fig-FORTH

ASSEMBLY SOURCE CODE LISTING

IBM® PC

VERSION 1.0

MARCH 1984

This implementation supports only one 64k segment

The listing has been made possible by the
prior work of:
Thomas Newman, Hayward, Ca.

: other_acknowledgements
John_Cassidy
Kim_Harris
George_Flammer
Robert_D._Villwock ;

To upgrade, modify, and understand Fig Forth, the value of the following book cannot be overstated:
Systems Guide to FIG Forth
C. H. Ting, PhD
It is available through MVP. See any recent issue of FORTH Dimensions for their ad.

No one who programs with FORTH can afford to be without:
Starting Forth
Leo Brodie
Get it. Available through FORTH Interest Group.
Can also be found in many book stores.
Chapter 3 serves as a guide for the EDITOR that you will probably type in from the FIG-Forth installation manual.

Although there is much to be said for typing in your own listing and getting it running, there is much to be said not typing in your own listing. If you feel that 100+ pages of plinking is nutty, contact me for availability of a disc with source & executable files. Obtainable at a bargain basement price, prepare yourself for bargain basement support.

P.O. Box 8231
San Jose, CA 95155

implemented by: Charlie Krajewski
225 (BIG) Blue Rd.
Middletown, CT 06457

```
                        PAGE
= 0001                  FIGREL  EQU     1       ; FIG RELEASE #
= 0000                  FIGREV  EQU     0       ;FIG REVISION #
= 0000                  USRVER  EQU     0       ; USER VERSION NUMBER
                        ;
                        ;       ASCII CHARACTER EQUIVALENTS
                        ;
= 0020                  ABL     EQU     20H     ; SPACE
= 000D                  ACR     EQU     0DH     ; CR
= 002E                  ADOT    EQU     2EH     ; PERIOD
= 0007                  BELL    EQU     07H     ; ^G
= 0008                  BSIN    EQU     08H     ; INPUT DELETE CHARACTER
= 0008                  BSOUT   EQU     08H     ; OUTPUT BACKSPACE ( ^H )
= 0010                  DLE     EQU     10H     ; ( ^P )  MAKE PRINTER OUTPUT DEVICE
= 000A                  LF      EQU     0AH     ; LINE FEED
= 000C                  FF      EQU     0CH     ; FORM FEED
                        ;
                        ;       MEMORY + I/O CONSTANTS
                        ;
= 0168                  SEC_DSK EQU     360
= 0000                  PRINTER_NO      EQU     0
= 4000                  EM      EQU     04000H  ; END OF MEMORY + 1
= 0002                  NSCR    EQU     2       ; NO. 1024 BYTE SCREENS
= 0200                  KBBUF   EQU     512     ;DATA BYTES PER DISK BUFFER
= 0040                  US      EQU     40H     ; USER VARIABLE SPACE
= 00A0                  RTS     EQU     0A0H    ; RETURN STACK & TERM BUFFER
                        ;
= 0204                  CO      EQU     KBBUF+4         ; DISK BUFFER + 4 BYTES
= 0004                  NBUF    EQU     NSCR*1024/KBBUF ; NO. OF BUFFERS
= 37F0                  BUF1    EQU     EM-CO*NBUF      ; FIRST DISK BUFFER
= 37B0                  INITR0  EQU     BUF1-US         ; ( R0 )
= 3710                  INITS0  EQU     INITR0-RTS      ; ( S0 )
                        ;
```

```
                        PAGE
0000                    CSEG    SEGMENT PARA PUBLIC 'CODE'
                                ASSUME CS:CSEG,DS:CSEG,SS:CSEG,ES:CSEG
0100                            ORG     100H    ; FOR EXE2BIN COMMAND AFTER LINK
                        ;                         SEE PG 10-14 OF DOS 2.0 MANUAL
                        ;                         FOR EXPLANATION OF EXE2BIN
0100                    ORIG    PROC    FAR     ; SEE PG 5-31, MACRO ASSEMBLER
0100  90                        NOP
0101  E9 0FD8 R                JMP     CLD     ;VECTOR TO COLD START
0104  90                        NOP
0105  E9 0FC3 R                JMP     WRM     ; VECTOR TO WARM START
                        ;
0108  01                        DB      FIGREL  ; FIG RELEASE #
0109  00                        DB      FIGREV  ; FIG REVISION #
010A  00                        DB      USRVER  ; USER REVISION #
010B  0E                        DB      0EH     ; VERSION ATTRIBUTES
010C  18E9 R                    DW      TASK-7  ; TOP WORD IN FORTH VOCABULARY
010E  0008                      DW      BSIN    ; BACKSPACE
0110  37B0                      DW      INITR0  ; INIT (UP)
                        ;
                        ;       ((((( following used in COLD start )))))
                        ;       ((((( must be in same order as user variables )))))
                        ;
0112  3710                      DW      INITS0  ; INIT (S0)
0114  37B0                      DW      INITR0  ; INIT (R0)
0116  3710                      DW      INITS0  ; INIT (TIB)
0118  0020                      DW      32      ;       INIT (WIDTH)
011A  0000                      DW      0       ;       INIT (WARNING)
011C  18F4 R                    DW      INITDP  ;       INIT (FENCE)
011E  18F4 R                    DW      INITDP  ;       INIT (DP)
0120  0F3A R                    DW      FORTH+6 ;       INIT (VOC-LINK)
                                ;
                        ;       ((((( end of data used by cold start )))))
                        ;
                        ;       The following is the CPU's name, printed
                        ;       during cold start.
                        ;       The name is 32 bits in base 32.
                        ;
0122  0005 B328                 DW      5H,0B328H       ; '8088'
0126  37B0              UP      DW      INITR0  ; USER AREA POINTER
0128  37B0              RPP     DW      INITR0  ; RETURNS STACK POINTER
```

```
        page
comment
   FORTH REGISTERS
```

