fig-FORTH FOR PACE

ASSEMBLY SOURCE LISTING

RELEASE 1

WITH COMPILER SECURITY

AND

VARIABLE LENGTH NAMES

MAY 1979

```
  1                        .TITLE  FORTH,'NUCLEUS FOR PACE'
  2              ;
  3                        .ASM    TI
  4              ;
  5              PART     =        1
  6              ;
  7                        .LIST   PART=1
  8              ;
  9              ;*****************************************************
 10              ;*      THIS IMPLEMENTATION OF THE FORTH LANGUAGE    *
 11              ;*      IS ONE OF A UNIFORM SERIES DEVELOPED BY THE   *
 12              ;*                                                    *
 13              ;*                 FORTH INTEREST GROUP               *
 14              ;*                   P.O. BOX 1105                    *
 15              ;*                 SAN CARLOS, CA 94070               *
 16              ;*                                                    *
 17              ;*      PACE IMPLEMENTATION BY DAVID KILBRIDGE        *
 18              ;*****************************************************
 19              ;
 20     0000              .ASECT
 21     0010              .=       0010
 22              ;
 23              ;*****************************************************
 24              ;*              BOC AND FLAG ABBREVIATIONS           *
 25              ;*****************************************************
 26              ;
 27     0001     Z        =        1
 28     0002     P        =        2
 29     0003     BIT0     =        3
 30     0005     NZ       =        5
 31     0007     CRY      =        7
 32     0008     LINK     =        8
 33     000A     CSET     =        10
 34     000B     M        =        11
 35              ;
 36              ;*****************************************************
 37              ;*                 MEMORY ASSIGNMENTS                *
 38              ;*****************************************************
 39              ;
 40     3FC0     HIBLK    =        03FC0         ; HIGHEST BLOCK FWA
 41     2000     LOBLK    =        02000         ; LOWEST BLOCK FWA
 42     0080     BLKSIZ   =        128           ; BLOCK SIZE IN BYTES
 43     0008     NBUF     =        8             ; NO OF BLOCK BUFFERS
 44     2000     TOPMEM   =        02000         ; LWA+1 OF DISK BUFFS
 45     0210     BUFMEM   =        BLKSIZ/2+2*NBUF ; LTH OF BUFFER AREA
 46     1DF0     BUFFS    =        TOPMEM-BUFMEM ; FWA OF DISK BUFFERS
 47     1DD0     UVARS    =        BUFFS-32      ; START OF USER AREA
 48     0100     DICT     =        0100          ; FWA OF DICTIONARY
 49              ;
 50              ;*****************************************************
 51              ;*                  START-UP LITERALS                *
 52              ;*****************************************************
 53              ;
 54 0010 9811 A  ORÍG:   JMP      @.+1          ; COLD
```

```
 55 0011 088C A              .WORD   CENT        ;   ENTRY
 56 0012 9813 A              JMP     @.+1        ; WARM
 57 0013 0892 A              .WORD   WENT        ;   ENTRY
 58 0014 0000 A    CPU:      .WORD   0           ; RESERVED
 59 0015 0000 A    REV:      .WORD   0           ; RESERVED
 60 0016 0C65 A    FORTHO:   .WORD   TASK-4      ; TOP WORD IN DICT
 61 0017 005F A    BACKSP:   .WORD   005F        ; BACKSPACE CHARACTER
 62 0018 1DD0 A    UO:       .WORD   UVARS       ; START OF USER AREA
 63 0019 1D8F A    SO:       .WORD   UVARS-65    ; TOP OF EMPTY STACK
 64 001A 1DD0 A    RO:       .WORD   UVARS       ; TOP OF RETURN STACK
 65 001B 1D8F A    TIBO:     .WORD   UVARS-65    ; SOURCE BUFFER ORIG
 66 001C 001F A    WIDTHO:   .WORD   31          ; INITIAL NAME LENGTH
 67 001D 0000 A    WARNO:    .WORD   0           ; ERROR WARNING MODE
 68 001E 0C65 A    FENCEO:   .WORD   TASK-4      ; BARRIER FOR FORGET
 69 001F 0C6B A    DPO:      .WORD   FIN         ; FWA OF FREE STORAGE
 70 0020 0843 A    VOCLO:    .WORD   FORTH+4     ; INITIAL VOC-LINK
 71
```

```
                            .PAGE
 72                ;
 73                ;*********************************************************
 74                ;*                    FORTH  REGISTERS                   *
 75                ;*********************************************************
 76                ;
 77 0021 0000 A    RP:       .WORD   0           ; RETURN STACK PTR
 78 0022 0000 A    UP:       .WORD   0           ; USER POINTER
 79      0002 A    X         =       2           ; INDEX
 80      0003 A    Y         =       3           ;   REGISTERS
 81      0001 A    IP        =       1           ; INTERPRETIVE PTR
 82      0002 A    W         =       X           ; FORTH CODE PTR
