```
000.000                 1  H84IO   EQU     0               ASSEMBLE FOR H8-4 CARD
000.000                 2          IF      H84IO
                        4          ELSE
                        5          TITLE   'ATIDVD - ATI DEVICE DRIVER, FOR H8-5 SERIAL I/O'
                        6          ENDIF
```

```
                                8  ***     ATDVD - AT DEVICE DRIVER.
                                9  *
                               10  *        J. G. L.,
                               11  *
                               12  *        G. C.,          78.10
                               13  *                        79.11
                               14  *                        79.12
                               16  **      ATDVD IS THE DEVICE DRIVER FOR THE DEVICE
                               17  *
                               18  *      AT:
                               19  *
                               20  *      IF H84IO=0
                               21  *        THEN
                               22  *          PORT = 374-5
                               23  *        ELSE
                               24  *          PORT = 320-7
                               25  *
                               26
                               27
          000.000              28          XTEXT   ASCII

                               30X **      ASCII CHARACTER EQUIVALENCES.
                               31X
          000.015              32X CR      EQU     13              CARRIAGE RETURN
          000.012              33X LF      EQU     10              LINE FEED
          000.200              34X NULL    EQU     200Q            PAD CHARACTER
          000.000              35X NUL2    EQU     0
          000.007              36X BELL    EQU     7               BELL CHARACTER
          000.177              37X RUBOUT  EQU     177Q
          000.010              38X BKSP    EQU     10Q             CTL-H
          000.026              39X C.SYN   EQU     26Q             SYNC
          000.002              40X C.STX   EQU     2               STX
          000.047              41X QUOTE   EQU     47Q
          000.011              42X TAB     EQU     11Q
          000.033              43X ESC     EQU     33Q
          000.012              44X NL      EQU     12Q             NEW LINE (HDOS SYSTEMS)
          000.212              45X ENL     EQU     NL+200Q         NL + END-OF-LINE-FLAG
          000.014              46X FF      EQU     14Q             FORM FEED
          000.001              47X CTLA    EQU     01Q             CTL-A
          000.002              48X CTLB    EQU     02Q             CTL-B
          000.003              49X CTLC    EQU     03Q             CTL-C
          000.004              50X CTLD    EQU     04Q             CTL-D
          000.017              51X CTLO    EQU     17Q             CTL-O
          000.020              52X CTLP    EQU     20Q             CTL-P
          000.021              53X CTLQ    EQU     21Q             CTL-Q
          000.023              54X CTLS    EQU     23Q             CTL-S
          000.032              55X CTLZ    EQU     32Q             CTL-Z
          000.000              56          XTEXT   DDDEF
```

```
                        58X **      DEVICE DRIVER COMMUNICATION FLAGS.
                        59X *
                        60X
000.000                 61X         ORG     0
                        62X
000.000                 63X DC.REA  DS      1           READ
000.001                 64X DC.WRI  DS      1           WRITE
000.002                 65X DC.RER  DS      1           READ REGARDLESS
000.003                 66X DC.OPR  DS      1           OPEN FOR READ
000.004                 67X DC.OPW  DS      1           OPEN FOR WRITE
000.005                 68X DC.OPU  DS      1           OPEN FOR UPDATE
000.006                 69X DC.CLO  DS      1           CLOSE
000.007                 70X DC.ABT  DS      1           ABORT
000.010                 71X DC.MOU  DS      1           MOUNT DEVICE
000.011                 72X DC.LOD  DS      1           LOAD DEVICE DRIVER
000.012                 73X DC.RDY  DS      1           Device Ready                /80.04.GC/
000.013                 74X DC.MAX  DS      1           MAXIMUM ENTRY INDEX
000.014                 75          XTEXT   MTR
```

```
                        78X **      MTR - PAM/8 EQUIVALENCES.
                        79X *
                        80X *       THIS DECK CONTAINS SYMBOLIC DEFINITIONS USED TO
                        81X *       MAKE USE OF THE PAM/8 CODE AND CONTROL BYTES.


                        83X **      IO PORTS
                        84X
    000.360             85X IP.PAD  EQU     360Q        PAD INPUT PORT
    000.360             86X OP.CTL  EQU     360Q        CONTROL OUTPUT PORT
    000.360             87X OP.DIG  EQU     360Q        DIGIT SELECT OUTPUT PORT
    000.361             88X OP.SEG  EQU     361Q        SEGMENT SELECT OUTPUT PORT
    000.362             89X IP.CON  EQU     362Q        H-88/H-89/HA-8-8 Configuration  /80.07.sc/
    000.362             90X OP2.CTL EQU     362Q        H-88/H-89/HA-8-8 Control Port   /80.07.sc/


                        92X **      FRONT PANEL CONTROL BITS.                           /80.07.sc/
                        93X *
                        94X *       CB.*  set in OP.CTL
                        95X *       CB2.* set in OP2.CTL
                        96X *
                        97X
    000.020             98X CB.SSI  EQU     00010000B   SINGLE STEP INTERRUPT
    000.040             99X CB.MTL  EQU     00100000B   MONITOR LIGHT
    000.100            100X CB.CLI  EQU     01000000B   CLOCK INTERRUPT ENABLE
    000.200            101X CB.SPK  EQU     10000000B   SPEAKER ENABLE
                       102X
    000.001            103X CB2.SSI EQU     00000001B   Single Step Interrupt
    000.002            104X CB2.CLI EQU     00000010B   Clock Interrupt Enable
    000.040            105X CB2.ORG EQU     00100000B   ORG 0 Select
    000.100            106X CB2.SID EQU     01000000B   Side 1 Select


                       108X **      Secondary Control Bits
                       109X


                       111X **      MONITOR MODE FLAGS.
                       112X
    000.000            113X DM.MR   EQU     0           MEMORY READ
    000.001            114X DM.MW   EQU     1           MEMORY WRITE
    000.002            115X DM.RR   EQU     2           REGISTER READ
    000.003            116X DM.RW   EQU     3           REGISTER WRITE
```

```
                        118X **     USER OPTION BITS.
                        119X *
                        120X *      THESE BITS ARE SET IN CELL .MFLAG.
                        121X
000.200                 122X UO.HLT EQU     10000000B       DISABLE HALT PROCESSING
000.100                 123X UO.NFR EQU     CB.CLI          NO REFRESH OF FRONT PANEL
000.002                 124X UO.DDU EQU     00000010B       DISABLE DISPLAY UPDATE
000.001                 125X UO.CLK EQU     00000001B       ALLOW PRIVATE INTERRUPT PROCESSING


                        127X **     MONITOR IDENTIFICATION FLAGS
                        128X *
                        129X *      THESE BYTES IDENTIFY THE ROM MONITOR.
                        130X *      THEY ARE THE VARIOUS VALUES OF LOCATION .IDENT
                        131X
000.021                 132X M.PAM8 EQU     021Q            'LXI' INSTRUCTION AT 000.000 IN PAM-8
000.303                 133X M.FOX  EQU     303Q            'JMP' INSTRUCTION AT 000.000 IN FOX ROM


                        135X **     Configuration Flags                                 /80.07.sc/
                        136X *
                        137X *      These bits are read in IP.CON.
                        138X *
                        139X
000.003                 140X CN.174M EQU    00000011B       Port 174Q Device-Type Mask
000.014                 141X CN.170M EQU    00001100B       Port 170Q Device-Type Mask
000.020                 142X CN.PRI EQU     00010000B       Primary/Secondary:  1=>Primary == 170Q
000.040                 143X CN.MEM EQU     00100000B       Memory Test/Normal Switch:  0=>Test; 1=>Normal
000.100                 144X CN.BAU EQU     01000000B       Baud Rate:  0=>9600; 1=>19,200
000.200                 145X CN.ABO EQU     10000000B       Auto-Boot:  1=>Auto-Boot
                        146X
000.000                 147X CND.H17 EQU    00B             H-17 Disk;              Valid only in CN.174M
000.000                 148X CND.NDI EQU    00B             No Device Installed;  Valid only in CN.170M
000.001                 149X CND.H47 EQU    01B             H-47 Disk


                        151X **     ROUTINE ENTRY POINTS.
                        152X *
                        153X
000.000                 154X .IDENT EQU     0000A           IDENTIFICATION LOCATION
000.053                 155X .DLY   EQU     0053A           DELAY
001.267                 156X .LOAD  EQU     1267A           TAPE LOAD
001.374                 157X .DUMP  EQU     1374A           TAPE DUMP
002.136                 158X .ALARM EQU     2136A           ALARM ROUTINE
002.140                 159X .HORN  EQU     2140A           HORN
002.172                 160X .CTC   EQU     2172A           CHECK TAPE CHECKSUM
002.205                 161X .TPERR EQU     2205A           TAPE ERROR ROUTINE
002.264                 162X .PCHL  EQU     2264A           PCHL INSTRUCTION
002.265                 163X .SRS   EQU     2265A           SCAN RECORD START
002.325                 164X .RNP   EQU     2325A           READ NEXT PAIR
002.331                 165X .RNB   EQU     2331A           READ NEXT BYTE
```

```
002.347                166X .CRC     EQU     2347A           CRC-16 CALCULATOR
003.017                167X .WNP     EQU     3017A           WRITE NEXT PAIR
003.024                168X .WNB     EQU     3024A           WRITE NEXT BYTE
003.122                169X .DOD     EQU     3122A           DECODE FOR OCTAL DISPLAY
003.260                170X .RCK     EQU     3260A           READ CONSOLE KEYSET
003.356                171X .DODA    EQU     3356A           SEGMENT CODE TABLE


                       173X **       RAM CELLS USED BY H8MTR.
                       174X *
                       175X
040.000                176X .START   EQU     40000A          START DUMP ADDRESS
040.002                177X .IOWRK   EQU     40002A          IN OR OUT INSTRUCTION
040.005                178X .REGI    EQU     40005A          DISPLAYED REGISTER INDEX
040.006                179X .DSPROT  EQU     40006A          PERIOD FLAG BYTE
040.007                180X .DSPMOD  EQU     40007A          DISPLAY MODE
040.010                181X .MFLAG   EQU     40010A          USER OPTION BYTE
040.011                182X .CTLFLG  EQU     40011A          PANEL CONTROL BYTE
040.013                183X .ALEDS   EQU     40013A          ABUSS LEDS
040.021                184X .DLEDS   EQU     40021A          DBUSS LEDS
040.024                185X .ABUSS   EQU     40024A          ABUSS REGISTER
040.027                186X .CRCSUM  EQU     40027A          CRCSUM WORD
040.031                187X .TPERRX  EQU     40031A          TAPE ERROR EXIT VECTOR
040.033                188X .TICCNT  EQU     40033A          CLOCK TICK COUNTER
040.035                189X .REGPTR  EQU     40035A          REGISTER POINTER
040.037                190X .UIVEC   EQU     40037A          USER INTERRUPT VECTORS
040.064                191X .NMIRET  EQU     40064A          H88/H89 NMI Return Address      /80.07.sc/
040.066                192X .CTL2FL  EQU     40066A          OP2.CTL Control Byte            /80.07.sc/
000.014                193           XTEXT   HOSEQU


                       195X **       HDOS SYSTEM EQUIVALENCES.
