```
000.001                2  DEBUG   EQU     1               ASSEMBLE IN DEBUG MODE
000.001                3  .MANUF. EQU     1               ASSEMBLE IN MANUFACTURE MODE
                       4
                       6  ***     SYSCMD - SYSTEM COMMAND PROCESSOR.
                       7  *
                       8  *       JGL, 12/06/1977
                       9  *
                      10  *       FOR HEATH COMPANY.
                      11  *
                      12  *            G. C.,     78/09   Maintenence release
                      13  *                       79/05   HDOS Version:  1.5
                      14  *                       80/04   HDOS Version:  1.7
                      15  *                       80/05     ---------------
                      16  *


                      18  **      SYSCMD CAN BE ASSEMBLED IN THREE DIFFERENT MODES:
                      19  *
                      20  *       PRODUCTION MODE
                      21  *               NORMAL SYSCMD
                      22  *
                      23  *       DEBUG MODE
                      24  *               SOME EXTRA COMMANDS FOR SYSTEM DEVELOPMENT
                      25  *
                      26  *       MANUFACTURE MODE
                      27  *               AUTOMATICALLY LINKS TO '/MANDIAG.ABS' UPON ENTRY, UNLESS
                      28  *               40076-40077 CONTAINS 'GL'
                      29
                      30
                      31
000.000               32          XTEXT   FBDEF


                     34X **       FILE BLOCK DEFINITIONS.
                     35X
000.000              36X          ORG     0
000.000              37X FB.CHA   DS      1               CHANNEL NUMBER
000.001              38X FB.FLG   DS      1               FLAGS
000.002              39X FB.FWA   DS      2               BUFFER FWA
000.004              40X FB.PTR   DS      2               BUFFER POINTER
000.006              41X FB.LIM   DS      2               LIMIT OF DATA IN BUFFER (READ OPERATIONS)
000.010              42X FB.LWA   DS      2               LWA OF BUFFER
000.012              43X FB.NAM   DS      4+8+4+1         NAME OF FILE
000.021              44X FB.NAML  EQU     *-FB.NAM
000.033              45X FBENL    EQU     *               ENTRY LENGTH
000.033              46          XTEXT   DIFDEF
```

```
                        48X **      DIRECTORY FILE FLAGS.
                        49X
000.200                 50X DIF.SYS EQU     10000000B       SYSTEM FILE
000.100                 51X DIF.LOC EQU     01000000B       LOCKED FOR CHANGE
000.040                 52X DIF.WP  EQU     00100000B       WRITE PROTECTED
000.020                 53X DIF.CNT EQU     00010000B       CONTIGUOUS FILE
                        54X
000.033                 55          XTEXT   ASCII


                        57X **      ASCII CHARACTER EQUIVALENCES.
                        58X
000.015                 59X CR      EQU     13              CARRIAGE RETURN
000.012                 60X LF      EQU     10              LINE FEED
000.200                 61X NULL    EQU     200Q            PAD CHARACTER
000.000                 62X NUL2    EQU     0
000.007                 63X BELL    EQU     7               BELL CHARACTER
000.177                 64X RUBOUT  EQU     177Q
000.010                 65X BKSP    EQU     10Q             CTL-H
000.026                 66X C.SYN   EQU     26Q             SYNC
000.002                 67X C.STX   EQU     2               STX
000.047                 68X QUOTE   EQU     47Q
000.011                 69X TAB     EQU     11Q
000.033                 70X ESC     EQU     33Q
000.012                 71X NL      EQU     12Q             NEW LINE (HDOS SYSTEMS)
000.212                 72X ENL     EQU     NL+200Q         NL + END-OF-LINE-FLAG
000.014                 73X FF      EQU     14Q             FORM FEED
000.001                 74X CTLA    EQU     01Q             CTL-A
000.002                 75X CTLB    EQU     02Q             CTL-B
000.003                 76X CTLC    EQU     03Q             CTL-C
000.004                 77X CTLD    EQU     04Q             CTL-D
000.017                 78X CTLO    EQU     17Q             CTL-O
000.020                 79X CTLP    EQU     20Q             CTL-P
000.021                 80X CTLQ    EQU     21Q             CTL-Q
000.023                 81X CTLS    EQU     23Q             CTL-S
000.032                 82X CTLZ    EQU     32Q             CTL-Z
000.033                 83          XTEXT   U8250


                        85X **      8250 UART CONTROL AND BIT DEFINITIONS.
                        86X
000.350                 87X SC.ACE  EQU     350Q            SYSTEM CONSOLE PORT IF 8250 ACE
000.156                 88X AC.DLY  EQU     110             220 MIL. SEC. DELAY FOR 8250
                        89X
000.000                 90X UR.RBR  EQU     0               RECEIVER BUFFER REGISTER (READ ONLY)
                        91X
000.000                 92X UR.THR  EQU     0               TRANSMITTER HOLDING REGISTER (WRITE ONLY)
                        93X
000.000                 94X UR.DLL  EQU     0               DIVISOR LATCH (LEAST SIGNIFICANT)
                        95X
000.001                 96X UR.DLM  EQU     1               DIVISOR LATCH (MOST SIGNIFICANT)
                        97X
000.001                 98X UR.IER  EQU     1               INTERRUPT ENABLE REGISTER
000.001                 99X UC.EDA  EQU     00000001B       ENABLE RECEIVED DATA AVAILABLE INTERRUPT
```

```
000.002             100X UC.TRE  EQU  00000010B   ENABLE TRANSMIT HOLD REGISTER EMPTY INTERRUPT
000.004             101X UC.RSI  EQU  00000100B   ENABLE RECEIVE STATUS INTERRUPT
000.010             102X UC.MSI  EQU  00001000B   ENABLE MODEM STATUS INTERRUPT
                    103X
000.002             104X UR.IIR  EQU  2           INTERRUPT IDENTIFICATION REGISTER
000.001             105X UC.IIP  EQU  00000001B    INVERTED INTERRUPT PENDING (0 MEANS PENDING)
000.006             106X UC.IID  EQU  00000110B    INTERRUPT ID
                    107X
000.003             108X UR.LCR  EQU  3           LINE CONTROL REGISTER
000.000             109X UC.5BW  EQU  00000000B    5 BIT WORDS
000.001             110X UC.6BW  EQU  00000001B    6 BIT WORDS
000.002             111X UC.7BW  EQU  00000010B    7 BIT WORDS
000.003             112X UC.8BW  EQU  00000011B    8 BIT WORDS
000.004             113X UC.2SB  EQU  00000100B    TWO STOP BITS SELECTED
000.010             114X UC.PEN  EQU  00001000B    PARITY COMPUTATION ENABLED
000.020             115X UC.EPS  EQU  00010000B    EVEN PARITY SELECT
000.040             116X UC.SKP  EQU  00100000B    STICK PARITY
000.100             117X UC.SB   EQU  01000000B    SET BREAK
000.200             118X UC.DLA  EQU  10000000B    DIVISOR LATCH ACCESS
                    119X
000.004             120X UR.MCR  EQU  4           MODEM CONTROL REGISTER
000.001             121X UC.DTR  EQU  00000001B    DATA TERMINAL READY
000.002             122X UC.RTS  EQU  00000010B    REQUEST TO SEND
000.004             123X UC.OU1  EQU  00000100B    OUT 1
000.010             124X UC.OU2  EQU  00001000B    OUT 2
000.020             125X UC.LOO  EQU  00010000B    LOOP
                    126X
000.005             127X UR.LSR  EQU  5           LINE STATUS REGISTER
000.001             128X UC.DR   EQU  00000001B    DATA READY
000.002             129X UC.OR   EQU  00000010B    OVERRUN
000.004             130X UC.PE   EQU  00000100B    PARITY ERROR
000.010             131X UC.FE   EQU  00001000B    FRAMING ERROR
000.020             132X UC.BI   EQU  00010000B    BREAK INTERRUPT
000.040             133X UC.THE  EQU  00100000B    TRANSMITTER HOLDING REGISTER EMPTY
000.100             134X UC.TSE  EQU  01000000B    TRANSMITTER SHIFT REGISTER EMPTY
                    135X
000.006             136X UR.MSR  EQU  6           MODEM STATUS REGISTER
000.001             137X UC.DCS  EQU  00000001B    DELTA CLEAR TO SEND
000.002             138X UC.DDR  EQU  00000010B    DELTA DATA SET READY
000.004             139X UC.TER  EQU  00000100B    TRAILING EDGE OF RING
000.010             140X UC.DRL  EQU  00001000B    DELTA RECEIVE LINE SIGNAL DETECT
000.020             141X UC.CTS  EQU  00010000B    CLEAR TO SEND
000.040             142X UC.DSR  EQU  00100000B    DATA SET READY
000.100             143X UC.RI   EQU  01000000B    RING INDICATOR
000.200             144X UC.RLS  EQU  10000000B    RECEIVED LINE SIGNAL DETECT
000.033             145          XTEXT U8251
```

```
                        148X **     8251 USART BIT DEFINITIONS.
                        149X *
                        150X
                        151X **     PORT ADDRESSES
                        152X
000.000                 153X UDR    EQU     0               DATA REGISTER IS EVEN
000.001                 154X USR    EQU     1               STATUS REGISTER IS NEXT
                        155X
000.372                 156X SC.UART EQU    372Q            CONSOLE USART ADDRESS (IFF 8251)
                        157X
                        158X
                        159X **     MODE INSTRUCTION CONTROL BITS.
                        160X
000.100                 161X UMI.1B EQU     01000000B       1 STOP BIT
000.200                 162X UMI.HB EQU     10000000B       1 1/2 STOP BITS
000.300                 163X UMI.2B EQU     11000000B       2 STOP BITS
000.040                 164X UMI.PE EQU     00100000B       EVEN PARITY
000.020                 165X UMI.PA EQU     00010000B       USE PARITY
000.000                 166X UMI.L5 EQU     00000000B       5 BIT CHARACTERS
000.004                 167X UMI.L6 EQU     00000100B       6 BIT CHARACTERS
000.010                 168X UMI.L7 EQU     00001000B       7 BIT CHARACTERS
000.014                 169X UMI.L8 EQU     00001100B       8 BIT CHARACTERS
000.001                 170X UMI.1X EQU     00000001B       CLOCK X 1
000.002                 171X UMI.16X EQU    00000010B       CLOCK X 16
000.003                 172X UMI.64X EQU    00000011B       CLOCK X 64
                        173X
                        174X **     COMMAND INSTRUCTION BITS.
                        175X
000.100                 176X UCI.IR EQU     01000000B       INTERNAL RESET
000.040                 177X UCI.RO EQU     00100000B       READER-ON CONTROL FLAG
000.020                 178X UCI.ER EQU     00010000B       ERROR RESET
000.004                 179X UCI.RE EQU     00000100B       RECEIVE ENABLE
000.002                 180X UCI.IE EQU     00000010B       ENABLE INTERRUPTS FLAG
000.001                 181X UCI.TE EQU     00000001B       TRANSMIT ENABLE
                        182X
                        183X **     STATUS READ COMMAND BITS.
                        184X
000.100                 185X USR.BD EQU     01000000B       Break Detect                    /80.08,sc/
000.040                 186X USR.FE EQU     00100000B       FRAMING ERROR
000.020                 187X USR.OE EQU     00010000B       OVERRUN ERROR
000.010                 188X USR.PE EQU     00001000B       PARITY ERROR
000.004                 189X USR.TXE EQU    00000100B       TRANSMITTER EMPTY
000.002                 190X USR.RXR EQU    00000010B       RECEIVER READY
000.001                 191X USR.TXR EQU    00000001B       TRANSMITTER READY
000.033                 192         XTEXT   MTR
```

```
                        195X **     MTR - PAM/8 EQUIVALENCES.
                        196X *
                        197X *      THIS DECK CONTAINS SYMBOLIC DEFINITIONS USED TO
                        198X *      MAKE USE OF THE PAM/8 CODE AND CONTROL BYTES.


                        200X **     IO PORTS
                        201X
    000.360             202X IP.PAD  EQU     360Q           PAD INPUT PORT
    000.360             203X OP.CTL  EQU     360Q           CONTROL OUTPUT PORT
    000.360             204X OP.DIG  EQU     360Q           DIGIT SELECT OUTPUT PORT
    000.361             205X OP.SEG  EQU     361Q           SEGMENT SELECT OUTPUT PORT
    000.362             206X IP.CON  EQU     362Q           H-88/H-89/HA-8-8 Confisuration  /80.07.sc/
    000.362             207X OP2.CTL EQU     362Q           H-88/H-89/HA-8-8 Control Port   /80.07.sc/


                        209X **     FRONT PANEL CONTROL BITS.                              /80.07.sc/
                        210X *
                        211X *      CB.*  set in OP.CTL
                        212X *      CB2.* set in OP2.CTL
                        213X *
                        214X
    000.020             215X CB.SSI  EQU     00010000B      SINGLE STEP INTERRUPT
    000.040             216X CB.MTL  EQU     00100000B      MONITOR LIGHT
    000.100             217X CB.CLI  EQU     01000000B      CLOCK INTERRUPT ENABLE
    000.200             218X CB.SPK  EQU     10000000B      SPEAKER ENABLE
                        219X
    000.001             220X CB2.SSI EQU     00000001B      Single Step Interrupt
    000.002             221X CB2.CLI EQU     00000010B      Clock Interrupt Enable
    000.040             222X CB2.ORG EQU     00100000B      ORG 0 Select
    000.100             223X CB2.SID EQU     01000000B      Side 1 Select


                        225X **     Secondary Control Bits
                        226X


                        228X **     MONITOR MODE FLAGS.
                        229X
    000.000             230X DM.MR   EQU     0              MEMORY READ
    000.001             231X DM.MW   EQU     1              MEMORY WRITE
    000.002             232X DM.RR   EQU     2              REGISTER READ
    000.003             233X DM.RW   EQU     3              REGISTER WRITE
```

```
                        235X **     USER OPTION BITS.
                        236X *
                        237X *      THESE BITS ARE SET IN CELL .MFLAG.
                        238X
000.200                 239X UO.HLT EQU     10000000B       DISABLE HALT PROCESSING
000.100                 240X UO.NFR EQU     CB.CLI          NO REFRESH OF FRONT PANEL
000.002                 241X UO.DDU EQU     00000010B       DISABLE DISPLAY UPDATE
000.001                 242X UO.CLK EQU     00000001B       ALLOW PRIVATE INTERRUPT PROCESSING


                        244X **     MONITOR IDENTIFICATION FLAGS
                        245X *
                        246X *      THESE BYTES IDENTIFY THE ROM MONITOR.
                        247X *      THEY ARE THE VARIOUS VALUES OF LOCATION .IDENT
                        248X
000.021                 249X M.PAM8 EQU     021Q            'LXI' INSTRUCTION AT 000.000 IN PAM-8
000.303                 250X M.FOX  EQU     303Q            'JMP' INSTRUCTION AT 000.000 IN FOX ROM


                        252X **     Configuration Flags                                 /80.07.sc/
                        253X *
                        254X *      These bits are read in IP.CON.
                        255X *
                        256X
000.003                 257X CN.174M EQU    00000011B       Port 174Q Device-Type Mask
000.014                 258X CN.170M EQU    00001100B       Port 170Q Device-Type Mask
000.020                 259X CN.PRI  EQU    00010000B       Primary/Secondary:  1=>Primary == 170Q
000.040                 260X CN.MEM  EQU    00100000B       Memory Test/Normal Switch:  0=>Test; 1=>Normal
000.100                 261X CN.BAU  EQU    01000000B       Baud Rate:  0=>9600; 1=>19,200
000.200                 262X CN.ABO  EQU    10000000B       Auto-Boot:  1=>Auto-Boot
                        263X
000.000                 264X CND.H17 EQU    00B             H-17 Disk,              Valid only in CN.174M
000.000                 265X CND.NDI EQU    00B             No Device Installed,    Valid only in CN.170M
000.001                 266X CND.H47 EQU    01B             H-47 Disk


                        268X **     ROUTINE ENTRY POINTS.
                        269X *
                        270X
000.000                 271X .IDENT  EQU    0000A           IDENTIFICATION LOCATION
000.053                 272X .DLY    EQU    0053A           DELAY
001.267                 273X .LOAD   EQU    1267A           TAPE LOAD
001.374                 274X .DUMP   EQU    1374A           TAPE DUMP
002.136                 275X .ALARM  EQU    2136A           ALARM ROUTINE
002.140                 276X .HORN   EQU    2140A           HORN
002.172                 277X .CTC    EQU    2172A           CHECK TAPE CHECKSUM
002.205                 278X .TPERR  EQU    2205A           TAPE ERROR ROUTINE
002.264                 279X .PCHL   EQU    2264A           PCHL INSTRUCTION
002.265                 280X .SRS    EQU    2265A           SCAN RECORD START
002.325                 281X .RNP    EQU    2325A           READ NEXT PAIR
002.331                 282X .RNB    EQU    2331A           READ NEXT BYTE
```

```
002.347          283X .CRC    EQU   2347A     CRC-16 CALCULATOR
003.017          284X .WNP    EQU   3017A     WRITE NEXT PAIR
003.024          285X .WNB    EQU   3024A     WRITE NEXT BYTE
003.122          286X .DOD    EQU   3122A     DECODE FOR OCTAL DISPLAY
003.260          287X .RCK    EQU   3260A     READ CONSOLE KEYSET
003.356          288X .DODA   EQU   3356A     SEGMENT CODE TABLE


                 290X **      RAM CELLS USED BY H8MTR.
                 291X *
                 292X
040.000          293X .START  EQU   40000A    START DUMP ADDRESS
040.002          294X .IOWRK  EQU   40002A    IN OR OUT INSTRUCTION
040.005          295X .REGI   EQU   40005A    DISPLAYED REGISTER INDEX
040.006          296X .DSPROT EQU   40006A    PERIOD FLAG BYTE
040.007          297X .DSPMOD EQU   40007A    DISPLAY MODE
040.010          298X .MFLAG  EQU   40010A    USER OPTION BYTE
040.011          299X .CTLFLG EQU   40011A    PANEL CONTROL BYTE
040.013          300X .ALEDS  EQU   40013A    ABUSS LEDS
040.021          301X .DLEDS  EQU   40021A    DBUSS LEDS
040.024          302X .ABUSS  EQU   40024A    ABUSS REGISTER
040.027          303X .CRCSUM EQU   40027A    CRCSUM WORD
040.031          304X .TPERRX EQU   40031A    TAPE ERROR EXIT VECTOR
040.033          305X .TICCNT EQU   40033A    CLOCK TICK COUNTER
040.035          306X .REGPTR EQU   40035A    REGISTER POINTER
040.037          307X .UIVEC  EQU   40037A    USER INTERRUPT VECTORS
040.064          308X .NMIRET EQU   40064A    H88/H89 NMI Return Address      /80.07.sc/
040.066          309X .CTL2FL EQU   40066A    OP2.CTL Control Byte            /80.07.sc/
000.033          310          XTEXT ECDEF


                 312X **      ERROR CODE DEFINITIONS.
                 313X
000.000          314X         ORG   0
000.000          315X         DS    1       NO ERROR #0
000.001          316X EC.EOF  DS    1       END OF FILE
000.002          317X EC.EOM  DS    1       END OF MEDIA
000.003          318X EC.ILC  DS    1       ILLEGAL SYSCALL CODE
000.004          319X EC.CNA  DS    1       CHANNEL NOT AVAILABLE
000.005          320X EC.DNS  DS    1       DEVICE NOT SUITABLE
000.006          321X EC.IDN  DS    1       ILLEGAL DEVICE NAME
000.007          322X EC.IFN  DS    1       ILLEGAL FILE NAME
000.010          323X EC.NRD  DS    1       NO ROOM FOR DEVICE DRIVER
000.011          324X EC.FNO  DS    1       CHANNEL NOT OPEN
000.012          325X EC.ILR  DS    1       ILLEGAL REQUEST
000.013          326X EC.FUC  DS    1       FILE USAGE CONFLICT
000.014          327X EC.FNF  DS    1       FILE NAME NOT FOUND
000.015          328X EC.UND  DS    1       UNKNOWN DEVICE
000.016          329X EC.ICN  DS    1       ILLEGAL CHANNEL NUMBER
000.017          330X EC.DIF  DS    1       DIRECTORY FULL
000.020          331X EC.IFC  DS    1       ILLEGAL FILE CONTENTS
000.021          332X EC.NEM  DS    1       NOT ENOUGH MEMORY
000.022          333X EC.RF   DS    1       READ FAILURE
000.023          334X EC.WF   DS    1       WRITE FAILURE
```

```
000.024                 335X EC.WPV  DS    1         WRITE PROTECTION VIOLATION
000.025                 336X EC.WP   DS    1         DISK WRITE PROTECTED
000.026                 337X EC.FAF  DS    1         FILE ALREADY PRESENT
000.027                 338X EC.DDA  DS    1         DEVICE DRIVER ABORT
000.030                 339X EC.FL   DS    1         FILE LOCKED
000.031                 340X EC.FAO  DS    1         FILE ALREADY OPEN
000.032                 341X EC.IS   DS    1         ILLEGAL SWITCH
000.033                 342X EC.UUN  DS    1         UNKNOWN UNIT NUMBER
000.034                 343X EC.FNR  DS    1         FILE NAME REQUIRED
000.035                 344X EC.DIW  DS    1         DEVICE IS NOT WRITABLE (OR WRITE LOCKED)
000.036                 345X EC.UNA  DS    1         UNIT NOT AVAILABLE
000.037                 346X EC.ILV  DS    1         ILLEGAL VALUE
000.040                 347X EC.ILO  DS    1         ILLEGAL OPTION
000.041                 348X EC.VPM  DS    1         VOLUME PRESENTLY MOUNTED ON DEVICE
000.042                 349X EC.NVM  DS    1         NO VOLUME PRESENTLY MOUNTED
000.043                 350X EC.FOD  DS    1         FILE OPEN ON DEVICE
000.044                 351X EC.NPM  DS    1         NO PROVISIONS MADE FOR REMOUNTING MORE DISKS
000.045                 352X EC.DNI  DS    1         DISK NOT INITIALIZED
000.046                 353X EC.DNR  DS    1         DISK IS NOT READABLE
000.047                 354X EC.DSC  DS    1         DISK STRUCTURE IS CORRUPT
000.050                 355X EC.NCV  DS    1         NOT CORRECT VERSION OF HDOS
000.051                 356X EC.NOS  DS    1         NO OPERATING SYSTEM MOUNTED
000.052                 357X EC.IOI  DS    1         ILLEGAL OVERLAY INDEX
000.053                 358X EC.OTL  DS    1         OVERLAY TO LARGE
000.054                 359          XTEXT OVLDEF

                        361X **      OVERLAY TABLE ENTRYS.
                        362X
000.000                 363X         ORG   0
                        364X
000.000                 365X OVL.COD DS    2         FIRST SECTOR OF OVERLAY CODE
000.002                 366X OVL.SIZ DS    2         OVERLAY SIZE
000.004                 367X OVL.ENT DS    2         OVERLAY ENTRY POINT
000.006                 368X OVL.FLB DS    1         OVERLAY FLAG BYTE
000.007                 369X         DS    1         DUMMY BYTE TO ROUND TABLE SIZE UP TO 8
000.010                 370X OVL.ENS EQU   *         OVERLAY ENTRY SIZE
                        371X
                        372X *       OVERLAY INDICES
                        373X
000.000                 374X         ORG   0
                        375X
000.000                 376X OVL0    DS    1
000.001                 377X OVL1    DS    1
000.002                 378          XTEXT DDFDEF
```

```
                    380X **     DIRECTORY DEVICE FORMAT DEFINITION.                    /80.09.sc/
                    381X *
                    382X *      Modified:       Sep-80
                    383X *                       No longer require 2 sectors per group
                    384X *                       Reserved Group Table dynamically allocated
                    385X *
                    386X
000.000             387X        ORG     0
                    388X
000.000             389X DDF.BOO DS     9               2K BOOT PROGRAM
000.011             390X DDF.BOL EQU    *               LENGTH OF BOOT
000.011             391X DDF.LAB DS     1               LABEL SECTOR
000.012             392X DDF.USR DS     0               BEGINNING OF OPEN SPACE
000.012             393          XTEXT  DIRDEF


                    395X **     DIRECTORY ENTRY FORMAT.
                    396X
000.000             397X        ORG     0
                    398X
                    399X
000.377             400X DF.EMP  EQU    377Q            FLAGS ENTRY EMPTY
000.376             401X DF.CLR  EQU    376Q            FLAGS ENTRY EMPTY, REST OF DIR ALSO CLEAR
                    402X
000.000             403X DIR.NAM DS     8               NAME
000.010             404X DIR.EXT DS     3               EXTENSION
000.013             405X DIR.PRO DS     1               PROJECT
000.014             406X DIR.VER DS     1               VERSION
000.015             407X DIRIDL  EQU    *               FILE IDENTIFICATION LENGTH
                    408X
000.015             409X DIR.CLU DS     1               CLUSTER FACTOR
000.016             410X DIR.FLG DS     1               FLAGS
000.017             411X         DS     1               RESERVED
000.020             412X DIR.FGN DS     1               FIRST GROUP NUMBER
000.021             413X DIR.LGN DS     1               LAST GROUP NUMBER
000.022             414X DIR.LSI DS     1               LAST SECTOR INDEX (IN LAST GROUP)
000.023             415X DIR.CRD DS     2               CREATION DATE
000.025             416X DIR.ALD DS     2               LAST ALTERATION DATE
                    417X
000.027             418X DIRELEN EQU    *               DIRECTORY ENTRY LENGTH
000.027             419          XTEXT  LABDEF


                    421X **     DISK LABEL SECTOR FORMATS.
                    422X
000.000             423X        ORG     0
000.000             424X LAB.SER DS     1               SERIAL NUMBER OF VOLUME
000.001             425X LAB.IND DS     2               INITIALIZATION DATE
000.003             426X LAB.DIS DS     2               SECTOR NUMBER OF 1ST DIRECTORY SECTOR
000.005             427X LAB.GRT DS     2               INDEX OF GRT SECTOR
000.007             428X LAB.SPG DS     1               SECTORS PER GROUP
                    429X
000.000             430X LAB.DAT EQU    0               DATA VOLUME ONLY
000.001             431X LAB.SYS EQU    1               SYSTEM VOLUME
```

```
000.002                 432X LAB.NOD EQU     2              => LAB.NOD MEANS VOLUME HAS NO DIRECTORY
                        433X
000.010                 434X LAB.VLT DS      1              VOLUME TYPE
000.011                 435X LAB.VER DS      1              VERSION OF INIT17 THAT INITED DISK
                        436X
000.012                 437X LAB.RGT DS      2              RGT sector number                  /80.06.sc/
                        438X
000.014                 439X LAB.VPR EQU     *              Volume dependant data              /80.05.sc/
000.014                 440X LAB.SIZ DS      2               Volume Size (Bytes/256)           /80.05.sc/
000.016                 441X LAB.PSS DS      2               Physical Sector Size              /80.05.sc/
000.020                 442X LAB.VFL DS      1               Volume dependant Flags            /80.09.sc/
000.001                 443X VFL.NSD EQU     00000001B        Number of Sides:  1 => 2         /80.09.sc/
000.005                 444X LAB.VPL EQU     *-LAB.VPR      Length of volume dependant data    /80.05.sc/
                        445X
000.000                 446X         ERRMI   5-LAB.VPL                                         /80.05.sc/
000.021                 447X         DS      5-LAB.VPL      Reserved                           /80.05.sc/
                        448X
000.021                 449X LAB.LAB DS      60             LABEL
000.074                 450X LAB.LBL EQU     *-LAB.LAB      LABEL LENGTH
000.115                 451X         DS      2              Reserved for 0 bytes               /80.09.sc/
                        452X
000.117                 453X LAB.AUX EQU     *              Auxiliary Data                     /80.09.sc/
000.117                 454X LAB.SPT DS      1               Sectors per Track                 /80.09.sc/
000.001                 455X LAB.AXL EQU     *-LAB.AUX      Length of Aux. Data                /80.09.sc/
000.120                 456          XTEXT   DISDEF


                        458X **      DIRECTORY BLOCK FORMAT.
                        459X **
000.000                 460X         ORG     0
                        461X
000.000                 462X DIS.ENT EQU     *              FIRST ENTRY ADDRESS
000.000                 463X         DS      22*DIRELEN     22 DIRECTORY ENTRYS PER BLOCK
001.372                 464X         DS      1              0 BYTE = END OF ENTRYS IN THIS BLOCK
                        465X
001.373                 466X         ORG     512-5          AT END OF BLOCK
001.373                 467X DIS.ENL DS      1              LENGTH OF EACH ENTRY (=DIRELEN)
001.374                 468X DIS.SEC DS      2              BLOCK # OF THIS BLOCK,
001.376                 469X DIS.LNK DS      2              BLOCK # OF NEXT BLOCK, =0 IF THIS IS LAST
002.000                 470          XTEXT   FILDEF


                        472X **      FILDEF - FILE TYPE DEFINITIONS.
                        473X *
                        474X *       DB      377Q,FT.XXX
                        475X
                        476X
000.000                 477X FT.ABS  EQU     0              ABSOLUTE BINARY
000.001                 478X FT.PIC  EQU     1              POSITION INDEPENDANT CODE
000.002                 479X FT.REL  EQU     2              RELOCATABLE CODE
000.003                 480X FT.BAC  EQU     3              COMPILED BASIC CODE
002.000                 481          XTEXT   DDDEF
```

```
                        483X **      DEVICE DRIVER COMMUNICATION FLAGS.
                        484X *
                        485X
000.000                 486X         ORG    0
                        487X
000.000                 488X DC.REA  DS     1           READ
000.001                 489X DC.WRI  DS     1           WRITE
000.002                 490X DC.RER  DS     1           READ REGARDLESS
000.003                 491X DC.OPR  DS     1           OPEN FOR READ
000.004                 492X DC.OPW  DS     1           OPEN FOR WRITE
000.005                 493X DC.OPU  DS     1           OPEN FOR UPDATE
000.006                 494X DC.CLO  DS     1           CLOSE
000.007                 495X DC.ABT  DS     1           ABORT
000.010                 496X DC.MOU  DS     1           MOUNT DEVICE
000.011                 497X DC.LOD  DS     1           LOAD DEVICE DRIVER
000.012                 498X DC.RDY  DS     1           Device Ready                /80.04.GC/
000.013                 499X DC.MAX  DS     1           MAXIMUM ENTRY INDEX
000.014                 500          XTEXT  HOSDEF


                        502X **      HOSDEF - DEFINE HOS PARAMETER.
                        503X *
                        504X
                        505X
000.040                 506X VERS    EQU    2*16+0      VERSION 2.0
                        507X
000.377                 508X SYSCALL EQU    377Q        SYSCALL INSTRUCTION
                        509X
                        510X
000.000                 511X         ORG    0
                        512X
                        513X *       RESIDENT FUNCTIONS
                        514X
000.000                 515X .EXIT   DS     1           EXIT (MUST BE FIRST)
000.001                 516X .SCIN   DS     1           SCIN
000.002                 517X .SCOUT  DS     1           SCOUT
000.003                 518X .PRINT  DS     1           PRINT
000.004                 519X .READ   DS     1           READ
000.005                 520X .WRITE  DS     1           WRITE
000.006                 521X .CONSL  DS     1           SET/CLEAR CONSOLE OPTIONS
000.007                 522X .CLRCO  DS     1           CLEAR CONSOLE BUFFER
000.010                 523X .LOADO  DS     1           LOAD AN OVERLAY
000.011                 524X .VERS   DS     1           RETURN HDOS VERSION NUMBER
000.012                 525X .SYSRES DS     1           PRECEDING FUNCTIONS ARE RESIDENT
                        526X
                        527X
                        528X *       *HDOSOVL0.SYS*  FUNCTIONS
                        529X
000.040                 530X         ORG    40A
                        531X
000.040                 532X .LINK   DS     1           LINK  (MUST BE FIRST)
000.041                 533X .CTLC   DS     1           CTL-C
000.042                 534X .OPENR  DS     1           OPENR
000.043                 535X .OPENW  DS     1           OPENW
000.044                 536X .OPENU  DS     1           OPENU
```

```
000.045                537X .OPENC  DS      1               OPENC
000.046                538X .CLOSE  DS      1               CLOSE
000.047                539X .POSIT  DS      1               POSITION
000.050                540X .DELET  DS      1               DELETE
000.051                541X .RENAM  DS      1               RENAME
000.052                542X .SETTP  DS      1               SETTOP
000.053                543X .DECODE DS      1               NAME DECODE
000.054                544X .NAME   DS      1               GET FILE NAME FROM CHANNEL
000.055                545X .CLEAR  DS      1               CLEAR CHAN
000.056                546X .CLEARA DS      1               CLEAR ALL CHANS
000.057                547X .ERROR  DS      1               LOOKUP ERROR
000.060                548X .CHFLG  DS      1               CHANGE FLAGS
000.061                549X .DISMT  DS      1               FLAG SYSTEM DISK DISMOUNTED
000.062                550X .LOADD  DS      1               LOAD DEVICE DRIVER
000.063                551X .OPEN   DS      1               Parametrized Open
                       552X
                       553X
                       554X *       *HDOSOVL1.SYS*  FUNCTIONS
                       555X
000.200                556X         ORG     200Q
                       557X
000.200                558X .MOUNT  DS      1               MOUNT  (MUST BE FIRST)
000.201                559X .DMOUN  DS      1               DISMOUNT
000.202                560X .MONMS  DS      1               MOUNT/NO MESSAGE
000.203                561X .DMNMS  DS      1               DISMOUNT/NO MESSAGE
000.204                562X .RESET  DS      1               RESET = DISMOUNT/MOUNT OF UNIT
000.205                563X .CLEAN  DS      1               Clean device
000.206                564X .DAD    DS      1               Dismount All Disks              /80.08,sc/
000.207                565          XTEXT   HOSEQU


                       567X **      HDOS SYSTEM EQUIVALENCES.
                       568X *
                       569X
024.000                570X S.GRT0  EQU     24000A          SYSTEM AREA FOR  GRT0
025.000                571X S.GRT1  EQU     25000A          SYSTEM AREA FOR  GRT1
026.000                572X S.GRT2  EQU     26000A          SYSTEM AREA FOR  GRT2
                       573X
030.000                574X ROMBOOT EQU     30000A          ROM BOOT ENTRY
                       575X
040.100                576X         ORG     40100A          FREE SPACE FROM PAM-8
                       577X
040.100                578X         DS      8               JUMP TO SYSTEM EXIT
040.110                579X D.CON   DS      16              DISK CONSTANTS
040.130                580X SYDD    EQU     *               SYSTEM DISK ENTRY POINT
040.130                581X D.VEC   DS      24*3            SYSTEM ROM ENTRY VECTORS
040.240                582X D.RAM   DS      31              SYSTEM ROM WORK AREA
040.277                583X S.VAL   DS      36              SYSTEM VALUES
040.343                584X S.INT   DS      115             SYSTEM INTERNAL WORK AREAS
041.126                585X         DS      16
041.146                586X S.SOVR  DS      2               STACK OVERFLOW WARNING
041.150                587X         DS      42200A-*        SYSTEM STACK
001.032                588X STACKL  EQU     *-S.SOVR        STACK SIZE
                       589X
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042.200                590X STACK   EQU     *               LWA+1 SYSTEM STACK
042.200                591X USERFWA EQU     *               USER FWA
042.200                592          XTEXT   EDCON


                       594X **      D.CON DETAILED EQUIVALENCES.
                       595X *
                       596X *       HOSEQU MUST BE MODIFIED WHEN THIS TABLE IS MODIFIED.
                       597X
040.110                598X         ORG     D.CON
                       599X
040.110                600X D.XITA  DS      2               SEE SYSTEM ROM FOR DESCRIPTION
040.112                601X D.WRITA DS      1
040.113                602X D.WRITB DS      1
040.114                603X D.WRITC DS      1
040.115                604X D.MAIA  DS      1
040.116                605X D.LPSA  DS      1
040.117                606X D.SDPA  DS      1
040.120                607X D.SDPB  DS      1
040.121                608X D.STSA  DS      1
040.122                609X D.STSB  DS      1
040.123                610X D.WHDA  DS      1
040.124                611X D.WNHA  DS      1
040.125                612X D.WSCA  DS      1
                       613X
040.126                614X D.ERTS  DS      2               TRACK AND SECTOR OF LAST DISK ERRORS
040.130                615          XTEXT   EDRAM


                       617X **      EDRAM - DISK RAM WORKAREA DEFINITION.
                       618X *
                       619X *       ZEROED UPON BOOTING UP.
                       620X *
                       621X *       HOSEQU MUST BE CHANGED WHEN THIS DECK IS CHANGED.
                       622X
                       623X
040.240                624X         ORG     D.RAM
                       625X
040.240                626X D.TT    DS      1               TARGET TRACK (CURRENT OPERATION)
040.241                627X D.TS    DS      1               TARGET SECTOR (CURRENT OPERATION)
                       628X
040.242                629X D.DVCTL DS      1               DEVICE CONTROL BYTE
                       630X
040.243                631X D.DLYMO DS      1               MOTOR ON DELAY COUNT
040.244                632X D.DLYHS DS      1               HEAD SETTLE DELAY COUNTER
                       633X
040.245                634X D.TRKPT DS      2               ADDRESS IN D.DRVTB FOR TRACK NUMBER
040.247                635X D.VOLPT DS      2               ADDRESS IN D.DRVTB FOR VOLUME NUMBER
                       636X
040.251                637X D.DRVTB DS      2*4             TRACK NUMBER AND VOLUME NUMBER FOR 4 DRIVES
                       638X
040.261                639X D.HECNT DS      1               HARD ERROR COUNT
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040.262                 640X D.SECNT DS      2              SOFT ERROR COUNT
040.264                 641X D.OECNT DS      1              OPERATION ERROR COUNT
                        642X
                        643X *       GLOBAL DISK ERROR COUNTERS
                        644X
040.265                 645X D.ERR   DS      0              BEGINNING OF ERROR BLOCK
040.265                 646X D.E.MDS DS      1              MISSING DATA SYNC
040.266                 647X D.E.HSY DS      1              MISSING HEADER SYNC
040.267                 648X D.E.CHK DS      1              DATA CHECKSUM
040.270                 649X D.E.HCK DS      1              HEADER CHECKSUM
040.271                 650X D.E.VOL DS      1              WRONG VOLUME NUMBER
040.272                 651X D.E.TRK DS      1              BAD TRACK SEEK
040.273                 652X D.ERRL  DS      0              LIMIT OF ERROR COUNTERS
                        653X
                        654X *       I/O OPERATION COUNTS
                        655X
040.273                 656X D.OPR   DS      2
040.275                 657X D.OPW   DS      2
                        658X
000.037                 659X D.RAML  EQU     *-D.RAM
040.277                 660          XTEXT   ESVAL


                        662X **      S.VAL - SYSTEM VALUE DEFINTIONS.
                        663X *
                        664X *       THESE VALUES ARE SET AND MAINTAINED BY THE SYSTEM.
                        665X *
                        666X *       THE DECK HOSEQU MUST BE MODIFIED WHEN THIS IS MODIFIED.
                        667X
                        668X
040.277                 669X         ORG     S.VAL
                        670X
040.277                 671X S.DATE  DS      9              SYSTEM DATE (IN ASCII)
040.310                 672X S.DATC  DS      2              CODED DATE
040.312                 673X S.TIME  DS      4              TIME FROM MIDNIGHT (IN TICS)
040.316                 674X S.HIMEM DS      2              HARDWARE HIGH MEMORY ADRESS+1
                        675X
040.320                 676X S.SYSM  DS      2              FWA RESIDENT SYSTEM
                        677X
040.322                 678X S.USRM  DS      2              LWA USER MEMORY
                        679X
040.324                 680X S.OMAX  DS      2              MAX OVERLAY SIZE FOR SYSTEM
                        681X
                        682X
                        683X **      THE FOLLOWING FIVE CELLS SHOULD BE MODIFIED/READ ONLY VIA THE .CONSL SYSCALL
                        684X
000.200                 685X CSL.ECH EQU     10000000B      SUPPRESS ECHO
000.004                 686X CSL.RAW EQU     00000100B      Raw Mode I/O                    /80.09,sc/
000.002                 687X CSL.WRP EQU     00000010B      WRAP LINES AT WIDTH
000.001                 688X CSL.CHR EQU     00000001B      OPERATE IN CHARACTER MODE
                        689X
000.000                 690X I.CSLMD EQU     0              S.CSLMD IS FIRST BYTE
040.326                 691X S.CSLMD DS      1              CONSOLE MODE
                        692X
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000.200                 693X CTP.BKS EQU     10000000B      TERMINAL PROCESSES BACKSPACES
000.100                 694X CTP.FF  EQU     01000000B      Terminal Processes Form-Feed    /80.09.sc/
000.040                 695X CTP.MLI EQU     00100000B      MAP LOWER CASE TO UPPER ON INPUT
000.020                 696X CTP.MLO EQU     00010000B      MAP LOWER CASE TO UPPER ON OUTPUT
000.010                 697X CTP.2SB EQU     00001000B      TERMINAL NEEDS TWO STOP BITS
000.002                 698X CTP.BKM EQU     00000010B      MAP BKSP (UPON INPUT) TO RUBOUT
000.001                 699X CTP.TAB EQU     00000001B      TERMINAL SUPPORTS TAB CHARACTERS
                        700X
000.001                 701X I.CONTY EQU     1              S.CONTY IS 2ND BYTE
000.000                 702X         ERRNZ   *-S.CSLMD-I.CONTY
040.327                 703X S.CONTY DS      1              CONSOLE TYPE FLAGS
000.002                 704X I.CUSOR EQU     2              S.CUSOR IS 3RD BYTE
000.000                 705X         ERRNZ   *-S.CSLMD-I.CUSOR
040.330                 706X S.CUSOR DS      1              CURRENT CURSOR POSITION
000.003                 707X I.CONWI EQU     3              S.CONWI IS 4TH BYTE
000.000                 708X         ERRNZ   *-S.CSLMD-I.CONWI
040.331                 709X S.CONWI DS      1              CONSOLE WIDTH
                        710X
000.001                 711X CO.FLG  EQU     00000001B      CTL-O FLAG
000.200                 712X CS.FLG  EQU     10000000B      CTL-S FLAG
                        713X
000.004                 714X I.CONFL EQU     4              S.CONFL IS 5TH BYTE
000.000                 715X         ERRNZ   *-S.CSLMD-I.CONFL
040.332                 716X S.CONFL DS      1              CONSOLE FLAGS
                        717X
040.333                 718X S.CAADR DS      2              ADDRESS FOR ABORT PROCESSING (>256 IF VALID)
040.335                 719X S.CCTAB DS      6              ADDR FOR CTL-A, CTL-B, CTL-C PROCESSING
040.343                 720          XTEXT   ESINT



                        722X **      S.INT - SYSTEM INTERNAL WORKAREA DEFINITIONS.
                        723X *
                        724X *       THESE CELLS ARE REFERENCED BY OVERLAYS AND MAIN CODE, AND
                        725X *       MUST THEREFORE RESIDE IN FIXED LOW MEMORY.
                        726X
                        727X
040.343                 728X         ORG     S.INT
                        729X
                        730X **      CONSOLE STATUS FLAGS
                        731X
040.343                 732X S.CDB   DS      1              CONSOLE DESCRIPTOR BYTE
000.000                 733X CDB.H85 EQU     00000000B
000.001                 734X CDB.H84 EQU     00000001B      =0 IF H8-5, =1 IF H8-4
040.344                 735X S.BAUD  DS      2              [0-14]  H8-4 BAUD RATE, =0 IF H8-5
                        736X *                              [15]    =1 IF BAUD RATE => 2 STOP BITS
                        737X
                        738X **      TABLE ADDRESS WORDS
                        739X
040.346                 740X S.DLINK DS      2              ADDRESS OF DATA IN HDOS CODE
040.350                 741X S.OFWA  DS      2              FWA  OVERLAY  TABLE
040.352                 742X S.CFWA  DS      2              FWA  CHANNEL  TABLE
040.354                 743X S.DFWA  DS      2              FWA  DEVICE   TABLE
040.356                 744X S.RFWA  DS      2              FWA  RESIDENT HDOS CODE
                        745X
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                    746X **      DEVICE DRIVER DELAYED LOAD FLAGS
                    747X
      040.360       748X S.DDLDA DS    2            DRIVER LOAD ADDRESS (HIGH BYTE=0 IF NO LOAD PENDING)
      040.362       749X S.DDLEN DS    2            CODE LENGTH IN BYTES
      040.364       750X S.DDGRP DS    1            GROUP NUMBER FOR DRIVER
      040.365       751X         DS    1            HOLD PLACE
                    752X *S.DDSEC      DS    2            SECTOR NUMBER FOR DRIVER ( * OBSOLETE ! * )
      040.366       753X S.DDDTA DS    2            DEVICE'S ADDRESS IN DEVLST +DEV.RES
      040.370       754X S.DDOPC DS    1            OPEN OPCODE PENDEDING
                    755X
                    756X **      OVERLAY MANAGEMENT FLAGS
                    757X
      000.001       758X OVL.IN  EQU   00000001B    IN MEMORY
      000.002       759X OVL.RES EQU   00000010B    PERMINANTLY RESIDENT
      000.014       760X OVL.NUM EQU   00001100B    OVERLAY NUMBER MASK
      000.200       761X OVL.UCS EQU   10000000B    USER CODE SWAPPED FOR OVERLAY
                    762X
      040.371       763X S.OVLFL DS    1            OVERLAY FLAG
      040.372       764X S.UCSF  DS    2            FWA SWAPPED USER CODE
      040.374       765X S.UCSL  DS    2            LENGTH SWAPPED USER CODE
      040.376       766X S.OVLS  DS    2            SIZE OF OVERLAY CODE
      041.000       767X S.OVLE  DS    2            ENTRY POINT OF OVERLAY CODE
                    768X
      041.002       769X S.SSN   DS    2            SWAP AREA SECTOR NUMBER
      041.004       770X S.OSN   DS    2            OVERLAY SECTOR NUMBER
                    771X
                    772X *       SYSCALL PROCESSING WORK AREAS
                    773X
      041.006       774X S.CACC  DS    1            (ACC) UPON SYSCALL
      041.007       775X S.CODE  DS    1            SYSCALL INDEX IN PROGRESS
                    776X
                    777X *.....JUMPS TO ROUTINES IN RESIDENT HDOS CODE
                    778X
      041.010       779X S.JUMPS DS    0            START OF DUMP VECTORS
      041.010       780X S.SDD   DS    3            JUMP TO STAND-IN DEVICE DRIVER
      041.013       781X S.FASER DS    3            JUMP TO FATSERR (FATAL SYSTEM ERROR)
      041.016       782X S.DIREA DS    3            JUMP TO DIREAD (DISK FILE READ)
      041.021       783X S.FCI   DS    3            JUMP TO FCI (FETCH CHANNEL INFO)
      041.024       784X S.SCI   DS    3            JUMP TO SCI (STORE CHANNEL INFO)
      041.027       785X S.GUP   DS    3            JUMP TO GUP (GET UNIT POINTER)
                    786X
      041.032       787X S.MOUNT DS    1            <>0 IF THE SYSTEM DISK IS MOUNTED
      041.033       788X S.DCS   DS    1            DEFAULT CLUSTER SIZE-1
                    789X
      041.034       790X S.BOOTF DS    1            BOOT FLAGS
      000.001       791X BOOT.P  EQU   00000001B    EXECUTE PROLOGUE UPON BOOTUP
                    792X
                    793X *       STACK VALUE SAVED FOR OVERLAY SYSCALLS
                    794X
      041.035       795X S.OVSTK DS    2            VALUE OF SP UPON SYSCALLS USING OVERLAY
                    796X
      041.037       797X         DS    1            RESERVED
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                        799X **     ACTIVE I/O AREA.
                        800X *
                        801X *      THE AIO.XXX AREA CONTAINS INFORMATION ABOUT THE I/O OPERATION
                        802X *      CURRENTLY BEING PERFORMED. THE INFORMATION IS OBTAINED FROM
                        803X *      THE CHANNEL TABLE, AND WILL BE RESTORED THERE WHEN DONE.
                        804X *
                        805X *      NORMALLY, THE AIO.XXX INFORMATION WOULD BE OBTAINED DIRECTLY
                        806X *      FROM VARIOUS SYSTEM TABLES VIA POINTER REGISTERS. SINCE THE
                        807X *      8080 HAS NO GOOD INDEXED ADDRESSING, THE DATA IS MANUALLY
                        808X *      COPIED INTO THE AIO.XXX CELLS BEFORE PROCESSING, AND
                        809X *      BACKDATED AFTER PROCESSING.
                        810X
041.040                 811X AIO.VEC DS     3           JUMP INSTRUCTION
041.041                 812X AIO.DDA EQU    *-2         DEVICE DRIVER ADDRESS
041.043                 813X AIO.FLG DS     1           FLAG BYTE
041.044                 814X AIO.GRT DS     2           ADDRESS OF GROUP RESERV TABLE
041.046                 815X AIO.SPG DS     1           SECTORS PER GROUP
041.047                 816X AIO.CGN DS     1           CURRENT GROUP NUMBER
041.050                 817X AIO.CSI DS     1           CURRENT SECTOR INDEX
041.051                 818X AIO.LGN DS     1           LAST GROUP NUMBER
041.052                 819X AIO.LSI DS     1           LAST SECTOR INDEX
041.053                 820X AIO.DTA DS     2           DEVICE TABLE ADDRESS
041.055                 821X AIO.DES DS     2           DIRECTORY SECTOR
041.057                 822X AIO.DEV DS     2           DEVICE CODE
041.061                 823X AIO.UNI DS     1           UNIT NUMBER (0-9)
                        824X
041.062                 825X AIO.DIR DS     DIRELEN     DIRECTORY ENTRY
                        826X
041.111                 827X AIO.CNT DS     1           SECTOR COUNT
041.112                 828X AIO.EOM DS     1           END OF MEDIA FLAG
041.113                 829X AIO.EOF DS     1           END OF FILE FLAG
041.114                 830X AIO.TFP DS     2           TEMP FILE POINTERS
041.116                 831X AIO.CHA DS     2           ADDRESS OF CHANNEL BLOCK (IOC:DDA)


041.120                 833X S.BDA   DS     1           Boot Device Address (Setup by ROM) /80.09.sc/
041.121                 834X S.SCR   DS     2           SYSTEM SCRATCH AREA ADDRESS
041.123                 835          XTEXT  DEVDEF


                        837X **     DEVICE TABLE ENTRYS.
                        838X
000.000                 839X         ORG    0
                        840X
000.000                 841X DEV.NAM DS     2           DEVICE NAME
000.000                 842X DV.EL   EQU    00000000B   END OF DEVICE LIST FLAG
000.001                 843X DV.NU   EQU    00000001B   DEVICE ENTRY NOT IN USE
                        844X
000.002                 845X DEV.RES DS     1           DRIVER RESIDENSE CODE
000.001                 846X DR.IM   EQU    00000001B   DRIVER IN MEMORY
000.002                 847X DR.PR   EQU    00000010B   DRIVER PERMINANTLY RESIDENT
                        848X
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000.003                 849X DEV.JMP DS      1              JMP TO PROCESSOR
000.004                 850X DEV.DDA DS      2              DRIVER ADDRESS
000.006                 851X DEV.FLG DS      1              FLAG BYTE
000.001                 852X DT.DD   EQU     00000001B      DIRECTORY DEVICE
000.002                 853X DT.CR   EQU     00000010B      CAPABLE OF READ OPERATION
000.004                 854X DT.CW   EQU     00000100B      CAPABLE OF WRITE OPERATION
000.010                 855X DT.RN   EQU     00001000B      Capable of random access        /80.02.8C/
000.020                 856X DT.CH   EQU     00010000B      Capable of Character mode       /80.02.8C/
                        857X
000.007                 858X DEV.MUM DS      1              MOUNTED UNIT MASK
000.010                 859X DEV.MNU DS      1              MAXIMUM NUMBER OF UNITS
000.011                 860X DEV.UNT DS      2              ADDRESS OF UNIT SPECIFIC DATA TABLE
                        861X
000.013                 862X DEV.DVL DS      2              DRIVER BYTE LENGTH
000.015                 863X DEV.DVG DS      1              DRIVER ROUTINE GROUP ADDRESS
                        864X
000.016                 865X DEVELEN EQU     *              DEVICE TABLE ENTRY LENGTH


