
1752                    /
1753                    /
1754                    /
1755                    /
1756                    /
1757                    /
1760                    /
1761                    /
1762    4610    0240    BININP, LEFT+240
1763    4611    0140            TOP=220
1764                    /
1765                    /
1766                            ASMIFN  RF08!CARD       /DO WE WANT STANDARD MESSAGE???
1767                            ASMSKP  12              /NOPE. DONT ASSEMBLE I.T  IN...
1770                    /
1771                    /
1772                            TEXT    "FINPUT DEVICE:
1773
1774
1775                    HH --= HIGH SPEED READER
1776                    HL --= LINC TAPE
1777                    HT --= TELETYPE\"
2000                    /
2001                    /
2002                    /
2003                    /
2004                            ASMIFZ  RF08+1&CARD     /DO WE WANT THE CARD READER BUT NO DISK?
2005                            ASMSKP  13              /YES. DONT ASSEMBLE THAT IN.
2006                    /
2007                    /
2010                            TEXT    "FINPUT DEVICE:
2011
2012
2013                    C --= CARD READER
2014                    HH --= HIGH SPEED READER
2015                    L --= LINC TAPE
2016                    T --= TELETYPE\"
2017                    /
2020                    /
2021                    /
2022                    /
2023                    /
2024                    /
2025                    /
2026                            ASMIFZ  CARD+1&RF08     /ASSEMBLE FOLLOWING MESSAGE IF DISK BUT NO CARD READER.
2027                            ASMSKP  13              /SKIP OVER IT.
2030                    /
2031                    /
2032                            TEXT    "FINPUT DEVICE:
2033
2034
2035                    HH --= HIGH SPEED READER
2036                    L --= LINC TAPE
2037                    R --= RF08,RK08 DISK
2040                    T --= TELETYPE\"
2041                    /
2042                    /
2043                    /
-
```

```
2044                    /
2045                    /
2046                    /
2047                    /
2050                            ASMIFE  RF08&CARD        /DO WE WANT BOTH DISK AND CARD?
2051                            ASMSKP  14              /NOPE. NOT THIS MESSAGE.
2052                    /
2053                    /
2054        4612  0611
2054        4613  1620
2054        4614  2524
2054        4615  4004
2054        4616  0526
2054        4617  1103
2054                            TEXT    "FINPUT DEVICE:
2055        4620  0572
2055
2056        4621  4340
2056
2057        4622  4340
2057        4623  4303
2057        4624  4055
2057        4625  5555
2057        4626  4003
2057        4627  0122
2057        4630  0440
2057        4631  2205
2057        4632  0104
2057                    C --- CARD READER
2060        4633  0522
2060        4634  4310
2060        4635  1040
2060        4636  5555
2060        4637  5540
2060        4640  1011
2060        4641  0710
2060        4642  4023
2060        4643  2005
2060        4644  0504
2060        4645  4022
2060        4646  0501
2060        4647  0405
2060                    HH --- HIGH SPEED READER
2061        4650  2243
2061        4651  1440
2061        4652  5555
2061        4653  5540
2061        4654  1411
2061        4655  1603
2061        4656  4024
2061        4657  0120
2061                    L --- LINC TAPE
2062        4660  0543
2062        4661  2240
2062        4662  5555
2062        4663  5540
2062        4664  2206
2062        4665  6070
2062        4666  5422
2062        4667  1360
2062        4670  7040
2062        4671  0411
2062                    R --- RF08,RK08 DISK
-
```

```
2063    4672  2313
2063    4673  4324
2063    4674  4055
2063    4675  5555
2063    4676  4024
2063    4677  0514
2063    4700  0524
2063    4701  3120
2063    4702  0534
2063                T --=
                    TELETYPE\"
2064                /
2065                /
2066                /
2067                /
2070                /
2071                /
2072                /
2073                /
2074                /
2075                /
2076                /
2077                /
2100                /
2101                /
2102                /
2103                /
2104                /
2105                /
2106                /
2107                /
2110                /
2111                /
2112                /
2113                /
2114    4703  0240  BINOUT, LEFT+240
2115    4704  0140          TOP=200
2116                /
2117                /
2120                /
2121                      ASMIFN  CARD!RF08       /DO WE WANT STANDARD OUTPUT DEVICES.
2122                      ASMSKP  12              /NOPE. DONT ASSEMBLE THEM IN.
2123                /
2124                /
2125                      TEXT    "FOUTPUT DEVICE:
2126
2127
2130                HH -== HIGH SPEED PUNCH
2131                HL -== LINC TAPE
2132                HT -== TELETYPE\"
2133                /
2134                /
2135                /
2136                /
2137                      ASMIFZ  RF08+18CARD     /DO WE WANT THE LINE PRINTER ROUTINES LOADED??
2140                      ASMSKP  13              /DO NOT DISPLAY LINE PRINTER MESSAGES.
2141                /
2142                /
2143                      TEXT    "FOUTPUT DEVICE:
2144
2145
2146                HH -== HIGH SPEED PUNCH
2147                L --= LINC TAPE
-
```

```
2150                    P --- LINE PRINTER
2151                    T --- TELETYPE\"
2152                    /
2153                    /
2154                    /
2155                    /
2156                    /
2157                    /
2160                    /
2161                    /
2162                            ASMIFZ  CARD+1&RF08     /DO WE WANT DISK BUT NOT PRINTER?
2163                            ASMSKP  13              /NOPE. SKIP OVER MESSAGE.
2164                    /
2165                    /
2166                            TEXT    "FOUTPUT DEVICE:
2167
2170
2171                    HH --- HIGH SPEED PUNCH
2172                    L --- LINC TAPE
2173                    R --- RF08,RK08 DISK
2174                    T --- TELETYPE\"
2175                    /
2176                    /
2177                    /
2200                    /
2201                    /
2202                    /
2203                            ASMIFZ  CARD&RF08       /DO WE WANT BOTH PRINTER AND DISK?
2204                            ASKSKP  14              /NOPE, DONT ASSEMBLE IN THIS MESSAGE
2205                    /
2206                    /
2207    4705    0617
2207    4706    2524
2207    4707    2025
2207    4710    2440
2207    4711    0405
2207    4712    2611
2207    4713    0305
2207                            TEXT    "FOUTPUT DEVICE:
2210    4714    7243
2210
2211    4715    4043
2211
2212    4716    4043
2212    4717    1010
2212    4720    4055
2212    4721    5555
2212    4722    4010
2212    4723    1107
2212    4724    1040
2212    4725    2320
2212    4726    0505
2212    4727    0440
2212    4730    2025
2212    4731    1603
2212                    HH --- HIGH SPEED PUNCH
2213    4732    1043
2213    4733    1440
2213    4734    5555
2213    4735    5540
2213    4736    1411
2213    4737    1603
2213    4740    4024
-
```

```
2213      4741  0120
2213                  L --- LINC TAPE
2214      4742  0543
2214      4743  2040
2214      4744  5555
2214      4745  5540
2214      4746  1411
2214      4747  1605
2214      4750  4020
2214      4751  2211
2214      4752  1624
2214                  P --- LINE PRINTER
2215      4753  0522
2215      4754  4322
2215      4755  4055
2215      4756  5555
2215      4757  4022
2215      4760  0660
2215      4761  7054
2215      4762  2213
2215      4763  6070
2215      4764  4004
2215      4765  1123
2215                  R --- RF08,RK08 DISK
2216      4766  1343
2216      4767  2440
2216      4770  5555
2216      4771  5540
2216      4772  2405
2216      4773  1405
2216      4774  2431
2216      4775  2005
2216      4776  3400
2216                  T ---
                       TELETYPE\"
2217                  /
2220                  /
2221                  /
2222                  /
2223                  /
2224                  /
2225                  /
2226                  /
2227                  /
2230                  /
2231                  /
2232                  /
2233                          EJECT
-
```

```
2234                    /
2235                    /
2236                    /
2237                    /
2240                    /
2241                    /
2242                    /
2243                    /               CHAIN TO THE NEXT PART OF PIP
2244                    /
2245                    /
2246                    /
2247                    /
2250                    /
2251                            CHAIN   "PIP4"
```

```
0000                    *2.
0001                            PMODE
0002                            EJECT
-
```

```
0003                /
0004                /
0005                /
0006                /
0007                /
0010                /                       P    I    P    4
0011                /
0012                /
0013                /
0014                /
0015                /                       THIS IS THE FOURTH PART OF PIP
0016                /
0017                /
0020                /
0021                /
0022                /
0023                /
0024                /
0025                /
0026                /
0027                /
0030                /
0031                /
0032                /
0033                /
0034                /
0035                /
0036                /
0037                /
0040                /
0041                /
0042                        EJECT
-
```

```
0043                    /
0044                    /
0045                            *5000
0046                    /
0047                    /
0050                    /
0051                    /
0052                    /
0053                    /                       S O U R C E   H A N D L E R
0054                    /
0055                    /
0056                    /
0057                    /
0060                    /
0061                    /
0062                    ASCINP=BININP                   /SAME DEFINITIONS AS BINARY(FOR NOW , ANYWAY)
0063                    ASCOUT=BINOUT
0064                    ASCLST=BINLST
0065                    ASCLTO=ASCLST
0066                    /
0067                    /
0070                    /
0071                    /
0072                    /
0073                    /
0074    5000    4562    ASCII,  DECODE                  /GET THE INPUT REQUEST NOW
0075    5001    4610            ASCINP                  /DISPLAY THE POSSIBLE INPUT DEVICES.
0076    5002    3102            DCA     BFLAG1
0077    5003    3104            DCA     BFLAG2
0100    5004    3140            DCA     BCOUNT
0101    5005    3130            DCA     ORIGIN
0102    5006    3135            DCA     BFIELD
0103    5007    3103            DCA     BOLDP
0104    5010    3073            DCA     CNTRLŻ          /INITIALIE VARIOUS POINTERS AND COUNTS.
0105                            ASMIFŻ  CARD-1          /ASSEMBLE NEXT CHECK IF CARD READER DEISRED.
0106    5011    4616            JMS I   ACRCHK          /SEE IF ITS A "C" FOR THE CARD READER
0107    5012    4573            SEARCH                  /SEARCH THE LIST FOR A GOOD OPTION
0110    5013    4377            ASCLST                  /LIST OF GOOD CHARS
0111    5014    5174            ASCGO                   /WHERE TO GO FOR THEM
0112    5015    5200            JMP     ASCII           /NO LEGAL REQUEST THERE.
0113                    /
0114                    /
0115                            ASMIFŻ  CARD-1          /ASSEMBLE IN CARD POINTER IF CARD READER DESIRED.
0116    5016    3561    ACRCHK, CRDLTT                  /CARD READER POINTER.
0117                    /
0120                    /
0121    5017    2102    ASCH1,  ISŻ     BFLAG1          //SET FOR HIGH SPPEED READER
0122    5020    2102    ASCT1,  ISŻ     BFLAG1          /SET FO R  TTY
0123    5021    5233            JMP     APART2          /GO AND GET OUTPUT
0124                    /
0125                    /
0126                            ASMIFŻ  RF08            /DO WE HAVE THE DISK?
0127                            ASMSKP  2               /NOPE. SKIP OVER DISK INSTRUCTIONS
0130    5022    4577    ASRF8,  DISC                    /SET UP FOR DISK OPERATION
0131    5023    7410            SKP
0132    5024    4402    ASCT,   TAPE                    /SET FOR TAPE OPERATION
0133    5025    7201            PONE                    /SET TO INPUT AND SOURCE
0134    5026    3123            DCA     FWHAT
0135    5027    7201            PONE
0136    5030    3121            DCA     FTYPE
0137    5031    4563            DIRECT                  /LOOKUP UP NAME NOW.
0140    5032    4404            HPUSH                   /AND SAVE IT AWAY
0141                    /
-
```

```
0142    5033  4562  APART2, DECODE              /GET THE OUTPUT DEVICE
0143    5034  4703  ASCOUT
0144    5035  4573  SEARCH                      /LOOKUP OR REPLY
0145    5036  4377  ASCLTO
0146    5037  5377  ASCG02                      /GO TO WHERE IT POINTS
0147                ASMIFZ  CARD-1              /IS LINE PRINTER THERE???
0150    5040  4642  JMS I   ASCLPT              /CHECK IF "P" TYPED AND INITIALIZE LINEPRINTER.
0151    5041  5233  JMP     APART2              /NOT - A GOOD REPLY
0152                /
0153                /
0154                ASMIFZ  CARD-1              /ASSEMBLE IN PRINTER POINTER?
0155    5042  5765  ASCLPT, LPT2                /POINTER TO CHECKER AND INITIALIZER.
0156                /
0157                /
0160    5043  2104  ASCH2,  ISZ     BFLAG2      /SET TO HIGH OUTPUT
0161    5044  2104  ASCT2,  ISZ     BFLAG2      /SET TO TTY OUTPUT
0162                /
0163                ASMIFZ  RF08                /DO WE HAVE THE DISK ROUTINES?
0164                ASMSKP  2                   /NOPE. SKIP NEXT TWO INSTRUCTIONS.
0165    5045  4577  ASRF82, DISC                /SET UP FOR DISK OPERATION
0166    5046  7410          SKP
0167    5047  4402  ASCTT,  TAPE                /SET FOR A TAPE OPERATION, SHOULD THERE BE ONE.
0170    5050  7201          PONE
0171    5051  3121          DCA     FTYPE       /SET FOR SOURCE MODD.
0172    5052  7240          MONE
0173    5053  1102          TAD     BFLAG1
0174    5054  1104          TAD     BFLAG2      /IS IT MASS STORAGE TO MASS STORAGE.
0175    5055  7710          SPA CLA             /????
0176    5056  5406          FILEC               /YEP. DO TRANSFER NOW.
0177    5057  4566          PUSH                /SAVE OUTPUT FILE INFORMATION
0200    5060  4403          HPOP                /BRING IN INPUT FILE INFORMATION
0201    5061  4762          JMS I   ASETI       /SET UP SEQUENTIAL TAPE INPUT
0202    5062  1104          TAD     BFLAG2      /ARE WE GOING TO TAPE
0203    5063  7640          SZA CLA
0204    5064  4405          LEADER              /NO, WE BETTER GENERATE SOME LEADER NOW.
0205                /
0206                /
0207                /
0210                /
0211    5065  6016  ANTAPE, 6016                /INITIALIZE THE HIGH SPEED READER
0212    5066  6032          6032                /AND CLEAR THE TTY FLAG AND THE AC.
0213                /
0214                /
0215    5067  1102  ALOOP,  TAD     BFLAG1      /GET THE INPUT DEVICE POINTER.
0216    5070  7640          SZA CLA             /FROM A FILE?
0217    5071  5274          JMP     .+3         /NOPE.
0220    5072  4763          JMS I   AAGET       /YEP. GET A CHAR NOW
0221    5073  7410          SKP                 /SKP OVER BELOW GET.
0222    5074  4574          AUXIN               /IF NOT  FROM A FILE, GET THE CHAR NOW. AND     L177
0223    5075  0142          AND     L177        /MAKE INTO A GOOD ASCII CHARACTER.
0224    5076  1026          TAD     L200        /WITH PARITY BIT ON.
0225    5077  3121          DCA     FTYPE       /AND STORE AWAY.
0226    5100  1073          TAD     CNTRLZ      /WAS A CONTROL Z TYPED?
0227    5101  7640          SZA CLA
0230    5102  5313          JMP     AEND        /YEP. DO END
0231    5103  4573          SEARCH              /SEARCH FOR POSIBLE SPECIAL CHARACTERS.
0232    5104  5165          AC1
0233    5105  5370          AG1
0234    5106  4764          JMS I   AALIMC      /CHECK TO SEE IF IT S IN 240-337 LIMITS.
0235    5107  5312          JMP     ABAD        / IT ISN.T IGNORE IT.
0236                /
0237    5110  4350  AOK,    JMS     APUTIT      /CHAR OK AS IS. OUTPUTTIT.
0240    5111  5267          JMP     ALOOP       /GO BACK AND GET ANOTHER ONE.
-
```

```
0241                    /
0242                    /
0243    5112    5267    ABAD,   JMP     ALOOP           /BAD CHAR, GET NEXT ONE
0244                    /
0245                    /
0246                    /
0247    5113    1122    AEND,   TAD     BFLAG1          /IS IT MASS INPUT?
0250    5114    7650            SNA CLA
0251    5115    5320            JMP     AEND2           /YEP, IGNORE STANDARD PAPER TAPE CRAP.
0252    5116    4476            JMS I   PMORE           /ASK FOR MORE TAPES??
0253    5117    5265            JMP     ANTAPE          /HE S   GOT ANOTHER TAPE.
0254    5120    4334    AEND2,  JMS     ACRR            /PLACE A CR IN THE BUFFER.
0255    5121    1372            TAD     AABLAH          /GETE  THE EOT-2 CHAR
0256    5122    3121            DCA      FTYPE          /AND PLACE IN THE BUFFER        JMS     APUTIT
0257    5123    4350            JMS     APUTIT          /PLACE IT OUT THERE
0260    5124    7240            MONE                    /IF LASS STOREAGE IT NEVER RETURNS TO HERE
0261    5125    3121            DCA     FTYPE           /PLACE A RUBOUT ON  BUS
0262    5126    4350            JMS     APUTIT          /AND SEND IT OUT
0263    5127    4334            JMS     ACRR            /DO ANOTHER CARRIGE RETURN.
0264    5130    4425            LEADER                  /THEN GENERATE TRAILER
0265    5131    5552            PIP                     /AND FINALLY GO BACK TO PIP
0266                    /
0267                    /
0270                    /
0271                    /
0272    5132    4334    ACR,    JMS     ACRR            /COMES HERE IF A CR ENCOUNTERED.        JMP     ALOOP
0273    5133    5267            JMP     ALOOP           /GET NEXT CHAR
0274                    /
0275                    /
0276    5134    0000    ACRR,   0                       /GENERATES A CR,LF,RUBOUT
0277    5135    1365            TAD     AC1             /215
0300    5136    3121            DCA     FTYPE
0301    5137    4350            JMS     APUTIT          /OUT GOES THE C R
0302    5140    1144            TAD     M212
0303    5141    7041            CIA
0304    5142    3121            DCA     FTYPE
0305    5143    4350            JMS     APUTIT          /OUT GOES THE L F
0306    5144    7240            MONE
0307    5145    3121            DCA     FTYPE
0310    5146    4350            JMS     APUTIT          /OUT GOES THE RUBOUT
0311    5147    5734            JMP I   ACRR            /RETURN
0312                    /
0313                    /
0314                    /
0315    5150    0000    APUTIT, 0                       /SENDS A CHAR ALONG CORRECTLY
0316    5151    1104            TAD     BFLAG2          /WHERES IT GOING?
0317    5152    7640            SZA CLA
0320    5153    5356            JMP     .+3             /TO THE SEQUENTIAL DEVICE
0321    5154    4761            JMS I   AAAPUT          /PLACE IN MASS BUFFER.
0322    5155    5750            JMP I   APUTIT          /AND RETURN
0323    5156    1121            TAD     FTYPE           /GET THE CHAR
0324    5157    4575            AUXOUT                  /GOOD BYE
0325    5160    5750            JMP I   APUTIT          /AND RETURN.
0326                    /
0327                    /
0330    5161    5200    AAAPUT, AAPUT
0331    5162    4514    ASETI,  SETI
0332    5163    5403    AAGET,  AAGET
0333    5164    1253    AALIMC, GGLIMC                  /LIMIT CHECKER
0334                    /
0335                    /
0336                    /
0337                    /
-
```

```
0340    5165  0215  AC1,    215
0341    5166  0300          300
0342    5167  0337          337
0343    5170  0243          243
0344                        ASMIFE  TERMC-44        /IS 44 A LEGAL CHAR???
0345                        244                     /NO. ASSEMBLE INTO THE EXCEPTION TABLE.
0346    5171  0247          247
0347    5172  0232  AABLAH, 232
0350    5173  4211          4211                    /END OF THE LIST
0351                /
0352                /
0353                /
0354                /
0355                /
0356    5174  5017  ASCGO,  ASCH1
0357    5175  5024          ASCT
0360                        ASMIFN  RF08            /DO WE HAVE DISK?
0361    5176  5022          ASRF8                   /YEP. ASSEMBLE IN BRANCH
0362    5177  5020          ASCT1
0363                /
0364                /
0365                /
0366                /
0367                /
0370                /
0371                /
0372                /
0373                /
0374                /
0375                /
0376                        EJECT
-
```