 83      0003 A    SP        =       Y           ; FORTH STACK PTR
 84                ;
 85                ;*********************************************************
 86                ;          INSTALLATION-DEPENDENT ROUTINES
 87                ;*********************************************************
 88                ;
 89      7E3B      GETC      =       07E3B
 90      7E44      PUTC      =       07E44
 91      7ECC      INTEST    =       07ECC
 92                ;
 93 0023 5000 A    INIT:     LI      0,0
 94 0024 0800 A              CRF     0
 95 0025 6700 A              PULL    Y
 96 0026 5109 A              LI      1,9
 97 0027 6400 A              PULL    0
 98 0028 79FF A              AISZ    1,-1
 99 0029 1827 A              JMP     .-2
100 002A 3100 A              PFLG    1
```

```
101  002B 6300 A              PUSH     Y
102  002C 1B00 A              JMP      (Y)
103                  ;
104         0000              .BSECT
             00F6              .=.+00F6                          ; POINTER AREA
105         002D              .ASECT
106                  ;*************************************************
107                  ;*        AIDS FOR NAME FIELD CONSTRUCTION        *
108                  ;*************************************************
109                  ;
110                           .FORM    HEAD,1(1),1,1(0),5,1,7
111                  ;
112         0000     ORD      =        0                        ; ORDIN. WD PREC BIT
113         0001     IMM      =        1                        ; IMMED. WD PREC BIT
114         0001     SHORT    =        1                        ; FOR 1-CHAR NAMES
115         0000     LONG     =        0                        ; FOR LONGER NAMES
116         8000     EVEN     =        08000                    ; EVEN-LTH STOP BIT
117         0080     ODD      =        00080                    ; ODD-LTH STOP BIT
118
```

```
                             .PAGE    'DICTIONARY'
119                  ;
120         002D              .ASECT
121         0100              .=       DICT
122                  ;
123                  ;*************************************************
124                  ;*              LIT, PUSH, PUT, NEXT             *
125                  ;*************************************************
126                  ;
127  0100 834C A              HEAD     ORD,3,LONG,'L'/256
128  0101 49D4 A              .WORD    'IT'+ODD,0000
     0102 0000 A
129  0103 0104 A     LIT:     .WORD    .+1
130  0104 5E40 A              RCPY     IP,X             ; PICK UP
131  0105 C200 A              LD       0,(X)            ;   VALUE
132  0106 7901 A              AISZ     IP,1             ; STEP IP OVER
133  0107 7BFF A     PUSH:    AISZ     SP,-1            ; EXTEND STACK
134  0108 D300 A     PUT:     ST       0,(SP)           ; STORE VALUE
135  0109 5E40 A     NEXT:    RCPY     IP,X
136  010A 7901 A              AISZ     IP,1             ; INCREMENT IP
137  010B CA00 A              LD       W,(X)            ; ADDR OF NEXT WORD
138  010C 9A00 A              JMP      @(W)             ; JUMP THRU CODE ADDR
139                  ;
140                  ;*************************************************
141                  ;*                    EXECUTE                    *
142                  ;*************************************************
143                  ;
144  010D 8745 A              HEAD     ORD,7,LONG,'E'/256
145  010E 5845 A              .WORD    'XE','CU','TE'+ODD,LIT-3
     010F 4355 A
     0110 54C5 A
     0111 0100 A
```

```
146  0112  0113  A    EXEC:   .WORD   .+1
147  0113  CB00  A            LD      W,0(SP)         ; FETCH CODE ADDR
148  0114  7B01  A            AISZ    SP,1            ; POP STACK
149  0115  9A00  A            JMP     @(W)            ; JUMP THRU CODE ADDR
150                   ;
151                   ;****************************************************
152                   ;*              BRANCH, OBRANCH                     *
153                   ;****************************************************
154                   ;
155  0116  8642  A            HEAD    ORD,6,LONG,'B'/256
156  0117  5241  A            .WORD   'RA','NC','H'+EVEN,EXEC-5
     0118  4E43  A
     0119  C820  A
     011A  010D  A
157  011B  011C  A    BRAN:   .WORD   .+1
158  011C  5E40  A            RCPY    IP,X            ; ADD OFFSET
159  011D  E600  A            ADD     IP,(X)          ;  TO IP
160  011E  19EA  A            JMP     NEXT
161                   ;
162  011F  8730  A            HEAD    ORD,7,LONG,'0'/256
163  0120  4252  A            .WORD   'BR','AN','CH'+ODD,BRAN-5
     0121  414E  A
     0122  43C8  A
```