                        867X **      UNIT SPECIFIC DEVICE DATA TABLE ENTRIES
                        868X
000.000                 869X         ORG     0
                        870X
000.000                 871X UNT.FLG DS      1              UNIT SPECIFIC  *DEV.FLG*
000.001                 872X UNT.SPG DS      1              Sectors Per Group               /80.04.8C/
000.002                 873X UNT.GRT DS      2              ADDRESS OF GROUP RESERVATION TABLE (IF DT.DD)
000.004                 874X UNT.GTS DS      2              GRT SECTOR NUMBER
000.006                 875X UNT.DIS DS      2              DIRECTORY FIRST SECTOR NUMBER
                        876X
000.010                 877X UNT.SIZ EQU     *              SIZE OF UNIT SPECIFIC DATA TABLE PER UNIT
000.010                 878          XTEXT   ABSDEF


                        880X **      ABS FORMAT EQUIVALENCES.
                        881X
000.000                 882X         ORG     0
                        883X
000.000                 884X ABS.ID  DS      1              377Q = BINARY FILE FLAG
000.001                 885X         DS      1              FILE TYPE (FT.ABS)
000.002                 886X ABS.LDA DS      2              LOAD ADDRESS
000.004                 887X ABS.LEN DS      2              LENGTH OF ENTIRE RECORD
000.006                 888X ABS.ENT DS      2              ENTRY POINT
                        889X
000.010                 890X ABS.COD DS      0              CODE STARTS HERE
000.010                 891          XTEXT   MTRDEF
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                        893X **     HDOS MONITOR PRIVATE RAM AREA DEFINITIONS.
                        894X
000.000                 895X        ORG     0
000.000                 896X M.SYSM DS      1           SYSCALL ITTERATION COUNT
000.001                 897X M.SALO DS      1           STAND-ALONE FLAG
000.002                 898X M.CSLC DS      1           LINES IN CONSOLE BUFFER
000.003                 899X M.CPRE DS      1           CONSOLE PREVIOUS CHARACTER
000.004                 900X M.CRUB DS      1           CONSOLE RUBOUT FLAG
000.005                 901X M.CINT DS      1           CONSOLE INTERRUPT FLAG
000.006                 902X M.CIN  DS      2           CONSOLE CB IN POINTER
000.010                 903X M.COUT DS      2           CONSOLE CB OUT POINTER
000.012                 904X M.CFWA DS      2           CONSOLE CB FWA POINTER
000.014                 905X M.CLWA DS      2           CONSOLE CB LWA POINTER
000.016                 906X M.CDLY DS      1           CONSOLE PAD CHARACTER COUNT
000.017                 907X M.CDCA DS      2           ADDRESS OF CHARACTER BEING PADDED
000.021                 908X M.SUNI DS      1           System Unit Number              /80.05.sc/
000.022                 909X M.SYDD DS      2           Address of Raw System Driver    /80.09.sc/


                        911  **     CODE HEADERS FOR ABSOLUTE MODE
                        912
042.170                 913         ORG     USERFWA-ABS.COD
042.170  377 000       914         DB      377Q,FT.ABS
042.172  200 042       915         DW      USERFWA
042.174  340 012       916         DW      MEML-USERFWA
042.176  200 042       917         DW      USERFWA         ENTRY
```

```
                          920  ***     SYSXIT - SYSTEM EXIT PROCESSOR.
                          921  *
                          922
                          923
042.200                   924  SYSXIT  EQU     *
                          925
042.200  062 312 042     926          STA     SYSXITA         Save abort flag                 /80.05.sc/
042.203  061 200 042     927          LXI     SP,STACK                                        /80.05.GC/
042.206  315 245 043     928          CALL    PRS             Preset                          /80.05.sc/
                          929
042.211  072 312 042     930          LDA     SYSXITA                                         /80.05.sc/
042.214  247             931          ANA     A
042.215  304 347 043     932          CNZ     PRSCL           PRESET CONSOLE IF SET
                          933
042.220  072 032 041     934  SYSX0   LDA     S.MOUNT                                         /80.04.GC/
042.223  247             935          ANA     A
042.224  312 121 044     936          JZ      SYSCMD          HDOS IS NOT MOUNTED
                          937
042.227  315 130 043     938          CALL    DLM             DE = Low-Water Mark             /80.04.GC/
042.232  353             939          XCHG                                                    /80.04.GC/
042.233  042 320 040     940          SHLD    S.SYSM          set the bottom of HDOS          /80.04.GC/
042.236  315 324 042     941          CALL    CDT             CLEAR DEVICE TABLE
042.241  315 046 043     942          CALL    COT             CLEAR OVERLAY TABLE
                          943
042.244  072 371 040     944          LDA     S.OVLFL                                         /80.04.GC/
042.247  346 001         945          ANI     OVL.IN                                          /80.04.GC/
042.251  312 121 044     946          JZ      SYSCMD          overlay is not even in memory   /80.04.sc/
                          947
042.254  072 371 040     948          LDA     S.OVLFL                                         /80.04.GC/
042.257  346 014         949          ANI     OVL.NUM                                         /80.04.GC/
042.261  007             950          RLC                                                     /80.04.GC/
000.000                   951          ERRNZ   OVL.NUM-00001100B                               /80.04.GC/
000.000                   952          ERRNZ   OVL.ENS-8                                       /80.04.GC/
042.262  052 350 040     953          LHLD    S.OFWA                                          /80.04.GC
042.265  026 000         954          MVI     D,0                                             /80.04.GC/
042.267  137             955          MOV     E,A                                             /80.04.GC/
042.270  031             956          DAD     D               HL = address of overlay entry   /80.04.sc/
                          957
042.271  315 003 054     958          CALL    $INDLB                                          /80.04.GC/
042.274  006 000         959          DW      OVL.FLB                                         /80.04.GC/
042.276  346 001         960          ANI     OVL.IN                                          /80.04.GC/
042.300  302 121 044     961          JNZ     SYSCMD          overlay is really in memory     /80.04.sc/
                          962
042.303  257             963          XRA     A                                               /80.04.GC/
042.304  062 371 040     964          STA     S.OVLFL         CLEAR S.OVLFL
042.307  303 121 044     965          JMP     SYSCMD          SYSTEM COMMAND
                          966
042.312  000             967  SYSXITA DB      0               PSW VALUE
                          968
042.313  123 131 060     969  SYSDEF  DB      'SY0','ABS'     System defaults                 /80.05.sc/
```

```
                                 973  **      CCT - CLEAR CHANNEL TABLE.
                                 974  *
                                 975  *       CCT CLEARS OUT THE CHANNEL TABLE.
                                 976  *
                                 977  *       ENTRY   NONE
                                 978  *       EXIT    NONE
                                 979  *       USES    ALL
                                 980
                                 981
042.321  377 056                 982  CCT     DB      SYSCALL,.CLEARA
042.323  311                     983          RET


                                 985  **      CDT - CLEAR DEVICE TABLE.
                                 986  *
                                 987  *       CDT CLEARS THE DEVICE TABLE.
                                 988  *
                                 989  *       NON-RESIDENT DEVICE DRIVERS ARE DISCARDED,
                                 990  *       DIRECTORY DEVICES ARE ABORTED.
                                 991  *
                                 992  *       ENTRY   NONE
                                 993  *       EXIT    NONE
                                 994  *       USES    ALL
                                 995
                                 996
042.324  052 354 040             997  CDT     LHLD    S.DFWA          (HL) = DEVICE TABLE FWA
                                 998
042.327  176                    999  CDT1    MOV     A,M
042.330  247                   1000          ANA     A
000.000                        1001          ERRNZ   DV.EL
042.331  310                   1002          RZ                      END OF TABLE
                               1003
042.332  345                   1004          PUSH    H               SAVE ADDRESS
                               1005
                               1006  *       HAVE ENTRY
                               1007
042.333  043                   1008          INX     H
042.334  043                   1009          INX     H
000.000                        1010          ERRNZ   DEV.RES-2
042.335  176                   1011          MOV     A,M                                     /80.04.GC/
042.336  346 001               1012          ANI     DR.IM                                   /80.04.GC/
042.340  312 035 043           1013          JZ      CDT3            NOT IN MEMORY           /80.04.GC/
                               1014
042.343  176                   1015          MOV     A,M             (A) = DEV.RES
042.344  346 002               1016          ANI     DR.PR
042.346  302 013 043           1017          JNZ     CDT2            PERMINANTLY RESIDENT
                               1018
042.351  315 234 030           1019          CALL    $INDL           DE = driver entry address  /80.04.GC/
042.354  002 000               1020          DW      DEV.DDA-DEV.RES                         /80.04.GC/
042.356  345                   1021          PUSH    H                                       /80.04.GC/
042.357  052 320 040           1022          LHLD    S.SYSM                                  /80.04.GC/
042.362  315 370 053           1023          CALL    HLCPDE          compare low-water with driver  /80.04.sc/
042.365  341                   1024          POP     H                                       /80.04.GC/
042.366  332 013 043           1025          JC      CDT2            low-water < driver      /80.04.sc/
```

```
042.371  312 013 043  1026          JZ      CDT2            low-water = driver              /80.04.GC/
                      1027
                      1028  *       Clean-Up After this driver                              /80.04.sc/
                      1029
042.374  176          1030          MOV     A,M
042.375  346 376      1031          ANI     377Q-DR.IM
042.377  167          1032          MOV     M,A             CLEAR IN MEMORY
043.000  021 010 041  1033          LXI     D,S.SDD                                         /80.04.sc/
043.003  315 024 054  1034          CALL    $INDS           set the driver entry as pseudo  /80.04.sc/
043.006  002 000      1035          DW      DEV.DDA-DEV.RES                                 /80.04.GC/
043.010  303 035 043  1036          JMP     CDT3            don't abort since not resident  /80.04.sc/
                      1037
                      1038  *       Abort Resident Directory Device Drivers                  /80.04.sc/
                      1039
043.013  315 003 054  1040  CDT2    CALL    $INDLB          A  = device flag                 /80.04.GC/
043.016  004 000      1041          DW      DEV.FLG-DEV.RES                                 /80.04.GC/
043.020  346 001      1042          ANI     DT.DD                                           /80.04.GC/
043.022  312 035 043  1043          JZ      CDT3            not a directory device          /80.04.GC/
                      1044
043.025  315 234 030  1045          CALL    $INDL           DE = device entry               /80.04.GC/
043.030  002 000      1046          DW      DEV.DDA-DEV.RES                                 /80.04.sc/
043.032  353          1047          XCHG
043.033  076 007      1048          MVI     A,DC.ABT
                      1049  *       CALL    PCHL            ABORT IT                        /80.09.sc/
                      1050
                      1051  *       ADVANCE TO NEXT ENTRY
                      1052
043.035  341          1053  CDT3    POP     H               (HL) = ENTRY FWA
043.036  021 016 000  1054          LXI     D,DEVELEN
043.041  031          1055          DAD     D
043.042  303 327 042  1056          JMP     CDT1            DO SOME MORE
                      1057
043.045  351          1058  PCHL    PCHL


                      1060  **      COT     - CLEAR OVERLAY TABLE                           /80.04.GC/
                      1061  *
                      1062  *       COT CLEARS THE OVERLAY TABLE
                      1063  *
                      1064  *       ENTRY:  NONE
                      1065  *       EXIT:   NONE
                      1066  *       USES:   ALL
                      1067  *
                      1068
043.046  052 350 040  1069  COT     LHLD    S.OFWA          (HL) = FIRST WORD OF OVERLAY TABLE
                      1070
043.051  315 064 043  1071          CALL    COT1            check  *HDOSOVL0.SYS*
                      1072
043.054  021 010 000  1073          LXI     D,OVL.ENS
043.057  031          1074          DAD     D
043.060  315 064 043  1075          CALL    COT1
                      1076
043.063  311          1077          RET
                      1078
```

```
043.064  315 003 054  1079  COTI   CALL    $INDLB          A  = flag byte
043.067  006 000      1080         DW      OVL.FLB
043.071  346 003      1081         ANI     OVL.IN+OVL.RES                          /80.08.GC/
043.073  310          1082         RZ                      overlay is not even resident
                      1083
043.074  076 001      1084         MVI     A,OVL.IN                                /80.08.GC/
043.076  315 060 054  1085         CALL    $INDSB          Force overlay only IN Memory /80.08.GC/
043.101  006 000      1086         DW      OVL.FLB                                 /80.08.GC/
                      1087
043.103  315 234 030  1088         CALL    $INDL           DE = overlay entry point
043.106  004 000      1089         DW      OVL.ENT
043.110  345          1090         PUSH    H
043.111  052 320 040  1091         LHLD    S.SYSM
043.114  315 370 053  1092         CALL    HLCPDE          compare low-water and overlay
043.117  341          1093         POP     H
043.120  330          1094         RC                      low-water < overlay
                      1095
043.121  257          1096         XRA     A
043.122  315 060 054  1097         CALL    $INDSB          flag overlay non-resident
043.125  006 000      1098         DW      OVL.FLB
043.127  311          1099         RET


                      1101  **     DLM     -  Determine Low-Water Mark             /80.04.sc/
                      1102  *
                      1103  *      DLM determines the low-water, or lowest address currently used
                      1104  *      by HDOS.  This is important because mass storage device drivers
                      1105  *      must be permanently resident, and anything above them might
                      1106  *      as well be also, since we do not support dynamic buffer allocation.
                      1107  *
                      1108  *      ENTRY:  NONE
                      1109  *
                      1110  *      EXIT:   DE      = Low-Water Mark
                      1111  *
                      1112  *      USES:   ALL
                      1113  *
                      1114
043.130  001 016 000  1115  DLM    LXI     B,DEVELEN       BC = device table entry length
043.133  052 356 040  1116         LHLD    S.RFWA
043.136  353          1117         XCHG                    DE = fwa of resident system
043.137  052 354 040  1118         LHLD    S.DFWA
                      1119
                      1120  *      Scan for resident mass storage device drivers which must be left in
                      1121
043.142  176          1122  DLM1   MOV     A,M
000.000               1123         ERRNZ   DEV.NAM
043.143  247          1124         ANA     A
000.000               1125         ERRNZ   DV.EL
043.144  310          1126         RZ                      at the end of the list
                      1127
043.145  376 001      1128         CPI     DV.NU
043.147  312 241 043  1129         JZ      DLM3            device entry not in use
                      1130
043.152  315 003 054  1131         CALL    $INDLB
```

```
043.155  002 000       1132            DW      DEV.RES
043.157  346 001       1133            ANI     DR.IM
043.161  312 241 043   1134            JZ      DLM3            not resident
                       1135
043.164  315 003 054   1136            CALL    $INDLB
043.167  002 000       1137            DW      DEV.RES
043.171  346 002       1138            ANI     DR.PR
043.173  302 221 043   1139            JNZ     DLM1.5          permanently resident
                       1140
043.176  315 003 054   1141            CALL    $INDLB
043.201  006 000       1142            DW      DEV.FLG
043.203  346 001       1143            ANI     DT.DD
043.205  312 241 043   1144            JZ      DLM3            not a directory device
                       1145
043.210  315 003 054   1146            CALL    $INDLB
043.213  007 000       1147            DW      DEV.MUM
043.215  247           1148            ANA     A
043.216  312 241 043   1149            JZ      DLM3            no units mounted
                       1150
043.221  325           1151  DLM1.5    PUSH    D
043.222  315 234 030   1152            CALL    $INDL           DE = device address
043.225  004 000       1153            DW      DEV.DDA
043.227  343           1154            XTHL                    HL = current water-mark
043.230  315 370 053   1155            CALL    HLCPDE
043.233  332 237 043   1156            JC      DLM2            HL < DE
                       1157
043.236  353           1158            XCHG                    HL <=> DE
043.237  343           1159  DLM2      XTHL
043.240  321           1160            POP     D               DE = new water-mark
                       1161
043.241  011           1162  DLM3      DAD     B               HL = address of next entry
043.242  303 142 043   1163            JMP     DLM1


                       1165  **        PRS     - Preset System                         /80.05.sc/
                       1166  *
                       1167  *         PRS presets the system by initializing system defaults,
                       1168  *         etc.
                       1169  *
                       1170
043.245  377 011       1171  PRS       SCALL   .VERS
043.247  332 327 043   1172            JC      PRS1            ERROR IN GETTING VERSION,
043.252  376 040       1173            CPI     VERS                    PROBABLY NO .VERS CALL
043.254  302 327 043   1174            JNZ     PRS1            NOT THE CORRECT HDOS VERSION FOR THIS SYSCMD
                       1175
043.257  041 321 057   1176            LXI     H,RMEML
043.262  377 052       1177            SCALL   .SETTP
043.264  076 021       1178            MVI     A,EC.NEM
043.266  332 332 043   1179            JC      PRS2            fatal error
                       1180
043.271  076 377       1181            MVI     A,-1
043.273  021 313 042   1182            LXI     D,SYSDEF        save default device
043.276  041 321 056   1183            LXI     H,LABEL         ignore file name
043.301  377 054       1184            SCALL   .NAME           fetch entry device
```

```
                                1185
043.303  001 003 000           1186          LXI     B,3
043.306  021 344 043           1187          LXI     D,PRSA          default extension
043.311  041 316 042           1188          LXI     H,SYSDEF+3
043.314  315 252 030           1189          CALL    $MOVE
                                1190
043.317  076 377               1191          MVI     A,-1
043.321  377 055               1192          SCALL   .CLEAR          CLEAR OVERLAY CHANNEL
043.323  315 321 042           1193          CALL    CCT             CLEAR CHANNEL TABLE
043.326  311                   1194          RET
                                1195
                                1196  *       HDOS VERSION NOT CORRECT, OR ERROR UPON RETURN
                                1197
043.327  076 050               1198  PRS1    MVI     A,EC.NCV        NOT CORRECT VERSION
043.331  067                   1199          STC                     SET ERROR FLAG
                                1200
043.332                         1201  PRS2    EQU     *
                                1202
043.332  046 012               1203  FATERR  MVI     H,NL
043.334  377 057               1204          SCALL   .ERROR
043.336  315 013 041           1205          CALL    S.FASER         FATAL SYSTEM ERROR
043.341  303 000 030           1206          JMP     ROMBOOT         SHOULD NEVER GET HERE!
                                1207
043.344  101 102 123           1208  PRSA    DB      'ABS'           default extension for SYSDEF


                                1210  **      PRSCL - PRESET CONSOLE.
                                1211  *
                                1212  *       PRSCL PRESETS THE CONSOLE UART, SETS THE DEFAULT CONTROL PARAMETERS,
                                1213  *       AND CLEARS THE TYPE-AHEAD BUFFER.
                                1214  *
                                1215  *       ENTRY   NONE
                                1216  *       EXIT    NONE
                                1217  *       USES    ALL
                                1218
                                1219
043.347                         1220  PRSCL   EQU     *
043.347  363                   1221          DI                      DISABLE INTERRUPTS WHILE FIXING
043.350  052 346 040           1222          LHLD    S.DLINK
043.353  043                   1223          INX     H
043.354  043                   1224          INX     H
000.000                         1225          ERRNZ   M.CSLC-2
043.355  066 000               1226          MVI     M,0             CLEAR LINE COUNT
043.357  043                   1227          INX     H
000.000                         1228          ERRNZ   M.CPRE-M.CSLC-1
043.360  066 000               1229          MVI     M,0             CLEAR PREVIOUS CHARACTER
043.362  043                   1230          INX     H
000.000                         1231          ERRNZ   M.CRUB-M.CPRE-1
043.363  066 000               1232          MVI     M,0             CLEAR RUBOUT FLAG
043.365  043                   1233          INX     H
000.000                         1234          ERRNZ   M.CINT-M.CRUB-1
043.366  066 000               1235          MVI     M,0             CLEAR INTERRUPT FLAGS
043.370  043                   1236          INX     H
000.000                         1237          ERRNZ   M.CIN-M.CINT-1
```

```
043.371  345          1238          PUSH    H               SAVE ADDRESS OF M.CIN
043.372  043          1239          INX     H
043.373  043          1240          INX     H
043.374  043          1241          INX     H
043.375  043          1242          INX     H
000.000               1243          ERRNZ   M.CFWA-M.CINT-5
043.376  136          1244          MOV     E,M
043.377  043          1245          INX     H
044.000  126          1246          MOV     D,M             (DE) = BUFFER FWA
044.001  341          1247          POP     H               (HL) = #M.CIN
044.002  163          1248          MOV     M,E
044.003  043          1249          INX     H
044.004  162          1250          MOV     M,D
044.005  043          1251          INX     H
000.000               1252          ERRNZ   M.COUT-M.CIN-2
044.006  163          1253          MOV     M,E
044.007  043          1254          INX     H
044.010  162          1255          MOV     M,D
044.011  373          1256          EI                      ALLOW INTERRUPTS NOW
044.012  315 240 054   1257          CALL    SCU
044.015  315 227 053   1258          CALL    ECI
044.020  311          1259          RET
```

```
                        1262  ***     SYSCMD - SYSTEM COMMAND PROCESSOR.
                        1263  *
                        1264
                        1265
044.021  365           1266  ERROR   PUSH    PSW             SAVE ERROR CODE
044.022  377 007       1267          DB      SYSCALL,.CLRCO  CLEAR CONSOLE BUFFER AND CTL-O
044.024  361           1268          POP     PSW             (A) = ERROR CODE
044.025  046 007       1269          MVI     H,BELL          ENTER HERE IF ERROR FROM SYSTEM
044.027  377 057       1270          DB      SYSCALL,.ERROR
044.031  257           1271          XRA     A               (A) = 0
044.032  303 200 042   1272          JMP     SYSXIT          MASTER CLEAR SYSTEM
                        1273
044.035  315 136 031   1274  ILLSYN  CALL    $TYPTX
044.040  012 007 111   1275          DB      NL,BELL,'Illegal Command Syntax',' '+200Q
044.071  303 121 044   1276          JMP     SYSCMD
                        1277
044.074  315 136 031   1278  ILLCMD  CALL    $TYPTX
044.077  012 007 111   1279          DB      NL,BELL,'Illegal Command',' '+200Q
                        1280
044.121  041 202 045   1281  SYSCMD  LXI     H,CCHIT
044.124  076 003       1282          MVI     A,CTLC
044.126  377 041       1283          DB      SYSCALL,.CTLC   SETUP CTL-C PROCESSOR
044.130  061 200 042   1284          LXI     SP,STACK
044.133  257           1285          XRA     A
044.134  062 326 040   1286          STA     S.CSLMD         CLEAR SPECIAL CONSOLE MODES
044.137  315 061 052   1287          CALL    $CCO            CLEAR CTL-O
044.142  315 354 053   1288          CALL    $GNL            GUARANTEE NEW LINE
000.001               1289          IF      .MANUF.
                        1290
                        1291  *       LINK TO MANDIAG.ABS UNLESS FLAGED
                        1292
                        1293          LHLD    40076A          SEE IF 'GL'
                        1294          LXI     D,'LG'
                        1295          CALL    $CDEHL
                        1296          JE      MANU1           RUN AS NORMAL
                        1297          LXI     H,MANUA
                        1298          DB      SYSCALL,.LINK
                        1299          JMP     ERROR
                        1300
                        1301  MANUA   DB      'SY0:MANDIAG.ABS',0
                        1302
                        1303  MANU1   EQU     *
                        1304          ENDIF
044.145  072 032 041   1305          LDA     S.MOUNT
044.150  247           1306          ANA     A
044.151  302 170 044   1307          JNZ     SYSCO           SYSTEM IS MOUNTED
044.154  021 001 000   1308          LXI     D,M.SALO
044.157  052 346 040   1309          LHLD    S.DLINK
044.162  031           1310          DAD     D
044.163  176           1311          MOV     A,M
044.164  247           1312          ANA     A
044.165  312 277 050   1313          JZ      BYE             NO SYSTEM, AND NO STAND-ALONE FLAG SET
                        1314
044.170  315 136 031   1315  SYSCO   CALL    $TYPTX
044.173  276           1316          DB      '>'+200Q                PROMPT
044.174  041 131 056   1317          LXI     H,LINE
```

```
044.177  315 173 054  1318          CALL    $RTL.           READ COMMAND LINE (UPPER CASE)
044.202  332 121 044  1319          JC      SYSCMD          CTL-D STRUCK
                      1320
                      1321  *       CRACK COMMAND NAME
                      1322
044.205  076 200      1323          MVI     A,200Q
044.207  062 340 055  1324          STA     VERB-1          REQUIRED BY VERB SCANNING
044.212  021 131 056  1325          LXI     D,LINE
044.215  041 341 055  1326          LXI     H,VERB
044.220  032          1327  SYSC1   LDAX    D
044.221  376 056      1328          CPI     '.'
044.223  312 252 044  1329          JZ      SYSC2           VALID FILE SPECIFICATION CHARACTER
044.226  376 060      1330          CPI     '0'
044.230  332 260 044  1331          JC      SYSC3           < "0" AND NOT "."
044.233  376 073      1332          CPI     ':'+1
044.235  332 252 044  1333          JC      SYSC2           NUMERIC, OR ":"
044.240  376 101      1334          CPI     'A'
044.242  332 260 044  1335          JC      SYSC3           NOT ALPHA, NOT NUMERIC, NOT ":", NOT "."
044.245  376 133      1336          CPI     'Z'+1
044.247  322 260 044  1337          JNC     SYSC3           NOT ALPHA
                      1338
                      1339  *       HAVE ALPHA CHARACTER, BUILD INTO COMMAND VERB
                      1340
044.252  167          1341  SYSC2   MOV     M,A
044.253  043          1342          INX     H
044.254  023          1343          INX     D
044.255  303 220 044  1344          JMP     SYSC1
                      1345
                      1346  *       HAVE SPLIT OUT THE VERB, SEE IF WE KNOW IT
                      1347
044.260  325          1348  SYSC3   PUSH    D               SAVE LINE POINTER
044.261  066 000      1349          MVI     M,0             FORCE END OF VERB
044.263  053          1350          DCX     H
044.264  176          1351          MOV     A,M
044.265  356 200      1352          XRI     200Q            SET END OF WORD
044.267  362 035 044  1353          JP      ILLSYN          NULL COMMAND
044.272  167          1354          MOV     M,A
                      1355
                      1356  *       SEE IF WE KNOW THIS COMMAND
                      1357
044.273  021 341 055  1358          LXI     D,VERB
044.276  041 372 044  1359          LXI     H,SYSCC
044.301  315 251 053  1360          CALL    $FST
044.304  302 353 044  1361          JNZ     SYSC5           NOT BUILD-IN COMMAND
044.307  176          1362          MOV     A,M             (A) = INDEX
044.310  315 061 031  1363          CALL    $TJMP           ENTER PROCESSOR
                      1364
```

```
044.313                 1366  SYSCA   DS      0
                        1367
000.000                 1368  I.RUN   EQU     *-SYSCA/2
044.313  214 045        1369          DW      RUN
                        1370
000.001                 1371  I.SYS   EQU     *-SYSCA/2
044.315  121 044        1372          DW      SYSCMD          UNUSED
                        1373
000.002                 1374  I.DMO   EQU     *-SYSCA/2
044.317  117 046        1375          DW      DMOUNT
                        1376
000.003                 1377  I.HEL   EQU     *-SYSCA/2
044.321  247 045        1378          DW      HELP
                        1379
000.004                 1380  I.LIS   EQU     *-SYSCA/2
044.323  321 045        1381          DW      LIST
                        1382
000.005                 1383  I.DEL   EQU     *-SYSCA/2
044.325  366 045        1384          DW      DELETE
                        1385
000.006                 1386  I.REN   EQU     *-SYSCA/2
044.327  020 046        1387          DW      RENAME
                        1388
000.007                 1389  I.MOU   EQU     *-SYSCA/2
044.331  106 046        1390          DW      MOUNT
                        1391
000.010                 1392  I.DAT   EQU     *-SYSCA/2
044.333  327 046        1393          DW      DATE
                        1394
000.011                 1395  I.DIR   EQU     *-SYSCA/2
044.335  056 046        1396          DW      DIR
                        1397
000.012                 1398  I.STA   EQU     *-SYSCA/2
044.337  034 047        1399          DW      STATUS
                        1400
000.013                 1401  I.COP   EQU     *-SYSCA/2
044.341  052 046        1402          DW      COPY
                        1403
000.014                 1404  I.BYE   EQU     *-SYSCA/2
044.343  277 050        1405          DW      BYE
                        1406
000.015                 1407  I.RES   EQU     *-SYSCA/2
044.345  160 046        1408          DW      RESET
                        1409
000.016                 1410  I.VER   EQU     *-SYSCA/2
044.347  211 046        1411          DW      VERSN
                        1412
000.017                 1413  I.LOA   EQU     *-SYSCA/2
044.351  275 046        1414          DW      LOADD
                        1415
000.001                 1416          IF      DEBUG
                        1417
                        1418  I.ROM   EQU     *-SYSCA/2
                        1419          DW      ROMBOOT         REBOOT
                        1420
                        1421  I.TRA   EQU     *-SYSCA/2
```

```
                        1422            DW      TRAP            TRAP TO HBUG
                        1423
                        1424  I.HBU     EQU     *-SYSCA/2
                        1425            DW      HBUG            LOAD HBUG
                        1426
                        1427  I.BUG     EQU     *-SYSCA/2
                        1428            DW      BUG             RUN WITH DEBUG
                        1429
                        1430            ENDIF
                        1431
                        1432  *         CANT FIND COMMAND ON THE MAGIC (BUILT-IN) LIST
                        1433  *         TRY TO LINK TO IT
                        1434
044.353  301            1435  SYSC5     POP     B               (BC) = START OF PARAMETERS
044.354  315 005 051     1436            CALL    PCL             PASS COMMAND LINE ON  STACK
044.357  041 131 056     1437            LXI     H,LINE
044.362  021 313 042     1438            LXI     D,SYSDEF        use system default              /80.05.sc/
044.365  377 040         1439            SCALL   .LINK           LINK TO IT                      /80.05.sc/
044.367  303 074 044     1440            JMP     ILLCMD          JUST DONT KNOW THIS GUY
                        1441
                        1442  **        COMMAND TABLE
                        1443  *
                        1444  *         DATA VALUES ARE INDEXES INTO SYSCA
044.313                 1445  .         SET     SYSCA           REFERENCE SYSCA
                        1446
044.372                 1447  SYSCC     DS      0
044.372  152 045        1448            DW      SYSCC+SYSCCL    TABLE LIMIT
044.374  001            1449            DB      1               DATA BYTES PER ENTRY
                        1450
044.375  122 125 316    1451            DB      'RU','N'+200Q,I.RUN
045.001  104 111 123    1452            DB      'DISMOUN','T'+200Q,I.DMO
045.012  110 105 114    1453            DB      'HEL','P'+200Q,I.HEL
045.017  114 111 123    1454            DB      'LIS','T'+200Q,I.LIS
045.024  124 131 120    1455            DB      'TYP','E'+200Q,I.LIS
045.031  104 105 114    1456            DB      'DELET','E'+200Q,I.DEL
045.040  122 105 116    1457            DB      'RENAM','E'+200Q,I.REN
045.047  115 117 125    1458            DB      'MOUN','T'+200Q,I.MOU
045.055  104 101 124    1459            DB      'DAT','E'+200Q,I.DAT
045.062  104 111 322    1460            DB      'DI','R'+200Q,I.DIR
045.066  103 101 324    1461            DB      'CA','T'+200Q,I.DIR
045.072  111 116 304    1462            DB      'IN','D'+200Q,I.DIR
045.076  111 116 104    1463            DB      'INDE','X'+200Q,I.DIR
045.104  123 124 101    1464            DB      'STATU','S'+200Q,I.STA
045.113  123 124 101    1465            DB      'STA','T'+200Q,I.STA
045.120  103 117 120    1466            DB      'COP','Y'+200Q,I.COP
045.125  102 131 305    1467            DB      'BY','E'+200Q,I.BYE
045.131  122 105 123    1468            DB      'RESE','T'+200Q,I.RES
045.137  126 105 322    1469            DB      'VE','R'+200Q,I.VER
045.143  114 117 101    1470            DB      'LOA','D'+200Q,I.LOA
000,001                 1471            IF      DEBUG
                        1472            DB      'REBOO','T'+200Q,I.ROM
                        1473            DB      'TRA','P'+200Q,I.TRA
                        1474            DB      'HBU','G'+200Q,I.HBU
                        1475            DB      'BU','G'+200Q,I.BUG
                        1476            ENDIF
045.150  000 000        1477            DB      0,0             END OF TABLE
```

```
000.160                1478  SYSCCL  EQU     *-SYSCC         END OF TABLE
045.152                1479          DS      24              TABLE EXTENSION PATCH AREA


                       1481  **      CCHIT - CTL-C PROCESSOR.
                       1482  *
                       1483  *       ENTER COMMAND LOOP
                       1484
                       1485
045.202  377 007       1486  CCHIT   DB      SYSCALL,,CLRCO          CLEAR CONSOLE BUFFER
045.204  315 136 031   1487          CALL    $TYPTX
045.207  136 303       1488          DB      '^','C'+200Q
045.211  303 121 044   1489          JMP     SYSCMD
```

```
                                1493  ***     RUN - PROCESS RUN COMMAND.
                                1494  *
                                1495  *       RUN FNAME [PARAMETER LIST]
                                1496
                                1497
045.214  341                   1498  RUN     POP     H               (HL) = COMMAND LINE ADDRESS
045.215  315 375 054            1499          CALL    $SOB            SKIP LEADING BLANKS
045.220  353                   1500          XCHG                    (DE) = PROGRAM NAME ADDRESS
045.221  041 131 056            1501          LXI     H,LINE          COPY BACK OVER SELF AND 'RUN '
045.224  315 076 052            1502          CALL    $CPF            COPY FILE NAME SEPERATE
045.227  102                   1503          MOV     B,D
045.230  113                   1504          MOV     C,E             (BC) = ARGUMENT LIST
045.231  315 005 051            1505          CALL    PCL             PASS COMMAND LINE
045.234  021 313 042            1506          LXI     D,SYSDEF        Use system defaults             /80.05.sc/
045.237  041 131 056            1507          LXI     H,LINE          (HL) = PROGRAM NAME
045.242  377 040                1508          SCALL   .LINK                                           /80.05.sc/
045.244  303 021 044            1509          JMP     ERROR           DIDNT MAKE IT
```

```
                                1513  ***     HELP - TYPE HELP FILE:
                                1514  *
                                1515  *       HELP
                                1516  *
                                1517  *       TYPES THE FILE SYSHELP.DOC
                                1518
                                1519
045.247  315 332 050           1520  HELP    CALL    FDD                                     /80.05.GC/
045.252  301 045               1521          DW      HELPB                                   /80.05.GC/
                                1522
045.254  315 137 054           1523          CALL    $MOVEL
045.257  025 000 274           1524          DW      HELPAL,HELPA,LINE       SETUP COMMAND LINE
045.265  041 136 056           1525          LXI     H,LINE+5                POINT TO PARAMETER LIST
045.270  343                   1526          XTHL                            SUBSTITUTE FOR OLD LIST
045.271  303 321 045           1527          JMP     LIST                    DO AS IN LIST
                                1528
045.274  114 111 123           1529  HELPA   DB      'LIST '
045.301  123 131 060           1530  HELPB   DB      'SY0:'
045.305  123 131 123           1531          DB      'SYSHELP.DOC',0
000.025                        1532  HELPAL  EQU     *-HELPA
```

```
                                1536  ***     LST - LIST FILE CONTENTS TO CONSOLE.
                                1537  *
                                1538  *       LIST FNAME
                                1539
                                1540
045.321                         1541  LIST    EQU     *
045.321  315 137 054           1542          CALL    $MOVEL
045.324  004 000 355           1543          DW      LISTAL,LISTA,LINE               SETUP PIP COMMANDS
045.332  301                   1544          POP     B                       DISCARD OLD PARAMETERS
045.333  315 355 050           1545          CALL    FEC                     FIND END OF COMMAND LINE
045.336  001 005 000           1546          LXI     B,LISTBL
045.341  021 361 045           1547          LXI     D,LISTB
045.344  315 252 030           1548          CALL    $MOVE                   ADD /SUP
045.347  001 131 056           1549          LXI     B,LINE
045.352  303 044 051           1550          JMP     PIP                     EXECUTE PIP
                                1551
045.355  124 124 072           1552  LISTA   DB      'TT:='
000.004                         1553  LISTAL  EQU     *-LISTA
045.361  057 123 125           1554  LISTB   DB      '/SUP',0
000.005                         1555  LISTBL  EQU     *-LISTB
```

```
                                1559  ***     DELETE - DELETE FILES
                                1560  *
                                1561  *       DELETE FNAME [;FNAME;...;FNAME]
                                1562
                                1563
          045.366               1564  DELETE  EQU     *
          045.366  301          1565          POP     B
          045.367  305          1566          PUSH    B               SAVE COMMAND ADDRESS
          045.370  315 355 050  1567          CALL    FEC             FIND END OF COMMAND LINE
          045.373  001 010 000  1568          LXI     B,DELAL
          045.376  021 010 046  1569          LXI     D,DELA
          046.001  315 252 030  1570          CALL    $MOVE           ADD /DEL COMMAND
          046.004  301          1571          POP     B
          046.005  303 044 051  1572          JMP     PIP
                                1573
          046.010  057 104 105  1574  DELA    DB      '/DELETE',0
          000.010               1575  DELAL   EQU     *-DELA
```

```
                                1579  ***     RENAME - RENAME FILES.
                                1580  *
                                1581  *       RENAME FILE1=FILE2
                                1582
                                1583
046.020                         1584  RENAME  EQU     *
046.020  301                    1585          POP     B
046.021  305                    1586          PUSH    B               (BC) = START OF COMMAND
046.022  315 355 050            1587          CALL    FEC             FIND END OF COMMAND
046.025  001 010 000            1588          LXI     B,RENAL
046.030  021 042 046            1589          LXI     D,RENA
046.033  315 252 030            1590          CALL    $MOVE           MOVE IN /REN
046.036  301                    1591          POP     B
046.037  303 044 051            1592          JMP     PIP             LINK TO PIP
                                1593
046.042  057 122 105            1594  RENA    DB      '/RENAME',0
000.010                         1595  RENAL   EQU     *-RENA
```

```
                        1599  ***     COPY - COPY FILES.
                        1600  *
                        1601  *       COPY TARG=SOURCE
                        1602
                        1603
     046.052            1604  COPY    EQU     *
     046.052  301       1605          POP     B               (BC) = ARG ADDRESS
     046.053  303 044 051 1606          JMP     PIP             CALL PIP
```

```
                        1610  ***     DIR - DIRECTORY LIST FOR DEVICE
                        1611  *
                        1612  *       DIR  [DEV:] [NAMES]
                        1613
                        1614
046.056                 1615  DIR     EQU     *
046.056  301           1616          POP     B
046.057  305           1617          PUSH    B
046.060  315 355 050   1618          CALL    FEC             FIND END OF COMMAND LINE
046.063  001 006 000   1619          LXI     B,DIRAL
046.066  021 100 046   1620          LXI     D,DIRA
046.071  315 252 030   1621          CALL    $MOVE
046.074  301           1622          POP     B
046.075  303 044 051   1623          JMP     PIP
                        1624
046.100  057 114 111   1625  DIRA    DB      '/LIST',0
000.006                 1626  DIRAL   EQU     *-DIRA
```

```
                          1630  ***     MOUNT - MOUNT DISK.
                          1631  *
                          1632  *       MOUNT DEV:
                          1633
                          1634
046.106                   1635  MOUNT   EQU     *
046.106  341              1636          POP     H               (HL) = DEVICE NAME ADDRESS
046.107  377 200          1637          DB      SYSCALL,.MOUNT
046.111  332 021 044      1638          JC      ERROR
046.114  303 121 044      1639          JMP     SYSCMD


                          1641  ***     DISMOUNT - DISMOUNT DEV:
                          1642  *
                          1643  *       DISMOUNT DEV:
                          1644
                          1645
046.117                   1646  DMOUNT  EQU     *
046.117  341              1647          POP     H               (HL) = LINE ADDRESS
046.120  345              1648          PUSH    H               SAVE IN CASE OF ERROR
046.121  377 201          1649          DB      SYSCALL,.DMOUN
046.123  341              1650          POP     H
046.124  332 132 046      1651          JC      DMOO            ERROR                           /80.04.GC/
                          1652
046.127  303 220 042      1653          JMP     SYSX0           re-initialize device tables     /80.04.sc/
                          1654
046.132  376 044          1655  DMOO    CPI     EC.NPM                                          /80.04.sc/
046.134  312 143 046      1656          JZ      DMO1            NO PROVISION MADE FOR HDOS TO RESIDE;NOT FATAL
046.137  067              1657          STC
046.140  303 021 044      1658          JMP     ERROR           RESET ERROR FLAG CLEARED BY CPI?
                          1659
046.143  345              1660  DMO1    PUSH    H               SAVE LINE ADDRESS
046.144  315 366 050      1661          CALL    LOADOV          LOAD OVERLAYS
046.147  341              1662          POP     H               RESTORE LINE ADDRESS
046.150  377 201          1663          DB      SYSCALL,.DMOUN
046.152  332 021 044      1664          JC      ERROR
046.155  303 220 042      1665          JMP     SYSX0           Re-initialize device tables     /80.05.sc/
```

```
                                1669  ***     RESET   - PROCESS RESET COMMAND
                                1670  *
                                1671  *       IF THE  *SALONE*  FLAG IS NOT SET, THIS COMMAND IS CONSIDERED ILLEGAL,
                                1672  *       WHICH IMPLIES THAT A DIRECTORY SEARCH SHOULD BE DONE.
                                1673  *
                                1674  *       RESET DEV:              RESET DEV:
                                1675  *
                                1676
046.160                         1677  RESET   EQU     *
046.160  315 314 050           1678          CALL    CSA             CHECK STAND ALONE
046.163  312 353 044           1679          JZ      SYSCS           STAND-ALONE NOT SET  =>  COMMAND ILLEGAL,
                                1680  *                                TRY LOOK-UP
046.166  315 366 050           1681          CALL    LOADOV          LOAD BOTH OVERLAYS
046.171  341                   1682          POP     H               (HL) = LINE ADDRESS
046.172  315 375 054           1683          CALL    $SOB            (A) = NEXT CHARACTER
046.175  247                   1684          ANA     A
046.176  312 035 044           1685          JZ      ILLSYN          MUST HAVE AN EXPLICIT DEVICE SPECIFICATION
046.201  377 204               1686          DB      SYSCALL,.RESET
046.203  332 021 044           1687          JC      ERROR
046.206  303 121 044           1688          JMP     SYSCMD


                                1691  ***     VERSN   - VERSION
                                1692  *
                                1693  *       VER                     PRINT THE CURRENT VERSION OF HDOS
                                1694  *
                                1695
046.211                         1696  VERSN   EQU     *
046.211  377 011               1697          DB      SYSCALL,.VERS
046.213  322 220 046           1698          JNC     VERS1
046.216  076 020               1699          MVI     A,1*16+0        IF  ERROR ON GETTING VERSION, MUST BE 1.0
046.220  365                   1700  VERS1   PUSH    PSW             SAVE VERSION
046.221  346 360               1701          ANI     11110000B       MAP OUT HIGH ORDER BCD DIGIT
046.223  017                   1702          RRC
046.224  017                   1703          RRC
046.225  017                   1704          RRC
046.226  017                   1705          RRC
046.227  306 060               1706          ADI     '0'
046.231  062 266 046           1707          STA     VERSA
046.234  361                   1708          POP     PSW
046.235  346 017               1709          ANI     00001111B       MAP OUT LOW ORDER BCD DIGIT
046.237  306 060               1710          ADI     '0'
046.241  062 270 046           1711          STA     VERSB
046.244  315 136 031           1712          CALL    $TYPTX
046.247  110 104 117           1713          DB      'HDOS',TAB,'Version:
046.266  000                   1714  VERSA   DB      0
046.267  056                   1715          DB      '.'
046.270  000                   1716  VERSB   DB      0
046.271  212                   1717          DB      ENL
046.272  303 121 044           1718          JMP     SYSCMD
```

```
                                1722  ***     LOADD   -  LOAD DEVICE DRIVER
                                1723  *
                                1724  *       IF THE  *SALONE*  FLAG IS NOT SET, THIS COMMAND IS CONSIDERED ILLEGAL
                                1725  *       WHICH IMPLIES THAT A DIRECTORY SEARCH SHOULD BE DONE.
                                1726  *
                                1727  *       LOAD DEV:
                                1728  *
                                1729
        046.275                 1730  LOADD   EQU     *
                                1731  *       CALL    CSA                                             /79.11.GC/
                                1732  *       JZ      SYSC5                                           /79.11.GC/
        046.275  341            1733          POP     H               (HL) = DEVICE SPECIFICATION
        046.276  377 062        1734          DB      SYSCALL+.LOADD
        046.300  332 021 044    1735          JC      ERROR
        046.303  052 320 040    1736          LHLD    S.SYSM
        046.306  042 356 040    1737          SHLD    S.RFWA          MAKE IT PART OF THE RESIDENT SYSTEM
        046.311  052 053 041    1738          LHLD    AIO.DTA         DEVICE TABLE ADDRESS
        046.314  021 002 000    1739          LXI     D,DEV.RES
        046.317  031            1740          DAD     D
        046.320  176            1741          MOV     A,M
        046.321  366 002        1742          ORI     DR.PR           FLAG DEVICE AS PERMANENTLY RESIDENT
        046.323  167            1743          MOV     M,A
        046.324  303 121 044    1744          JMP     SYSCMD
```

```
                                1748  ***     DATE - PROCESS DATE COMMAND.
                                1749  *
                                1750  *       DATE                    PRINT DATE
                                1751  *       DATE MM-DDD-YY          SET DATE
                                1752
                                1753
046.327                         1754  DATE    EQU     *
046.327  341                   1755          POP     H
046.330  315 375 054           1756          CALL    $SOB
046.333  176                   1757          MOV     A,M
046.334  247                   1758          ANA     A
046.335  312 014 047           1759          JZ      DATE3           HE JUST WANTS TO KNOW THE DATE
                                1760
                                1761  *       SET NEW DATE
                                1762
046.340  315 215 051           1763          CALL    $CAD            CODE AUGUSTAN DATE
046.343  322 001 047           1764          JNC     DATE2           OK
046.346  315 136 031           1765          CALL    $TYPTX