                       196X *
                       197X
024.000                198X S.GRT0   EQU     24000A          SYSTEM AREA FOR  GRT0
025.000                199X S.GRT1   EQU     25000A          SYSTEM AREA FOR  GRT1
026.000                200X S.GRT2   EQU     26000A          SYSTEM AREA FOR  GRT2
                       201X
030.000                202X ROMBOOT  EQU     30000A          ROM BOOT ENTRY
                       203X
040.100                204X          ORG     40100A          FREE SPACE FROM PAM-8
                       205X
040.100                206X          DS      8               JUMP TO SYSTEM EXIT
040.110                207X D.CON    DS      16              DISK CONSTANTS
040.130                208X SYDD     EQU     *               SYSTEM DISK ENTRY POINT
040.130                209X D.VEC    DS      24*3            SYSTEM ROM ENTRY VECTORS
040.240                210X D.RAM    DS      31              SYSTEM ROM WORK AREA
040.277                211X S.VAL    DS      36              SYSTEM VALUES
040.343                212X S.INT    DS      115             SYSTEM INTERNAL WORK AREAS
041.126                213X          DS      16
041.146                214X S.SOVR   DS      2               STACK OVERFLOW WARNING
041.150                215X          DS      42200A-*        SYSTEM STACK
001.032                216X STACKL   EQU     *-S.SOVR        STACK SIZE
```

```
                    217X
042.200             218X STACK   EQU     *               LWA+1 SYSTEM STACK
042.200             219X USERFWA EQU     *               USER FWA
042.200             220          XTEXT   ESVAL


                    222X **      S.VAL - SYSTEM VALUE DEFINTIONS.
                    223X *
                    224X *       THESE VALUES ARE SET AND MAINTAINED BY THE SYSTEM.
                    225X *
                    226X *       THE DECK HOSEQU MUST BE MODIFIED WHEN THIS IS MODIFIED.
                    227X
                    228X
040.277             229X         ORG     S.VAL
                    230X
040.277             231X S.DATE  DS      9               SYSTEM DATE (IN ASCII)
040.310             232X S.DATC  DS      2               CODED DATE
040.312             233X S.TIME  DS      4               TIME FROM MIDNIGHT (IN TICS)
040.316             234X S.HIMEM DS      2               HARDWARE HIGH MEMORY ADRESS+1
                    235X
040.320             236X S.SYSM  DS      2               FWA RESIDENT SYSTEM
                    237X
040.322             238X S.USRM  DS      2               LWA USER MEMORY
                    239X
040.324             240X S.OMAX  DS      2               MAX OVERLAY SIZE FOR SYSTEM
                    241X
                    242X
                    243X **      THE FOLLOWING FIVE CELLS SHOULD BE MODIFIED/READ ONLY VIA THE .CONSL SYSCALL
                    244X
000.200             245X CSL.ECH EQU     10000000B       SUPPRESS ECHO
000.004             246X CSL.RAW EQU     00000100B       Raw Mode I/O                    /80.09.sc/
000.002             247X CSL.WRP EQU     00000010B       WRAP LINES AT WIDTH
000.001             248X CSL.CHR EQU     00000001B       OPERATE IN CHARACTER MODE
                    249X
000.000             250X I.CSLMD EQU     0               S.CSLMD IS FIRST BYTE
040.326             251X S.CSLMD DS      1               CONSOLE MODE
                    252X
000.200             253X CTP.BKS EQU     10000000B       TERMINAL PROCESSES BACKSPACES
000.100             254X CTP.FF  EQU     01000000B       Terminal Processes Form-Feed    /80.09.sc/
000.040             255X CTP.MLI EQU     00100000B       MAP LOWER CASE TO UPPER ON INPUT
000.020             256X CTP.MLO EQU     00010000B       MAP LOWER CASE TO UPPER ON OUTPUT
000.010             257X CTP.2SB EQU     00001000B       TERMINAL NEEDS TWO STOP BITS
000.002             258X CTP.BKM EQU     00000010B       MAP BKSP (UPON INPUT) TO RUBOUT
000.001             259X CTP.TAB EQU     00000001B       TERMINAL SUPPORTS TAB CHARACTERS
                    260X
000.001             261X I.CONTY EQU     1               S.CONTY IS 2ND BYTE
000.000             262X         ERRNZ   *-S.CSLMD-I.CONTY
040.327             263X S.CONTY DS      1               CONSOLE TYPE FLAGS
000.002             264X I.CUSOR EQU     2               S.CUSOR IS 3RD BYTE
000.000             265X         ERRNZ   *-S.CSLMD-I.CUSOR
040.330             266X S.CUSOR DS      1               CURRENT CURSOR POSITION
000.003             267X I.CONWI EQU     3               S.CONWI IS 4TH BYTE
000.000             268X         ERRNZ   *-S.CSLMD-I.CONWI
040.331             269X S.CONWI DS      1               CONSOLE WIDTH
```

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                    270X
000.001             271X CO.FLG  EQU     00000001B       CTL-O FLAG
000.200             272X CS.FLG  EQU     10000000B       CTL-S FLAG
                    273X
000.004             274X I.CONFL EQU     4               S.CONFL IS 5TH BYTE
000.000             275X         ERRNZ   *-S.CSLMD-I.CONFL
040.332             276X S.CONFL DS      1               CONSOLE FLAGS
                    277X
040.333             278X S.CAADR DS      2               ADDRESS FOR ABORT PROCESSING (>256 IF VALID)
040.335             279X S.CCTAB DS      6               ADDR FOR CTL-A, CTL-B, CTL-C PROCESSING
040.343             280          XTEXT   ECDEF


                    282X **      ERROR CODE DEFINITIONS.
                    283X
000.000             284X         ORG     0
000.000             285X         DS      1               NO ERROR #0
000.001             286X EC.EOF  DS      1               END OF FILE
000.002             287X EC.EOM  DS      1               END OF MEDIA
000.003             288X EC.ILC  DS      1               ILLEGAL SYSCALL CODE
000.004             289X EC.CNA  DS      1               CHANNEL NOT AVAILABLE
000.005             290X EC.DNS  DS      1               DEVICE NOT SUITABLE
000.006             291X EC.IDN  DS      1               ILLEGAL DEVICE NAME
000.007             292X EC.IFN  DS      1               ILLEGAL FILE NAME
000.010             293X EC.NRD  DS      1               NO ROOM FOR DEVICE DRIVER
000.011             294X EC.FNO  DS      1               CHANNEL NOT OPEN
000.012             295X EC.ILR  DS      1               ILLEGAL REQUEST
000.013             296X EC.FUC  DS      1               FILE USAGE CONFLICT
000.014             297X EC.FNF  DS      1               FILE NAME NOT FOUND
000.015             298X EC.UND  DS      1               UNKNOWN DEVICE
000.016             299X EC.ICN  DS      1               ILLEGAL CHANNEL NUMBER
000.017             300X EC.DIF  DS      1               DIRECTORY FULL
000.020             301X EC.IFC  DS      1               ILLEGAL FILE CONTENTS
000.021             302X EC.NEM  DS      1               NOT ENOUGH MEMORY
000.022             303X EC.RF   DS      1               READ FAILURE
000.023             304X EC.WF   DS      1               WRITE FAILURE
000.024             305X EC.WPV  DS      1               WRITE PROTECTION VIOLATION
000.025             306X EC.WP   DS      1               DISK WRITE PROTECTED
000.026             307X EC.FAP  DS      1               FILE ALREADY PRESENT
000.027             308X EC.DDA  DS      1               DEVICE DRIVER ABORT
000.030             309X EC.FL   DS      1               FILE LOCKED
000.031             310X EC.FAO  DS      1               FILE ALREADY OPEN
000.032             311X EC.IS   DS      1               ILLEGAL SWITCH
000.033             312X EC.UUN  DS      1               UNKNOWN UNIT NUMBER
000.034             313X EC.FNR  DS      1               FILE NAME REQUIRED
000.035             314X EC.DIW  DS      1               DEVICE IS NOT WRITABLE (OR WRITE LOCKED)
000.036             315X EC.UNA  DS      1               UNIT NOT AVAILABLE
000.037             316X EC.ILV  DS      1               ILLEGAL VALUE
000.040             317X EC.ILO  DS      1               ILLEGAL OPTION
000.041             318X EC.VPM  DS      1               VOLUME PRESENTLY MOUNTED ON DEVICE
000.042             319X EC.NVM  DS      1               NO VOLUME PRESENTLY MOUNTED
000.043             320X EC.FOD  DS      1               FILE OPEN ON DEVICE
000.044             321X EC.NPM  DS      1               NO PROVISIONS MADE FOR REMOUNTING MORE DISKS
000.045             322X EC.DNI  DS      1               DISK NOT INITIALIZED
000.046             323X EC.DNR  DS      1               DISK IS NOT READABLE
```

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000.047                 324X EC.DSC  DS      1               DISK STRUCTURE IS CORRUPT
000.050                 325X EC.NCV  DS      1               NOT CORRECT VERSION OF HDOS
000.051                 326X EC.NOS  DS      1               NO OPERATING SYSTEM MOUNTED
000.052                 327X EC.IOI  DS      1               ILLEGAL OVERLAY INDEX
000.053                 328X EC.OTL  DS      1               OVERLAY TO LARGE
000.054                 329          XTEXT   PICDEF


                        331X **      PIC FORMAT EQUIVALENCES.
                        332X
000.000                 333X         ORG     0
                        334X
000.000                 335X PIC.ID  DS      1               377Q = BINARY FILE FLAG
000.001                 336X         DS      1               FILE TYPE (FT.PIC)
000.002                 337X PIC.LEN DS      2               LENGTH OF ENTIRE RECORD
000.004                 338X PIC.PTR DS      2               INDEX OF START OF PIC TABLE
                        339X
000.006                 340X PIC.COD DS      0               CODE STARTS HERE
000.006                 341          XTEXT   DEVDEF


                        343X **      DEVICE TABLE ENTRYS.