FORTH	8088	FORTH PRESERVATION RULES
IP	SI	Interpreter pointer. Must be preserved across FORTH words.
W	DX	Working register. Jump to 'DPUSH' will push contents onto the parameter stack before executing 'APUSH'.
SP	SP	Parameter stack pointer. Must be preserved across FORTH words.
RP	BP	Return stack. Must be preserved across FORTH words.
	AX	General register. Must be preserved across FORTH words.
	BX	General purpose register.
	CX	General purpose register.
	DI	General purpose register.
	CS	Segment register. Must be preserved across FORTH words.
	DS	ditto
	SS	ibid
	ES	Temporary segment register only used by a few words.

```
        page
comment ~
-------------------------------------------------------

  COMMENT CONVENTIONS
  ------- -----------

  =       IS EQUAL TO
  (-      ASSIGNMENT

 NAME        =  Address of name
 (NAME)      =  Contents of name
 ((NAME))    =  Indirect contents

 CFA         =  Address of CODE FIELD
 LFA         =  Address of LINK FIELD
 NFA         =  Address of NAME FIELD
 PFA         =  Address of PARAMETER FIELD

 S1          =  Parameter stack - 1st word
 S2          =  Parameter stack - 2nd word
 R1          =  Return stack    - 1st word
 R2          =  Return stack    - 2nd word

 LSB         =  Least significant bit
 MSB         =  Most  significant bit
 LB          =  Low byte
 HB          =  High byte
 LW          =  Low  word

-------------------------------------------------------- ~
```

```
                                        page
                                COMMENT  ~
                                                DEBUG SUPPORT

                                THIS ROUTINE WILL ALLOW YOU TO STEP THRU FORTH PROGRAMS
                                EVERY TIME 'NEXT' IS EXECUTED.

                                IN ORDER TO USE THE STEP FEATURE YOU MUST DO THE FOLLOWING:

                                        1.  PATCH THE INSTRUCTION IN 'NEXT' WITH A JUMP
                                            TO 'TNEXT'

                                        2.  PATCH YOUR BREAKPOINT ROUTINE AT
                                            LABEL  'BREAK'

                                        3.  SET VARIABLES, `BIP' & `BIPE' TO THE
                                            ADDRESSES YOU WANT TO STEP THRU.

                                THE CONTENTS OF THE 2 VARIABLES 'BIP` AND `BIPE'
                                ARE INTERPRETED AS FOLLOWS:

                                BIP     BIPE    DEBUG-CONDITION
                                ---     ----    ---------------

                                  0       X     OFF
                                 -1       X     TRACE ALL `NEXT' CALLS
                                ADDR1     0     TRACE `ADDR1' ONLY
                                ADDR1   ADDR2   TRACE `ADDR1' TO `ADDR1'

                                NOTE:   THE ABOVE ADDRESSES CAN'T POINT TO A
                                        `CODE FIELD ADDRESS'.
                                        X = DON'T CARE

                                ------------------------------------------------- ~

 012A  0000                     BIP     DW      0       ; BREAKPOINT START ADDRESS
 012C  0000                     BIPE    DW      0       ; BREAKPOINT END ADDR
```

```
                                PAGE
                        ;       THIS IS THE 'NEXT' WITH DEBUG SUPPORT

012E  9C                TNEXT:  PUSHF           ;SAVE REGISTER
012F  50                        PUSH    AX
0130  A1 012A R                 MOV     AX,BIP  ; BREAKPOINT START ADDR
0133  0B C0                     OR      AX,AX   ; ZERO?
0135  74 19                     JZ      TNEXT2  ; NO BREAKPOINT
0137  3D FFFF                   CMP     AX,-1
013A  74 11                     JZ      TNEXT1  ; STEP ALL POINTS
013C  3B C6                     CMP     AX,SI   ; IN BREAKPOINT RANGE?
013E  74 0D                     JZ      TNEXT1  ; STEP THIS LOCATION
0140  77 0E                     JA      TNEXT2  ; NO
0142  A1 012C R                 MOV     AX,BIPE ; BREAKPOINT END ADDR
0145  0B C0                     OR      AX,AX   ; ZERO?
0147  74 07                     JZ      TNEXT2  ; ONLY 1 LOCATION
0149  3B C6                     CMP     AX,SI   ; IN RANGE STILL?
014B  72 03                     JB      TNEXT2  ; NO

                        ;       PAUSE ON ADDRESS
                        ;
014D  9D                TNEXT1: POPF
                        ;
                        ;******** ADD YOUR BREAKPOINT HERE **********
                        ;
014E  EB 02             BREAK:  JMP     SHORT   TNEXT3  ;CONT WITH PROGRAM
                        ;
                        ;       NO BREAKPOINT PAUSE - RESTORE REGISTERS
                        ;
0150  58                TNEXT2: POP     AX
0151  9D                        POPF
0152  AD                TNEXT3: LODSW           ; AX (- (IP)
0153  8B D8                     MOV     BX,AX
0155  EB 05                     JMP     SHORT   NEXT1
```

```
                                PAGE
0157  52                DPUSH:  PUSH    DX
0158  50                APUSH:  PUSH    AX
                        COMMENT *

                                Patch the next 3 locations
                        ( using a DBUG monitor )
                        with a 'JMP TNEXT' for tracing through
                        high level FORTH words.
                        *
0159  AD                NEXT:   LODSW           ;AX (- (IP)
015A  8B D8                     MOV     BX,AX
                        ;
                        ;
015C  8B D3             NEXT1:  MOV     DX,BX   ; (W) (- (IP)
015E  42                        INC     DX      ; (W) (- (W) + 1
015F  FF 27                     JMP     WORD PTR [BX]   ; TO 'CFA'
```

```
                                        PAGE
0161  83                        DP0     DB      83H
0162  4C 49                            DB      'LI'
0164  D4                              DB      'T'+80H
0165  0000                            DW      0         ; START OF DICTIONARY
0167  0169 R                     LIT     DW      $+2       ; (S1) (- ((IP))
0169  AD                              LODSW             ; AX (- LITERAL
016A  EB EC                            JMP     APUSH     ; TO TOP OF STACK

                                ;       EXECUTE
                                ;
016C  87                               DB      87H
016D  45 58 45 43 55 54                DB      'EXECUT'
0173  C5                               DB      'E'+80H
0174  0161 R                          DW      LIT-6
0176  0178 R                     EXEC    DW      $+2
0178  5B                              POP     BX        ; GET CFA
0179  EB E1                            JMP     NEXT1     ; EXECUTE NEXT
                                ;
                                ;       BRANCH
                                ;
017B  86                               DB      86H       ; BRANCH
017C  42 52 41 4E 43                   DB      'BRANC'
0181  C8                               DB      'H'+80H
0182  016C R                          DW      EXEC-0AH
0184  0186 R                     BRAN    DW      $+2
0186  03 34                     BRAN1:  ADD     SI,[SI]
0188  EB CF                            JMP     NEXT      ; JUMP TO OFFSET
                                ;
                                ;       0BRANCH
                                ;
018A  87                               DB      87H
018B  30 42 52 41 4E 43                DB      '0BRANC'
0191  C8                               DB      'H'+80H
0192  017B R                          DW      BRAN-9
0194  0196 R                     ZBRAN   DW      $+2
0196  58                              POP     AX        ; GET STACK VALUE
0197  0B C0                           OR      AX,AX     ; ZERO?
0199  74 EB                           JZ      BRAN1     ; YES, BRANCH
019B  46                               INC     SI        ; NO - CONTINUE...
019C  46                               INC     SI
019D  EB BA                            JMP     NEXT
                                ;
```

```
                                PAGE
                        ;
                        ;       (LOOP)
019F  86                        DB      86H
01A0  28 4C 4F 4F 50            DB      '(LOOP'
01A5  A9                        DB      ')'+80H
01A6  018A R                    DW      ZBRAN-8AH
01A8  01AA R            XLOOP   DW      $+2
01AA  BB 0001                   MOV     BX,1    ; INCREMENT
01AD  01 5E 00          XLOO1:  ADD     [BP],BX ; INDEX = INDEX + INCR
01B0  8B 46 00                  MOV     AX,[BP] ; GET NEW INDEX
01B3  2B 46 02                  SUB     AX,2[BP]        ; COMPARE WITH LIMIT
01B6  33 C3                     XOR     AX,BX   ; TEST SIGN
01B8  78 CC                     JS      BRAN1   ; KEEP LOOPING
                        ;
                        ;  END OF 'DO' LOOP
01BA  83 C5 04                  ADD     BP,4    ; ADJ RETURN STACK
01BD  46                        INC     SI      ; BYPASS BRANCH OFFSET
01BE  46                        INC     SI
01BF  EB 98                     JMP     NEXT
                        ;       DEBUG STUFF
                        ;
01C1  84                        DB      84H
01C2  4E 4F 4F                  DB      'NOO'
01C5  D0                        DB      'P'+80H
01C6  019F R                    DW      XLOOP-9
01C8  01CC R            NOOP    DW      $+4
01CA  01CC R            NOOP0   DW      $+2
01CC  EB 8B                     JMP     NEXT
01CE  01D0 R            NOOP1   DW      $+2
01D0  EB 87                     JMP     NEXT
01D2  01D4 R            NOOP2   DW      $+2
01D4  EB 83                     JMP     NEXT
                        ;
                        ;       (+LOOP)
                        ;
01D6  87                        DB      87H
01D7  28 2B 4C 4F 4F 50         DB      '(+LOOP'
01DD  A9                        DB      ')'+80H
01DE  01C1 R                    DW      NOOP-7
01E0  01E2 R            XPLOO   DW      $+2
01E2  5B                        POP     BX      ; GET LOOP VALUE
01E3  EB C8                     JMP     XLOO1
                        ;
                        ;       (DO)
                        ;
01E5  84                        DB      84H
01E6  28 44 4F                  DB      '(DO'
01E9  A9                        DB      ')'+80H
01EA  01D6 R                    DW      XPLOO-8AH
01EC  01EE R            XDO     DW      $+2
01EE  5A                        POP     DX      ; INITIAL INDEX VALUE
01EF  58                        POP     AX      ; LIMIT VALUE
01F0  87 EC                     XCHG    BP,SP   ; GET RETURN STACK
01F2  50                        PUSH    AX
01F3  52                        PUSH    DX
01F4  87 EC                     XCHG    BP,SP   ; GET PARAMETER STACK
01F6  E9 0159 R                 JMP     NEXT
```

```
                                PAGE
                        ;
                        ;       I
                        ;
01F9  81                        DB      81H
01FA  C9                        DB      'I'+80H
01FB  01E5 R                    DW      XDO-7
01FD  01FF R            IDO     DW      $+2     ; (SI) (- (RI)
01FF  8B 46 00                  MOV     AX,[BP] ; GET INDEX VALUE
0202  E9 0158 R                 JMP     APUSH   ; TO PARAMETER STACK
                        ;
0205  85                        DB      85H
0206  44 49 47 49               DB      'DIGI'
020A  D4                        DB      'T'+80H
020B  01F9 R                    DW      IDO-4
020D  020F R            DIGIT   DW      $+2
020F  5A                        POP     DX      ;NUMBER BASE
0210  58                        POP     AX      ;ASCII DIGIT
0211  2C 30                     SUB     AL,'0'
0213  72 17                     JB      DIGI2   ;NUMBER ERROR
0215  3C 09                     CMP     AL,9
0217  76 06                     JBE     DIGI1   ;NUMBER = 0 THRU 9
0219  2C 07                     SUB     AL,7
021B  3C 0A                     CMP     AL,10   ;NUMBER 'A' THRU 'Z'?
021D  72 0D                     JB      DIGI2   ;NO
021F  3A C2             DIGI1:  CMP     AL,DL   ; COMPARE NUMBER TO BASE
0221  73 09                     JAE     DIGI2   ;NUMBER ERROR
0223  2B D2                     SUB     DX,DX   ;ZERO
0225  8A D0                     MOV     DL,AL   ;NEW BINARY NUMBER
0227  B0 01                     MOV     AL,1    ;TRUE FLAG
0229  E9 0157 R                 JMP     DPUSH   ;ADD TO STACK
                        ;   NUMBER ERROR
022C  2B C0             DIGI2:  SUB     AX,AX   ;FALSE FLAG
022E  E9 0158 R                 JMP     APUSH
```

```
                                        PAGE
                                ;
0231  86                        ;       DB      86H
0232  28 46 49 4E 44           ;       DB      '(FIND'
0237  A9                        ;       DB      ')'+80H
0238  0205 R                   ;       DW      DIGIT-8
023A  023C R                   PFIND   DW      $+2
023C  8C D8                            MOV     AX,DS
023E  8E C0                            MOV     ES,AX   ;ES = DS
0240  5B                               POP     BX      ;NFA
0241  59                               POP     CX      ;STRING ADDR
                                ;
                                ;  SEARCH LOOP
0242  8B F9                    PFIN1:  MOV     DI,CX   ;GET ADDR
0244  8A 07                            MOV     AL,[BX] ;GET WORD LENGTH
0246  8A D0                            MOV     DL,AL   ;SAVE WORD LENGTH
0248  32 05                            XOR     AL,[DI]
024A  24 3F                            AND     AL,3FH  ;CHECK LENGTHS
024C  75 18                            JNZ     PFIN5   ;LENGTHS DIFFER

                                ;
                                ;   LENGTHS MATCH - CHECK EACH CHARACTER IN NAME
024E  43                       PFIN2:  INC     BX
024F  47                               INC     DI      ; NEXT CHAR OF NAME
0250  8A 07                            MOV     AL,[BX]
0252  32 05                            XOR     AL,[DI] ;COMPARE NAMES
0254  02 C0                            ADD     AL,AL   ;THIS WILL BE TEST BIT 8
0256  75 0E                            JNZ     PFIN5   ;NO MATCH
0258  73 F4                            JNB     PFIN2   ;MATCH SO FAR - LOOP
                                ;
                                ;   FOUND END OF NAME (BIT 8 SET) - A MATCH
025A  83 C3 05                         ADD     BX,5    ; BX = PFA
025D  53                               PUSH    BX      ; (S3) (- PFA
025E  B8 0001                          MOV     AX,1    ;TRUE VALUE
0261  2A F6                            SUB     DH,DH
0263  E9 0157 R                        JMP     DPUSH
                                ;
                                ;   NO NAME MATCH - TRY ANOTHER
                                ;
                                ; GET NEXT LINK FIELD ADDR (LFA)
                                ; ( ZERO = FIRST WORD OF DICTIONARY )
                                ;
0266  43                       PFIN5:  INC     BX      ;NEXT ADDR
0267  72 06                            JB      PFIN6   ;END OF NAME
0269  8A 07                            MOV     AL,[BX] ;GET NEXT CHAR
026B  02 C0                            ADD     AL,AL   ;SET/RESET CARRY
026D  EB F7                            JMP     PFIN5   ;LOOP UNTIL FOUND
                                ;
026F  8B 1F                    PFIN6:  MOV     BX,[BX] ; GET LINK FIELD ADDR
0271  0B DB                            OR      BX,BX   ; START OF DICT ( 0 )
0273  75 CD                            JNZ     PFIN1   ; NO , LOOK MORE
0275  B8 0000                          MOV     AX,0    ; FALSE FLAG
0278  E9 0158 R                        JMP     APUSH   ; DONE ( NO MATCH FOUND )
                                ;
```

```
                                        PAGE
027B  87                                DB      87H
027C  45 4E 43 4C 4F 53                 DB      'ENCLOS'
0282  C5                                DB      'E'+80H
0283  0231 R                            DW      PFIND-9
0285  0287 R                    ENCL    DW      $+2
0287  58                                POP     AX      ;S1 - TERMINATOR CHAR
0288  5B                                POP     BX      ;S2 - TEXT ADDR
0289  53                                PUSH    BX      ;ADDR - BACK TO STACK ( IT RHYMES )
028A  B4 00                             MOV     AH,0    ;ZERO
028C  BA FFFF                           MOV     DX,-1   ;CHAR OFFSET COUNTER
028F  4B                                DEC     BX      ;ADDR -1
                                ;
                                ;   SCAN TO FIRST NON-TERMINATOR CHARACTER
0290  43                        ENCL1:  INC     BX      ;ADDR+1
0291  42                                INC     DX      ;COUNT+1
0292  3A 07                             CMP     AL,[BX]
0294  74 FA                             JZ      ENCL1   ;WAIT FOR NON-TERMINATOR
0296  52                                PUSH    DX      ;OFFSET TO 1ST TEXT CHAR
0297  3A 27                             CMP     AH,[BX] ;NULL CHAR?
0299  75 06                             JNZ     ENCL2   ;NO
                                ;
                                ;  FOUND NULL BEFORE 1ST NON-TERM CHAR
029B  8B C2                             MOV     AX,DX   ;COPY COUNTER
029D  42                                INC     DX      ; +1
029E  E9 0157 R                         JMP     DPUSH
                                ;
                                ;   FOUND FIRST TEXT CHAR - COUNT THE CHARS
02A1  43                        ENCL2:  INC     BX      ; ADDR+1
02A2  42                                INC     DX      ;COUNT+1
02A3  3A 07                             CMP     AL,[BX] ;TERMINATOR CHAR?
02A5  74 09                             JZ      ENCL4   ;YES
02A7  3A 27                             CMP     AH,[BX] ;NULL CHAR?
02A9  75 F6                             JNZ     ENCL2   ;NO, LOOP AGAIN
                                ;
                                ;   FOUND NULL AT END OF TEXT
02AB  8B C2                     ENCL3:  MOV     AX,DX   ;COUNTERS ARE EQUAL
02AD  E9 0157 R                         JMP     DPUSH
                                ;
                                ;   FOUND TERMINATOR CHARACTER
02B0  8B C2                     ENCL4:  MOV     AX,DX
02B2  40                                INC     AX      ;COUNT+1
02B3  E9 0157 R                         JMP     DPUSH
```

```
                                PAGE
                                %OUT    LINE ^500
                        ;       EMIT
02B5  84                        DB      84H
02B7  45 4D 49                  DB      'EMI'
02BA  D4                        DB      'T'+80H
02BB  027B R                    DW      ENCL-0AH
02BD  0552 R            EMIT    DW      DOCOL
02BF  14A7 R                    DW      PEMIT
02C1  05CE R 0688 R             DW      ONE,OUTT
02C5  049E R 03A3 R             DW      PSTOR,SEMIS
                        ;
                        ;       KEY
02C9  83                        DB      83H
02CA  4B 45                     DB      'KE'
02CC  D9                        DB      'Y'+80H
02CD  02B6 R                    DW      EMIT-7
02CF  02D1 R            KEY     DW      $+2
02D1  E9 1493 R                 JMP     PKEY
                        ;
                        ;       ?TERMINAL
02D4  89                        DB      89H
02D5  3F 54 45 52 4D 49         DB      '?TERMINA'
      4E 41
02DD  CC                        DB      'L'+80H
02DE  02C9 R                    DW      KEY-6
02E0  02E2 R            QTERM   DW      $+2
02E2  E9 1485 R                 JMP     PQTER
                        ;
                        ;       CR
02E5  82                        DB      82H
02E6  43                        DB      'C'
02E7  D2                        DB      'R'+80H
02E8  02D4 R                    DW      QTERM-0CH
02EA  02EC R            CR      DW      $+2
02EC  E9 14B0 R                 JMP     PCR
```

```
                                PAGE
                        ;       CMOVE
02EF  85                        DB      85H
02F0  43 4D 4F 56               DB      'CMOV'
02F4  C5                        DB      'E'+80H
02F5  02E5 R                    DW      CR-5
02F7  02F9 R            CMOVE   DW      $+2
02F9  FC                        CLD             ;INC DIRECTION
02FA  8B DE                     MOV     BX,SI   ;SAVE IP
02FC  59                        POP     CX      ;COUNT
02FD  5F                        POP     DI      ;DEST
02FE  5E                        POP     SI      ;SOURCE
02FF  8C D8                     MOV     AX,DS
0301  8E C0                     MOV     ES,AX   ;ES <- DS
0303  F3/ A4                    REP     MOVSB   ;THAT'S THE MOVE
0305  8B F3                     MOV     SI,BX   ;GET BACK IP
0307  E9 0159 R                 JMP     NEXT
                        ;
                        ;       U*
                        ;
030A  82                        DB      82H
030B  55                        DB      'U'
030C  AA                        DB      '*'+80H
030D  02EF R                    DW      CMOVE-8
030F  0311 R            USTAR   DW      $+2
0311  58                        POP     AX
0312  5B                        POP     BX
0313  F7 E3                     MUL     BX      ;UNSIGNED
0315  92                        XCHG    AX,DX   ;AX NOW = MSW
0316  E9 0157 R                 JMP     DPUSH   ;STORE DOUBLE WORD
                        ;
                        ;       U/
                        ;
0319  82                        DB      82H
031A  55                        DB      'U'
031B  AF                        DB      '/'+80H
031C  030A R                    DW      USTAR-5
031E  0320 R            USLAS   DW      $+2
0320  5B                        POP     BX      ;DIVISOR
0321  5A                        POP     DX      ;MSW OF DIVIDEND
0322  58                        POP     AX      ;LSW OF DIVIDEND
0323  3B D3                     CMP     DX,BX   ;DICIDE BY 0?
0325  73 05                     JNB     DZERO   ; ERROR - ZERO DIVIDE
0327  F7 F3                     DIV     BX      ;16 BIT DIVIDE
0329  E9 0157 R                 JMP     DPUSH   ;STORE QUOT/REM
                        ;
                        ;       DIVIDE BY ZERO ERROR - SHOW MAX NUMBERS
032C  B8 FFFF           DZERO:  MOV     AX,-1
032F  8B D0                     MOV     DX,AX
0331  E9 0157 R                 JMP     DPUSH   ;STORE QUOT/REM
```

```
                                PAGE
                        ;       AND
                        ;
0334  83                        DB      83H
0335  41 4E                     DB      'AN'
0337  C4                        DB      'D'+80H
0338  0319 R                    DW      USLAS-5
033A  033C R            ANDD    DW      $+2
033C  58                        POP     AX
033D  5B                        POP     BX
033E  23 C3                     AND     AX,BX
0340  E9 0158 R                 JMP     APUSH
                        ;
                        ;       OR
                        ;
0343  82                        DB      82H
0344  4F                        DB      'O'
0345  D2                        DB      'R'+80H
0346  0334 R                    DW      ANDD-5
0348  034A R            ORR     DW      $+2     ; (S1) (- (S1) OR (S2)
034A  58                        POP     AX
034B  5B                        POP     BX
034C  0B C3                     OR      AX,BX
034E  E9 0158 R                 JMP     APUSH
                        ;
                        ;       XOR
                        ;
0351  83                        DB      83H
0352  58 4F                     DB      'XO'
0354  D2                        DB      'R'+80H
0355  0343 R                    DW      ORR-5
0357  0359 R            XORR    DW      $+2     ; (S1) (- (S1) XOR (S2)
0359  58                        POP     AX
035A  5B                        POP     BX
035B  33 C3                     XOR     AX,BX
035D  E9 0158 R                 JMP     APUSH
```

```
                                PAGE
                        ;       SP@
                        ;
0360  83                        DB      83H
0361  53 50                     DB      'SP'
0363  C0                        DB      '@'+80H
0364  0351 R                   DW      XORR-6
0366  0368 R            SPAT    DW      $+2     ; (S1) (- (SP)
0368  8B C4                     MOV     AX,SP
036A  E9 0158 R                 JMP     APUSH
                        ;
                        ;       SP!
                        ;
036D  83                        DB      83H
036E  53 50                     DB      'SP'
0370  A1                        DB      '!'+80H
0371  0360 R                   DW      SPAT-6
0373  0375 R            SPSTO   DW      $+2
0375  8B 1E 0126 R              MOV     BX,UP   ;USER VAR BASE ADDR
0379  8B 67 06                  MOV     SP,6[BX]        ;RESET PARAM STACK POINTER
037C  E9 0159 R                 JMP     NEXT
                        ;
                        ;       RP@
                        ;
037F  83                        DB      83H
0380  52 50                     DB      'RP'
0382  C0                        DB      '@'+80H
0383  036D R                   DW      SPSTO-6
0385  0387 R            RPAT    DW      $+2     ;(S1) (- (RP)
0387  8B C5                     MOV     AX,BP   ;RETURN STACK ADDR
0389  E9 0158 R                 JMP     APUSH
                        ;
                        ;       RP!
                        ;
038C  83                        DB      83H
038D  52 50                     DB      'RP'
038F  A1                        DB      '!'+80H
0390  037F R                   DW      RPAT-6
0392  0394 R            RPSTO   DW      $+2
0394  8B 1E 0126 R              MOV     BX,UP   ;(AX) (- USR VAR BASE
0398  8B 6F 08                  MOV     BP,8[BX]        ;RESET RETURN STACK PTR
039B  E9 0159 R                 JMP     NEXT
                        ;
```

```
                                PAGE
                        ;       ;S
                        ;
                        ;   END OF SCREEN OR RUN TIME COLON WORDS
                        ;
039E  82                        DB      82H
039F  3B                        DB      ';'
03A0  D3                        DB      'S'+80H
03A1  038C R                    DW      RPSTO-6
03A3  03A5 R            SEMIS   DW      $+2
03A5  8B 76 00                  MOV     SI,[BP] ;(IP) (- (R1)
03A8  45                        INC     BP
03A9  45                        INC     BP      ;ADJUST STACK
03AA  E9 0159 R                 JMP     NEXT
                        ;
                        ;       LEAVE
                        ;
03AD  85                        DB      85H
03AE  4C 45 41 56               DB      'LEAV'
03B2  C5                        DB      'E'+80H
03B3  039E R                    DW      SEMIS-5
03B5  03B7 R            LEAVE   DW      $+2     ;LIMIT (- INDEX
03B7  8B 46 00                  MOV     AX,[BP] ;GET INDEX
03BA  89 46 02                  MOV     2[BP],AX        ;STORE IT AT LIMIT
03BD  E9 0159 R                 JMP     NEXT
```

```
                                PAGE
                        ;
                        ;       )R
                        ;
03C0  82                        DB      82H
03C1  3E                        DB      ')'
03C2  D2                        DB      'R'+80H
03C3  03AD R                    DW      LEAVE-8
03C5  03C7 R            TOR     DW      $+2     ; (R1) (- (S1)
03C7  5B                        POP     BX      ;GET STACK PARAMETER
03C8  4D                        DEC     BP
03C9  4D                        DEC     BP      ;MOVE RETURN STACK DOWN
03CA  89 5E 00                  MOV     [BP],BX ;ADD TO RETURN STACK
03CD  E9 0159 R                 JMP     NEXT
                        ;
                        ;       R)
                        ;
03D0  82                        DB      82H
03D1  52                        DB      'R'
03D2  BE                        DB      ')'+80H
03D3  03C0 R                    DW      TOR-5
03D5  03D7 R            FROMR   DW      $+2     ;(S1) (- (R1)
03D7  8B 46 00                  MOV     AX,[BP] ; GET RETURN STACK VALUE
03DA  45                        INC     BP      ;DELETE FROM STACK
03DB  45                        INC     BP
03DC  E9 0158 R                 JMP     APUSH
                        ;
                        ;       R
                        ;
03DF  81                        DB      81H
03E0  D2                        DB      'R'+80H
03E1  03D0 R                    DW      FROMR-5
03E3  01FF R            RR      DW      IDO+2
```

```
                                PAGE
                        ;       0=
                        ;
03E5  82                        DB      82H
03E6  30                        DB      '0'
03E7  BD                        DB      '='+80H
03E8  03DF R                    DW      RR-4
03EA  03EC R            ZEQU    DW      $+2
03EC  58                        POP     AX
03ED  0B C0                     OR      AX,AX   ;DO TEST
03EF  B8 0001                   MOV     AX,1    ;TRUE
03F2  74 01                     JZ      ZEQU1   ;IT'S 0
03F4  48                        DEC     AX      ;FALSE
03F5  E9 0158 R         ZEQU1:  JMP     APUSH
                        ;
                        ;       0<
                        ;
03F8  82                        DB      82H
03F9  30                        DB      '0'
03FA  BC                        DB      '('+80H
03FB  03E5 R                    DW      ZEQU-5
03FD  03FF R            ZLESS   DW      $+2
03FF  58                        POP     AX
0400  0B C0                     OR      AX,AX   ;SET FLAGS
0402  B8 0001                   MOV     AX,1    ;TRUE
0405  78 01                     JS      ZLESS1
0407  48                        DEC     AX      ;FALSE
0408  E9 0158 R         ZLESS1: JMP     APUSH
                        ;
                        ;       +
                        ;
040B  81                        DB      81H
040C  AB                        DB      '+'+80H
040D  03F8 R                    DW      ZLESS-5
040F  0411 R            PLUS    DW      $+2     ;(S1) (- (S1) + (S2)
0411  58                        POP     AX
0412  5B                        POP     BX
0413  03 C3                     ADD     AX,BX
0415  E9 0158 R                 JMP     APUSH
```

```
                                PAGE
                        ;       D+
                        ;
                        ;  XLW  XHW    YLW  YHW  --)  SLW  SHW
                        ;   S4   S3     S2   S1        S2   S1
                        ;
0418  82                        DB      82H
0419  44                        DB      'D'
041A  AB                        DB      'D'+80H
041B  040B R                    DW      PLUS-4
041D  041F R            DPLUS   DW      $+2
041F  58                        POP     AX      ; YHW
0420  5A                        POP     DX      ; YLW
0421  5B                        POP     BX      ; XHW
0422  59                        POP     CX      ; XLW
0423  03 D1                     ADD     DX,CX   ; SLW
0425  13 C3                     ADC     AX,BX   ; SHW
0427  E9 0157 R                 JMP     DPUSH
                        ;
                        ;       MINUS
                        ;
042A  85                        DB      85H
042B  4D 49 4E 55               DB      'MINU'
042F  D3                        DB      'S'+80H
0430  0418 R                    DW      DPLUS-5
0432  0434 R            MINUS   DW      $+2
0434  58                        POP     AX
0435  F7 D8                     NEG     AX
0437  E9 0158 R                 JMP     APUSH
                        ;
                        ;       DMINUS
                        ;
043A  86                        DB      86H
043B  44 4D 49 4E 55            DB      'DMINU'
0440  D3                        DB      'S'+80H
0441  042A R                    DW      MINUS-8
0443  0445 R            DMINU   DW      $+2
0445  5B                        POP     BX
0446  59                        POP     CX
0447  2B C0                     SUB     AX,AX
0449  8B D0                     MOV     DX,AX
044B  2B D1                     SUB     DX,CX   ; MAKE 2'S COMPLEMENT
044D  1B C3                     SBB     AX,BX   ; HIGH WORD
044F  E9 0157 R                 JMP     DPUSH
```

```
                                PAGE
                        ;
                        ;       OVER
                        ;
0452  84                        DB      84H
0453  4F 56 45                  DB      'OVE'
0456  D2                        DB      'R'+80H
0457  043A R                    DW      DMINU-9
0459  045B R            OVER    DW      $+2
045B  5A                        POP     DX
045C  58                        POP     AX
045D  50                        PUSH    AX
045E  E9 0157 R                 JMP     DPUSH
                        ;
                        ;       DROP
                        ;
0461  84                        DB      84H
0462  44 52 4F                  DB      'DRO'
0465  D0                        DB      'P'+80H
0466  0452 R                    DW      OVER-7
0468  046A R            DROP    DW      $+2
046A  58                        POP     AX
046B  E9 0159 R                 JMP     NEXT
                        ;
                        ;       SWAP
                        ;
046E  84                        DB      84H
046F  53 57 41                  DB      'SWA'
0472  D0                        DB      'P'+80H
0473  0461 R                    DW      DROP-7
0475  0477 R            SWAP    DW      $+2
0477  5A                        POP     DX
0478  58                        POP     AX
0479  E9 0157 R                 JMP     DPUSH
                        ;
                        ;       DUP
                        ;
047C  83                        DB      83H
047D  44 55                     DB      'DU'
047F  D0                        DB      'P'+80H
0480  046E R                    DW      SWAP-7
0482  0484 R            DUPE    DW      $+2
0484  58                        POP     AX
0485  50                        PUSH    AX
0486  E9 0158 R                 JMP     APUSH
```

```
                                PAGE
                        ;       2DUP
                        ;
0489  84                        DB      84H
048A  32 44 55                  DB      '2DU'
048D  D0                        DB      'P'+80H
048E  047C R                    DW      DUPE-6
0490  0492 R           TDUP     DW      $+2
0492  58                        POP     AX
0493  5A                        POP     DX
0494  52                        PUSH    DX
0495  50                        PUSH    AX
0496  E9 0157 R                 JMP     DPUSH
                        ;
                        ;       +!
                        ;
0499  82                        DB      82H
049A  2B                        DB      '+'
049B  A1                        DB      '!'+80H
049C  0489 R                    DW      TDUP-7
049E  04A0 R           PSTOR    DW      $+2
04A0  5B                        POP     BX      ;ADDRESS
04A1  58                        POP     AX      ;INCREMENT
04A2  01 07                     ADD     [BX],AX
04A4  E9 0159 R                 JMP     NEXT
                        ;
                        ;       TOGGLE
                        ;
04A7  86                        DB      86H
04A8  54 4F 47 47 4C            DB      'TOGGL'
04AD  C5                        DB      'E'+80H
04AE  0499 R                    DW      PSTOR-5
04B0  04B2 R           TOGGL    DW      $+2
04B2  58                        POP     AX      ;BIT PATTERN
04B3  5B                        POP     BX      ;ADDR
04B4  30 07                     XOR     [BX],AL ;
04B6  E9 0159 R                 JMP     NEXT
                        ;
                        ;       @
                        ;
04B9  81                        DB      81H
04BA  C0                        DB      '@'+80H
04BB  04A7 R                    DW      TOGGL-9
04BD  04BF R           AT       DW      $+2
04BF  5B                        POP     BX
04C0  8B 07                     MOV     AX,[BX]
04C2  E9 0158 R                 JMP     APUSH
```

```
                                PAGE
                        ;       C@
                        ;
04C5  82                        DB      82H
04C6  43                        DB      'C'
04C7  C0                        DB      '@'+80H
04C8  04B9 R                    DW      AT-4
04CA  04CC R            CAT     DW      $+2
04CC  5B                        POP     BX
04CD  8A 07                     MOV     AL,[BX]
04CF  2A E4                     SUB     AH,AH
04D1  E9 0158 R                 JMP     APUSH
                        ;
                        ;       2@
                        ;
04D4  82                        DB      82H
04D5  32                        DB      '2'
04D6  C0                        DB      '@'+80H
04D7  04C5 R                    DW      CAT-5
04D9  04DB R            TAT     DW      $+2
04DB  5B                        POP     BX      ;ADDR
04DC  8B 07                     MOV     AX,[BX] ;MSW
04DE  8B 57 02                  MOV     DX,2[BX]        ;LSW
04E1  E9 0157 R                 JMP     DPUSH
                        ;
                        ;       !
                        ;
04E4  81                        DB      81H
04E5  A1                        DB      '!'+80H
04E6  04D4 R                    DW      TAT-5
04E8  04EA R            STORE   DW      $+2
04EA  5B                        POP     BX      ;ADDR
04EB  58                        POP     AX      ;DATA
04EC  89 07                     MOV     [BX],AX
04EE  E9 0159 R                 JMP     NEXT
                        ;
                        ;       C!
                        ;
04F1  82                        DB      82H
04F2  43                        DB      'C'
04F3  A1                        DB      '!'+80H
04F4  04E4 R                    DW      STORE-4
04F6  04F8 R            CSTOR   DW      $+2
04F8  5B                        POP     BX      ;ADDR
04F9  58                        POP     AX      ;DATA
04FA  88 07                     MOV     [BX],AL
04FC  E9 0159 R                 JMP     NEXT
                        ;
                        ;       2!
                        ;
04FF  82                        DB      82H
0500  32                        DB      '2'
0501  A1                        DB      '!'+80H
0502  04F1 R                    DW      CSTOR-5
0504  0506 R            TSTOR   DW      $+2
0506  5B                        POP     BX      ;ADDR
0507  58                        POP     AX      ;MSW
0508  89 07                     MOV     [BX],AX
050A  58                        POP     AX      ;LSW
050B  89 47 02                  MOV     2[BX],AX
050E  E9 0159 R                 JMP     NEXT
```

```
                                ;
                                ;       L@
                                ;
0511  82                                DB      82H     ;( SEG# IP -- N )
0512  4C                                DB      'L'
0513  C0                                DB      '@'+80H
0514  04FF R                            DW      TSTOR-5
0516  0518 R                    LAT     DW      $+2
0518  5B                                POP     BX      ;MEM LOC
0519  59                                POP     CX      ;SEG REG VAL
051A  8C DA                             MOV     DX,DS
051C  8E D9                             MOV     DS,CX
051E  8B 07                             MOV     AX,[BX]
0520  8E DA                             MOV     DS,DX
0522  E9 0158 R                         JMP     APUSH
                                ;
                                ;       L!
                                ;
0525  82                                DB      82H     ;( N SEG# IP -- )
0526  4C                                DB      'L'
0527  A1                                DB      '!'+80H
0528  0511 R                            DW      LAT-5
052A  052C R                    LSTORE  DW      $+2
052C  5B                                POP     BX
052D  59                                POP     CX
052E  8C DA                             MOV     DX,DS
0530  8E D9                             MOV     DS,CX
0532  58                                POP     AX
0533  89 07                             MOV     [BX],AX
0535  8E DA                             MOV     DS,DX
0537  E9 0159 R                         JMP     NEXT
```

```
                                PAGE
                                %OUT    LINE ~1000
                        ;
                        ;       :
                        ;
053A  C1                        DB      0C1H
053B  BA                        DB      ':'+80H
053C  0525 R                    DW      LSTORE-5
053E  0552 R            COLON   DW      DOCOL
0540  08F2 R                    DW      QEXEC
0542  08AD R                    DW      SCSP
0544  06EB R                    DW      CURR
0546  04BD R                    DW      AT
0548  06DD R                    DW      CONT
054A  04E8 R                    DW      STORE
054C  0DC1 R                    DW      CREAT
054E  0977 R                    DW      RBRAC
0550  09CA R                    DW      PSCOD
0552  42                DOCOL:  INC     DX      ;W=W+1
0553  4D                        DEC     BP
0554  4D                        DEC     BP      ;(RP) (- (RP)-2
0555  89 76 00                  MOV     [BP],SI ;R1 (- (RP)
0558  8B F2                     MOV     SI,DX   ;(IP) (- (W)
055A  E9 0159 R                 JMP     NEXT
                        ;
                        ;       ;
                        ;
055D  C1                        DB      0C1H
055E  BB                        DB      ';'+80H
055F  053A R                    DW      COLON-4
0561  0552 R            SEMI    DW      DOCOL
0563  091C R                    DW      QCSP
0565  0953 R                    DW      COMP
0567  03A3 R                    DW      SEMIS
0569  098C R                    DW      SMUDG
056B  0969 R                    DW      LBRAC
056D  03A3 R                    DW      SEMIS
```

```
                                PAGE
                        ;       CONSTANT
                        ;
056F  88                        DB      88H
0570  43 4F 4E 53 54 41         DB      'CONSTAN'
      4E
0577  D4                        DB      'T'+80H
0578  055D R                    DW      SEMI-4
057A  05E2 R            CON     DW      DOCOL
057C  0DC1 R                    DW      CREAT
057E  038C R                    DW      SMUDG
0580  0774 R                    DW      COMMA
0582  09CA R                    DW      PSCOD
0584  42                DOCON:  INC     DX      ;PFA
0585  8B DA                     MOV     BX,DX
0587  8B 07                     MOV     AX,[BX] ;GET DATA
0589  E9 0158 R                 JMP     APUSH
                        ;
                        ;       VARIABLE
                        ;
058C  88                        DB      88H
058D  56 41 52 49 41 42         DB      'VARIABL'
      4C
0594  C5                        DB      'E'+80H
0595  056F R                    DW      CON-0BH
0597  0552 R            VAR     DW      DOCOL
0599  057A R                    DW      CON
059B  09CA R                    DW      PSCOD
059D  42                DOVAR:  INC     DX      ;(DE) (- PFA
059E  52                        PUSH    DX
059F  E9 0159 R                 JMP     NEXT
                        ;
                        ;       USER
                        ;
05A2  84                        DB      84H
05A3  55 53 45                  DB      'USE'
05A6  D2                        DB      'R'+80H
05A7  058C R                    DW      VAR-0BH
05A9  0552 R            USER    DW      DOCOL
05AB  057A R                    DW      CON
05AD  09CA R                    DW      PSCOD
05AF  42                DOUSE:  INC     DX      ;PFA
05B0  8B DA                     MOV     BX,DX
05B2  8A 1F                     MOV     BL,[BX]
05B4  2A FF                     SUB     BH,BH
05B6  8B 3E 0126 R              MOV     DI,UP   ;USER VAR ADDRESS
05BA  8D 01                     LEA     AX,[BX+DI]      ;ADDR OF VARIABLE
05BC  E9 0158 R                 JMP     APUSH
```

```
                                        PAGE
                                ;       0
05BF  81                                DB      81H
05C0  B0                                DB      '0'+80H
05C1  05A2 R                            DW      USER-7
05C3  05C5 R                    ZERO    DW      $+2
05C5  33 C0                             XOR     AX,AX
05C7  E9 0158 R                         JMP     APUSH
                                ;
                                ;       1
                                ;
05CA  81                                DB      81H
05CB  B1                                DB      '1'+80H
05CC  05BF R                            DW      ZERO-4
05CE  05D0 R                    ONE     DW      $+2
05D0  B8 0001                           MOV     AX,1
05D3  E9 0158 R                         JMP     APUSH
                                ;
                                ;       2
                                ;
05D6  81                                DB      81H
05D7  B2                                DB      '2'+80H
05D8  05CA R                            DW      ONE-4
05DA  05DC R                    TWO     DW      $+2
05DC  B8 0002                           MOV     AX,2
05DF  E9 0158 R                         JMP     APUSH
                                ;
                                ;       3
                                ;
05E2  81                                DB      81H
05E3  B3                                DB      '3'+80H
05E4  05D6 R                            DW      TWO-4
05E6  05E8 R                    THREE   DW      $+2
05E8  B8 0003                           MOV     AX,3
05EB  E9 0158 R                         JMP     APUSH
                                ;
                                ;       BL
                                ;
                                ;       THIS IS ONLY A SPAC
05EE  82                                DB      82H
05EF  42                                DB      'B'
05F0  CC                                DB      'L'+80H
05F1  05E2 R                            DW      THREE-4
05F3  0584 R                    BLS     DW      DOCON
05F5  0020                              DW      20H
                                ;
                                ;       C/L
                                ;
05F7  83                                DB      83H     ;CHARACTERS/LINE
05F8  43 2F                             DB      'C/'
05FA  CC                                DB      'L'+80H
05FB  05EE R                            DW      BLS-5
05FD  0584 R                    CSLL    DW      DOCON
05FF  0040                              DW      64
                                ;
                                ;       FIRST
                                ;
0601  85                                DB      85H
0602  46 49 52 53                        DB      'FIRS'
0606  D4                                DB      'T'+80H
0607  05F7 R                            DW      CSLL-5
```

```
0609  0584 R                FIRST   DW      DOCON
060B  37F0                          DW      BUF1
                            ;
                            ;       LIMIT
                            ;
060D  85                            DB      85H
060E  4C 49 4D 49                   DB      'LIMI'
0612  D4                            DB      'T'+80H
0613  0601 R                        DW      FIRST-8
0615  0584 R                LIMIT   DW      DOCON
0617  4000                          DW      EM
                            ;
                            ;       B/BUF
                            ;
0619  85                            DB      85H     ;BYTES/BUFFER
061A  42 2F 42 55                   DB      'B/BU'
061E  C6                            DB      'F'+80H
061F  060D R                        DW      LIMIT-8
0621  0584 R                BBUF    DW      DOCON
0623  0200                          DW      KBBUF
                            ;
                            ;       B/SCR
                            ;
0625  85                            DB      85H     ;BUFFERS/SCREEN
0626  42 2F 53 43                   DB      'B/SC'
062A  D2                            DB      'R'+80H
062B  0619 R                        DW      BBUF-8
062D  0584 R                BSCR    DW      DOCON
062F  0002                          DW      400H/KBBUF
                            ;
                            ;       +ORIGIN
                            ;
0631  87                            DB      87H
0632  2B 4F 52 49 47 49             DB      '+ORIGI'
0638  CE                            DB      'N'+80H
0639  0625 R                        DW      BSCR-8
063B  0552 R                PORIG   DW      DOCOL
063D  0167 R                        DW      LIT