046.351  007 111 154           1766          DB      BELL,'Illegal Date Format',ENL
046.376  303 014 047           1767          JMP     DATE3
                                1768
047.001  353                   1769  DATE2   XCHG
047.002  042 310 040           1770          SHLD    S.DATC
047.005  353                   1771          XCHG
047.006  041 277 040           1772          LXI     H,S.DATE
047.011  315 146 052           1773          CALL    $DAD            DECODE INTO ASCII
                                1774
                                1775  *       DISPLAY THE CURRENT DATE
                                1776
047.014  046 040               1777  DATE3   MVI     H,' '
047.016  257                   1778          XRA     A
047.017  377 057               1779          DB      SYSCALL,.ERROR  PRINT SYSTEM TYPE
047.021  041 277 040           1780          LXI     H,S.DATE
047.024  076 011               1781          MVI     A,9
047.026  315 013 055           1782          CALL    $TYPCC          TYPE DATE
047.031  303 121 044           1783          JMP     SYSCMD          EXIT
```

```
                                1787  ***     STATUS - PRINT SYSTEM STATUS.                    /80.04.sc/
                                1788  *
                                1789  *       STATUS
                                1790  *
                                1791
047.034                         1792  STATUS  EQU     *
047.034  315 053 047           1793          CALL    STAT1           Header
047.037  315 077 047           1794          CALL    STAT2           Memory Statistics
047.042  315 321 047           1795          CALL    STAT3           Overlay Statistics
047.045  315 060 050           1796          CALL    STAT5           Device Statistics
047.050  303 121 044           1797          JMP     SYSCMD



                                1799  **      STAT1
                                1800  *
                                1801  *       STAT1 types the system identification and headers
                                1802  *
                                1803
047.053  315 140 052           1804  STAT1   CALL    $CRLF
047.056  257                   1805          XRA     A
047.057  046 011               1806          MVI     H,TAB
047.061  377 057               1807          SCALL   .ERROR          SYSTEM BANNER MESSAGE    /80.04.GC/
047.063  041 277 040           1808          LXI     H,S.DATE
047.066  076 011               1809          MVI     A,9
047.070  315 013 055           1810          CALL    $TYPCC          TYPE DATE
047.073  315 140 052           1811          CALL    $CRLF
047.076  311                   1812          RET



                                1814  **      STAT2
                                1815  *
                                1816  *       STAT2 prints the memory statistics
                                1817  *
                                1818
047.077                         1819  STAT2   EQU     *
                                1820
                                1821  *       Set up Physical Memory Limit
                                1822
047.077  052 316 040           1823          LHLD    S.HIMEM
047.102  353                   1824          XCHG                    DE = hardware high memory limit
047.103  041 215 047           1825          LXI     H,STATB
047.106  315 165 051           1826          CALL    UOW
                                1827
                                1828  *       Set up HDOS Lower Bound
                                1829
047.111  052 320 040           1830          LHLD    S.SYSM
047.114  353                   1831          XCHG                    DE = FWA Resident System
047.115  041 251 047           1832          LXI     H,STATC
047.120  315 165 051           1833          CALL    UOW
                                1834
                                1835  *       Set up Maximum Overlay Size
                                1836
```

```
047.123  052 324 040  1837           LHLD    S.OMAX
047.126  353          1838           XCHG                    DE = Maximum Overlay Size
047.127  041 311 047  1839           LXI     H,STATD
047.132  315 165 051  1840           CALL    UOW
                      1841
                      1842  *        Actually Type the stuff
                      1843
047.135  041 144 047  1844           LXI     H,STATA
047.140  315 144 031  1845           CALL    $TYPTX,
047.143  311          1846           RET
                      1847
047.144  012 012      1848  STATA    DB      NL,NL
047.146  115 145 155  1849           DB      'Memory Usage',NL
047.163  012          1850           DB      NL
047.164  040 040 120  1851           DB      '  Physical Memory Limit:',TAB
047.215  060 060 060  1852  STATB    DB      '000000'
000.000               1853           ERRNZ   *-STATB-6
047.223  012          1854           DB      NL
047.224  040 040 110  1855           DB      '  HDOS Lower Bound:',TAB,TAB
047.251  060 060 060  1856  STATC    DB      '000000'
000.000               1857           ERRNZ   *-STATC-6
047.257  012          1858           DB      NL
047.260  040 040 115  1859           DB      '  Maximum Overlay Size:',TAB,TAB
047.311  060 060 060  1860  STATD    DB      '000000'
000.000               1861           ERRNZ   *-STATD-6
047.317  012 212      1862           DB      NL,ENL



                      1864  **       STAT3
                      1865  *
                      1866  *        STAT3 Prints the Overlay Status
                      1867  *
                      1868
047.321               1869  STAT3    EQU     *
                      1870
047.321  041 040 040  1871           LXI     H,'  '
047.324  042 036 050  1872           SHLD    STATF           zero the flags
047.327  042 054 050  1873           SHLD    STATG
                      1874
047.332  052 350 040  1875           LHLD    S.OFWA          HL = address of overlay table
047.335  021 036 050  1876           LXI     D,STATF
047.340  315 364 047  1877           CALL    STAT4
                      1878
047.343  021 010 000  1879           LXI     D,OVL.ENS
047.346  031          1880           DAD     D               HL = address of next overlay data
047.347  021 054 050  1881           LXI     D,STATG
047.352  315 364 047  1882           CALL    STAT4
                      1883
                      1884  *        Print the stuff
                      1885
047.355  041 002 050  1886           LXI     H,STATE
047.360  315 144 031  1887           CALL    $TYPTX,
047.363  311          1888           RET
                      1889
```

```
                        1890  **      STAT4
                        1891  *
                        1892
047.364  315 003 054  1893  STAT4   CALL    $INDLB
047.367  006 000      1894          DW      OVL.FLB
                        1895
047.371  315 252 050  1896          CALL    STAT8
047.374  001 111      1897          DB      OVL.IN,'I'
047.376  002 120      1898          DB      OVL.RES,'P'
050.000  000          1899          DB      0
                        1900
050.001  311          1901          RET
                        1902
050.002  012          1903  STATE   DB      NL
050.003  117 166 145  1904          DB      'Overlay Status',NL
050.022  012          1905          DB      NL
050.023  040 040 110  1906          DB      '  HDOSOVL0',TAB
050.036  170 170 012  1907  STATF   DB      'xx',NL
050.041  040 040 110  1908          DB      '  HDOSOVL1',TAB
050.054  170 170 012  1909  STATG   DB      'xx',NL
050.057  212          1910          DB      ENL


                        1912  **      STAT5
                        1913  *
                        1914  *       STAT5 prints the Device Status
                        1915  *
                        1916
050.060  315 136 031  1917  STAT5   CALL    $TYPTX
050.063  012          1918          DB      NL
050.064  104 145 166  1919          DB      'Device Status',NL
050.102  012 212      1920          DB      NL,ENL
                        1921
050.104  052 354 040  1922          LHLD    S.DFWA
                        1923
050.107  176          1924  STAT6   MOV     A,M
050.110  247          1925          ANA     A
000.000               1926          ERRNZ   DV.EL
050.111  310          1927          RZ                      at the end of the list of devices
                        1928
050.112  345          1929          PUSH    H
050.113  315 126 050  1930          CALL    STAT7
050.116  341          1931          POP     H
                        1932
050.117  021 016 000  1933          LXI     D,DEVELEN
050.122  031          1934          DAD     D
050.123  303 107 050  1935          JMP     STAT6
                        1936
                        1937  **      STAT7
                        1938  *
                        1939
050.126  176          1940  STAT7   MOV     A,M
000.000               1941          ERRNZ   DEV.NAM
050.127  376 001      1942          CPI     DV.NU
```

```
                    050.131  310          1943          RZ                      entry is not really in use
                                          1944
                    050.132  353          1945          XCHG
                    050.133  041 040 040  1946          LXI     H,'  '
                    050.136  042 242 050  1947          SHLD    STATJ           initialize driver flags
                    050.141  042 245 050  1948          SHLD    STATK           initialize device capability flags
                    050.144  174          1949          MOV     A,H
                    050.145  062 247 050  1950          STA     STATK+2
                    050.150  353          1951          XCHG
                                          1952
                                          1953  *       Set up device name
                                          1954
                    050.151  315 234 030  1955          CALL    $INDL
                    050.154  000 000      1956          DW      DEV.NAM
                    050.156  353          1957          XCHG
                    050.157  042 236 050  1958          SHLD    STATI
                    050.162  353          1959          XCHG
                                          1960
                                          1961  *       Set up device flags
                                          1962
                    050.163  021 242 050  1963          LXI     D,STATJ
                    050.166  315 003 054  1964          CALL    $INDLB
                    050.171  002 000      1965          DW      DEV.RES
                    050.173  315 252 050  1966          CALL    STAT8
                    050.176  001 111      1967          DB      DR.IM,'I'       In memory
                    050.200  002 120      1968          DB      DR.PR,'P'       Permanently resident
                    050.202  000          1969          DB      0
                                          1970
                    050.203  021 245 050  1971          LXI     D,STATK
                    050.206  315 003 054  1972          CALL    $INDLB
                    050.211  006 000      1973          DW      DEV.FLG
                    050.213  315 252 050  1974          CALL    STAT8
                    050.216  001 104      1975          DB      DT.DD,'D'       Directory device
                    050.220  002 122      1976          DB      DT.CR,'R'       Capable of Read
                    050.222  004 127      1977          DB      DT.CW,'W'       Capable of Write
                    050.224  000          1978          DB      0
                                          1979
                                          1980  *       Unit dependant stuff
                                          1981
P                   000.001               1982          ERRNZ   1                       FINISH DEVICE / UNIT STUFF
                                          1983
                                          1984  *       Print the stuff
                                          1985
                    050.225  041 234 050  1986          LXI     H,STATH
                    050.230  315 144 031  1987          CALL    $TYPTX.
                    050.233  311          1988          RET
                                          1989
                    050.234  040 040      1990  STATH   DB      '  '
                    050.236  144 145 072  1991  STATI   DB      'de:',TAB               name
                    050.242  170 170 011  1992  STATJ   DB      'xx',TAB                driver
                    050.245  170 170 170  1993  STATK   DB      'xxx'                   capabilities
                    050.250  012          1994          DB      NL
                    050.251  212          1995          DB      ENL
                                          1996
                                          1997  **      STAT8
                                          1998  *
```

```
                                1999
050.252  107                    2000  STAT8   MOV     B,A             save flag byte
050.253  343                    2001          XTHL
                                2002
050.254  176                    2003  STAT9   MOV     A,M
050.255  043                    2004          INX     H
050.256  247                    2005          ANA     A
050.257  312 275 050            2006          JZ      STAT10          at the end of the list
                                2007
050.262  240                    2008          ANA     B
050.263  176                    2009          MOV     A,M
050.264  043                    2010          INX     H
050.265  312 254 050            2011          JZ      STAT9           set the next flag
                                2012
050.270  022                    2013          STAX    D               set the flag in the field
050.271  023                    2014          INX     D
050.272  303 254 050            2015          JMP     STAT9
                                2016
050.275  343                    2017  STAT10  XTHL
050.276  311                    2018          RET
                                2019
000.001                         2020          IF      1
                                2021          LHLD    D.OPR
                                2022          MOV     B,H
                                2023          MOV     C,L
                                2024          LXI     H,STATB
                                2025          MVI     A,5
                                2026          CALL    $UDDN           UNPACK READ COUNT
                                2027          LHLD    D.OPW
                                2028          MOV     B,H
                                2029          MOV     C,L
                                2030          LXI     H,STATC
                                2031          MVI     A,5
                                2032          CALL    $UDDN           UNPACK WRITE COUNT
                                2033          LDA     D.HECNT
                                2034          MOV     C,A
                                2035          MVI     B,0
                                2036          MVI     A,3
                                2037          LXI     H,STATD
                                2038          CALL    $UDDN           UNPACK HARD COUNT
                                2039          LHLD    D.SECNT
                                2040          MOV     A,H
                                2041          ANA     A
                                2042          RAR
                                2043          MOV     B,A
                                2044          MOV     A,L
                                2045          RAR
                                2046          MOV     C,A
                                2047          MVI     A,5
                                2048          LXI     H,STATE
                                2049          CALL    $UDDN           UNPACK SOFT COUNT
                                2050          LXI     H,STATA
                                2051          DB      SYSCALL+.PRINT
                                2052          LDA     D.ERTS
                                2053          ANA     A
                                2054          JZ      STAT0           NO RECENT ERROR TO REPORT
```

```
2055            MOV     E,A
2056            MVI     D,0
2057            CALL    $MU10           (HL) = TRACK*10
2058            LDA     D.ERTS+1
2059            CALL    $DADA.          (HL) = SECTOR NUMBER
2060            MOV     B,H
2061            MOV     C,L             (BC) = SECTOR NUMBER
2062            LXI     H,STATG
2063            MVI     A,3
2064            CALL    $UDDN           UNPACK NUMBER
2065            LXI     H,STATF
2066            DB      SYSCALL,.PRINT
2067            XRA     A
2068            STA     D.ERTS
2069
2070            CALL    STAT1           Output the system statistics    /80.04.sc/
2071            JMP     SYSCMD
2072
2073  *STAT0    EQU     *
2074
2075
2076            CALL    $CRLF           OUTPUT AN EXTRA BLANK LINE FOR AESTHETICS
2077            LHLD    S.DFWA
2078            CALL    $INDLB
2079            DW      DEV.MUM
2080            MOV     C,A             C  = MOUNTED UNITS MASK
2081
2082            CALL    $INDLB
2083            DW      DEV.MNU
2084            DCR     A               A  = MAXIMUM UNIT NUMBER
2085
2086  STAT1     PUSH    PSW
2087            CALL    STAT2.          OUTPUT THE DEVICE INFORMATION
2088            CALL    $TYPTX
2089            DB      NL,ENL          OUTPUT THE NEWLINES, ETC.
2090            POP     PSW
2091            DCR     A
2092            JP      STAT1           NOT FINISHED
2093
2094            JMP     SYSCMD
2095
2096  *         OUTPUT THE INFORMATION FOR ONE UNIT OF SY:
2097
2098  STAT2.    EQU     *
2099            MOV     B,A
2100            STA     AIO.UNI         GET READY FOR THE UNIT LATER
2101            ADI     '0'
2102            STA     STATK           SET UP UNIT NUMBER IN MESSAGE
2103
2104            XRA     A
2105            CALL    BITS
2106            ANA     C
2107            JNZ     STAT3           DEVICE IS MOUNTED
2108
2109  *         OUTPUT MESSAGE FOR UNMOUNTED UNIT
2110
```

```
2111            CALL    $TYPTX
2112            DB      'No Diskette Mounted On',' '+200Q
2113            MVI     A,STATL
2114            LXI     H,STATJ
2115            CALL    $TYPCC
2116            RET
2117            ;
2118    *       OUTPUT VOLUME NUMBER, AND LABEL FOR MOUNTED UNIT
2119
2120    STAT3   EQU     *
2121            PUSH    B
2122
2123    *       READ THE VOLUME LABEL
2124
2125            MVI     A,DC.RER
2126            LXI     B,256
2127            LXI     D,LABEL
2128            LXI     H,DDF.LAB
2129            CALL    SYDD
2130            JC      ERROR           BAD TROUBLE
2131
2132    *       OUTPUT THE MESSAGE STRINGS
2133
2134            LDA     LABEL+LAB.SER
2135            MOV     C,A
2136            MVI     B,0
2137            LXI     H,STATI
2138            MVI     A,3
2139            CALL    $UDD
2140            LXI     H,STATH
2141            DB      SYSCALL,.PRINT  PRINT THE UNIT, AND VOLUME NUMBER
2142
2143            LXI     H,LABEL+LAB.LAB
2144            CALL    $DTB
2145            DCR     A
2146            CNZ     $TYPCC          PRINT THE LABEL
2147            POP     B
2148            RET
2149
2150    STATA   DB      NL,'Disk I/O:   '
2151    STATB   DB      'NNNNN Reads, '
2152    STATC   DB      'NNNNN Writes Performed'
2153            DB      NL,'Errors:             '
2154    STATD   DB      'NNN Hard Errors ('
2155    STATE   DB      'NNNNN Recovered Errors)';NL,ENL
2156    STATF   DB      'Last Hard Error Occurred on Sector #'
2157    STATG   DB      'NNN';NL,ENL
2158
2159    STATH   DB      'Volume '
2160    STATI   DB      'xxx, Mounted On '
2161
2162    STATJ   DB      'SY'
2163    STATK   DB      '0:';NL
2164    STATL   EQU     *-STATJ
2165
2166            DB      'Label:',' '+200Q
```

```
2167
2168          ENDIF
```

```
                                2171  ***     BYE
                                2172  *
                                2173  *       BYE DISMOUNTS BOTH DISKS AND REBOOTS THE SYSTEM
                                2174  *
                                2175
        050.277  301            2176  BYE     POP     B
                                2177
        050.300  315 151 053    2178          CALL    $DOS.           Dismount  *HDOS*                /80.04,gc/
        050.303  332 021 044    2179          JC      ERROR                                           /80.04.GC/
                                2180
        050.306  257            2181          XRA     A
        050.307  377 000        2182          SCALL   .EXIT   RETURN TO RE-BOOT
        050.311  303 332 043    2183          JMP     FATERR          Fatal (should never happen)     /80.05.gc/
        000.001                 2184          IF      DEBUG
                                2185          STL     'DEBUG COMMANDS'
                                2186          EJECT
                                2187  **      TRAP - TRAP TO HBUG
                                2188
                                2189  TRAP    RST     2
                                2190          JMP     SYSCMD          ENTER SYSCMD
                                2191  BUG     SPACE   3,10
                                2192  **      BUG - SAME AS RUN, BUT WITH BUG FLAG
                                2193
                                2194  BUG     CALL    LBUG            LOAD HBUG
                                2195          MVI     A,1
                                2196          STA     40077A
                                2197          JMP     RUN
                                2198  HBUG    SPACE   3,10
                                2199  **      HBUG - LOAD HBUG.
                                2200
                                2201  HBUG    CALL    LBUG            LOAD HBUG
                                2202          JMP     160000A         ENTER IT
                                2203  LBUG    SPACE   3,10
                                2204  **      LBUG = LOAD HBUG
                                2205
                                2206  LBUG    LXI     H,HBUGA
                                2207          MVI     A,0
                                2208          DB      SYSCALL,.OPENR
                                2209          JC      ERROR           IF ERROR
                                2210          LXI     B,21000A
                                2211          LXI     D,160000A
                                2212          XRA     A
                                2213          DB      SYSCALL,.READ           READ IT IN
                                2214          XRA     A
                                2215          DB      SYSCALL,.CLOSE
                                2216          RET
                                2217
                                2218  HBUGA   DB      'SY0:HBUG.BIN',0
                                2219          ENDIF
```

```
                                2223  **      CSA     -  CHECK STAND-ALONE
                                2224  *
                                2225  *       CHECK THE STAND-ALONE FLAG.
                                2226  *
                                2227  *       ENTRY:  NONE
                                2228  *
                                2229  *       EXIT:   (PSW)   =  'Z' CLEAR IF FLAG IS     SET
                                2230  *                          =  'Z' SET   IF FLAG IS NOT SET
                                2231  *
                                2232  *       USES:   (PSW)
                                2233  *
                                2234
050.314  325                   2235  CSA     PUSH    D
050.315  345                   2236          PUSH    H
050.316  021 001 000           2237          LXI     D,M.SALO
050.321  052 346 040           2238          LHLD    S.DLINK
050.324  031                   2239          DAD     D                       (HL) => SALONE
050.325  176                   2240          MOV     A,M
050.326  247                   2241          ANA     A
050.327  341                   2242          POP     H
050.330  321                   2243          POP     D
050.331  311                   2244          RET


                                2246  **      FDD     - Fetch Default Device
                                2247  *
                                2248  *       FDD stores the default system device in the specified
                                2249  *       string area.
                                2250  *
                                2251  *       ENTRY:  HL      = address to store default device
                                2252  *
                                2253  *       EXIT:   NONE
                                2254  *
                                2255  *       USES:   PSW,DE,HL
                                2256  *
                                2257
050.332  343                   2258  FDD     XTHL
050.333  136                   2259          MOV     E,M
050.334  043                   2260          INX     H
050.335  126                   2261          MOV     D,M
050.336  043                   2262          INX     H
050.337  343                   2263          XTHL
050.340  353                   2264          XCHG                    HL = address to store device name
                                2265
050.341  305                   2266  FDD.    PUSH    B
050.342  001 003 000           2267          LXI     B,3
050.345  021 313 042           2268          LXI     D,SYSDEF
050.350  315 252 030           2269          CALL    $MOVE
050.353  301                   2270          POP     B
050.354  311                   2271          RET
```

```
                                2273  **      FEC - FIND END OF COMMAND LINE.
                                2274  *
                                2275  *       FEC LOCATES THE END OF  THE CURRENT COMMAND LINE.
                                2276  *
                                2277  *       ENTRY   (BC) = START OF LINE
                                2278  *       EXIT    (HL) = ADDRESS OF TERMINATING 00 BYTE
                                2279  *       USES    A,F,H,L
                                2280
                                2281
050.355  140                   2282  FEC     MOV     H,B
050.356  151                   2283          MOV     L,C
050.357  176                   2284  FEC1    MOV     A,M
050.360  247                   2285          ANA     A
050.361  310                   2286          RZ                      AT END
050.362  043                   2287          INX     H
050.363  303 357 050           2288          JMP     FEC1


                                2290  **      LOADOV  - LOAD OVERLAYS
                                2291  *
                                2292  *       LOADOV LOADS BOTH OVL0, AND OVL1.
                                2293  *
                                2294  *       ENTRY:  NONE
                                2295  *
                                2296  *       EXIT:   IF  ERROR
                                2297  *                   TO  ERROR
                                2298  *                 ELSE
                                2299  *                   TO  CALLER
                                2300  *
                                2301  *       USES:   ALL
                                2302  *
                                2303
050.366  076 000               2304  LOADOV  MVI     A,OVL0
050.370  377 010               2305          DB      SYSCALL,.LOADO
050.372  332 021 044           2306          JC      ERROR
050.375  076 001               2307          MVI     A,OVL1
050.377  377 010               2308          DB      SYSCALL,.LOADO
051.001  332 021 044           2309          JC      ERROR
051.004  311                   2310          RET


                                2312  **      PCL - PASS COMMAND LINEE.
                                2313  *
                                2314  *       PCL PASSES A COMMAND LINE INTO THE STACK, FOR USE BY THE PROGRAM
                                2315  *       WHICH WILL BE 'LINK'ED TO.
                                2316  *
                                2317  *       THE N BYTES ARE PUT IN THE STACK STARTING AT 'STACK-N' TO 'STACK-1'
                                2318  *
                                2319  *       * * NOTE * *
                                2320  *       THIS ROUTINE PLAYS WITH THE STACK. IT IS ENTERED VIA A CALL,
                                2321  *       BUT IT THEN EMPTIES THE STACK TO SETUP THE COMMAND LINE. THUS, 'PCL'S CALLER
                                2322  *       MUST NOT TRY TO RETURN TO IT'S CALLER.
```

```
                                2323  *
                                2324  *       ENTRY   (BC) = LINE ADDRESS
                                2325  *       EXIT    TO CALLER
                                2326  *               (SP) = #STACK-N
                                2327  *       USES    ALL
                                2328
                                2329
051.005  341                   2330  PCL     POP     H               (HL) = RETURN ADDRESS
051.006  363                   2331          DI                      NO INTERRUPTS WHILE PLAYING WITH STACK
051.007  042 042 051           2332          SHLD    PCLA            SET RETURN ADDRESS
051.012  021 200 042           2333          LXI     D,STACK
051.015  315 355 050           2334          CALL    FEC             FIND END OF COMMAND
051.020  012                   2335          LDAX    B
051.021  247                   2336          ANA     A
051.022  312 036 051           2337          JZ      PCL2            HAVE NO LINE TO PASS
                                2338
                                2339  *       GOT A LINE.. MOVE INTO STACK AREA
                                2340
051.025  176                   2341  PCL1    MOV     A,M
051.026  033                   2342          DCX     D
051.027  022                   2343          STAX    D               STORE
051.030  175                   2344          MOV     A,L
051.031  271                   2345          CMP     C
051.032  053                   2346          DCX     H
051.033  302 025 051           2347          JNE     PCL1            MORE TO GO
                                2348
051.036  353                   2349  PCL2    XCHG
051.037  371                   2350          SPHL                    SET STACK POINTER BELOW DATA
051.040  373                   2351          EI
051.041  303 041 051           2352          JMP     *               EXIT
051.042                        2353  PCLA    EQU     *-2



                                2355  **      PIP - ENVOKE 'PIP'
                                2356  *
                                2357  *       PIP IS ENTERED (VIA A JMP) TO CAUSE A LINK TO PIP.
                                2358  *
                                2359  *       ENTRY   (BC) = COMMAND LINE FWA
                                2360  *       EXIT    TO PIP IF LINK IS OK
                                2361  *               TO SYSCMD VIA ERRMSG OTHERWISE
                                2362  *       USES    ALL
                                2363
                                2364
051.044  315 005 051           2365  PIP     CALL    PCL             PASS COMMAND LINE
                                2366
051.047  315 332 050           2367          CALL    FDD                                     /80.05.GC/
051.052  100 051               2368          DW      PIPA                                    /80.05.GC/
051.054  315 332 050           2369          CALL    FDD                                     /80.05.GC/
051.057  151 051               2370          DW      PIPB                                    /80.05.GC/
                                2371
051.061  041 151 051           2372          LXI     H,PIPB                                  /80.05.GC/
051.064  377 040               2373          SCALL   .LINK                                   /80.05.GC/
                                2374
                                2375  *       COULDNT LINK TO PIP
```

```
                        2376
051.066 315 136 031     2377            CALL    $TYPTX
051.071 012 007 106     2378            DB      NL,BELL,'File '                         /80.05.sc/
051.100 123 131 060     2379    PIPA    DB      'SY0'                                   /80.05.sc/
051.103 072 120 111     2380            DB      ':PIP.ABS Required For This Command',ENL        /80.05.sc/
051.146 303 121 044     2381            JMP     SYSCMD
                        2382
051.151 123 131 060     2383    PIPB    DB      'SY0:PIP.ABS',0


                        2385    **      UOW     -  Unpack Octal Word
                        2386    *
                        2387    *       UOW unpacks an octal word.
                        2388    *
                        2389    *       ENTRY:  DE      = value
                        2390    *               HL      = buffer address
                        2391    *
                        2392    *       EXIT:   HL advanced
                        2393    *
                        2394    *       USES:   PSW,HL
                        2395    *
                        2396
051.165 172             2397    UOW     MOV     A,D
051.166 315 102 055     2398            CALL    $UOD
                        2399
051.171 173             2400            MOV     A,E
051.172 315 102 055     2401            CALL    $UOD
051.175 311             2402            RET
```

```
051.176                 2405            XTEXT   BITS


                        2407X **        BITS    -  BIT SET
                        2408X *
                        2409X *         BITS SETS THE SPECIFIED BIT IN THE ACCUMULATOR.
                        2410X *
                        2411X *         ENTRY:  A       = ORIGINAL  A
                        2412X *                 B       = NUMBER OF BIT TO SET ( 7=HIGH,...,0=LOW )
                        2413X *
                        2414X *         EXIT:   A       = ORIGINAL  A  WITH  BIT(B) SET
                        2415X *
                        2416X *         USES:   PSW
                        2417X *
                        2418X
051.176  305           2419X BITS      PUSH    B
                        2420X
051.177  365           2421X           PUSH    PSW
051.200  076 200       2422X           MVI     A,10000000B
051.202  004           2423X           INR     B
051.203  007           2424X BITS1     RLC
051.204  005           2425X           DCR     B
051.205  302 203 051    2426X           JNZ     BITS1
                        2427X
051.210  117           2428X           MOV     C,A
051.211  361           2429X           POP     PSW
051.212  261           2430X           ORA     C
                        2431X
051.213  301           2432X           POP     BC
051.214  311           2433X           RET
051.215                 2434            XTEXT   CAD


                        2436X **        $CAD - CODE AUGUSTAN DATE.
                        2437X *
                        2438X *         $CAD IS CALLED TO CODE AN AUGUSTAN DATE INTO THE FORM:
                        2439X *
                        2440X *
                        2441X *         -----------------------------------
                        2442X *         I  0  I  6 BITS  I  4 BITS  I  5 BITS  I
                        2443X *         -----------------------------------
                        2444X *                 YEAR-70       MON       DAY
                        2445X *                  1-63         1-12      1-31
                        2446X *
                        2447X *         FROM THE FORM:
                        2448X *
                        2449X *         DD-MMM-YY
                        2450X *
                        2451X *         ENTRY   (HL) = ADDRESS OF STRING
                        2452X *         EXIT    'C' CLEAR IF OK
                        2453X *                 (DE) = 15 BIT VALUE
                        2454X *                 (HL) ADVANCED PAST '-YY'
```

```
                          2455X *                 'C' SET IF ERROR
                          2456X *         USES    ALL
                          2457X
                          2458X
051.215  345             2459X $CAD      PUSH    H                                       /80.08.GC/
051.216  016 011         2460X           MVI     C,CADBL                                 /80.08.GC/
051.220  021 050 052     2461X           LXI     D,CADB                                  /80.08.GC/
051.223  315 060 030     2462X           CALL    $COMP                                   /80.08.GC/
051.226  302 237 051     2463X           JNZ     CAD0            Is not 'No-Date'        /80.08.GC/
051.231  321             2464X           POP     D                                       /80.08.GC/
051.232  021 000 000     2465X           LXI     D,0             0 => No Date            /80.08.sc/
051.235  247             2466X           ANA     A               Clear 'C'               /80.08.sc/
051.236  311             2467X           RET                                             /80.08.GC/
                          2468X
051.237  341             2469X CAD0      POP     H                                       /80.08.GC/
051.240  315 362 052     2470X           CALL    $DDD            DECODE DECIMAL DIGITS
051.243  330             2471X           RC                      ERROR
051.244  172             2472X           MOV     A,D
051.245  247             2473X           ANA     A
051.246  067             2474X           STC                     ASSUME TOO LARGE
051.247  300             2475X           RNZ                     TOO LARGE
051.250  173             2476X           MOV     A,E
051.251  247             2477X           ANA     A
051.252  067             2478X           STC
051.253  310             2479X           RZ                      TOO SMALL FOR DD
051.254  376 040         2480X           CPI     32
051.256  077             2481X           CMC
051.257  330             2482X           RC                      TOO LARGE
051.260  353             2483X           XCHG                    (HL) = DAY
051.261  076 040         2484X           MVI     A,100000B
051.263  205             2485X           ADD     L
051.264  157             2486X           MOV     L,A             COUNT 1ST MONTH
051.265  353             2487X           XCHG                    (DE) = DD*16+1, (HL) = ADDRESS
                          2488X
                          2489X *         DECODE MONTH
                          2490X
051.266  325             2491X           PUSH    D               SAVE DD*16+1
051.267  176             2492X           MOV     A,M
051.270  043             2493X           INX     H
051.271  376 055         2494X           CPI     '-'
051.273  302 335 051     2495X           JNE     CAD2            FORMAT ERROR
051.276  021 003 052     2496X           LXI     D,CADA          (DE) = MONTH TABLE ADDRESS
051.301  001 003 000     2497X CAD1      LXI     B,3
051.304  345             2498X           PUSH    H               SAVE TEXT ADDRESS, CADA ADDRESS
051.305  325             2499X           PUSH    D
051.306  315 060 030     2500X           CALL    $COMP           COMPARE
051.311  321             2501X           POP     D               (DE) = *CADA* ADDRESS
051.312  312 340 051     2502X           JE      CAD3            GOT MONTH
051.315  341             2503X           POP     H               (HL) = BUFFER ADDRESS OF MMM-YY
051.316  023             2504X           INX     D
051.317  023             2505X           INX     D
051.320  023             2506X           INX     D               TRY NEXT MONTH
051.321  343             2507X           XTHL
051.322  076 040         2508X           MVI     A,100000B
051.324  315 101 030     2509X           CALL    $DADA.          COUNT MONTH
051.327  343             2510X           XTHL
```

```
051.330  032          2511X          LDAX    D               (A) = ENTRY IN CADA
051.331  247          2512X          ANA     A
051.332  302 301 051  2513X          JNZ     CAD1            MORE MONTHS TO GO
                      2514X
                      2515X *        ERROR
                      2516X
051.335  341          2517X CAD2     POP     H               CLEAR STACK
051.336  067          2518X          STC
051.337  311          2519X          RET                     FLAG ERROR
                      2520X
                      2521X *        CRACK -YY
                      2522X
051.340  301          2523X CAD3     POP     B               DISCARD ADDRESS IF MMM-YY
051.341  176          2524X          MOV     A,M
051.342  376 055       2525X          CPI     '-'
051.344  302 335 051  2526X          JNE     CAD2            NOT -
051.347  043          2527X          INX     H
051.350  315 362 052  2528X          CALL    $DDD            DECODE DECIMAL DIGITS
051.353  332 335 051  2529X          JC      CAD2            IF ERROR
051.356  172          2530X          MOV     A,D
051.357  247          2531X          ANA     A
051.360  302 335 051  2532X          JNZ     CAD2            ERROR
051.363  173          2533X          MOV     A,E             (A) = YEAR
051.364  326 106       2534X          SUI     70              SUBTRACT DISPLACEMENT
051.366  332 335 051  2535X          JC      CAD2            ERROR
051.371  376 077       2536X          CPI     63
051.373  322 335 051  2537X          JNC     CAD2            TOO LARGE
051.376  321          2538X          POP     D               (DE) = MONTH AND DAY
051.377  207          2539X          ADD     A               (A) = YEAR*2
052.000  202          2540X          ADD     D
052.001  127          2541X          MOV     D,A             MERGE WITH REST OF IT
052.002  311          2542X          RET
                      2543X
052.003               2544X CADA     DS      0               TABLE OF MONTHS
052.003  112 101 116  2545X          DB      'JANFEBMARAPRMAYJUNJULAUGSEPOCTNOVDEC',0
                      2546X
052.050  040 116 157  2547X CADB     DB      ' No-Date '                                     /80.08.GC/
000.011               2548X CADBL    EQU     *-CADB                                          /80.08.GC/
052.061               2549           XTEXT   CDEHL



                      2551X **       $CDEHL - COMPARE (DE) TO (HL)
                      2552X *
                      2553X *        $CDEHL COMPARES (DE) TO (HL) FOR EQUALITY.
                      2554X *
                      2555X *        ENTRY   NONE
                      2556X *        EXIT    'Z' SET IF (DE) = (HL)
                      2557X *        USES    A,F
                      2558X
                      2559X
030.216               2560X $CDEHL   EQU     30216A          IN H17 ROM
052.061               2561           XTEXT   CCO
```

```
                                2563X **      $CCO - CLEAR CONTROL-O
                                2564X *
                                2565X *       $CCO IS CALLED TO CLEAR THE EFFECT OF THE CTL-O CHARACTER.
                                2566X *
                                2567X *       ENTRY   NONE
                                2568X *       EXIT    NONE
                                2569X *       USES    NONE
                                2570X
                                2571X
052.061  315 054 031           2572X $CCO    CALL    $SAVALL         SAVE REGISTERS
052.064  076 004               2573X         MVI     A,I.CONFL
052.066  001 001 000           2574X         LXI     B,CO.FLG        CLEAR CO.FLG
052.071  377 006               2575X         DB      SYSCALL+.CONSL
052.073  303 047 031           2576X         JMP     $RSTALL         RESTORE REGISTERS AND RETURN
052.076                        2577          XTEXT   COMP


                                2579X **      $COMP - COMPARE TWO CHARACTER STRINGS.
                                2580X *
                                2581X *       $COMP COMPARES TWO BYTE STRINGS.
                                2582X *
                                2583X *       ENTRY   (C) = COMPARE COUNT
                                2584X *               (DE) = FWA OF STRING #1
                                2585X *               (HL) = FWA OF STRING #2
                                2586X *       EXIT    'Z' CLEAR, IS MIS-MATCH
                                2587X *                (C) = LENGTH REMAINING
                                2588X *                (DE) = ADDRESS OF MISMATCH IN STRING#1
                                2589X *                (HL) = ADDRESS OF MISMATCH IN STRING #2
                                2590X *               'C' SET, HAVE MATCH
                                2591X *                (C) = 0
                                2592X *                (DE) = (DE) + (0C)
                                2593X *                (HL) = (HL) + (0C)
                                2594X *       USES    A,F,C,D,E,H,L
                                2595X
                                2596X
030.060                         2597X $COMP   EQU     30060A          IN H17 ROM
052.076                         2598          XTEXT   CPF


                                2600X **      $CPF - COPY FILE NAME
                                2601X *
                                2602X *       $CPF COPIES A FILE NAME FROM ONE LOCATION TO ANOTHER.
                                2603X *
                                2604X *       THE CHARACTERS ARE COPIED UNTIL A DELIMITER (',', ' ', '=', OR 00)
                                2605X *       IS FOUND.
                                2606X *
                                2607X *       THE FILENAME IS THEN TERMINATED WITH A 00 BYTE.
                                2608X *
                                2609X *       ENTRY   (DE) = FROM ADDRESS
                                2610X *               (HL) = TO ADDRESS
                                2611X *       EXIT    'C' CLEAR IF OK
                                2612X *                (DE) = ADVANCED PAST NAME AND DELIMITER
```

```
                                2613X *                 (HL) POINTS TO 00 BYTE OF DESTINATION
                                2614X *                 (A) = DELIMITER
                                2615X *                 'C' SET IF ERROR
                                2616X *         USES    ALL
                                2617X
                                2618X
052.076  066 022               2619X $CPF      MVI     B,FB.NAML+1             SET MAX LENGTH
052.100  032                   2620X $CPF1     LDAX    D
052.101  247                   2621X           ANA     A
052.102  312 135 052           2622X           JZ      $CPF2           END
052.105  023                   2623X           INX     D
052.106  376 054               2624X           CPI     ','
052.110  312 135 052           2625X           JE      $CPF2
052.113  376 075               2626X           CPI     '='
052.115  312 135 052           2627X           JE      $CPF2
052.120  376 040               2628X           CPI     ' '
052.122  312 135 052           2629X           JE      $CPF2           IS BLANK
052.125  167                   2630X           MOV     M,A             COPY
052.126  043                   2631X           INX     H
052.127  005                   2632X           DCR     B
052.130  302 100 052           2633X           JNZ     $CPF1           IF MORE GO TO
052.133  067                   2634X           STC                     OVERFLOW OF AREA
052.134  311                   2635X           RET
                               2636X
                               2637X *          DONE.
                               2638X
052.135  066 000               2639X $CPF2     MVI     M,0             TERMINATE
052.137  311                   2640X           RET
052.140                        2641            XTEXT   CRLF


                               2643X **         $CRLF - TYPE CARRIAGE RETURN/ LINE FEED
                               2644X *
                               2645X *          $CRLF IS USED TO GENERATE PADDED CRLF'S.
                               2646X *
                               2647X *          ENTRY   NONE
                               2648X *          EXIT    (A) = 0
                               2649X *          USES    A,F
                               2650X
                               2651X
052.140  076 012               2652X $CRLF     MVI     A,NL
052.142  377 002               2653X           DB      SYSCALL,.SCOUT
052.144  257                   2654X           XRA     A
052.145  311                   2655X           RET
052.146                        2656            XTEXT   DAD
```

```
                                2658X **      $DAD - DECODE AUGUSTAN DATE.
                                2659X *
                                2660X *       $DAD DECODES A 15 BIT DATE CODE OF THE FORMAT:
                                2661X *
                                2662X *       ---------------------------------------
                                2663X *       I  0  I  6 BITS  I  4 BITS  I  5 BITS  I
                                2664X *       ---------------------------------------
                                2665X *              YEAR-70       MON       DAY
                                2666X *               1-63        1-12      1-31
                                2667X *
                                2668X *       TO THE FORM:
                                2669X *
                                2670X *       DD-MMM-YY
                                2671X *
                                2672X *       ENTRY   (DE) = 15 BIT VALUE
                                2673X *               (HL) = ADDRESS FOR DECODE
                                2674X *       EXIT    'C' CLEAR IF OK
                                2675X *                (DE) = (DE)+9
                                2676X *               'C' SET IF ERROR
                                2677X *       USES    ALL
                                2678X
                                2679X
052.146  172                    2680X $DAD    MOV     A,D                                    /80.08.sc/
052.147  263                    2681X         ORA     E                                      /80.08.sc/
052.150  312 274 052            2682X         JZ      DAD2            No-Date                /80.08.sc/
                                2683X
052.153  102                    2684X         MOV     B,D
052.154  113                    2685X         MOV     C,E
052.155  021 040 000            2686X         LXI     D,32
052.160  345                    2687X         PUSH    H               SAVE ADDRESS
052.161  315 106 030            2688X         CALL    $DU66           (DE) = DAY, (HL) = YEAR & MONTH
052.164  343                    2689X         XTHL                    (HL) = ADDRESS
052.165  102                    2690X         MOV     B,D
052.166  113                    2691X         MOV     C,E
052.167  173                    2692X         MOV     A,E
052.170  247                    2693X         ANA     A
052.171  312 271 052            2694X         JZ      DAD1            BAD VALUE
052.174  076 002                2695X         MVI     A,2
052.176  315 157 031            2696X         CALL    $UDD            UNPACK DAY
052.201  066 055                2697X         MVI     M,'-'
052.203  043                    2698X         INX     H
052.204  301                    2699X         POP     B               (BC) = YEAR & MONTH
052.205  021 020 000            2700X         LXI     D,16
052.210  345                    2701X         PUSH    H               SAVE ADDRESS
052.211  315 106 030            2702X         CALL    $DU66
052.214  343                    2703X         XTHL                    (HL) = ADDRESS, ((SP)) = YEAR
052.215  173                    2704X         MOV     A,E
052.216  207                    2705X         ADD     A
052.217  203                    2706X         ADD     E               (A) = 3*MONTH
052.220  312 271 052            2707X         JZ      DAD1            BAD VALUE
052.223  376 047                2708X         CPI     13*3
052.225  322 271 052            2709X         JNC     DAD1            TOO LARGE
052.230  353                    2710X         XCHG                    (DE) = ADDRESS
052.231  041 302 052            2711X         LXI     H,DADB-3
052.234  315 101 030            2712X         CALL    $DADA.          (HL) = ADDRESS OF MONTH
052.237  001 003 000            2713X         LXI     B,3
```