```
0377                    /                       THIS PAGE OVERLAPS A LITTLE FROM PREVIOUS PAGE.
0400                    /
0401                    /
0402                    /
0403                    /                       MORE OF THE ASCII HANDLER.
0404                    /
0405                    /
0406                    /
0407                    /
0410                    /
0411    5200  0000  AAPUT,  0
0412    5201  4573          SEARCH                  /CHECK FOR A SPECIAL CONTROL CHAR.
0413    5202  5165          AC1                     /SAME LIST IS OK.
0414    5203  5470          AG2
0415    5204  1121          TAD     FTYPE           /GET THE CHAR
0416    5205  1146          TAD     M240
0417    5206  7710          SPA CLA
0420    5207  5220          JMP     AP              /TOO SMALL. NOG A REGULAR CHAR.
0421    5210  1121          TAD     FTYPE
0422    5211  1147          TAD     M340
0423    5212  7700          SMA CLA
0424    5213  5220          JMP     AP              /TOO BIG. IT S NO GOOD.
0425    5214  1121          TAD     FTYPE           /GET THE CHAR AGAIN
0426    5215  0024          AND     L77             /JUST THE LOW ORDER BITS.
0427    5216  4253  AAA1,   JMS     AAAAAA          /PLACE THE CHAR IN THE BUFFER.
0430    5217  5600          JMP I   AAPUT           /AND EXIT
0431                    /
0432                    /
0433                    /
0434    5220  5600  AP,     JMP I   AAPUT           /BAD CHAR.
0435                    /
0436    5221  1365  APCR,   TAD     AL43            /CR FOUND. PLACE A "43" IN THE BUFFER
0437    5222  5216          JMP     AAA1            /STICK IN BUFFER
0440                    /
0441    5223  1060  AATAB,  TAD     L7
0442    5224  1364          TAD     AL40            /CONVERT TAB TO A 47
0443    5225  5216          JMP     AAA1
0444                    /
0445                    /
0446                    /
0447                    AAEND,  ASMIFN  TERMC-44        /IS 44 THE END OF FILE CHARACTER?
0450                            ASMSKP  2               /NO. ZERO IS. IGNORE NEXT TWO STATEMENTS.
0451                            PFOUR                   /DOLLAR SIGN IS THE END OF BUFFER CRAP
0452                            TAD     AL40            /MAKE IT INTO A DOLLAR SIGN
0453    5226  4253              JMS     AAAAAA          /AND PLACE EOF CHAR IN THE BUFFER.
0454    5227  1354              TAD     AAAORG          /SEE IF BUFFER IS WRITTEN OUT.
0455    5230  7040              CMA
0456    5231  0103              AND     BOLDP           /BY CHECKING ENDING ADDRESS
0457    5232  7650              SNA CLA
0460    5233  5236              JMP     .+3             /BUFFER IS CLEAR AND WRITTEN OUT.
0461    5234  4253              JMS     AAAAAA          /BUFFER STILL IN USE. ADD 1 CHAR AND SEE IF DUMPED.
0462    5235  5227              JMP     .-6             /NOT DUMPED. WAIT.
0463    5236  1353              TAD     AAUNIT          /GET THE UNIT
0464    5237  3120              DCA     FUNIT           /AND PLACE AWAY
0465    5240  1363              TAD     AABLOCK         /GET THE FIRST BLOCK
0466    5241  3122              DCA     FBNUM           /AND STASH AWAY.
0467    5242  1363              TAD     AABLOCK         /GET THE FIRST BLOCK
0470    5243  7041              CIA
0471    5244  1356              TAD     AAOUTB          /ADD IN NEXT BLOCK TO GET SIZE.
0472    5245  3117              DCA     FSIZE           /AND STASH AWAY.
0473    5246  7201              PONE                    /SET FOR SEOURCE
0474    5247  3121              DCA     FTYPE
0475    5250  4404              HPUSH                   /NOW STASH THIS AWAY FOR FILEC TO USE.
```

```
0476    5251  4565          POP                 /REGET THE OUTPUT UNIT CONFIGUARTATION.
0477    5252  5406          FILEC               /AND DO A DIRCTORY TYPE COPY.
0500                /
0501                /
0502                /
0503                /
0504                /
0505    5253  0000  AAAAAA, 0                   /PLACES HALF A CHAR IN THE BUFFER.
0506    5254  3132          DCA     BTEMP1
0507    5255  1135          TAD     BFIELD      /FIRST TIME THROUGH?
0510    5256  7640          SZA CLA
0511    5257  5303          JMP     AAA         /NOPE. IGNORE SETUP
0512    5260  2135          ISZ     BFIELD      /SET SWITCH
0513    5261  1363          TAD     AABLOCK     /GET START OF BINARY CRAP.
0514    5262  3356          DCA     AAOUTB      /AND SET UP WRITE BLOCK.
0515    5263  1354          TAD     AAAORG      /GET THE LOCATION OF START
0516    5264  3103          DCA     BOLDP       /AND SAVE IN THE ADDRESS
0517    5265  7240          MONE                /SET THE SWITCH TO PLACE IN LEFT HALF OFWORD.
0520    5266  3130          DCA     ORIGIN
0521    5267  1004          TAD     M400        /SET THE WORD COUNTER
0522    5270  3134          DCA     BTEMP3      /TO 400 WORDS TO GO IN BUFFER.
0523                /
0524                /
0525                          ASMIFN  STAR20-1    /DO WE WANT TO STICK IN A "*20" AT BEGINNING OF FILE???
0526                          ASMSKP  13          /NOPE. DONT ASSEMBLETHEM IN.
0527                /
0530    5271  1361          TAD     A5262       /GET A "*20" AND PLACE IT
0531    5272  3503          DCA I   BOLDP
0532    5273  2103          ISZ     BOLDP       /IN FIRST TWO WORDS OF FILE.
0533    5274  1362          TAD     A6043
0534    5275  3503          DCA I   BOLDP
0535    5276  2103          ISZ     BOLDP       /BOP UP THE IN POINTER.
0536    5277  2134          ISZ     BTEMP3
0537    5300  2134          ISZ     BTEMP3      /INCREMENT THE BUFFER COUNTER BY 2.
0540                /
0541    5301  1365          TAD     AL43        /TELL BUFFERS WE JUST PUT A "43" IN IT.
0542    5302  3366          DCA     ALASTC      /BY PLACING IT IN LAST CAR INSERTED.
0543                /
0544    5303  1132  AAA,    TAD     BTEMP1      /GET THE CAR
0545    5304  7041          CIA
0546    5305  1365          TAD     AL43        /IS IT A 43
0547    5306  7640          SZA CLA
0550    5307  5315          JMP     .+6         /NOPE. INSERT IT
0551    5310  1366          TAD     ALASTC      /GET PREVIOUS CHAR
0552    5311  7041          CIA
0553    5312  1365          TAD     AL43        /WAS  IT ALSO A 43
0554    5313  7650          SNA CLA
0555    5314  5653          JMP I   AAAAAA      /YEP. IGNORE IT.
0556    5315  1132          TAD     BTEMP1      /UPDATE OLD CHAR
0557    5316  3366          DCA     ALASTC
0560    5317  2130          ISZ     ORIGIN      /TEST LEFT OR RIGHT SWITCH
0561    5320  5330          JMP     AAA2        /RIGHT HALF
0562    5321  1132          TAD     BTEMP1      /LEFT HALF
0563    5322  7006          RTL
0564    5323  7006          RTL
0565    5324  7006          RTL
0566    5325  0053          AND     L7700       /PLACE IN LEFT HALF OF WORD
0567    5326  3503          DCA I   BOLDP       /AND STASH AWAY.
0570    5327  5653          JMP I   AAAAAA      /AND EXIT NOW.
0571                /
0572    5330  7240  AAA2,   MONE
0573    5331  3130          DCA     ORIGIN      /RESET HALF SWITCH.
0574    5332  1132          TAD     BTEMP1      /PLACE IN RIGHT HALF OF WORD.
-
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0575    5333  0024          AND     L77
0576    5334  1523          TAD I   BOLDP
0577    5335  3523          DCA I   BOLDP           /AND PLACE IT AWAY.
0600    5336  2123          ISZ     BOLDP           /THAT ALL?
0601    5337  7000          NOP                     /THIS CAN SKIP IF BUFFER=7420
0602    5340  2134          ISZ     BTEMP3          /INCREMENT THE COUNTER. ALL DONE WITH THIS BUFFER?
0603    5341  5653          JMP I   AAAAAA          /NOPE. BUFFER STILL GOOD.
0604    5342  1354          TAD     AAAORG          /BUFFER FULL. RESET POINTER.
0605    5343  3123          DCA     BOLDP
0606    5344  1064          TAD     M400
0607    5345  3134          DCA     BTEMP3          /RESET COUNTER.
0610    5346  1356          TAD     AAOUTB          /GET THE OUTPUT BLOCK
0611    5347  1367          TAD     AALIM           /WILL IT EXCEED WORKING AREA?
0612    5350  7650          SNA CLA
0613    5351  4567          NO                      /YEP, IT WILL. GIVE ERROR MESSAGE.
0614    5352  4572          WRITE                   /WRITE OUT FULL BUFFER.
0615    5353  0001  AAUNIT, SYSBIN
0616    5354  6400  AAAORG, BUFFER
0617    5355  0001          1
0620    5356  0000  AAOUTB, 0
0621    5357  2356          ISZ     AAOUTB          /BOP UP BLOCK
0622    5360  5653          JMP I   AAAAAA          /AND EXIT
0623                /
0624                DSYS4=AAUNIT
0625                /
0626                /
0627                        ASMIFN  STAR20-1        /DO WE WANT THE "*20" LITERALS IN???
0630                        ASMSKP  3               /NOPE. DON T PUT THEM IN.
0631                /
0632    5361  5262  A5262,  5262
0633    5362  6043  A6043,  6043
0634                /
0635    5363  0370  AABLOCK,SYSBBLOCK
0636    5364  0040  AL40,   40
0637    5365  0043  AL43,   43
0640    5366  0000  ALASTC, 0
0641    5367  7310  AALIM,  -SYSWT-1              /MAXIMUM SIZE OF THE WORKSPACE.
0642                /
0643                /
0644                /
0645                /
0646                /
0647                /
0650                /
0651                /
0652                /
0653                /
0654                /
0655                /
0656    5370  5132  AG1,    ACR
0657    5371  5112          ABAD
0660    5372  5112          ABAD
0661    5373  5112          ABAD
0662                        ASMIFZ  TERMC-44        /SHOULD WE IGNORE DOLLAR SIGNS?
0663                        ABAD                    /YEP. ASSEMBLE IN THE POINTER
0664    5374  5112          ABAD
0665    5375  5113          AEND
0666    5376  5110          AOK
0667                /
0670                /
0671                /
0672                /
0673                /
-
```

```
0674                    /
0675                    /
0676        5377  5043  ASCG02, ASCH2
0677        5400  5047          ASCTT
0700                            ASMIFN  RF08            /DISK THERE?
0701        5401  5045          ASRF82                  /YEP.
0702        5402  5044          ASCT2
0703                    /
0704                    /
0705                    /
0706                    /
0707                    /
0710                    /
0711                    /
0712                    /
0713                    /
0714                    /
0715                    /
0716                    /
0717                    /
0720                    /
0721                    /
0722                    /
0723                    /
0724                            EJECT
-
```

```
0725                    /                       MORE ASCII HANDLERS
0726                    /
0727                    /       WHICH OVERLAP SOME MORE FROM THE PREVIOUS PAGE.
0730                    /
0731                    /
0732                    /
0733                    /
0734                    /
0735                    /
0736                    /
0737                    /
0740                    /
0741                    /
0742                    /
0743                    /
0744                    /
0745                    /
0746                    /
0747    5403    0000    AAAGET, 0                       /MAIN BUFFER GETTER ROUTINE
0750    5404    7200            CLA
0751    5405    1135            TAD     BFIELD
0752    5406    7640            SZA CLA                 /ARE WE ACTIVE?
0753    5407    5215            JMP     AAGET2          /YEP. IGNORE NEXT.
0754    5410    2135            ISZ     BFIELD          /SET STATUS SWITCH
0755                    /
0756                            ASMIFN  STAR20-1        /DO WE WANT TO SKIP PAST A "*20"
0757                            ASMSKP  3               /NOPE. NO *20 SKIP.
0760                    /
0761    5411    4644            JMS I   AGETI           /GET A WORD
0762    5412    4644            JMS I   AGETI           /GET TWO WORDS (BYPASS "*20")
0763                    /
0764    5413    7240            MONE
0765    5414    3130            DCA     ORIGIN          / LEFT HALF OF WORD CHAR.
0766                    /
0767    5415    2130    AAGET2, ISZ     ORIGIN          /WHICH HALF?
0770    5416    5224            JMP     AAGET3          /RIGHT HALF .
0771    5417    4644            JMS I   AGETI           /GET A WORD.
0772    5420    3103            DCA     BOLDP           /AND STASH AWAY
0773    5421    1103            TAD     BOLDP           /RETURN WITH ITS VALUE.
0774    5422    4550            ROR6                    /SHIFT LEFT HALF OF AC TO THE RIGHT HALF
0775    5423    5227            JMP     AAGET4          /GO DOWN AND GET REST.
0776                    /
0777    5424    7240    AAGET3, MONE
1000    5425    3130            DCA     ORIGIN          /RESET RIGHT-LEFT SWITHC.
1001    5426    1103            TAD     BOLDP           /GET THE RIGHT CHAR
1002    5427    0024    AAGET4, AND     L77             /JUST GET 6 BITS
1003    5430    3121            DCA     FTYPE           /STORE AWAY.
1004    5431    4573            SEARCH                  /CHECK FOR A NO NO.
1005    5432    5460            AAGL1
1006    5433    5464            AAGO1
1007    5434    1121            TAD     FTYPE
1010    5435    1056            TAD     M40             /FIGURE OUT CORRECT BIT 4
1011    5436    7510            SPA                     />40. A 200  TYPE CHARACTER
1012    5437    1025            TAD     L100            /<40 A 300 TXPE CHAR.
1013    5440    1224            TAD     AAGET3          /ADD IN 240 (ACTUALLY 7240)
1014    5441    0243            AND     A377            /JUST MAKE IT8 BITS
1015    5442    5603            JMP I   AAAGET          /AND EXIT.
1016                    /
1017                    /
1020    5443    0377    A377,   377
1021    5444    4525    AGETI,  GETI
1022                    /
1023                    /
-
```

```
1024    5445  1143  AACR,   TAD     M215            /CARRIGE RETURN
1025    5446  7041          CIA
1026    5447  5603          JMP I   AAAGET
1027                /
1030    5450  7201  AAATAB, PONE
1031    5451  1054          TAD     L10
1032    5452  1026          TAD     L200
1033    5453  5603          JMP I   AAAGET
1034                /
1035    5454  7305  AAAEND, PTWO
1036    5455  1061          TAD     L30
1037    5456  1026          TAD     L200
1040    5457  5603          JMP I   AAAGET          /EXIT WITH A CONTROL Z IN THE AC.
1041                /
1042                /
1043                /
1044                /
1045                /
1046    5460  0000  AAGL1,  0
1047                        ASMIFZ  TERMC-44        /IS 44 THE END OF FILE CHAR?
1050                        44                      /YEP. ON 44 GO TO THE CONTROL Z GENERATOR.
1051    5461  0043          43
1052    5462  0047          47
1053    5463  4037          4037                    /END OF LIST
1054                /
1055                AAGO1,  ASMIFN  TERMC-44
1056    5464  5454          AAAEND                  /00 IS THE END OF FILE CHARQACTER.
1057                        ASMIFZ  TERMC-44
1060                        AAAGET+1                /44 (DOLLAR SIGN) IS THE TERMINATOR.
1061                        ASMIFZ  TERMC-44        /IS DOLLAR SIGN LEGAL?
1062                        AAAEND                  /NOPE. IT S THE END OF FILE CHAR.
1063    5465  5445          AACR
1064    5466  5450          AAATAB
1065    5467  5404          AAAGET+1
1066                /
1067    5470  5221  AG2,    APCR
1070    5471  5220          AP
1071    5472  5220          AP
1072                        ASMIFZ  TERMC-44        /ASMEBLE IGNORE CHARACTER IF DOLLA.R IS THE END OF FILE CAHR...
1073                        AP
1074    5473  5220          AP
1075    5474  5220          AP
1076    5475  5226          AAEND
1077    5476  5223          AATAB
1100                /
1101                /
1102                /
1103                /
1104                /
1105                /
1106                /
1107                /
1110                /
1111                /
1112                /
1113                /
1114    5477  0200  ABDIS,  LEFT+200
1115    5500  0100          TOP=240
1116                        ASMIFN  REMAKE!RF08     /DO WE WANT REMAKE OPTION OR THE DISK?
1117                        ASMSKP  5               /YEP. SKIP NEXT MESSAGE.
1120                        TEXT    "FAUXILIARY OPTIONS:
1121
1122
-
```

```
1123                    HC -== COPY SPECIFED BLOCKS
1124                    HD -== DUPLICATE TAPE ? ONTO 1\"
1125                    /
1126                    /
1127                    /
1130                    /
1131                    /
1132                            ASMIFE  REMAKE          /DO WE WANT REMAKE MESSAGE?
1133                            ASMSKP  6               /YEP. PUT IN MESSAGE.
1134                            TEXT    "FAUXILLIARY OPTIONS:
1135
1136
1137                    HC -== COPY SPECIFIED BLOCKS
1140                    HD -== DUPLICATE TAPE Ø ONTO 1
1141                    HR -== REFORMAT FILE\"
1142                    /
1143                    /
1144                    /
1145                    /
1146                    /
1147                    /
1150                    /
1151                    /
1152                    /
1153                    /
1154                            ASMIFE  RFØ8            /DO WE WANT THE RFØ8 OPTIONS.
1155                            ASKSKP  6               /NOPE. DON T  PUT IN THE MESSAGE.
1156                    /
1157                    /
1160    5501    0601
1160    5502    2530
1160    5503    1114
1160    5504    1101
1160    5505    2231
1160    5506    4017
1160    5507    2024
1160    5510    1117
1160    5511    1623
1160                            TEXT    "FAUXILLIARY OPTIONS:
1161    5512    7243
1161
1162    5513    4043
1162
1163    5514    4043
1163    5515    0340
1163    5516    5555
1163    5517    5540
1163    5520    0317
1163    5521    2031
1163    5522    4023
1163    5523    2005
1163    5524    0311
1163    5525    0611
1163    5526    0504
1163    5527    4002
1163    5530    1417
1163    5531    0313
1163                    C -== COPY SPECIFIED BLOCKS
1164    5532    2343
1164    5533    0440
1164    5534    5555
1164    5535    5540
1164    5536    0425
-
```

```
1164       5537  2014
1164       5540  1103
1164       5541  0124
1164       5542  0540
1164       5543  2401
1164       5544  2005
1164       5545  4060
1164       5546  4017
1164       5547  1624
1164       5550  1740
1164                   D --- DUPLICATE TAPE 0 ONTO 1
1165       5551  6143
1165       5552  2340
1165       5553  5555
1165       5554  5540
1165       5555  0317
1165       5556  2031
1165       5557  4023
1165       5560  3123
1165       5561  2405
1165                   S --- COPY SYSTEM
1166       5562  1543
1166       5563  2540
1166       5564  5555
1166       5565  5540
1166       5566  0317
1166       5567  2031
1166       5570  4025
1166       5571  1611
1166       5572  2434
1166                   U -
                       -- COPY UNIT\"
1167                   /
1170                   /
1171                   /
1172                   /
1173                   /
1174                   /
1175                   /
1176                   /
1177                   /
1200                   /
1201                   /
1202                   /
1203                   /
1204                   /
1205                           EJECT
-
```

```
1206                    /
1207                    /
1210                    /
1211                    /
1212                    /
1213                            *5600
1214                    /
1215                    /
1216                    /
1217                    /
1220                    /               THIS IS THE ABSOLUTE BLOCK HANDLER
1221                    /
1222                    /
1223                    /
1224                    /
1225                    /
1226                    /
1227                    /
1230                    /
1231                    /
1232                    CINPUT=ASCINP                   /SAME AS SOURCE INPUT(FOR NOW)
1233                    COUTPUT=ASCOUT                  /SAME AS SOURCE FOR NOW.
1234                    /
1235                    /
1236                    /
1237    5600    4562    ABSOL,  DECODE                  /GIVE THE MESSAGE AND WAIT FOR A REPLY.
1240    5601    5477            ABDIS                   /ABSOLUTE DISPLAY CRAP.
1241    5602    1120            TAD     FUNIT           /GET THE NUMBER OF ADDITION AL  UNITS.
1242    5603    0060            AND     L7              /ONLY 3 GOOD BITS ALWLOED.
1243    5604    7450            SNA                     /WAS IT ZERO?
1244    5605    7201            PONE                    /YEP. MAKE IT INTO A ONE.
1245    5606    7041            CIA                     /COMP TO SET UP COUNT
1246    5607    3365            DCA     ABSTMP          /AND STORE AWAY IN COUNTER SET.
1247    5610    4573            SEARCH                  /LOOKUP THE RELYP.
1250    5611    5755            ABL1
1251    5612    5761            ABG1
1252    5613    5200            JMP     ABSOL           /ILLEGAL REPLY.
1253                    /
1254                    /
1255                    /
1256                    /
1257    5614    3103    DUP,    DCA     INUNIT          /COPIES 0 TO 1 OR MORE TAPES.
1260    5615    3102            DCA     INBLOCK         /SET UP INPUT UNIT AND BLOCK TO 0, OUTPUT BLOCK TO 0.
1261    5616    3104            DCA     OUTBLOCK
1262    5617    7201            PONE
1263    5620    3105            DCA     OUTUNIT         /SET THE OUTPUT UNIT TO 1
1264    5621    7332            CLA CLL CML RTR         /2000
1265    5622    7010            RAR                     /1000. A 1000 BLOCK COPY.
1266    5623    3117            DCA     FSIZE           /SET UP SIZE.
1267    5624    1365            TAD     ABSTMP          /RECALL THE NUMBER OF COPIES TO MAKE
1270    5625    3106            DCA     OUTNUM          /AND SAVE IN THE COPIER PARAMETER TABLE.
1271    5626    4554            COPY                    /THEN GO DO OCPY.
1272    5627    5552            PIP                     /RETURN TO PIP WHEN DONE
1273                    /
1274                    /
1275                    /
1276    5630    4562    ACOPY,  DECODE                  /GET THE INPUT DEVICE AND BLOCK NUMBER.
1277    5631    4610            CINPUT                  /FROM THE COPY INPUT CRAP.
1300    5632    4573            SEARCH                  /LOOK-UP REPLY.
1301    5633    4577            ACPL1                   /INPUT LIST
1302    5634    5674            ACPG1                   /GO TO LIST
1303    5635    5230            JMP     ACOPY           /NO GOOD REPLY FOUND
1304                    /
-
```