063F  0100 R                        DW      ORIG
0641  040F R                        DW      PLUS
0643  03A3 R                        DW      SEMIS
```

```
                                page
                        ;
                        ;       S0
                        ;
0645  82                        DB      82H
0646  53                        DB      'S'
0647  B0                        DB      '0'+80H
0648  0631 R                    DW      PORIG-0AH
064A  05AF R            SZERO   DW      DOUSE
064C  0006                      DW      6
                        ;
                        ;       R0
                        ;
064E  82                        DB      82H
064F  52                        DB      'R'
0650  B0                        DB      '0'+80H
0651  0645 R                    DW      SZERO-5
0653  05AF R            RZERO   DW      DOUSE
0655  0008                      DW      8
                        ;
                        ;       TIB
                        ;
0657  83                        DB      83H
0658  54 49                    DB      'TI'
065A  C2                        DB      'B'+80H
065B  064E R                    DW      RZERO-5
065D  05AF R            TIB     DW      DOUSE
065F  000A                      DW      0AH
                        ;
                        ;       WIDTH
                        ;
0661  85                        DB      85H
0662  57 49 44 54               DB      'WIDT'
0666  C8                        DB      'H'+80H
0667  0657 R                    DW      TIB-6
0669  05AF R            WIDTHE  DW      DOUSE
066B  000C                      DW      0CH
                        ;
                        ;       WARNING
                        ;
066D  87                        DB      87H
066E  57 41 52 4E 49 4E         DB      'WARNIN'
0674  C7                        DB      'G'+80H
0675  0661 R                    DW      WIDTHE-6
0677  05AF R            WARN    DW      DOUSE
0679  000E                      DW      0EH
                        ;
                        ;       FENCE
                        ;
067B  85                        DB      85H
067C  46 45 4E 43               DB      'FENC'
0680  C5                        DB      'E'+80H
0681  066D R                    DW      WARN-0AH
0683  05AF R            FENCE   DW      DOUSE
0685  0010                      DW      10H
                        ;
                        ;       DP
                        ;
0687  82                        DB      82H
0688  44                        DB      'D'
0689  D0                        DB      'P'+80H
```

```
068A  067B R                          DW      FENCE-8
068C  05AF R                  DP      DW      DOUSE
068E  0012                            DW      12H
                              ;
                              ;       VOC-LINK
                              ;
0690  88                              DB      88H
0691  56 4F 43 2D 4C 49               DB      'VOC-LIN'
      4E
0698  CB                              DB      'K'+80H
0699  0687 R                          DW      DP-5
069B  05AF R                  VOCL    DW      DOUSE
069D  0014                            DW      14H
                              ;
                              ;       BLK
                              ;
069F  83                              DB      83H
06A0  42 4C                           DB      'BL'
06A2  CB                              DB      'K'+80H
06A3  0690 R                          DW      VOCL-05H
06A5  05AF R                  BLK     DW      DOUSE
06A7  0016                            DW      16H
```

```
                                        PAGE
                                ;
                                ;       IN
                                ;
06A9  82                                DB      82H
06AA  49                                DB      'I'
06AB  CE                                DB      'N'+80H
06AC  069F R                            DW      BLK-6
06AE  05AF R                    INN     DW      DOUSE
06B0  0018                              DW      18H
                                ;
                                ;       OUT
                                ;
06B2  83                                DB      83H
06B3  4F 55                             DB      'OU'
06B5  D4                                DB      'T'+80H
06B6  06A9 R                            DW      INN-5
06B8  05AF R                    OUTT    DW      DOUSE
06BA  001A                              DW      1AH
                                ;
                                ;       SCR
                                ;
06BC  83                                DB      83H
06BD  53 43                             DB      'SC'
06BF  D2                                DB      'R'+80H
06C0  06B2 R                            DW      OUTT-6
06C2  05AF R                    SCR     DW      DOUSE
06C4  001C                              DW      1CH
                                ;
                                ;       OFFSET
                                ;
06C6  86                                DB      86H
06C7  4F 46 46 53 45                    DB      'OFFSE'
06CC  D4                                DB      'T'+80H
06CD  06BC R                            DW      SCR-6
06CF  05AF R                    OFSET   DW      DOUSE
06D1  0000                              DW      0
                                ;
                                ;       CONTENT
                                ;
06D3  87                                DB      87H
06D4  43 4F 4E 54 45 58                 DB      'CONTEX'
06DA  D4                                DB      'T'+80H
06DB  06C6 R                            DW      OFSET-9
06DD  05AF R                    CONT    DW      DOUSE
06DF  0020                              DW      20H
                                ;
                                ;       CURRENT
                                ;
06E1  87                                DB      87H
06E2  43 55 52 52 45 4E                 DB      'CURREN'
06E8  D4                                DB      'T'+80H
06E9  06D3 R                            DW      CONT-0AH
06EB  05AF R                    CURR    DW      DOUSE
06ED  0022                              DW      22H
                                ;
                                ;       STATE
                                ;
06EF  85                                DB      85H
06F0  53 54 41 54                       DB      'STAT'
06F4  C5                                DB      'E'+80H
```

```
06F5  06E1 R                        DW      CURR-0AH
06F7  05AF R                STATE   DW      DOUSE
06F9  0024                          DW      24H
                            ;
                            ;       BASE
                            ;
06FB  84                            DB      84H
06FC  42 41 53                      DB      'BAS'
06FF  C5                            DB      'E'+80H
0700  06EF R                        DW      STATE-8
0702  05AF R                BASE    DW      DOUSE
0704  0026                          DW      26H
                            ;
                            ;       DPL
                            ;
0706  83                            DB      83H
0707  44 50                      DB      'DP'
0709  CC                            DB      'L'+80H
070A  06FB R                        DW      BASE-7
070C  05AF R                DPL     DW      DOUSE
070E  0028                          DW      28H
                            ;
                            ;       FLD
                            ;
0710  83                            DB      83H
0711  46 4C                      DB      'FL'
0713  C4                            DB      'D'+80H
0714  0706 R                        DW      DPL-6
0716  05AF R                FLD     DW      DOUSE
0718  002A                          DW      2AH
                            ;
                            ;       CSP
                            ;
071A  83                            DB      83H
071B  43 53                      DB      'CS'
071D  D0                            DB      'P'+80H
071E  0710 R                        DW      FLD-6
0720  05AF R                CSPP    DW      DOUSE
0722  002C                          DW      2CH
                            ;
                            ;       R#
                            ;
0724  82                            DB      82H
0725  52                      DB      'R'
0726  A3                            DB      '#'+80H
0727  071A R                        DW      CSPP-6
0729  05AF R                RNUM    DW      DOUSE
072B  002E                          DW      2EH
                            ;
                            ;       HLD
                            ;
072D  83                            DB      83H
072E  48 4C                      DB      'HL'
0730  C4                            DB      'D'+80H
0731  0724 R                        DW      RNUM-5
0733  05AF R                HLD     DW      DOUSE
0735  0030                          DW      30H
                            ;
                            ;========== END USER VARIABLES ==========;
```

```
                                        PAGE
                                ;
                                ;       1+
                                ;
0737  82                                DB      82H
0738  31                                DB      '1'
0739  AB                                DB      '+'+80H
073A  072D R                            DW      HLD-6
073C  073E R                    ONEP    DW      $+2
073E  58                                POP     AX
073F  40                                INC     AX
0740  E9 0158 R                         JMP     APUSH
                                ;
                                ;       2+
                                ;
0743  82                                DB      82H
0744  32                                DB      '2'
0745  AB                                DB      '+'+80H
0746  0737 R                            DW      ONEP-5
0748  074A R                    TWOP    DW      $+2
074A  58                                POP     AX
074B  05 0002                           ADD     AX,2
074E  E9 0158 R                         JMP     APUSH
                                ;
                                ;       HERE
                                ;
0751  84                                DB      84H
0752  48 45 52                          DB      'HER'
0755  C5                                DB      'E'+80H
0756  0743 R                            DW      TWOP-5
0758  0552 R                    HERE    DW      DOCOL
075A  068C R                            DW      DP
075C  04BD R                            DW      AT
075E  03A3 R                            DW      SEMIS
                                ;
                                ;       ALLOT
                                ;
0760  85                                DB      85H
0761  41 4C 4C 4F                       DB      'ALLO'
0765  D4                                DB      'T'+80H
0766  0751 R                            DW      HERE-7
0768  0552 R                    ALLOT   DW      DOCOL
076A  068C R                            DW      DP
076C  049E R                            DW      PSTOR
076E  03A3 R                            DW      SEMIS
                                ;
                                ;       ,
                                ;
0770  81                                DB      81H
0771  AC                                DB      ','+80H
0772  0760 R                            DW      ALLOT-8
0774  0552 R                    COMMA   DW      DOCOL
0776  0758 R                            DW      HERE
0778  04EB R                            DW      STORE
077A  05DA R                            DW      TWO
077C  0768 R                            DW      ALLOT
077E  03A3 R                            DW      SEMIS
                                ;
                                ;       C,
                                ;
0780  82                                DB      82H
```

```
0781  43                              DB      'C'
0782  AC                              DB      ',+80H
0783  0770 R                          DW      COMMA-4
0785  0552 R                  CCOMM   DW      DOCOL
0787  0758 R                          DW      HERE
0789  04F6 R                          DW      CSTOR
078B  05CE R                          DW      ONE
078D  0768 R                          DW      ALLOT
078F  03A3 R                          DW      SEMIS
                              ;
                              ;       -
                              ;
0791  81                              DB      81H
0792  AD                              DB      '-'+80H
0793  0780 R                          DW      CCOMM-5
0795  0797 R                  SUBB    DW      $+2
0797  5A                              POP     DX      ;S1
0798  58                              POP     AX
0799  2B C2                          SUB     AX,DX
079B  E9 0158 R                       JMP     APUSH   ;S1 = S2 - S1
                              ;
                              ;       =
                              ;
079E  81                              DB      81H
079F  BD                              DB      '='+80H
07A0  0791 R                          DW      SUBB-4
07A2  0552 R                  EQUAL   DW      DOCOL
07A4  0795 R                          DW      SUBB
07A6  03EA R                          DW      ZEQU
07A8  03A3 R                          DW      SEMIS
                              ;
                              ;       (
                              ;
07AA  81                              DB      81H
07AB  BC                              DB      '('+80H
07AC  079E R                          DW      EQUAL-4
07AE  07B0 R                  LESS    DW      $+2
07B0  5A                              POP     DX      ;S1
07B1  58                              POP     AX      ;S2
07B2  8B DA                           MOV     BX,DX
07B4  33 D8                           XOR     BX,AX   ;TEST FOR EQUAL SIGNS
07B6  78 02                           JS      LES1    ;SIGNS ARE NOT THE SAME
07B8  2B C2                           SUB     AX,DX
07BA  0B C0                   LES1:   OR      AX,AX   ;TEST SIGN BIT
07BC  B8 0000                         MOV     AX,0    ;ASSUME FALSE
07BF  79 01                           JNS     LES2    ;NOT LESS THAN
07C1  40                              INC     AX      ;TRUE (1)
07C2  E9 0158 R               LES2:   JMP     APUSH
                              ;
                              ;       U(
                              ;
07C5  82                              DB      82H
07C6  55                              DB      'U'
07C7  BC                              DB      '('+80H
07C8  07AA R                          DW      LESS-4
07CA  0552 R 0490 R           ULESS   DW      DOCOL,TDUP
07CE  0357 R 03FD R                   DW      XDRR,ZLESS
07D2  0194 R                          DW      ZBRAN
07D4  000C                            DW      OFFSET ULES1-$  ;IF
07D6  0468 R 03FD R                   DW      DROP,ZLESS
07DA  03EA R                          DW      ZEQU
```

```
07DC  0184 R                        DW      BRAN
07DE  0006                          DW      OFFSET ULES2-$
07E0  0795 R 03FD R           ULES1 DW      SUBB,ZLESS      ;ELSE
07E4  03A3 R                  ULES2 DW      SEMIS           ;ENDIF
                                    ;
                                    ;     }
07E5  81                            DB      81H
07E7  BE                            DB      ')'+80H
07E8  07C5 R                        DW      ULESS-5
07EA  0552 R                  GREAT DW      DOCOL
07EC  0475 R                        DW      SWAP
07EE  07AE R                        DW      LESS
07F0  03A3 R                        DW      SEMIS
                                    ;
                                    ;     ROT
                                    ;
07F2  83                            DB      83H
07F3  52 4F                         DB      'RO'
07F5  D4                            DB      'T'+80H
07F6  07E6 R                        DW      GREAT-4
07F8  07FA R                  ROT   DW      $+2
07FA  5A                            POP     DX      ;S1
07FB  5B                            POP     BX      ;S2
07FC  58                            POP     AX      ;S3
07FD  53                            PUSH    BX
07FE  E9 0157 R                     JMP     DPUSH
                                    ;
                                    ;     SPACE
                                    ;
0801  85                            DB      85H
0802  53 50 41 43                   DB      'SPAC'
0806  C5                            DB      'E'+80H
0807  07F2 R                        DW      ROT-6
0809  0552 R                  SPACE DW      DOCOL
080B  05F3 R                        DW      BLS
080D  02BD R                        DW      EMIT
080F  03A3 R                        DW      SEMIS
                                    ;
                                    ;     -DUP
                                    ;
0811  84                            DB      84H
0812  2D 44 55                      DB      '-DU'
0815  D0                            DB      'P'+80H
0816  0801 R                        DW      SPACE-6
0818  0552 R                  DDUP  DW      DOCOL
081A  0482 R                        DW      DUPE
081C  0194 R                        DW      ZBRAN   ; IF
081E  0004                          DW      OFFSET DDUP1-$
0820  0482 R                        DW      DUPE    ;ENDIF
0822  03A3 R                  DDUP1 DW      SEMIS
                                    ;
                                    ;     TRANVERSE
                                    ;
0824  88                            DB      88H
0825  54 52 41 56 45 52            DB      'TRAVERS'
      53
082C  C5                            DB      'E'+80H
082D  0811 R                        DW      DDUP-7
082F  0552 R                  TRAV  DW      DOCOL
0831  0475 R                        DW      SWAP
0833  0459 R                  TRAV1 DW      OVER    ;BEGIN
```

```
0835  040F R                        DW      PLUS
0837  0167 R 007F                   DW      LIT,7FH
083B  0459 R                        DW      OVER
083D  04CA R                        DW      CAT
083F  07AE R                        DW      LESS
0841  0194 R                        DW      ZBRAN   :UNTIL
0843  FFF0                         DW      OFFSET TRAV1-$
0845  0475 R                        DW      SWAP
0847  0468 R                        DW      DROP
0849  03A3 R                        DW      SEMIS
                                ;
                                ;       LATEST
                                ;
084B  86                            DB      86H
084C  4C 41 54 45 53                DB      'LATES'
0851  D4                            DB      'T'+80H
0852  0824 R                        DW      TRAV-0BH
0854  0552 R                LATES   DW      DOCOL
0856  06EB R                        DW      CURR
0858  04BD R                        DW      AT
085A  04BD R                        DW      AT
085C  03A3 R                        DW      SEMIS
                                ;
                                ;       LFA
                                ;
085E  83                            DB      83H
085F  4C 46                         DB      'LF'
0861  C1                            DB      'A'+80H
0862  084B R                        DW      LATES-9
0864  0552 R                LFA     DW      DOCOL
0866  0167 R 0004                   DW      LIT,4
086A  0795 R                        DW      SUBB
086C  03A3 R                        DW      SEMIS
                                ;       CFA
                                ;
086E  83                            DB      83H
086F  43 46                         DB      'CF'
0871  C1                            DB      'A'+80H
0872  085E R                        DW      LFA-6
0874  0552 R                CFA     DW      DOCOL
0876  05DA R                        DW      TWO
0878  0795 R                        DW      SUBB
087A  03A3 R                        DW      SEMIS
                                ;
                                ;       NFA
                                ;
087C  83                            DB      83H
087D  4E 46                         DB      'NF'
087F  C1                            DB      'A'+80H
0880  086E R                        DW      CFA-6
0882  0552 R                NFA     DW      DOCOL
0884  0167 R 0005                   DW      LIT,5
0888  0795 R                        DW      SUBB
088A  0167 R FFFF                   DW      LIT,0FFFFH
088E  082F R                        DW      TRAV
0890  03A3 R                        DW      SEMIS
                                ;
                                ;       PFA
                                ;
0892  83                            DB      83H
0893  50 46                         DB      'PF'
```

```
0895  C1                              DB      'A'+80H
0896  087C R                          DW      NFA-6
0898  0552 R                  PFA     DW      DOCOL
089A  05CE R                          DW      ONE
089C  082F R                          DW      TRAV
089E  0167 R 0005                     DW      LIT,5
08A2  040F R                          DW      PLUS
08A4  03A3 R                          DW      SEMIS
```

```
                                        PAGE
                                        %OUT    LINE *1500
                                ;       !CSP
                                ;
08A6  84                                DB      84H
08A7  21 43 53                          DB      '!CS'
08AA  D0                                DB      'P'+80H
08AB  0892 R                            DW      PFA-6
08AD  0552 R                    SCSP    DW      DOCOL
08AF  0366 R                            DW      SPAT
08B1  0720 R                            DW      CSPP
08B3  04E8 R                            DW      STORE
08B5  03A3 R                            DW      SEMIS
                                ;
                                ;       ?ERROR
                                ;
08B7  86                                DB      86H
08B8  3F 45 52 52 4F                    DB      '?ERRO'
08BD  D2                                DB      'R'+80H
08BE  08A6 R                            DW      SCSP-7
08C0  0552 R                    QERR    DW      DOCOL
08C2  0475 R                            DW      SWAP
08C4  0194 R                            DW      ZBRAN   ;IF
08C6  0008                              DW      OFFSET QERR1-$
08C8  0D55 R                            DW      ERROR
08CA  0184 R                            DW      BRAN    ;ELSE
08CC  0004                              DW      OFFSET QERR2-$
08CE  0468 R                    QERR1   DW      DROP    ;ENDIF
08D0  03A3 R                    QERR2   DW      SEMIS
                                ;
                                ;       ?COMP
                                ;
08D2  85                                DB      85H
08D3  3F 43 4F 4D                       DB      '?COM'
08D7  D0                                DB      'P'+80H
08D8  08B7 R                            DW      QERR-9
08DA  0552 R                    QCOMP   DW      DOCOL
08DC  06F7 R                            DW      STATE
08DE  04BD R                            DW      AT
08E0  03EA R                            DW      ZEQU
08E2  0167 R 0011                       DW      LIT,11H
08E5  08C0 R                            DW      QERR
08E8  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       ?EXEC
                                ;
08EA  85                                DB      85H
08EB  3F 45 58 45                       DB      '?EXE'
08EF  C3                                DB      'C'+80H
08F0  08D2 R                            DW      QCOMP-8
08F2  0552 R                    QEXEC   DW      DOCOL
08F4  06F7 R                            DW      STATE
08F6  04BD R                            DW      AT
08F8  0167 R 0012                       DW      LIT,12H
08FC  08C0 R                            DW      QERR
08FE  03A3 R                            DW      SEMIS
                                ;
                                ;       ?PAIRS
                                ;
0900  86                                DB      86H
0901  3F 50 41 49 52                    DB      '?PAIR'
0906  D3                                DB      'S'+80H
0907  08EA R                            DW      QEXEC-8
0909  0552 R                    QPAIR   DW      DOCOL
090B  0795 R                            DW      SUBB
090D  0167 R 0013                       DW      LIT,13H
0911  08C0 R                            DW      QERR
0913  03A3 R                            DW      SEMIS
                                ;
                                ;       ?CSP
                                ;
0915  84                                DB      84H
0916  3F 43 53                          DB      '?CS'
0919  D0                                DB      'P'+80H
091A  0900 R                            DW      QPAIR-9
091C  0552 R                    QCSP    DW      DOCOL
091E  0366 R                            DW      SPAT
0920  0720 R                            DW      CSPP
0922  04BD R                            DW      AT
0924  0795 R                            DW      SUBB
0926  0167 R 0014                       DW      LIT,14H
092A  08C0 R                            DW      QERR
092C  03A3 R                            DW      SEMIS
                                ;
                                ;       ?LOADING
                                ;
092E  88                                DB      88H
092F  3F 4C 4F 41 44 49                 DB      '?LOADIN'
      4E
0936  C7                                DB      'G'+80H
0937  0915 R                            DW      QCSP-7
0939  0552 R                    QLOAD   DW      DOCOL
093B  06A5 R                            DW      BLK
093D  04BD R                            DW      AT
093F  03E9 R                            DW      ZEQU
0941  0167 R 0016                       DW      LIT,16H
0945  08C0 R                            DW      QERR
0947  03A3 R                            DW      SEMIS
```

```
                                PAGE
                        ;       COMPILE
                        ;
0949  87                        DB      87H
094A  43 4F 4D 50 49 4C         DB      'COMPIL'
0950  C5                        DB      'E'+80H
0951  092E R                    DW      QLOAD-0BH
0953  0552 R            COMP    DW      DOCOL
0955  08DA R                    DW      QCOMP
0957  03D5 R                    DW      FROMR
0959  0482 R                    DW      DUPE
095B  0748 R                    DW      TWOP
095D  03C5 R                    DW      TOR
095F  04BD R                    DW      AT
0961  0774 R                    DW      COMMA
0963  03A3 R                    DW      SEMIS
                        ;
                        ;       [
                        ;
0965  C1                        DB      0C1H
0966  DB                        DB      '['+80H
0967  0949 R                    DW      COMP-0AH
0969  0552 R            LBRAC   DW      DOCOL
096B  05C3 R                    DW      ZERO
096D  06F7 R                    DW      STATE
096F  04E8 R                    DW      STORE
0971  03A3 R                    DW      SEMIS
                        ;
                        ;       ]
                        ;
0973  81                        DB      81H
0974  DD                        DB      ']'+80H
0975  0965 R                    DW      LBRAC-4
0977  0552 R            RBRAC   DW      DOCOL
0979  0167 R 00C0               DW      LIT,0C0H
097D  06F7 R                    DW      STATE
097F  04E8 R                    DW      STORE
0981  03A3 R                    DW      SEMIS
```

```
                                        PAGE
                                ;       SMUDGE
                                ;
0983  86                                DB      86H
0984  53 4D 55 44 47                   DB      'SMUDG'
0989  C5                                DB      'E'+80H
098A  0973 R                            DW      RERAC-4
098C  0552 R                    SMUDG   DW      DOCOL
098E  0854 R                            DW      LATES
0990  0167 R 0020                       DW      LIT,20H
0994  0480 R                            DW      TOGGL
0996  03A3 R                            DW      SEMIS
                                ;
                                ;       HEX
                                ;
0998  83                                DB      83H
0999  48 45                             DB      'HE'
099B  D8                                DB      'X'+80H
099C  0983 R                            DW      SMUDG-9
099E  0552 R                    HEX     DW      DOCOL
09A0  0167 R 0010                       DW      LIT,16
09A4  0702 R                            DW      BASE
09A6  04EB R                            DW      STORE
09A8  03A3 R                            DW      SEMIS
                                ;
                                ;       DECIMAL
                                ;
09AA  87                                DB      87H
09AB  44 45 43 49 4D 41                 DB      'DECIMA'
09B1  CC                                DB      'L'+80H
09B2  0998 R                            DW      HEX-6
09B4  0552 R                    DECA    DW      DOCOL
09B6  0167 R 000A                       DW      LIT,10
09BA  0702 R                            DW      BASE
09BC  04EB R                            DW      STORE
09BE  03A3 R                            DW      SEMIS
                                ;
                                ;       (;CODE)
                                ;
09C0  87                                DB      87H
09C1  28 3B 43 4F 44 45                 DB      '(;CODE'
09C7  A9                                DB      ')'+80H
09C8  09AA R                            DW      DECA-0AH
09CA  0552 R                    PSCOD   DW      DOCOL
09CC  03D5 R                            DW      FROMR
09CE  0854 R                            DW      LATES
09D0  0898 R                            DW      PFA
09D2  0874 R                            DW      CFA
09D4  04EB R                            DW      STORE
09D6  03A3 R                            DW      SEMIS
                                ;
                                ;       ;CODE
                                ;
09D8  C5                                DB      0C5H
09D9  3B 43 4F 44                       DB      ';COD'
09DD  C5                                DB      'E'+80H
09DE  09C0 R                            DW      PSCOD-0AH
09E0  05E2 R                    SEMIC   DW      DOCOL
09E2  091C R                            DW      QCSP
09E4  0953 R                            DW      COMP
09E5  09CA R                            DW      PSCOD
```

```
09E8  0969 R                        DW      LBRAC
09EA  01C8 R                SEMI1   DW      NOOP    ; ( ASSEMBLER )
09EC  03A3 R                        DW      SEMIS
                            ;
                            ;       (BUILDS
                            ;
09EE  67                            DB      87H
09EF  3C 42 55 49 4C 44             DB      '(BUILD'
09F5  D3                            DB      'S'+80H
09F6  09D8 R                        DW      SEMIC-8
09F8  0552 R                BUILD   DW      DOCOL
09FA  05C3 R                        DW      ZERO
09FC  057A R                        DW      CON
09FE  03A3 R                        DW      SEMIS
                            ;
                            ;       DOES>
                            ;
0A00  85                            DB      85H
0A01  44 4F 45 53                   DB      'DOES'
0A05  BE                            DB      '>'+80H
0A06  09EE R                        DW      BUILD-0AH
0A08  0552 R                DOES    DW      DOCOL
0A0A  03D5 R                        DW      FROMR
0A0C  0854 R                        DW      LATES
0A0E  0858 R                        DW      PFA
0A10  04E8 R                        DW      STORE
0A12  09CA R                        DW      PSCOD
0A14  87 EC                 DODOE:  XCHG    BP,SP   ;GET RETURN STACK
0A16  56                            PUSH    SI      ; (RP) (- (IP)
0A17  87 EC                         XCHG    BP,SP
0A19  42                            INC     DX      ;PFA
0A1A  8B DA                         MOV     BX,DX
0A1C  8B 37                         MOV     SI,[BX] ;NEW CFA
0A1E  42                            INC     DX
0A1F  42                            INC     DX
0A20  52                            PUSH    DX      ;PFA
0A21  E9 0159 R                     JMP     NEXT
                            ;
                            ;       COUNT
                            ;
0A24  85                            DB      85H
0A25  43 4F 55 4E                   DB      'COUN'
0A29  D4                            DB      'T'+80H
0A2A  0A00 R                        DW      DOES-8
0A2C  0552 R                COUNT   DW      DOCOL
0A2E  0482 R                        DW      DUPE
0A30  073C R                        DW      ONEP
0A32  0475 R                        DW      SWAP
0A34  04CA R                        DW      CAT
0A36  03A3 R                        DW      SEMIS
                            ;
                            ;       TYPE
                            ;
0A38  84                            DB      84H
0A39  54 59 50                      DB      'TYP'
0A3C  C5                            DB      'E'+80H
0A3D  0A24 R                        DW      COUNT-8
0A3F  0552 R                TYPES   DW      DOCOL
0A41  0818 R                        DW      DDUP
0A43  0194 R                        DW      ZBRAN   ; IF
0A45  001E                          DW      OFFSET TYPE1-$
```

```
0A67  0459 R                          DW      OVER
0A69  040F R                          DW      PLUS
0A6B  0475 R                          DW      SWAP
0A6D  01EC R                          DW      XDO     ; DO
0A6F  01FD R                  TYPE2   DW      IDO
0A71  04CA R                          DW      CAT
0A73  0167 R 007F                     DW      LIT,7FH
0A77  033A R                          DW      ANDD    ;STRIP 80H FROM LAST CHAR
0A79  02BD R                          DW      EMIT
0A7B  01A8 R                          DW      XLOOP   ; LOOP
0A7D  FFF2                            DW      OFFSET TYPE2-$
0A7F  0184 R                          DW      BRAN    ; ELSE
0A81  0004                            DW      OFFSET TYPE3-$
0A83  0468 R                  TYPE1   DW      DROP    ; ENDIF
0A85  03A3 R                  TYPE3   DW      SEMIS
                              ;
                              ;       -TRAILING
                              ;
0A87  89                              DB      89H
0A88  2D 54 52 41 49 4C               DB      '-TRAILIN'
      49 4E
0A90  C7                              DB      'G'+80H
0A91  0A38 R                          DW      TYPES-7
0A93  0552 R                  DTRA1   DW      DOCOL
0A95  0482 R                          DW      DUPE
0A97  05C3 R                          DW      ZERO
0A99  01EC R                          DW      XDO     ;DO
0A9B  0459 R                  DTRA1   DW      OVER
0A9D  0459 R                          DW      OVER
0A9F  040F R                          DW      PLUS
0AA1  05CE R                          DW      ONE
0AA3  0795 R                          DW      SUBB
0AA5  04CA R                          DW      CAT
0AA7  05F3 R                          DW      BLS
0AA9  0795 R                          DW      SUBB
0AAB  0194 R                          DW      ZBRAN   ;IF
0AAD  0008                            DW      OFFSET DTRA2-$
0AAF  03B5 R                          DW      LEAVE
0AB1  0184 R                          DW      BRAN    ; ELSE
0AB3  0006                            DW      OFFSET DTRA3-$
0AB5  05CE R                  DTRA2   DW      ONE
0AB7  0795 R                          DW      SUBB    ; ENDIF
0AB9  01A8 R                  DTRA3   DW      XLOOP   ; LOOP
0ABB  FFE0                            DW      OFFSET DTRA1-$
0ABD  03A3 R                          DW      SEMIS
```

```
                                PAGE
                                %OUT    LINE ^2000
                        ;       (.")
                        ;
0A9F  84                        DB      84H
0AA0  28 2E 22                  DB      '(."'
0AA3  A9                        DB      ')'+80H
0AA4  0A67 R                    DW      DTRAI-0CH
0AA6  0552 R            PDOTQ   DW      DOCOL
0AA8  03E3 R                    DW      RR
0AAA  0A2C R                    DW      COUNT
0AAC  0482 R                    DW      DUPE
0AAE  073C R                    DW      ONEP
0AB0  03D5 R                    DW      FROMR
0AB2  040F R                    DW      PLUS
0AB4  03C5 R                    DW      TOR
0AB6  0A3F R                    DW      TYPES
0AB8  03A3 R                    DW      SEMIS
                        ;
                        ;       ."
                        ;
0ABA  C2                        DB      0C2H
0ABB  2E                        DB      '.'
0ABC  A2                        DB      '"'+80H
0ABD  0A9F R                    DW      PDOTQ-7
0ABF  0552 R            DOTQ    DW      DOCOL
0AC1  0167 R 0022               DW      LIT,22H
0AC5  06F7 R                    DW      STATE
0AC7  04BD R                    DW      AT
0AC9  0194 R                    DW      ZBRAN   ; IF
0ACB  0014                      DW      OFFSET DOTQ1-$
0ACD  0953 R                    DW      COMP
0ACF  0AA6 R                    DW      PDOTQ
0AD1  0C27 R                    DW      WORDS
0AD3  0758 R                    DW      HERE
0AD5  04CA R                    DW      CAT
0AD7  073C R                    DW      ONEP
0AD9  0768 R                    DW      ALLOT
0ADB  0184 R                    DW      BRAN    ; ELSE
0ADD  000A                      DW      OFFSET DOTQ2-$
0ADF  0C27 R            DOTQ1   DW      WORDS
0AE1  0758 R                    DW      HERE
0AE3  0A2C R                    DW      COUNT
0AE5  0A3F R                    DW      TYPES   ; ENDIF
0AE7  03A3 R            DOTQ2   DW      SEMIS
```

```
                                PAGE
                        ;       EXPECT
                        ;
0AE9  86                        DB      86H
0AEA  45 58 50 45 43            DB      'EXPEC'
0AEF  D4                        DB      'T'+80H
0AF0  0ABA R                    DW      DUTQ-5
0AF2  0552 R            EXPEC   DW      DOCOL
0AF4  0459 R                    DW      OVER
0AF6  040F R                    DW      PLUS
0AF8  0459 R                    DW      OVER
0AFA  01EC R                    DW      XDO     ; DO
0AFC  02CF R            EXPE1   DW      KEY
0AFE  0482 R                    DW      DUPE
0B00  0167 R 000E               DW      LIT,0EH
0B04  063B R                    DW      PORIG
0B06  048D R                    DW      AT
0B08  07A2 R                    DW      EQUAL
0B0A  0194 R                    DW      ZBRAN   ; IF
0B0C  0020                      DW      OFFSET EXPE2-$
0B0E  0468 R                    DW      DROP
0B10  0482 R                    DW      DUPE
0B12  01FD R                    DW      IDO
0B14  07A2 R                    DW      EQUAL
0B16  0482 R                    DW      DUPE
0B18  03D5 R                    DW      FROMR
0B1A  05DA R                    DW      TWO
0B1C  0795 R                    DW      SUBB
0B1E  040F R                    DW      PLUS
0B20  03C5 R                    DW      TOR
0B22  0194 R                    DW      ZBRAN   ; IF
0B24  000A                      DW      OFFSET EXPE6-$
0B26  0167 R                    DW      LIT
0B28  0007                      DW      BELL
0B2A  0184 R                    DW      BRAN    ; ELSE
0B2C  0006                      DW      OFFSET EXPE7-$
0B2E  0167 R            EXPE6   DW      LIT
0B30  0008                      DW      BSOUT   ; ENDIF
0B32  0184 R            EXPE7   DW      BRAN    ; ELSE
0B34  0028                      DW      OFFSET EXPE3-$
0B36  0482 R            EXPE2   DW      DUPE
0B38  0167 R 000D               DW      LIT,0DH
0B3C  07A2 R                    DW      EQUAL
0B3E  0194 R                    DW      ZBRAN   ; IF
0B40  000E                      DW      OFFSET EXPE4-$
0B42  03B5 R                    DW      LEAVE
0B44  0468 R                    DW      DROP
0B46  05F3 R                    DW      BLS
0B48  05C3 R                    DW      ZERO
0B4A  0184 R                    DW      BRAN    ; ELSE
0B4C  0004                      DW      OFFSET EXPE5-$
0B4E  0482 R            EXPE4   DW      DUPE    ; ENDIF
0B50  01FD R            EXPE5   DW      IDO
0B52  04F6 R                    DW      CSTOR
0B54  05C3 R                    DW      ZERO
0B56  01FD R                    DW      IDO
0B58  073C R                    DW      ONEP
0B5A  04E8 R                    DW      STORE   ; ENDIF
0B5C  02BD R            EXPE3   DW      EMIT
0B5E  01A8 R                    DW      XLOOP   ; LOOP
0B60  FF9C                      DW      OFFSET EXPE1-$
```

```
0B62  0468 R                        DW      DROP
0B64  03A3 R                        DW      SEMIS
                              ;
                              ;     QUERY
                              ;
0B66  85                            DB      85H
0B67  51 55 45 52                   DB      'QUER'
0B6B  D9                            DB      'Y'+80H
0B6C  0AE9 R                        DW      EXPEC-9
0B6E  0552 R                QUERY   DW      DOCOL
0B70  065D R                        DW      TIB
0B72  04BD R                        DW      AT
0B74  0167 R 0050                   DW      LIT,50H
0B78  0AF2 R                        DW      EXPEC
0B7A  05C3 R                        DW      ZERO
0B7C  06AE R                        DW      INN
0B7E  04EB R                        DW      STORE
0B80  03A3 R                        DW      SEMIS
```

```
                                PAGE
                                ;       0 (NULL)
                                ;
0B82  C1                        DB      0C1H    ; A BINARY ZERO
0B83  30                        DB      30H
0B84  0B66 R                    DW      QUERY-8
0B86  0552 R                NULL    DW      DOCOL
0B88  06A5 R                    DW      BLK
0B8A  04BD R                    DW      AT
0B8C  0194 R                    DW      ZBRAN   ; IF
0B8E  000A                      DW OFFSET NULL1-$
0B90  05CE R                    DW      ONE
0B92  06A5 R                    DW      BLK
0B94  049E R                    DW      PSTOR
0B96  05C3 R                    DW      ZERO
0B98  06AE R                    DW      INN
0B9A  04E8 R                    DW      STORE
0B9C  06A5 R                    DW      BLK
0B9E  04BD R                    DW      AT
0BA0  062D R                    DW      BSCR
0BA2  05CE R                    DW      ONE
0BA4  0795 R                    DW      SUBB
0BA6  033A R                    DW      ANDD
0BA8  03EA R                    DW      ZEQU
0BAA  0194 R                    DW      ZBRAN   ; IF
0BAC  0008                      DW      OFFSET NULL2-$
0BAE  08F2 R                    DW      QEXEC
0BB0  03D5 R                    DW      FROMR
0BB2  0468 R                    DW      DROP    ; ENDIF
0BB4  0184 R                NULL2   DW      BRAN    ; ELSE
0BB6  0006                      DW      OFFSET NULL3-$
0BB8  03D5 R                NULL1   DW      FROMR
0BBA  0468 R                    DW      DROP    ; ENDIF
0BBC  03A3 R                NULL3   DW      SEMIS
                                ;
                                ;       FILL
                                ;
0BBE  84                        DB      84H
0BBF  46 49 4C                  DB      'FIL'
0BC2  CC                        DB      'L'+80H
0BC3  0B82 R                    DW      NULL-4
0BC5  0BC7 R                FILL    DW      $+2
0BC7  58                        POP     AX      ; FILL CHAR
0BC8  59                        POP     CX      ; FILL COUNT
0BC9  5F                        POP     DI      ; BEGIN ADDR
0BCA  8C DB                     MOV     BX,DS
0BCC  8E C3                     MOV     ES,BX   ; ES (- DS
0BCE  FC                        CLD             ; INC DIRECTION
0BCF  F3/ AA                    REP     STOSB   ;STORE BYTE
0BD1  E9 0159 R                 JMP     NEXT
                                ;
                                ;       ERASE
                                ;
0BD4  85                        DB      85H
0BD5  45 52 41 53               DB      'ERAS'
0BD9  D3                        DB      'S'+80H
0BDA  0BBE R                    DW      FILL-7
0BDC  0552 R                ERASEE  DW      DOCOL
0BDE  05C3 R                    DW      ZERO
0BE0  0BC5 R                    DW      FILL
0BE2  03A3 R                    DW      SEMIS
```

```
                                ;
                                ;       BLANKS
                                ;
0BE4  86                        BLANKS  DB      86H
0BE5  42 4C 41 4E 4B                    DB      'BLANK'
0BEA  D3                                DB      'S'+80H
0BEB  0BD4 R                            DW      ERASEE-8
0BED  0552 R                    BLANK   DW      DOCOL
0BEF  05F3 R                            DW      BLS
0BF1  0BC5 R                            DW      FILL
0BF3  03A3 R                            DW      SEMIS
                                ;
                                ;       HOLD
                                ;
0BF5  84                        HOLD    DB      84H
0BF6  48 4F 4C                          DB      'HOL'
0BF9  C4                                DB      'D'+80H
0BFA  0BE4 R                            DW      BLANK-9
0BFC  0552 R                    HOLD    DW      DOCOL
0BFE  0167 R FFFF                       DW      LIT,-1
0C02  0733 R                            DW      HLD
0C04  049E R                            DW      PSTOR
0C06  0733 R                            DW      HLD
0C08  04BD R                            DW      AT
0C0A  04F6 R                            DW      CSTOR
0C0C  03A3 R                            DW      SEMIS
                                ;
                                ;       PAD
                                ;
0C0E  83                        PAD     DB      83H
0C0F  50 41                             DB      'PA'
0C11  C4                                DB      'D'+80H
0C12  0BF5 R                            DW      HOLD-7
0C14  0552 R                    PAD     DW      DOCOL
0C16  0758 R                            DW      HERE
0C18  0167 R 0054                       DW      LIT,84
0C1C  040F R                            DW      PLUS
0C1E  03A3 R                            DW      SEMIS
                                ;
                                ;       WORD
                                ;
0C20  84                        WORD    DB      84H
0C21  57 4F 52                          DB      'WOR'
0C24  C4                                DB      'D'+80H
0C25  0C0E R                            DW      PAD-6
0C27  0552 R                    WORDS   DW      DOCOL
0C29  06A5 R                            DW      BLK
0C2B  04BD R                            DW      AT
0C2D  0194 R                            DW      ZBRAN   ; IF
0C2F  000C                              DW      OFFSET WORD1-$
0C31  06A5 R                            DW      BLK
0C33  04BD R                            DW      AT
0C35  1328 R                            DW      BLOCK
0C37  0184 R                            DW      BRAN    ; ELSE
0C39  0006                              DW      OFFSET WORD2-$
0C3B  065D R                    WORD1   DW      TIB
0C3D  04BD R                            DW      AT      ; ENDIF
0C3F  06AE R                    WORD2   DW      INN
0C41  04BD R                            DW      AT
0C43  040F R                            DW      PLUS
0C45  0475 R                            DW      SWAP
```

```
0C47  0285 R                      DW      ENCL
0C49  0758 R                      DW      HERE
0C4B  0167 R 0022                 DW      LIT,22H
0C4F  0BED R                      DW      BLANK
0C51  06AE R                      DW      INN
0C53  049E R                      DW      PSTOR
0C55  0459 R                      DW      OVER
0C57  0795 R                      DW      SUBB
0C59  03C5 R                      DW      TOR
0C5B  03E3 R                      DW      RR
0C5D  0758 R                      DW      HERE
0C5F  04F6 R                      DW      CSTOR
