```
000.001                 1  H84IO   EQU     1               DON'T ASSEMBLE FOR H8-4 CARD
000.001                 2          IF      H84IO
                        3          TITLE   'ATDVD - AT: DEVICE DRIVER, FOR H8-4 MULTI PORT SERIAL I/O'
                        4          ELSE
                        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 Confisuration  /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 **     Confisuration Flass                                 /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
```

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

                    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
```

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                    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 T.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   EQDEF


                        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 AIO.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
    000.001             574          IF      H84IO
                        575  DFLT.AT EQU     320Q            PORT ADDRESS
                        576  DFLT.BD EQU     1200A           300 BAUD
                        577          ELSE
    000.374             578  DFLT.AT EQU     374Q            PORT ADDRESS
    000.000             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  021 166 001            618          LXI     D,PRCTAB        (DE) = PROCESSOR TABLE ADDRESS
000.064  041 044 001            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
000.001                         648          IF      H84IO
                                649  BAUD    SPACE   4,10
                                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
                                663  BAUD    MVI     A,10            (A)  = DEFAULT RADIX
                                664          CALL    $CNA
                                665          JC      BAU1
                                666          XCHG                    (DE) = BAUD RATE VALUE
                                667          CALL    $LBD
                                668          JNZ     BAU1
                                669          SHLD    TAT.BAU         SET BAUD RATE WORD
                                670          RET
                                671
                                672  BAU1    MVI     A,EC.ILV
                                673          STC
                                674          RET
                                675          ENDIF
```

```
                                677  **      HELP - PROCESS HELP OPTION
                                678  *
                                679  *       TYPE VALID OPTIONS ON USER CONSOLE
                                680  *
                                681
000.115  315 136 031            682  HELP    CALL    $TYPTX
000.120  012 012 123            683          DB      NL,NL,'Set Options:',NL,NL
000.140  061 123 102            684          DB      '1SB            One stop bit',NL
000.162  062 123 102            685          DB      '2SB            Two stop bits',NL
000.205  115 114 103            686          DB      'MLC            Map Lower Case',NL
000.231  116 117 115            687          DB      'NOMLC          No mapping of Lower Case',NL
000.271  127 111 104            688          DB      'WIDTH  n       Page width',NL
000.314  120 101 104            689          DB      'PAD    n       Number of Pad characters for <CR>',NL
000.364  120 117 122            690          DB      'PORT   n       Port address',NL
000.001                         691          IF      H84IO
                                692          DB      'BAUD   n       Baud rate',NL
                                693          ENDIF
001.010  110 105 114            694          DB      'HELP           Type this message',NL
001.040  012 212                695          DB      NL,ENL
001.042  257                    696          XRA     A               CLEAR CARRY
001.043  311                    697          RET
```

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


                                703  **      OPTTAB - OPTION TABLE
                                704  *
                                705
001.044  165 001                706  OPTTAB  DW      OPTTABE         END ADDRESS OF TABLE
001,046  006                    707          DB      6               NUMBER OF DATA BYTES
                                708
001.047  061 123 302            709          DB      '1S',','B'+200Q,FLAGI,SB.1!SB.2,SB.1
001.055  241 003                710          DW      TAT.SB
001,057  000                    711          DB      0
                                712
001.060  062 123 302            713          DB      '2S',','B'+200Q,FLAGI,SB.1!SB.2,SB.2
001.066  241 003                714          DW      TAT.SB
001,070  000                    715          DB      0
                                716
001.071  115 114 303            717          DB      'ML',','C'+200Q,FLAGI,MLC!NOMLC,MLC
001.077  242 003                718          DW      TAT.CON
001.101  000                    719          DB      0
                                720
001.102  116 117 115            721          DB      'NOML',','C'+200Q,FLAGI,MLC!NOMLC,NOMLC
001.112  242 003                722          DW      TAT.CON
001.114  000                    723          DB      0
                                724
001.115  127 111 104            725          DB      'WIDT',','H'+200Q,VALI,10,20,132
001.126  244 003                726          DW      TAT.WID
                                727
001.130  120 101 304            728          DB      'PA',','D'+200Q,VALI,10,0,15
001.137  243 003                729          DW      TAT.PAD
                                730
001.141  120 117 122            731          DB      'POR',','T'+200Q,VALI,8,0,377Q
001.151  237 003                732          DW      TAT.POR
                                733
000.001                         734          IF      H84ID
                                735          DB      'BAU',','D'+200Q,BAUDI
                                736          DB      0,0,0,0,0
                                737          ENDIF
                                738
001.153  110 105 114            739          DB      'HEL',','P'+200Q,HELPI
001.160  000 000 000            740          DB      0,0,0,0,0
                                741
001.165  000                    742  OPTTABE DB      0                       END OF TABLE
```