```
1305                    /
1306                    /
1307                    /
1310                    /
1311                    /
1312                            ASMIFZ  RF00            /DISK?
1313                            ASKSKP  2               /NO DISK HANDLERS THERE.
1314    5636    4577    ACOPR,  DISC                    /SET UP FOR DISK
1315    5637    7410            SKP
1316    5640    4402    ACOPT,  TAPE                    /SET UP FOR TAPE
1317    5641    1120            TAD     FUNIT
1320    5642    3103            DCA     INUNIT          /SET UP THE INPUT UNIT NOW.
1321    5643    4566            PUSH                    /SAV THE SIZE BECUASE DECODE MIGH ZAP IT.
1322    5644    4304            JMS     AGETN           /GET THE STARTING BLOCK NUMBER.
1323    5645    5230            JMP     ACOPY           /NOT ALL LEGAL NUMBERS.
1324    5646    1331            TAD     AGNUM           /GET THE BLOCK NUMBER
1325    5647    3102            DCA     INBLOCK         /AND SAVE AWAY.
1326    5650    4562    ACOPY2, DECODE                  /GET THE OUTPUT DEVICE
1327    5651    4703            COUTPUT                 /DISPLAY CHOICES
1330    5652    4573            SEARCH                  /LOOK UP THE REPLY
1331    5653    4377            ACPL1
1332    5654    5700            ACPG2
1333    5655    5250            JMP     ACOPY2          /NOT A LEGAL REPLY
1334                    /
1335                    /
1336                    /
1337                    /
1340                    /
1341                            ASMIFZ  RF00            /DISK?
1342                            ASMSKP  2               /NOPE.
1343    5656    4577    ACOPR2, DISC                    /SET UP FOR DISK
1344    5657    7410            SKP
1345    5660    4402    ACOPT2, TAPE                    /SET UP FOR TAPE
1346    5661    1120            TAD     FUNIT           /GET THE CORRECT OUTPUT UNIT
1347    5662    3105            DCA     OUTUNIT         /AND STASH AWAY.
1350    5663    4304            JMS     AGETN           /GET THE BLOCK NUMBER.
1351    5664    5250            JMP     ACOPY2          /NOT A LEBGAL NUMBER
1352    5665    1331            TAD     AGNUM           /GET THE STARTING BLOCK
1353    5666    3104            DCA     OUTBLOCK                /AND STASH AWAY.
1354    5667    4565            POP                     /RESTORE THE SIZE OF THE COPY.
1355    5670    1365            TAD     ABSTMP          /RECALL THE NUMBER OF COPIES TO MAKE
1356    5671    3106            DCA     OUTNUM          /AND SAVE IN THE COPY PARAMETER
1357    5672    4554            COPY                    /AND DO IT.
1360    5673    5552            PIP                     /RETURN TO PIP WHEN DONE.
1361                    /
1362                    /
1363                    /
1364                    /
1365                    /
1366                    /
1367                    /
1370                    /
1371                            ACPL1=BINLST
1372                    /
1373    5674    5630    ACPG1,  ACOPY                   /ILLEGAL REPLY
1374    5675    5640            ACOPT                   /LINC TAPE
1375                            ASMIFN  RF00            /DISK?
1376    5676    5636            ACOPR                   /YES. DISK
1377    5677    5630            ACOPY                   /ILLEGAL
1400                    /
1401                    /
1402                    /
1403    5700    5650    ACPG2,  ACOPY2                  /ILLEGAL
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1404    5701  5660          ACOPT2                  /LINC TAPE
1405                        ASMIFN  RF.28           /DISK?
1406    5702  5656          ACOPR2                  /YES.
1407    5703  5654          ACOPY2                  /ILLEGAL
1410                  /
1411                  /
1412    5704  0000  AGETN,   0                       /CONVERTS FNAME INTO A NUMBER(IF NOT THERE RETURNS TO .+1, OTHERWSIE TO .+2)
1413    5705  6141          LINC                    /GO OVEL MODE
1414                        LMODE
1415    1706  0061          SET I   1               /SET 1 TO POINT TO FNAME BLOCK.
1416    1707  6123          FNAME+6000-1
1417    1710  0642          LDF     2               /IN DF 2
1420    1711  5731          STC     AGNUM           /ZAP OUT PRESENT NUMBER.
1421    1712  0062          SET I   2               /SET 2 TO A COUNT.
1422    1713  7772          -5
1423    1714  1521  AALOOP, LDH I   1               /GET THE NEXT CHAR FROM FNAME.
1424    1715  1426          SMD I                   /IS IT A 77
1425    1716  7777          7777                    /WHICH IS END OF NUMBER?
1426    1717  7752          JMP     ALD             /YEP. EXIT.
1427    1720  1122          ADA I                   /IS IT TOO SMALL?
1430    1721  7720          -57                     /(BELOW 60)
1431    1722  0451          APO
1432    1723  7752          JMP     AALL            /YEP. BAD CHAR.
1433    1724  1120          ADA I                   /IS IT TOO LARGE
1434    1725  7760          -11                     /(ABOVE 72)
1435    1726  0471          APO I
1436    1727  7752          JMP     AALL            /YEP. BAD CHAR.
1437    1730  1020          LDA I                   /GET OLD TOTAL
1440    1731  0000  AGNUM,  0
1441    1732  0243          RDL     3               /MULTIPLY BY 10
1442    1733  1560          BCL I
1443    1734  0007          7
1444    1735  5731          STC     AGNUM           /MULTIPLY DONE
1445    1736  1301          LDH     1               /REGET THE NUMBER
1446    1737  1120          ADA I
1447    1740  7717          -60                     /CHOP OFF CHAR BITS
1450    1741  3731          ADD     AGNUM           /ADD IN OLD TOTAL.
1451    1742  0470          AZE I                   /IF NOT ZERO THEN SKP
1452    1743  0011          CLR                     /IF ZERO , ZERO AC TO 0000, IN CASE IT WAS 7777, WHICH IS EVIL IN 8 MODE.
1453    1744  5731          STC     AGNUM           /STASH AWAY SOMEPLACE O OTHER.
1454    1745  0222          XSK I   2               /BOP UP COUNT
1455    1746  7714          JMP     AALOOP          /MORE TO GO.
1456    1747  7752          JMP     AALL            /TOO MANY DIGITS. NUM TOO LARGE.
1457                  /
1460                  /
1461                  /
1462                  /
1463    1750  0002  ALD,     PDP                     /GET INTO PMODE
1464                        PMODE
1465    5751  2304          ISZ     AGETN           /GO TO GOOD RETURN
1466                  /
1467                        LMODE
1470                  /
1471    1752  0002  AALL,    PDP                     /GET INTO 8 MODE
1472                        PMODE                   /WE RE BACK IN PMODE NOW.
1473    5753  7200          CLA                     /CLEAR THE AC
1474    5754  5704          JMP I   AGETN           /AND EXIT.
1475                  /
1476                  /
1477                  /
1500                  /
1501                  /
1502                  /
```

```
1503                    /
1504                    /
1505                    /
1506                    /
1507                    /
1510                    /
1511    5755    0303    ABL1,   303
1512                            ASMIFN  REMAKE          /REMAKE OPTION INCLUDED???
1513                            322                     /YEP. PLACE CHECK CHAR IN LIST.
1514                            ASMIFZ  RF08            /DISK THERE
1515                            ASMSKP  2               /NOPE. DO NTT OUT IN S AND U
1516    5756    0323            323
1517    5757    0325            325
1520    5760    4304            4304
1521                    /
1522    5761    5630    ABG1,   ACOPY
1523                            ASMIFN  REMAKE          /REMAKE OPTION???
1524                            KONVRT                  /YEP. PLACE IN POINTER OPTION.
1525                            ASMIFZ  RF08            /HOW ABOUT THE POINTERS?
1526                            ASKSKP  2               /NOT THERE
1527    5762    7400            AASYSC
1530    5763    7405            AAUNTC
1531    5764    5614            DUP
1532                    /
1533                    /
1534                    /
1535                    /
1536                    /
1537                    /
1540                    /
1541                    /
1542                    /
1543                    /
1544                    /
1545                    /
1546                    /
1547                    /
1550                    /
1551                            ASMIFN  CARD-1          /DO WE WANT LINE PRINTRTER.???
1552                            ASMSKP  30              /NOPE. DONT ASEEMBLE IT N.
1553                    /
1554                    /
1555                    /
1556    5765    0000    LPT2,   0                       /LINE PRINTER CHECKER AND INITIALIZER.
1557    5766    1121            TAD     FTYPE           /GET THE OUTPUT DEVICE
1560    5767    1376            TAD     LPM320          /IS IT A "P"
1561    5770    7640            SZA CLA                 /?
1562    5771    5765            JMP I   LPT2            /NOPE. RETURN TO CHECK SOME MORE.
1563    5772    4777            JMS I   LLPEJ2          /YEP. GIVE TWO EJECTS TO GET THINGS GOING.
1564    5773    2104            ISZ     BFLAG2          /PREPARE TO SET OUTPUT FLAG TO 3
1565    5774    5775            JMP I   .+1             /RETURN AND ADD TWO MORE TO BFLGA2
1566    5775    5043            ASCH2                   /HIGH SPPEED PUNCH SETTER
1567                    /
1570    5776    7460    LPM320, -320                    /"P"
1571    5777    6323    LLPEJ2, LPEJ2                   /POINTER TO EJECTOR ROUTINE.
1572                    /
1573                    /
1574                    /
1575                    /
1576                    /
1577                    /
1600                    /
1601                    /
-
```

```
1602                    /
1603                    /
1604                    /
1605                    /
1606                            ASMIFZ  CARD            /L.P. THERE?
1607                    ABSTMP, 0                       /NOPE. DEFINE THE TEMPORARY NOW
1610                    /
1611                    /
1612                            ASMIFN  CARD            /L.P. THERE?
1613                    ABSTMP=LPT2                     /YEP. USE ENTRY AS THE TEMP
1614                    /
1615                    /
1616                    /
1617                    /
1620                    /
1621                    /
1622                    /
1623                    /
1624                    /
1625                    /
1626                    /
1627                    /
1630                    /
1631                    /
1632                    /
1633                    /
1634                    /
1635                    /
1636                            EJECT
-
```

```
1637                    /
1640                    /
1641                    /
1642                    /
1643                    /
1644                    /
1645                    /
1646                    /               GET THE LAST PART OF PIP
1647                    /
1650                    /
1651                    /
1652                            CHAIN   "PIP5"
```

```
0000            *2.0
0001                    P.ODE
0002                    EVEDT
-
```

```
0003                    /
0004                    /
0005                    /
0006                    /
0007                    /
0010                    /
0011                    /
0012                    /                 P  I P 5
0013                    /
0014                    /
0015                    /
0016                    /
0017                    /
0020                    /
0021                    /
0022                    /
0023                    /
0024                    /
0025                            EJECT
-
```

```
0026                    /
0027                    /
0030                    /
0031                    /
0032                            ASMIFN  CARD-1          /DO WE WANT THE WARD READER ROUTINE IN THERE??????
0033                            ASMSKP  2237-1415       /NOPE. SKIP PAST THE MESS.
0034                    /
0035                    /
0036                    /
0037                    /
0040                            *6000
0041                    /
0042                    /
0043                    /
0044                    /
0045                    /               CARD READER AND LINE PRINTER ROUTINES.
0046                    /
0047                    /
0050                    /
0051    6000    0000    CDFLAG, 0000                    /FOR JUMPS IN LINC MODE.
0052                                                    /ALSO USED AS THE CARD MOVING INDICATOR. THIS CAN BE DONE BECAUSE WE WILL ON
                    LY EXECUTE
0053                                                    /JUMPS IN LINC MODE WHEN THIS FLAG IS NON-ZERO(CARD MOVING)
0054                                                    /IF YOU HAVE ANY DOUBTS ABOUT WHETHER THIS IS TRUE AFTER YOU MAKE CHANGES, M
                    OVE THIS TO
0055                                                    /A NEW LOCATION OTHER THEN 0 OF THIS SEGMENT.
0056                                                    /THIS WORD MAY BE LOCATED ANYPLACE ON THIS PAGE
0057                    /
0060                    /
0061                    /
0062                    /
0063                    /
0064                    /
0065                    /
0066                            LMODE                   /DEFINE SYMBOLS IN LMODE IN CASE OF ADDRESSING ERRORS WHILE ASSEMBLING
0067                    /
0070    0001    0000    CDCUNT, 0000
0071    0002    0000    CPOINT, 0000
0072    0003    0000    CDSWT,  0000
0073    0004    0000    CDCONT, 0000
0074                    /
0075                    /
0076                    /
0077                    /
0100                    /
0101                            PMODE                   /TELL IT WE RE BACK IN PMODE NOW.
0102                    /
0103                    /
0104                    /
0105                    /
0106                    RCSF=6631                       /SKIP IF COLUMN READY.
0107                    RCRA=6632                       /READ IN AN ALPHA CHAR
0110                    RCRB=6634                       /READ IN A BINARY CHAR.
0111                    RCSD=6671                       /SKIP IF END OF CARD.
0112                    RCSE=6672                       /START A NEW CARD MOVING AND SKIPIF OK.
0113                    RCRD=6674                       /TURN OFF THE CARD DONE FLAG.
0114                    /
0115                    /
0116                    /
0117                    /
0120                    /
0121                    /
0122                    /
```

```
0123    6005  0000  CDINIT, 0                      /INITIALIZE THE CARD READER.
0124    6006  3200        DCA     CDFLAG           /CLEAR THE CARD MOVING FLAG.
0125    6007  3133        DCA     BTEMP2           /CLEAR THE CARD IN BUFFER FLAG.
0126    6010  1136        TAD     BOLDO            /GET THE FIRST COLUMN TO BE LOOKED AT.
0127    6011  1131        TAD     DATA             /GET THE LAST COLUMN TO BE DONE.
0130    6012  7650        SNA CLA                  /BOTH ZERO?
0131    6013  1224        TAD     CDL110           /GET A 72 IN THE AC.
0132    6014  7440        SZA                      /IS IT ZERO???
0133    6015  3131        DCA     DATA             /NOPE. STORE THE 72 IN THE LAST COLUMN SCAN.
0134    6016  1131        TAD     DATA             /GET THE LAST COLUMN AGAIN
0135    6017  7040        CMA                      /NEGATE IT
0136    6020  1136        TAD     BOLDO            /IS THE FIRST > LAST???
0137    6021  7700        SMA CLA                  /?
0140    6022  4567        NO                       /IT ISN. T  GIVE ERROR MESSAGE.
0141    6023  5605        JMP I   CDINIT           /INITIALIZATION FINISHED.
0142                /
0143                /
0144    6024  0110  CDL110, 110                    /72 DECMIL
0145                /
0146                /
0147                /
0150    6025  0000  CDREAD, 0                      /READS A CHAR FROM THE CARD READER.
0151    6026  7346        MTHREE                   /DO WE WANT CARD READER INPUT????
0152    6027  1102        TAD     BFLAG1           /CHECK THE INPUT FLAG.
0153    6030  7650        SNA CLA
0154    6031  5234        JMP     .+3              /YEP. WE CWANT CARD READER INPUT
0155    6032  2225        ISZ     CDREAD           /NOPE. JMP THRIRD RETURN ADDRESS.
0156    6033  5314        JMP     CDISZ            /ISZ CDREAD AGAIN BEFORE EXITING.
0157    6034  1133        TAD     BTEMP2           /IS THE CARD ALREADY IN THE BUFFER???
0160    6035  7640        SZA CLA
0161    6036  5303        JMP     CDNEXT           /YEP. IT IS. FETCH A CHAR FROM IT.
0162    6037  1200        TAD     CDFLAG           /IS THE CARD MOVING????
0163    6040  7640  CDL240, SZA CLA                /TESTA ND LITTERAL
0164    6041  5254        JMP     CDGONG           /ITS MOVING. CHECK TO SEE IF COLUMN IS READY.
0165    6042  6672        RCSE                     /START THE CARD GOING NOW...
0166    6043  5277        JMP     CNOTR            /ITS NOT READY. WAIT AWILE BY RETURN TO USER.
0167    6044  2200        ISZ     CDFLAG           /SET THE SWITCH TO SHOW THE CARD MOVING.
0170    6045  4564        MOVE                     /ZERO OUT THE CARD BUFFER.
0171    6046  6163        CDBUF-1                  /CONTAINS A 0000
0172    6047  6164        CDBUF
0173    6050  0050        50                       /80=120=50*2
0174    6051  1356        TAD     CDPONT           /SET CPOINT TO POINT TO FIRST CHAR OF CARD BUFFER
0175    6052  3202        DCA     CPOINT
0176    6053  3140        DCA     BCOUNT           /ZERO OUT THE CURRENT COLUMN COUNTER.
0177                /
0200    6054  6631  CDGONG, RCSF                   /IS THERE A CHAR THERE???
0201    6055  5277        JMP     CNOTR            /NOPE. WAIT.
0202    6056  6632        RCRA                     /READ IT IN ALPHA NUMERIC TYPE
0203    6057  3065        DCA     TEMP             /STORE IN TEMP
0204    6060  2140        ISZ     BCOUNT           /BOP UP COLUMN COUNTER BY 1.
0205    6061  1140        TAD     BCOUNT           /GET CURRENT POSITIION.
0206    6062  7161        CLL CML CMA IAC          /13 BIT NEGATE
0207    6063  1136        TAD     BOLDO            /IS IT BELOW THE STARTING COLUMN???
0210    6064  7660        SNL SZA CLA
0211    6065  5277        JMP     CNOTR            /YEP.  IGNORE IT.
0212    6066  1131        TAD     DATA             /GET THE UPPER LIMIT
0213    6067  7161        CLL CML CMA IAC          /13 BIT NEGATE.
0214    6070  1140        TAD     BCOUNT           /HAVE WE GONE TOO FAR???
0215    6071  7660        SNL SZA CLA
0216    6072  5277        JMP     CNOTR            /YEP. IGNORE THE CHAR.
0217    6073  1065        TAD     TEMP             /ALL IS WELL. RETRIEVE THE HCARACTER.
0220    6074  6141        LINC                     /NOW GO OVER TO THE LINC SIDE.
0221                LMODE
-
```

```
0222    0075  1562          SIH I   CPOINT          /SAVE THE HALFWORD IN THE BUFFER.
0223    0076  0002          POP
0224                        PMODE                   /AND BACK INTO 8 MODE.
0225                /
0226    6077  7200  CNOIR,   CLA                     /THE AC IS DEFINETLY NOT ZERO WHEN IT COMES HERE.
0227    6100  6671          RCSD                    /END OF CARD REACHED???
0230    6101  5625          JMP I   CDREAD          /NOPE. RETURN TO USER TO WAIT AWHILE.
0231    6102  5322          JMP     CDDONE          /GO CONVERT STORED CARD.
0232                /
0233                /
0234                /
0235    6103  6141  CDNEXT, LINC                    /CARD IN BUFFER AND CONVERTED.
0236                        LMODE                   /LETS GET A CHAR.
0237    0104  1522  CDNXT2, LDH I   CPOINT          /GET A CHAR.[COMES HERE IN LINC MODE SOMETIMES]
0240    0105  0002          POP                     /GET OVER INTO A DECENT MODE
0241                        PMODE
0242    6106  7450          SNA                     /IS IT THROUGH(00=CR)
0243    6107  5316          JMP     CDEOC           /YEP. END OF CARD.
0244    6110  1056          TAD     M40             /NOT DONE. SEE WHICIH WAY TO ADD.
0245    6111  7510          SPA
0246    6112  1025          TAD     L100            /01-37=301-337
0247    6113  1240          TAD     CDL240          /40-77=240-277
0250                /
0251    6114  2225  CDISZ,  ISZ     CDREAD          /AND EXIT TO SECOND LOCATION
0252    6115  5625          JMP I   CDREAD          /(OR THIRD IF CARD READER NOT CHOSEN DEVICE.
0253                /
0254                /
0255                /
0256    6116  3133  CDEOC,  DCA     BTEMP2          /TURN OF THE CARD IN FLAG
0257    6117  3200          DCA     CDFLAG          /ALSO TURN OFF THE CARD MOVING FLAG.
0260    6120  1561          TAD     CDL215          /GET A CR IN THE AC
0261    6121  5314          JMP     CDISZ           /AND EXIT.
0262                /
0263                /
0264                /
0265                /
0266                /
0267    6122  2133  CDDONE, ISZ     BTEMP2          /TURN ON THE CARD IN BUFFER FLAG
0270                                                /WE CAN LEAVE ON THE CARD MOVING FLAG FOR NOW BECAUSE THE CARD MOVING FLAG I
                    S TESTED FIRST
0271    6123  6674          RCRD                    /TURN OFF THE CARD DONE FLAG.
0272    6124  6141          LINC                    /AND GO OVER TO LMODE
0273                        LMODE
0274    0125  0061          SET I   CDCUNT          /SET COUNTER TO 80 COLUMNS
0275    0126  7657          -120
0276    0127  0062          SET I   CPOINT          /SET POINTER TO POINT TO LAST COLUMN+1
0277    0130  0234          CDBUF+50
0300    0131  4003          STC     CDSWT           /TELL THE BLANK SCANNER TO DELETE BLANKS.
0301                /
0302    0132  1020  CDLOOP, LDA I
0303    0133  3777          -4000                   /BACKSPACE 1 CHAR IN CARD BUFFEER.
0304    0134  1140          ADM
0305    0135  0002          CPOINT
0306    0136  1302          LDH     CPOINT          /GET THE CHAR
0307    0137  0203          XSK     CDSWT           /TEST THE BLANKS SCAN SWITCH.
0310    0140  0450          AZE                     /STILL SCANNING. CHECK FOR BLANK.
0311    0141  0456          SKP                     /NOT BLANK OR NOT SCANNING.
0312    0142  6152          JMP     CDFUNT          /IT BLANK. IGNORE IT.
0313    0143  0301          ROR     1               /ROTATE RIGHT TO PUT BIT 11 IN BIT 0
0314    0144  1120          ADA I                   /NOW ADD IN BASIC TABLA ADDRESS POINTER.
0315    0145  0235          CDTAB
0316    0146  4004          STC     CDCONT          /GET TRANSITION CHAR ADDRESS.
0317    0147  1304          LDH     CDCONT          /NOW GET THE TRANSITION CHARACTER.
-
```