0C61  040F R                      DW      PLUS
0C63  0758 R                      DW      HERE
0C65  073C R                      DW      ONEP
0C67  03D5 R                      DW      FROMR
0C69  02F7 R                      DW      CMOVE
0C6B  03A3 R                      DW      SEMIS
```

```
                                        PAGE
                                ;       (NUMBER)
                                ;
0C6D  88                                DB      88H
0C6E  28 4E 55 4D 42 45                 DB      '(NUMBER'
      52
0C75  A9                                DB      ')'+80H
0C76  0C20 R                            DW      WORDS-7
0C78  0552 R                    PNUMB   DW      DOCOL
0C7A  073C R                    PNUM1   DW      ONEP    ; BEGIN
0C7C  0482 R                            DW      DUPE
0C7E  03C5 R                            DW      TOR
0C80  04CA R                            DW      CAT
0C82  0702 R                            DW      BASE
0C84  04BD R                            DW      AT
0C86  020D R                            DW      DIGIT
0C88  0194 R                            DW      ZBRAN   ; WHILE
0C8A  002C                              DW      OFFSET PNUM2-$
0C8C  0475 R                            DW      SWAP
0C8E  0702 R                            DW      BASE
0C90  04BD R                            DW      AT
0C92  030F R                            DW      USTAR
0C94  0468 R                            DW      DROP
0C96  07F8 R                            DW      ROT
0C98  0702 R                            DW      BASE
0C9A  04BD R                            DW      AT
0C9C  030F R                            DW      USTAR
0C9E  041D R                            DW      DPLUS
0CA0  070C R                            DW      DPL
0CA2  04BD R                            DW      AT
0CA4  073C R                            DW      ONEP
0CA6  0194 R                            DW      ZBRAN   ; IF
0CA8  0008                              DW      OFFSET PNUM3-$
0CAA  05CE R                            DW      ONE
0CAC  070C R                            DW      DPL
0CAE  049E R                            DW      PSTOR   ; ENDIF
0CB0  03D5 R                    PNUM3   DW      FROMR
0CB2  0184 R                            DW      BRAN    ; REPEAT
0CB4  FFC6                              DW      OFFSET PNUM1-$
0CB6  03D5 R                    PNUM2   DW      FROMR
0CB8  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       NUMBER
                                ;
0CBA  86                                DB      86H
0CBB  4E 55 4D 42 45                    DB      'NUMBE'
0CC0  D2                                DB      'R'+80H
0CC1  0C6D R                            DW      PNUMB-0BH
0CC3  0552 R                    NUMB    DW      DOCOL
0CC5  05C3 R                            DW      ZERO
0CC7  05C3 R                            DW      ZERO
0CC9  07F8 R                            DW      ROT
0CCB  0482 R                            DW      DUPE
0CCD  073C R                            DW      ONEP
0CCF  04CA R                            DW      CAT
0CD1  0167 R 002D                       DW      LIT,2DH
0CD5  07A2 R                            DW      EQUAL
0CD7  0482 R                            DW      DUPE
0CD9  03C5 R                            DW      TOR
0CDB  040F R                            DW      PLUS
0CDD  0167 R FFFF                       DW      LIT,-1
0CE1  070C R                    NUMB1   DW      DPL     ; BEGIN
0CE3  04E8 R                            DW      STORE
0CE5  0C78 R                            DW      PNUMB
0CE7  0482 R                            DW      DUPE
0CE9  04CA R                            DW      CAT
0CEB  05F3 R                            DW      BLS
0CED  0795 R                            DW      SUBB
0CEF  0194 R                            DW      ZBRAN   ; WHILE
0CF1  0016                              DW      OFFSET NUMB2-$
0CF3  0482 R                            DW      DUPE
0CF5  04CA R                            DW      CAT
0CF7  0167 R 002E                       DW      LIT,2EH
0CFB  0795 R                            DW      SUBB
0CFD  05C3 R                            DW      ZERO
0CFF  08C0 R                            DW      QERR
0D01  05C3 R                            DW      ZERO
0D03  0184 R                            DW      BRAN    ; REPEAT
0D05  FFDC                              DW      OFFSET NUMB1-$
0D07  0468 R                    NUMB2   DW      DROP
0D09  03D5 R                            DW      FROMR
0D0B  0194 R                            DW      ZBRAN   ; IF
0D0D  0004                              DW      OFFSET NUMB3-$
0D0F  0443 R                            DW      DMINU   ; ENDIF
0D11  03A3 R                    NUMB3   DW      SEMIS
```

```
                                PAGE
                        ;       -FIND
                        ;
0D13  85                        DB      85H
0D14  2D 46 49 4E               DB      '-FIN'
0D18  C4                        DB      'D'+80H
0D19  0CBA R                    DW      NUMB-9
0D1B  0552 R            DFIND   DW      DOCOL
0D1D  05F3 R                    DW      BLS
0D1F  0C27 R                    DW      WORDS
0D21  0758 R                    DW      HERE
0D23  06DD R                    DW      CONT
0D25  04BD R                    DW      AT
0D27  04BD R                    DW      AT
0D29  023A R                    DW      PFIND
0D2B  0482 R                    DW      DUPE
0D2D  03EA R                    DW      ZEQU
0D2F  0194 R                    DW      ZBRAN   ;IF
0D31  000A                      DW      OFFSET DFIN1-$
0D33  0468 R                    DW      DROP
0D35  0758 R                    DW      HERE
0D37  0854 R                    DW      LATES
0D39  023A R                    DW      PFIND   ;ENDIF
0D3B  03A3 R            DFIN1   DW      SEMIS
                        ;
                        ;       (ABORT)
                        ;
0D3D  87                        DB      87H
0D3E  28 41 42 4F 52 54         DB      '(ABORT'
0D44  A9                        DB      ')'+80H
0D45  0D13 R                    DW      DFIND-8
0D47  0552 R            PABOR   DW      DOCOL
0D49  0F3A R                    DW      ABORT
0D4B  03A3 R                    DW      SEMIS
                        ;
                        ;       ERROR
                        ;
0D4D  85                        DB      85H
0D4E  45 52 52 4F               DB      'ERRO'
0D52  D2                        DB      'R'+80H
0D53  0D3D R                    DW      PABOR-0AH
0D55  0552 R            ERROR   DW      DOCOL
0D57  0677 R                    DW      WARN
0D59  04BD R                    DW      AT
0D5B  03FD R                    DW      ZLESS
0D5D  0194 R                    DW      ZBRAN   ;IF
0D5F  0004                      DW      OFFSET ERRO1-$
0D61  0D47 R                    DW      PABOR   ;ENDIF
0D63  0758 R            ERRO1   DW      HERE
0D65  0A2C R                    DW      COUNT
0D67  0A3F R                    DW      TYPES
0D69  0AA6 R                    DW      PDOTQ
0D6B  02                        DB      2
0D6C  3F 20                     DB      '? '
0D6E  11CB R                    DW      MESS
0D70  0373 R                    DW      SPSTO
                        ;
                        ;       CHANGE FROM FIG MODEL
                        ;       DW INN,AT,BLK,AT
                        ;
0D72  06A5 R 04BD R             DW      BLK,AT
```

```
0D76  0818 R                          DW      DDUP
0D78  0194 R                          DW      ZBRAN   ; IF
0D7A  0008                            DW      OFFSET ERR02-$
0D7C  06AE R 04BD R                   DW      INN,AT
0D80  0475 R                          DW      SWAP    ;ENDIF
0D82  0F6D R                ERR02     DW      QUIT
                            ;
                            ;       ID.
                            ;
0D84  83                              DB      83H
0D85  49 44                           DB      'ID'
0D87  AE                              DB      '.'+80H
0D88  0D4D R                          DW      ERROR-8
0D8A  0552 R                IDDOT     DW      DOCOL
0D8C  0C14 R                          DW      PAD
0D8E  0167 R 0020                     DW      LIT,20H
0D92  0167 R 005F                     DW      LIT,5FH
0D96  0BC5 R                          DW      FILL
0D98  0482 R                          DW      DUPE
0D9A  0898 R                          DW      PFA
0D9C  0864 R                          DW      LFA
0D9E  0459 R                          DW      OVER
0DA0  0795 R                          DW      SUBB
0DA2  0C14 R                          DW      PAD
0DA4  0475 R                          DW      SWAP
0DA6  02F7 R                          DW      CMOVE
0DA8  0C14 R                          DW      PAD
0DAA  0A2C R                          DW      COUNT
0DAC  0167 R 001F                     DW      LIT,1FH
0DB0  033A R                          DW      ANDD
0DB2  0A3F R                          DW      TYPES
0DB4  0809 R                          DW      SPACE
0DB6  03A3 R                          DW      SEMIS
```

```
                                        PAGE
                                ;       CREATE
                                ;
0DB8  86                                DB      86H
0DB9  43 52 45 41 54                    DB      'CREAT'
0DBE  C5                                DB      'E'+80H
0DBF  0D84 R                            DW      IDDOT-6
0DC1  0552 R                    CREAT   DW      DOCOL
0DC3  0D1B R                            DW      DFIND
0DC5  0194 R                            DW      ZBRAN   ;IF
0DC7  0010                              DW      OFFSET CREA1-$
0DC9  0468 R                            DW      DROP
0DCB  0882 R                            DW      NFA
0DCD  0D8A R                            DW      IDDOT
0DCF  0167 R 0004                       DW      LIT,4
0DD3  11CB R                            DW      MESS
0DD5  0809 R                            DW      SPACE   ;ENDIF
0DD7  0758 R                    CREA1   DW      HERE
0DD9  0482 R                            DW      DUPE
0DDB  04CA R                            DW      CAT
0DDD  0669 R                            DW      WIDTHE
0DDF  04BD R                            DW      AT
0DE1  1004 R                            DW      MIN
0DE3  073C R                            DW      ONEP
0DE5  0768 R                            DW      ALLOT
0DE7  0482 R                            DW      DUPE
0DE9  0167 R 00A0                       DW      LIT,0A0H
0DED  04B0 R                            DW      TOGGL
0DEF  0758 R                            DW      HERE
0DF1  05CE R                            DW      ONE
0DF3  0795 R                            DW      SUBB
0DF5  0167 R 0080                       DW      LIT,80H
0DF9  04B0 R                            DW      TOGGL
0DFB  0854 R                            DW      LATES
0DFD  0774 R                            DW      COMMA
0DFF  06EB R                            DW      CURR
0E01  04BD R                            DW      AT
0E03  04E8 R                            DW      STORE
0E05  0758 R                            DW      HERE
0E07  0748 R                            DW      TWOP
0E09  0774 R                            DW      COMMA
0E0B  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       [COMPILE]
                                ;
0E0D  C9                                DB      0C9H
0E0E  5B 43 4F 4D 50 49                 DB      '[COMPILE'
      4C 45
0E16  DD                                DB      ']'+80H
0E17  0DB8 R                            DW      CREAT-9
0E19  0552 R                    BCOMP   DW      DOCOL
0E1B  0D1B R                            DW      DFIND
0E1D  03EA R                            DW      ZEQU
0E1F  05C3 R                            DW      ZERO
0E21  08C0 R                            DW      QERR
0E23  0468 R                            DW      DROP
0E25  0874 R                            DW      CFA
0E27  0774 R                            DW      COMMA
0E29  03A3 R                            DW      SEMIS
                                ;
                                ;       LITERAL
                                ;
0E2B  C7                                DB      0C7H
0E2C  4C 49 54 45 52 41                 DB      'LITERA'
0E32  CC                                DB      'L'+80H
0E33  0E0D R                            DW      BCOMP-0CH
0E35  0552 R                    LITER   DW      DOCOL
0E37  06F7 R                            DW      STATE
0E39  04BD R                            DW      AT
0E3B  0194 R                            DW      ZBRAN   ;IF
0E3D  0008                              DW      OFFSET LITE1-$
0E3F  0953 R                            DW      COMP
0E41  0167 R                            DW      LIT
0E43  0774 R                            DW      COMMA   ;ENDIF
0E45  03A3 R                    LITE1   DW      SEMIS
```

```
                                PAGE
                        ;
                        ;       DLITERAL
                        ;
0E47  C8                        DB      0C8H
0E48  44 4C 49 54 45 52         DB      'DLITERA'
      41
0E4F  CC                        DB      'L'+80H
0E50  0E2B R                    DW      LITER-0AH
0E52  0552 R            DLITE   DW      DOCOL
0E54  06F7 R                    DW      STATE
0E56  04BD R                    DW      AT
0E58  0194 R                    DW      ZBRAN   ; IF
0E5A  0008                      DW      OFFSET DLIT1-$
0E5C  0475 R                    DW      SWAP
0E5E  0E35 R                    DW      LITER
0E60  0E35 R                    DW      LITER   ; ENDIF
0E62  03A3 R            DLIT1   DW      SEMIS
                        ;
                        ;       ?STACK
                        ;
0E64  86                        DB      86H
0E65  3F 53 54 41 43            DB      '?STAC'
0E6A  CB                        DB      'K'+80H
0E6B  0E47 R                    DW      DLITE-0BH
0E6D  0552 R            QSTAC   DW      DOCOL
0E6F  0366 R                    DW      SPAT
0E71  064A R                    DW      SZERO
0E73  04BD R                    DW      AT
0E75  0475 R                    DW      SWAP
0E77  07CA R                    DW      ULESS
0E79  05CE R                    DW      ONE
0E7B  08C0 R                    DW      QERR
0E7D  0366 R                    DW      SPAT
0E7F  0758 R                    DW      HERE
0E81  0167 R 0080               DW      LIT,80H
0E85  040F R                    DW      PLUS
0E87  07CA R                    DW      ULESS
0E89  0167 R 0007               DW      LIT,7
0E8D  08C0 R                    DW      QERR
0E8F  03A3 R                    DW      SEMIS
```

```
                                PAGE
                                %OUT    LINE 2500
                        ;       INTERPRET
                        ;
0E91  89                        DB      89H
0E92  49 4E 54 45 52 50         DB      'INTERPRE'
      52 45
0E9A  D4                        DB      'T'+80H
0E9B  0E64 R                    DW      QSTAC-9
0E9D  0552 R            INTER   DW      DOCOL
0E9F  0D1B R            INTE1   DW      DFIND   ;BEGIN
0EA1  0194 R                    DW      ZBRAN   ;IF
0EA3  001E                      DW      OFFSET INTE2-$
0EA5  06F7 R                    DW      STATE
0EA7  04BD R                    DW      AT
0EA9  07AE R                    DW      LESS
0EAB  0194 R                    DW      ZBRAN   ;IF
0EAD  000A                      DW      OFFSET INTE3-$
0EAF  0874 R                    DW      CFA
0EB1  0774 R                    DW      COMMA
0EB3  0184 R                    DW      BRAN    ;ELSE
0EB5  0006                      DW      OFFSET INTE4-$
0EB7  0874 R            INTE3   DW      CFA
0EB9  0176 R                    DW      EXEC    ;ENDIF
0EBB  0E6D R            INTE4   DW      QSTAC
0EBD  0184 R                    DW      BRAN    ;ELSE
0EBF  001C                      DW      OFFSET INTE5-$
0EC1  0758 R            INTE2   DW      HERE
0EC3  0CC3 R                    DW      NUMB
0EC5  070C R                    DW      DPL
0EC7  04BD R                    DW      AT
0EC9  073C R                    DW      ONEP
0ECB  0194 R                    DW      ZBRAN   ;IF
0ECD  0008                      DW      OFFSET INTE6-$
0ECF  0E52 R                    DW      DLITE
0ED1  0184 R                    DW      BRAN    ;ELSE
0ED3  0006                      DW      OFFSET INTE7-$
0ED5  0468 R            INTE6   DW      DROP
0ED7  0E35 R                    DW      LITER   ;ENDIF
0ED9  0E6D R            INTE7   DW      QSTAC   ;ENDIF
0EDB  0184 R            INTE5   DW      BRAN    ;AGAIN
0EDD  FFC2                      DW      OFFSET INTE1-$
```

```
                                        PAGE
                                ;       IMMEDIATE
                                ;
0EDF  89                                DB      89H
0EE0  49 4D 4D 45 44 49                 DB      'IMMEDIAT'
      41 54
0EE8  C5                                DB      'E'+80H
0EE9  0E91 R                            DW      INTER-0CH
0EEB  0552 R                    IMMED   DW      DOCOL
0EED  0854 R                            DW      LATES
0EEF  0167 R 0040                       DW      LIT,40H
0EF3  04B0 R                            DW      TOGGL
0EF5  03A3 R                            DW      SEMIS
                                ;
                                ;       VOCABULARY
                                ;
0EF7  8A                                DB      8AH
0EF8  56 4F 43 41 42 55                 DB      'VOCABULAR'
      4C 41 52
0F01  D9                                DB      'Y'+80H
0F02  0EDF R                            DW      IMMED-0CH
0F04  0552 R                    VOCAB   DW      DOCOL
0F06  09F8 R                            DW      BUILD
0F08  0167 R                            DW      LIT
0F0A  A081                              DW      0A081H
0F0C  0774 R                            DW      COMMA
0F0E  06EB R                            DW      CURR
0F10  04BD R                            DW      AT
0F12  0874 R                            DW      CFA
0F14  0774 R                            DW      COMMA
0F16  0758 R                            DW      HERE
0F18  069B R                            DW      VOCL
0F1A  04BD R                            DW      AT
0F1C  0774 R                            DW      COMMA
0F1E  069B R                            DW      VOCL
0F20  04E8 R                            DW      STORE
0F22  0A08 R                            DW      DOES
0F24  0748 R                    DOVOC   DW      TWOP
0F26  06DD R                            DW      CONT
0F28  04E8 R                            DW      STORE
0F2A  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       FORTH
                                ;
                                ;   THE 'TASK-7' IS A COLD START VALUE ONLY.
                                ;   IT IS CHANGED EACH TIME A DEFINITION IS
                                ;   APPENDED TO THE 'FORTH' VOCABULARY.
                                ;
0F2C  C5                                DB      0C5H
0F2D  46 4F 52 54                       DB      'FORT'
0F31  C8                                DB      'H'+80H
0F32  0EF7 R                            DW      VOCAB-0DH
0F34  0A14 R                    FORTH   DW      DODOE
0F36  0F24 R                            DW      DOVOC
0F38  A081                              DW      0A081H
0F3A  18E9 R                            DW      TASK-7  ;COLD START VALUE ONLY
0F3C  0000                              DW      0       ; END OF VOCABULARY LIST
                                ;
                                ;       DEFINITIONS
                                ;
0F3E  8B                                DB      8BH
0F3F  44 45 46 49 4E 49                 DB      'DEFINITION'
      54 49 4F 4E
0F49  D3                                DB      'S'+80H
0F4A  0F2C R                            DW      FORTH-8
0F4C  0552 R                    DEFIN   DW      DOCOL
0F4E  06DD R                            DW      CONT
0F50  04BD R                            DW      AT
0F52  06EB R                            DW      CURR
0F54  04E8 R                            DW      STORE
0F56  03A3 R                            DW      SEMIS
                                ;
                                ;       (
                                ;
0F58  C1                                DB      0C1H
0F59  A8                                DB      '('+80H
0F5A  0F3E R                            DW      DEFIN-0EH
0F5C  0552 R                    PAREN   DW      DOCOL
0F5E  0167 R 0029                       DW      LIT,')'
0F62  0C27 R                            DW      WORDS
0F64  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       QUIT
                                ;
0F66  84                                DB      84H
0F67  51 55 49                          DB      'QUI'
0F6A  D4                                DB      'T'+80H
0F6B  0F58 R                            DW      PAREN-4
0F6D  0552 R                    QUIT    DW      DOCOL
0F6F  05C3 R                            DW      ZERO
0F71  06A5 R                            DW      BLK
0F73  04E8 R                            DW      STORE
0F75  0969 R                            DW      LBRAC
0F77  0392 R                    QUIT1   DW      RPSTO   ;BEGIN
0F79  02EA R                            DW      CR
0F7B  0B6E R                            DW      QUERY
0F7D  0E9D R                            DW      INTER
0F7F  06F7 R                            DW      STATE
0F81  04BD R                            DW      AT
0F83  03EA R                            DW      ZEQU
0F85  0194 R                            DW      ZBRAN   ;IF
0F87  0007                              DW      OFFSET QUIT2-$
0F89  0AA6 R                            DW      PDOTQ
0F8B  02                                DB      2
0F8C  4F 4B                             DB      'OK'    ;ENDIF
0F8E  0184 R                    QUIT2   DW      BRAN    ;AGAIN
0F90  FFE7                              DW      OFFSET QUIT1-$
                                ;
                                ;       ABORT
                                ;
0F92  85                                DB      85H
0F93  41 42 4F 52                       DB      'ABOR'
0F97  D4                                DB      'T'+80H
0F98  0F66 R                            DW      QUIT-7
0F9A  0552 R                    ABORT   DW      DOCOL
0F9C  0373 R                            DW      SPSTO
0F9E  09B4 R                            DW      DECA
0FA0  0E6D R                            DW      QSTAC   ; IT DID TO & INCL THIS
0FA2  02EA R                            DW      CR
0FA4  1890 R                            DW      DOTCPU
0FA6  0AA6 R                            DW      PDOTQ
0FA8  14                                DB      20
0FA9  49 42 4D 2D 50 43                 DB      'IBM-PC Fig-Fortn '
      20 46 69 67 2D 46
      6F 72 74 68 20
0FBA  31 2E 30                          DB      FIGREL+30H,ADOT,FIGREV+30H
0FBD  0F34 R                            DW      FORTH
0FBF  0F4C R                            DW      DEFIN
0FC1  0F6D R                            DW      QUIT
```

```
                                PAGE
                        ;       WARM START VECTOR COMES HERE
                        ;
0FC3  BE 0FC9 R         WRM:    MOV     SI,OFFSET WRM1
0FC6  E9 0159 R                 JMP     NEXT
                        ;
0FC9  0FD2 R            WRM1    DW      WARM
                        ;
                        ;       WARM
                        ;
0FCB  84                        DB      84H
0FCC  57 41 52                  DB      'WAR'
0FCF  CD                        DB      'M'+80H
0FD0  0F92 R                    DW      ABORT-8
0FD2  0552 R            WARM    DW      DOCOL
0FD4  12B9 R                    DW      MTBUF
0FD6  0F9A R                    DW      ABORT
                        ;
                        ;       COLD START VECTOR COMES HERE
                        ;
0FD8  BE 1001 R         CLD:    MOV     SI,OFFSET CLD1  ; (IP) (-
0FDB  B8 0000                   MOV     AX,0
0FDE  8E D8                     MOV     DS,AX           ;TO VECTOR AREA
0FE0  BB 008C                   MOV     BX,08CH
0FE3  8D 06 0FC3 R              LEA     AX,WRM
0FE7  89 07                     MOV     [BX],AX         ;JUMP TO WRM ON (CTRL-BREAK)
0FE9  43                        INC     BX
0FEA  43                        INC     BX
0FEB  8C 0F                     MOV     [BX],CS
0FED  8C C8                     MOV     AX,CS
0FEF  8E D8                     MOV     DS,AX           ; SET DATA SEG
0FF1  8B 26 0112 R              MOV     SP,WORD PTR ORIG+12H    ;PARAM. STACK
0FF5  8E D0                     MOV     SS,AX           ; SET STACK SEGMENT
0FF7  8E C0                     MOV     ES,AX           ; SET EXTRA SEG
0FF9  FC                        CLD                     ; DIR = INC
0FFA  8B 2E 0126 R              MOV     BP,RPP          ; RETURN STACK
0FFE  E9 0159 R                 JMP     NEXT
                        ;
1001  100A R            CLD1    DW      COLD
                        ;
                        ;       COLD
                        ;
1003  84                        DB      84H
1004  43 4F 4C                  DB      'COL'
1007  C4                        DB      'D'+80H
1008  0FCB R                    DW      WARM-7
100A  0552 R            COLD    DW      DOCOL
100C  12B9 R                    DW      MTBUF
100E  0609 R                    DW      FIRST
1010  123A R 04E8 R             DW      USE.STORE
1014  0609 R                    DW      FIRST
1016  1245 R 04E8 R             DW      PREV,STORE
101A  12CD R                    DW      DRZER
101C  0167 R 0000               DW      LIT,0
1020  0167 R 14CC R             DW      LIT,EPRINT
1024  04E8 R                    DW      STORE
1026  0167 R                    DW      LIT
1028  0112 R                    DW      ORIG+12H
102A  0167 R 0126 R             DW      LIT,UP
102E  04BD R                    DW      AT
1030  0167 R 0006               DW      LIT,6
```

```
1034  040F R                          DW      PLUS
1036  0167 R 0010                     DW      LIT,10H
103A  02F7 R                          DW      CMOVE
103C  0167 R 010C R                   DW      LIT,ORIG+0CH
1040  04BD R                          DW      AT
1042  0167 R 0F3A R                   DW      LIT,FORTH+6
1046  04E8 R                          DW      STORE
1048  0F9A R                          DW      ABORT
```

```
                                PAGE
                        ;       S->D
                        ;
104A  84                        DB      84H
1049  53 2D 3E                  DB      'S->'
104E  C4                        DB      'D'+80H ; 1 WORD TO 2 WORDS
104F  1003 R                    DW      COLD-7
1051  1053 R          STOD      DW      $+2
1053  5A                        POP     DX      ;S1
1054  2B C0                     SUB     AX,AX
1056  0B D2                     OR      DX,DX
1058  79 01                     JNS     STOD1   ;POS
105A  48                        DEC     AX      ;NEG
105B  E9 0157 R           STOD1:  JMP     DPUSH
                        ;
                        ;       <-
                        ;
105E  82                        DB      82H
105F  2B                        DB      '+'
1060  AD                        DB      '-'+80H
1061  104A R                    DW      STOD-7
1063  0552 R          PM        DW      DOCOL
1065  03FD R                    DW      ZLESS
1067  0194 R                    DW      ZBRAN   ;IF
1069  0004                      DW      OFFSET PM1-$
106B  0432 R                    DW      MINUS   ;ENDIF
106D  03A3 R          PM1       DW      SEMIS
                        ;
                        ;       D<-
                        ;
106F  83                        DB      83H
1070  44 2B                     DB      'D+'
1072  AD                        DB      '-'+80H
1073  105E R                    DW      PM-5
1075  0552 R          DPM       DW      DOCOL
1077  03FD R                    DW      ZLESS
1079  0194 R                    DW      ZBRAN   ;IF
107B  0004                      DW      OFFSET DPM1-$
107D  0443 R                    DW      DMINU   ;ENDIF
107F  03A3 R          DPM1      DW      SEMIS
                        ;
                        ;       ABS
                        ;
1081  83                        DB      83H
1082  41 42                     DB      'AB'
1084  D3                        DB      'S'+80H
1085  106F R                    DW      DPM-6
1087  0552 R          ABS1      DW      DOCOL
1089  0482 R                    DW      DUPE
108B  1063 R                    DW      PM
108D  03A3 R                    DW      SEMIS
                        ;
                        ;       DABS
                        ;
108F  84                        DB      84H
1090  44 41 42                  DB      'DAB'
1093  D3                        DB      'S'+80H
1094  1081 R                    DW      ABS1-6
1096  0552 R          DABS      DW      DOCOL
1098  0482 R                    DW      DUPE
109A  1075 R                    DW      DPM
```

```
109C  03A3 R                        DW      SEMIS
                                ;
                                ;       MIN
                                ;
109E  83                            DB      83H
109F  4D 49                         DB      'MI'
10A1  CE                            DB      'N'+80H
10A2  108F R                        DW      DABS-7
10A4  0552 R 0490 R         MIN     DW      DOCOL,TDUP
10A8  07EA R                        DW      GREAT
10AA  0194 R                        DW      ZBRAN   ;IF
10AC  0004                          DW      OFFSET MIN1-$
10AE  0475 R                        DW      SWAP    ;ENDIF
10B0  0468 R                MIN1    DW      DROP
10B2  03A3 R                        DW      SEMIS
                                ;
                                ;       MAX
                                ;
10B4  83                            DB      83H
10B5  4D 41                         DB      'MA'
10B7  D8                            DB      'X'+80H
10B8  109E R                        DW      MIN-6
10BA  0552 R 0490 R         MAX     DW      DOCOL,TDUP
10BE  07AE R                        DW      LESS
10C0  0194 R                        DW      ZBRAN   ;IF
10C2  0004                          DW      OFFSET MAX1-$
10C4  0475 R                        DW      SWAP    ;ENDIF
10C6  0468 R                MAX1    DW      DROP
10C8  03A3 R                        DW      SEMIS
```

```
                                        PAGE
                                ;       M*
                                ;
10CA  82                                DB      82H
10CB  4D                                DB      'M'
10CC  AA                                DB      'M'+80H
10CD  10B4 R                            DW      MAX-6
10CF  0552 R 0490 R             MSTAR   DW      DOCOL, TDUP
10D3  0357 R                            DW      XORR
10D5  03C5 R                            DW      TOR
10D7  1087 R                            DW      ABS1
10D9  0475 R                            DW      SWAP
10DB  1087 R                            DW      ABS1
10DD  030F R                            DW      USTAR
10DF  03D5 R                            DW      FROMR
10E1  1075 R                            DW      DPM
10E3  03A3 R                            DW      SEMIS
                                ;
                                ;       M/
                                ;
10E5  82                                DB      82H
10E6  4D                                DB      'M'
10E7  AF                                DB      '/'+80H
10E8  10CA R                            DW      MSTAR-5
10EA  0552 R                    MSLAS   DW      DOCOL
10EC  0459 R                            DW      OVER
10EE  03C5 R                            DW      TOR
10F0  03C5 R                            DW      TOR
10F2  1096 R                            DW      DABS
10F4  03E3 R                            DW      RR
10F6  1087 R                            DW      ABS1
10F8  031E R                            DW      USLAS
10FA  03D5 R                            DW      FROMR
10FC  03E3 R                            DW      RR
10FE  0357 R                            DW      XORR
1100  1063 R                            DW      PM
1102  0475 R                            DW      SWAP
1104  03D5 R                            DW      FROMR
1106  1063 R                            DW      PM
1108  0475 R                            DW      SWAP
110A  03A3 R                            DW      SEMIS
                                ;
                                ;       *
                                ;
110C  81                                DB      81H
110D  AA                                DB      '*'+80H
110E  10E5 R                            DW      MSLAS-5
1110  0552 R                    STAR    DW      DOCOL
1112  10CF R                            DW      MSTAR
1114  0468 R                            DW      DROP
1116  03A3 R                            DW      SEMIS
                                ;
                                ;       /MOD
                                ;
1118  84                                DB      84H
1119  2F 4D 4F                          DB      '/MO'
111C  C4                                DB      'D'+80H
111D  110C R                            DW      STAR-4
111F  0552 R                    SLMOD   DW      DOCOL
1121  03C5 R                            DW      TOR
1123  1051 R                            DW      STOD
```

```
1125  03D5 R                        DW      FROMR
1127  10EA R                        DW      MSLAS
1129  03A3 R                        DW      SEMIS
                                    ;
                                    ;       /
                                    ;
112B  81                            DB      81H
112C  AF                            DB      '/'+80H
112D  1118 R                        DW      SLMOD-7
112F  0552 R                  SLASH DW      DOCOL
1131  111F R                        DW      SLMOD
1133  0475 R                        DW      SWAP
1135  0468 R                        DW      DROP
1137  03A3 R                        DW      SEMIS
                                    ;
                                    ;       MOD
                                    ;
1139  83                            DB      83H
113A  4D 4F                         DB      'MO'
113C  C4                            DB      'D'+80H
113D  112B R                        DW      SLASH-4
113F  0552 R                  MODD  DW      DOCOL
1141  111F R                        DW      SLMOD
1143  0468 R                        DW      DROP
1145  03A3 R                        DW      SEMIS
                                    ;
                                    ;       */MOD
                                    ;
1147  85                            DB      85H
1148  2A 2F 4D 4F                   DB      '*/MO'
114C  C4                            DB      'D'+80H
114D  1139 R                        DW      MODD-6
114F  0552 R                  SSMOD DW      DOCOL
1151  03C5 R                        DW      TOR
1153  10CF R                        DW      MSTAR
1155  03D5 R                        DW      FROMR
1157  10EA R                        DW      MSLAS
1159  03A3 R                        DW      SEMIS
                                    ;
                                    ;       */
                                    ;
115B  82                            DB      82H
115C  2A                            DB      '*'
115D  AF                            DB      '/'+80H
115E  1147 R                        DW      SSMOD-8
1160  0552 R                  SSLA  DW      DOCOL
1162  114F R                        DW      SSMOD
1164  0475 R                        DW      SWAP
1166  0468 R                        DW      DROP
1168  03A3 R                        DW      SEMIS
                                    ;
                                    ;       M/MOD
                                    ;
116A  85                            DB      85H
116B  4D 2F 4D 4F                   DB      'M/MO'
116F  C4                            DB      'D'+80H
1170  115B R                        DW      SSLA-5
1172  0552 R                  MSMOD DW      DOCOL
1174  03C5 R                        DW      TOR
1176  05C3 R                        DW      ZERO
1178  03E3 R                        DW      RR
```

```
117A  031E R                    DW      USLAS
117C  03D5 R                    DW      FROMR
117E  0475 R                    DW      SWAP
1180  03C5 R                    DW      TOR
1182  031E R                    DW      USLAS
1184  03D5 R                    DW      FROMR
1186  03A3 R                    DW      SEMIS
```

```
                                        PAGE
                                ;       (LINE)
                                ;
1188  86                                DB      86H
1189  28 4C 49 4E 45                    DB      '(LINE'
118E  A9                                DB      ')'+80H
118F  116A R                            DW      SSMOD-8
1191  0552 R                    PLINE   DW      DOCOL
1193  03C5 R                            DW      TOR
1195  0167 R 0040                       DW      LIT,64
1199  0621 R                            DW      BBUF
119B  114F R                            DW      SSMOD
119D  03D5 R                            DW      FROMR
119F  062D R                            DW      BSCR
11A1  1110 R                            DW      STAR
11A3  040F R                            DW      PLUS
11A5  1328 R                            DW      BLOCK
11A7  040F R                            DW      PLUS
11A9  0167 R 0040                       DW      LIT,64
11AD  03A3 R                            DW      SEMIS
                                ;
                                ;       .LINE
                                ;
11AF  85                                DB      85H
11B0  2E 4C 49 4E                       DB      '.LIN'
11B4  C5                                DB      'E'+80H
11B5  1188 R                            DW      PLINE-9
11B7  0552 R                    DLINE   DW      DOCOL
11B9  1191 R                            DW      PLINE
11BB  0A73 R                            DW      DTRAI
11BD  0A3F R                            DW      TYPES
11BF  03A3 R                            DW      SEMIS
                                ;
                                ;       MESSAGE
                                ;
11C1  87                                DB      87H
11C2  4D 45 53 53 41 47                 DB      'MESSAG'
11C8  C5                                DB      'E'+80H
11C9  11AF R                            DW      DLINE-8
11CB  0552 R                    MESS    DW      DOCOL
11CD  0677 R                            DW      WARN
11CF  04BD R                            DW      AT
11D1  0194 R                            DW      ZBRAN   ;IF
11D3  001E                              DW      OFFSET MESS1-$
11D5  0818 R                            DW      DDUP
11D7  0194 R                            DW      ZBRAN   ;IF
11D9  0014                              DW      OFFSET MESS2-$
11DB  0167 R 0004                       DW      LIT,4
11DF  06CF R                            DW      OFSET
11E1  04BD R                            DW      AT
11E3  062D R                            DW      BSCR
11E5  112F R                            DW      SLASH
11E7  0795 R                            DW      SUBB
11E9  11B7 R                            DW      DLINE
11EB  0809 R                            DW      SPACE   ;ENDIF
11ED  0184 R                    MESS2   DW      BRAN    ;ELSE
11EF  000D                              DW      OFFSET MESS3-$
11F1  0AA6 R                    MESS1   DW      PDOTQ
11F3  06                                DB      6
11F4  4D 53 47 20 23 20                 DB      'MSG # '
11FA  1754 R                            DW      DOT     ;ENDIF
```

```
11FC  03A3 R                    MESS3   DW      SEMIS
```

```
                                PAGE
                                %OUT    LINE %3000
                        ;-----------------------------------------------
                        ;
                        ;       8086/88 PORT FETCH AND STORE
                        ;
                        ;-----------------------------------------------
                        ;
                        ;       PC@
                        ;
                        ; FETCH CHARACTER (BYTE) FROM PORT
                        ;
11FE  83                        DB      83H
11FF  50 43                     DB      'PC'
1201  C0                        DB      '@'+80H
1202  11C1 R                    DW      MESS-8AH
1204  1206 R            PTCAT   DW      $+2
1206  5A                        POP     DX      ; PORT ADDR
1207  EC                        IN      AL,DX   ; BYTE INPUT
1208  2A E4                     SUB     AH,AH
120A  E9 0158 R                 JMP     APUSH
                        ;
                        ;       PC!
                        ;
                        ; STORE CHARACTER (BYTE) AT PORT
                        ;
120D  83                        DB      83H
120E  50 43                     DB      'PC'
1210  A1                        DB      '!'+80H
1211  11FE R                    DW      PTCAT-6
1213  1215 R            PTCSTO  DW      $+2
1215  5A                        POP     DX      ;PORT ADDR
1216  58                        POP     AX      ;DATA
1217  EE                        OUT     DX,AL   ; BYTE OUTPUT
1218  E9 0159 R                 JMP     NEXT
                        ;
                        ;       P@
                        ; FETCH WORD FROM PORT
                        ;
121B  82                        DB      82H
121C  50                        DB      'P'
121D  C0                        DB      '@'+80H
121E  120D R                    DW      PTCSTO-6
1220  1222 R            PTAT    DW      $+2
1222  5A                        POP     DX      ;PORT ADDR
1223  ED                        IN      AX,DX   ;WORD INPUT
1224  E9 0158 R                 JMP     APUSH
                        ;
                        ;       PC!
                        ; STORE WORD AT PORT
                        ;
1227  82                        DB      82H
1228  50                        DB      'P'
1229  A1                        DB      '!'+80H
122A  121B R                    DW      PTAT-5
122C  122E R            PTSTO   DW      $+2
122E  5A                        POP     DX      ;PORT ADDR
122F  58                        POP     AX      ;DATA
1230  EF                        OUT     DX,AX   ;WORD OUTPUT
1231  E9 0159 R                 JMP     NEXT
                        ;
```

```
= 0200                  BPS     EQU     512     ;BYTES PER SECTOR
= 0002                  MXDRV   EQU     2       ; MAX # DRIVES
                        ;
                        ;
                        ;       USE
                        ;
1234  83                        DB      83H     ;ADDR OF NEXT BUFR TO USE
1235  55 53                     DB      'US'
1237  C5                        DB      'E'+80H
1238  1227 R                    DW      PTSTO-5
123A  059D R            USE     DW      DOVAR
123C  37F0                      DW BUF1
                        ;
                        ;       PREV
                        ;
123E  84                        DB      84H     ;ADDR OF PREV USED BUFR
123F  50 52 45                  DB      'PRE'
1242  D6                        DB      'V'+80H
1243  1234 R                    DW      USE-6
1245  059D R            PREV    DW      DOVAR
1247  37F0                      DW      BUF1
                        ;
                        ;       SEC/BLK
                        ;
1249  87                        DB      87H     ;# SECTORS/BLOCK
124A  53 45 43 2F 42 4C         DB      'SEC/BL'
1250  CB                        DB      'K'+80H
1251  123E R                    DW      PREV-7
1253  0584 R            SPBLK   DW      DOCON
1255  0001                      DW      KBBUF/BPS
```

```
                                        PAGE
                                ;       #BUFF
                                ;
1257  85                                DB      85H     ;NO. OF BUFFERS
1258  23 42 55 46                       DB      '#BUF'
125C  C6                                DB      'F'+80H
125D  1249 R                            DW      SPBLK-10
125F  0584 R 0004               NOBUF   DW      DOCON,NBUF
                                ;
                                ;       +BUF
                                ;
1263  84                                DB      84H
1264  2B 42 55                          DB      '+BU'
1267  C6                                DB      'F'+80H
1268  1257 R                            DW      NOBUF-8
126A  0552 R                    PBUF    DW      DOCOL
126C  0167 R 0204                       DW      LIT,CD
1270  040F R 0482 R                     DW      PLUS,DUPE
1274  0615 R 07A2 R                     DW      LIMIT,EQUAL
1278  0194 R                            DW      ZBRAN
127A  0006                              DW      OFFSET PBUF1-$
127C  0468 R 0609 R                     DW      DROP,FIRST
1280  0482 R 1245 R             PBUF1   DW      DUPE,PREV
1284  04BD R 0795 R                     DW      AT,SUBB
1288  03A3 R                            DW      SEMIS
                                ;
                                ;       UPDATE
                                ;
128A  86                                DB      86H
128B  55 50 44 41 54                    DB      'UPDAT'
1290  C5                                DB      'E'+80H
1291  1263 R                            DW      PBUF-7
1293  0552 R 1245 R             UPDAT   DW      DOCOL,PREV
1297  04BD R 04BD R                     DW      AT,AT
129B  0167 R 8000                       DW      LIT,8000H
129F  0348 R                            DW      ORR
12A1  1245 R 04BD R                     DW      PREV,AT
12A5  04E8 R 03A3 R                     DW      STORE,SEMIS
                                ;
                                ;       EMPTY-BUFFERS
                                ;
12A9  8D                                DB      8DH
12AA  45 4D 50 54 59 2D                 DB      'EMPTY-BUFFER'
      42 55 46 46 45 52
12B6  D3                                DB      'S'+80H
12B7  128A R                            DW      UPDAT-9
12B9  0552 R 0609 R             MTBUF   DW      DOCOL,FIRST
12BD  0615 R 0459 R                     DW      LIMIT,OVER
12C1  0795 R 0BDC R                     DW      SUBB,ERASEE
12C5  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       DR0
                                ;
12C7  83                                DB      83H
12C8  44 52                             DB      'DR'
12CA  B0                                DB      '0'+80H
12CB  1299 R                            DW      MTBUF-16
12CD  0552 R 05C3 R             DRZER   DW      DOCOL,ZERO
12D1  06CF R 04EB R                     DW      OFSET,STORE
12D5  03A3 R                            DW      SEMIS
                                ;
                                ;       BUFFER
                                ;
                                ; NOTE: THIS WORD WON'T WORK IF ONLY
                                ;       USING SINGLE BUFFER
                                ;
12D7  86                                DB      86H
12D8  42 55 46 46 45                    DB      'BUFFE'
12DD  D2                                DB      'R'+80H
12DE  12C7 R                            DW      DRZER-6
12E0  0552 R 123A R             BUFFE   DW      DOCOL,USE
12E4  04BD R 0482 R                     DW      AT,DUPE
12E8  03C5 R                            DW      TOR
12EA  126A R                    BUFF1   DW      PBUF
12EC  0194 R                            DW      ZBRAN
12EE  FFFC                              DW      OFFSET BUFF1-$
12F0  123A R 04E8 R                     DW      USE,STORE
12F4  03E3 R 04BD R                     DW      RR,AT
12F8  03FD R                            DW      ZLESS
12FA  0194 R                            DW      ZBRAN
12FC  0014                              DW      OFFSET BUFF2-$
12FE  03E3 R 0748 R                     DW      RR,TWOP
1302  03E3 R 04BD R                     DW      RR,AT
1306  0167 R 7FFF                       DW      LIT,7FFFH
130A  033A R 05C3 R                     DW      ANDD,ZERO
130E  1402 R                            DW      RSLW