```
                         744  **      PRCTAB - PROCESSOR TABLE
                         745  *
                         746
001.166                  747  PRCTAB  DS      0
                         748
000.000                  749  FLAGI   EQU     *-PRCTAB/2
001.166  107 000         750          DW      FLAG
                         751
000.001                  752  VALI    EQU     *-PRCTAB/2
001.170  112 000         753          DW      VAL
                         754
000.001                  755          IF      H84IO
                         756  BAUDI   EQU     *-PRCTAB/2
                         757          DW      BAUD
                         758          ENDIF
                         759
000.002                  760  HELPI   EQU     *-PRCTAB/2
001.172  115 000         761          DW      HELP


000.001                  763          IF      H84IO
                         764          ELSE
001.174                  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
002.011  041                   793         DB      ATNOP-*         CLOSE
002.012  007                   794         DB      ATABT-*         ABORT
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  072 237 003           823          LDA     TAT.FOR
002.036  052 240 003           824          LHLD    TAT.BAU
000.001                        825          IF      H84IO
                                826          CALL    I8250
                                827          ELSE
002.041  315 123 003           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  072 245 003   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  072 242 003           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  315 225 003           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  072 245 003  1006          LDA     TAT.CX
002.302  075          1007          DCR     A
002.303  041 244 003  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  072 242 003  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  315 225 003  1016          CALL    $MCU
002.331  365          1017          PUSH    PSW
                      1018
002.332  361          1019  WCHAR1  POP     PSW
                      1020
002.333  315 055 003  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  072 245 003  1027          LDA     TAT.CX
002.353  074          1028          INR     A
002.354  062 245 003  1029          STA     TAT.CX
002.357  311          1030          RET
                      1031
002.360  076 001      1032  WCHAR2  MVI     A,1
002.362  062 245 003  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  072 243 003  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
```