                        344X
000.000                 345X         ORG     0
                        346X
000.000                 347X DEV.NAM DS      2               DEVICE NAME
000.000                 348X DV.EL   EQU     00000000B       END OF DEVICE LIST FLAG
000.001                 349X DV.NU   EQU     00000001B       DEVICE ENTRY NOT IN USE
                        350X
000.002                 351X DEV.RES DS      1               DRIVER RESIDENSE CODE
000.001                 352X DR.IM   EQU     00000001B       DRIVER IN MEMORY
000.002                 353X DR.PR   EQU     00000010B       DRIVER PERMINANTLY RESIDENT
                        354X
000.003                 355X DEV.JMP DS      1               JMP TO PROCESSOR
000.004                 356X DEV.DDA DS      2               DRIVER ADDRESS
000.006                 357X DEV.FLG DS      1               FLAG BYTE
000.001                 358X DT.DD   EQU     00000001B       DIRECTORY DEVICE
000.002                 359X DT.CR   EQU     00000010B       CAPABLE OF READ OPERATION
000.004                 360X DT.CW   EQU     00000100B       CAPABLE OF WRITE OPERATION
000.010                 361X DT.RN   EQU     00001000B       Capable of random access        /80.02.sc/
000.020                 362X DT.CH   EQU     00010000B       Capable of Character mode       /80.02.sc/
                        363X
000.007                 364X DEV.MUM DS      1               MOUNTED UNIT MASK
000.010                 365X DEV.MNU DS      1               MAXIMUM NUMBER OF UNITS
000.011                 366X DEV.UNT DS      2               ADDRESS OF UNIT SPECIFIC DATA TABLE
                        367X
000.013                 368X DEV.DVL DS      2               DRIVER BYTE LENGTH
000.015                 369X DEV.DVG DS      1               DRIVER ROUTINE GROUP ADDRESS
                        370X
000.016                 371X DEVELEN EQU     *               DEVICE TABLE ENTRY LENGTH
```

```
                        373X **     UNIT SPECIFIC DEVICE DATA TABLE ENTRIES
                        374X
000.000                 375X        ORG     0
                        376X
000.000                 377X UNT.FLG DS     1           UNIT SPECIFIC  *DEV.FLG*
000.001                 378X UNT.SPG DS     1           Sectors Per Group              /80.04.GC/
000.002                 379X UNT.GRT DS     2           ADDRESS OF GROUP RESERVATION TABLE (IF DT.DD)
000.004                 380X UNT.GTS DS     2           GRT SECTOR NUMBER
000.006                 381X UNT.DIS DS     2           DIRECTORY FIRST SECTOR NUMBER
                        382X
000.010                 383X UNT.SIZ EQU    *           SIZE OF UNIT SPECIFIC DATA TABLE PER UNIT
000.010                 384         XTEXT   DVDDEF



                        386X **     DEVICE DRIVER EQUIVALENCES.
                        387X
000.307                 388X DVDFLV  EQU    307Q        DEVICE DRIVER FLAG VALUE
                        389X
000.006                 390X        ORG     PIC.COD     STARTS AT PIC CODE AREA
                        391X
000.006                 392X DVD.DVD DS     1           MUST BE DVDFLV, FLAGS TO HDOS AS DRIVER
000.007                 393X DVD.CAP DS     1           DEVICE CAPABILITY FLAG
000.010                 394X DVD.MUM DS     1           MOUNTED UNIT MASK
000.011                 395X DVD.MNU DS     1           MAXIMUM NUMBER OF UNITS
000.012                 396X DVD.UFL DS     8           UNIT SUB-CAPABILITY FLAGS FOR UNITS 0-7
000.022                 397X DVD.SET DS     1           = DVDFLV IFF DRIVER WILL TAKE SET OPTIONS
000.023                 398X DVD.INP DS     2           Pointer to Init Code           /80.07.sc/
000.025                 399X        DS      22          RESERVED, MUST BE 0            /80.07.sc/
000.053                 400X DVD.STE EQU    *           ENTRY FOR 'SET' INVOCATION
                        401X
002.000                 402X DVD.ENT EQU    2000A       DRIVER ENTRY POINT (MUST BE MULT OF 256)
000.053                 403         XTEXT   SETCAL



                        405X **     SETCAL - FIXED ADDRESS ROUTINES IN SET
                        406X *
                        407X *      THESE VECTORS ARE FIXED ENTRY POINTS INTO THE
                        408X *      SET PROGRAM TO UTILIZED BY DEVICE DRIVERS IN
                        409X *      PROCESSING SET COMMANDS.
                        410X *
                        411X
042.201                 412X        ORG     USERFWA+1
                        413X
042.201                 414X $SNA   DS      3
                        415X
042.204                 416X $DCS   DS      3
                        417X
042.207                 418X $CNA   DS      3
                        419X
042.212                 420X $FST   DS      3
                        421X
042.215                 422X $TBLS  DS      3
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                    423X
042,220             424X $WTBLS  DS      3
                    425X
042,223             426X $LBD    DS      3
                    427X
042,226             428X $SOP    DS      3
                    429X
042,231             430X $PBF    DS      3
                    431X
042,234             432X $PBV    DS      3
                    433X
042,237             434X         DS      60      RESERVED
042.333             435          XTEXT   U8250


                    437X **      8250 UART CONTROL AND BIT DEFINITIONS.
                    438X
000.350             439X SC.ACE  EQU     350Q            SYSTEM CONSOLE PORT IF 8250 ACE
000.156             440X AC.DLY  EQU     110             220 MIL. SEC. DELAY FOR 8250
                    441X
000.000             442X UR.RBR  EQU     0               RECEIVER BUFFER REGISTER (READ ONLY)
                    443X
000.000             444X UR.THR  EQU     0               TRANSMITTER HOLDING REGISTER (WRITE ONLY)
                    445X
000.000             446X UR.DLL  EQU     0               DIVISOR LATCH (LEAST SIGNIFICANT)
                    447X
000.001             448X UR.DLM  EQU     1               DIVISOR LATCH (MOST SIGNIFICANT)
                    449X
000.001             450X UR.IER  EQU     1               INTERRUPT ENABLE REGISTER
000.001             451X UC.EDA  EQU     00000001B        ENABLE RECEIVED DATA AVAILABLE INTERRUPT
000.002             452X UC.TRE  EQU     00000010B        ENABLE TRANSMIT HOLD REGISTER EMPTY INTERRUPT
000.004             453X UC.RSI  EQU     00000100B        ENABLE RECEIVE STATUS INTERRUPT
000.010             454X UC.MSI  EQU     00001000B        ENABLE MODEM STATUS INTERRUPT
                    455X
000.002             456X UR.IIR  EQU     2               INTERRUPT IDENTIFICATION REGISTER
000.001             457X UC.IIP  EQU     00000001B        INVERTED INTERRUPT PENDING (0 MEANS PENDING)
000.006             458X UC.IID  EQU     00000110B        INTERRUPT ID
                    459X
000.003             460X UR.LCR  EQU     3               LINE CONTROL REGISTER
000.000             461X UC.5BW  EQU     00000000B        5 BIT WORDS
000.001             462X UC.6BW  EQU     00000001B        6 BIT WORDS
000.002             463X UC.7BW  EQU     00000010B        7 BIT WORDS
000.003             464X UC.8BW  EQU     00000011B        8 BIT WORDS
000.004             465X UC.2SB  EQU     00000100B        TWO STOP BITS SELECTED
000.010             466X UC.PEN  EQU     00001000B        PARITY COMPUTATION ENABLED
000.020             467X UC.EPS  EQU     00010000B        EVEN PARITY SELECT
000.040             468X UC.SKP  EQU     00100000B        STICK PARITY
000.100             469X UC.SB   EQU     01000000B        SET BREAK
000.200             470X UC.DLA  EQU     10000000B        DIVISOR LATCH ACCESS
                    471X
000.004             472X UR.MCR  EQU     4               MODEM CONTROL REGISTER
000.001             473X UC.DTR  EQU     00000001B        DATA TERMINAL READY
000.002             474X UC.RTS  EQU     00000010B        REQUEST TO SEND
000.004             475X UC.OU1  EQU     00000100B        OUT 1
```

```
000.010                 476X UC.OU2  EQU     00001000B       OUT 2
000.020                 477X UC.LOO  EQU     00010000B       LOOP
                        478X
000.005                 479X UR.LSR  EQU     5               LINE STATUS REGISTER
000.001                 480X UC.DR   EQU     00000001B        DATA READY
000.002                 481X UC.OR   EQU     00000010B       OVERRUN
000.004                 482X UC.PE   EQU     00000100B       PARITY ERROR
000.010                 483X UC.FE   EQU     00001000B       FRAMING ERROR
000.020                 484X UC.BI   EQU     00010000B       BREAK INTERRUPT
000.040                 485X UC.THE  EQU     00100000B       TRANSMITTER HOLDING REGISTER EMPTY
000.100                 486X UC.TSE  EQU     01000000B       TRANSMITTER SHIFT REGISTER EMPTY
                        487X
000.006                 488X UR.MSR  EQU     6               MODEM STATUS REGISTER
000.001                 489X UC.DCS  EQU     00000001B       DELTA CLEAR TO SEND
000.002                 490X UC.DDR  EQU     00000010B       DELTA DATA SET READY
000.004                 491X UC.TER  EQU     00000100B       TRAILING EDGE OF RING
000.010                 492X UC.DRL  EQU     00001000B       DELTA RECEIVE LINE SIGNAL DETECT
000.020                 493X UC.CTS  EQU     00010000B       CLEAR TO SEND
000.040                 494X UC.DSR  EQU     00100000B       DATA SET READY
000.100                 495X UC.RI   EQU     01000000B       RING INDICATOR
000.200                 496X UC.RLS  EQU     10000000B       RECEIVED LINE SIGNAL DETECT
042.333                 497          XTEXT   U8251
```

```
                        500X **     8251 USART BIT DEFINITIONS.
                        501X *
                        502X
                        503X **     PORT ADDRESSES
                        504X
000.000                 505X UDR    EQU     0               DATA REGISTER IS EVEN
000.001                 506X USR    EQU     1               STATUS REGISTER IS NEXT
                        507X
000.372                 508X SC.UART EQU    372Q            CONSOLE USART ADDRESS (IFF 8251)
                        509X
                        510X
                        511X **     MODE INSTRUCTION CONTROL BITS.
                        512X
000.100                 513X UMI.1B EQU     01000000B       1 STOP BIT
000.200                 514X UMI.HB EQU     10000000B       1 1/2 STOP BITS
000.300                 515X UMI.2B EQU     11000000B       2 STOP BITS
000.040                 516X UMI.PE EQU     00100000B       EVEN PARITY
000.020                 517X UMI.PA EQU     00010000B       USE PARITY
000.000                 518X UMI.L5 EQU     00000000B       5 BIT CHARACTERS
000.004                 519X UMI.L6 EQU     00000100B       6 BIT CHARACTERS
000.010                 520X UMI.L7 EQU     00001000B       7 BIT CHARACTERS
000.014                 521X UMI.L8 EQU     00001100B       8 BIT CHARACTERS
000.001                 522X UMI.1X EQU     00000001B       CLOCK X 1
000.002                 523X UMI.16X EQU    00000010B       CLOCK X 16
000.003                 524X UMI.64X EQU    00000011B       CLOCK X 64
                        525X
                        526X **     COMMAND INSTRUCTION BITS.