1310  03E3 R 04E8 R             BUFF2   DW      RR,STORE
1314  03E3 R 1245 R                     DW      RR,PREV
1318  04E8 R 03D5 R                     DW      STORE,FROMR
131C  0748 R 03A3 R                     DW      TWOP,SEMIS
```

```
                                        PAGE
                                ;       BLOCK
                                ;
1320  85                                DB      85H
1321  42 4C 4F 43                       DB      'BLOC'
1325  CB                                DB      'K'+80H
1326  12D7 R                            DW      BUFFE-9
1328  0552 R 06CF R             BLOCK   DW      DOCOL,OFSET
132C  04BD R 040F R                       DW      AT,PLUS
1330  03C5 R 1245 R                       DW      TOR,PREV
1334  04BD R 0482 R                       DW      AT,DUPE
1338  04BD R 03E3 R                       DW      AT,RR
133C  0795 R                              DW      SUBB
133E  0482 R 040F R                       DW      DUPE,PLUS
1342  0194 R                              DW      ZBRAN
1344  0034                                DW      OFFSET BLOC1-$
1346  126A R 03EA R             BLOC2   DW      PBUF,ZEQU
134A  0194 R                              DW      ZBRAN
134C  0014                                DW      OFFSET BLOC3-$
134E  0468 R 03E3 R                       DW      DROP,RR
1352  12E0 R 0482 R                       DW      BUFFE,DUPE
1356  03E3 R 05CE R                       DW      RR,ONE
135A  1402 R                              DW      RSLW
135C  05DA R 0795 R                       DW      TWO,SUBB
1360  0482 R 04BD R             BLOC3   DW      DUPE,AT
1364  03E3 R 0795 R                       DW      RR,SUBB
1368  0482 R 040F R                       DW      DUPE,PLUS
136C  03EA R                              DW      ZEQU
136E  0194 R                              DW      ZBRAN
1370  FFD6                                DW      OFFSET BLOC2-$
1372  0482 R 1245 R                       DW      DUPE,PREV
1376  04E8 R                              DW      STORE
1378  03D5 R 0468 R             BLOC1   DW      FROMR,DROP
137C  0748 R 03A3 R                       DW      TWOP,SEMIS
```

```
                                PAGE
1380  44 49 53 48 20 57         WERR    DB      'DISK WRITE ERROR  $'
      52 49 54 45 20 45
      52 52 4F 52 20 20
      24
1393  44 49 53 48 20 52         RERR    DB      'DISK READ ERROR   $'
      45 41 44 20 45 52
      52 4F 52 20 20 20
      24

                                ;
13A6                            SSEC    PROC    NEAR
                                ;       ( ADDR  SEC# -- )
                                ;       THIS ROUTINE WILL SELECT THE HEAD & DRIVE
13A6  5F                                POP     DI      ;SAVE RETURN
13A7  58                                POP     AX      ;SECTOR #
13A8  3D 0168                           CMP     AX,SEC_DSK      ;B DRIVE?
13AB  72 0A                             JB      DR0
13AD  2D 0168                           SUB     AX,SEC_DSK
13B0  8B D0                             MOV     DX,AX   ;LOAD LOGICAL SECTOR #
13B2  B0 01                             MOV     AL,1    ;SELECT DR B
13B4  EB 05 90                          JMP     GSEC1
13B7  8B D0                     DR0:    MOV     DX,AX   ;DR A
13B9  B0 00                             MOV     AL,0    ;SELECT DR A
13BB  5B                        GSEC1:  POP     BX      ;TRANSFER ADDR
13BC  B9 0001                           MOV     CX,1    ;READ 1 SECTOR
13BF  57                                PUSH    DI      ;GET THAT RETURN BACK
13C0  C3                                RET
13C1                            SSEC    ENDP
                                ;
                                ;       RSEC
                                ;
13C1  84                                DB      84H
13C2  52 53 45                          DB      'RSE'
13C5  C3                                DB      'C'+80H
13C6  1320 R                            DW      BLOCK-8
13C8  13CA R                    RSEC    DW      $+2
13CA  EB 13A6 R                         CALL    SSEC
13CD  56                                PUSH    SI      ;PRESERVE INTERPRETER POINTER
13CE  55                                PUSH    BP      ;RETURN POINTER
13CF  CD 25                             INT     25H
13D1  73 23                             JNC     DOK     ;NO ERRORS
13D3  8D 16 1393 R                      LEA     DX,RERR
13D7  EB 17 90                          JMP     DERR
                                ;
                                ;       WSEC
                                ;
13DA  84                                DB      84H
13DB  57 53 45                          DB      'WSE'
13DE  C3                                DB      'C'+80H
13DF  13C1 R                            DW      RSEC-7
13E1  13E3 R                    WSEC    DW      $+2
13E3  EB 13A6 R                         CALL    SSEC
13E6  56                                PUSH    SI
13E7  55                                PUSH    BP
13E8  CD 26                             INT     26H
13EA  73 0A                             JNC     DOK
13EC  8D 16 1380 R                      LEA     DX,WERR
13F0  50                        DERR:   PUSH    AX
13F1  B4 09                             MOV     AH,9    ;STRING WRITE FNCN
13F3  CD 21                             INT     21H
13F5  58                                POP     AX      ;ERROR CODE IN AX
```

```
                        ;  WRITE ERROR MESSAGE HERE
                        ;
13F6  9D                DOK:    POPF            ;POP FLAGS
13F7  5D                        POP     BP      ;RETURN STACK
13F8  5E                        POP     SI      ;INTERPRETER PNTR
13F9  E9 0159 R                 JMP     NEXT
                        ;
                        ;       R/W
                        ;
                        ;       ( ADDR  SECTOR#  FLAG (0=W, 1=R) --- )
13FC  83                        DB      83H
13FD  52 2F                     DB      'R/'
13FF  D7                        DB      'W'+80H
1400  13DA R                    DW      WSEC-7
1402  0552 R            RSLW  DW      DOCOL
1404  0194 R 0008               DW      ZBRAN,OFFSET RSLW1-$
1408  13C8 R                    DW      RSEC
140A  0184 R 0004               DW      BRAN,OFFSET RSLW2-$
140E  13E1 R            RSLW1 DW      WSEC
1410  03A3 R            RSLW2 DW      SEMIS
```

```
                                        PAGE
                                ;       FLUSH
                                ;
1412  85                                DB      85H
1413  46 4C 55 53                       DB      'FLUS'
1417  C8                                DB      'H'+80H
1418  13FC R                            DW      RSLW-6
141A  0552 R                    FLUSH   DW      DOCOL
141C  125F R 073C R                     DW      NOBUF,ONEP
1420  05C3 R 01EC R                     DW      ZERO,XDO
1424  05C3 R 12E0 R             FLUS1   DW      ZERO,BUFFE
1428  0468 R                            DW      DROP
142A  01A8 R                            DW      XLOOP
142C  FFF8                              DW      OFFSET FLUS1-$
142E  03A3 R                            DW      SEMIS
                                ;
                                ;       LOAD
                                ;
1430  84                                DB      84H
1431  4C 4F 41                          DB      'LOA'
1434  C4                                DB      'D'+80H
1435  1412 R                            DW      FLUSH-8
1437  0552 R 06A5 R             LOAD    DW      DOCOL,BLK
143B  04BD R 03C5 R                     DW      AT,TOR
143F  06AE R 04BD R                     DW      INN,AT
1443  03C5 R 05C3 R                     DW      TOR,ZERO
1447  06AE R 04E8 R                     DW      INN,STORE
144B  062D R 1110 R                     DW      BSCR,STAR
144F  06A5 R 04E8 R                     DW      BLK,STORE       ;BLK (- SCR * B/SCR
1453  0E9D R                            DW      INTER   ;INTERPRET FROM OTHER
1455  03D5 R 06AE R             SCREEN  DW      FROMR,INN
1459  04E8 R                            DW      STORE
145B  03D5 R 06A5 R                     DW      FROMR,BLK
145F  04E8 R                            DW      STORE
1461  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       -->
                                ;
1463  C3                                DB      0C3H
1464  2D 2D                             DB      '--'
1466  BE                                DB      ')'+80H
1467  1430 R                            DW      LOAD-7
1469  0552 R                    ARROW   DW      DOCOL
146B  0939 R                            DW      QLOAD
146D  05C3 R                            DW      ZERO
146F  06AE R                            DW      INN
1471  04E8 R                            DW      STORE
1473  062D R                            DW      BSCR
1475  06A5 R                            DW      BLK
1477  04BD R                            DW      AT
1479  0459 R                            DW      OVER
147B  113F R                            DW      MODD
147D  0795 R                            DW      SUBB
147F  06A5 R                            DW      BLK
1481  049E R                            DW      PSTOR
1483  03A3 R                            DW      SEMIS
```

```
                                PAGE
                        ;
                        ;-------------------------------
                        ; QUERY KEYBOARD FOR KEY PRESSED
                        ;-------------------------------
                        ;
                        ; ( TRUE = CHAR READY, FALSE = NO CHAR )
                        ;
                        ; CALLED FROM  "?TERMINAL"
                        ;
                        ; USE 'KEY' TO GET KEY VALUE
                        ;
1485  E8 14CE R         PQTER:  CALL    CSTAT   ;TEST FOR KEY
1488  0A C0                    OR      AL,AL   ;ANY KEY?
148A  74 02                    JZ      PQTER1  ;NO
148C  B0 01                    MOV     AL,1    ;TRUE = CHAR FOUND
148E  B4 00             PQTER1: MOV     AH,0    ;MAKE 16 BITS
1490  E9 0158 R                 JMP     APUSH   ;SAVE STATUS
                        ;
                        ;-------------------------
                        ; CONSOLE INPUT ROUTINE
                        ;-------------------------
                        ;
                        ; WAITS FOR A KEYBOARD CHAR
                        ;
                        ; CTRL-P WILL TOGGLE PRINTER ECHO FLAG
                        ;
                        ; CALLED FROM 'KEY'
                        ;
1493  E8 14D9 R         PKEY:   CALL    CI      ;CONSOLE INPUT
1496  3C 10                    CMP     AL,DLE  ;PRINTER TOGGLE?
1498  75 08                    JNE     PKEY1   ;NO
149A  80 36 14CC R 01 90        XOR     EPRINT,1        ;TOGGLE ECHO
14A0  EB F1                    JMP     PKEY    ;GET ANOTHER KEY
14A2  B4 00             PKEY1: MOV     AH,0    ;MAKE 16 BITS
14A4  E9 0158 R                 JMP     APUSH   ;SAVE KEY VALUE
                        ;
                        ;-------------------------------------
                        ; CONSOLE/PRINTER CHAR OUTPUT
                        ;-------------------------------------
                        ;
                        ; CALLED FROM 'EMIT'
                        ;
14A7  14A9 R            PEMIT   DW      $+2
14A9  58                        POP     AX      ;GET CHAR
14AA  E8 14BD R                 CALL    POUT    ;CHAR OUTPUT
14AD  E9 0159 R                 JMP     NEXT
```

```
                                PAGE
                        ;-------------------------------
                        ; CRLF TO CONSOLE/PRINTER
                        ;-------------------------------
                        ;
                        ; CALLED FROM 'CR'
                        ;
14B0  B0 0D             PCR:    MOV     AL,ACR
14B2  E8 14BD R                 CALL    POUT    ;CHAR OUTPUT
14B5  B0 0A                     MOV     AL,LF
14B7  E8 14BD R                 CALL    POUT
14BA  E9 0159 R                 JMP     NEXT
                        ;
                        ;-------------------------------------
                        ; TRUE CONSOLE/PRINTER OUTPUT ROUTINE
                        ;-------------------------------------
                        ;
14BD                    POUT    PROC    NEAR
14BD  E8 14DE R                 CALL    CHO     ;CONSOLE OUT
14C0  F6 06 14CC R 01 90        TEST    EPRINT,1        ;PRINTER ECHO?
14C5  74 03                     JZ      POUT1   ;OFF
14C8  E8 14E9 R                 CALL    LO      ;LIST OUTPUT
14CB  C3                POUT1:  RET
14CC                    POUT    ENDP
                        ;
                        ; PRINTER ECHO FLAG
                        ;
                        ; VALUE: 0 = OFF, 1 = ON
                        ;
14CC  00 00             EPRINT  DB      0,0
                        ;
                        ;-----------------------
                        ; GET KEYBOARD STATUS
                        ;-----------------------
                        ;
                        ; RETURNS KEYBOARD STATUS
                        ;
                        ;
                        ; EXIT: REG AL = 0 IF NO KEY PRESSED
                        ;       REG AL = CHAR IF  KEY PRESSED
                        ;
14CE                    CSTAT   PROC    NEAR
14CE  52                        PUSH    DX
14CF  BA 00FF                   MOV     DX,0FFH
14D2  B8 0600                   MOV     AX,0600H
14D5  CD 21                     INT     21H
14D7  5A                        POP     DX
14D8  C3                STATRT: RET
14D9                    CSTAT   ENDP
                        ;
                        ;-----------------------
                        ; CONSOLE INPUT
                        ;-----------------------
                        ;
                        ; WAITS FOR KEY FROM KEYBOARD
                        ;
14D9                    CI      PROC    NEAR
14D9  B4 00                     MOV     AH,0    ; READ CHAR FUNCTION
14DB  CD 16                     INT     16H
14DD  C3                        RET
14DE                    CI      ENDP
```

```
                        PAGE
                        ;-----------------
                        ; CONSOLE OUTPUT
                        ;-----------------
                        ;
                        ; OUTPUTS CHAR IN REG AL TO CONSOLE
                        ;
                        ; EXIT: REG AL = CHAR
                        ;
14DE                    CHO     PROC    NEAR
14DE  52                        PUSH    DX
14DF  50                        PUSH    AX      ;SAVE CHAR
14E0  8A D0                     MOV     DL,AL   ;CHAR TO WRITE
14E2  B4 02                     MOV     AH,2    ;CHAR OUT FUNCTION
14E4  CD 21                     INT     21H     ;DOS
14E6  58                        POP     AX
14E7  5A                        POP     DX
14E8  C3                        RET
14E9                    CHO     ENDP
                        ;
                        ;---------------------
                        ;       LIST OUTPUT
                        ;---------------------
                        ;
                        ; OUTPUTS CHAR IN REG AL TO
                        ; LIST DEVICE (PRINTER)
                        ;
                        ; EXIT: REG AL = CHAR
                        ;
14E9                    LO      PROC    NEAR
14E9  50                        PUSH    AX      ;SAVE CHAR
14EA  52                        PUSH    DX
14EB  BA 0000                   MOV     DX,PRINTER_NO
14EE  B4 00                     MOV     AH,0    ;PRINT CHAR
14F0  CD 17                     INT     17H
14F2  5A                        POP     DX
14F3  58                        POP     AX
14F4  C3                        RET
14F5                    LO      ENDP
```

```
                                PAGE
                                %OUT    LINE *3500
                        ;       '
                        ;
14F5  C1                        DB      0C1H
14F6  A7                        DB      0A7H
14F7  1463 R                    DW      ARROW-6
14F9  0552 R            TICK    DW      DOCOL
14FB  0D1B R                    DW      DFIND
14FD  03EA R                    DW      ZEQU
14FF  05C3 R                    DW      ZERO
1501  08C0 R                    DW      QERR
1503  0468 R                    DW      DROP
1505  0E35 R                    DW      LITER
1507  03A3 R                    DW      SEMIS
                        ;
                        ;       FORGET
                        ;
1509  86                        DB      86H
150A  46 4F 52 47 45            DB      'FORGE'
150F  D4                        DB      'T'+80H
1510  14F5 R                    DW      TICK-4
1512  0552 R            FORG    DW      DOCOL
1514  06EB R                    DW      CURR
1516  04BD R                    DW      AT
1518  06DD R                    DW      CONT
151A  04BD R                    DW      AT
151C  0795 R                    DW      SUBB
151E  0167 R 0018               DW      LIT,18H
1522  08C0 R                    DW      QERR
1524  14F9 R                    DW      TICK
1526  0482 R                    DW      DUPE
1528  0683 R                    DW      FENCE
152A  04BD R                    DW      AT
152C  07AE R                    DW      LESS
152E  0167 R 0015               DW      LIT,15H
1532  08C0 R                    DW      QERR
1534  0482 R                    DW      DUPE
1536  0882 R                    DW      NFA
1538  068C R                    DW      DP
153A  04E8 R                    DW      STORE
153C  0864 R                    DW      LFA
153E  04BD R                    DW      AT
1540  06DD R                    DW      CONT
1542  04BD R                    DW      AT
1544  04E8 R                    DW      STORE
1546  03A3 R                    DW      SEMIS
```

```
                                        PAGE
                                ;       BACK
                                ;
1548  84                                DB      84H
1549  42 41 43                         DB      'BAC'
154C  CB                                DB      'K'+80H
154D  1509 R                            DW      FORS-9
154F  0552 R                    BACK    DW      DOCOL
1551  0758 R                            DW      HERE
1553  0795 R                            DW      SUBB
1555  0774 R                            DW      COMMA
1557  03A3 R                            DW      SEMIS
                                ;
                                ;       BEGIN
                                ;
1559  C5                                DB      0C5H
155A  42 45 47 49                       DB      'BEGI'
155E  CE                                DB      'N'+80H
155F  1548 R                            DW      BACK-7
1561  0552 R                    BEGIN   DW      DOCOL
1563  08DA R                            DW      QCOMP
1565  0758 R                            DW      HERE
1567  05CE R                            DW      ONE
1569  03A3 R                            DW      SEMIS
                                ;
                                ;       ENDIF
                                ;
156B  C5                                DB      0C5H
156C  45 4E 44 49                       DB      'ENDI'
1570  C6                                DB      'F'+80H
1571  1559 R                            DW      BEGIN-8
1573  0552 R                    ENDIFF  DW      DOCOL
1575  08DA R                            DW      QCOMP
1577  05DA R                            DW      TWO
1579  0909 R                            DW      QPAIR
157B  0758 R                            DW      HERE
157D  0459 R                            DW      OVER
157F  0795 R                            DW      SUBB
1581  0475 R                            DW      SWAP
1583  04E8 R                            DW      STORE
1585  03A3 R                            DW      SEMIS
```

```
                                PAGE
                        ;       THEN
                        ;
1587  C4                        DB      0C4H
1588  54 48 45                  DB      'THE'
158B  CE                        DB      'N'+80H
158C  156B R                    DW      ENDIFF-8
158E  0552 R            THEN    DW      DOCOL
1590  1573 R                    DW      ENDIFF
1592  03A3 R                    DW      SEMIS
                        ;
                        ;       DO
                        ;
1594  C2                        DB      0C2H
1595  44                        DB      'D'
1596  CF                        DB      'O'+80H
1597  1587 R                    DW      THEN-7
1599  0552 R            DO      DW      DOCOL
159B  0953 R                    DW      COMP
159D  01EC R                    DW      XDO
159F  0758 R                    DW      HERE
15A1  05E6 R                    DW      THREE
15A3  03A3 R                    DW      SEMIS
                        ;
                        ;       LOOP
                        ;
15A5  C4                        DB      0C4H
15A6  4C 4F 4F                  DB      'LOO'
15A9  D0                        DB      'P'+80H
15AA  1594 R                    DW      DO-5
15AC  0552 R            LOOPC   DW      DOCOL
15AE  05E6 R                    DW      THREE
15B0  0909 R                    DW      QPAIR
15B2  0953 R                    DW      COMP
15B4  01A8 R                    DW      XLOOP
15B6  154F R                    DW      BACK
15B8  03A3 R                    DW      SEMIS
```

```
                                        PAGE
                                ;       +LOOP
                                ;
15BA  C5                                DB      0C5H
15BB  2B 4C 4F 4F                       DB      '+LOO'
15BF  D0                                DB      'P'+80H
15C0  15A5 R                            DW      LOOPC-7
15C2  0552 R                    PLOOP   DW      DOCOL
15C4  05E6 R                            DW      THREE
15C6  0909 R                            DW      QPAIR
15C8  0953 R                            DW      COMP
15CA  01E0 R                            DW      XPLOO
15CC  154F R                            DW      BACK
15CE  03A3 R                            DW      SEMIS
                                ;
                                ;       UNTIL
                                ;
15D0  C5                                DB      0C5H
15D1  55 4E 54 49                       DB      'UNTI'
15D5  CC                                DB      'L'+80H
15D6  15BA R                            DW      PLOOP-8
15D8  0552 R                    UNTIL   DW      DOCOL
15DA  05CE R                            DW      ONE
15DC  0909 R                            DW      QPAIR
15DE  0953 R                            DW      COMP
15E0  0194 R                            DW      ZBRAN
15E2  154F R                            DW      BACK
15E4  03A3 R                            DW      SEMIS
                                ;
                                ;       END
                                ;
15E6  C3                                DB      0C3H
15E7  45 4E                             DB      'EN'
15E9  C4                                DB      'D'+80H
15EA  15D0 R                            DW      UNTIL-8
15EC  0552 R                    ENDD    DW      DOCOL
15EE  15D8 R                            DW      UNTIL
15F0  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       AGAIN
                                ;
15F2  C5                                DB      0C5H
15F3  41 47 41 49                       DB      'AGAI'
15F7  CE                                DB      'N'+80H
15F8  15E6 R                            DW      ENDD-6
15FA  0552 R                    AGAIN   DW      DOCOL
15FC  05CE R                            DW      ONE
15FE  0909 R                            DW      QPAIR
1600  0953 R                            DW      COMP
1602  0184 R                            DW      BRAN
1604  154F R                            DW      BACK
1606  03A3 R                            DW      SEMIS
                                ;
                                ;       REPEAT
                                ;
1608  C6                                DB      0C6H
1609  52 45 50 45 41                    DB      'REPEA'
160E  D4                                DB      'T'+80H
160F  15F2 R                            DW      AGAIN-8
1611  0552 R                    REPEA   DW      DOCOL
1613  03C5 R                            DW      TOR
1615  03C5 R                            DW      TOR
1617  15FA R                            DW      AGAIN
1619  03D5 R                            DW      FROMR
161B  03D5 R                            DW      FROMR
161D  05DA R                            DW      TWO
161F  0795 R                            DW      SUBB
1621  1573 R                            DW      ENDIFF
1623  03A3 R                            DW      SEMIS
                                ;
                                ;       IF
                                ;
1625  C2                                DB      0C2H
1626  49                                DB      'I'
1627  C6                                DB      'F'+80H
1628  1608 R                            DW      REPEA-9
162A  0552 R                    IFF     DW      DOCOL
162C  0953 R                            DW      COMP
162E  0194 R                            DW      ZBRAN
1630  0758 R                            DW      HERE
1632  05C3 R                            DW      ZERO
1634  0774 R                            DW      COMMA
1636  05DA R                            DW      TWO
1638  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       ELSE
                                ;
163A  C4                                DB      0C4H
163B  45 4C 53                          DB      'ELS'
163E  C5                                DB      'E'+80H
163F  1625 R                            DW      IFF-5
1641  0552 R                    ELSEE   DW      DOCOL
1643  05DA R                            DW      TWO
1645  0909 R                            DW      QPAIR
1647  0953 R                            DW      COMP
1649  0184 R                            DW      BRAN
164B  0758 R                            DW      HERE
164D  05C3 R                            DW      ZERO
164F  0774 R                            DW      COMMA
1651  0475 R                            DW      SWAP
1653  05DA R                            DW      TWO
1655  1573 R                            DW      ENDIFF
1657  05DA R                            DW      TWO
1659  03A3 R                            DW      SEMIS
                                ;
                                ;       WHILE
                                ;
165B  C5                                DB      0C5H
165C  57 48 49 4C                       DB      'WHIL'
1660  C5                                DB      'E'+80H
1661  163A R                            DW      ELSEE-7
1663  0552 R                    WHILE   DW      DOCOL
1665  162A R                            DW      IFF
1667  0748 R                            DW      TWOP
1669  03A3 R                            DW      SEMIS
```

```
                                PAGE
                        ;       SPACES
                        ;
166B  86                        DB      86H
166C  53 50 41 43 45            DB      'SPACE'
1671  D3                        DB      'S'+80H
1672  165B R                    DW      WHILE-8
1674  0552 R            SPACS   DW      DOCOL
1676  05C3 R                    DW      ZERO
1678  10BA R                    DW      MAX
167A  0818 R                    DW      DDUP
167C  0194 R                    DW      ZBRAN
167E  000C                      DW      OFFSET SPAX1-$
1680  05C3 R                    DW      ZERO
1682  01EC R                    DW      XDO     ;DO
1684  0809 R            SPAX2   DW      SPACE
1686  01A8 R                    DW      XLOOP   ;LOOP
1688  FFFC                      DW      OFFSET SPAX2-$
168A  03A3 R            SPAX1   DW      SEMIS
                        ;
                        ;       (#
                        ;
168C  82                        DB      82H
168D  3C                        DB      '('
168E  A3                        DB      '#'+80H
168F  166B R                    DW      SPACS-9
1691  0552 R            BDIGS   DW      DOCOL
1693  0C14 R                    DW      PAD
1695  0733 R                    DW      HLD
1697  04E8 R                    DW      STORE
1699  03A3 R                    DW      SEMIS
                        ;
                        ;       #)
                        ;
169B  82                        DB      82H
169C  23                        DB      '#'
169D  BE                        DB      ')'+80H
169E  168C R                    DW      BDIGS-5
16A0  0552 R            EDIGS   DW      DOCOL
16A2  0468 R                    DW      DROP
16A4  0468 R                    DW      DROP
16A6  0733 R                    DW      HLD
16A8  04BD R                    DW      AT
16AA  0C14 R                    DW      PAD
16AC  0459 R                    DW      OVER
16AE  0795 R                    DW      SUBB
16B0  03A3 R                    DW      SEMIS
```

```
                                        PAGE
                                ;       SIGN
                                ;
16B2  84                                DB      84H
16B3  53 49 47                          DB      'SIG'
16B6  CE                                DB      'N'+80H
16B7  1698 R                            DW      EDIGS-5
16B9  0552 R                    SIGN    DW      DOCOL
16BB  07F8 R                            DW      ROT
16BD  03FD R                            DW      ZLESS
16BF  0194 R                            DW      ZBRAN   ;IF
16C1  0008                              DW      OFFSET SIGN1-$
16C3  0167 R 002D                       DW      LIT,2DH
16C7  0BFC R                            DW      HOLD    ;ENDIF
16C9  03A3 R                    SIGN1   DW      SEMIS
                                ;
                                ;       $
                                ;
16CB  81                                DB      81H
16CC  A3                                DB      '#'+80H
16CD  16B2 R                            DW      SIGN-7
16CF  0552 R                    DIG     DW      DOCOL
16D1  0702 R                            DW      BASE
16D3  048D R                            DW      AT
16D5  1172 R                            DW      MSMOD
16D7  07F8 R                            DW      ROT
16D9  0167 R 0009                       DW      LIT,9
16DD  0459 R                            DW      OVER
16DF  07AE R                            DW      LESS
16E1  0194 R                            DW      ZBRAN   ;IF
16E3  0008                              DW      OFFSET DIG1-$
16E5  0167 R 0007                       DW      LIT,7
16E9  040F R                            DW      PLUS    ;ENDIF
16EB  0167 R 0030               DIG1    DW      LIT,30H
16EF  040F R                            DW      PLUS
16F1  0BFC R                            DW      HOLD
16F3  03A3 R                            DW      SEMIS
                                ;
                                ;       #S
                                ;
16F5  82                                DB      82H
16F6  23                                DB      '#'
16F7  D3                                DB      'S'+80H
16F8  16CB R                            DW      DIG-4
16FA  0552 R                    DIGS    DW      DOCOL
16FC  16CF R                    DIGS1   DW      DIG     ;BEGIN
16FE  0459 R                            DW      OVER
1700  0459 R                            DW      OVER
1702  0348 R                            DW      ORR
1704  03EA R                            DW      ZEQU
1706  0194 R                            DW      ZBRAN   ;UNTIL
1708  FFF4                              DW      OFFSET DIGS1-$
170A  03A3 R                            DW      SEMIS
                                ;
                                ;       D.R.
                                ;
170C  83                                DB      83H
170D  44 2E                             DB      'D.'
170F  D2                                DB      'R'+80H
1710  16F5 R                            DW      DIGS-5
1712  0552 R                    DDOTR   DW      DOCOL
```

```
1714  03C5 R                        DW      TOR
1716  0475 R                        DW      SWAP
1718  0459 R                        DW      OVER
171A  1096 R                        DW      DABS
171C  1691 R                        DW      BDIGS
171E  16FA R                        DW      DIGS
1720  16B9 R                        DW      SIGN
1722  16A0 R                        DW      EDIGS
1724  03D5 R                        DW      FROMR
1726  0459 R                        DW      OVER
1728  0795 R                        DW      SUBB
172A  1674 R                        DW      SPACS
172C  0A3F R                        DW      TYPES
172E  03A3 R                        DW      SEMIS
                              ;
                              ;       .R
                              ;
1730  82                            DB      82H
1731  2E                            DB      '.'
1732  D2                            DB      'R'+80H
1733  170C R                        DW      DDOTR-6
1735  0552 R                  DOTR  DW      DOCOL
1737  03C5 R                        DW      TOR
1739  1051 R                        DW      STOD
173B  03D5 R                        DW      FROMR
173D  1712 R                        DW      DDOTR
173F  03A3 R                        DW      SEMIS
```

```
                                PAGE
                        ;       D.
                        ;
1741  82                        DB      82H
1742  44                        DB      'D'
1743  AE                        DB      '.'+80H
1744  1730 R                    DW      DOTR-5
1746  0552 R            DDOT    DW      DOCOL
1748  05C3 R                    DW      ZERO
174A  1712 R                    DW      DDOTR
174C  0809 R                    DW      SPACE
174E  03A3 R                    DW      SEMIS
                        ;
                        ;       .
                        ;
1750  81                        DB      81H
1751  AE                        DB      '.'+80H
1752  1741 R                    DW      DDOT-5
1754  0552 R            DOT     DW      DOCOL
1756  1051 R                    DW      STOD
1758  1746 R                    DW      DDOT
175A  03A3 R                    DW      SEMIS
                        ;
                        ;       ?
                        ;
175C  81                        DB      81H
175D  BF                        DB      '?'+80H
175E  1750 R                    DW      DOT-4
1760  0552 R            QUES    DW      DOCOL
1762  04BD R                    DW      AT
1764  1754 R                    DW      DOT
1766  03A3 R                    DW      SEMIS
                        ;
                        ;       U.
                        ;
1768  82                        DB      82H
1769  55                        DB      'U'
176A  AE                        DB      '.'+80H
176B  175C R                    DW      QUES-4
176D  0552 R            UDOT    DW      DOCOL
176F  05C3 R                    DW      ZERO
1771  1746 R                    DW      DDOT
1773  03A3 R                    DW      SEMIS
```

```
                                PAGE
                                %OUT    LINE ~4000
                        ;       VLIST
                        ;
1775  85                        DB      85H
1776  56 4C 49 53               DB      'VLIS'
177A  D4                        DB      'T'+80H
177B  1768 R                    DW      UDOT-5
177D  0552 R            VLIST   DW      DOCOL
177F  0167 R 0080               DW      LIT,80H
1783  06B8 R                    DW      OUTT
1785  04E8 R                    DW      STORE
1787  06DD R                    DW      CONT
1789  04BD R                    DW      AT
178B  04BD R                    DW      AT
178D  06B8 R            VLIS1   DW      OUTT    ;BEGIN
178F  04BD R                    DW      AT
1791  05FD R                    DW      CSLL
1793  07EA R                    DW      GREAT
1795  0194 R                    DW      ZBRAN   ;IF
1797  000A                      DW      OFFSET VLIS2-$
1799  02EA R                    DW      CR
179B  05C3 R                    DW      ZERO
179D  06B8 R                    DW      OUTT
179F  04E8 R                    DW      STORE   ;ENDIF
17A1  0482 R            VLIS2   DW      DUPE
17A3  0D8A R                    DW      IDDOT
17A5  0809 R                    DW      SPACE
17A7  0809 R                    DW      SPACE
17A9  0898 R                    DW      PFA
17AB  0864 R                    DW      LFA
17AD  04BD R                    DW      AT
17AF  0482 R                    DW      DUPE
17B1  03EA R                    DW      ZEQU
17B3  02E0 R                    DW      QTERM
17B5  0348 R                    DW      ORR
17B7  0194 R                    DW      ZBRAN   ;UNTIL
17B9  FFD4                      DW      OFFSET VLIS1-$
17BB  0468 R                    DW      DROP
17BD  03A3 R                    DW      SEMIS
                        ;
                        ;       BYE
                        ;
                        ; EXIT TO PC-DOS
                        ;
17BF  83                        DB      83H
17C0  42 59                     DB      'BY'
17C2  C5                        DB      'E'+80H
17C3  1775 R                    DW      VLIST-8
17C5  17C7 R            BYE     DW      $+2
17C7  CD 27                     INT     27H     ;I'M HISTORY
```

```
                                        PAGE
                                ;       LIST
                                ;
17C9  84                                DB      84H
17CA  4C 49 53                          DB      'LIS'
17CD  D4                                DB      'T'+80H
17CE  17BF R                            DW      BYE-6
17D0  0552 R 09B4 R             LISTC   DW      DOCOL,DECA
17D4  02EA R 0482 R                     DW      CR,DUPE
17D8  06C2 R 04E8 R                     DW      SCR,STORE
17DC  0AA6 R                            DW      PDOTQ
17DE  06 53 43 52 20 23                 DB      6,'SCR # '
      20
17E5  1754 R                            DW      DOT
17E7  0167 R 0010                       DW      LIT,10H
17EB  05C3 R 01EC R                     DW      ZERO,XDO
17EF  02EA R 01FD R             LIST1   DW      CR,IDO
17F3  0167 R 0003                       DW      LIT,3
17F7  1735 R 0809 R                     DW      DOTR,SPACE
17FB  01FD R 06C2 R                     DW      IDO,SCR
17FF  048D R 1197 R                     DW      AT,DLINE
1803  02E2 R                            DW      QTERM   ; ?TERMINAL
1805  0194 R                            DW      ZBRAN
1807  0004                              DW      OFFSET LIST2-$  ;IF
1809  03B5 R                            DW      LEAVE
180B  01A8 R                    LIST2   DW      XLOOP
180D  FFE2                              DW      OFFSET LIST1-$  ;ENDIF
180F  02EA R 03A3 R                     DW      CR,SEMIS
                                ;
                                ;       INDEX
                                ;
1813  85                                DB      85H
1814  49 4E 44 45                       DB      'INDE'
1818  D8                                DB      'X'+80H
1819  17C9 R                            DW      LISTC-7
181B  0552 R                    INDEX   DW      DOCOL
181D  0167 R 000C                       DW      LIT,FF
1821  028D R 02EA R                     DW      EMIT,CR
1825  073C R 0475 R                     DW      ONEP,SWAP
1829  01ED R                            DW      XDO
182B  02EA R 01FD R             INDE1   DW      CR,IDO
182F  0167 R 0003                       DW      LIT,3
1833  1735 R 0809 R                     DW      DOTR,SPACE
1837  05C3 R 01FD R                     DW      ZERO,IDO
183B  1197 R 02E0 R                     DW      DLINE,QTERM
183F  0194 R                            DW      ZBRAN
1841  0004                              DW      OFFSET INDE2-$
1843  03B5 R                            DW      LEAVE
1845  01A8 R                    INDE2   DW      XLOOP
1847  FFE4                              DW      OFFSET INDE1-$
1849  03A3 R                            DW      SEMIS
```

```
                                        PAGE
                                ;       TRIAD
                                ;
1848  85                                DB      85H
1849  54 52 49 41                       DB      'TRIA'
184D  C4                                DB      'D'+80H
184E  1813 R                            DW      INDEX-8
1850  0552 R                    TRIAD   DW      DOCOL
1852  0167 R 000C                       DW      LIT,FF
1856  02BD R                            DW      EMIT
1858  0167 R 0003                       DW      LIT,3
185C  112F R                            DW      SLASH
185E  0167 R 0003                       DW      LIT,3
1862  1110 R                            DW      STAR
1864  0167 R 0003                       DW      LIT,3
1868  0459 R 040F R                     DW      OVER,PLUS
186C  0475 R 01EC R                     DW      SWAP,XDO
1870  02EA R 01FD R             TRIA1   DW      CR,IDO
1874  17D0 R                            DW      LISTC
1876  02E0 R                            DW      QTERM   ; ?TERMINAL
1878  0134 R                            DW      ZBRAN
187A  0004                              DW      OFFSET TRIA2-$  ;IF
187C  03B5 R                            DW      LEAVE   ;LEAVE
187E  01A8 R                    TRIA2   DW      XLOOP   ;ENDIF
1880  FFF0                              DW      OFFSET TRIA1-$
1882  02EA R                            DW      CR
1884  03A3 R                            DW      SEMIS
                                ;
                                ;       .CPU
                                ;
                                ; PRINT CPU TYPE (8088)
                                ;
1886  84                                DB      84H
1887  2E 43 50                          DB      '.CP'
188A  D5                                DB      'U'+80H
188B  1848 R                            DW      TRIAD-8
188D  0552 R                    DOTCPU  DW      DOCOL
188F  0702 R 04BD R                     DW      BASE,AT
1893  0167 R 0024                       DW      LIT,36
1897  0702 R 04E8 R                     DW      BASE,STORE
189B  0167 R 0022                       DW      LIT,22H
189F  063B R 04D9 R                     DW      PORIG,TAT
18A3  1746 R                            DW      DDOT
18A5  0702 R 04E8 R                     DW      BASE,STORE
18A9  03A3 R                            DW      SEMIS
```

```
                                PAGE
                        COMMENT *

                                CODE LEVEL "MATCH" DEFINITIONS

                         STACK PARAMETERS:

                         ( cursor:addr   byte:left   str:addr  str:len
                                  --     flag  new:cursor:offset       )

                         This version of MATCH will handle string lengths
                             up to 65535 bytes in length.

                                *
18AE  85                        DB      85H     ; MATCH
18AF  4D 41 54 43               DB      'MATC'
18B3  C8                        DB      'H'+80H
18B4  1889 R                    DW      DOTCPU-7
18B6  18B8 R            MATCH   DW      $+2
18B8  8B FE                     MOV     DI,SI   ; SAVE IP
18BA  59                        POP     CX      ; STRING COUNT
18BB  5B                        POP     BX      ;STRING ADDR
18BC  5A                        POP     DX      ;BYTES LEFT TO SEARCH
18BD  5E                        POP     SI      ;CURSOR ADDR
18BE  56                        PUSH    SI      ;SAVE COPY
18BF  AC                MAT1:   LODSB           ;GET FIRST BYTE
18C0  3A 07                     CMP     AL,[BX] ;MATCH?
18C2  75 12                     JNZ     MAT3    ;NO
18C4  53                        PUSH    BX      ;SAVE STRING ADDR
18C5  51                        PUSH    CX      ; &   STRING COUNT
18C6  56                        PUSH    SI      ; &   CURSOR ADDR
                        ; TRY TO MATCH REMAINING CHARS IN STRING
                        ;
18C7  49                MAT2:   DEC     CX      ;STR. COUNT -1
18C8  74 12                     JZ      MATCHOK ;EXIT - MATCH FOUND
18CA  4A                        DEC     DX      ;BYTES LEFT -1
18CB  74 0F                     JZ      NOMATCH ;EXIT - NO MATCH
18CD  43                        INC     BX      ;NEXT STR CHAR ADDR
18CE  AC                        LODSB           ;GET FIRST BYTE
18CF  3A 07                     CMP     AL,[BX] ;MATCH?
18D1  74 F4                     JZ      MAT2    ;YES, GET MORE
                        ; NO MATCH YET
18D3  5E                        POP     SI
18D4  59                        POP     CX
18D5  5B                        POP     BX      ;RESTORE POINTERS
18D6  4A                MAT3:   DEC     DX      ;BYTE LEFT COUNT -1
18D7  75 E5                     JNZ     MAT1    ;START OVER
18D9  EB 04 90                  JMP     MAT4    ;EXIT...NO MATCH
18DC                    MATCHOK:
18DC                    NOMATCH:
18DC  59                        POP     CX      ;ADJUST STACK
18DD  59                        POP     CX      ;FOR EXIT
18DE  59                        POP     CX
                        ; EXIT HERE: DX = TRUE/FALSE FLAG ( 0=NO MATCH)
                        ;
18DF  8B C6             MAT4:   MOV     AX,SI   ;NEW CURSOR ADDR
18E1  5E                        POP     SI      ;GET STARTING ADDR
18E2  2B C6                     SUB     AX,SI   ;COMPUTE CURSOR OFFSET
18E4  8B F7                     MOV     SI,DI   ;GET BACK UP
18E6  E9 0157 R                 JMP     DPUSH   ; BYE..BYE
```

```
                                PAGE
                        ;
                        ;**** LAST DICTIONARY WORD ****
                        ;           T A S K
                        ;
18E9  84                        DB      84H
18EA  54 41 53                  DB      'TAS'
18ED  CB                        DB      'K'+80H
18EE  18AE R                    DW      MATCH-8
18F0  0552 R            TASK    DW      DOCOL
18F2  03A3 R                    DW      SEMIS
                        ;
= 18F4                  INITDP  EQU     $       ;SHOW END OF DICTIONARY
                        ;
                        COMMENT ^

                        The remaining memory ( up to 'EM' ) is
                        used for:

                                1. EXTENSION DICTIONARY
                                2. PARAMETER STACK
                                3. TERMINAL INPUT BUFFER
                                4. RETURN STACK
                                5. USER VARIABLE AREA
                                6. DISK BUFFERS

                                                                ^
3FFF                            ORG     EM-1    ;LAST MEMORY ADDR-1
3FFF  00                        DB      0       ;LAST LOCATION
4000                    CSEG    ENDS
0000                    ORIG    ENDP
```

```
        PAGE
COMMENT ^

  MISC. NOTES AND SCATTERED THOUGHTS

- All developement was done under DOS 2.0 using IBM's
    Macro Assembler ( MASM ).  FORTH disks may be formatted
    using FORMAT in DOS.

- When in FORTH, (Ctrl) P  will echo all output to the
  printer.

- Use the installation manual.  Descriptions for all FIG
  words are given.  Those ERROR messages you get in FORTH
  correspond to the relative line numbers in blocks
  4 and 5 of the installation manual's model.

- Remember that all the FORTH words in this version are
  upper case letters.  Use (CAPS LOCK) when in FORTH.

- Changing variable EM will allow you to create a larger
  dictionary space.  However I suggest you develop and
  DEBUG with EM set to 4000H.  Setting it to a larger value
  will result in a larger FORTH.EXE file, and you may
  need to run EXE2BIN ( Chap 10, DOS 2.0 ) to get enough
  disk space.  Once you are satisfied with what you have,
  then by all means take that extra memory.

- Reading the section on batch files may speed up your
  developement.  See the example files that came with
  the Macro Assembler.

- Subscribe to FORTH Dimensions.  It is a valuable source
  of system and application ideas.  Talking with fellow
  FORTH programmers is sure to stir up some exciting ideas.
  Consider joining a FIG chapter.  See the back of FORTH
  Dimensions for more info.

- (Ctrl-Break) will vector to WARM start ( Label WRM: )

        ^

        END     ORIG
```