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052.242  353              2714X          XCHG                    (HL) = BUFFER ADDR, (DE) = ADDR IN 'DADB'
052.243  315 252 030      2715X          CALL    $MOVE           MOVE MONTH IN
052.246  066 055          2716X          MVI     M,'-'
052.250  043              2717X          INX     H
052.251  301              2718X          POP     B               (BC) = YEAR
052.252  171              2719X          MOV     A,C
052.253  306 106          2720X          ADI     70
052.255  376 144          2721X          CPI     100
052.257  077              2722X          CMC
052.260  330              2723X          RC                      TOO LARGE
052.261  117              2724X          MOV     C,A             (BC) = YEAR
052.262  076 002          2725X          MVI     A,2
052.264  315 157 031      2726X          CALL    $UDD            UNPACK YEAR
052.267  247              2727X          ANA     A
052.270  311              2728X          RET
                          2729X
                          2730X *        ILLEGAL FORMAT. (NOT ALL ILLEGALS EXIT HERE!)
                          2731X
052.271  341              2732X DAD1     POP     H               RESTORE STACK
052.272  067              2733X          STC                     FLAG ERROR
052.273  311              2734X          RET
                          2735X
                          2736X *        No-Date                                                 /80.08.sc/
                          2737X
052.274  001 011 000      2738X DAD2     LXI     B,DADCL                                         /80.08.sc/
052.277  021 351 052      2739X          LXI     D,DADC                                          /80.08.sc/
052.302  303 252 030      2740X          JMP     $MOVE                                           /80.08.sc/
                          2741X
052.305  112 141 156      2742X DADB     DB      'JanFebMarAprMayJunJulAugSepOctNovDec'
                          2743X
052.351  040 116 157      2744X DADC     DB      ' No-Date '                                     /80.08.sc/
000.011                   2745X DADCL    EQU     *-DADC                                          /80.08.sc/
052.362                   2746           XTEXT   DADA