                        527X
000.100                 528X UCI.IR EQU     01000000B       INTERNAL RESET
000.040                 529X UCI.RO EQU     00100000B       READER-ON CONTROL FLAG
000.020                 530X UCI.ER EQU     00010000B       ERROR RESET
000.004                 531X UCI.RE EQU     00000100B       RECEIVE ENABLE
000.002                 532X UCI.IE EQU     00000010B       ENABLE INTERRUPTS FLAG
000.001                 533X UCI.TE EQU     00000001B       TRANSMIT ENABLE
                        534X
                        535X **     STATUS READ COMMAND BITS.
                        536X
000.100                 537X USR.BD EQU     01000000B       Break Detect                    /80.08.sc/
000.040                 538X USR.FE EQU     00100000B       FRAMING ERROR
000.020                 539X USR.OE EQU     00010000B       OVERRUN ERROR
000.010                 540X USR.PE EQU     00001000B       PARITY ERROR
000.004                 541X USR.TXE EQU    00000100B       TRANSMITTER EMPTY
000.002                 542X USR.RXR EQU    00000010B       RECEIVER READY
000.001                 543X USR.TXR EQU    00000001B       TRANSMITTER READY
                        544
                        545
041.061                 546 AID.UNI EQU     041061A         ADDRESS OF I/O UNIT NUMBER
                        547
                        548
                        549 *       CODE HEADER
                        550
                        551         CODE    PIC
                        552
000.006  307           553         DB      DVDFLV          DEVICE DRIVER FLAG VALUE
000.007  006           554         DB      DT.CR+DT.CW     DEVICE CAPABILITY:  READ AND WRITE
000.010  001           555         DB      00000001B       MOUNTED UNIT MASK
```

```
000.011  001          556          DB      1               ONLY 1 UNIT
000.012  006          557          DB      DT,CR+DT,CW     0:   CAPABLE OF WRITE
000.013               558          DS      7               1-7: IGNORED
000.022  307          559          DB      DVDFLV
000.023  000 000      560          DW      0                                        /80.09.sc/
                      561
000.025               562  .       SET     025Q                                     /80.09.sc/
000.000               563          ERRNZ   *-.                                      /80.09.sc/
000.025               564          DS      DVD.STE-.       RESERVED AREAS           /80.09.sc/
```

```
                        567  ***     ASSEMBLY CONSTANTS
                        568  *
                        569  *
                        570
                        571  **      DEFAULT DEVICE DEFINITIONS
                        572  *
                        573
000.000                 574          IF      H84IO
000.320                 575  DFLT.AT EQU     320Q            PORT ADDRESS
001.200                 576  DFLT.BD EQU     1200A           300 BAUD
                        577          ELSE
                        578  DFLT.AT EQU     374Q            PORT ADDRESS
                        579  DFLT.BD EQU     000A
                        580          ENDIF
                        581
000.000                 582  DFLT.PD EQU     0               DEFAULT NUMBER OF PAD CHARACTERS
000.120                 583  DFLT.WD EQU     80              80 COLUMN WIDTH
000.001                 584  DFLT.CX EQU     1               INITIAL COLUMN INDEX
000.000                 585  DFLT.CS EQU     0               DEFAULT CTL-S SETTING



                        587  **
                        588  *
                        589
000.000                 590  SB.1    EQU     00000000B       ONE STOP BIT
000.200                 591  SB.2    EQU     10000000B       TWO STOP BITS
                        592
000.000                 593  MLC     EQU     00000000B       MAP LOWER CASE
000.001                 594  NOMLC   EQU     00000001B       NO MAP OF LOWER CASE
```

```
                                597  ***     SET CODE ENTRY POINT
                                598  *
                                599  *       SET COMMANDS ENTER HERE
                                600  *
                                601  *
                                602  *       ENTRY:  (DE)    = LINE POINTER
                                603  *               (A)     = UNIT NUMBER
                                604  *
                                605  *       EXIT:   'C' CLEAR IF OK
                                606  *               'C' SET IF ERROR
                                607  *                (A) = ERROR CODE
                                608  *
                                609  *       USES:   ALL
                                610  *
                                611
000.053                         612  SETNTR  EQU     *
000.000                         613          ERRNZ   *-DVD.STE
000.053  247                    614          ANA     A
000.054  302 103 000           615          JNZ     SET1
000.057  102                    616          MOV     B,D
000.060  113                    617          MOV     C,E             (BC) = PARAMETER LIST ADDRESS
000.061  021 250 001           618          LXI     D,PRCTAB        (DE) = PROCESSOR TABLE ADDRESS
000.064  041 114 001           619          LXI     H,OPTTAB        (HL) = OPTION TABLE ADDRESS
000.067  315 226 042           620          CALL    $SOP
000.072  330                   621          RC
000.073  315 201 042           622          CALL    $SNA
000.076  310                   623          RZ                      AT END OF LINE
000.077  076 040               624          MVI     A,EC.ILO        ILLEGAL OPTION SPECIFICATION
000.101  067                   625          STC
000.102  311                   626          RET
                                627
000.103  076 033               628  SET1    MVI     A,EC.UUN        UNKNOWN UNIT NUMBER
000.105  067                   629          STC
000.106  311                   630          RET
```

```
                                632  ***     PROCESSORS
                                633  *


                                635  **      FLAG - PROCESS FLAG OPTIONS
                                636  *
                                637  *       ENTRY, EXIT, AND USE THE SAME AS PBF.
                                638  *
                                639
000.107  303 231 042           640  FLAG    JMP     $PBF


                                642  **      VAL - PROCESS VALUE OPTIONS
                                643  *
                                644  *       ENTRY, EXIT, AND USE THE SAME AS PBV.
                                645  *
                                646
000.112  303 234 042           647  VAL     JMP     $PBV
000.000                         648          IF      H84IO


                                650  **      BAUD - PROCESS BAUD RATE OPTION SPECIFICATION
                                651  *
                                652  *
                                653  *       ENTRY:  (BC)    = TEXT ADDRESS
                                654  *
                                655  *       EXIT:   (BC)    = TEXT ADDRESS UPDATED
                                656  *               'C' CLEAR IF OK
                                657  *               'C' SET IF ERROR
                                658  *                (A) = ERROR CODE
                                659  *
                                660  *       USES:   ALL
                                661  *
                                662
000.115  076 012                663  BAUD    MVI     A,10            (A)  = DEFAULT RADIX
000.117  315 207 042           664          CALL    $CNA
000.122  332 140 000           665          JC      BAU1
000.125  353                   666          XCHG                    (DE) = BAUD RATE VALUE
000.126  315 223 042           667          CALL    $LBD
000.131  302 140 000           668          JNZ     BAU1
000.134  042 267 003           669          SHLD    TAT.BAU         SET BAUD RATE WORD
000.137  311                   670          RET
                                671
000.140  076 037               672  BAU1    MVI     A,EC.ILV
000.142  067                   673          STC
000.143  311                   674          RET
                                675          ENDIF
```

```
                                677  **      HELP - PROCESS HELP OPTION
                                678  *
                                679  *       TYPE VALID OPTIONS ON USER CONSOLE
                                680  *
                                681
000.144  315 136 031            682  HELP    CALL    $TYPTX
000.147  012 012 123            683          DB      NL,NL,'Set Options:',NL,NL
000.167  061 123 102            684          DB      '1SB            One stop bit',NL
000.211  062 123 102            685          DB      '2SB            Two stop bits',NL
000.234  115 114 103            686          DB      'MLC            Map Lower Case',NL
000.260  116 117 115            687          DB      'NOMLC          No mappins of Lower Case',NL
000.320  127 111 104            688          DB      'WIDTH  n       Pase width',NL
000.343  120 101 104            689          DB      'PAD    n       Number of Pad characters for <CR>',NL
001.013  120 117 122            690          DB      'PORT   n       Port address',NL
000.000                         691          IF      H84IO
001.037  102 101 125            692          DB      'BAUD   n       Baud rate',NL
                                693          ENDIF
001.060  110 105 114            694          DB      'HELP           Type this message',NL
001.110  012 212                695          DB      NL,ENL
001.112  257                    696          XRA     A               CLEAR CARRY
001.113  311                    697          RET
```

```
                                699  ***     TABLES
                                700  *
                                701  *


                                703  **      OPTTAB - OPTION TABLE
                                704  *
                                705
001.114  247 001               706  OPTTAB  DW      OPTTABE         END ADDRESS OF TABLE
001.116  006                   707          DB      6               NUMBER OF DATA BYTES
                                708
001.117  061 123 302           709          DB      '1S','B'+200Q,FLAGI,SB.1!SB.2,SB.1
001.125  270 003               710          DW      TAT.SB
001.127  000                   711          DB      0
                                712
001.130  062 123 302           713          DB      '2S','B'+200Q,FLAGI,SB.1!SB.2,SB.2
001.136  270 003               714          DW      TAT.SB
001.140  000                   715          DB      0
                                716
001.141  115 114 303           717          DB      'ML','C'+200Q,FLAGI,MLC!NOMLC,MLC
001.147  271 003               718          DW      TAT.CON
001.151  000                   719          DB      0
                                720
001.152  116 117 115           721          DB      'NOML','C'+200Q,FLAGI,MLC!NOMLC,NOMLC
001.162  271 003               722          DW      TAT.CON
001.164  000                   723          DB      0
                                724
001.165  127 111 104           725          DB      'WIDT','H'+200Q,VALI,10,20,132
001.176  273 003               726          DW      TAT.WID
                                727
001.200  120 101 304           728          DB      'PA','D'+200Q,VALI,10,0,15
001.207  272 003               729          DW      TAT.PAD
                                730
001.211  120 117 122           731          DB      'POR','T'+200Q,VALI,8,0,377Q
001.221  266 003               732          DW      TAT.POR
                                733
000.000                         734          IF      H84IO
001.223  102 101 125           735          DB      'BAU','D'+200Q,BAUDI
001.230  000 000 000           736          DB      0,0,0,0,0
                                737          ENDIF
                                738
001.235  110 105 114           739          DB      'HEL','P'+200Q,HELPI
001.242  000 000 000           740          DB      0,0,0,0,0
                                741
001.247  000                   742  OPTTABE DB      0                       END OF TABLE
```

```
                                744  **      PRCTAB - PROCESSOR TABLE
                                745  *
                                746
001.250                         747  PRCTAB  DS      0
                                748
000.000                         749  FLAGI   EQU     *-PRCTAB/2
001.250  107 000               750          DW      FLAG
                                751
000.001                         752  VALI    EQU     *-PRCTAB/2
001.252  112 000               753          DW      VAL
                                754
000.000                         755          IF      H84IO
000.002                         756  BAUDI   EQU     *-PRCTAB/2
001.254  115 000               757          DW      BAUD
                                758          ENDIF
                                759
000.003                         760  HELPI   EQU     *-PRCTAB/2
001.256  144 000               761          DW      HELP


000.000                         763          IF      H84IO
                                764          ELSE
                                765          DS      064Q                    ACCOUNT FOR CONDITIONAL ASSEMBLY
                                766          ENDIF
                                767
001.260                         768          SET     1260A
000.000                         769          ERRNZ   *-.