Segments and groups:

Name	Size	align	combine	class
CSEG	4000	PARA	PUBLIC	'CODE'

Symbols:

Name	Type	Value	Attr	
ABL	Number	0020		
ABORT.	L WORD	0F9A	CSEG	
ABS1	L WORD	1087	CSEG	
ACR.	Number	000D		
ADJT	Number	002E		
AGAIN.	L WORD	15FA	CSEG	
ALLOT.	L WORD	0768	CSEG	
AND	L WORD	033A	CSEG	
ANSH.	L NEAR	0158	CSEG	
ARROW.	L WORD	1469	CSEG	
AT	L WORD	04BD	CSEG	
BACK	L WORD	154F	CSEG	
BASE	L WORD	0702	CSEG	
BBUF	L WORD	0621	CSEG	
BCOMP.	L WORD	0E19	CSEG	
BDIGS.	L WORD	1691	CSEG	
BEGIN.	L WORD	1561	CSEG	
BELL	Number	0007		
BIP.	L WORD	012A	CSEG	
BIPE	L WORD	012C	CSEG	
BLANK.	L WORD	0BED	CSEG	
BLK.	L WORD	06A5	CSEG	
BLOC1.	L WORD	1378	CSEG	
BLOC2.	L WORD	1346	CSEG	
BLOC3.	L WORD	1360	CSEG	
BLOCK.	L WORD	1328	CSEG	
BLS.	L WORD	05F3	CSEG	
BPS.	Number	0200		
BRAN	L WORD	0184	CSEG	
BRAN1.	L NEAR	0186	CSEG	
BREAK.	L NEAR	014E	CSEG	
BSCR	L WORD	062D	CSEG	
BSIN	Number	0008		
BSOUT.	Number	0008		
BUF1	Number	37F0		
BUFF1.	L WORD	12EA	CSEG	
BUFF2.	L WORD	1310	CSEG	
BUFFE.	L WORD	12E0	CSEG	
BUILD.	L WORD	09F8	CSEG	
BYE.	L WORD	17C5	CSEG	
CAT.	L WORD	04CA	CSEG	
CCOMM.	L WORD	0785	CSEG	
CFA.	L WORD	0874	CSEG	
CHO.	N PROC	14DE	CSEG	Length =0008
CI	N PROC	14D9	CSEG	Length =0005
CLD.	L NEAR	0FD8	CSEG	
CLD1	L WORD	1001	CSEG	
CMOVE.	L WORD	02F7	CSEG	
CO	Number	0204		
COLD	L WORD	100A	CSEG	
COLON.	L WORD	053E	CSEG	

```
COMMA. . . . . L WORD  0774   CSEG
COMP . . . . . L WORD  0953   CSEG
CON. . . . . L WORD  057A   CSEG
CONT . . . . . L WORD  06DD   CSEG
CONT. . . . . L WORD  0A2C   CSEG
CP . . . . . L WORD  02EA   CSEG
CREG1. . . . . L WORD  0DD7   CSEG
CREAT. . . . . L WORD  0DC1   CSEG
CS_. . . . . L WORD  05FD   CSEG
CSPP . . . . . L WORD  0720   CSEG
CSTAT. . . . . N PROC  14CE   CSEG   Length =000B
CSTOR. . . . . L WORD  04F6   CSEG
CURR . . . . . L WORD  06EB   CSEG
DABS . . . . . L WORD  1096   CSEG
DDOT . . . . . L WORD  1746   CSEG
DDOTR. . . . . L WORD  1712   CSEG
DDUP . . . . . L WORD  0818   CSEG
DDUP1. . . . . L WORD  0822   CSEG
DECA . . . . . L WORD  09B4   CSEG
DEFIN. . . . . L WORD  0F4C   CSEG
DERR . . . . . L NEAR  13F0   CSEG
DFIN1. . . . . L WORD  0D3B   CSEG
DFIND. . . . . L WORD  0D1B   CSEG
DIG. . . . . L WORD  16CF   CSEG
DIG1 . . . . . L WORD  16EB   CSEG
DIGI1. . . . . L NEAR  021F   CSEG
DIGI2. . . . . L NEAR  022C   CSEG
DIGIT. . . . . L WORD  020D   CSEG
DIGS . . . . . L WORD  16FA   CSEG
DIGS1. . . . . L WORD  16FC   CSEG
DLE. . . . . Number 0010
DLINE. . . . . L WORD  11B7   CSEG
DLIT1. . . . . L WORD  0E62   CSEG
DLITE. . . . . L WORD  0E52   CSEG
DMINU. . . . . L WORD  0A43   CSEG
DO . . . . . L WORD  1599   CSEG
DOCOL. . . . . L NEAR  0652   CSEG
DOCON. . . . . L NEAR  0684   CSEG
DODOE. . . . . L NEAR  0A14   CSEG
DOES . . . . . L WORD  0A08   CSEG
DOK. . . . . L NEAR  13F6   CSEG
DOT. . . . . L WORD  1754   CSEG
DOTCPU . . . . . L WORD  1890   CSEG
DOTQ . . . . . L WORD  0ABF   CSEG
DOTQ1. . . . . L WORD  0ADF   CSEG
DOTQ2. . . . . L WORD  0AE7   CSEG
DOTR . . . . . L WORD  1735   CSEG
DOUSE. . . . . L NEAR  05AF   CSEG
DOVAR. . . . . L NEAR  0659   CSEG
DOVOC. . . . . L WORD  0F24   CSEG
DP . . . . . L WORD  068C   CSEG
DP0. . . . . L BYTE  0161   CSEG
DP_. . . . . L WORD  070C   CSEG
DPLUS. . . . . L WORD  241D   CSEG
DPM. . . . . L WORD  1075   CSEG
DPM1 . . . . . L WORD  107F   CSEG
DPUSH. . . . . L NEAR  0157   CSEG
DR0. . . . . L NEAR  13B7   CSEG
DROP . . . . . L WORD  0468   CSEG
DRZER. . . . . L WORD  12CD   CSEG
```

```
DTRA2. . . . . L WORD  0A95   CSEG
DTRA3. . . . . L WORD  0A99   CSEG
DTRAI. . . . . L WORD  0A73   CSEG
DUPE . . . . . L WORD  0482   CSEG
DZERO. . . . . L NEAR  032C   CSEG
EDIGS. . . . . L WORD  16A0   CSEG
ELSEE. . . . . L WORD  1641   CSEG
EM . . . . . Number 4000
EMIT . . . . . L WORD  029D   CSEG
ENCL . . . . . L WORD  0285   CSEG
ENCL1. . . . . L NEAR  0290   CSEG
ENCL2. . . . . L NEAR  02A1   CSEG
ENCL3. . . . . L NEAR  02AB   CSEG
ENCL4. . . . . L NEAR  02B0   CSEG
END . . . . . L WORD  15EC   CSEG
ENDIFF . . . . . L WORD  1573   CSEG
EPRINT . . . . . L BYTE  14CC   CSEG
EQUAL. . . . . L WORD  07A2   CSEG
ERASEE . . . . . L WORD  0BDC   CSEG
ERRO1. . . . . L WORD  0D63   CSEG
ERRO2. . . . . L WORD  0D82   CSEG
ERROR. . . . . L WORD  0D55   CSEG
EXEC . . . . . L WORD  0176   CSEG
EXPE1. . . . . L WORD  0AFC   CSEG
EXPE2. . . . . L WORD  0B36   CSEG
EXPE3. . . . . L WORD  0B5C   CSEG
EXPE4. . . . . L WORD  0B4E   CSEG
EXPE5. . . . . L WORD  0B50   CSEG
EXPE6. . . . . L WORD  0B2E   CSEG
EXPE7. . . . . L WORD  0B32   CSEG
EXPEC. . . . . L WORD  0AF2   CSEG
FENCE. . . . . L WORD  0683   CSEG
FF . . . . . Number 000C
FIGREL . . . . . Number 0001
FIGREV . . . . . Number 0000
FILL . . . . . L WORD  0BC5   CSEG
FIRST. . . . . L WORD  0609   CSEG
FLD. . . . . L WORD  0716   CSEG
FLUS1. . . . . L WORD  1424   CSEG
FLUSH. . . . . L WORD  141A   CSEG
FORG . . . . . L WORD  1512   CSEG
FORTH. . . . . L WORD  0F34   CSEG
FROMR. . . . . L WORD  03D5   CSEG
GREAT. . . . . L WORD  07EA   CSEG
GSED1. . . . . L NEAR  13BB   CSEG
HERE . . . . . L WORD  0758   CSEG
HEX. . . . . L WORD  099E   CSEG
HLD. . . . . L WORD  0733   CSEG
HOLD . . . . . L WORD  0BFC   CSEG
IDDOT. . . . . L WORD  0D8A   CSEG
IDO. . . . . L WORD  01FD   CSEG
IFF. . . . . L WORD  162A   CSEG
IMMED. . . . . L WORD  0EEB   CSEG
INDE1. . . . . L WORD  182B   CSEG
INDE2. . . . . L WORD  1845   CSEG
INDEX. . . . . L WORD  181B   CSEG
INITDP . . . . . Number 18F4   CSEG
INITR0 . . . . . Number 37B0
INITS0 . . . . . Number 3710
INN. . . . . L WORD  06AE   CSEG
INTE1. . . . . L WORD  0E9F   CSEG
```