```
0320    0150  0063          SET I   CDSWT       /AND TELL IT WE RE NOT SCANNING BLANKS ANYMORE
0321    0151  7777          -0
0322    0152  1342  CDFUNT, STH     CPOINT      /NOW STASH AWAY CONVERTED CHAR.
0323    0153  0221          XSK I   CDCUNT      /HAVE WE DONE 80 COLUMNS??
0324    0154  6132          JMP     CDLOOP      /NOPE. GO BACK AND DO ANOTHER.
0325    0155  0062          SET I   CPOINT      /YEP. WE VE DONE 80 COLUMNS.
0326    0156  4163  CDPONT, CDBUF-1+4000        /SET THE POINTER SO CDNEXT CAN GET THE CHARS.
0327    0157  6104          JMP     CDNXT2      /AND EXIT BUT FIRST GET A CHAR TO SEND BACK
0330                /
0331                /
0332                /
0333                /
0334                /
0335                /
0336                /
0337    0160  0211  LP1,    211                 /TAB
0340    0161  0215  CDL215, 215                 /CR
0341    0162  4232          4232                /  END-OF-TAPE
0342                /
0343                /
0344                /
0345                /
0346                /
0347                /
0350                /
0351                /
0352                /
0353                      EJECT
-
```

```
0354                    /
0355                    /
0356                    /
0357        0163  0000          0000                    /USED FOR ZEROING OUT THE CARD BUFFER.
0360                    /
0361        0164  0000  CDBUF,   0000                    /80 COLUMN BUFFER
0362                    /
0363                          *CDBUF+50
0364                    /
0365        0234  0000          0000                    /USED AS END OF CHAR CHARACTER INCASE OF 80 CHARACTER SCAN.
0366                    /
0367                    /
0370                    /
0371                    /
0372                    /
0373                    /
0374                    /
0375                    /                         THIS IS THE CONVERSION TABLE FOR THE CARD READER CHARS TO ASCII CHARS.
0376                    /
0377                    /
0400                    /
0401        0235  4061  CDTAB,   4061                    /BLANK  1
0402        0236  6263          6263                    /2      3
0403        0237  6465          6465                    /4      5
0404        0240  6667          6667                    /6      7
0405        0241  7071          7071                    /8      9
0406        0242  7243          7243                    /:      NUMBER SIGN
0407        0243  4047          4047                    /AT SIGN        APOSTROPHE
0410        0244  7542          7542                    /=      "
0411        0245  6057          6057                    /@      /
0412        0246  2324          2324                    /S      T
0413        0247  2526          2526                    /U      V
0414        0250  2730          2730                    /W      X
0415        0251  3132          3132                    /Y      Z
0416        0252  3554          3554                    /]      ,
0417        0253  4537          4537                    /%      BACK ARROW.
0420        0254  7677          7677                    />      ?
0421        0255  5512          5512                    /-      J
0422        0256  1314          1314                    /K      L
0423        0257  1516          1516                    /M      N
0424        0260  1720          1720                    /O      P
0425        0261  2122          2122                    /Q      R
0426        0262  4144          4144                    /!      DOLLAR SIGN
0427        0263  5251          5251                    /*      )
0430        0264  7334          7334                    /;      \
0431        0265  4601          4601                    /&      A
0432        0266  0203          0203                    /B      C
0433        0267  0405          0405                    /D      E
0434        0270  0607          0607                    /F      G
0435        0271  1011          1011                    /H      I
0436        0272  3356          3356                    /[      .
0437        0273  7450          7450                    /<      (
0440        0274  5536          5536                    /+      +
0441                    /
0442                    /
0443                    /
0444                    /
0445                    /
0446                    /
0447                    /
0450                    /
0451                    /
0452                          EJECT
-
```

```
0453                    /
0454                    /
0455                            PMODE
0456                    /
0457                    /
0460                    /
0461                    /                               LINE PRINTER ROUTINE.
0462                    /
0463                    /
0464                    /
0465                    /
0466                    /
0467                    /
0470                    /                                       LINE PRINTER DEFINITIONS.
0471                    /
0472                    /
0473                    LSE=6651
0474                    LCF=6652
0475                    LLB=6654
0476                    LSD=6661
0477                    LCB=6662
0500                    LPR=6664
0501                    /
0502                    /
0503                    /
0504                    /
0505                    /
0506                    /
0507                    /
0510                    /
0511                    /
0512                    /
0513    6275    0000    LPTEST, 0000                    /MAIN LINE PRINT CHARACTER CABOSH.
0514    6276    7346            MTHREE                  /IS IF LINE PRINTER IS THE CHOSEN ONE(DEVICE 3)
0515    6277    1104            TAD     BFLAG2
0516    6300    7640            SZA CLA
0517    6301    5675            JMP I   LPTEST          /NOT THE CHOSEN ONE.
0520    6302    1721            TAD I   LPSEQ           /GET THE CHAR
0521    6303    3121            JCA     FTYPE           /PLACE IN SEARCHER INPUT.
0522    6304    4573            SEARCH
0523    6305    6160            LP1
0524    6306    6356            LP2
0525    6307    1121            TAD     FTYPE           /GET THE CHAR
0526    6310    1147            TAD     M340            /SUBTRACT TOO BIG CHAR.
0527    6311    7100            CLL                     /CLEAR LINC FOR NEW TEST.
0530    6312    1025            TAD     L100            /CHECK FOR LOWER LIMIT
0531    6313    7620            SNL CLA                 /IS IT INBETWEEN 240-337???
0532    6314    5720            JMP I   LPEXIT          /NOPE. IGNORE IT.
0533    6315    1121            TAD     FTYPE           /GET THE CHAR
0534    6316    4333    LPCOMM, JMS     LPPUT           /AND OUTPUT THE CHAR.
0535    6317    5720            JMP I   LPEXIT          /AM D  EXIT
0536                    /
0537                    /
0540                    /
0541    6320    3767    LPEXIT, SEQEXT
0542    6321    3711    LPSEQ,  SEQIN
0543    6322    0000    LPCOL,  0000
0544                    /
0545                    /
0546                    /
0547                    /
0550    6323    0000    LPEJ2,  0                       /GIVES TWO EJECTS ON THE PRINTER.
0551    6324    7240    LP0802, MONE                    /REALLY A 17
-
```

```
0552    6325  4333          JMS     LPPUT           /EJECT 1
0553    6326  1374          TAD     LPM204          /RESET THE COLUMN COUNTER TO THE BEGINNING OF A LINE.
0554    6327  3322          DCA     LPCOL           /STASH AWAY.
0555    6330  7240  LP0803, NONE
0556    6331  4333          JMS     LPPUT           /EJECT 2
0557    6332  5723          JMP I   LPEJ2           /RETURN TO THE CALLER.
0560                /
0561                /
0562                /
0563                /
0564    6333  0000  LPPUT,   0                       /PRINTS A CHAR OR DOES A CONTROL CRAP.
0565    6334  3065          DCA     TEMP            /SAVE THE CHAR.
0566    6335  2322          ISZ     LPCOL           /END OF THE LINE??
0567    6336  5343          JMP     LPWFIT          /NOPE. PRINT IT.
0570    6337  1374  LPCR,   TAD     LPM204          /RESET THE COLUMN COUNTER
0571    6340  3322          DCA     LPCOL           /STASH AWAY.
0572    6341  1021  LP0804, TAD     L7770           /SPACE 1 PRINTER LINE
0573    6342  5316          JMP     LPCOMM          /COMMON PUTTER ROUTINE
0574    6343  4556  LPWFIT, CHECKIO                 /CHECK FOR A CONTROL Z OR SOMETHING.
0575    6344  6661          LSD                     /LINE PRINTER CLEAR????
0576    6345  5343          JMP     .-2             /NOPE. WAIT.
0577    6346  6652          LCF                     /CLEAR THE FLAG
0600    6347  1065          TAD     TEMP            /GET THE FUNCTION.
0601    6350  7500  LP0805, SMA                     /IS IT A CONTROL.
0602    6351  6654          LLB                     /NOPE. MUST BE CHAR.  STICK IN BUFFER,R.
0603    6352  7510          SPA                     /IS IT POSITIVE?
0604    6353  6664  LP0806, LPR                     /NOPE. MUST BE CONTROL, ZAP IT
0605    6354  7200          CLA                     /NOW CLEAR THE AC TO BE SURE.
0606    6355  5733          JMP I   LPPUT           /AND RETURN TO THE CALLER.
0607                /
0610                /
0611                /
0612                /
0613                /
0614                /
0615                /
0616                /
0617    6356  6361  LP2,     LPTAB
0620    6357  6337          LPCR
0621    6360  6371          LPEND
0622                /
0623                /
0624                /
0625                /
0626    6361  1373  LPTAB,   TAD     LP40            /BLANK
0627    6362  4333          JMS     LPPUT           /SEND TO PUTTER ROUTINE.
0630    6363  7525  LP0807, PTHREE                  /TO COMPENSTATE FOR THE -204 [204-1]
0631    6364  1322          TAD     LPCOL           /GET THE COLUMN.
0632    6365  0060          AND     L7              /IS IT A MULTIPLE OF 8
0633    6366  7640          SZA CLA                 /??
0634    6367  5361          JMP     LPTAB           /NOPE. GIVE ANOTHER BLAKN.
0635    6370  5720          JMP I   LPEXIT          /AND EXIT.
0636                /
0637                /
0640    6371  4323  LPEND,  JMS     LPEJ2           /GIVE TWO EJECTS.
0641    6372  5552          PIP
0642                /
0643                /
0644                /
0645                /
0646    6373  0040  LP40,    40
0647    6374  7574  LPM204,  -204
0650    6375  0212  LP212,   212                   /LINE FEED IF LP08 PRESENT.
-
```

```
0651        6376  0214  LP214,  214                    /FORM FEED IF LP08 PRESENT
0652                    /
0653                    /
0654                    /
0655                    /
0656                    /
0657                    /
0660                    /
0661                    /
0662                    /
0663                    /
0664                    /
0665                    /
0666                    /
0667                    /
0670                    /
0671                            EJECT
-
```

```
0672                    /                       THIS ORIGIN INSURES THAT BUFFER-1 CONTAINS A ZERO FOR THE TRIVIAL CORE ZERO ROUTINE
0673                    /                       WHICH IS LOCATED IN PAGE 1(200-377)
0674                    /
0675                    /
0676                    /
0677                    /
0700                            *BUFFER-1
0701                    /
0702        6377  0000            0000
0703                    /
0704                    /
0705                    /
0706                    /
0707                    /
0710                    /
0711                    /
0712                            EJECT
-
```

```
2713                        *BUFFER
0714                    /
0715                    /
0716                    /
0717                    /               THIS ROUTINE IS CALLED ONLY ONCE AT INITIALIZATION TO FIGURE OUT HOW
0720                    /                       MANY K OF CORE THE GUY HAS. THEN IT S USED IN THE
0721                    /                       BUFFER AREA.
0722                    /
0723                    /
0724                    /
0725                    /
0726                    /
0727                    /
0730                    /
0731    6400    0000    COREF,  0                       /MAIN ENTRY.
0732    6401    7200            CLA                     /CLEAR AC TO BE SURE. WE VE GOT ROOM.
0733    6402    1261            TAD     CLITO1          /REPLACE JMS INSTRUCTION BY NORMAL TAD.
0734    6403    3712            DCA I   CLITO2          /AND OVERLAY NOW.
0735                    /
0736    6404    3065            DCA     TEMP            /ZERO OUT
0737    6405    2065    CLOOP,  ISZ     TEMP
0740    6406    1065            TAD     TEMP
0741    6407    7041            CIA
0742    6410    3141            DCA     COUNT
0743    6411    3066            DCA     TEMP1
0744    6412    2066    CLLOOP, ISZ     TEMP1
0745    6413    4275            JMS     CSET
0746    6414    1066            TAD     TEMP1
0747    6415    3711            DCA I   CPBYTE
0750    6416    2141            ISZ     COUNT
0751    6417    5212            JMP     CLLOOP
0752    6420    1065            TAD     TEMP
0753    6421    7041            CIA
0754    6422    3141            DCA     COUNT
0755    6423    3066            DCA     TEMP1
0756    6424    2066    CCLOOP, ISZ     TEMP1
0757    6425    4275            JMS     CSET
0760    6426    1711            TAD I   CPBYTE
0761    6427    7041            CIA
0762    6430    1066            TAD     TEMP1
0763    6431    7640            SZA CLA
0764    6432    5236            JMP COUT
0765    6433    2141            ISZ     COUNT
0766    6434    5224            JMP     CCLOOP
0767    6435    5205            JMP     CLOOP
0770                    /
0771    6436    7344    COUT,   MTWO
0772    6437    1065            TAD     TEMP
0773    6440    7106            CLL RTL
0774    6441    7006            RTL
0775    6442    3066            DCA     TEMP1
0776    6443    1310            TAD     CBUFF
0777    6444    7041            CIA
1000    6445    7106            CLL RTL
1001    6446    7006            RTL
1002    6447    7004            RAL
1003    6450    1066            TAD     TEMP1
1004                            ASMIFN  RF08            /DISK PRESENT???
1005    6451    1047            TAD     L7777           /YEP. BOP DOWN THE NUMBER OF BUFFERS BY 1 TO PROTECT 7400
1006    6452    3074            DCA     BNUM
1007    6453    6201            CDF     0
1010    6454    1074            TAD     BNUM
1011    6455    7110            CLL RAR
-
```

```
1012    6456  0021          AND     L7770
1013    6457  7640          SZA CLA
1014    6460  5267          JMP     CDCDDC
1015    6461  1056  CLITO1, TAD     M40             /A LITTER TYPE.
1016    6462  3236          DCA     COUT
1017    6463  4551          DISPLAY
1020    6464  6513          INSULT
1021    6465  2236          ISZ     COUT
1022    6466  5263          JMP     .-3
1023                CDCDDC, ASMIFZ  CARD            /TEST FOR THE LINE PRINTER
1024                        ASMSKP  3               /SKIP PAST LP08 CRAP
1025    6467  4671          JMS I   .+2             /TEST FOR NO ANALEX
1026    6470  7410          SKP
1027    6471  6703          LP08TS
1030                        ASMIFZ  RF08            /DO WE WANT A SCRATCH DISK SETUP????
1031                        ASMSKP  3               /NOPE. DO DISK CHECK NOW.
1032    6472  1200          TAD     COREF           /RETURN ADDRESS
1033    6473  5674          JMP I   .+1             /DO TO CORE CHECKER
1034    6474  6601          CDISKC                  /NOW CHECK FOR DISKSSSSS
1035                        ASMIFZ  RF08
1036                        CMA CMA                 /MINUS ONE COUNT, FOR NOW.
1037                        ASMIFZ  RF08            /CHECK FOR THIS RETURN.......
1040                        JMP I   COREF           /RETURN NOW
1041                /
1042                /
1043    6475  0000  CSET,   0
1044    6476  1047          TAD     L7777
1045    6477  1066          TAD     TEMP1
1046    6500  0060          AND     L7
1047    6501  7106          CLL RTL
1050    6502  7004          RAL
1051    6503  1307          TAD     CCDF
1052    6504  3305          DCA     .+1
1053    6505  0000          0
1054    6506  5675          JMP I   CSET
1055                /
1056    6507  6201  CCDF,   CDF     0
1057    6510  6400  CBUFF,  BUFFER
1060    6511  7777  CPBYTE, 7777                    /SHOULD BE A FREE LOC NOW.
1061    6512  0222  CLITO2, INITOV                 /POINTER INITIALIZATION OVERLAY.
1062                /
1063                /
1064                /
1065                /
1066    6513  0240  INSULT, LEFT+240               /ABOUT CENTER OF SCREEN
1067    6514  0340          TOP
1070                TEXT "
1071    6515  4306
1071    6516  1140
1071    6517  2717
1071    6520  2514
1071                FI WOULD
1072    6521  0443
1072    6522  0640
1072    6523  4022
1072                F  RUN
1073    6524  2516
1073    6525  4306
1073    6526  4006
1073    6527  0123
1073    6530  2405
1073                F FASTER
1074    6531  2243
-
```

```
1074       6532  0611
1074       6533  0640
1074       6534  3117
1074                   FIF YOU
1075       6535  2543
1075       6536  0640
1075       6537  4010
1075                   F  HAD
1076       6540  0104
1076       6541  4306
1076       6542  4040
1076                   F  8K
1077       6543  7013
1077       6544  4306
1077       6545  1116
1077       6546  2324
1077       6547  0501
1077                   FINSTEAD
1100       6550  0443
1100       6551  0617
1100       6552  0640
1100       6553  1716
1100                   FOF ONLY
1101       6554  1431
1101       6555  4306
1101       6556  4040
1101       6557  6413
1101       6560  3400
1101                   F  4K\"
1102                   /
1103                   /
1104                   /
1105                   /
1106                   /
1107                   /
1110                           EJECT
-
```

```
1111                    /
1112                    /
1113                    /
1114                    /
1115                    /
1116                    /
1117                    /
1120                    /
1121                            ASMIFZ  RF08            /DISK CHECKER OK???
1122                            ASMSKP  127             /SKIP FOLLOWING CODE
1123                    /
1124                    /
1125                    /
1126                    /
1127                    /
1130                    /
1131                            *BUFFER+200             /DISK CHECKER CRAP.....
1132                    /
1133                    /
1134    6600    0000    CDISK,  0                       /PHOONEY RETURN
1135    6601    3200    CDISKC, DCA     CDISK           /SAVE RETURN ADDRESS.
1136    6602    7240            CLA CMA                 /CLEAR THE RK08 STATUS REGISTER
1137    6603    6742            DCLS
1140    6604    7200            CLA                     /NOW CLEAR THE AC
1141    6605    1302            TAD     CDIL70          /PLACE A 70 IN THE AC TO SEE IF THE RK08 IS THERE
1142    6606    6732            DLDC                    /SEND TO THE CONTROLLER
1143    6607    7200            CLA                     /CLEAR AC IN CASE IOT WAS A NOP
1144    6610    6736            DRDC                    /NOW READ BACK IN COMMAND REGISITER
1145    6611    7041            CIA                     /NEGATE IT
1146    6612    1302            TAD     CDIL70          /TEST TO SEE IF STILL THERE
1147    6613    7650            SNA CLA                 /HOW ABOUT IT.
1150    6614    5261            JMP     CRK08           /REG IS GOOD. WEVE GOT AN RK08
1151                    /
1152    6615    6601            DCMA                    /BAM. CLEAR DISK
1153    6616    6601            DCMA                    /ONE MORE TIME FOR GOOD MEASURE
1154    6617    1024            TAD     L77             /A DISK ADDRESS.
1155    6620    6643            DXAL                    /SEND IT OUT
1156    6621    7200            CLA                     /CLEAR THE AC TO BE SURE
1157    6622    6645            DXAC                    /READ IT BACK???
1160    6623    7041            CIA
1161    6624    1024            TAD     L77             /ALL WELL?
1162    6625    7650            SNA CLA                 /???
1163    6626    4231            JMS     DSET            /SET UP FOR THE DISKS NOW???
1164    6627    7240            CLA CMA                 /MINUS 1 FOR THE COUNT.
1165    6630    5600            JMP I   CDISK           /RETURN
1166                    /
1167                    /
1170                    /
1171                    /
1172    6631    0000    DSET,   0
1173    6632    7240            MONE                    /SET TO ALL ONES SO RK08 CONTROLLER WILL THINK ITS THE
1174    6633    3670            DCA I   CRKPTN          /WRONG UNIT AND WILL GIVE A POWER CLEAR.
1175    6634    1074            TAD     BNUM            /GET THE NUMBER OF BUFFERS NOW.
1176    6635    0021            AND     L7770           /SEE IF GREATER THEN 20. ACTUALLY 10 WILL DO
1177    6636    7650            SNA CLA                 /?
1200    6637    5250            JMP     DSETP1          /NOT 8K. NO REBOOTSTRAP.
1201    6640    4564            MOVE
1202    6641    0750            RKBTST                  /SAVE OLD INSTRUCTIONS
1203    6642    6213            RKBST                   /IN CARD READER TEMP.
1204    6643    0002            2
1205    6644    4564            MOVE
1206    6645    6671            RKSETU                  /NOW MOVE IN KEYBOARD TEST INSTRUCTIONS.
1207    6646    0750            RKBTST
-
```