                          2748X **       $DADA - PERFORM (H,L) = (H,L) + (0,A)
                          2749X *
                          2750X *        ENTRY   (H,L) = BEFORE VALUE
                          2751X *                (A) = BEFORE VALUE
                          2752X *        EXIT    (H,L) = (H,L) + (0,A)
                          2753X *                'C' SET IF OVERFLOW
                          2754X *        USES    F,H,L
                          2755X
                          2756X
030.072                   2757X $DADA    EQU     30072A          IN H17 ROM
052.362                   2758           XTEXT   DADA2
```

```
                        2760X **      $DADA. - ADD (0,A) TO (H,L)
                        2761X *
                        2762X *       ENTRY   NONE
                        2763X *       EXIT    (HL) = (HL) + (0A)
                        2764X *       USES    A,F,H,L
                        2765X
                        2766X
    030.101             2767X $DADA.  EQU     30101A          IN H17 ROM
    052.362             2768          XTEXT   DDD



                        2770X **      $DDD - DECODE DECIMAL DIGITS.
                        2771X *
                        2772X *       $DDD DECODES A STRING OF DECIMAL DIGITS INTO A DECIMAL INTEGER.
                        2773X *
                        2774X *       THE CHARACTERS ARE TAKEN OUT OF MEMORY. CONVERSION STOPS WITH THE
                        2775X *       FIRST NON-DIGIT CHARACTER FOUND.
                        2776X *
                        2777X *       ENTRY   (HL) = ADDRESS OF CHARACTERS
                        2778X *       EXIT    'C' CLEAR IF OK
                        2779X *                (DE) = NUMBER
                        2780X *                (HL) = INDEX OF FIRST NON-DIGIT ENCOUNTERED
                        2781X *                'C' SET IF ERROR
                        2782X *       USES    A,F,D,E,H,L
                        2783X
                        2784X
    052.362  021 000 000 2785X $DDD    LXI     D,0             (DE) = ACCUM
                        2786X
    052.365  176        2787X $DDD1   MOV     A,M
    052.366  326 060    2788X         SUI     '0'
    052.370  077        2789X         CMC
    052.371  320        2790X         RNC                     TOO SMALL
    052.372  376 012    2791X         CPI     10
    052.374  320        2792X         RNC                     TOO LARGE
    052.375  043        2793X         INX     H               ADVANCE ADDRESS
    052.376  345        2794X         PUSH    H               SAVE (HL)
    052.377  315 324 030 2795X         CALL    $MU10           (HL) = ACCUM*10
    053.002  353        2796X         XCHG                    (DE) = ACCUM
    053.003  341        2797X         POP     H               (HL) = ADDRESS OF STRING
    053.004  330        2798X         RC                      OVERFLOW
    053.005  203        2799X         ADD     E
    053.006  137        2800X         MOV     E,A
    053.007  076 000    2801X         MVI     A,0
    053.011  212        2802X         ADC     D
    053.012  127        2803X         MOV     D,A
    053.013  322 365 052 2804X         JNC     $DDD1           NOT OVERFLOW
    053.016  311        2805X         RET
    053.017             2806          XTEXT   DOS                                     /80.04.GC/
```