001.260                         770          DS      DVD.ENT-.
```

```
                                    773  ***     ATDVD ENTRY POINT.
                                    774  *
                                    775  *       ENTRY   (A) = PROCESS CODE
                                    776  *               (BC) = BYTE COUNT (USUALLY)
                                    777  *               (DE) = MEMORY ADDRESS (USUALLY)
                                    778  *       EXIT    'C' CLEAR IF OK
                                    779  *               'C' SET IF ERROR
                                    780  *                (A) = ERROR CODE
                                    781  *       USES    ALL
                                    782
                                    783
002.000                             784  ATDVD   EQU     *               ENTRY POINT
000.000                             785          ERRNZ   *-DVD.ENT
002.000  315 076 031                786          CALL    $TBRA           ENTER PROCESSOR
002.003  054                       787          DB      ATREAD-*        READ
002.004  121                       788          DB      ATWRITE-*       WRITE
002.005  010                       789          DB      ATABTR-*        READR
002.006  021                       790          DB      ATOPE-*         OPENR
002.007  020                       791          DB      ATOPE-*         OPENW
002.010  005                       792          DB      ATABTR-*        OPENU   = will never happen
002.011  041                       793          DB      ATNOP-*         CLOSE
002.012  007                       794          DB      ATABT-*         ABORT   = will never happen
002.013  002                       795          DB      ATABTR-*        MOUNT
002.014  011                       796          DB      ATLOAD-*        LOAD


                                    798  **      ATABTR - ISSUE DEVICE DRIVER ABORT TO REQUEST.
                                    799
002.015  076 027                   800  ATABTR  MVI     A,EC.DDA        DEVICE DRIVER ABORT
002.017  067                       801          STC
002.020  311                       802          RET


                                    804  **      ATABT - ABORT DEVICE DRIVER
                                    805  *
                                    806
002.021  315 366 002               807  ATABT   CALL    CRLF
002.024  311                       808          RET


                                    810  **      ATLOAD - LOAD DEVICE DRIVER
                                    811  *
                                    812
002.025                             813  ATLOAD  EQU     *
002.025  247                       814          ANA     A               CLEAR CARRY
002.026  311                       815          RET
```

```
                                817  **      ATOPE - OPEN (READ OR WRITE)
                                818  *
                                819
                                820
002.027  257                   821  ATOPE   XRA     A
002.030  062 124 002           822          STA     EOFFLG          CLEAR EOF ON INPUT FLAG
002.033  072 266 003           823          LDA     TAT.POR
002.036  052 267 003           824          LHLD    TAT.BAU
000.000                        825          IF      H84IO
002.041  315 122 003           826          CALL    I8250
                                827          ELSE
                                828          CALL    I8251
                                829          ENDIF
002.044  076 015               830          MVI     A,CR
002.046  315 146 002           831          CALL    TCH             RESET COLUMN INDEX, AND RETURN CARRIAGE
002.051  311                   832          RET


                                834  **      ATNOP - IGNORE REQUEST.
                                835
                                836
002.052  247                   837  ATNOP   ANA     A
002.053  311                   838          RET                     DO NOTHING
```

```
                                841  **      ATREAD - READ DATA FROM CONSOLE.
                                842  *
                                843  *       ATREAD READS BYTES UNTIL THE REQUEST IS SATISFIED,
                                844  *       OR A CTL-D IS STRUCK. THE CTL-D IS TAKEN AS EOF.
                                845
002.054  022                   846  ATR2    STAX    D               STORE CHAR
002.055  023                   847          INX     D
002.056  013                   848          DCX     B
                                849
002.057                         850  ATREAD  EQU     *
002.057  072 124 002           851          LDA     EOFFLG
002.062  037                   852          RAR
002.063  330                   853          RC                      IS EOF
                                854
002.064  170                   855          MOV     A,B
002.065  261                   856          ORA     C
002.066  310                   857          RZ                      ALL DONE
                                858
                                859  *       TAKE A CHAR
                                860
002.067  315 222 002           861  ATR1    CALL    RCHAR           READ CHARACTER
002.072  332 102 002           862          JC      ATREOF
002.075  376 004               863          CPI     04
002.077  302 054 002           864          JNE     ATR2            NOT CTL-D
                                865
                                866  *       HAVE EOF CHARACTER. FILL THIS SECTOR WITH 0'S
                                867
002.102  076 003               868  ATREOF  MVI     A,EC.EOF*2+1
002.104  062 124 002           869          STA     EOFFLG          FLAG EOF
002.107  257                   870  ATR4    XRA     A
002.110  022                   871          STAX    D               STORE 0
002.111  023                   872          INX     D
002.112  013                   873          DCX     B
002.113  171                   874          MOV     A,C
002.114  261                   875          ORA     C
002.115  302 107 002           876          JNZ     ATR4
002.120  076 001               877          MVI     A,EC.EOF
002.122  067                   878          STC                     SET EOF
002.123  311                   879          RET
                                880
                                881
002.124  000                   882  EOFFLG  DB      0               EOF FLAG
```

```
                                885
                                886  ***     ATWRITE - WRITE TO AT DEVICE.
                                887  *
                                888  *       ATWRITE WRITES THE DATA TO THE AT DEVICE.
                                889  *
                                890  *       THE SPECIAL CHARACTERS:
                                891  *
                                892  *       TAB
                                893  *       FF
                                894  *       NULL
                                895  *       NL
                                896  *
                                897  *       ARE TREATED SEPERATELY.
                                898  *
                                899  *       IF AN ABORT IS POSTED BEFORE THE OPERATION COMPLETS,
                                900  *       ATWRITE EXITS.
                                901
                                902
002.125                         903  ATWRITE EQU     *
002.125  072 334 040            904          LDA     S.CAADR+1       SEE IF ADDRESS
002.130  247                   905          ANA     A
002.131  300                   906          RNZ                     ABORT, CLAIM ALL DONE
002.132  170                   907          MOV     A,B
002.133  261                   908          ORA     C               CHECK BYTE COUNT LEFT
002.134  310                   909          RZ                      ALL DONE
                                910
                                911  *       (A) = CHARACTER. SEE IF NEEDS SPECIAL PROCESSING:
                                912  *
                                913  *       NULL
                                914  *       NL
                                915  *       TAB
                                916  *       FF
                                917
002.135  032                   918          LDAX    D
002.136  315 146 002            919          CALL    TCH             TYPE CHARACTER
002.141  023                   920  ATW2    INX     D               INCREMENT POINTER
002.142  013                   921          DCX     B               DECREMENT COUNT
002.143  303 125 002            922          JMP     ATWRITE
```

```
                                924  **      TCH - TYPE CHARACTER
                                925  *
                                926  *       (A) = CHARACTER
                                927  *       EXIT    NONE
                                928  *       USES    A,F
                                929  .
002.146  247                   930  TCH     ANA     A
002.147  310                   931          RZ                      IS NULL
002.150  376 012                932          CPI     NL
002.152  312 366 002            933          JE      CRLF            IS NEW LINE
002.155  376 014                934          CPI     FF
002.157  302 176 002            935          JNE     TCH2            IS NOT FF
002.162  076 006                936          MVI     A,6
002.164  365                   937  TCH1    PUSH    PSW
```

```
002.165  315 366 002   938          CALL    CRLF
002.170  361           939          POP     PSW
002.171  075           940          DCR     A
002.172  302 164 002   941          JNZ     TCH1
002.175  311           942          RET
                       943
002.176  376 011       944  TCH2    CPI     TAB
002.200  302 271 002   945          JNE     WCHAR           IS NOT TAB, JUST PRINT IT
002.203  076 040       946  WCH3    MVI     A,' '
002.205  315 271 002   947          CALL    WCHAR           WRITE BLANK
002.210  072 274 003   948          LDA     TAT.CX
002.213  075           949          DCR     A
002.214  346 007       950          ANI     7
002.216  302 203 002   951          JNZ     WCH3
002.221  311           952          RET
```

```
                                956  **      RCHAR - READ CHARACTER.
                                957  *
                                958  *       ENTRY   NONE
                                959  *       EXIT    'C' CLEAR IF CHARACTER
                                960  *               (A) = CHARACTER
                                961  *               'C' SET IF USER CONSOLE INTERRUPT
                                962  *       USES    A,F
                                963
                                964
002.222  072 334 040           965  RCHAR   LDA     S.CAADR+1
002.225  247                   966          ANA     A
002.226  067                   967          STC
002.227  300                   968          RNZ                     CONSOLE INTERRUPT
                                969
002.230  315 022 003           970          CALL    INCHAR
002.233  312 222 002           971          JZ      RCHAR
002.236  346 177               972          ANI     177Q            MASK OUT HIGH ORDER BIT
                                973
002.240  376 015               974          CPI     CR
002.242  302 247 002           975          JNE     RCHAR2          NOT CR
002.245  076 012               976          MVI     A,NL
                                977
002.247  365                   978  RCHAR2  PUSH    PSW
002.250  072 271 003           979          LDA     TAT.CON
002.253  346 001               980          ANI     MLC!NOMLC
002.255  302 265 002           981          JNZ     RCHAR3          NO MAPPING OF LOWER CASE
002.260  361                   982          POP     PSW
002.261  315 254 003           983          CALL    $MCU
002.264  365                   984          PUSH    PSW
                                985
002.265  361                   986  RCHAR3  POP     PSW
002.266  247                   987          ANA     A               CLEAR CARRY
002.267  311                   988          RET


                                990  **      WAIT - WAIT FOR THE HANDSHAKE
                                991  *
                                992
002.270                         993  WAIT    EQU     *
002.270  311                   994          RET


                                996  **      WCHAR - WRITE CHARACTER
                                997  *
                                998  *       ENTRY   (A) = CHARACTER
                                999  *       EXIT    NONE
                               1000  *       USES    A,F
                               1001
                               1002
002.271  365                   1003 WCHAR   PUSH    PSW
002.272  376 040               1004         CPI     ' '
002.274  332 315 002           1005         JC      WCHAR0          NOT PRINTABLE, SO SKIP COUNT CHECK!