```
                                1058X **      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  072 237 003            1071X         LDA   D.PORT
003.026  147                    1072X         MOV   H,A
                                1073X
                                1074X *       CHECK FOR DATA
                                1075X
000.001                         1076X         IF      H84IO
                                1077X
                                1078X         MVI   L,UR.LSR
                                1079X         CALL  IN
                                1080X         ANI   UC.DR                     'Z' SET IF THERE IS DATA
                                1081X         JZ    INC1                      NO DATA
                                1082X         MVI   L,UR.RBR
                                1083X         CALL  IN
                                1084X         JMP   INC2
                                1085X
                                1086X         ELSE
                                1087X
003.027  056 001                1088X         MVI   L,USR
003.031  315 203 003            1089X         CALL  IN
003.034  346 002                1090X         ANI   USR.RXR                   'Z' SET IF THERE IS NO DATA
003.036  312 052 003            1091X         JZ    INC1                      NO DATA
003.041  056 000                1092X         MVI   L,UDR
003.043  315 203 003            1093X         CALL  IN
003.046  247                    1094X         ANA   A                         IGNORE NULL CHARACTERS
003.047  303 053 003            1095X         JMP   INC2
                                1096X
                                1097X         ENDIF
                                1098X
003.052  067                    1099X INC1    STC
                                1100X
003.053  341                    1101X INC2    POP   H
003.054  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
003.055                 1115X OUTCHAR EQU   *
003.055  345            1116X         PUSH  H
                        1117X
003.056  365            1118X         PUSH  PSW
003.057  072 237 003    1119X         LDA   D.PORT
003.062  147            1120X         MOV   H,A
                        1121X
000.001                 1122X         IF      H84IO
                        1123X
                        1124X         MVI   L,UR.LSR
                        1125X         CALL  WAIT                    WAIT FOR THE HAND-SHAKE!/79.11.GC/
                        1126X OUTC0   LDA   S.CAADR+1
                        1127X         ANA   A                       /
                        1128X         JNZ   OUTC1                   IF  CTL-Z,-A,-B,-C HIT
                        1129X         CALL  IN
                        1130X         ANI   UC.THE
                        1131X         JZ    OUTC0                   IF  NOT READY FOR TRANSMIT
                        1132X         POP   PSW
                        1133X         MVI   L,UR.THR
                        1134X         CALL  OUT
                        1135X         JMP   OUTC2
                        1136X
                        1137X         ELSE
                        1138X
003.063  056 001        1139X         MVI   L,USR
003.065  315 270 002    1140X         CALL  WAIT                    WAIT FOR THE HAND-SHAKE /79.11.GC/
003.070  072 334 040    1141X OUTC0   LDA   S.CAADR+1
003.073  247            1142X         ANA   A
003.074  302 120 003    1143X         JNZ   OUTC1                   IF  CTL-Z,-A,-B,-C HIT
003.077  315 203 003    1144X         CALL  IN
003.102  346 001        1145X         ANI   USR.TXR
003.104  312 070 003    1146X         JZ    OUTC0                   IF  NOT READY FOR TRANSMIT
003.107  361            1147X         POP   PSW
003.110  056 000        1148X         MVI   L,UDR
003.112  315 213 003    1149X         CALL  OUT
003.115  303 121 003    1150X         JMP   OUTC2
                        1151X
                        1152X         ENDIF
                        1153X
003.120  361            1154X OUTC1   POP   PSW
                        1155X
003.121  341            1156X OUTC2   POP   H
003.122  311            1157X         RET
000.001                 1158X         IF      H84IO
                        1159X I8250   SPACE   4,10
```

```
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
1173X I8250  EQU   *
1174X        PUSH  D
1175X
1176X        XCHG
1177X        MOV   H,A
1178X        MVI   L,UR.IER                                          /79.02.GC/
1179X        XRA   A                                                 /79.02.GC/
1180X        CALL  OUT                                               /79.02.GC/
1181X        MVI   L,UR.MCR                                          /79.01.GC/
1182X        MVI   A,UC.LOO                                          /79.01.GC/
1183X        CALL  OUT             SET LOOP-BACK                     /79.01.GC/
1184X        MVI   L,UR.LCR
1185X        MVI   A,UC.DLA
1186X        CALL  OUT
1187X        MVI   L,UR.DLL
1188X        MOV   A,E
1189X        CALL  OUT
1190X        MVI   L,UR.DLM
1191X        MOV   A,D
1192X        ANI   177Q
1193X        CALL  OUT
1194X        MVI   L,UR.LCR
1195X        MOV   A,D
1196X        RLC
1197X        RLC
1198X        RLC
1199X        ERRNZ UC.2SB-4
1200X        ANI   UC.2SB
1201X        ORI   UC.8BW                      8 BIT WORDS
1202X        CALL  OUT
1203X        MVI   L,UR.RBR
1204X        CALL  IN                        REMOVE GARBAGE
1205X        MVI   A,AC.DLY                                          /79.01.GC/
1206X        CALL  .DLY                                              /79.01.GC/
1207X        MVI   L,UR.MCR                                          /79.01.GC/
1208X        CALL  IN                                                /79.01.GC/
1209X        ANI   377Q-UC.LOO                                       /79.01.GC/
1210X        CALL  OUT           TURN OFF LOOP-BACK                  /79.01.GC/
1211X
1212X        POP   D
1213X        RET
1214X        ELSE
```