```
1210    6647  0002          2
1211    6650  1273  DSETP1, TAD     DTAB1          /GET THE FIRST TABLE LOCATIONS
1212    6651  3010          DCA     AUTO1          /SAVE AWAY
1213    6652  1410  DCLOOP, TAD I   AUTO1          /GET THE NEX ADDRESS
1214    6653  7450          SNA                    /IS IT ZERO????
1215    6654  5631          JMP I   DSET           /YEP. RETURN
1216    6655  3005          DCA     TEMP           /SAVE THE ADDRESS
1217    6656  1301          TAD     DSYSBIN        /GET THE CORRECT NEW UNIT
1220    6657  3405          DCA I   TEMP           /AND SET IT UP.
1221    6660  5252          JMP     DCLOOP         /GO BACK FOR NEXT.
1222                  /
1223                  /
1224                  /
1225                  /
1226    6661  4231  CRK08,  JMS     DSET           /SET UP THE BINARY UNITS AS ADVERTISED.
1227    6662  4564          MOVE                   /NOW MOVE THE RK08 ROUTINES UP THE
1230    6663  7226          RKREAD                 /THE DESIRED AREA
1231    6664  7626          RFREAD
1232    6665  0152          -RFREAD                /LENGTH JUST HAPPENS TO BE THIS NUM.
1233    6666  7240          CLA CMA                /MINUS 1 FOR THE COUNT, BABY.
1234    6667  5600          JMP I   CDISK          /HANDLER NOW SET UP USE DISKS.
1235                  /
1236                  /
1237                  /
1240                  /
1241                  /
1242                  /
1243                  /
1244    6670  4576  CRKPTN, RKSTAT                 /RK08 STATUS AS OF BEFORE I-O PRESET.
1245    6671  4751  RKSETU, RKBTST+1&177!4600      /JMS I  RKBTST+1
1246    6672  6164          RKCHAR                 /CHECK THE RK08 CHARACTER.
1247                  /
1250                  /
1251                  /
1252                  /
1253                  /
1254                  /
1255                  /
1256                  /
1257                  /
1260                  /
1261                  /
1262                  /
1263                  /
1264                  /
1265                  /
1266                  /
1267                  /
1270                  /
1271                  /
1272                  /
1273                  /
1274                  /
1275    6673  6673  DTAB1,  .                      /POINTS TO NEXT -1
1276    6674  4145          DSYS1
1277    6675  4157          DSYS2
1300    6676  4206          DSYS3
1301    6677  5353          DSYS4
1302    6700  0000          00000
1303                  /
1304                  /
1305    6701  0011  DSYSBIN,SYSBSP                 /SPECIAL BINARY UNIT.
1306    6702  0070  CDIL70, 70
-
```

```
1307                    /
1310                    /
1311                    /
1312                    /
1313                    /
1314                    /
1315                    /
1316                    /
1317                    /
1320                    /
1321                    /
1322                    /
1323                    /
1324                    /
1325                    /
1326                    /
1327                    /
1330                    /
1331                    /
1332                    /
1333                    /
1334                    /
1335                    /
1336                            EJECT
-
```

```
1337                    /
1340                    /
1341                    /
1342                    /
1343                    /
1344                    /
1345                    /
1346                            ASMIFZ  CARD            /LP08 TESTER ROUTINES
1347                            ASKSKP  1373-1273       /SKIP PAST THE STUFF NOW
1350                    /
1351                    /
1352                    /
1353                    /
1354                    /
1355    6703    0000    LP08TS, 0
1356    6704    6652            LCF
1357    6705    1022            TAD     M4
1360    6706    3065            DCA     TEMP
1361    6707    3066            DCA     TEMP1
1362    6710    6662            LCB
1363    6711    6661    LP08LP, LSD
1364    6712    7410            SKP
1365    6713    5703            JMP I   LP08TS
1366    6714    2066            ISZ     TEMP1
1367    6715    5311            JMP     LP08LP
1370    6716    2065            ISZ     TEMP
1371    6717    5311            JMP     LP08LP
1372    6720    1337    LP08LT, TAD     LP08PT
1373    6721    7450            SNA
1374    6722    5703            JMP I   LP08TS          /ALL FINISHED WITH THE PATCH NOW
1375    6723    3727            DCA I   LP08P0          /STORE IN THE POINTER NOW
1376    6724    2323            ISZ     .-1
1377    6725    2320            ISZ     LP08LT
1400    6726    5320            JMP     LP08LT
1401                    /
1402                    /
1403                    /
1404                    /
1405    6727    0240    LP08P0, LP0801
1406    6730    6324            LP0802
1407    6731    6330            LP0803
1410    6732    6341            LP0804
1411    6733    6350            LP0805
1412    6734    6353            LP0806
1413    6735    6363            LP0807
1414    6736    6374            LPM204
1415                    /
1416                    /
1417                    /
1420                    /
1421                            LP08BA=.&7600
1422                            LP08B2=LPEJ2&7600
1423                    /
1424                    /
1425                    /
1426    6737    6666    LP08PT, LPR!LCB
1427    6740    1376            TAD     LP214-LP08B2+LP08BA
1430    6741    1376            TAD     LP214-LP08B2+LP08BA
1431    6742    1375            TAD     LP212-LP08B2+LP08BA
1432    6743    5353            JMP     LP0806-LP08B2+LP08BA
1433    6744    6666            LPR!LCB
1434    6745    7201            PONE                    /ALL THATS NECESSARY TO FILL OUT TABS CORRECTLY,
1435    6746    7656            -122
-
```

```
1436        6747  0000            0
1437                    /
1440                    /
1441                    /
1442                    /
1443                    /
1444                    /
1445                    /
1446                    /
1447                    /
1450                    /
1451                            EJECT
```

```
1452                    /
1453                    /
1454                    /
1455                    /
1456                    /
1457                    /
1460                    /
1461                            *CDBUF                  /ORIGIN INITIALIZATION CODE IN THE CARD READER BUFFER.
1462    6164    0000    RKCHAR, 2
1463    6165    7300            CLA CLL                 /CLEAR AC TO BE SURE.
1464    6166    6034            KRS                     /READ IN THE AC CHARACTER NOW
1465    6167    1143            TAD     M215            /IS IT A C.R.
1466    6170    7650            SNA CLA                 /?
1467    6171    5376            JMP     DIALEX          /NORMAL TAPE EXIT.
1470    6172    4564            MOVE                    /SET UP DISK RETURN NOW.
1471    6173    6204            JACKS                   /MOVE OVERLAY IN NOW
1472    6174    0247            OVEREX
1473    6175    0007            OVERLEN
1474    6176    4564    DIALEX, MOVE                    /OLD INFO
1475    6177    6213            RKBST
1476    6200    0750            RKBTST
1477    6201    0002            2
1500    6202    5603            JMP I   .+1
1501    6203    0750            RKBTST
1502                    /
1503                    /                               /READ IN DIAL-MS BOOTSTRAP NOW.
1504    6204    4571    JACKS,  READ
1505    6205    0010            10
1506    6206    6400            BUFFER                  /TWENTY TWO FOR 8=K.
1507    6207    0022            22                      /302+21&22=322&323
1510    6210    0302            302                     /UPPER CORE
1511    6211    6213            CDF CIF 10              /REBOOTSTRAP
1512    6212    5447            JMP I   L7777
1513                    /
1514                            OVERLEN=.=JACKS
1515                    /
1516                    /
1517    6213    0000    RKBST,  0
1520    6214    0000            0
1521                    /
1522                    /
1523                    /
1524                    /
1525                    /
1526                    /
1527                    /
1530                    /
1531                    /
1532                    /
1533                    /
1534                    /
1535                    /
1536                    /
1537                    /
1540                    /
1541                    /
1542                    /
1543                            EJECT
-
```

```
1544                    /
1545                    /
1546                    /
1547                    /
1550                    /               THIS IS THE OPTIONAL RF08-RK08 ROUTINE. IT S DIVIDED INTO TWO PARTS.
1551                    /
1552                    /       THE SECOND PART IS THE ACTUAL LOW LEVEL DISK ROUTINE.
1553                    /
1554                    /       THE FIRST PART IS A LITTLE CALLING ROUTINE WHICH INTERPRETS THE CALLS FROM PIPS MASS STOREAGE ROUTIN
                        ES.
1555                    /       AND PROTECTS LOCATIONS 7400-7777 FROM THE DISK ZAPPING THEM.
1556                    /
1557                    /
1560                    /
1561                    /
1562                    /
1563                    /
1564                    /
1565                    /
1566                    /
1567                    /
1570                    /
1571                    /
1572                            ASMIFZ  RF08
1573                            ASMSKP  1362            /SHOULD BE CORRECT NUMBER TO SKIP OVER THEM
1574                    /
1575                    /
1576                    /
1577                    /
1600                    /
1601                            *7400
1602                    /
1603                    /
1604                    /
1605                    /
1606                    /
1607                    /
1610                    /
1611                    /
1612                    /
1613                    /
1614                    /
1615                    /
1616                    /
1617                    /               THE SYSTEM AND UNIT COPIER HANDLERS.
1620                    /
1621                    /
1622                    /
1623                    /
1624                    /
1625                    /
1626                    /
1627                    /
1630                    /
1631                    /
1632                    /
1633                    /
1634    7400    4564    AASYSC, MOVE                    /SET UP TO COPY JUST THE SYSTEM (NO INDEX)
1635    7401    7472            ASYSL                   /SYSTEM COPY INFORMATION
1636    7402    7466            AASUC                   /COMMON INFORMATION
1637    7403    0004            AASUCS                  /SIZE OF SYSTEM INFORMATION
1640    7404    5211            JMP     AASUCR          /GO TO COMMON ROUTINES
1641                    /
-
```

```
1642                    /
1643                    /
1644                    /
1645    7405    4564    AAUNTC, MOVE                    /SET UP TO COPY THE ENTIRE UNIT.
1646    7406    7476            AUNTL                   /INFORMATION
1647    7407    7466            AASUC                   /TO COMMON ROUTINES.
1650    7410    0004            AASUCS                  /NUMBER OF WORDS TO MOVE
1651                    /
1652                    /
1653                    /
1654                    /
1655    7411    1120    AASUCR, TAD     FUNIT           /GET THE NUMBER OF COPIES TO MAKE
1656    7412    0060            AND     L7              /CHOP OFF THE HIGH ORDER CRAP
1657    7413    7450            SNA                     /ZERO???
1660    7414    7001            IAC                     /YEP, MAKE 1 COPY ONLY
1661    7415    7041            CIA
1662    7416    3301            DCA     AAMHOW          /STASH AWAY NUMBER TO MAKE
1663                    /
1664                    /
1665                    /
1666                    /
1667                    /
1670    7417    4562    ASULP1, DECODE                  /GET THE INPUT DEVICE
1671    7420    4610            CINPUT                  /COPY INPUT IS GOOD ENOUGH FOR ME
1672    7421    4573            SEARCH                  /LOOK UP THE REPLY
1673    7422    4377            ACPL1                   /TABLE OF CHARS
1674    7423    4550            ASUG01                  /TRANSFER TABLE
1675    7424    5217            JMP     ASULP1          /NOT A LEGAL REPLY
1676                    /
1677                    /
1700                    /
1701                    /
1702                    /
1703    7425    4577    ASUDD1, DISC                    /DISC IS CHOOSEN
1704    7426    7410            SKP
1705    7427    4402    ASUTT1, TAPE                    /TAPE IS CHOOSEN
1706    7430    1120            TAD     FUNIT
1707    7431    3103            DCA     INUNIT
1710                    /
1711    7432    4562    ASULP2, DECODE                  /GET THE OUTPUT UNIT
1712    7433    4703            COUTPUT                 /OUTPUT OPTIONS
1713    7434    4573            SEARCH                  /LOOKUP REPLY
1714    7435    4377            ACPL1                   /REPLY LIST
1715    7436    4554            ASUG02                  /WHERE TO GO WHEN FOUND
1716    7437    5232            JMP     ASULP2          /NOT A LEGAL OUTPUT DEVICE
1717                    /
1720                    /
1721                    /
1722    7440    4577    ASUDD2, DISC                    /DISC IS THE CHOOSEN ONE.
1723    7441    7410            SKP
1724    7442    4402    ASUTT2, TAPE                    /TAPE IS THE CHOOSEN ONE
1725    7443    1120            TAD     FUNIT
1726    7444    3105            DCA     OUTUNIT         /STASH AWAY
1727                    /
1730                    /
1731                    /
1732    7445    1301            TAD     AAMHOW          /GET THE NUMBER OF COPIES TO MAKE
1733    7446    3106            DCA     OUTNUM          /STASH AWAY NOW.
1734    7447    1266            TAD     AASIZ1          /GET THE SIZE OF THE FIRST COPY
1735    7450    3117            DCA     FSIZE           /AND STASH IN THE SIZE PARAMETER
1736    7451    1267            TAD     AABL1           /GET THE FIRST BLOCK NUMBER
1737    7452    3102            DCA     INBLOCK         /AND SET UP THE READ
1740    7453    1102            TAD     INBLOCK         /AND THE
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1741    7454  3104          DCA     OUTBLOCK        /AND THE WRITE
1742    7455  4554          COPY                    /COPY THE SELECTED BLOCKS.
1743    7456  1270          TAD     AASIZ2          /THE THE SECOND COPY
1744    7457  3117          DCA     FSIZE           /STASH THAT AWAY
1745    7460  1271          TAD     AABL2           /THE THE SECOND STARTING BLOCK NUMBER
1746    7461  3102          DCA     INBLOCK
1747    7462  1102          TAD     INBLOCK
1750    7463  3104          DCA     OUTBLOCK        /SET UP FINAL COPY
1751    7464  4554          COPY                    /AND DO IT
1752    7465  5552          PIP                     /FINALLY RESTART PIP.
1753                  /
1754                  /
1755                  /
1756                  /
1757                  /
1760                  /
1761                  /
1762                  /
1763                  /
1764                  /
1765                  /
1766    7466  0000  AASIZ1, 0                       /SIZE OF THE FIRST COPY
1767    7467  0000  AABL1,  0                       /BLOCK NUMBER OF THE FIRST COPY.
1770    7470  0000  AASIZ2, 0                       /SIZE OF THE SECOND COPY
1771    7471  0000  AABL2,  0                       /BLOCK NUMBER OF THE SECOND COPY.
1772                  /
1773                  /
1774                  /
1775                  /
1776                  AASUC=AASIZ1            /POINTER TO COMMON TABLE
1777                  AASUCS=.-AASUC          /SIZE OF MOVE.
2000                  /
2001                  /
2002                  /
2003                  /
2004                  /
2005                  /
2006                  /
2007                  /
2010                  /
2011                  /
2012                  /
2013    7472  0046  ASYSL,  TINDEX-DIALSYS
2014    7473  0300          DIALSYS
2015    7474  0020          SYSSBLOCK-TINDEX-TILEN
2016    7475  0350          TINDEX+TILEN
2017                  /
2020                  /
2021    7476  1000  AUNTL,  TUPPER-TLOWER+1
2022    7477  0000          TLOWER
2023    7500  0000          0
2024                  /
2025                  /
2026                  /
2027                  /
2030                  /
2031                  /
2032                  /
2033                  /
2034                  /
2035                  /
2036                  /
2037                  /
-
```

```
2040                    /
2041                    /
2042                    /
2043                    /
2044                    /
2045                    /
2046                    /
2047                    /
2050                    /
2051                            EJECT
-
```

```
2052                    /
2053                    /
2054                    /
2055                    /
2056                    /
2057                    /
2060                    /
2061                    /
2062                    /
2063                    /       DISK DEFINITIONS.......
2064                    /
2065                    /
2066                    /                               DISK DEFINITIONS FOR THE RF08
2067                    /
2070                    /
2071                    /
2072                    /
2073                    /
2074                    /
2075                    /
2076                    /
2077                            DMAW=6605
2100                            DCMA=6601
2101                            DMAR=6603
2102                            DEAL=6615
2103                            DEAC=6616
2104                            DFSE=6621
2105                            DISK=6623
2106                            DCIM=6611
2107                            DSAC=6612
2110                            DIML=6615
2111                            DIMA=6616
2112                            DFSC=6622
2113                            DXAL=6643
2114                            DXAC=6645
2115                            DMAC=6626
2116                    /
2117                    /
2120                    /
2121                    /
2122                    /
2123                    /
2124                    /                               RK08 DISK DEFINITIONS.
2125                    /
2126                    /
2127                    /
2130                    /
2131                    /
2132                    /
2133                    /
2134                    /
2135                    /
2136                    /
2137                    /
2140                            DCLA=6751
2141                            DLDC=6732
2142                            DLDR=6733
2143                            DLDW=6735
2144                            DCHP=6737
2145                            DRDA=6734
2146                            DRDC=6736
2147                            DRDS=6741
2150                            DCLS=6742
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2151                            DMNT=6743
2152                            DSKC=6745
2153                            DSKT=6746
2154                            DSKE=6747
2155                            DRWC=6752
2156                            DLWC=6753
2157                            DLCA=6755
2160                            DRCA=6757
2161                    /
2162                    /
2163                    /
2164                    /
2165                    /
2166                    /
2167                    /
2170                    /
2171                    /
2172                    /
2173                    /
2174                    /
2175                    /
2176                    /
2177                    /
2200                    /
2201                    /
2202                    /
2203                    /
2204                    /
2205                    /
2206                    /
2207                    /
2210                    /
2211                    /
2212                            EJECT
-
```