```

```
002.277  072 274 003  1006          LDA     TAT.CX
002.302  075          1007          DCR     A
002.303  041 273 003  1008          LXI     H,TAT.WID
002.306  276          1009          CMP     M
002.307  332 315 002  1010          JC      WCHAR0          TAT.CX-1 < TAT.WID
002.312  315 366 002  1011          CALL    CRLF
002.315  072 271 003  1012  WCHAR0  LDA     TAT.CON
002.320  346 001      1013          ANI     MLC!NOMLC
002.322  302 332 002  1014          JNZ     WCHAR1          NO MAPPING
002.325  361          1015          POP     PSW
002.326  315 254 003  1016          CALL    $MCU
002.331  365          1017          PUSH    PSW
                      1018
002.332  361          1019  WCHAR1  POP     PSW
                      1020
002.333  315 054 003  1021          CALL    OUTCHAR
                      1022
002.336  376 015      1023          CPI     CR
002.340  312 360 002  1024          JZ      WCHAR2
002.343  376 040      1025          CPI     ' '
002.345  332 365 002  1026          JC      WCHAR3          NOT PRINTABLE
002.350  072 274 003  1027          LDA     TAT.CX
002.353  074          1028          INR     A
002.354  062 274 003  1029          STA     TAT.CX
002.357  311          1030          RET
                      1031
002.360  076 001      1032  WCHAR2  MVI     A,1
002.362  062 274 003  1033          STA     TAT.CX
002.365  311          1034  WCHAR3  RET


                      1036  **      CRLF  - TYPE CRLF.
                      1037  *
                      1038
                      1039
002.366  076 015      1040  CRLF    MVI     A,CR
002.370  315 271 002  1041          CALL    WCHAR
002.373  076 012      1042          MVI     A,LF
002.375  315 271 002  1043          CALL    WCHAR
003.000  072 272 003  1044          LDA     TAT.PAD
003.003  267          1045          ORA     A
003.004  312 021 003  1046  CRLF1   JZ      CRLF2
003.007  365          1047          PUSH    PSW
003.010  257          1048          XRA     A
003.011  315 271 002  1049          CALL    WCHAR
003.014  361          1050          POP     PSW
003.015  075          1051          DCR     A
003.016  303 004 003  1052          JMP     CRLF1
003.021  311          1053  CRLF2   RET
003.022               1054          XTEXT   DVDIO
```

```
                        1056X **      INCHAR - INPUT CHARACTER
                        1057X *
                        1058X *       INPUT CHARACTER FROM SPECIFIED DEVICE
                        1059X *
                        1060X *       ENTRY   NONE
                        1061X *
                        1062X *       EXIT    (PSW) = 'Z' CLEAR IF THERE IS A CHARACTER
                        1063X *                       (A) = CHARACTER
                        1064X *                   = 'Z' SET   IF THERE IS NOT A CHARACTER
                        1065X *
                        1066X *       USES    (PSW)
                        1067X *
                        1068X
003.022                 1069X INCHAR  EQU   *
003.022  345            1070X         PUSH  H
003.023  072 266 003    1071X         LDA   D,PORT
003.026  147            1072X         MOV   H,A
                        1073X
                        1074X *       CHECK FOR DATA
                        1075X
000.000                 1076X         IF      H84IO
                        1077X
003.027  056 005        1078X         MVI   L,UR.LSR
003.031  315 232 003    1079X         CALL  IN
003.034  346 001        1080X         ANI   UC.DR                   'Z' SET IF THERE IS DATA
003.036  312 051 003    1081X         JZ    INC1                    NO DATA
003.041  056 000        1082X         MVI   L,UR.RBR
003.043  315 232 003    1083X         CALL  IN
003.046  303 052 003    1084X         JMP   INC2
                        1085X
                        1086X         ELSE
                        1087X
                        1088X         MVI   L,USR
                        1089X         CALL  IN
                        1090X         ANI   USR.RXR                 'Z' SET IF THERE IS NO DATA
                        1091X         JZ    INC1                    NO DATA
                        1092X         MVI   L,UDR
                        1093X         CALL  IN
                        1094X         ANA   A                       IGNORE NULL CHARACTERS
                        1095X         JMP   INC2
                        1096X
                        1097X         ENDIF
                        1098X
003.051  067            1099X INC1    STC
                        1100X
003.052  341            1101X INC2    POP   H
003.053  311            1102X         RET
```

```
                                1104X **      OUTCHAR - OUTPUT CHARACTER
                                1105X *
                                1106X *       OUTPUT CHARACTER TO SPECIFIED DEVICE
                                1107X *
                                1108X *       ENTRY   (A)   = CHARACTER
                                1109X *
                                1110X *       EXIT    NONE
                                1111X *
                                1112X *       USES    (PSW)
                                1113X *
                                1114X
003.054                         1115X OUTCHAR EQU   *
003.054  345                    1116X         PUSH  H
                                1117X
003.055  365                    1118X         PUSH  PSW
003.056  072 266 003            1119X         LDA   D.PORT
003.061  147                    1120X         MOV   H,A
                                1121X
000.000                         1122X         IF      H84IO
                                1123X
003.062  056 005                1124X         MVI   L,UR.LSR
003.064  315 270 002            1125X         CALL  WAIT                    WAIT FOR THE HAND-SHAKE!/79.11.GC/
003.067  072 334 040            1126X OUTC0   LDA   S.CAADR+1
003.072  247                    1127X         ANA   A
003.073  302 117 003            1128X         JNZ   OUTC1                   IF  CTL-Z,-A,-B,-C HIT
003.076  315 232 003            1129X         CALL  IN
003.101  346 040                1130X         ANI   UC.THE
003.103  312 067 003            1131X         JZ    OUTC0                   IF  NOT READY FOR TRANSMIT
003.106  361                    1132X         POP   PSW
003.107  056 000                1133X         MVI   L,UR.THR
003.111  315 242 003            1134X         CALL  OUT
003.114  303 120 003            1135X         JMP   OUTC2
                                1136X
                                1137X         ELSE
                                1138X
                                1139X         MVI   L,USR
                                1140X         CALL  WAIT                    WAIT FOR THE HAND-SHAKE /79.11.GC/
                                1141X OUTC0   LDA   S.CAADR+1
                                1142X         ANA   A
                                1143X         JNZ   OUTC1                   IF  CTL-Z,-A,-B,-C HIT
                                1144X         CALL  IN
                                1145X         ANI   USR.TXR
                                1146X         JZ    OUTC0                   IF  NOT READY FOR TRANSMIT
                                1147X         POP   PSW
                                1148X         MVI   L,UDR
                                1149X         CALL  OUT
                                1150X         JMP   OUTC2
                                1151X
                                1152X         ENDIF
                                1153X
003.117  361                    1154X OUTC1   POP   PSW
                                1155X
003.120  341                    1156X OUTC2   POP   H
003.121  311                    1157X         RET
000.000                         1158X         IF      H84IO
```

```
                        1160X **      I8250 - INITIALIZE 8250
                        1161X *
                        1162X *       INITIALIZE AN 8250 PORT.  STOLEN AS CAP FROM CONSL. DRIVER.
                        1163X *
                        1164X *       ENTRY   (A)          =  PORT ADDRESS
                        1165X *               (HL)[0-14]   =  NEW BAUD RATE
                        1166X *               (HL)[15]     =  1 IF TWO STOP BITS
                        1167X *
                        1168X *       EXIT    NONE
                        1169X *
                        1170X *       USES    (A)
                        1171X *
                        1172X
003.122                 1173X I8250   EQU   *
003.122  325            1174X         PUSH  D
                        1175X
003.123  353            1176X         XCHG
003.124  147            1177X         MOV   H,A
003.125  056 001        1178X         MVI   L,UR.IER                                        /79.02.GC/
003.127  257            1179X         XRA   A                                               /79.02.GC/
003.130  315 242 003    1180X         CALL  OUT                                             /79.02.GC/
003.133  056 004        1181X         MVI   L,UR.MCR                                        /79.01.GC/
003.135  076 020        1182X         MVI   A,UC.LOO                                        /79.01.GC/
003.137  315 242 003    1183X         CALL  OUT             SET LOOP-BACK                   /79.01.GC/
003.142  056 003        1184X         MVI   L,UR.LCR
003.144  076 200        1185X         MVI   A,UC.DLA
003.146  315 242 003    1186X         CALL  OUT
003.151  056 000        1187X         MVI   L,UR.DLL
003.153  173            1188X         MOV   A,E
003.154  315 242 003    1189X         CALL  OUT
003.157  056 001        1190X         MVI   L,UR.DLM
003.161  172            1191X         MOV   A,D
003.162  346 177        1192X         ANI   177Q
003.164  315 242 003    1193X         CALL  OUT
003.167  056 003        1194X         MVI   L,UR.LCR
003.171  172            1195X         MOV   A,D
003.172  007            1196X         RLC
003.173  007            1197X         RLC
003.174  007            1198X         RLC
000.000                 1199X         ERRNZ UC.2SB-4
003.175  346 004        1200X         ANI   UC.2SB
003.177  366 003        1201X         ORI   UC.8BW          8 BIT WORDS
003.201  315 242 003    1202X         CALL  OUT
003.204  056 000        1203X         MVI   L,UR.RBR
003.206  315 232 003    1204X         CALL  IN                      REMOVE GARBAGE
003.211  076 156        1205X         MVI   A,AC.DLY                                        /79.01.GC/
003.213  315 053 000    1206X         CALL  .DLY                                            /79.01.GC/
003.216  056 004        1207X         MVI   L,UR.MCR                                        /79.01.GC/
003.220  315 232 003    1208X         CALL  IN                                              /79.01.GC/
003.223  346 357        1209X         ANI   377Q-UC.LOO                                     /79.01.GC/
003.225  315 242 003    1210X         CALL  OUT             TURN OFF LOOP-BACK              /79.01.GC/
                        1211X
003.230  321            1212X         POP   D
003.231  311            1213X         RET
                        1214X         ELSE
                        1215X I8251   SPACE 4,10
```

```
                        1216X **      I8251 - INITIALIZE 8251
                        1217X *
                        1218X *       INITIALIZE AN 8251 PORT
                        1219X *
                        1220X *       ENTRY   (A)      = PORT ADDRESS
                        1221X *               (HL)[15] = 1 IF TWO STOP BITS
                        1222X *
                        1223X *       EXIT    NONE
                        1224X *
                        1225X *       USES    ALL
                        1226X *
                        1227X
                        1228X I8251   EQU   *
                        1229X         XCHG
                        1230X         MOV   H,A
                        1231X         MVI   L,USR
                        1232X         MOV   A,D
                        1233X         ANI   200Q                        (A) = 200Q IF TWO STOP BITS
                        1234X         ERRNZ   200Q+UMI.1B-UMI.2B
                        1235X         ORI   UMI.1B+UMI.L8+UMI.16X
                        1236X         STA   I8251.B
                        1237X         LXI   B,I8251.A
                        1238X I8251.1 LDAX  B
                        1239X         CPI   #377Q
                        1240X         JZ    I8251.2
                        1241X         CALL  OUT
                        1242X         INX   B
                        1243X         JMP   I8251.1
                        1244X I8251.2 MVI   A,UCI.ER+UCI.TE+UCI.RE
                        1245X         CALL  OUT
                        1246X         MVI   L,UDR
                        1247X         CALL  IN
                        1248X         RET
                        1249X I8251.A DB      0,0,0,0,0,0
                        1250X         DB      UCI.IR
                        1251X I8251.B DB      0                         CONFIGURATION BYTE
                        1252X         DB      377Q
                        1253X         ENDIF


                        1255X **      IN - INPUT
                        1256X *
                        1257X *       INPUT BYTE FROM SPECIFIED PORT
                        1258X *
                        1259X *       ENTRY   (H)    = PORT ADDRESS
                        1260X *               (L)    = OFFSET
                        1261X *
                        1262X *       EXIT    (A)    = BYTE READ
                        1263X *
                        1264X *       USES    (PSW)
                        1265X *
                        1266X
        003,232         1267X IN      EQU   *
        003,232  174    1268X         MOV   A,H
```

```
003.233  205            1269X          ADD   L
003.234  062 240 003    1270X          STA   IN.ADD
003.237  333 000        1271X          IN    *-*
003.240                 1272X IN.ADD   EQU   *-1
003.241  311            1273X          RET


                        1275X **       OUT - OUTPUT
                        1276X *
                        1277X *        OUTPUT BYTE TO SPECIFIED PORT
                        1278X *
                        1279X *        ENTRY   (A)   = BYTE TO BE WRITTEN
                        1280X *                (H)   = PORT ADDRESS
                        1281X *                (L)   = OFFSET
                        1282X *
                        1283X *        EXIT    NONE
                        1284X *
                        1285X *        USES    NONE
                        1286X *
                        1287X
003.242                 1288X OUT      EQU   *
003.242  365            1289X          PUSH  PSW
003.243  174            1290X          MOV   A,H
003.244  205            1291X          ADD   L
003.245  062 252 003    1292X          STA   OUT.ADD
003.250  361            1293X          POP   PSW
003.251  323 000        1294X          OUT   *-*
003.252                 1295X OUT.ADD  EQU   *-1
003.253  311            1296X          RET
003.254                 1297           XTEXT   MCU


                        1299X **       MCU - MAP LOWER CASE TO UPPER CASE.