```
                        2808X **      $DOS - DISMOUNT OPERATING SYSTEM.
                        2809X *
                        2810X *       $DOS disounts all units of all directory devices        /80.04.sc/
                        2811X *
                        2812X *       THE USER IS MESSAGED ABOUT THE DISKS, AND THE OPERATING
                        2813X *       SYSTEM IS NOTIFIED.
                        2814X *
                        2815X *
                        2816X *       ENTRY   NONE
                        2817X *
                        2818X *       EXIT    (PSW)   = 'C' CLEAR IF NO ERROR
                        2819X *                         'C' SET   IF    ERROR
                        2820X *                          (A)  = ERROR CODE
                        2821X *
                        2822X *       USES    ALL
                        2823X *
                        2824X
053.017  315 136 031    2825X $DOS    CALL    $TYPTX
053.022  012 007 104    2826X         DB      NL,BELL,'Dismounting All Disks:',NL,ENL
                        2827X
053.054  315 151 053    2828X         CALL    $DOS.
053.057  330            2829X         RC
                        2830X
053.060  315 136 031    2831X         CALL    $TYPTX
053.063  012 122 145    2832X         DB      NL,'Remove the Disk(s). Hit RETURN when ready:',' '+200Q
                        2833X
053.137  315 162 054    2834X DOS1    CALL    $RCHAR          READ CHARACTER
053.142  376 012        2835X         CPI     NL
053.144  302 137 053    2836X         JNE     DOS1
                        2837X
053.147  247            2838X         ANA     A               CLEAR CARRY
053.150  311            2839X         RET



053.151  076 000        2841X $DOS.   MVI     A,OVL0
053.153  377 010        2842X         SCALL   ,LOAD0
053.155  330            2843X         RC
                        2844X
053.156  076 001        2845X         MVI     A,OVL1
053.160  377 010        2846X         SCALL   ,LOAD0
053.162  330            2847X         RC
                        2848X
053.163  377 206        2849X         SCALL   .DAD            Dismount all Disks              /80.09.sc/
053.165  311            2850X         RET
053.166                 2851          XTEXT   DTB
```

```
                        2853X **      $DTB - DELETE TRAILING BLANKS.
                        2854X *
                        2855X *       $DTB DELETES THE TRAILING BLANKS FROM A CODED LINE.
                        2856X *
                        2857X *       ENTRY   (HL) = LINE FWA
                        2858X *       EXIT    (A) = LENGTH OF RESULT (ENCLUDING 00 TERMINATOR BYTE)
                        2859X *       USES    A,F
                        2860X
                        2861X
053.166  325           2862X $DTB    PUSH    D               SAVE (DE)
053.167  124           2863X         MOV     D,H
053.170  135           2864X         MOV     E,L             (DE) = FWA
053.171  033           2865X         DCX     D               (DE) = FWA-1
053.172  176           2866X $DTB1   MOV     A,M
053.173  043           2867X         INX     H
053.174  247           2868X         ANA     A               FIND END OF LINE
053.175  302 172 053   2869X         JNZ     $DTB1
053.200  053           2870X         DCX     H               (HL) = ADDRESS OF TERMINATING ZERO BYTE
                        2871X
                        2872X *       GOT END OF LINE. DELETE TRAILING BLANKS
                        2873X
053.201  053           2874X $DTB2   DCX     H               BACKUP ONE CHARACTER
053.202  315 216 030   2875X         CALL    $CDEHL
053.205  312 216 053   2876X         JE      $DTB3           GONE PAST FRONT OF LINE, MUST BE ALL BLANKS
053.210  176           2877X         MOV     A,M
053.211  376 040       2878X         CPI     ' '
053.213  312 201 053   2879X         JE      $DTB2           GOT BLANK
                        2880X
                        2881X *       HAVE TRIMED LINE. COMPUTE LENGTH
                        2882X
053.216  043           2883X $DTB3   INX     H
053.217  066 000       2884X         MVI     M,0             TERMINATE LINE
053.221  175           2885X         MOV     A,L
053.222  223           2886X         SUB     E               (A) = LENGTH +1 (FOR 00 BYTE)
053.223  353           2887X         XCHG
053.224  043           2888X         INX     H               (HL) = LINE FWA
053.225  321           2889X         POP     D               RESTORE (DE)
053.226  311           2890X         RET
053.227               2891          XTEXT   DU66



                        2893X **      $DU66 - UNSIGNED 16 / 16 DIVIDE.
                        2894X *
                        2895X *       (HL) = (BC)/(DE)
                        2896X *
                        2897X *       ENTRY   (BC), (DE) PRESET
                        2898X *       EXIT    (HL) = RESULT
                        2899X *               (DE) = REMAINDER
                        2900X *       USES    ALL
                        2901X
                        2902X
030.106                 2903X $DU66   EQU     30106A          IN H17 ROM
053.227                 2904          XTEXT   ECI
```

```
                                2906X **      ECI - ENABLE CONSOLE INTERRUPTS
                                2907X *
                                2908X *       ENTRY   NONE
                                2909X *       EXIT    NONE
                                2910X *       USES    (PSW)
                                2911X *
                                2912X
053.227  072 343 040           2913X ECI     LDA     S.CDB
053.232  376 001               2914X         CPI     CDB.H84
053.234  312 244 053           2915X         JZ      ECI1                    IF  8250
                                2916X
                                2917X *       HAVE 8251
                                2918X
053.237  076 027               2919X         MVI     A,UCI.RE+UCI.TE+UCI.ER+UCI.IE
053.241  323 373               2920X         OUT     SC.UART+USR
053.243  311                   2921X         RET
                                2922X
                                2923X *       HAVE 8250
                                2924X
053.244  076 001               2925X ECI1    MVI     A,UC.EDA
053.246  323 351               2926X         OUT     SC.ACE+UR.IER
053.250  311                   2927X         RET
053.251                         2928          XTEXT   FST



                                2930X **      $FST - FIND IN SERIAL TABLE
                                2931X *
                                2932X *       $FST SEARCHES A SERIAL TABLE FOR
                                2933X *       A SPECIFIC KEY
                                2934X *
                                2935X *       ENTRY   (HL) = ADDR. OF TABLE
                                2936X *               (DE) = ADDR. OF SEARCH KEY
                                2937X *       EXIT    (DE) = UNCHANGED
                                2938X *               'Z' CLEARED IF NO MATCH FOUND
                                2939X *                 (HL) = ADDR. OF NEXT AVAILABLE BYTE
                                2940X *               'Z' SET IF MATCH FOUND
                                2941X *                 (HL) = ADDR. OF FIRST DATA BYTE
                                2942X *       USES    A,F,H,L
                                2943X
                                2944X
                                2945X
053.251  305                   2946X $FST    PUSH    B               SAVE REGISTERS
053.252  325                   2947X         PUSH    D
                                2948X
                                2949X *       SAVE TABLE LIMIT AND DATA BYTE COUNT
                                2950X
053.253  136                   2951X         MOV     E,M             GET AND SAVE TABLE LIMIT
053.254  043                   2952X         INX     H               (HL) = 2ND BYTE OF SIZE
053.255  126                   2953X         MOV     D,M
053.256  353                   2954X         XCHG
053.257  042 351 053           2955X         SHLD    $FST.L          SAVE MAX. TABLE SIZE
                                2956X
053.262  353                   2957X         XCHG
053.263  043                   2958X         INX     H               (HL) = # OF BYTES OF DATA/ENTRY
```

```
053.264  176            2959X          MOV     A,M
053.265  062 353 053     2960X          STA     $FST.C
053.270  043            2961X          INX     H               (HL) = BEGINNING OF DATA
053.271  321            2962X FST1     POP     D               RESTORE ADDR. TO SEARCH KEY
053.272  325            2963X          PUSH    D
                        2964X
                        2965X *        CHECK FOR END OF DATA
                        2966X
053.273  176            2967X          MOV     A,M
053.274  267            2968X          ORA     A               AT END OF DATA? ((A) = 0)
053.275  302 304 053     2969X          JNZ     FST2            NO, START MATCHING
053.300  074            2970X          INR     A               CLEAR 'Z'
053.301  321            2971X          POP     D
053.302  301            2972X          POP     B               RESTORE REGISTERS
053.303  311            2973X          RET
                        2974X
053.304  032            2975X FST2     LDAX    D               (A) = KEY CHAR.
053.305  276            2976X          CMP     M               COMPARE TO TABLE
053.306  302 322 053     2977X          JNE     FST3            NO MATCH, FIND NEXT KEY
053.311  247            2978X          ANA     A               END OF KEY?
053.312  372 344 053     2979X          JM      FST4            YES, SET UP FOR EXIT
053.315  043            2980X          INX     H
053.316  023            2981X          INX     D
053.317  303 304 053     2982X          JMP     FST2
                        2983X
053.322  176            2984X FST3     MOV     A,M             SEARCH FOR END OF KEY
053.323  247            2985X          ANA     A               TEST CHAR.
053.324  043            2986X          INX     H
053.325  362 322 053     2987X          JP      FST3            CONTINUE SEARCH
053.330  072 353 053     2988X          LDA     $FST.C          (A) = # OF BYTES OF DATA/ENTRY
053.333  205            2989X          ADD     L
053.334  157            2990X          MOV     L,A
053.335  076 000        2991X          MVI     A,0
053.337  214            2992X          ADC     H
053.340  147            2993X          MOV     H,A             (HL) = HEAD OF NEXT KEY
053.341  303 271 053     2994X          JMP     FST1            COMPARE NEXT KEY
                        2995X
053.344  257            2996X FST4     XRA     A               SET 'Z' FOR EXIT
053.345  043            2997X          INX     H               (HL) = FIRST BYTE OF DATA
053.346  321            2998X          POP     D               RESTORE REGISTERS
053.347  301            2999X          POP     B
053.350  311            3000X          RET                     EXIT
                        3001X
                        3002X
053.351                 3003X $FST.L   DS      2
053.353                 3004X $FST.C   DS      1
053.354                 3005           XTEXT   GNL
```

```
                                3007X **      $GNL - GUARANTEE NEW LINE.
                                3008X *
                                3009X *       $GNL GUARANTEES THE START OF A NEW LINE BY ISSUING A CRLF
                                3010X *       IF THE CURSOR IS NOT AT COLUMN 1..
                                3011X *
                                3012X *       ENTRY   NONE
                                3013X *       EXIT    NONE
                                3014X *       USES    ALL
                                3015X
                                3016X
053.354  076 002               3017X $GNL    MVI     A,I.CUSOR
053.356  001 000 000           3018X         LXI     B,0
053.361  377 006               3019X         DB      SYSCALL,.CONSL          READ CURSOR
053.363  075                   3020X         DCR     A
053.364  310                   3021X         RZ                      AT COLUMN 1
053.365  303 140 052           3022X         JMP     $CRLF           NEW LINE
053.370                        3023          XTEXT   HLCPDE                                   /80.04.GC/
                                3024X **      HLCPDE  - (HL) COMPARED TO (DE)
                                3025X *
                                3026X *       THIS ROUTINE IS DOUBLE WORD COMPARE OF REGISTER PAIRS (DE) AND (HL).
                                3027X *
                                3028X *       ENTRY:  (HL)&(DE) SET UP
                                3029X *
                                3030X *       EXIT:   (PSW)   =
                                3031X *                       'Z' SET   IF (HL) =  (DE)
                                3032X *                       'C' SET   IF (HL) <  (DE)
                                3033X *                       'C' CLEAR IF (HL) >= (DE)
                                3034X *
                                3035X *
                                3036X *       USES:   (PSW)
                                3037X *
                                3038X
053.370  174                   3039X HLCPDE  MOV     A,H
053.371  272                   3040X         CMP     D       'C' SET => (A) < (D)
053.372  300                   3041X         RNZ
053.373  175                   3042X         MOV     A,L
053.374  273                   3043X         CMP     E       'C' SET => (L) < (E)
053.375  311                   3044X         RET
053.376                        3045          XTEXT   ILDEHL


                                3047X **      ILDEHL - INDEXED LOAD OF DE FROM HL.
                                3048X *
                                3049X *       'DE' GET THE FULL WORD VALUE POINTED TO BY 'HL', AND 'HL' IS
                                3050X *       INCREMENTED BY TWO.
                                3051X *
                                3052X *       ENTRY:  HL      = ADDRESS OF FULL WORD VALUE
                                3053X *
                                3054X *       EXIT:   DE      = (HL)
                                3055X *               HL      = HL + 2
                                3056X *
                                3057X *       USES:   DE
                                3058X *
                                3059X
```

```
053.376  136          3060X ILDEHL  MOV     E,M
053.377  043          3061X         INX     H
054.000  126          3062X         MOV     D,M
054.001  043          3063X         INX     H
054.002  311          3064X         RET
054.003               3065          XTEXT   INDL


                      3067X **      $INDL - INDEXED LOAD.
                      3068X *
                      3069X *       $INDL LOADS DE WITH THE TWO BYTES AT (HL)+DISPLACMENT
                      3070X *
                      3071X *       THIS ACTS AS AN INDEXED FULL WORD LOAD.
                      3072X *
                      3073X *       (DE) = ( (HL) + DSPLACEMENT )
                      3074X *
                      3075X *       ENTRY   ((RET)) = DISPLACMENT (FULL WORD)
                      3076X *               (HL) = TABLE ADDRESS
                      3077X *       EXIT    TO (RET+2)
                      3078X *       USES    A,F,D,E
                      3079X
                      3080X
030.234               3081X $INDL   EQU     30234A          IN H17 ROM
054.003               3082          XTEXT   INDXX


                      3084X **      $INDLB  -  INDEXED LOAD BYTE
                      3085X *
                      3086X *       BYTE INDEXED LOAD PRIMITIVE
                      3087X *
                      3088X *       ENTRY:  HL      = BASE ADDRESS
                      3089X *               (RET)   = FULL WORD RELOCATION
                      3090X *
                      3091X *       EXIT:   A       = ( HL + (RET) )
                      3092X *
                      3093X *       USES:   A
                      3094X *
                      3095X
054.003  353          3096X $INDLB  XCHG                    DE = BASE
054.004  343          3097X         XTHL                    SAVE  ,DE.
054.005  325          3098X         PUSH    D               SAVE  BASE
054.006  305          3099X         PUSH    B               SAVE  ,BC.
                      3100X
054.007  116          3101X         MOV     C,M
054.010  043          3102X         INX     H
054.011  106          3103X         MOV     B,M             BC = OFFSET
054.012  043          3104X         INX     H               HL =  .RET.
                      3105X
054.013  353          3106X         XCHG                    HL = BASE
054.014  011          3107X         DAD     B               HL = BASE + OFFSET
054.015  176          3108X         MOV     A,M             A  = ( BASE + OFFSET )
054.016  353          3109X         XCHG                    HL =  ,RET.
```

```
                        3110X
     054.017  301       3111X          POP     B               RESTORE  .BC.
     054.020  321       3112X          POP     D               RESTORE  BASE
     054.021  343       3113X          XTHL                    HL = .DE. ; (SP) = .RET.
     054.022  353       3114X          XCHG                    DE = .DE. ; HL = BASE
     054.023  311       3115X          RET


                        3117X **       $INDS   -  INDEXED STORE
                        3118X *
                        3119X *        INDEXED STORE PRIMITIVE.
                        3120X *
                        3121X *        ENTRY:  HL = BASE ADDRESS
                        3122X *                DE = VALUE TO STORE
                        3123X *
                        3124X *        EXIT:   ( HL + (RET) ) = DE
                        3125X *
                        3126X *        USES:   NONE
                        3127X *
                        3128X
     054.024  315 127 055  3129X $INDS  CALL    XCHGBC
     054.027  343          3130X          XTHL                    SAVE  .BC.
     054.030  325          3131X          PUSH    D
     054.031  315 376 053  3132X          CALL    ILDEHL          DE = OFFSET
     054.034  315 127 055  3133X          CALL    XCHGBC          BC = .RET.
     054.037  353          3134X          XCHG                    DE = BASE ; HL = OFFSET
     054.040  031          3135X          DAD     D               HL = BASE + OFFSET
     054.041  353          3136X          XCHG
     054.042  343          3137X          XTHL                    SAVE  BASE
     054.043  353          3138X          XCHG                    DE = VALUE
     054.044  315 101 054  3139X          CALL    ISDEHL
     054.047  341          3140X          POP     H               HL = BASE
     054.050  315 127 055  3141X          CALL    XCHGBC
     054.053  343          3142X          XTHL                    RESTORE  .BC.
     054.054  315 127 055  3143X          CALL    XCHGBC
     054.057  311          3144X          RET