```
2213                    /
2214                    /
2215                    /
2216                    /
2217                    /
2220                    /
2221                    /
2222                    /
2223                    /
2224                    /
2225                    /
2226    7501  0000  RF08R,  0                   /DISK-READ SETUP ROUTINE
2227    7502  1767        TAD I   RRRT          /ADDRESS OF TREAD
2230    7503  3770        DCA I   WWWT          /MOVE TO TWRITE FOR THE ARGUEMENT GETTER.
2231    7504  5307        JMP     RRC           /GO TO THE COMMON ARG GETTER.
2232                    /
2233    7505  0000  RF08W,  0                   /DISK-WRITE SET-UP ROUTINE
2234    7506  7305        CLA CLL IAC RAL       /+2 IN THE AC TO ADD THE READ ROUTINE ADDRESS
2235    7507  1371  RRC,  TAD     RRR           /POINTER TO THE READ ROUTINE
2236    7510  3372        DCA     RRT           /SAVE IN THE GO- TO LOCATION.
2237    7511  4555        SETA                  /INITIALIZE THE ARGUEMENT GETTER
2240    7512  1417        GETA                  /GET THE FIRST ARGUEMENT
2241    7513  0060        AND     L7            /CHOP OFF RANDOM UNITS BITS.
2242    7514  3362        DCA     RUNIT         /STASH AWAY NOW.
2243    7515  1417        GETA                  /GET THE NEXT ARGUEMENT NOW.
2244    7516  3363        DCA     RLOC          /SAVE AWAY IN THE LOCATION WORD
2245    7517  1417        GETA                  /NOW GET THE NUMBER OF BLOCKS TO TRANSFER
2246    7520  3364        DCA     RNUM          /AND STASH AWAY NOW.
2247    7521  1417        GETA                  /NOW GET THE FIRST BLOCK TO BE TRANSFERRED
2250    7522  3365        DCA     RFIRST        /AND STASH AWAY ALSO.
2251    7523  1074        TAD     BNUM          /NOW GET THE NUMBER OF BUFFERS AVAILABLE
2252    7524  0060        AND     L7            /JUST GET HOW MUCH GOES INTO FIELD 0
2253    7525  3366        DCA     ROUT          /AND STORE IN THE FIRST TIME THROUGH BIT.
2254                    /
2255                    /
2256                    /
2257                    /
2260    7526  1364  ROK,  TAD     RNUM          /GET THE NUMBER LEFT TO DO
2261    7527  7650        SNA CLA               /STILL SOME MORE???
2262    7530  5774        JMP I   RRRET         /NOPE. EXIT NOW.
2263    7531  1366        TAD     ROUT          /TEST TO SEE IF ITLL FIT THIS TIME.
2264    7532  7041        CIA                   /NEGATE.
2265    7533  1364        TAD     RNUM          /NUMBER LEFT
2266    7534  7510        SPA                   /TEST NOW
2267    7535  5356        JMP     RFIT          /ITLL FIT. GO AND READJUST COUNT NOT
2270    7536  3364        DCA     RNUM          /STORE AWAY NUMBER TO GO NEXT TIME.
2271    7537  4772  RRTRY,  JMS I   RRT           /GO DO THE DISK OPERATION.
2272    7540  5773        JMP I   RRERR         /DISK ERROR HAS OCCURED.
2273    7541  3363  RRGOOD, DCA     RLOC          /CLEAR THE LOCATIONTO 0000
2274    7542  1362        TAD     RUNIT         /BOP UP TO THE NEXT MEMORY FIELD
2275    7543  1054        TAD     L10
2276    7544  3362        DCA     RUNIT         /SO THE OVERLAP WORKS CORRECTLY.
2277    7545  1365        TAD     RFIRST        /BOP UP THE BLOCK NUMBER BY THE NUMBER DONE
2300    7546  1366        TAD     ROUT
2301    7547  3365        DCA     RFIRST        /SO THAT WELL PICK UP FROM WHERE WE LEFT OFF.
2302    7550  1020        TAD     L20           /SET THE NUMBER OF BLOCKS TO DO TO 20
2303    7551  3366        DCA     ROUT          /WHICH IS THE NUMBER IN 1 MEMORY FIELD
2304    7552  5326        JMP     ROK           /AND GO BACK AND DO THE NEXT ONE.
2305                    /
2306                    /
2307                    /
2310                    /
2311                    /
-
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2312                    /
2313    7553    7541    REWERE, RRGOOD                  /IF ACCEPTED AS IS
2314    7554    7537            RRTRY                   /TO RETRY THE OPERATION.
2315    7555    7541            RRGOOD                  /TO TRY TO SKIP PAST THE ERROR
2316                    /
2317                    /
2320                    /
2321                    /
2322    7556    7200    RFIT,   CLA                     /I'LL FIT THIS TIME. SET TO CORRECT OUTPUT NUMBER
2323    7557    1364            TAD     RNUM
2324    7560    3366            DCA     ROUT            /NUMBER TO DO IS THE EXACT NUMBER
2325    7561    5326            JMP     ROK             /AND GO BACK AND TRY AGAIN
2326                    /
2327                    /
2330                    /
2331    7562    0000    RUNIT,  0
2332    7563    0000    RLOC,   0
2333    7564    0000    RNUM,   0
2334    7565    0000    RFIRST, 0
2335    7566    0000    ROUT,   0
2336    7567    1400    RRRT,   TREAD                   /POINTS TO TREAD
2337    7570    1412    WWWT,   TWRITE                  /POINTS TO TWRITE
2340    7571    7626    RRR,    READSK                  /POINTS TO A READ DISK ROUTINE
2341    7572    0000    RRT,    0                       /FINAL POINTER
2342    7573    7615    RRERR,  RERR                    /POINTER TO THE ERROR RECOVERY ROUTINE
2343    7574    1476    RRRET,  TEXIT                   /MASS I-O EXIT LOCATION
2344                    /
2345                    /
2346                    /
2347                    /
2350                            AAMHOW=RF08R            /DEFINE A TEMPORARY FOR THE SPECIAL COPIES
2351                    /
2352                    /
2353                    /
2354                    /
2355                    /
2356                    /
2357                    /
2360                    /
2361                    /
2362                    /
2363                    /
2364                    /
2365                    /
2366                    /
2367                    /
2370                            EJECT
-
```

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2371                    /
2372                    /
2373                    /
2374                    /
2375                    /
2376                    /
2377                    /
2400                    /
2401                    /
2402                    /
2403                    /
2404                    /
2405    7575    0601
2405    7576    4004
2405    7577    1123
2405    7600    1340
2405    7601    0522
2405    7602    2217
2405                    RRBAD,  TEXT    "FA DISK ERROR
2406    7603    2243
2406    7604    0610
2406    7605    0123
2406    7606    4017
2406    7607    0303
2406    7610    2522
2406    7611    2205
2406    7612    0440
2406    7613    4040
2406                    FHAS OCCURRED
2407    7614    4043
2407                    "
2410                    /
2411                    /
2412                    /
2413                    /
2414                    /
2415                    /
2416                    /
2417                    /
2420                    /
2421                    /
2422    7615    3001    RERR,   DCA     LOC1            /STASH AWAY IN A PLACE I KNOW IS FREE
2423    7616    4564            MOVE                    /MOVE IN THE DISK ERROR MESSAGE
2424    7617    7575            RRBAD
2425    7620    2101            TMAIND
2426    7621    0020            20                      /32CHARS=16 WORDS=20 WORDS
2427    7622    1001            TAD     LOC1            /RETRIEVE THE BLOCK NUMBER
2430    7623    4625            JMS I   RREREO          /CALL THE ERROR MESSAGE DISPLAY ROUTINE
2431    7624    7553            REWERE                  /LIST OF RETURN OPTIONS.
2432                    /
2433                    /
2434                    /
2435    7625    2037    RREREO, TTBC                    /POINTER TO THE ERROR MESSAGE DISPLAY ROUTINE
2436                    /
2437                    /
2440                    /
2441                    /
2442                            READSK=.                /THE DISK READ ROUTINE GOES HERE.
2443                    /
2444                    /
2445                    /
2446                    /
2447                    /
```

```
2450                    /
2451                    /
2452                    /
2453                    /
2454                    /
2455                            EJECT
-
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2456                    /
2457                    /
2460                    /
2461                    /
2462                    /
2463    7626    0000    RFREAD, 0                       /RF08 READ-WRITE ROUTINES. READ ENTRY
2464    7627    5234            JMP     RFCOMM          /GO TO COMMEN ENTRY
2465                    /
2466    7630    0000    RFWRITE,0                       /RF08 WRITE ENTRY
2467    7631    1230            TAD     RFWRITE         /REPLACE THE READ ENTRY BY THE WRITE FOR
2470    7632    3226            DCA     RFREAD          /THE RETURN
2471    7633    7305            CLA CLL IAC RAL         /+2 TO MAKE DMAR A DMAW
2472                    /
2473    7634    1343    RFCOMM, TAD     RFDMAR          /ADD A READ INSTRUCTION TO THE AC.
2474    7635    3275            DCA     RFINST          /NOW STORE AWAY THE CORRECT FUNCTION
2475    7636    6601            DCMA                    /CLEAR THE DISK STATUS REGISTER
2476    7637    1740            TAD I   RRLOC           /GET THE LOC TO WHERE WERE GOING TO
2477    7640    1047            TAD     L7777           /SUBTRACT 1 FOR GOOD MEASURE
2500    7641    3351            DCA     RFDBAD          /STORE AWAY NOW
2501    7642    1063            TAD     M6              /SET UP THE RANDOM COUNTER
2502    7643    3066            DCA     TEMP1           /WHICH TIMES OUT THE DISK THERE FLAG.
2503    7644    1741            TAD I   RROUT           /GET THE NUMBER OF BLOCKS TO DO
2504    7645    7053            CIA RTR                 /MOVE TO BITS 0-3 OF THE AC AND
2505    7646    7012            RTR                     /NEGATE
2506    7647    7010            RAR
2507    7650    0064            AND     L7400           /CHOP OFF ANY CRAP WE PICKED UP ON THE WAY.
2510    7651    3350            DCA     RFDBWC          /STASH AWAY NOW
2511    7652    1737            TAD I   RRUNIT          /GET THE FIELD BITS ON
2512    7653    0021            AND     L7770           /AND OUT UNIT BITS
2513    7654    6615            DIML                    /AND SET THE FIELD BITS IN THE STATUS REG.
2514    7655    1737            TAD I   RRUNIT          /NOW GET THE UNIT FOR REAL
2515    7656    0060            AND     L7              /JUST THE UNIT BITS
2516    7657    7106            CLL RTL
2517    7660    7006            RTL
2520    7661    7004            RAL                     /SHIFT OVER TO EXTENED DISK BITS
2521    7662    3065            DCA     TEMP            /SAVE FOR A SECOND
2522    7663    1742            TAD I   RRFIRST         /GET THE FIRST BLOCK NUMBER
2523    7664    7012            RTR
2524    7665    7012            RTR                     /IGNORE 4 LOW ORDER BITS
2525    7666    0344            AND     RFL377          /JUST BLOCK BITS OF DISK
2526    7667    1065            TAD     TEMP            /ADD IN DISK SELECTION BITS
2527    7670    6643            DXAL                    /SET UP THE DISK ADDRESS.
2530    7671    1742            TAD I   RRFIRST         /RECALL THE STARTING BLOCK NUMBER
2531    7672    4550            ROR6                    /ROTAE LOW BITS TO BITS 0-3 OF
2532    7673    7004            RAL                     /THE AC. THIS SAVES A LOC.
2533    7674    0064            AND     L7400           /CHOP OFF STRAY CRAP
2534    7675    0000    RFINST, 0                       /CORRECT DISK INSTRUCTION GOES HERE
2535    7676    4556            CHECKIO                 /CHECK KEYBOARD NOW
2536    7677    2067            ISZ     TEMP2           /INCREMENT THE FAST COUNTER
2537    7700    5304            JMP     RFNOSK          /DIDNT SKIP
2540    7701    2066            ISZ     TEMP1           /NOW INCREMENT THE SLOW COUNTER
2541    7702    5304            JMP     RFNOSK          /IT DIDNT SKIP EITHER
2542    7703    5334            JMP     RF08NO          /DISK FLAG DIDNT RAISE, PROBABLY NO DISK.
2543    7704    6623    RFNOSK, DISK                    /AND NOW CHECK THE DISK FLAG
2544    7705    5276            JMP     RFINST+1        /IT DIDNT SKIP EITHER, HANG AROUND.
2545    7706    6621            DFSE                    /WAS THERE AN ERROR?
2546    7707    5332            JMP     RFGXT           /NOPE. GOOD RETURN
2547    7710    6616            DIMA                    /AN. ERROR. WAS IT A MYTHICAL ONE
2550    7711    0345            AND     RF1003          /THIS CHECKS IMPORTANT BITS
2551    7712    7112            CLL RTR
2552    7713    1350            TAD     RFDBWC          /ALSO CHECK TO SEE IF OPERATION COMPLETED
2553    7714    7650            SNA CLA                 /ALL WELL????
2554    7715    5332            JMP     RFGXT           /ALL IS WELL. EXIT
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2555    7716  6645          DXAC                    /READ IN THE EXTENDED REGISTER
2556    7717  0344          AND     RFL377          /CHOP OFF CRAP
2557    7720  7106          CLL RTL
2560    7721  7006          RTL                     /ROTATE TO GOOD BLOCK NUMBER BITS
2561    7722  3065          DCA     TEMP            /SAVE FOR A SECOND
2562    7723  6626          DMAC                    /NOW PICK UP THE LOW ORDER BITS
2563    7724  0064          AND     L7400           /IGNORE RANDOM WORD STUFF
2564    7725  7106          CLL RTL
2565    7726  7006          RTL                     /SHIFT INTO CORRECT PLACE
2566    7727  7004          RAL                     /WHICH IS BITS 8-11 OF THE AC.
2567    7730  1065          TAD     TEMP            /ADD IN THE CORRECT FACTOR
2570    7731  5626          JMP I   RFREAD          /AND RETURN TO THE CALLER
2571                /
2572                /
2573                /
2574    7732  2226  RFGXT,  ISZ     RFREAD          /ALL IS WELL. SKIP PAST ERROR RETURN
2575    7733  5626          JMP I   RFREAD          /AND EXIT TO THE USER
2576                /
2577                /
2600                /
2601                /
2602                /
2603    7734  4551  RF08NO, DISPLAY                /DISK FLAG NOT UP. GIVE ERROR MESSAGE
2604    7735  7752          RF08N2
2605    7736  5334          JMP     RF08NO          /ITS AN INFINITE WAIT.
2606                /
2607                /
2610                /
2611                /
2612                /
2613                /
2614                /
2615                /
2616    7737  7562  RRUNIT, RUNIT                   /POINTER TO PREVIOUS SECTION INFO
2617    7740  7563  RRLOC,  RLOC
2620    7741  7566  RROUT,  ROUT
2621    7742  7565  RRFIRST,RFIRST
2622                /
2623    7743  6603  RFDMAR, DMAR                    /ACTUAL RF08 DISK READ IOT
2624    7744  0377  RFL377, 377
2625    7745  1003  RF1003, 1003
2626                /
2627                /
2630                /
2631                /
2632                /
2633                /
2634                      RFDBAD=7751               /DATA BREAK ADDRESS
2635                      RFDBWC=7750               /WORD COUNT LOCATION
2636                /
2637                /
2640                /
2641                /
2642                /
2643                /
2644                /
2645                      *RFDBAD+1                 /ORIGIN PAST DATA BREAK
2646                /
2647                /
2650                /
2651                /
2652    7752  0300  RF08N2, LEFT+300               /ABOUT THE CENTER OF THE SCREEN
2653    7753  0000          TOP=340
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2654        7754  0616
2654        7755  1742
2654        7756  0411
2654        7757  2313
2654        7760  3400
2654                          TEXT    "END DISK\"
2655                    /
2656                    /
2657                    /
2660                    /
2661                    /
2662                    /
2663                    /
2664                    /
2665                    /
2666                    /
2667                    /
2670                    /
2671                    /
2672                    /
2673                    /
2674                    /
2675                    /
2676                    /
2677                    /
2700                    /
2701                    /
2702                          EJECT
-
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2703                    /
2704                    /
2705                    /
2706                    /
2707                    /
2710                    /
2711                    /
2712                    /
2713                    /
2714                    /
2715                    /
2716                    /
2717                    /
2720                    /
2721                            *READSK-400             /ORIGIN THIS SECTION INTO FREE AREA.
2722                    /
2723                    /
2724                    /
2725                    /
2726                    /
2727                    /
2730    7226    0000    RKREAD, 0                       /RK08 READ ROUTINES
2731    7227    5234            JMP     RKCOMM          /GO TO COMMON AREA
2732                    /
2733    7230    0000    RKWRITE,0                       /RK08 WRITE ENTRY POINT
2734    7231    1230            TAD     RKWRITE         /REPLACE THE READ ENTRY BY THE CORRECT
2735    7232    3226            DCA     RKREAD          /WRITE ENTRY
2736    7233    7305            CLA CLL IAC RAL         /+2 TO MAKE THE READ A WRITE
2737                    /
2740    7234    1634    RKCOMM, TAD     RKDLDR          /ADD IN THE READ INSTRUCTION
2741    7235    3275            DCA     RKINST          /AND SAVE IN THE CORRECT INSTRUCTION WORD
2742    7236    1733            TAD I   RKUNIT          /GET THE FIELD BITS
2743    7237    0021            AND     L7770           /AND LOAD INTO THE COMMAND REGISTER
2744    7240    1107            TAD     RKDRIV          /INSERT CORRECT DRIVE NUMBER NOW.
2745    7241    6732            DLDC                    /SEND TO JIMS CONTROLLER
2746    7242    1733            TAD I   RKUNIT          /NOW WELL GET THE UNIT BITS
2747    7243    0060            AND     L7              /JUST THE UNIT PORTION
2750    7244    7112            CLL RTR                 /ROTATE TO BITS 0-3
2751    7245    7012            RTR
2752    7246    1730            TAD I   RKIRST          /NOW ADD IN THE CORRECT BLOCK NUMBER.
2753    7247    3013            DCA     RKTRCK          /SAVE IN THE TRACK POINTER NOW
2754    7250    1732            TAD I   RKLOC           /GET THE CORE LOCATION
2755    7251    1047            TAD     L7777           /SUBTRACT 1 FOR THE D.B.
2756    7252    3014            DCA     RKLOCC          /SAVE IN A LOCATION POINTER NOW.
2757    7253    1731            TAD I   RKOUT           /GET THE NUMBER OF RECORDS TO DO
2760    7254    7041            CIA                     /NEGATE IT NOW
2761    7255    3012            DCA     RKCUNT          /SAVE IN THE COUNTER NOW.
2762    7256    5263            JMP     RKNBOP          /DONT BOP UP THE ADDRESS AND TRACK FOR FIRST OPERATION
2763                    /
2764    7257    1014    RKBOP,  TAD     RKLOCC          /GET THE LAST LOCATION
2765    7260    1040            TAD     L400            /BOP UP BY 400 TO THE NEXT CORE LOC.
2766    7261    3014            DCA     RKLOCC          /AND SAVE IT.
2767    7262    2013            ISZ     RKTRCK          /BOP UP THE SECTOR BY 1 NOW.
2770                    /
2771    7263    7240    RKNBOP, CLA CMA                 /PREPARE TO START THE NEXT OPERATION
2772    7264    6742            DCLS                    /CLEAR THE STATUS REGISTER NOW.
2773    7265    7200            CLA                     /CLEAR THE AC BECAUSE DCLS DOESNT
2774    7266    1023            TAD     M20             /RESET THE TIME OUT COUNTER SO THAT
2775    7267    3066            DCA     TEMP1           /WELL KNOW IF WE TAKE TOO MUCH TIME.
2776    7270    1014            TAD     RKLOCC          /GET THE LOCATION TO DO.
2777    7271    6755            DLCA                    /SEND IT OUT TO THE CONTROLLER
3000    7272    1064            TAD     M400            /SET THE WORD COUNT TO 1 RECORD (-400 WORDS)
3001    7273    6753            DLWC                    /AND SEND IT TO THE CONTROLLER
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3002    /274  1013          TAD     RKTRCK          /NOW GET THE TRACK AND SECTOR IN THE AC.
3003                 /
3004    7275  0000  RKINST, 0                       /DO RK8 INSTRUCTION
3005                 /
3006    7276  4556          CHECKIO                 /TEST THE KEY BOARD
3007    7277  2067          ISZ     TEMP2           /AND ALSO THE TIME-OUT FLAG
3010    7300  5306          JMP     RKNOSK          /STILL OK
3011    7301  2066          ISZ     TEMP1           /HOW ABOUT THE SLOW COUNTER
3012    7302  5306          JMP     RKNOSK          /STILL OK
3013                 /
3014    7303  4551          DISPLAY                 /ERROR . NOT DONE YET. A BOO BOO.
3015    7304  7735          RKBAD8177!7600          /RK8 BAD MESSAGE FOR ORIGIN AT 7600
3016    7305  5303          JMP     .-2             /WAIT FOREVER
3017                 /
3020    /306  6745  RKNOSK, DSKC                    /NOW TEST THE DISK FLAG.
3021    7307  7410          SKP                     /NOT COMPLETE. TEST THE ERROR FLAG.
3022    7310  5313          JMP     .+3             /COMPLETE. TEST THE ERROR FLAG ANYWAY
3023    7311  6747          DSKE                    /ALSO CHECK THE POSSIBLILTY OF AN ERROR WITH NO COMPLETION FLAG.
3024    /312  5276          JMP     RKINST+1        /NOT YET DONE. HANG AROUND AWHILE
3025    7313  6747          DSKE                    /TEST THE ERROR FLAG
3026    7314  5323          JMP     RKOUN1          /WEVE FINISHED WITH THIS SECTOR. CHECK FOR MORE TO GO
3027    7315  6741  RKSEKE, DRDS                    /READ IN THE STATUS REGISTER
3030    7316  0327          AND     RKL40           /WAS IT A TRACK MISS
3031    7317  7640          SZA CLA                 /?
3032    7320  5351          JMP     RKOFF           /IT WAS. DRIVE BLEW IT. A NO-NO
3033    7321  1013          TAD     RKTRCK          /NOW GET THE RECORD THAT FAILED.
3034    7322  5626          JMP I   RKREAD          /RETURN ON AN ERROR CONDITION TO DISPLAY MESSAGE.
3035                 /
3036                 /
3037    7323  2012  RKOUN1, ISZ     RKCUNT          /BOP UP THE RECORD COUNT. DONE?
3040    7324  5257          JMP     RKBOP           /NOT YET DONE. BOP ALL AND GET NEXT.
3041    7325  2226          ISZ     RKREAD          /GOOD OPERATION. GOOD RETURN. ALL IS WELL
3042    7326  5626          JMP I   RKREAD          /RETURN TO CALLER
3043                 /
3044                 /
3045                 /
3046                 /
3047                 /
3050                 /
3051                 /
3052                 /
3053    7327  0040  RKL40,  40
3054    7330  7565  RKIRST, RFIRST                  /POINTER TO FIRST BLOCK NUMBER
3055    7331  7566  RKOUT,  ROUT                    /POINTER TO THE NUMBER OF BLOCKS TO DO
3056    7332  7563  RKLOC,  RLOC                    /POINTER TO THE CORRECT LOACTION TO DO
3057    7333  7562  RKUNIT, RUNIT                   /POINTER TO THE UNIT AND FIELD BITS
3060    7334  6733  RKDLDR, DLDR                    /ACTUAL RK8 READ INSTRUCTION
3061                 /
3062                 /
3063                 /
3064                                                 /THESE NEXT DEFINITIONS ARE DEFINED AS
3065                                                 /AUTO-INDEX REGISTERS BECAUSE OF SPACE
3066                                                 /REQUIREMENTS. NO ROUTINE WHICH WE CALL
3067                                                 /WILL TOUCH THEM. BECAREFUL OF THIS
3070                                                 /IN THE FUTURE, IF DISPLAY OR CHECKIO
3071                                                 /SHOULD EVER NEED TO USE THEM.
3072                 /
3073                 /
3074                 /
3075                 RKLOCC=AUTO5                    /CONTAINS THE CORE ADDRESS-1 FOR THE PRESENT TRANSFER
3076                 RKTRCK=AUTO4                    /CONTAINS THE TRACK AND SECTOR PRESENTLY BEING USED
3077                 RKCUNT=AUTO3                    /CONTAINS -THE NUMBER OF RECORDS TO GO.
3100                 /
-
```

```
3101                    /
3102                    /
3103                    /
3104                    /
3105                    /
3106    7335    0140    RKBAD,  LEFT+140                /SHOULD BE GOOD ENOUGH
3107    7336    0000            TOP=340                 /ABOUT THE CENTER
3110    7337    0604
3110    7340    2211
3110    7341    2605
3110    7342    4016
3110    7343    1724
3110    7344    4027
3110    7345    1722
3110    7346    1311
3110    7347    1607
3110    7350    3400
3110                    TEXT    "FDRIVE NOT WORKING\"
3111                    /
3112                    /
3113                    /
3114                    /
3115                    /
3116                    /
3117                    /
3120                    /
3121                    /
3122    7351    3230    RKOFF,  DCA     RKWRITE         /SET UP A COUNT OF 4096 IN A TEMPORARY REGISTER
3123    7352    4551            DISPLAY                 /DISPLAY THE ERROR MESSAGE FOR A FEW SECONDS
3124    7353    7170            RKOFF2&177!7600         /POINTER TO 7600 ERROR MESSAGE
3125    7354    2230            ISZ     RKWRITE         /INCREMENT AND TEST THE COUNTER
3126    7355    5352            JMP     .-3             /DISPLAY FOR ABOUT 10 SECONDS.
3127    7356    7240            CLA CMA                 /CLEAR THE STATUS REGISTER BITS
3130    7357    6742            DCLS                    /CLEAR THE STATUS REGISTER
3131    7360    6751            DCLA                    /DO A POWER CLEAR
3132    7361    4556    RKHANG, CHECKIO                 /NOW WAIT FOR THE RESYNC OF THE DISC
3133    7362    6747            DSKE                    /WAS THERE AND ERROR ON THE RECALIBRATE?
3134    7363    7410            SKP                     /NOPE. NOT YET ANYWAY.
3135    7364    5315            JMP     RKSEKE          /THERE WAS AN ERROR, GIVE THE MESSAGE
3136    7365    6745            DSKC                    /IS THE RECALIBRATE FINISHED.
3137    7366    5361            JMP     RKHANG          /NOPE. WAIT FOR IT.
3140    7367    5263            JMP     RKNBOP          /RETRY THE OPERATION NOW.
3141                    /
3142                    /
3143                    /
3144                    /
3145                    /
3146                    /
3147                    /
3150                    /
3151                    /
3152                    /
3153    7370    0240    RKOFF2, LEFT+240                /ABOUT CENTER SCREEN
3154    7371    0000            TOP=340
3155    7372    0623
3155    7373    0505
3155    7374    1340
3155    7375    0522
3155    7376    2217
3155    7377    2234
3155                    TEXT    "FSEEK ERROR\"
3156                    /
3157                    /
-
```

```
3160                    /
3161                    /
3162                    /
3163                    /
3164                    /
3165                    /
3166                    /
3167                    /
3170                    /
3171                    /
3172                    /
3173                    /
3174                    /
3175                    /
3176                    /
3177                    /
3200                    /
3201                    /
3202                    /
3203                    /
3204                    /
3205                    /
3206                    /
3207                    /
3210                    /
3211                    /
3212                            EJECT
```

```
3213                    /
3214                    /
3215                    /
3216                    /
3217                    /
```