                        1300X *
                        1301X *        MCU MAPS A LOWER CASE ALPHABETIC TO UPPER
                        1302X *        CASE.
                        1303X *
                        1304X *        ENTRY   (A) = CHARACTER
                        1305X *        EXIT    (A) = CHARACTER RESULT
                        1306X *        USES    A,F
                        1307X
                        1308X
003.254  376 141        1309X $MCU     CPI     'a'
003.256  330            1310X          RC                      NOT LOWER CASE
003.257  376 173        1311X          CPI     'z'+1
003.261  320            1312X          RNC                     NOT LOWER CASE
003.262  326 040        1313X          SUI     'a'-'A'
003.264  311            1314X          RET
```

```
                        1316  ***     TAT.UNT - TABLE AT: UNIT CONSTANTS
                        1317  *
                        1318
        003.265         1319  TAT.UNA EQU     *
                        1320
        003.265  000    1321  TAT.UNT DB      0               UNIT NUMBER
                        1322
        003.265         1323  TAT.AS  EQU     TAT.UNT         [7] = 1 IF ASSIGNED
                        1324
        003.266  320    1325  TAT.POR DB      DFLT.AT         PORT NUMBER
        003.266         1326  D.PORT  EQU     TAT.POR
                        1327
        003.267  200 001 1328  TAT.BAU DW      DFLT.BD         BAUD RATE
        003.270         1329  TAT.SB  EQU     *-1             [7] = 1 IF TWO STOP BITS
                        1330
        003.271  000    1331  TAT.CON DB      MLC             CONFIGURATION BYTE
                        1332
        003.272  000    1333  TAT.PAD DB      DFLT.PD         NUMBER OF PAD CHAR. FOR <CR>
                        1334
        003.273  120    1335  TAT.WID DB      DFLT.WD         TERMINAL WIDTH
                        1336
        003.274  001    1337  TAT.CX  DB      DFLT.CX         COLUMN INDEX
                        1338
        003.275  000    1339  TAT.CTS DB      DFLT.CS         CTL-S FLAG
```

```
003.276                 1342            XTEXT   TBRA


                        1344X **        $TBRA - BRANCH RELATIVE THOUGH TABLE.
                        1345X *
                        1346X *         $TBRA USES THE SUPPLIED INDEX TO SELECT A BYTE FROM THE
                        1347X *         JUMP TABLE. THE CONTENTS OF THIS BYTE ARE ADDED TO THE
                        1348X *         ADDRESS OF THE BYTE, YEILDING THE PROCESSOR ADDRESS.
                        1349X *
                        1350X *         CALL    $TBRA
                        1351X *         DB      LAB1-*          INDEX = 0 FOR LAB1
                        1352X *         DB      LAB2-*          INDEX = 1 FOR LAB2
                        1353X *         DB      LABN-*          INDEX = N-1 FOR LABN
                        1354X *
                        1355X *         ENTRY   (A) = INDEX
                        1356X *                 (RET) = TABLE FWA
                        1357X *         EXIT    TO COMPUTED ADDRESS
                        1358X *         USES    F,H,L
                        1359X
                        1360X
031.076                 1361X $TBRA     EQU     31076A          IN H17 ROM
003.276                 1362            XTEXT   TYPTX


                        1364X **        $TYPTX - TYPE TEXT.
                        1365X *
                        1366X *         $TYPTX IS CALLED TO TYPE A BLOCK OF TEXT ON THE SYSTEM CONSOLE.
                        1367X *
                        1368X *         IMBEDDED ZERO BYTES INDICATE A CARRIAGE RETURN LINE FEED,
                        1369X *         A BYTE WITH THE 200Q BIT SET IS THE LAST BYTE IN THE MESSAGE.
                        1370X *
                        1371X *         ENTRY   (RET) = TEXT
                        1372X *         EXIT    TO (RET+LENGTH)
                        1373X *         USES    A,F
                        1374X
                        1375X
031.136                 1376X $TYPTX    EQU     31136A          IN H17 ROM
                        1377X
031.144                 1378X $TYPTX.   EQU     31144A          IN H17 ROM
                        1379
003.276  114 122       1380            DW      'RL'            DUMY ADDRESS FOR RELOCATION
003.300                 1381            DS      64              PATCH AREA
                        1382
                        1383            LON     G
                        1384
004.000  055 000 062   1385            END
         000 065 000
         123 000 132
         000 135 000
         114 001 125
         001 136 001
         147 001 162
```

```
001 176 001
207 001 221
001 250 001
252 001 254
001 256 001
022 002 031
002 034 002
037 002 042
002 047 002
060 002 070
002 073 002
100 002 105
002 116 002
137 002 144
002 153 002
160 002 166
002 173 002
201 002 206
002 211 002
217 002 231
002 234 002
243 002 251
002 256 002
262 002 275
002 300 002
304 002 310
002 313 002
316 002 323
002 327 002
334 002 341
002 346 002
351 002 355
002 363 002
371 002 376
002 001 003
005 003 012
003 017 003
024 003 032
003 037 003
044 003 047
003 057 003
065 003 074
003 077 003
104 003 112
003 115 003
131 003 140
003 147 003
155 003 165
003 202 003
207 003 221
003 226 003
235 003 246
003 000 000
ASSEMBLY COMPLETE
  1385 STATEMENTS
     0 ERRORS DETECTED
12354 BYTES FREE
```

```
$CNA    042207  418L  664
$DCS    042204  416L
$FST    042212  420L
$LBD    042223  426L  667
$MCU    003254' 983   1016  1309L
$PBF    042231  430L  640
$PBV    042234  432L  647
$SNA    042201  414L  622
$SOF    042226  428L  620
$TBLS   042215  422L
$TBRA   031076  786   1361E
$TYPTX  031136  682   1376E
$TYPTX. 031144  1378E
$WTBLS  042220  424L
.       001260  562S  563   564   768S  769   770
.ABUSS  040024  185E
.ALARM  002136  158E
.ALEDS  040013  183E
.CRC    002347  166E
.CRCSUM 040027  186E
.CTC    002172  160E
.CTL2FL 040066  192E
.CTLFLG 040011  182E
.DLEDS  040021  184E
.DLY    000053  155E  1206
.DOD    003122  169E
.DODA   003356  171E
.DSPMOD 040007  180E
.DSPROT 040006  179E
.DUMP   001374  157E
.HORN   002140  159E
.IDENT  000000  154E
.IOWRK  040002  177E
.LOAD   001267  156E
.MFLAG  040010  181E
.NMIRET 040064  191E
.PCHL   002264  162E
.RCK    003260  170E
.REGI   040005  178E
.REGPTR 040035  189E
.RNB    002331  165E
.RNP    002325  164E
.SRS    002265  163E
.START  040000  176E
.TICCNT 040033  188E
.TPERR  002205  161E
.TPERRX 040031  187E
.UIVEC  040037  190E
.WNB    003024  168E
.WNP    003017  167E
AC.DLY  000156  440E  1205
AIO.UNI 041061  546E
ATABT   002021' 794   807L
ATABTR  002015' 789   792   795   800L
ATDVD   002000' 784E
ATLOAD  002025' 796   813E
ATNOP   002052' 793   837L
ATOPE   002027' 790   791   821L
```

ATR1	002067'	861L				
ATR2	002054'	846L	864			
ATR4	002107'	870L	876			
ATREAD	002057'	787	850E			
ATREOF	002102'	862	868L			
ATW2	002141'	920L				
ATWRITE	002125'	788	903E	922		
BAUI	000140'	665	668	672L		
BAUD	000115'	663L	757			
BAUDI	000002	735	756E			
BELL	000007	36E				
BKSP	000010	38E				
C.STX	000002	40E				
C.SYN	000026	39E				
CB.CLI	000100	100E	123			
CB.MTL	000040	99E				
CB.SPK	000200	101E				
CB.SSI	000020	98E				
CB2.CLI	000002	104E				
CB2.ORG	000040	105E				
CB2.SID	000100	106E				
CB2.SSI	000001	103E				
CN.170M	000014	141E				
CN.174M	000003	140E				
CN.ABO	000200	145E				
CN.BAU	000100	144E				
CN.MEM	000040	143E				
CN.PRI	000020	142E				
CND.H17	000000	147E				
CND.H47	000001	149E				
CND.NDI	000000	148E				
CO.FLG	000001	271E				
CR	000015	32E	830	974	1023	1040
CRLF	002366'	807	933	938	1011	1040L
CRLF1	003004'	1046L	1052			
CRLF2	003021'	1046	1053L			
CS.FLG	000200	272E				
CSL.CHR	000001	248E				
CSL.ECH	000200	245E				
CSL.RAW	000004	246E				
CSL.WRP	000002	247E				
CTLA	000001	47E				
CTLB	000002	48E				
CTLC	000003	49E				
CTLD	000004	50E				
CTLO	000017	51E				
CTLP	000020	52E				
CTLQ	000021	53E				
CTLS	000023	54E				
CTLZ	000032	55E				
CTP.2SB	000010	257E				
CTP.BKM	000002	258E				
CTP.BKS	000200	253E				
CTP.FF	000100	254E				
CTP.MLI	000040	255E				
CTP.MLO	000020	256E				
CTP.TAB	000001	259E				
D.CON	040110	207L				

```
D.PORT  003266'  1071  1119  1326E
D.RAM   040240   210L
D.VEC   040130   209L
DC.ABT  000007    70L
DC.CLO  000006    69L
DC.LOD  000011    72L
DC.MAX  000013    74L
DC.MOU  000010    71L
DC.OPR  000003    66L
DC.OPU  000005    68L
DC.OPW  000004    67L