INTE2.	L WORD	0EC1	CSEG
INTE3.	L WORD	0EB7	CSEG
INTE4.	L WORD	0EBB	CSEG
INTE5.	L WORD	0EDB	CSEG
INTE6.	L WORD	0ED5	CSEG
INTE7.	L WORD	0ED9	CSEG
INTE8.	L WORD	0E3D	CSEG
KBBUF.	Number	0200	
KEY.	L WORD	02CF	CSEG
LAT.	L WORD	0516	CSEG
LATES.	L WORD	0854	CSEG
LBRAC.	L WORD	0969	CSEG
LEAVE.	L WORD	03B5	CSEG
LES1	L NEAR	07BA	CSEG
LES2	L NEAR	07C2	CSEG
LESS	L WORD	07AE	CSEG
LF	Number	000A	
LFA.	L WORD	0864	CSEG
LIMIT.	L WORD	0615	CSEG
LIST1.	L WORD	17EF	CSEG
LIST2.	L WORD	180B	CSEG
LISTC.	L WORD	17D0	CSEG
LIT.	L WORD	0167	CSEG
LITE1.	L WORD	0E45	CSEG
LITER.	L WORD	0E35	CSEG
LQ	N PROC	14E9	CSEG Length =000C
LOAD	L WORD	1437	CSEG
LOOPC.	L WORD	15AC	CSEG
LSTORE	L WORD	052A	CSEG
MAT1	L NEAR	18BF	CSEG
MAT2	L NEAR	18C7	CSEG
MAT3	L NEAR	18D6	CSEG
MAT4	L NEAR	18DF	CSEG
MATCH.	L WORD	1886	CSEG
MATCHOK.	L NEAR	18DC	CSEG
MAX.	L WORD	10BA	CSEG
MAX1	L WORD	10C6	CSEG
MESS	L WORD	11C3	CSEG
MESS1.	L WORD	11F1	CSEG
MESS2.	L WORD	11ED	CSEG
MESS3.	L WORD	11FC	CSEG
MIN.	L WORD	10A4	CSEG
MIN1	L WORD	10B0	CSEG
MINUS.	L WORD	0432	CSEG
MOD	L WORD	113F	CSEG
MSLAS.	L WORD	10EA	CSEG
MSMOD.	L WORD	1172	CSEG
MSTAR.	L WORD	10CF	CSEG
MTBUF.	L WORD	1289	CSEG
MXDRV.	Number	0002	
NBUF	Number	0004	
NEXT	L NEAR	0159	CSEG
NEXT1.	L NEAR	015C	CSEG
NFA.	L WORD	0882	CSEG
NUBUF.	L WORD	125F	CSEG
NOMATCH.	L NEAR	18DC	CSEG
NOOP	L WORD	01C8	CSEG
NOP0	L WORD	01CA	CSEG
NOP1	L WORD	01CE	CSEG
NOP2	L WORD	01D2	CSEG
NSCR	Number	0002	

```
NULL . . . . . L WORD  0B86  CSEG
NULL1. . . . . L WORD  0BB8  CSEG
NULL2. . . . . L WORD  0BB4  CSEG
NULL3. . . . . L WORD  0BBC  CSEG
NUMB . . . . . L WORD  0CC3  CSEG
NUMB1. . . . . L WORD  0CE1  CSEG
NUMB2. . . . . L WORD  0D07  CSEG
NUMB3. . . . . L WORD  0D11  CSEG
OFSET. . . . . L WORD  06CF  CSEG
ONE. . . . . L WORD  05CE  CSEG
ONEP . . . . . L WORD  073C  CSEG
ORIG . . . . . F PROC  0100  CSEG    Length =FF00
ORR. . . . . L WORD  0348  CSEG
OUTT . . . . . L WORD  06B8  CSEG
OVER . . . . . L WORD  0459  CSEG
PABOR. . . . . L WORD  0D47  CSEG
PAD. . . . . L WORD  0C14  CSEG
PAREN. . . . . L WORD  0F5C  CSEG
PBUF . . . . . L WORD  126A  CSEG
PBUF1. . . . . L WORD  1280  CSEG
PCR. . . . . L NEAR  14B0  CSEG
PDOTQ. . . . . L WORD  0AA6  CSEG
PEMIT. . . . . L WORD  14A7  CSEG
PFA. . . . . L WORD  0898  CSEG
PFIN1. . . . . L NEAR  0242  CSEG
PFIN2. . . . . L NEAR  024E  CSEG
PFIN5. . . . . L NEAR  0266  CSEG
PFIN6. . . . . L NEAR  026F  CSEG
PFIND. . . . . L WORD  023A  CSEG
PKEY . . . . . L NEAR  1493  CSEG
PKEY1. . . . . L NEAR  14A2  CSEG
PLINE. . . . . L WORD  1191  CSEG
PLOOP. . . . . L WORD  15C2  CSEG
PLUS . . . . . L WORD  040F  CSEG
PM . . . . . L WORD  1063  CSEG
PM1. . . . . L WORD  106D  CSEG
PNUM1. . . . . L WORD  0C7A  CSEG
PNUM2. . . . . L WORD  0CB6  CSEG
PNUM3. . . . . L WORD  0CB0  CSEG
PNUMB. . . . . L WORD  0C78  CSEG
PORIG. . . . . L WORD  063B  CSEG
POUT . . . . . N PROC  14BD  CSEG    Length =000F
POUT1. . . . . L NEAR  14CB  CSEG
PQTER. . . . . L NEAR  1485  CSEG
PQTER1 . . . . . L NEAR  148E  CSEG
PREV . . . . . L WORD  1245  CSEG
PRINTER_NO . . . . . Number  0000
PSCOD. . . . . L WORD  09CA  CSEG
PSTOR. . . . . L WORD  049E  CSEG
PTAT . . . . . L WORD  1220  CSEG
PTCAT. . . . . L WORD  1204  CSEG
PTCSTO . . . . . L WORD  1213  CSEG
PTSTO. . . . . L WORD  122C  CSEG
QCOMP. . . . . L WORD  08DA  CSEG
QCSP . . . . . L WORD  091C  CSEG
QERR . . . . . L WORD  08C0  CSEG
QERR1. . . . . L WORD  08CE  CSEG
QERR2. . . . . L WORD  08D0  CSEG
QEXEC. . . . . L WORD  08F2  CSEG
QLOAD. . . . . L WORD  0939  CSEG
QPAIR. . . . . L WORD  0909  CSEG
```