NO ERRORS

```
SYMBOL   VALUE  DEF   REFERENCES

AAA      5303  0544  0511
AAAAAA   5253  0505  0427 0456 0461 0555 0570 0643 1622
AAAEND   5454  1035  1056 1062
AAAGET   5403  0747  0332 1215 1226 1333 1340 1362 1465
AAAORG   5354  0616  0454 0515 0624
AAAPUT   5161  0330  0321
AAATAB   5450  1030  1064
AAA1     5216  0427  0437 0443
AAA2     5330  0572  0561
AABLAH   5172  0347  0255
AABLOC   5363  0635  0465 0467 0513
AABL1    7467  1767  1736
AABL2    7471  1771  1745
AACR     5445  1024  1063
AAEND    5226  0447  1076
AAGET    5163  0332  0220
AAGET2   5415  0767  0753
AAGET3   5424  0777  0770 1013
AAGET4   5427  1002  0775
AAGL1    5460  1046  1005
AAGO1    5464  1055  1006
AALIM    5367  0641  0611
AALIMC   5164  0333  0234
AALL     5752  1471  1432 1436 1456
AALOOP   5714  1423  1455
AAMHOW   7501  2350  1662 1732
AAOUTB   5356  0620  0471 0514 0610 0621
AAPUT    5200  0411  0330 0430 0434
AASIZ1   7466  1766  1734 1776
AASIZ2   7470  1770  1743
AASUC    7466  1776  1636 1647 1777
AASUCR   7411  1655  1640
AASUCS   0004  1777  1637 1650
AASYSC   7400  1634  1527
AATAB    5223  0441  1077
AAUNIT   5353  0615  0463 0624
AAUNTC   7405  1645  1530
ABAD     5112  0243  0235 0657 0660 0661 0663 0664
ABDIS    5477  1114  1240
ABG1     5761  1522  1251
ABL1     5755  1511  1250
ABSOL    5600  1237  0635 1252
ABSTMP   5765  1613  1246 1267 1355
ACOPR    5636  1314  1376
ACOPR2   5656  1343  1406
ACOPT    5640  1316  1374
ACOPT2   5660  1345  1404
ACOPY    5630  1276  1303 1323 1373 1377 1522
ACOPY2   5650  1326  1333 1351 1403 1407
ACPG1    5674  1373  1302
ACPG2    5700  1403  1332
ACPL1    4377  1371  1301 1331 1673 1714
ACR      5132  0272  0656
ACRCHK   5016  0116  0106
ACRR     5134  0276  0254 0263 0272 0311
AC1      5165  0340  0232 0277 0413
AEND     5113  0247  0230 0665
AEND2    5120  0254  0251
AGETI    5444  1021  0761 0762 0771
AGETN    5704  1412  1322 1350 1465 1474
AGNUM    5731  1440  1324 1352 1420 1444 1450 1453
```

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SYMBOL   VALUE  DEF   REFERENCES

AG1      5370  0656  0233
AG2      5470  1067  0414
ALASTC   5366  0640  0542 0551 0557
ALD      5750  1463  1426
ALOOP    5067  0215  0240 0243 0275
AL40     5364  0636  0442 0452
AL43     5365  0637  0436 0541 0546 0553
ANTAPE   5065  0211  0253
AOK      5110  0237  0666
AP       5220  0434  0420 0424 1270 1271 1273 1274 1275
APART2   5033  0142  0123 0151
APCR     5221  0436  1067
APUTIT   5150  0315  0237 0257 0262 0301 0305 0312 0322 0325
ASCGO    5174  0356  0111
ASCGO2   5377  0676  0146
ASCH1    5017  0121  0512 0556
ASCH2    5043  0160  0676 1566
ASCII    5002  0074  0637 0112
ASCINP   4610  0062  0075 1232
ASCLPT   5042  0155  0150
ASCLST   4377  0064  0065 0110
ASCLTO   4377  0065  0145
ASCOUT   4703  0063  0143 1233
ASCT     5024  0152  0557
ASCTT    5047  0167  0677
ASCT1    5020  0122  0562
ASCT2    5044  0161  0702
ASET     1502  0254  0511 0260
ASETI    5162  0331  0201
ASRF8    5022  0150  0561
ASRF82   5045  0165  0701
ASUDD1   7425  1703  1606
ASUDD2   7440  1722  1615
ASUGO1   4550  1604  1674
ASUGO2   4554  1613  1715
ASULP1   7417  1670  1604 1607 1675
ASULP2   7432  1711  1613 1616 1716
ASUTT1   7427  1705  1605
ASUTT2   7442  1724  1614
ASYSL    7472  2013  1635
AUNTL    7476  2021  1646
AUTO1    0010  0131  1415 1417 1426 1435 1466 1715 1717 1723 1724 1725 1726 1727 1733 1734 1766 1771 1776 2000 2007 2114 2115 2117
                     2121 2130 2150 2151 2152 2154 2171 2210 2220 2225 2232 2237 1212 1213
AUTO2    0011  0132  1467 1656 1660
AUTO3    0012  0133  2366 2370 2373 2375 2405 2122 2123 3077
AUTO4    0013  0134  2371 2401 3076
AUTO5    0014  0135  2374 2402 3075
AUTO6    0015  0136  2624
AUTO7    0016  0137  1427 1433 1434 2060 2071
AUTO8    0017  0140  0512 0257
AUXIN    4574  0552  0561 0420 0222
AUXOUT   4575  0554  2507 1216 1221 1242 1310 0324
A377     5443  1020  1014
A5262    5361  0632  0530
A6043    5362  0633  0533
BASSEM   3634  0406  0365 0414 0453
BBBASE   4270  1171  1134
BBBBBJ   4316  1225  1212
BBBHDR   4211  1103  1127
BBBPUT   3627  0400  0367
BBDUMP   4267  1170  1072
BBLT     4376  1313  1205
```

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SYMBOL   VALUE  DEF   REFERENCES

BBNEWO   4342   1252  1243
BBN1     4335   1245  1237
BBN2     4352   1263  1251
BBOINT   4272   1173  1076 1142
BBOOT    3551   0250  0126 0130 0132 0146
BBOUT    4273   1201  0557 1206 1232 1276
BBTAPE   3546   0244  0236
BCERR    3775   0577  0457
BCHAR    0105   0414  0357 0432 0441 0530 0531 0535
BCHECK   3771   0573  0356 0375 0455
BCHEX    3621   0371  0404
BCOUNT   0140   0461  0052 1004 1073 1110 1213 1217 1305 1306 0100 0176 0204 0205 0214
BDELZ    0101   0401  0204 0206 1225
BEEND    4261   1157  1152
BEGG     3643   0416  0353 0363 0426 0431 0436 0440 0450
BEILOP   4024   0663  0713
BELOOP   4252   1150  1163
BEND     3676   0453  0364
BEOUT    4045   0704  0700
BETLP2   4037   0676  0707
BFEILD   3772   0574  0352 0371 0443 0444
BFIELD   0135   0456  0050 0351 0372 0463 0675 0715 0725 0731 0756 0767 1210 1233 1240 1265 0102 0507 0512 0751 0754
BFLAG1   0102   0411  0053 0065 0066 0225 0234 0310 0476 0076 0121 0122 0173 0215 0247 0152
BFLAG2   0104   0412  0054 0200 0201 0226 0231 0545 1202 0077 0160 0161 0174 0202 0316 1564 0515
BGETI    4173   1051  0701
BGO      3606   0356  0376
BGOLST   3555   0255  0100
BHIGH    3417   0065  1354
BHIGH2   3513   0200  1364
BIDIFF   4115   0763  0735 0743
BIDUMP   4152   1023  0774 1034 1170
BINARY   3400   0042  0636 1000 0060 0102
BINGO    4403   1354  0057
BINGO2   4407   1364  0174
BININP   4610   1762  0043 0062
BINLST   4377   1344  0056 0173 0064 1371
BINOUT   4703   2114  0171 0063
BINTAP   4003   0641  0244
BINTRY   4101   0745  1017
BLODE    3442   0114  0260
BLODYR   3547   0245  0237
BLRF8    3474   0155  1357
BLRF82   3524   0216  1367
BLT      3476   0157  1355
BLT2     3526   0220  1365
BL7345   3501   0162  0203
BMBASE   4164   1042  1010 1025
BMTAB    4167   1045  0660 1000
BNFILE   3600   0347  0245 0461
BNUM     0074   0374  2421 2424 2426 1006 1010 1175 2251
BOADD    4366   1302  1256 1261 1272 1275 1311
BOFIEL   0137   0460  0045 0733 0757 0772 1235 1266
BOLDO    0136   0457  0051 0304 0741 0755 1245 1264 0126 0136 0207
BOLDP    0103   0413  0047 0776 1024 0103 0456 0516 0531 0532 0534 0535 0567 0576 0577 0600 0605 0772 0773 1001
BOTTOM   7400   0300  2016 2301
BPART2   3504   0167  0073 0147 0175 0210
BPODE    3434   0105  0261
BPOINT   4166   1044  0747
BSCOMM   3452   0126  0112
BSETI    4172   1050  0655
BSTGO    3557   0260  0101
BSYS     4206   1100  1105 1125
```

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SYMBOL   VALUE  DEF   REFERENCES

BTAPE    4061   0724  0760 1313
BTEMP1   0132   0455  0657 0665 0712 0771 0775 0777 1007 1143 1150 1160 0506 0544 0556 0562 0574
BTEMP2   0133   0454  0661 0676 0710 1001 1002 1006 0125 0157 0256 0267
BTEMP3   0134   0455  0664 0706 1145 1162 0522 0536 0537 0602 0607
BTEND    4170   1046  0730
BTENT    4200   1072  1046
BTTY     3420   0066  1360
BTTY2    3514   0201  1370
BUFFER   6400   0306  0676 0677 0701 0703 1404 2441 2446 0250 0251 0252 0253 0650 1014 1031 1044 1045 1101 1137 1140 1172 1173 1
                      0616 0700 0713 1057 1131 1506
BWORD1   0077   0377  0360 0373 0407
BWORD2   0100   0400  0362 0374 0413
CARD     0001   0167  0303 0305 0672 0272 0512 0555 0604 1435 1454 1766 2004 2013 2026 2050 2057 2121 2137 2162 2203 0105 0115 /1
                      0154 1551 1606 1612 0032 1023 1346
CBUFF    6510   1057  0776
CCDF     6507   1056  1051
CCERR    4502   1510  1503
CCLOOP   6424   0756  0766
CCMORE   3256   2444  2453
CCOM     3251   2437  2430
CCOPY    3214   2377  0507 2417
CCOUNT   3302   2477  2414 2452
CDBUF    6164   0361  0171 0172 0277 0326 0363 1461
CDCDDC   6467   1023  1014
CDCONT   6004   0073  0316 0317
CDCUNT   6001   0070  0274 0323
CDDONE   6122   0267  0231
CDEOC    6116   0256  0243
CDFLAG   6000   0051  0124 0162 0167 0257
CDFUNT   6152   0322  0312
CDGONG   6054   0200  0164
CDIL70   6702   1306  1141 1146
CDINIT   6005   0123  0315 0141
CDISK    6600   1134  1135 1165 1234
CDISKC   6601   1135  1034
CDISZ    6114   0251  0156 0261
CDLOOP   6132   0302  0324
CDL110   6024   0144  0131
CDL215   6161   0340  0260
CDL240   6040   0163  0247
CDNEXT   6103   0235  0161
CDNXT2   6104   0237  0327
CDPONT   6156   0326  0174
CDREAD   6025   0150  0607 0155 0230 0251 0252
CDSWT    6003   0072  0300 0307 0320
CDTAB    6235   0401  0315
CERR     4477   1502  0577
CHECKI   4556   0513  1337 1473 2000 0611 2576 0474 0544 0560 0574 2535 3006 3132
CINB     3255   2443  2403 2460 2461
CINPUT   4610   1232  1277 1671
CINS     3254   2442  2425 2433 2457 2465
CINU     3252   2440  2401
CLITO1   6461   1015  0733
CLITO2   6512   1061  0734
CLLOOP   6412   0744  0751
CLOOP    6405   0737  0767
CLOWER   0114   0432  1500 1505
CNOTR    6077   0226  0166 0201 0211 0216
CNTRLZ   0073   0373  0475 0506 0534 0104 0226
COPY     4554   0506  0323 1133 1135 1123 1137 1163 1165 1271 1357 1742 1751
COREF    6400   0731  0753 1032 1040
COUNT    0141   0464  1677 1710 1713 1727 2377 2403 1204 1206 1236 1254 1413 1423 1742 1762 2242 2206 2211 2250 2505 2512 0742 075
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                        0754 0765
COUT     6436  0771     0764 1016 1221
COUTB    3262  2450     2405 2463 2464
COUTPU   4703  1233     1327 1712
COUTS    3261  2447     2427 2435 2462
COUTU    3257  2445     2412 2451
CPBYTE   6511  1000     0747 0760
CPLOOP   3225  2411     2471
CPOINT   6002  0071     0175 0222 0237 0276 0305 0306 0322 0325
CROLTT   3561  0276     0302 0116
CRINIT   3577  0315     0307
CRKPTN   6670  1244     1174
CRK08    6661  1226     1150
CRLF     4557  0517     0617 2177 2235
CRM303   3576  0314     0300
CSET     6475  1043     0745 0757 1054
CSIZE    3301  2476     2407 2415 2432 2434 2467 2470
CSMALL   3245  2432     2423
CUPPER   0115  0433     1537 2551
DATA     0131  0452     0306 0400 0702 0751 1230 1267 1273 0127 0133 0134 0212
DBACK    2725  1774     1601 2001 2261
DBAD1    2527  1533     1525
DBAD2    2554  1564     1544 1552
DBLANK   2701  1741     1722 1736
DCHECK   2653  1712     1573 1744 1745 2015 2025 2036
DCHP     6737  2144
DCIM     6611  2106
DCLA     6751  2140     1654 3131
DCLOOP   6652  1213     1221
DCLS     6742  2150     1137 2772 3130
DCMA     6601  2100     1152 1153 2475
DCOM     2622  1654     1705
DCOMMA   2325  1261     1324
DDAGIN   2227  1162     1214 1217 1232 1257 1266
DDBACK   3145  2261     2132 2262
DDCHEC   2561  1573     1510 1553
DDCHEK   2360  1316     1237 1246 1256 1326
DDCODE   2222  1155     0526 1157 1161 1227 1267 1321
DDCOM    0737  1513     1516 1621 1332
DDDIS    2243  1176     1160
DDDIS1   2765  2043     1631 1641 1651
DDDIS2   2766  2044     1635 1643 1700
DDEXIT   2642  1674     2161
DDFIG    2562  1574     1561 1566
DDFOUN   2564  1576     1411
DDGLEN   2771  2047     1716
DDGTEX   2373  1334     1177
DDIN     3041  2137     2077
DDIS1    2557  1571     1517 1534 2043
DDIS2    2560  1572     1560 1565 2044
DDNAME   2563  1575     1410
DDO2     2531  1536     1520
DDPAST   2773  2051     1741
DDPOIN   2770  2046     1714
DDT      3051  2147     2142
DDTHER   2772  2050     1732 1737
DDYREC   2767  2045     1674
DEAC     6616  2103
DEAL     6615  2102
DECODE   4562  0525     0620 1056 2310 0042 0170 1404 0074 0142 1237 1276 1326 1670 1711
DFBIGR   2755  2030     2017
DFIG     2600  1631     1574
DFIRST   0075  0375     1501 1502 1512 1521 1527 1530 1540 1542 1547 1557 1704 2013 2022 2034
DFNAME   2372  1333     1233
```

```
SYMBOL   VALUE  DEF   REFERENCES

DFOUND   3000   2074  1576
DFSC     6622   2112
DFSE     6621   2104  2545
DGETNU   2334   1271  1222 1261 1300 1324 1314
DGLEN    2706   1756  1577 1763 2047 2264
DIAL     5553   0524  1544
DIALBO   0300   0231  0724
DIALEX   6176   1474  1467
DIALSY   0300   0232  2013 2014
DIMA     6616   2111  2547
DIML     6615   2110  2513
DINDEX   2415   1406  1374
DIRECT   4563   0530  0511 0165 1117 0137
DISC     4577   0562  0155 0216 0130 0165 1314 1343 1723 1722
DISK     6623   2105  2037 2062 2173 2215 2543
DISKWO   0001   0155  0244 0246
DISPLA   4551   0500  0653 1701 1703 1720 1722 2274 1502 1656 1017 2603 3014 3123
DISREP   3173   2322  2311
DLCA     6755   2157  2777
DLDC     6732   2141  1142 2745
DLDR     6733   2142  3060
DLDW     6735   2143
DLEN     2414   1405  1376
DLOOK    2475   1500
DLOOP    2304   1237  1255
DLOOP1   2477   1502  1531
DLOOP2   2534   1542  1554
DLOOP3   2660   1717  1743
DLWC     6753   2156  3001
DL5757   2570   1602  1440
DMAC     6626   2115  2562
DMAR     6603   2101  2623
DMAW     6605   2077
DMNT     6743   2151
DNAME    3064   2166  1575 2201 2213 2245 2252 2253
DNBACK   3145   2262  2244
DNGLEN   3147   2264  2172
DNOS     2674   1733  1731
DNOT     3141   2250  2224 2231 2236 2243
DNO1     2516   1521  1507 1511
DNPAST   3150   2265  2217
DNPOIN   3146   2263  2167 2173
DOK      3112   2217  2200 2251
DPAST    2717   1765  1600 1772 1775 2051 2265
DPGETL   2371   1332  1205 1211 1273 1317
DPOINT   2413   1404  1414 1662 2046 2263
DPSTAR   2374   1335  1200
DPSWIT   2375   1336  1202
DRCA     6757   2160
DRDA     6734   2145
DRDC     6736   2146  1715 1144
DRDS     6741   2147  1660 3027
DREENT   2453   1446  2134
DRWC     6752   2155
DSAC     6612   2107
DSET     6631   1172  1163 1215 1226
DSETP1   6650   1211  1200
DSIZE    2376   1337  1203
DSKC     6745   2152  3020 3136
DSKE     6747   2154  3023 3025 3133
DSKT     6746   2153
DSOURC   2472   1465  1460
```

```
SYMBOL   VALUE  DEF   REFERENCES

DSYSBI   6701   1305  1217
DSYS1    4145   1013  1276
DSYS2    4157   1030  1277
DSYS3    4206   1105  1300
DSYS4    5353   0624  1301
DTAB1    6673   1275  1211
DTHERE   2733   2005  2026 2037 2050
DUP      5614   1257  1531
DWRITE   2634   1666  1663
DXAC     6645   2114  1157 2555
DXAL     6643   2113  1155 2527
DYBACK   2567   1601  1443
DYGLEN   2565   1577  1412
DYGOOD   2435   1426  1422
DYLOOP   2425   1416  1424
DYPAST   2566   1600  1416
DYRECT   2400   1371  0531 2045
DZAP     3017   2113  2106
D1CLOS   2615   1647  1640
D1NOG    2645   1700  1634
D2CLOS   2651   1704  1645
ECHO     0001   0200  0515 0616 1055 2154 2156 2176 2212 2221 2230
ELOWER   0112   0430  1523
EUPPER   0113   0431  1545
EXIT     0246   0710  0505
EXITLO   0251   0713  0715
FBNUM    0122   0441  0314 0321 1654 1655 2153 0644 0654 1121 1523 0466
FCORE    0262   0753  0651
FFILEC   1515   0303  0123
FFTEMP   1537   0330  0307
FILEC    5406   0122  0230 0176 0477
FNAME    0124   0443  2414 2423 2430 1163 1165 1167 1171 1333 1431 2222 2227 2234 2241 2522 2532 2537 0070 0074 0202 0205 1416
FSIZE    0117   0436  2412 2414 2422 2423 2430 0310 1174 1263 1503 1513 1550 1650 1657 2023 2157 2406 2520 2522 2531 2532 2537 0105
                      0110 0114 0117 0122 0127 0141 0305 1112 1132 1154 0472 1266 1735 1744
FTYPE    0121   0440  1026 2141 2155 2160 2253 2262 2263 2264 1173 1221 1455 2103 2137 2312 0076 0161 0223 0277 1116 0136 0171 0225
                      0256 0261 0300 0304 0307 0323 0415 0421 0425 0474 1003 1007 1557 0521 0525 0533
FUNIT    0120   0437  0312 0317 0350 0362 0363 1172 1224 1400 2552 2554 0133 0140 0145 0303 0642 1123 1525 0464 1241 1317 1344
                      1706 1725
FWHAT    0123   0442  0306 1446 2074 0164 1114 0134
GALL     1243   2250  2342
GCLEAR   1006   1665  2314
GCOUNT   1103   1771  1676 1712
GCUNT    4547   1562  1530 1541 1544
GEENUM   4542   1554  1524 1547
GETA     1417   0512  0440 0453 0455 0462 2240 2243 2245 2247
GETI     4525   1537  1051 1557 1021
GETL     4560   0521  1705 1724 0502 0526
GGCLEA   1302   2314  2153 2200
GGIN     1300   2312  2165 2233
GGINSE   1102   1770  1707 1726
GGLIMC   1253   2252  2145 2271 2272 0353
GGLINE   1275   2307  2236
GGMAIN   1301   2313  2167 2223
GGM33    1274   2304  2257
GGNUM    1100   1766  1665 1667 1673 1715
GGTEXT   1104   1772  1742
GIN      1052   1735  1670 1674 1716 1752 1753 1755 1757 2312
GINSER   1200   2136  1770 2146 2237 2240
GINTO    1070   1753  1763
GLEFT    1073   1757  1747
GLIMIT   1277   2311  2151
GLINE    1000   1657  0524 1660 1662 2307
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SYMBOL   VALUE  DEF   REFERENCES