                        3146X **       $INDSB  -  INDEXED BYTE STORE
                        3147X *
                        3148X *        INDEXED BYTE STORE.
                        3149X *
                        3150X *        ENTRY:  A       = VALUE TO STORE
                        3151X *                HL      = BASE ADDRESS
                        3152X *                (RET)   = OFFSET
                        3153X *
                        3154X *        EXIT:   NONE
                        3155X *
                        3156X *        USES:   PSW
                        3157X *
                        3158X
     054.060  353       3159X $INDSB  XCHG                    DE = BASE
```

```
054.061  343          3160X          XTHL                    SAVE  .DE.
054.062  325          3161X          PUSH    D               SAVE  BASE
054.063  305          3162X          PUSH    B               SAVE  .BC.
                      3163X
054.064  116          3164X          MOV     C,M
054.065  043          3165X          INX     H
054.066  106          3166X          MOV     B,M             BC = OFFSET
054.067  043          3167X          INX     H               HL =  .RET.
                      3168X
054.070  353          3169X          XCHG                    HL = BASE
054.071  011          3170X          DAD     B               HL = BASE + OFFSET
054.072  167          3171X          MOV     M,A             ( BASE + OFFSET ) = A
054.073  353          3172X          XCHG
                      3173X
054.074  301          3174X          POP     B               RESTORE  .BC.
054.075  321          3175X          POP     D               RESTORE  BASE
054.076  343          3176X          XTHL                    HL = .DE. ; (SP) = .RET.
054.077  353          3177X          XCHG                    DE = .DE. ; HL = BASE
054.100  311          3178X          RET
054.101               3179           XTEXT   ISDEHL


                      3181X **       ISDEHL  -  INDEXED STORE OF DE AT HL
                      3182X *
                      3183X *        STORE 'DE' AT THE ADDRESS POINTED TO BY 'HL', AND INCREMENT 'HL'
                      3184X *        BY 2.
                      3185X *
                      3186X *        ENTRY:  DE      = VALUE
                      3187X *                HL      = ADDRESS OF VALUE
                      3188X *
                      3189X *        EXIT:   (HL)    = DE
                      3190X *                HL      = HL + 2
                      3191X *
                      3192X *        USES:   HL
                      3193X *
                      3194X
054.101  163          3195X ISDEHL   MOV     M,E
054.102  043          3196X          INX     H
054.103  162          3197X          MOV     M,D
054.104  043          3198X          INX     H
054.105  311          3199X          RET
054.106               3200           XTEXT   MCU


                      3202X **       MCU - MAP LOWER CASE TO UPPER CASE.
                      3203X *
                      3204X *        MCU MAPS A LOWER CASE ALPHABETIC TO UPPER
                      3205X *        CASE.
                      3206X *
                      3207X *        ENTRY   (A) = CHARACTER
                      3208X *        EXIT    (A) = CHARACTER RESULT
                      3209X *        USES    A,F
```

```
                                3210X
                                3211X
054.106  376 141               3212X $MCU    CPI     'a'
054.110  330                   3213X         RC                      NOT LOWER CASE
054.111  376 173               3214X         CPI     'z'+1
054.113  320                   3215X         RNC                     NOT LOWER CASE
054.114  326 040               3216X         SUI     'a'-'A'
054.116  311                   3217X         RET
054.117                        3218          XTEXT   MLU
```

```
                                3220X **      MLU - MAP LOWER CASE LINE TO UPPER CASE.
                                3221X *
                                3222X *       MLU MAPS THE LOWER CASE ALPHABETICS IN A LINE TO UPPER CASE.
                                3223X *
                                3224X *       ENTRY   (HL) = LINE FWA
                                3225X *       EXIT    NONE
                                3226X *       USES    NONE
                                3227X
                                3228X
054.117  365                   3229X $MLU    PUSH    PSW             SAVE (PSW)
054.120  345                   3230X         PUSH    H               SAVE FWA
054.121  053                   3231X         DCX     H               ANTICIPATE INX H
054.122  043                   3232X $MLU1   INX     H
054.123  176                   3233X         MOV     A,M             (A)= CHARACTER
054.124  315 106 054           3234X         CALL    $MCU            MAP CHAR TO UPPER
054.127  167                   3235X         MOV     M,A
054.130  247                   3236X         ANA     A
054.131  302 122 054           3237X         JNZ     $MLU1           MORE TO GO
054.134  341                   3238X         POP     H               RESTORE (HL)
054.135  361                   3239X         POP     PSW             RESTORE (PSW)
054.136  311                   3240X         RET
054.137                        3241          XTEXT   MOVE
```

```
                                3243X **      $MOVE - MOVE DATA
                                3244X *
                                3245X *       $MOVE MOVES A BLOCK OF BYTES TO A NEW MEMORY ADDRESS.
                                3246X *       IF THE MOVE IS TO A LOWER ADDRESS, THE BYTES ARE MOVED FROM
                                3247X *       FIRST TO LAST.
                                3248X *
                                3249X *       IF THE MOVE IS TO A HIGHER ADDRESS, THE BYTES ARE MOVED FROM
                                3250X *       LAST TO FIRST.
                                3251X *
                                3252X *       THIS IS DONE SO THAT AN OVERLAPED MOVE WILL NOT 'RIPPLE'.
                                3253X *
                                3254X *       ENTRY   (BC) = COUNT
                                3255X *               (DE) = FROM
                                3256X *               (HL) = TO
                                3257X *       EXIT    MOVED
                                3258X *               (DE) = ADDRESS OF NEXT FROM BYTE
                                3259X *               (HL) = ADDRESS OF NEXT *TO* BYTE
```

```
                        3260X *             'C' CLEAR
                        3261X *       USES  ALL
                        3262X
                        3263X
    030.252             3264X $MOVE   EQU   30252A          IN H17 ROM
    054.137             3265          XTEXT MOVEL


                        3267X **      $MOVEL - MOVE DATA
                        3268X *
                        3269X *       $MOVEL MOVES A BLOCK OF BYTES TO A NEW MEMORY ADDRESS.
                        3270X *       IF THE MOVE IS TO A LOWER ADDRESS, THE BYTES ARE MOVED FROM
                        3271X *       FIRST TO LAST.
                        3272X *
                        3273X *       IF THE MOVE IS TO A HIGHER ADDRESS, THE BYTES ARE MOVED FROM
                        3274X *       LAST TO FIRST.
                        3275X *
                        3276X *       THIS IS DONE SO THAT AN OVERLAPED MOVE WILL NOT 'RIPPLE'.
                        3277X *
                        3278X *       CALL  $MOVEL
                        3279X *       DW    COUNT
                        3280X *       DW    FROM
                        3281X *       DW    TO
                        3282X *
                        3283X *       ENTRY ((SP)) = RET
                        3284X *             (RET+0) = COUNT (WORD VALUE)
                        3285X *             (RET+2) = FROM
                        3286X *             (RET+4) = TO
                        3287X *       EXIT  TO (RET+6)
                        3288X *             (DE) = ADDRESS OF NEXT FROM BYTE
                        3289X *             (HL) = ADDRESS OF NEXT *TO* BYTE
                        3290X *             'C' CLEAR
                        3291X *       USES  ALL
                        3292X
                        3293X
    054.137  341        3294X $MOVEL  POP   H               (HL) = RET
    054.140  116        3295X         MOV   C,M
    054.141  043        3296X         INX   H
    054.142  106        3297X         MOV   B,M             (BC) = COUNT
    054.143  043        3298X         INX   H
    054.144  136        3299X         MOV   E,M
    054.145  043        3300X         INX   H
    054.146  126        3301X         MOV   D,M             (DE) = FROM
    054.147  043        3302X         INX   H
    054.150  325        3303X         PUSH  D               ((SP)) = FROM
    054.151  136        3304X         MOV   E,M
    054.152  043        3305X         INX   H
    054.153  126        3306X         MOV   D,M             (DE) = TO
    054.154  043        3307X         INX   H
    054.155  343        3308X         XTHL                  ((SP)) = RET, (HL) = FROM
    054.156  353        3309X         XCHG                  (DE) = FROM , (HL) = TO
    054.157  303 252 030 3310X         JMP   $MOVE           MOVE IT
    054.162             3311          XTEXT MU10
```

```
                        3313X **      $MU10 - MULTIPLY UNSIGNED 16 BIT QUANTITY BY 10.
                        3314X *
                        3315X *       (HL) = (DE)*10
                        3316X *
                        3317X *       ENTRY   (DE) = MULTIPLIER
                        3318X *       EXIT    'C' CLEAR IF OK
                        3319X *                (HL) = PRODUCT
                        3320X *                'C' SET IF ERROR
                        3321X *       USES    D,E,H,L,F
                        3322X
                        3323X
    030.324             3324X $MU10   EQU     30324A          IN H17 ROM
    054.162             3325          XTEXT   RCHAR


                        3327X **      $RCHAR - READ SINGLE CHARACTER FROM CONSOLE.
                        3328X *
                        3329X *       ENTRY   NONE
                        3330X *       EXIT    (A) = CHARACTER
                        3331X *       USES    A,F
                        3332X
                        3333X
    054.162 377 001     3334X $RCHAR  DB      SYSCALL,.SCIN
    054.164 332 162 054 3335X         JC      $RCHAR          NOT READY
    054.167 311         3336X         RET
                        3337X
    054.170 377 002     3338X $WCHAR  DB      SYSCALL,.SCOUT
    054.172 311         3339X         RET
    054.173             3340          XTEXT   RTL


                        3342X **      $RTL - READ TEXT LINE.
                        3343X *
                        3344X *       $RTL READS A LINE FROM THE TERMINAL.
                        3345X *
                        3346X *       CHARACTER ARE ACCEPTED FROM THE TERMINAL, RUBOUT AND BACKSPACE
                        3347X *       CHARACTERS ARE PROCESSED. WHEN A CARRIAGE RETURN IS ENTERED,
                        3348X *       $RTL RETURNS.
                        3349X *
                        3350X *       ENTRY   (HL) = BUFFER FWA
                        3351X *       EXIT    'C' CLEAR IF OK
                        3352X *                DATA IN BUFFER
                        3353X *                (A) = TEXT LENGTH
                        3354X *                'C' SET IF CTL-D STRUCK
                        3355X *       USES    A,F
                        3356X
                        3357X
    054.173 315 202 054 3358X $RTL:   CALL    $RTL            $RTL IN UPPER CASE
    054.176 330         3359X         RC                      CTL-D
    054.177 303 117 054 3360X         JMP     $MLU            MAP LINE TO UPPER CASE
                        3361X
    054.202             3362X $RTL    EQU     *
```

```
054.202  345          3363X          PUSH    H               SAVE FWA
054.203  315 162 054  3364X $RTL1    CALL    $RCHAR
054.206  376 004      3365X          CPI     CTLD
054.210  312 235 054  3366X          JE      $RTL2           CTL-D STRUCK
054.213  167          3367X          MOV     M,A
054.214  043          3368X          INX     H
054.215  376 012      3369X          CPI     NL
054.217  302 203 054  3370X          JNE     $RTL1
054.222  053          3371X          DCX     H
054.223  066 000      3372X          MVI     M,0
054.225  043          3373X          INX     H
                      3374X
                      3375X *        ALL DONE. COMPUTE LENGTH
                      3376X
054.226  353          3377X          XCHG                    (DE) = LWA+1
054.227  343          3378X          XTHL                    (HL) = FWA
054.230  173          3379X          MOV     A,E
054.231  225          3380X          SUB     L               (A) = LENGTH
054.232  247          3381X          ANA     A               CLEAR CARRY
054.233  321          3382X          POP     D               RESTORE (DE)
054.234  311          3383X          RET
                      3384X
                      3385X *        CTL-D STRUCK
                      3386X
054.235  341          3387X $RTL2    POP     H               (HL) = FWA
054.236  067          3388X          STC
054.237  311          3389X          RET
054.240               3390           XTEXT   SAVALL


                      3392X **       $RSTALL - RESTORE ALL REGISTERS.
                      3393X *
                      3394X *        $RSTALL RESTORES ALL THE REGISTERS OFF THE STACK, AND
                      3395X *        RETURNS TO THE PREVIOUS CALLER.
                      3396X *
                      3397X *        ENTRY   (SP) = PSW
                      3398X *                (SP+2) = BC
                      3399X *                (SP+4) = DE
                      3400X *                (SP+6) = HL
                      3401X *                (SP+8) = RET
                      3402X *        EXIT    TO *RET*, REGISTERS RESTORED
                      3403X *        USES    ALL
                      3404X
                      3405X
031,047               3406X $RSTALL EQU     31047A          IN H17 ROM
```

```
                                3408X **      $SAVALL - SAVE ALL REGISTERS ON STACK.
                                3409X *
                                3410X *       $SAVALL SAVES ALL THE REGISTERS ON THE STACK.
                                3411X *
                                3412X *       ENTRY   NONE
                                3413X *       EXIT    (SP) = PSW
                                3414X *               (SP+2) = BC
                                3415X *               (SP+4) = DE
                                3416X *               (SP+6) = HL
                                3417X *       USES    H,L
                                3418X
                                3419X
      031.054                   3420X $SAVALL EQU     31054A          IN H17 ROM
      054.240                   3421          XTEXT   SCU



                                3423X **      SCU - SETUP CONSOLE USART.
                                3424X *
                                3425X *       SCU CONFIGURES THE CONSOLE USART.
                                3426X *
                                3427X *       IF  8250
                                3428X *         THEN  PORT = 372-3Q
                                3429X *          ELSE  PORT = 340-7Q
                                3430X *
                                3431X *
                                3432X *       ENTRY   NONE
                                3433X *       EXIT    NONE
                                3434X *       USES    A,F,(BC),(HL)
                                3435X
                                3436X
      054.240  072 343 040      3437X SCU     LDA     S.CDB
      054.243  376 001          3438X         CPI     CDB.H84
      054.245  312 310 054      3439X         JZ      SCU1                    IF  8250
                                3440X
                                3441X *       PRESET 8251
                                3442X
      054.250  076 201          3443X         MVI     A,201Q
      054.252  323 373          3444X         OUT     SC,UART+USR             GET USART IN KNOWN STATE
      054.254  323 373          3445X         OUT     SC,UART+USR
      054.256  323 373          3446X         OUT     SC,UART+USR
      054.260  323 373          3447X         OUT     SC,UART+USR
      054.262  076 100          3448X         MVI     A,UCI.IR                RESET
      054.264  323 373          3449X         OUT     SC,UART+USR
      054.266  072 327 040      3450X         LDA     S,CONTY
      054.271  346 010          3451X         ANI     CTP.2SB
      000,000                   3452X         ERRNZ   CTP.2SB*16+UMI.1B-UMI.2B
      054.273  007              3453X         RLC
      054.274  007              3454X         RLC
      054.275  007              3455X         RLC
      054.276  007              3456X         RLC
      054.277  366 116          3457X         ORI     UMI.1B+UMI.L8+UMI.16X
      054.301  323 373          3458X         OUT     SC,UART+USR
      054.303  076 025          3459X         MVI     A,UCI.ER+UCI.RE+UCI.TE
      054.305  323 373          3460X         OUT     SC,UART+USR
```

```
054.307  311          3461X          RET
                      3462X
                      3463X *        IS 8250
                      3464X
054.310  333 355      3465X SCU1     IN      SC.ACE+UR.LSR                                  /80.01.GC/
054.312  346 100      3466X          ANI     UC.TSE          CHECK FOR SHIFT EMPTY          /80.01.GC/
054.314  312 310 054  3467X          JZ      SCU1                                           /80.01.GC/
                      3468X
054.317  257          3469X          XRA     A                                              /79.01.GC/
054.320  323 351      3470X          OUT     SC.ACE+UR.IER   TURN OFF ANY INTERRUPTS        /79.01.GC/
054.322  076 020      3471X          MVI     A,UC.LOO                                       /79.01.GC/
054.324  323 354      3472X          OUT     SC.ACE+UR.MCR                                  /79.01.GC/
054.326  052 344 040  3473X          LHLD    S.BAUD
054.331  076 200      3474X          MVI     A,UC.DLA
054.333  323 353      3475X          OUT     SC.ACE+UR.LCR   ACCESS DIVISOR LATCHES
054.335  175          3476X          MOV     A,L
054.336  323 350      3477X          OUT     SC.ACE+UR.DLL   SET LEAST SIGNIFICANT
054.340  174          3478X          MOV     A,H
054.341  346 177      3479X          ANI     177Q            TRIM STOP BITS
054.343  323 351      3480X          OUT     SC.ACE+UR.DLM   SET MOST SIGNIFICANT
054.345  072 327 040  3481X          LDA     S.CONTY
054.350  346 010      3482X          ANI     CTP.2SB
054.352  017          3483X          RRC
000.000               3484X          ERRNZ   CTP.2SB/2-UC.2SB
000.000               3485X          ERRNZ   UC.2SB-4        (A) = UC.2SB IF 2 STOP BITS
054.353  366 003      3486X          ORI     UC.8BW          8 BIT WORDS
054.355  323 353      3487X          OUT     SC.ACE+UR.LCR
054.357  076 156      3488X          MVI     A,AC.DLY                                       /79.01.GC/
054.361  315 053 000  3489X          CALL    .DLY                                           /79.01.GC/
054.364  333 350      3490X          IN      SC.ACE+UR.RBR   GOBBLE ANY TRASH              /79.01.GC/
054.366  333 354      3491X          IN      SC.ACE+UR.MCR                                  /79.01.GC/
054.370  346 357      3492X          ANI     377Q-UC.LOO                                    /79.01.GC/
054.372  323 354      3493X          OUT     SC.ACE+UR.MCR                                  /79.01.GC/
054.374  311          3494X          RET
054.375               3495           XTEXT   SOB


                      3497X **       $SOB - SKIP OVER BLANKS.
                      3498X *
                      3499X *        $SOB IS CALLED TO SKIP AN ARBITRARILY LONG STRING OF BLANKS AND TABS.
                      3500X *
                      3501X *        ENTRY   (HL) = FWA OF (POSSIBLE) BLANK STRING
                      3502X *        EXIT    (HL) = LWA+1 OF BLANK STRING (UNCHANGED IF NO BLANKS)
                      3503X *                (A) = FIRST NON-BLANK, NON-TAB CHARACTER EEN
                      3504X *        USES    A,F,H,L
                      3505X
                      3506X
054.375  053          3507X $SOB     DCX     H               PRE-DECREMENT
054.376  043          3508X $SOB1    INX     H
054.377  176          3509X          MOV     A,M
055.000  376 040      3510X          CPI     ' '
055.002  312 376 054  3511X          JE      $SOB1           GOT BLANK
055.005  376 011      3512X          CPI     TAB
055.007  312 376 054  3513X          JE      $SOB1           GOT TAB
```

```
055.012  311          3514X          RET
055.013               3515           XTEXT   TJMP


                      3517X **       $TJMP - TABLE JUMP.
                      3518X *
                      3519X *        USAGE
                      3520X *
                      3521X *        CALL     $TJMP          (A) = INDEX
                      3522X *        DW       ADDR1
                      3523X *        .          .
                      3524X *        .          .
                      3525X *        .          .
                      3526X *        DW       ADDRN
                      3527X *
                      3528X *        ENTRY    (A) = INDEX
                      3529X *        EXIT     TO PROCESSOR
                      3530X *                 (A) = INDEX*2
                      3531X *        USES     NONE.
                      3532X
                      3533X
031.061               3534X $TJMP    EQU      31061A         IN H17 ROM; (A) = INDEX*2
                      3535X
031.062               3536X $TJMP.   EQU      31062A         IN H17 ROM
055.013               3537           XTEXT    TYPCC


                      3539X **       $TYPCC - TYPE A CHARACTER STRING BY COUNT.
                      3540X *
                      3541X *        $TYPCC TYPES A STRING OF CHARACTERS. THE CALLER SUPPLIES
                      3542X *        THE CHARACTER ADDRESS AND COUNT.
                      3543X *
                      3544X *        ENTRY    (HL) = ADDRESS
                      3545X *                 (A) = COUNT
                      3546X *        EXIT     (HL) = LAST CHARACTER ADDRESS+1
                      3547X *        USES     A,F,H,L
                      3548X
                      3549X
055.013               3550X $TYPCC   EQU      *
055.013  247          3551X          ANA      A
055.014  310          3552X          RZ                      NOTHING TO TYPE
055.015  365          3553X          PUSH     PSW            SAVE COUNT
055.016  176          3554X          MOV      A,M            (A) = CHARACTER
055.017  043          3555X          INX      H
055.020  377 002       3556X          DB       SYSCALL,.SCOUT
055.022  361          3557X          POP      PSW
055.023  075          3558X          DCR      A
055.024  303 013 055  3559X          JMP      $TYPCC
055.027               3560           XTEXT    TYPT2
```

```
                        3562X **      $TYPTX - TYPE TEXT.
                        3563X *
                        3564X *       $TYPTX IS CALLED TO TYPE A BLOCK OF TEXT ON THE SYSTEM CONSOLE.
                        3565X *
                        3566X *       IMBEDDED ZERO BYTES INDICATE A CARRIAGE RETURN LINE FEED,
                        3567X *       A BYTE WITH THE 2000 BIT SET IS THE LAST BYTE IN THE MESSAGE.
                        3568X *
                        3569X *       ENTRY   (RET) = TEXT
                        3570X *       EXIT    TO (RET+LENGTH)
                        3571X *       USES    A,F
                        3572X
                        3573X
031.136                 3574X $TYPTX  EQU     31136A          IN H17 ROM
                        3575X
031.144                 3576X $TYPTX. EQU     31144A          IN H17 ROM
055.027                 3577          XTEXT   UDD


                        3579X **      $UDD - UNPACK DECIMAL DIGITS.
                        3580X *
                        3581X *       UDD CONVERTS A 16 BIT VALUE INTO A SPECIFIED NUMBER OF
                        3582X *       DECIMAL DIGITS. THE RESULT IS ZERO FILLED.
                        3583X *
                        3584X *       ENTRY   (B,C) = ADDRESS VALUE
                        3585X *               (A) = DIGIT COUNT
                        3586X *               (H,L) = MEMORY ADDRESS
                        3587X *       EXIT    (HL) = (HL) + (A)
                        3588X *       USES    ALL
                        3589X
                        3590X
031.157                 3591X $UDD    EQU     31157A          IN H17 ROM
055.027                 3592          XTEXT   UDDN


                        3594X **      $UDDN - UNPACK DECIMAL DIGITS.
                        3595X *
                        3596X *       UDDN CONVERTS A 16 BIT VALUE INTO A SPECIFIED NUMBER OF
                        3597X *       DECIMAL DIGITS. THE RESULT IS NULL FILLED TO THE LEFT.
                        3598X *
                        3599X *       ENTRY   (B,C) = ADDRESS VALUE
                        3600X *               (A) = DIGIT COUNT
                        3601X *               (H,L) = MEMORY ADDRESS
                        3602X *       EXIT    (HL) = (HL) + (A)
                        3603X *       USES    ALL
                        3604X
                        3605X
055.027                 3606X $UDDN   EQU     *
055.027  315 072 030    3607X         CALL    $DADA
055.032  345            3608X         PUSH    H               SAVE FINAL (H,L) VALUE
                        3609X
055.033  365            3610X UDDN1   PUSH    PSW
055.034  345            3611X         PUSH    H
```

```
055.035  021 012 000  3612X          LXI     D,10
055.040  315 106 030  3613X          CALL    $DU66           (H,L) = VALUE/10
055.043  104          3614X          MOV     B,H
055.044  115          3615X          MOV     C,L             (BC) = QUOTIENT
055.045  341          3616X          POP     H
055.046  076 060      3617X          MVI     A,'0'
055.050  203          3618X          ADD     E               ADD REMAINDER
055.051  053          3619X          DCX     H
055.052  167          3620X          MOV     M,A             STORE DIGIT
055.053  170          3621X          MOV     A,B
055.054  261          3622X          ORA     C
055.055  312 067 055  3623X          JZ      UDDN2           ALL ZEROS
055.060  361          3624X          POP     PSW
055.061  075          3625X          DCR     A
055.062  302 033 055  3626X          JNZ     UDDN1           IF MORE TO GO
                      3627X
                      3628X *        ALL DONE. EXIT
                      3629X
055.065  341          3630X UDDN1.5  POP     H               RESTORE H
055.066  311          3631X          RET                       RETURN
                      3632X
                      3633X *        DIGITS LEADING THIS ONE ARE ZERO. STORE NULLS INSTEAD.
                      3634X
055.067  361          3635X UDDN2    POP     PSW
055.070  075          3636X UDDN3    DCR     A
055.071  312 065 055  3637X          JE      UDDN1.5         ALL DONE
055.074  053          3638X          DCX     H
055.075  066 000      3639X          MVI     M,0
055.077  303 070 055  3640X          JMP     UDDN3
055.102               3641           XTEXT   UOD


                      3643X **       $UOD - UNPACK OCTAL DIGITS.
                      3644X *
                      3645X *        UOD CONVERTS A SINGLE BYTE INTO 3 OCTAL DIGITS., ZERO FILL
                      3646X *
                      3647X *        ENTRY   (A) = BYTE VALUE
                      3648X *                (H,L) = ADDRESS OF 3 BYTE AREA FOR DIGITS
                      3649X *        EXIT    (H,L) = (H,L)+3
                      3650X *        USES    A,H,L
                      3651X
                      3652X
055.102  305          3653X $UOD     PUSH    B
055.103  006 003      3654X          MVI     B,3             (B) = LOOP COUNT
055.105  247          3655X          ANA     A               CLEAR CARRY
                      3656X
055.106  027          3657X UOD1     RAL
055.107  027          3658X          RAL
055.110  027          3659X          RAL
055.111  365          3660X          PUSH    PSW             SAVE VALUE
055.112  346 007      3661X          ANI     7
055.114  306 060      3662X          ADI     '0'
055.116  167          3663X          MOV     M,A             STORE DIGIT
055.117  043          3664X          INX     H
```

```
055.120  361          3665X          POP     PSW             RESTORE VALUE
055.121  005          3666X          DCR     B
055.122  302 106 055  3667X          JNZ     UOD1            IF MORE TO GO
055.125  301          3668X          POP     B               RESTORE (B,C)
055.126  311          3669X          RET                        EXIT
055.127               3670           XTEXT   XCHGBC