DC.RDY  000012    73L
DC.REA  000000    63L
DC.RER  000002    65L
DC.WRI  000001    64L
DEV.DDA 000004   356L
DEV.DVB 000015   369L
DEV.DVL 000013   368L
DEV.FLG 000006   357L
DEV.JMP 000003   355L
DEV.MNU 000010   365L
DEV.MUM 000007   364L
DEV.NAM 000000   347L
DEV.RES 000002   351L
DEV.UNT 000011   366L
DEVELEN 000016   371E
DFLT.AT 000320   575E  1325
DFLT.BD 001200   576E  1328
DFLT.CS 000000   585E  1339
DFLT.CX 000001   584E  1337
DFLT.PD 000000   582E  1333
DFLT.WD 000120   583E  1335
DM.MR   000000   113E
DM.MW   000001   114E
DM.RR   000002   115E
DM.RW   000003   116E
DR.IM   000001   352E
DR.PR   000002   353E
DT.CH   000020   362E
DT.CR   000002   359E   554   557
DT.CW   000004   360E   554   557
DT.DD   000001   358E
DT.RN   000010   361E
DV.EL   000000   348E
DV.NU   000001   349E
DVD.CAP 000007   393L
DVD.DVD 000006   392L
DVD.ENT 002000   402E   770   785
DVD.INP 000023   398L
DVD.MNU 000011   395L
DVD.MUM 000010   394L
DVD.SET 000022   397L
DVD.STE 000053   400E   564   613
DVD.UFL 000012   396L
DVDFLV  000307   388E   553   559
EC.CNA  000004   289L
EC.DDA  000027   308L   800
EC.DIF  000017   300L
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EC.DIW  000035  314L
EC.DNI  000045  322L
EC.DNR  000046  323L
EC.DNS  000005  290L
EC.DSC  000047  324L
EC.EOF  000001  286L    868     877
EC.EOM  000002  287L
EC.FAO  000031  310L
EC.FAP  000026  307L
EC.FL   000030  309L
EC.FNF  000014  297L
EC.FNO  000011  294L
EC.FNR  000034  313L
EC.FOD  000043  320L
EC.FUC  000013  296L
EC.ICN  000016  299L
EC.IDN  000006  291L
EC.IFC  000020  301L
EC.IFN  000007  292L
EC.ILC  000003  288L
EC.ILO  000040  317L    624
EC.ILR  000012  295L
EC.ILV  000037  316L    672
EC.IOI  000052  327L
EC.IS   000032  311L
EC.NCV  000050  325L
EC.NEM  000021  302L
EC.NOS  000051  326L
EC.NPM  000044  321L
EC.NRD  000010  293L
EC.NVM  000042  319L
EC.OTL  000053  328L
EC.RF   000022  303L
EC.UNA  000036  315L
EC.UND  000015  298L
EC.UUN  000033  312L    628
EC.VPM  000041  318L
EC.WF   000023  304L
EC.WP   000025  306L
EC.WPV  000024  305L
ENL     000212   45E    695
EOFFLG  002124' 822     851     869     882L
ESC     000033   43E
FF      000014   46E    934
FLAG    000107' 640L    750
FLAGI   000000  709     713     717     721     749E
H84IO   000000    1E      2     574     648     691     734     755     763     825    1076    1122    1158
HELP    000144' 682L    761
HELPI   000003  739     760E
I.CONFL 000004  274E    275
I.CONTY 000001  261E    262
I.CONWI 000003  267E    268
I.CSLMD 000000  250E
I.CUSOR 000002  264E    265
I8250   003122' 826     1173E
IN      003232' 1079    1083    1129    1204    1208    1267E
IN.ADD  003240' 1270    1272E
INC1    003051' 1081    1099L
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INC2     003052'   1084     1101L
INCHAR   003022'    970     1069E
IP.CON   000362      89E
IP.PAD   000360      85E
LF       000012      33E     1042
M.FOX    000303     133E
M.PAM8   000021     132E
MLC      000000     593E      717     717     721     980    1013    1331
NL       000012      44E       45     683     683     683     683     684     685     686     687     688     689
                     690      692     694     695     932     976
NOMLC    000001     594E      717     721     721     980    1013
NUL2     000000      35E
NULL     000200      34E
OP.CTL   000360      86E
OP.DIG   000360      87E
OP.SEG   000361      88E
OP2.CTL  000362      90E
OPTTAB   001114'    619      706L
OPTTABE  001247'    706      742L
OUT      003242'   1134     1180    1183    1186    1189    1193    1202    1210    1288E
OUT.ADD  003252'   1292     1295E
OUTC0    003067'   1126L    1131
OUTC1    003117'   1128     1154L
OUTC2    003120'   1135     1156L
OUTCHAR  003054'   1021     1115E
PIC.COD  000006     340L      390
PIC.ID   000000     335L
PIC.LEN  000002     337L
PIC.PTR  000004     338L
PRCTAB   001250'    618      747L    749     752     756     760
QUOTE    000047      41E
RCHAR    002222'    861      965L    971
RCHAR2   002247'    975      978L
RCHAR3   002265'    981      986L
ROMBOOT  030000     202E
RUBOUT   000177      37E
S.CAADR  040333     278L      904     965    1126
S.CCTAB  040335     279L
S.CONFL  040332     276L
S.CONTY  040327     263L
S.CONWI  040331     269L
S.CSLMD  040326     251L      262     265     268     275
S.CUSOR  040330     266L
S.DATC   040310     232L
S.DATE   040277     231L
S.GRT0   024000     198E
S.GRT1   025000     199E
S.GRT2   026000     200E
S.HIMEM  040316     234L
S.INT    040343     212L
S.OMAX   040324     240L
S.SOVR   041146     214L      216
S.SYSM   040320     236L
S.TIME   040312     233L
S.USRM   040322     238L
S.VAL    040277     211L      229
SB.1     000000     590E      709     709     713
SB.2     000200     591E      709     713     713
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SC.ACE   000350      439E
SC.UART  000372      508E
SET1     000103'     615       628L
SETNTR   000053'     612E
STACK    042200      218E
STACKL   001032      216E
SYDD     040130      208E
TAB      000011      42E       944
TAT.AS   003265'    1323E
TAT.BAU  003267'     669       824     1328L
TAT.CON  003271'     718       722      979    1012    1331L
TAT.CTS  003275'    1339L
TAT.CX   003274'     948      1006     1027    1029    1033    1337L
TAT.PAD  003272'     729      1044     1333L
TAT.POR  003266'     732       823     1325L   1326
TAT.SB   003270'     710       714     1329E
TAT.UNA  003265'    1319E
TAT.UNT  003265'    1321L     1323
TAT.WID  003273'     726      1008     1335L
TCH      002146'     831       919      930L
TCH1     002164'     937L      941
TCH2     002176'     935       944L
UC.2SB   000004      465E     1199     1200
UC.5BW   000000      461E
UC.6BW   000001      462E
UC.7BW   000002      463E
UC.8BW   000003      464E     1201
UC.BI    000020      484E
UC.CTS   000020      493E
UC.DCS   000001      489E
UC.DDR   000002      490E
UC.DLA   000200      470E     1185
UC.DR    000001      480E     1080
UC.DRL   000010      492E
UC.DSR   000040      494E
UC.DTR   000001      473E
UC.EDA   000001      451E
UC.EPS   000020      467E
UC.FE    000010      483E
UC.IID   000006      458E
UC.IIP   000001      457E
UC.LOO   000020      477E     1182     1209
UC.MSI   000010      454E
UC.OR    000002      481E
UC.OU1   000004      475E
UC.OU2   000010      476E
UC.PE    000004      482E
UC.PEN   000010      466E
UC.RI    000100      495E
UC.RLS   000200      496E
UC.RSI   000004      453E
UC.RTS   000002      474E
UC.SB    000100      469E
UC.SKP   000040      468E
UC.TER   000004      491E
UC.THE   000040      485E     1130
UC.TRE   000002      452E
UC.TSE   000100      486E
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UCI.ER  000020      530E
UCI.IE  000002      532E
UCI.IR  000100      528E
UCI.RE  000004      531E
UCI.RO  000040      529E
UCI.TE  000001      533E
UDR     000000      505E
UMI.16X 000002      523E
UMI.1B  000100      513E
UMI.1X  000001      522E
UMI.2B  000300      515E
UMI.64X 000003      524E
UMI.HB  000200      514E
UMI.L5  000000      518E
UMI.L6  000004      519E
UMI.L7  000010      520E
UMI.L8  000014      521E
UMI.PA  000020      517E
UMI.PE  000040      516E
UNT.DIS 000006      381L
UNT.FLG 000000      377L
UNT.GRT 000002      379L
UNT.GTS 000004      380L
UNT.SIZ 000010      383E
UNT.SPG 000001      378L
UO.CLK  000001      125E
UO.DDU  000002      124E
UO.HLT  000200      122E
UO.NFR  000100      123E
UR.DLL  000000      446E    1187
UR.DLM  000001      448E    1190
UR.IER  000001      450E    1178
UR.IIR  000002      456E
UR.LCR  000003      460E    1184    1194
UR.LSR  000005      479E    1078    1124
UR.MCR  000004      472E    1181    1207
UR.MSR  000006      488E
UR.RBR  000000      442E    1082    1203
UR.THR  000000      444E    1133
USERFWA 042200      219E     412
USR     000001      506E
USR.BD  000100      537E
USR.FE  000040      538E
USR.OE  000020      539E
USR.PE  000010      540E
USR.RXR 000002      542E
USR.TXE 000004      541E
USR.TXR 000001      543E
VAL     000112'     647L     753
VALI    000001      725      728     731     752E
WAIT    002270'     993E    1125
WCH3    002203'     946L     951
WCHAR   002271'     945      947    1003L   1041    1043    1049
WCHAR0  002315'    1005     1010    1012L
WCHAR1  002332'    1014     1019L
WCHAR2  002360'    1024     1032L
WCHAR3  002365'    1026     1034L

26714 BYTES FREE
```