GLOOP1   1021   1701  1711
GLOOP2   1040   1720  1730
GMAIN    1007   1666  1731 2100 2313
GMLEN    1101   1767  1736
GNLF     1230   2176  2341
GNL334   1307   2330  2216
GNRNO    1242   2221  2215
GNRUB    1232   2205  2343
GNUM     1276   2310  1766 2147 2163 2164 2206 2210 2232
GNXIT    1210   2146  2345 2346 2347 2350 2351 2354
GOK      4543   1555  1542
GPLACE   4540   1552  1545
GPLCE2   4546   1561  1546 1555 1556
GPUT     1226   2166  2162
GSPG1    1315   2341  2144
GSPL1    1303   2322  2143
GTEXT    1120   2015  1704 1723 1772 1334
GUNIT    4537   1551  1526
G1       1022   1702  1661 1663
G2       1041   1721  1664
HHPOP    3321   2526  0115 2533
HHPUSH   3313   2516  0117 2523
HHTEMP   3327   2536  0330 2521 2530 2537
HPOP     4403   0114  0316 0641 0653 0200
HPUSH    4404   0116  0167 1120 0140 0475
ILEN     0111   0427  1375 1754
INBLOC   0102   0403  0411 0322 2402 1130 1135 1157 1260 1325 1737 1740 1746 1747
INDEX    0110   0426  1373 1515 1555 1653 2550 2551
INITOV   0222   0651  1061
INSULT   6513   1066  1020
INUNIT   0103   0404  0413 0320 2400 1126 1257 1320 1707
IOCD     0766   1562  1542
IOCHEC   0743   1521  0514 1524 1556
IOCP     0767   1563  1545
JACKS    6204   1504  1471 1514
KEYCHA   0072   0372  0657 1550 1555 2001 2007
LBMAX    0054   2021  2511
LBNUM    0006   2020  1767 2021 1337
LCB      6662   0477  0673 1426 1433
LCF      6652   0474  0577 1362
LEADER   4405   0120  0233 1222 0204 0264
LEFT     0000   0276  0772 2014 1102 2300 2322 1427 1510 1762 2114 1114 1066 2652 3106 3153
LINE     4561   0523  1175 2150 2214
LINEB    1120   2014  2015 2033
LLB      6654   0475  0602
LLEDER   3303   2503  0121 2512
LLPEJ2   5777   1571  1563
LOC1     0001   0111  1401 1440 1441 2626 2627 2422 2427
LPCOL    6322   0543  0554 0566 0571 0631
LPCOMM   6316   0534  0573
LPCR     6337   0570  0620
LPEJ2    6323   0550  1571 0557 0640 1422
LPEND    6371   0640  0621
LPEXIT   6320   0541  0532 0535 0635
LPM204   6374   0647  0553 0570 1414
LPM320   5776   1570  1560
LPPUT    6333   0564  0534 0552 0556 0606 0627
LPR      6664   0500  0604 1426 1433
LPSEQ    6321   0542  0520
LPTAB    6361   0626  0617 0634
LPTEST   6275   0513  0610 0517
LPT2     5765   1556  0155 1562 1613
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SYMBOL   VALUE  DEF   REFERENCES

LPWFIT   6543   0574  0567
LP08BA   6600   1421  1427 1430 1431 1432
LP08B2   6200   1422  1427 1430 1431 1432
LP08LP   6711   1363  1367 1371
LP08LT   6720   1372  1377 1400
LP0801   0240   0672  1405
LP0802   6324   0551  1406
LP0803   6330   0555  1407
LP0804   6341   0572  1410
LP0805   6350   0601  1411
LP0806   6353   0604  1412 1432
LP0807   6363   0630  1413
LP08PO   6727   1405  1375
LP08PT   6737   1426  1372
LP08TS   6705   1355  1027 1365 1374
LP1      6160   0337  0523
LP2      6356   0617  0524
LP212    6375   0650  1431
LP214    6376   0651  1427 1430
LP40     6373   0646  0626
LSD      6661   0476  0575 1363
LSE      6651   0473
LUNOAD   1154   2047  2352
L10      0054   0347  0356 0361 1031 2275
L100     0025   0320  2267 1255 1012 0246 0530
L177     0142   0465  2137 0223
L20      0020   0312  0662 2062 2302
L200     0026   0321  1414 2140 2506 0107 0136 0224 1032 1037
L30      0061   0355  0165 0442 1036
L333     0051   0344  1220
L377     4165   1043  0746
L4       0055   0350  1465 2113 2147
L40      4171   1047  0666
L400     0040   0333  0535 0536 0545 0552 0137 2765
L4000    0030   0323  1024 2005 2625
L4020    3550   0246  0116
L5000    0031   0324  0516
L54      0041   0354  1325
L5757    0116   0435  2116 2127 2207
L60      0035   0330
L6000    0032   0325  0120 0123 0142
L7       0060   0354  0175 1770 2553 0134 0766 0441 1242 0632 1046 1656 2241 2252 2515 2747
L70      3774   0576  0442
L700     0036   0331  0433 1241
L7000    0033   0326  0476 0504 0542
L7400    0064   0360  0361 0737 0754 2507 2533 2563
L77      0024   0317  1461 2161 1244 1247 1215 1220 1254 1260 1271 1274 0426 0575 1002 1154 1161
L7700    0053   0346  1751 1243 0075 0566
L7740    0056   0351  0352 1760
L7757    0034   0327  0530
L7770    0021   0314  1767 2205 0572 1012 1176 2512 2743
L7777    0047   0342  1212 1447 1452 1456 1461 2075 2100 2104 2107 2140 2143 2170 0477 0546 1005 1044 1512 2477 2755
MAINDI   0263   0772  0621 0654 1657
MANDM1   4422   1412  1423
MANDM2   4423   1413  1422 1424
MAORN    4424   1416  1407
MGOTO    4427   1422  1410
MMEXIT   1351   2405  2400
MMORE    4432   1427  1405
MMOVE    1327   2363  0533 2365
MONE     7240   0275  0647 1352 1360 1456 2205 2364 2367 2372 0255 0303 0470 0736 1162 1164 1166 1170 1201 1526 1533 1564 1647 1713
                      2006 2555 0224 0462 0714 1005 1522 1527 0172 0267 0306 0517 0572 0764 0777 0551 0555 1173
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SYMBOL  VALUE  DEF  REFERENCES

MORE    4413  1403  0376 1411 1412 1413 1444 1463 1464
MOVE    4564  0532  0675 0711 2411 2422 2732 1436 1437 1661 2517 2527 2546 1136 2174 1201 1225 1227 1470 1474 1634 1645 2423
MTHREE  7346  0275  0151 2514
MTWO    7344  0274  0151 0044 0771
M10     0021  0313  0314 1363 1777
M12     0037  0332
M20     0023  0316  1404 1405 0445 2774
M200    3632  0403  0434
M212    0144  0467  1264 2504 2502
M215    0143  0466  1061 0514 1224 1465
M232    3773  0575  0504 0532
M240    0146  2471  0416
M32     0052  0343  1215
M322    0027  0322  2313
M34     0052  0345  1464
M340    0147  0472  2254 2265 0422 0526
M377    0145  0470  0421
M4      0022  0315  1376 1377 1235 1357
M40     0056  0352  2261 0656 1144 1010 0244 1015
M400    0064  0361  0506 0511 0663 1543 0521 0606 3002
M43     0062  0356  1470
M54     0042  0335  1322
M5757   0057  0353  1420 1720 2176
M6      0063  0357  1367 2501
M60     0043  0336  1276 1312
M70     0044  0337  1302
M73     0045  0340  1230
M77     0046  0341  1251
NO      4567  0540  1425 1451 1703 2156 0447 1075 1444 1463 1633 0613 0140
NODIS   3151  2273  0541
NONODI  3155  2300  2275
NOSUCH  4560  1652  0074 0075 0076 0077 0110 0111 0112 0133 0134 0135 0136 0140 0141 0142
ORIGIN  0130  0451  0046 0370 0402 0672 0704 0736 0745 0753 0763 1247 1252 1257 1263 0101 0520 0560 0573 0765 0767 1000
OUTBLO  0104  0405  0412 0313 2404 1122 1146 1156 1261 1353 1741 1750
OUTNUM  0106  0407  0650 0304 2413 2556 1270 1356 1733
OUTUNI  0105  0406  0414 0313 2411 1124 1263 1347 1726
OVEREX  0247  0711  1472
OVERLE  0007  1514  1473
PALT    0730  1500  1443
PCHAR   0736  1506  1362 1366 1424 1462 1463 1467 1515
PCOM    0714  1461  1455
PCSW    0737  1621  1361 1372 1374 1402 1412
PDCAVR  0612  1347  1410
PDIS    0731  1501  1341 1343 1345 1346 1350
PDO     0636  1374  1371
PFLICK  0001  0204  1442 1477 2620
PFOUR   7307  0271  0246 1434 0451
PGETL   0702  1447  1357 1373 1444 1472 1514
PHOR    0732  1502  1344 1400
PINST1  0601  1336  1354
PIP     5552  0502  1347 0324 0465 0717 1164 1223 0265 1272 1360 0641 1752
PIPGO   0213  0635  0624
PIPL    0202  0620  0625
PIPLST  0210  0631  0623
PIPPIP  0200  0615  0503
PLOOP   0663  1424  1445
PMORE   0076  0376  0460 0252
PNOT1   0651  1407  1355 1411
PONE    7201  0260  0267 1666 1714 2231 0523 1131 1153 1207 0133 0135 0170 0473 1030 1244 1262 1434
POP     4565  0534  1407 1673 2126 2316 1107 0476 1354
POTHER  3372  2623  1500 2630
PPAST   0635  1373  1365
```

```
SYMBOL   VALUE  DEF   REFERENCES

PPDIS    0600   1335  0501 1340 1342 1466
PPOP     1360   2417  0535 2424
PPSTAR   0621   1357  1474
PPTEMP   1366   2427  2413 2421 2430
PPUSH    1352   2410  0537 2415
PRIGHT   0711   1456  1451
PSIX     7527   0272
PSTART   0734   1504  1351 1452 1453 1460 1335
PSWITC   0735   1505  1353 1450 1457 1336
PTABLE   0747   1525  1426
PTHREE   7525   0270  0272 0630
PTWO     7505   0267  0270 0271 1437 1672 0305 1464 2112 2146 0111 0160 0222 1113 1115 1035
PUSH     4566   0536  1377 1665 2120 2131 2307 0221 0177 1321
PUTL     4407   0124  1063 1066 2157 2217 0552
PUTWOR   4576   0556  0401 0464 0703 0716
PVER     0733   1503  1347 1406 1407 1430
RCRA     6632   0107  0202
RCRB     6634   0110
RCRD     6674   0113  0271
RCSD     6671   0111  0227
RCSE     6672   0112  0165
RCSF     6631   0106  0200
READ     4571   0544  1402 2437 0646 1012 1445 1464 1550 1504
READEN   0260   0726  0713 0714
READIN   0254   0720  0712 0713 0714
READSK   7626   2442  2340 2721
REMAKE   0000   0175  1116 1132 1512 1523
REPDIS   3161   2306  0543 2315 2317
REPLAC   4570   0542  2125 2327
RERR     7615   2422  2342
RESTAR   0216   0645  0615 0704 0710
RESTST   0261   0736  0667
REWERE   7553   2313  2431
RFCOMM   7634   2473  2464
RFDBAD   7751   2634  2500 2645
RFDBWC   7750   2635  2510 2552
RFDISK   1540   0347  0563 0364
RFDMAR   7743   2623  2473
RFGXT    7732   2574  2546 2554
RFINST   7675   2534  2474 2544
RFIRST   7565   2334  2250 2277 2301 2621 3054
RFIT     7556   2322  2267
RFL377   7744   2624  2525 2556
RFNOSK   7704   2543  2537 2541
RFREAD   7626   2463  1231 1232 2470 2570 2574 2575
RFWRIT   7630   2466  2467
RF08     0001   2215  0244 0246 0421 0560 0700 0702 0072 0101 0122 0131 0160 0410 0501 0532 0673 0153 0214 1346 1356 1366 1600 1766
                      2004 2026 2050 2121 2137 2162 2203 0126 0163 0360 0700 1116 1154 1312 1341 1375 1405 1514 1525 1044 1030 1035
                      1037 1121 1572
RF08NO   7734   2603  2542 2605
RF08N2   7752   2652  2604
RF08R    7501   2226  0103 0104 0105 0106 2350
RF08W    7505   2233  0124 0125 0126 0127
RF1003   7745   2625  2550
RKBAD    7535   3106  3015
RKBOP    7257   2764  3040
RKBST    6213   1517  1203 1475
RKBTST   0750   1541  1202 1207 1245 1476 1501
RKCHAR   6164   1462  1246
RKCOMM   7234   2740  2731
RKCUNT   0012   3077  2761 3037
RKDLDR   7334   3060  2740
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SYMBOL   VALUE  DEF   REFERENCES

RKDRIV   0107   0422  0167 2744
RKDUN1   7323   3037  3026
RKHANG   7361   3132  3137
RKINST   7275   3004  2741 3024
RKIRST   7330   3054  2752
RKLOC    7332   3056  2754
RKLOCC   0014   3075  2756 2764 2766 2776
RKL40    7327   3053  3060
RKNBOP   7263   2771  2762 3140
RKNOSK   7306   3020  3010 3012
RKOFF    7351   3122  3032
RKOFF2   7370   3153  3124
RKOUT    7331   3055  2757
RKREAD   7226   2730  1230 2735 3054 3041 3042
RKSEKE   7315   3027  3135
RKSETU   6671   1245  1206
RKSTAT   4576   1670  1652 1725 1244
RKSTTP   4607   1725  1717
RKTRCK   0013   3076  2753 2767 3002 3053
RKUNIT   7333   3057  2742 2746
RKWRIT   7230   2733  2734 3122 3125
RK70     1556   0370  0164 0354 0357 0360
RLOC     7563   2332  2244 2273 2617 3056
RNUM     7564   2333  2246 2260 2265 2270 2323
ROK      7526   2260  2304 2325
ROR6     4550   0476  1454 1214 1253 1270 0774 2531
ROUT     7566   2335  2253 2263 2300 2303 2324 2620 3055
RRBAD    7575   2405  2424
RRC      7507   2235  2231
RRERE0   7625   2435  2430
RRERR    7573   2342  2272
RRFIRS   7742   2621  2522 2530
RRGOOD   7541   2273  2313 2315
RRLOC    7740   2617  2476
RROUT    7741   2620  2503
RRR      7571   2340  2235
RRRET    7574   2343  2262
RRRT     7567   2336  2227
RRT      7572   2341  2236 2271
RRTRY    7537   2271  2314
RRUNIT   7737   2616  2511 2514
RSIX     0770   1576  0477 1602
RUNIT    7562   2331  2242 2274 2276 2616 3057
SAVEST   0260   0735  0646
SEARCH   4573   0550  0622 2142 1060 0055 0077 0172 1406 0107 0144 0231 0412 1004 1247 1300 1330 0522 1672 1713
SEQCIN   3776   0607  0515
SEQCOM   3740   0530  0517 0525
SEQEXT   3767   0565  0541
SEQIN    3711   0473  0553 0510 0536 0543 0551 0563 0542
SEQLP    3777   0610  0556
SEQN1    3727   0512  0503
SEQOUT   3747   0542  0555 0553 0566
SEQQ2    3761   0555  0550
SEQTST   3720   0502  0516 0523
SEQTTY   3736   0526  0501
SETA     4555   0510  0437 2237
SETI     4514   1521  1050 1531 0331
SSERCH   0334   1011  0551 1013 1015 1016 1020 1040
SSLOOP   0344   1022  1042
SSNO     0356   1035  1030
STAR20   0001   0220  0525 0627 0756
STATLP   4567   1656  1664
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SYMBOL   VALUE  DEF   REFERENCES

STATRS   4562   1650  0736 1663
STATSV   4600   1713  0735 1720
STL6     4606   1724  1716
SYSBBL   0370   0242  1042 1171 2635
SYSBIN   0001   0243  1013 1030 1100 2615
SYSBSP   0011   0247  1305
SYSERR   7402   0527  1454 1463 2102 2111 2145
SYSHDR   0447   0251  1103
SYSSBL   0370   0250  2015
SYSWT    0467   0253  0641
TABLED   0400   1107  1525 1535
TAPE     4402   0112  0352 0157 0220 1445 1776 2015 2036 2061 2131 2147 2172 2213 2132 0167 1124 1140 1164 1316 1345 1705 1724
TAPER    1453   0212  0071
TAPEW    1464   0227  0121
TAXO     1704   0561  0443 0477 0500 0503 0541
TBEXIT   1754   0640  1004
TBLAH    1600   0436  0272 0446 0452 0457 2640
TBLAHT   2036   1004  0763
TBLOCK   1720   0575  0464 0471 0472 0602 1001
TBLOKK   2033   1001  0737
TBREG    0005   1026  1030 1045
TCHEKE   1755   0645  0635
TCOUNT   1761   0656  0461 0524 0636 1002
TDOC     1752   0636  0633
TDOWN    1644   0511  0475
TEERNT   1513   0274  0216 0233
TEMAIN   1764   0661  0617 0645 0647
TEMP     0065   0364  1014 1022 1032 1033 1036 1041 1737 1740 1744 0153 0154 0155 0163 0172 0202 1223 1262 1272 1305 1313 1675 1676
                      0750 0752 0203 0217 0565 0600 0736 0737 0740 0752 0772 1216 1220 1360 1370 2521 2526 2561 2567
TEMP1    0066   0365  1017 1031 1035 1225 1264 1274 1275 1301 1311 0743 0744 0746 0755 0756 0762 0775 1003 1045 1361 1366 2502 2540
                      2775 3011
TEMP2    0067   0366  1743 1750 1754 2536 3007
TEMP3    0070   0367  1234 1245 1250 1252 1253 2010 2011 2020 2030 2031 2032 1303 1304 1307
TEMP4    0071   0370  0570 0577 2174 2175 0417 0424 0427
TERENT   1512   0273  0215
TERMC    0000   0173  2325 2344 0344 0447 0662 1047 1055 1057 1061 1072
TERRC1   1762   0657  0612
TERRC2   1763   0660  0515 0614
TERROT   2031   0771  0750
TEXIT    1476   0246  0224 2343
TILEN    0002   0235  0427 2563 2015 2016
TINDEX   0346   0234  0426 2562 2013 2015 2016
TKOUNT   2034   1002  0761
TLOC1    1715   0572  0454 0473 0512 0534 0546 0547 0553 0554
TLOOP    1652   0523  0637
TLOOP2   1730   0607  0625
TLOWER   0000   0236  0430 2564 2021 2022
TLP1     1675   0551  0540 0544
TMAIND   2101   1104  0734 1057 1105 2425
TMAINE   2005   0724  0661 0730 1026
TMESS1   2202   1117  0620
TMESS2   1557   0676  0646
TMESS3   1765   0702  0650
TNT2LG   1740   0622  0613 0615
TOP      0340   0277  0773 1103 2323 1430 1511 1763 2115 1115 1767 2653 3107 3154
TOPR     1717   0574  0447 0450 0527 0531
TOUT1    2132   1107  1031
TOUT2    2133   1110
TREAD    1400   0067  0545 0213 0351 0353 2336
TREENT   1627   0470  0273 1000
TRENT2   1646   0514  1003
TRENT3   2026   0761  0747 0751
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SYMBOL	VALUE	DEF	REFERENCES
TSELER	1757	0647	0625
TSKP	1756	0634	0270
TSTOPR	1727	0564	0451
TSYSLO	0272	0240	0432 2566
TSYSUP	0467	0241	0433 2567
TTAPE	3340	2545	0113 2557 2575 2601
TTAPEW	1514	2275	0252
TTBC	2037	1023	0740 1054 2435
TTBLAH	1511	0272	0220 0234 0241
TTBLP	2044	1033	1056
TTEBLK	2046	1035	1027 1040
TTEG1	2023	0747	0741
TTRENT	2032	1000	0274 0771
TTRNT2	2035	1003	0762
TTSKP	1527	0270	0217 0231 0240
TTS1	2074	1067	1061
TTS2	2072	1062	1055
TTTSET	3353	2562	2547
TTTSKP	1510	0271	0230
TTYCR	0364	1060	0520 1067
TTYGET	1105	1777	0522 2003 2004 2011
TTYPUT	3361	2574	0125 2604
TUPPER	0777	0237	0431 2565 2021
TWHERE	1424	0150	0070 0120 0152 0176 0177 0200 0201 0203 0204 0205
TWRITE	1412	0117	0547 0214 0247 0252 0251 0256 0275 2557
UL300	1175	2077	2047
UNLOAD	1155	2054	2553
UNLOOP	1162	2063	2272
UNPOS	1173	2074	2554
WRITE	4572	0546	1066 2444 1227 1077 0614
WWWT	7570	2537	2230
ZERO	7200	0265	0266