```
                                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
003.123                         1228X I8251   EQU   *
003.123  353                    1229X         XCHG
003.124  147                    1230X         MOV   H,A
003.125  056 001                1231X         MVI   L,USR
003.127  172                    1232X         MOV   A,D
003.130  346 200                1233X         ANI   200Q                      (A) = 2000 IF TWO STOP BITS
000.000                         1234X         ERRNZ   2000+UMI.1B-UMI.2B
003.132  366 116                1235X         ORI   UMI.1B+UMI.L8+UMI.16X
003.134  062 201 003            1236X         STA   I8251.B
003.137  001 172 003            1237X         LXI   B,I8251.A
003.142  012                   1238X I8251.1 LDAX  B
003.143  376 377                1239X         CPI   #377Q
003.145  312 157 003            1240X         JZ    I8251.2
003.150  315 213 003            1241X         CALL  OUT
003.153  003                    1242X         INX   B
003.154  303 142 003            1243X         JMP   I8251.1
003.157  076 025                1244X I8251.2 MVI   A,UCI.ER+UCI.TE+UCI.RE
003.161  315 213 003            1245X         CALL  OUT
003.164  056 000                1246X         MVI   L,UDR
003.166  315 203 003            1247X         CALL  IN
003.171  311                    1248X         RET
003.172  000 000 000            1249X I8251.A DB    0,0,0,0,0,0
003.200  100                    1250X         DB    UCI.IR
003.201  000                    1251X I8251.B DB    0                         CONFIGURATION BYTE
003.202  377                    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
003.203                         1267X IN      EQU   *
003.203  174                    1268X         MOV   A,H
```

```
003.204  205          1269X          ADD   L
003.205  062 211 003  1270X          STA   IN.ADD
003.210  333 000      1271X          IN    *-*
003.211               1272X IN.ADD   EQU   *-1
003.212  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
003.213               1288X OUT      EQU   *
003.213  365          1289X          PUSH  PSW
003.214  174          1290X          MOV   A,H
003.215  205          1291X          ADD   L
003.216  062 223 003  1292X          STA   OUT.ADD
003.221  361          1293X          POP   PSW
003.222  323 000      1294X          OUT   *-*
003.223               1295X OUT.ADD  EQU   *-1
003.224  311          1296X          RET
003.225               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
003.225  376 141      1309X $MCU     CPI   'a'
003.227  330          1310X          RC                    NOT LOWER CASE
003.230  376 173      1311X          CPI   'z'+1
003.232  320          1312X          RNC                   NOT LOWER CASE
003.233  326 040      1313X          SUI   'a'-'A'
003.235  311          1314X          RET
```

```
                        1316  ***     TAT.UNT - TABLE AT: UNIT CONSTANTS
                        1317  *
                        1318
003,236                 1319  TAT,UNA EQU     *
                        1320
003,236 000             1321  TAT,UNT DB      0               UNIT NUMBER
                        1322
003,236                 1323  TAT,AS  EQU     TAT,UNT         [7] = 1 IF ASSIGNED
                        1324
003,237 374             1325  TAT,POR DB      DFLT,AT         PORT NUMBER
003,237                 1326  D,PORT  EQU     TAT,POR
                        1327
003,240 000 000         1328  TAT,BAU DW      DFLT,BD         BAUD RATE
003,241                 1329  TAT,SB  EQU     *-1             [7] = 1 IF TWO STOP BITS
                        1330
003,242 000             1331  TAT,CON DB      MLC             CONFIGURATION BYTE
                        1332
003,243 000             1333  TAT,PAD DB      DFLT,PD         NUMBER OF PAD CHAR. FOR <CR>
                        1334
003,244 120             1335  TAT,WID DB      DFLT,WD         TERMINAL WIDTH
                        1336
003,245 001             1337  TAT,CX  DB      DFLT,CX         COLUMN INDEX
                        1338
003,246 000             1339  TAT,CTS DB      DFLT,CS         CTL-S FLAG
```

```
003.247                 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
003.247                 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
003.247  114 122        1380          DW      'RL'            DUMY ADDRESS FOR RELOCATION
003.251                 1381          DS      64              PATCH AREA
                        1382
                        1383          LON     G
                        1384
003.351  055 000 062    1385          END
         000 065 000
         044 001 055
         001 066 001
         077 001 112
         001 128 001
         137 001 151
```

```
                001 166 001
170 001 172
                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
050 003 060
                003 066 003
075 003 100
                003 105 003
113 003 116
                003 135 003
140 003 146
                003 151 003
155 003 162
                003 167 003
206 003 217
                003 000 000
    ASSEMBLY COMPLETE
     1385 STATEMENTS
        0 ERRORS DETECTED
    12336 BYTES FREE
```