                      3672X **       XCHGBC  -  XCHG BC
                      3673X *
                      3674X *        EXCHANGE THE 'BC' REGISTER PAIR WITH THE 'HL' REGISTER PAIR.
                      3675X *
                      3676X *        ENTRY:  BC      = ORIGINAL BC
                      3677X *                HL      = ORIGINAL HL
                      3678X *
                      3679X *        EXIT:   BC      = ORIGINAL HL
                      3680X *                HL      = ORIGINAL BC
                      3681X *
                      3682X *        USES:   BC,HL
                      3683X *
                      3684X
055.127  365          3685X XCHGBC   PUSH    PSW
055.130  170          3686X          MOV     A,B
055.131  104          3687X          MOV     B,H
055.132  147          3688X          MOV     H,A
055.133  171          3689X          MOV     A,C
055.134  115          3690X          MOV     C,L
055.135  157          3691X          MOV     L,A
055.136  361          3692X          POP     PSW
055.137  311          3693X          RET
```

```
                        3696  **      BUFFERS
                        3697
     055.140            3698  MEML    EQU     *               LOAD IMAGE LWA
                        3699
     055.140            3700          DS      128             PATCH AREA
                        3701
     055.340            3702          DS      1               SET TO 200Q FOR PROCESSING 'VERB'
     055.341            3703  VERB    DS      120             VERB BUFFER
                        3704
     056.131            3705  LINE    DS      120             LINE BUFFER
                        3706
     056.321            3707  LABEL   DS      256             LABEL BUFFER
                        3708
     057.321            3709  RMEML   EQU     *               RUNNING LIMIT
                        3710
     057.321            3711          END
ASSEMBLY COMPLETE
 3711 STATEMENTS
    1 ERRORS DETECTED
 9520 BYTES FREE
```

```
$CAD    051215   1763    2459L
$CCO    052061   1287    2572L
$CDEHL  030216   2560E   2875
$COMP   030060   2462    2500    2597E
$CPF    052076   1502    2619L
$CPF1   052100   2620L   2633
$CPF2   052135   2622    2625    2627    2629    2639L
$CRLF   052140   1804    1811    2652L   3022
$DAD    052146   1773    2680L
$DADA   030072   2757E   3607
$DADA.  030101   2509    2712    2767E
$DDD    052362   2470    2528    2785L
$DDD1   052365   2787L   2804
$DOS    053017   2825L
$DOS.   053151   2178    2828    2841L
$DTB    053166   2862L
$DTB1   053172   2866L   2869
$DTB2   053201   2874L   2879
$DTB3   053216   2876    2883L
$DU66   030106   2688    2702    2903E   3613
$FST    053251   1360    2946L
$FST.C  053353   2960    2988    3004L
$FST.L  053351   2955    3003L
$GNL    053354   1288    3017L
$INDL   030234   1019    1045    1088    1152    1955    3081E
$INDLB  054003    958    1040    1079    1131    1136    1141    1146    1893    1964    1972    3098L
$INDS   054024   1034    3129L
$INDSB  054060   1085    1097    3159L
$MCU    054106   3212L   3234
$MLU    054117   3229L   3360
$MLU1   054122   3232L   3237
$MOVE   030252   1189    1548    1570    1590    1621    2269    2715    2740    3264E   3310
$MOVEL  054137   1523    1542    3294L
$MU10   030324   2795    3324E
$RCHAR  054162   2834    3334L   3335    3364
$RSTALL 031047   2576    3406E
$RTL    054202   3358    3362E
$RTL.   054173   1318    3358L
$RTL1   054203   3364L   3370
$RTL2   054235   3366    3387L
$SAVALL 031054   2572    3420E
$SOB    054375   1499    1683    1756    3507L
$SOB1   054376   3508L   3511    3513
$TJMP   031061   1363    3534E
$TJMP.  031062   3536E
$TYPCC  055013   1782    1810    3550E   3559
$TYPTX  031136   1274    1278    1315    1487    1712    1765    1917    2377    2825    2831    3574E
$TYPTX. 031144   1845    1887    1987    3576E
$UDD    031157   2696    2726    3591E
$UDDN   055027   3606E
$UOD    055102   2398    2401    3653L
$WCHAR  054170   3338L
.       044313   1445S
.ABUSS  040024    302E
.ALARM  002136    275E
.ALEDS  040013    300E
.CHFLG  000060    548L
.CLEAN  000205    563L
```

.CLEAR	000055	545L	1192				
.CLEARA	000056	546L	982				
.CLOSE	000046	538L					
.CLRCD	000007	522L	1267	1486			
.CONSL	000006	521L	2575	3019			
.CRC	002347	283E					
.CRCSUM	040027	303E					
.CTC	002172	277E					
.CTL2FL	040066	309E					
.CTLC	000041	533L	1283				
.CTLFLG	040011	299E					
.DAD	000206	564L	2849				
.DECODE	000053	543L					
.DELET	000050	540L					
.DISMT	000061	549L					
.DLEDS	040021	301E					
.DLY	000053	272E	3489				
.DMNMS	000203	561L					
.DMOUN	000201	559L	1649	1663			
.DOD	003122	286E					
.DODA	003356	288E					
.DSPMOD	040007	297E					
.DSPROT	040006	296E					
.DUMP	001374	274E					
.ERROR	000057	547L	1204	1270	1779	1807	
.EXIT	000000	515L	2182				
.HORN	002140	276E					
.IDENT	000000	271E					
.IOWRK	040002	294E					
.LINK	000040	532L	1439	1508	2373		
.LOAD	001267	273E					
.LOADD	000062	550L	1734				
.LOADO	000010	523L	2305	2308	2842	2846	
.MANUF.	000001	3E	1289				
.MFLAG	040010	298E					
.MONMS	000202	560L					
.MOUNT	000200	558L	1637				
.NAME	000054	544L	1184				
.NMIRET	040064	308E					
.OPEN	000063	551L					
.OPENC	000045	537L					
.OPENR	000042	534L					
.OPENU	000044	536L					
.OPENW	000043	535L					
.PCHL	002264	279E					
.POSIT	000047	539L					
.PRINT	000003	518L					
.RCK	003260	287E					
.READ	000004	519L					
.REGI	040005	295E					
.REGPTR	040035	306E					
.RENAM	000051	541L					
.RESET	000204	562L	1686				
.RNB	002331	282E					
.RNF	002325	281E					
.SCIN	000001	516L	3334				
.SCOUT	000002	517L	2653	3338	3556		
.SETTP	000052	542L	1177				

```
CB2,SSI 000001    220E
CCHIT   045202   1281    1486L
CCI     042321    982L   1193
CDB.H84 000001    734E   2914   3438
CDB.H85 000000    733E
CDT     042324    941     997L
CDT1    042327    999L   1056
CDT2    043013   1017    1025   1026   1040L
CDT3    043035   1013    1036   1043   1053L
CN.170M 000014    258E
CN.174M 000003    257E
CN.ABU  000200    262E
CN.BAU  000100    261E
CN.MEM  000040    260E
CN.PRI  000020    259E
CND.H17 000000    264E
CND.H47 000001    266E
CND.NDI 000000    265E
CO.FLG  000001    711E   2574
COPY    046052   1402    1604E
COT     043046    942    1069L
COT1    043064   1071    1075   1079L
CR      000015     59E
CS.FLG  000200    712E
CSA     050314   1678    2235L
CSL.CHR 000001    688E
CSL.ECH 000200    685E
CSL.RAW 000004    686E
CSL.WRP 000002    687E
CTLA    000001     74E
CTLB    000002     75E
CTLC    000003     76E   1282
CTLD    000004     77E   3365
CTLO    000017     78E
CTLP    000020     79E
CTLQ    000021     80E
CTLS    000023     81E
CTLZ    000032     82E
CTP.2SB 000010    697E   3451   3452   3482   3484
CTP.BKM 000002    698E
CTP.BKS 000200    693E
CTP.FF  000100    694E
CTP.MLI 000040    695E
CTP.MLO 000020    696E
CTP.TAB 000001    699E
D.CON   040110    579L    598
D.DLYHS 040244    632L
D.DLYMO 040243    631L
D.DRVTB 040251    637L
D.DVCTL 040242    629L
D.E.CHK 040267    648L
D.E.HCK 040270    649L
D.E.HSY 040266    647L
D.E.MDS 040265    646L
D.E.TRK 040272    651L
D.E.VOL 040271    650L
D.ERR   040265    645L
D.ERRL  040273    652L
```

```
D.ERTS  040126   614L
D.HECNT 040261   639L
D.LPSA  040116   605L
D.MAIA  040115   604L
D.OECNT 040264   641L
D.OPR   040273   656L
D.OPW   040275   657L
D.RAM   040240   582L   624   659
D.RAML  000037   659E
D.SDPA  040117   606L
D.SDPB  040120   607L
D.SECNT 040262   640L
D.STSA  040121   608L
D.STSB  040122   609L
D.TRKPT 040245   634L
D.TS    040241   627L
D.TT    040240   626L
D.VEC   040130   581L
D.VOLPT 040247   635L
D.WHDA  040123   610L
D.WNHA  040124   611L
D.WRITA 040112   601L
D.WRITB 040113   602L
D.WRITC 040114   603L
D.WSCA  040125   612L
D.XITA  040110   600L
DAD1    052271   2694   2707   2709   2732L
DAD2    052274   2682   2738L
DADB    052305   2711   2742L
DADC    052351   2739   2744L  2745
DADCL   000011   2738   2745E
DATE    046327   1393   1754E
DATE2   047001   1764   1769L
DATE3   047014   1759   1767   1777L
DC.ABT  000007   495L   1048
DC.CLO  000006   494L
DC.LOD  000011   497L
DC.MAX  000013   499L
DC.MOU  000010   496L
DC.OPR  000003   491L
DC.OPU  000005   493L
DC.OPW  000004   492L
DC.RDY  000012   498L
DC.REA  000000   488L
DC.RER  000002   490L
DC.WRI  000001   489L
DDF.BOL 000011   390E
DDF.BOO 000000   389L
DDF.LAB 000011   391L
DDF.USR 000012   392L
DEBUG   000001     2E   1416   1471   2184
DELA    046010   1569   1574L  1575
DELAL   000010   1568   1575E
DELETE  045366   1384   1564E
DEV.DDA 000004   850L   1020   1035   1046   1153
DEV.DVG 000015   863L
DEV.DVL 000013   862L
DEV.FLG 000006   851L   1041   1142   1973
```

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DEV.JMP 000003    849L
DEV.MNU 000010    859L
DEV.MUM 000007    858L   1147
DEV.NAM 000000    841L   1123  1941  1956
DEV.RES 000002    845L   1010  1020  1035  1041  1046  1132  1137  1739  1965
DEV.UNT 000011    860L
DEVELEN 000016    865E   1054  1115  1933
DF.CLR  000376    401E
DF.EMP  000377    400E
DIF.CNT 000020     53E
DIF.LOC 000100     51E
DIF.SYS 000200     50E
DIF.WP  000040     52E
DIR     046056   1396   1615E
DIR.ALD 000025    416L
DIR.CLU 000015    409L
DIR.CRD 000023    415L
DIR.EXT 000010    404L
DIR.FGN 000020    412L
DIR.FLG 000016    410L
DIR.LGN 000021    413L
DIR.LSI 000022    414L
DIR.NAM 000000    403L
DIR.PRO 000013    405L
DIR.VER 000014    406L
DIRA    046100   1620   1625L  1626
DIRAL   000006   1619   1626E
DIRELEN 000027    418E    463   825
DIRIDL  000015    407E
DIS.ENL 001373    467L
DIS.ENT 000000    462E
DIS.LNK 001376    469L
DIS.SEC 001374    468L
DLM     043130    938   1115L
DLM1    043142   1122L  1163
DLM1.5  043221   1139   1151L
DLM2    043237   1156   1159L
DLM3    043241   1129   1134  1144  1149  1162L
DM.MR   000000    230E
DM.MW   000001    231E
DM.RR   000002    232E
DM.RW   000003    233E
DMOO    046132   1651   1655L
DMO1    046143   1656   1660L
DMOUNT  046117   1375   1646E
DOS1    053137   2834L  2836
DR.IM   000001    846E   1012  1031  1133  1967
DR.PR   000002    847E   1016  1138  1742  1968
DT.CH   000020    856E
DT.CR   000002    853E   1976
DT.CW   000004    854E   1977
DT.DD   000001    852E   1042  1143  1975
DT.RN   000010    855E
DV.EL   000000    842E   1001  1125  1926
DV.NU   000001    843E   1128  1942
EC.CNA  000004    319L
EC.DDA  000027    338L
EC.DIF  000017    330L
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EC.DIW  000035   344L
EC.DNI  000045   352L
EC.DNR  000046   353L
EC.DNS  000005   320L
EC.DSC  000047   354L
EC.EOF  000001   316L
EC.EOM  000002   317L
EC.FAO  000031   340L
EC.FAP  000026   337L
EC.FL   000030   339L
EC.FNF  000014   327L
EC.FNO  000011   324L
EC.FNR  000034   343L
EC.FOD  000043   350L
EC.FUC  000013   326L
EC.ICN  000016   329L
EC.IDN  000006   321L
EC.IFC  000020   331L
EC.IFN  000007   322L
EC.ILC  000003   318L
EC.ILO  000040   347L
EC.ILR  000012   325L
EC.ILV  000037   346L
EC.IOI  000052   357L
EC.IS   000032   341L
EC.NCV  000050   355L    1198
EC.NEM  000021   332L    1178
EC.NOS  000051   356L
EC.NPM  000044   351L    1655
EC.NRD  000010   323L
EC.NVM  000042   349L
EC.OTL  000053   358L
EC.RF   000022   333L
EC.UNA  000036   345L
EC.UND  000015   328L
EC.UUN  000033   342L
EC.VPM  000041   348L
EC.WF   000023   334L
EC.WP   000025   336L
EC.WPV  000024   335L
ECI     053227  1258    2913L
ECI1    053244  2915    2925L
ENL     000212    72E   1717  1766  1862  1910  1920  1995  2380  2826
ERROR   044021  1266L   1509  1638  1658  1664  1687  1735  2179  2306  2309
ESC     000033    70E
FATERR  043332  1203L   2183
FB.CHA  000000    37L
FB.FLG  000001    38L
FB.FWA  000002    39L
FB.LIM  000006    41L
FB.LWA  000010    42L
FB.NAM  000012    43L     44
FB.NAML 000021    44E   2619
FB.PTR  000004    40L
FBENL   000033    45E
FDD     050332  1520    2258L  2367  2369
FDD.    050341  2266L
FEC     050355  1545    1567  1587  1618  2282L  2334
```

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FEC1    050357  2284L   2288
FF      000014    73E
FST1    053271  2962L   2994
FST2    053304  2969    2975L   2982
FST3    053322  2977    2984L   2987
FST4    053344  2979    2996L
FT.ABS  000000   477E     914
FT.BAC  000003   480E
FT.PIC  000001   478E
FT.REL  000002   479E
HELP    045247  1378    1520L
HELPA   045274  1524    1529L   1532
HELPAL  000025  1524    1532E
HELPB   045301  1521    1530L
HLCPDE  053370  1023    1092    1155    3039L
I.BYE   000014  1404E   1467
I.CONFL 000004   714E    715    2573
I.CONTY 000001   701E    702
I.CONWI 000003   707E    708
I.COP   000013  1401E   1466
I.CSLMD 000000   690E
I.CUSOR 000002   704E    705    3017
I.DAT   000010  1392E   1459
I.DEL   000005  1383E   1456
I.DIR   000011  1395E   1460    1461    1462    1463
I.DMO   000002  1374E   1452
I.HEL   000003  1377E   1453
I.LIS   000004  1380E   1454    1455
I.LOA   000017  1413E   1470
I.MOU   000007  1389E   1458
I.REN   000006  1386E   1457
I.RES   000015  1407E   1468
I.RUN   000000  1368E   1451
I.STA   000012  1398E   1464    1465
I.SYS   000001  1371E
I.VER   000016  1410E   1469
ILDEHL  053376  3060L   3132
ILLCMD  044074  1278L   1440
ILLSYN  044035  1274L   1353    1685
IP.CON  000362   206E
IP.PAD  000360   202E
ISDEHL  054101  3139    3195L
LAB.AUX 000117   453E    455
LAB.AXL 000001   455E
LAB.DAT 000000   430E
LAB.DIS 000003   426L
LAB.GRT 000005   427L
LAB.IND 000001   425L
LAB.LAB 000021   449L    450
LAB.LBL 000074   450E
LAB.NOD 000002   432E
LAB.PSS 000016   441L
LAB.RGT 000012   437L
LAB.SER 000000   424L
LAB.SIZ 000014   440L
LAB.SPG 000007   428L
LAB.SPT 000117   454L
LAB.SYS 000001   431E
```

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LAB.VER 000011      435L
LAB.VFL 000020      442L
LAB.VLT 000010      434L
LAB.VPL 000005      444E     446     447
LAB.VPR 000014      439E     444
LABEL   056321     1183     3707L
LF      000012       60E
LINE    056131     1317     1325    1437    1501    1507    1524    1525    1543    1549    3705L
LIST    045321     1381     1527    1541E
LISTA   045355     1543     1552L   1553
LISTAL  000004     1543     1553E
LISTB   045361     1547     1554L   1555
LISTBL  000005     1546     1555E
LOADD   046275     1414     1730E
LOADOV  050366     1661     1681    2304L
M.CDCA  000017      907L
M.CDLY  000016      906L
M.CFWA  000012      904L     1243
M.CIN   000006      902L     1237    1252
M.CINT  000005      901L     1234    1237    1243
M.CLWA  000014      905L
M.COUT  000010      903L     1252
M.CPRE  000003      899L     1228    1231
M.CRUB  000004      900L     1231    1234
M.CSLC  000002      898L     1225    1228
M.FOX   000303      250E
M.PAMB  000021      249E
M.SALO  000001      897L     1308    2237
M.SUNI  000021      908L
M.SYDD  000022      909L
M.SYSM  000000      896L
MEML    055140      916      3698E
MOUNT   046106     1390     1635E
NL      000012       71E       72    1203    1275    1279    1848    1848    1849    1850    1854    1858    1862
                    1903     1904    1905    1907    1909    1918    1919    1920    1994    2378    2652    2826    2826
                    2832     2835    3369
NUL2    000000       62E
NULL    000200       61E
OP.CTL  000360      203E
OP.DIG  000360      204E
OP.SEG  000361      205E
OP2.CTL 000362      207E
OVL.COD 000000      365L
OVL.ENS 000010      370E      952    1073    1879
OVL.ENT 000004      367L     1089
OVL.FLB 000006      368L      959    1080    1086    1098    1894
OVL.IN  000001      758E      945     960    1081    1084    1897
OVL.NUM 000014      760E      949     951
OVL.RES 000002      759E     1081    1898
OVL.SIZ 000002      366L
OVL.UCS 000200      761E
OVL0    000000      376L     2304    2841
OVL1    000001      377L     2307    2845
PCHL    043045     1058L
PCL     051005     1436     1505    2330L   2365
PCL1    051025     2341L    2347
PCL2    051036     2337     2349L
PCLA    051042     2332     2353E
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PIP      051044   1550   1572   1592   1606   1623   2365L
PIPA     051100   2368   2379L
PIPB     051151   2370   2372   2383L
PRS      043245    928   1171L
PRS1     043327   1172   1174   1198L
PRS2     043332   1179   1201E
PRSA     043344   1187   1208L
PRSCL    043347    932   1220E
QUOTE    000047     68E
RENA     046042   1589   1594L  1595
RENAL    000010   1588   1595E
RENAME   046020   1387   1584E
RESET    046160   1408   1677E
RMEML    057321   1176   3709E
ROMBOOT  030000    574E   1206
RUBOUT   000177     64E
RUN      045214   1369   1498L
S.BAUD   040344    735L   3473
S.BDA    041120    833L
S.BOOTF  041034    790L
S.CAADR  040333    718L
S.CACC   041006    774L
S.CCTAB  040335    719L
S.CDB    040343    732L   2913   3437
S.CFWA   040352    742L
S.CODE   041007    775L
S.CONFL  040332    716L
S.CONTY  040327    703L   3450   3481
S.CONWI  040331    709L
S.CSLMD  040326    691L    702    705    708    715   1286
S.CUSOR  040330    706L
S.DATC   040310    672L   1770
S.DATE   040227    671L   1772   1780   1808
S.DCS    041033    788L
S.DDDTA  040366    753L
S.DDGRP  040364    750L
S.DDLDA  040360    748L
S.DDLEN  040362    749L
S.DDOFC  040370    754L
S.DFWA   040354    743L    997   1118   1922
S.DIREA  041016    782L
S.DLINK  040346    740L   1222   1309   2238
S.FASER  041013    781L   1205
S.FCI    041021    783L
S.GRT0   024000    570E
S.GRT1   025000    571E
S.GRT2   026000    572E
S.GUP    041027    785L
S.HIMEM  040316    674L   1823
S.INT    040343    584L    728
S.JUMPS  041010    779L
S.MOUNT  041032    787L    934   1305
S.OFWA   040350    741L    953   1069   1875
S.OMAX   040324    680L   1837
S.OSN    041004    770L
S.OVLE   041000    767L
S.OVLFL  040371    763L    944    948    964
S.OVLS   040376    766L
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S.OVSTK 041035  795L
S.RFWA  040356  744L  1116  1737
S.SCI   041024  784L
S.SCR   041121  834L
S.SDD   041010  780L  1033
S.SOVR  041146  586L   588
S.SSN   041002  769L
S:SYSM  040320  676L   940  1022  1091  1736  1830
S.TIME  040312  673L
S:UCSF  040372  764L
S.UCSL  040374  765L
S:USRM  040322  678L
S.VAL   040277  583L   669
SC.ACE  000350   87E  2926  3465  3470  3472  3475  3477  3480  3487  3490  3491  3493
SC.UART 000372  156E  2920  3444  3445  3446  3447  3449  3458  3460
SCU     054240 1257  3437L
SCU1    054310 3439  3465L  3467
STACK   042200  590E   927  1284  2333
STACKL  001032  588E
STAT1   047053 1793  1804L
STAT10  050275 2006  2017L
STAT2   047077 1794  1819E
STAT3   047321 1795  1869E
STAT4   047364 1877  1882  1893L
STAT5   050060 1796  1917L
STAT6   050107 1924L 1935
STAT7   050126 1930  1940L
STAT8   050252 1896  1966  1974  2000L
STAT9   050254 2003L 2011  2015
STATA   047144 1844  1848L
STATB   047215 1825  1852L 1853
STATC   047251 1832  1856L 1857
STATD   047311 1839  1860L 1861
STATE   050002 1886  1903L
STATF   050036 1872  1876  1907L
STATG   050054 1873  1881  1909L
STATH   050234 1986  1990L
STATI   050236 1958  1991L
STATJ   050242 1947  1963  1992L
STATK   050245 1948  1950  1971  1993L
STATUS  047034 1399  1792E
SYDD    040130  580E
SYSC0   044170 1307  1315L
SYSC1   044220 1327L 1344
SYSC2   044252 1329  1333  1341L
SYSC3   044260 1331  1335  1337  1348L
SYSC5   044353 1361  1435L 1679
SYSCA   044313 1366L 1368  1371  1374  1377  1380  1383  1386  1389  1392  1395  1398
               1401  1404  1407  1410  1413  1445
SYSCALL 000377  508E   982  1267  1270  1283  1486  1637  1649  1663  1686  1697  1734
               1779  2305  2308  2575  2653  3019  3334  3338  3556
SYSCC   044372 1359  1447L 1448  1478
SYSCCL  000160 1448  1478E
SYSCMD  044121  936   946   961   965  1276  1281L 1319  1372  1489  1639  1688  1718
               1744  1783  1797  2381
SYSDEF  042313  969L 1182  1188  1438  1506  2268
SYSX0   042220  934L 1653  1665
SYSXIT  042200  924E 1272
```

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SYSXITA 042312      926      930     967L
TAB     000011      69E     1713     1806    1851    1855    1855    1859    1859    1906    1908    1991    1992
                   3512
UC.2SB  000004     113E     3484     3485
UC.5BW  000000     109E
UC.6BW  000001     110E
UC.7BW  000002     111E
UC.8BW  000003     112E     3486
UC.BI   000020     132E
UC.CTS  000020     141E
UC.DCS  000001     137E
UC.DDR  000002     138E
UC.DLA  000200     118E     3474
UC.DR   000001     128E
UC.DRL  000010     140E
UC.DSR  000040     142E
UC.DTR  000001     121E
UC.EDA  000001      99E     2925
UC.EPS  000020     115E
UC.FE   000010     131E
UC.IID  000006     106E
UC.IIP  000001     105E
UC.LOO  000020     125E     3471     3492
UC.MSI  000010     102E
UC.OR   000002     129E
UC.OU1  000004     123E
UC.OU2  000010     124E
UC.PE   000004     130E
UC.PEN  000010     114E
UC.RI   000100     143E
UC.RLS  000200     144E
UC.RSI  000004     101E
UC.RTS  000002     122E
UC.SB   000100     117E
UC.SKP  000040     116E
UC.TER  000004     139E
UC.THE  000040     133E
UC.TRE  000002     100E
UC.TSE  000100     134E     3466
UCI.ER  000020     178E     2919     3459
UCI.IE  000002     180E     2919
UCI.IR  000100     176E     3448
UCI.RE  000004     179E     2919     3459
UCI.RO  000040     177E
UCI.TE  000001     181E     2919     3459
UDDN1   055033    3610L     3626
UDDN1.5 055065    3630L     3637
UDDN2   055067     3623     3635L
UDDN3   055070    3636L     3640
UDR     000000     153E
UMI.16X 000002     171E     3457
UMI.1B  000100     161E     3452     3457
UMI.1X  000001     170E
UMI.2B  000300     163E     3452
UMI.64X 000003     172E
UMI.HB  000200     162E
UMI.L5  000000     166E
UMI.L6  000004     167E
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UMI.L7  000010   168E
UMI.L8  000014   169E   3457
UMI.PA  000020   165E
UMI.PE  000040   164E
UNT.DIS 000006   875L
UNT.FLG 000000   871L
UNT.GRT 000002   873L
UNT.GTS 000004   874L
UNT.SIZ 000010   877E
UNT.SPG 000001   872L
UO.CLK  000001   242E
UO.DDU  000002   241E
UO.HLT  000200   239E
UO.NFR  000100   240E
UOD1    055106  3657L   3667
UOW     051165  1826    1833   1840   2397L
UR.DLL  000000    94E   3477
UR.DLM  000001    96E   3480
UR.IER  000001    98E   2926   3470
UR.IIR  000002   104E
UR.LCR  000003   108E   3475   3487
UR.LSR  000005   127E   3465
UR.MCR  000004   120E   3472   3491   3493
UR.MSR  000006   136E
UR.RBR  000000    90E   3490
UR.THR  000000    92E
USERFWA 042200   591E    913    915    916    917
USR     000001   154E   2920   3444   3445   3446   3447   3449   3458   3460
USR.BD  000100   185E
USR.FE  000040   186E
USR.OE  000020   187E
USR.PE  000010   188E
USR.RXR 000002   190E
USR.TXE 000004   189E
USR.TXR 000001   191E
VERB    055341  1324    1326   1358   3703L
VERS    000040   506E   1173
VERS1   046220  1698    1700L
VERSA   046266  1707    1714L
VERSB   046270  1711    1716L
VERSN   046211  1411    1696E
VFL.NSD 000001   443E
XCHGBC  055127  3129    3133   3141   3143   3685L

18614 BYTES FREE
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