GSTAC.	L WORD	0E6D	CSEG
GTERM.	L WORD	02E0	CSEG
GUERY.	L WORD	0B6E	CSEG
GUES	L WORD	1760	CSEG
GUIT	L WORD	0F6D	CSEG
GUIT1.	L WORD	0F77	CSEG
GUIT2.	L WORD	0F8E	CSEG
REPAC.	L WORD	0377	CSEG
REPE0.	L WORD	1611	CSEG
RER	L BYTE	1393	CSEG
RNUM	L WORD	0729	CSEG
ROT.	L WORD	07F8	CSEG
RPAT	L WORD	0385	CSEG
RP0.	L WORD	0128	CSEG
RPSTO.	L WORD	0392	CSEG
RR	L WORD	03E3	CSEG
RSEC	L WORD	13C8	CSEG
RSLW	L WORD	1402	CSEG
RSLW1.	L WORD	140E	CSEG
RSLW2.	L WORD	1410	CSEG
RTS.	Number	00A0	
RZERO.	L WORD	0653	CSEG
SCR.	L WORD	06C2	CSEG
SCREEN	L WORD	1455	CSEG
SCSP	L WORD	08AD	CSEG
SEC_DSK.	Number	0168	
SEMI	L WORD	0561	CSEG
SEMI1.	L WORD	09EA	CSEG
SEMIC.	L WORD	09E0	CSEG
SEMIS.	L WORD	03A3	CSEG
SIGN	L WORD	16B9	CSEG
SIGN1.	L WORD	16C9	CSEG
SLASH.	L WORD	112F	CSEG
SLMOD.	L WORD	111F	CSEG
SMUDG.	L WORD	098C	CSEG
SPACE.	L WORD	0809	CSEG
SPACS.	L WORD	1674	CSEG
SPAT	L WORD	0366	CSEG
SPAX1.	L WORD	168A	CSEG
SPAX2.	L WORD	1684	CSEG
SPBLK.	L WORD	1253	CSEG
SPSTO.	L WORD	0373	CSEG
SSEC	N PROC	13A6	CSEG Length =001B
SSLA	L WORD	1160	CSEG
SSMOD.	L WORD	114F	CSEG
STAR	L WORD	1110	CSEG
STATE.	L WORD	06F7	CSEG
STATRT	L NEAR	14D8	CSEG
STOD	L WORD	1051	CSEG
STOD1.	L NEAR	105B	CSEG
STORE.	L WORD	04E8	CSEG
SUBB	L WORD	0795	CSEG
SWAP	L WORD	0475	CSEG
SZERO.	L WORD	064A	CSEG
TASK	L WORD	18F0	CSEG
TAT.	L WORD	04D9	CSEG
TDUP	L WORD	0490	CSEG
THEN	L WORD	158E	CSEG
THREE.	L WORD	05E6	CSEG
TIB.	L WORD	065D	CSEG
TICK	L WORD	14F9	CSEG

```
TNEXT. . . . . L NEAR  012E   CSEG
TNEXT1 . . . . . L NEAR  014D   CSEG
TNEXT2 . . . . . L NEAR  0150   CSEG
TNEXT3 . . . . . L NEAR  0152   CSEG
TOGGL. . . . . L WORD  0AB0   CSEG
TOR. . . . . L WORD  03C5   CSEG
TRAV . . . . . L WORD  082F   CSEG
TRAV1. . . . . L WORD  0833   CSEG
TRIA1. . . . . L WORD  1873   CSEG
TRIA2. . . . . L WORD  1881   CSEG
TRIAD. . . . . L WORD  1853   CSEG
TSTOR. . . . . L WORD  0504   CSEG
TWO. . . . . L WORD  05DA   CSEG
TWOP . . . . . L WORD  0748   CSEG
TYPE1. . . . . L WORD  0063   CSEG
TYPE2. . . . . L WORD  004F   CSEG
TYPE3. . . . . L WORD  0065   CSEG
TYPES. . . . . L WORD  003F   CSEG
UDOT . . . . . L WORD  176D   CSEG
ULES1. . . . . L WORD  07E0   CSEG
ULES2. . . . . L WORD  07E4   CSEG
ULESS. . . . . L WORD  07CA   CSEG
UNTIL. . . . . L WORD  15D8   CSEG
UP . . . . . L WORD  0126   CSEG
UPDAT. . . . . L WORD  1293   CSEG
US . . . . . Number  0040
USE. . . . . L WORD  123A   CSEG
USER . . . . . L WORD  05A9   CSEG
USLAS. . . . . L WORD  031E   CSEG
USRVER . . . . . Number  0000
USTAR. . . . . L WORD  038F   CSEG
VAR. . . . . L WORD  0597   CSEG
VLIS1. . . . . L WORD  178D   CSEG
VLIS2. . . . . L WORD  17A1   CSEG
VLIST. . . . . L WORD  177D   CSEG
VOCAB. . . . . L WORD  0F04   CSEG
VOCL . . . . . L WORD  069B   CSEG
WARM . . . . . L WORD  0FD2   CSEG
WARN . . . . . L WORD  0677   CSEG
WERR . . . . . L BYTE  1380   CSEG
WHILE. . . . . L WORD  1663   CSEG
WIDTH. . . . . L WORD  0669   CSEG
WORD1. . . . . L WORD  0C3B   CSEG
WORD2. . . . . L WORD  0C3F   CSEG
WORDS. . . . . L WORD  0C27   CSEG
WRM. . . . . L NEAR  0FC3   CSEG
WRM1 . . . . . L WORD  0FC9   CSEG
WSEC . . . . . L WORD  13E1   CSEG
XDO. . . . . L WORD  01EC   CSEG
XLOO1. . . . . L NEAR  01AD   CSEG
XLOOP. . . . . L WORD  01A8   CSEG
XOR# . . . . . L WORD  0357   CSEG
XPLOO. . . . . L WORD  01E0   CSEG
ZERO. . . . . L WORD  0194   CSEG
ZEQU . . . . . L WORD  03EA   CSEG
ZEQU1. . . . . L NEAR  03F5   CSEG
ZERO . . . . . L WORD  05C3   CSEG
ZLESS. . . . . L WORD  03FD   CSEG
ZLESS1 . . . . . L NEAR  0408   CSEG
```

Errors Errors
0 0