```
$CNA    042207  418L
$DCS    042204  416L
$FST    042212  420L
$LBD    042223  426L
$MCU    003225' 983     1016    1309L
$PBF    042231  430L    640
$PBV    042234  432L    647
$SNA    042201  414L    622
$SOP    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
.CTR    002172  160E
.CTL2FL 040066  192E
.CTLFLG 040011  182E
.DLEDS  040021  184E
.DLY    000053  155E
.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
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
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   003237'   1071      1119    1326E
D.RAM    040240     210L
D.VEC    040130     209L
```

```
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
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   000001  1E    2    574  648  691  734  755  763  825  1076  1122  1158
HELP    000115  682L  761
HELPI   000002  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
I8251   003123  828   1228E
I8251.1 003142  1238L 1243
I8251.2 003157  1240  1244L
I8251.A 003172  1237  1249L
I8251.B 003201  1236  1251L
IN      003203  1089  1093  1144  1247  1267E
IN.ADD  003211  1270  1272E
```

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INC1     003052'    1091       1099L
INC2     003053'    1095       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       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   001044'     619       706L
OPTTABE  001165'     706       742L
OUT      003213'    1149       1241     1245     1288E
OUT.ADD  003223'    1292       1295E
OUTC0    003070'    1141L      1146
OUTC1    003120'    1143       1154L
OUTC2    003121'    1150       1156L
OUTCHAR  003055'    1021       1115E
PIC.COD  000006      340L       390
PIC.ID   000000      335L
PIC.LEN  000002      337L
PIC.PTR  000004      338L
PRCTAB   001166'     618       747L      749      752      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     1141
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
```

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SB.2      000200      591E      709      713      713
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    003236'    1323E
TAT.BAU   003240'     824      1328L
TAT.CON   003242'     718       722      979     1012     1331L
TAT.CTS   003246'    1339L
TAT.CX    003245'     948      1006     1027     1029     1033     1337L
TAT.PAD   003243'     729      1044     1333L
TAT.POR   003237'     732       823     1325L    1326
TAT.SB    003241'     710       714     1329E
TAT.UNA   003236'    1319E
TAT.UNT   003236'    1321L     1323
TAT.WID   003244'     726      1008     1335L
TCH       002146'     831       919      930L
TCH1      002164'     937L      941
TCH2      002176'     935       944L
UC.2SB    000004      465E
UC.5BW    000000      461E
UC.6BW    000001      462E
UC.7BW    000002      463E
UC.8BW    000003      464E
UC.BI     000020      484E
UC.CTS    000020      493E
UC.DCS    000001      489E
UC.DDR    000002      490E
UC.DLA    000200      470E
UC.DR     000001      480E
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
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
UC.TRE    000002      452E
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UC.TSE  000100  486E
UCI.ER  000020  530E  1244
UCI.IE  000002  532E
UCI.IR  000100  528E  1250
UCI.RE  000004  531E  1244
UCI.RO  000040  529E
UCI.TE  000001  533E  1244
UDR     000000  505E  1092  1148  1246
UMI.16X 000002  523E  1235
UMI.1B  000100  513E  1234  1235
UMI.1X  000001  522E
UMI.2B  000300  515E  1234
UMI.64X 000003  524E
UMI.HB  000200  514E
UMI.L5  000000  518E
UMI.L6  000004  519E
UMI.L7  000010  520E
UMI.L8  000014  521E  1235
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
UR.DLM  000001  448E
UR.IER  000001  450E
UR.IIR  000002  456E
UR.LCR  000003  460E
UR.LSR  000005  479E
UR.MCR  000004  472E
UR.MSR  000006  488E
UR.RBR  000000  442E
UR.THR  000000  444E
USERFWA 042200  219E  412
USR     000001  506E  1088  1139  1231
USR.BD  000100  537E
USR.FE  000040  538E
USR.OE  000020  539E
USR.PE  000010  540E
USR.RXR 000002  542E  1090
USR.TXE 000004  541E
USR.TXR 000001  543E  1145
VAL     000112'  647L  753
VALI    000001  725  728  731  752E
WAIT    002270'  993E  1140
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
```

26874 BYTES FREE