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```
     0123  0116  A
164  0124  0125  A    ZBRAN:  .WORD   .+1
165  0125  C300  A            LD      0,0(SP)         ; GET BOOLEAN
166  0126  7B01  A            AISZ    SP,1            ; POP STACK
167  0127  41F4  A            BOC     Z,BRAN+1        ; IF BOOLEAN = 0
168  0128  7901  A            AISZ    IP,1            ; STEP IP OVER OFFSET
169  0129  19DF  A            JMP     NEXT
170                   ;
171                   ;****************************************************
172                   ;*              LOOP CONTROL                       *
173                   ;****************************************************
174                   ;
175  012A  8628  A            HEAD    ORD,6,LONG,'('/256
176  012B  4C4F  A            .WORD   'LO','OP',')'+EVEN,ZBRAN-5
     012C  4F50  A
     012D  A920  A
     012E  011F  A
177  012F  0130  A    XLOOP:  .WORD   .+1
178  0130  5001  A            LI      0,1             ; INCREMENT = 1
179  0131  C821  A            LD      X,RP            ; GET RETURN POINTER
180  0132  E200  A            ADD     0,(X)           ; UPDATE
181  0133  D200  A            ST      0,(X)           ;  INDEX
182  0134  3780  A            SFLG    CRY             ; SUBTRACT
183  0135  9201  A            SUBB    0,1(X)          ;  LIMIT
184  0136  4BE5  A            BOC     M,BRAN+1        ; IF LIMIT > INDEX
185  0137  7901  A    XLOOP1: AISZ    IP,1            ; STEP IP OVER OFFSET
186  0138  7A02  A            AISZ    X,2             ; POP INDEX AND LIMIT
187  0139  D821  A            ST      X,RP            ;  FROM RETURN STACK
188  013A  19CE  A            JMP     NEXT
```

```
189                  ;
190 013B 8728 A                  HEAD    ORD,7,LONG,'('/256
191 013C 2B4C A                  .WORD   '+L','OO','P)'+ODD,XLOOP-5
    013D 4F4F A
    013E 50A9 A
    013F 012A A
192 0140 0141 A      XPLOOP: .WORD   .+1
193 0141 6100 A                  PUSH    IP                  ; SAVE IP
194 0142 C700 A                  LD      1,0(SP)             ; GET INCREMENT
195 0143 7B01 A                  AISZ    SP,1                ; POP STACK
196 0144 C821 A                  LD      X,RP                ; GET RETURN POINTER
197 0145 C200 A                  LD      0,(X)               ; GET INDEX
198 0146 6840 A                  RADD    1,0                 ; ADD INCREMENT
199 0147 D200 A                  ST      0,(X)               ; UPDATE INDEX
200 0148 3780 A                  SFLG    CRY                 ; SUBTRACT
201 0149 9201 A                  SUBB    0,1(X)              ;  LOOP LIMIT
202 014A 4104 A                  BOC     Z,PULL              ; IF INDEX = LIMIT
203 014B 5840 A                  RXOR    1,0                 ; COMBINE SIGN BITS
204 014C 6500 A                  PULL    IP                  ; RESTORE IP
205 014D 4BCE A                  BOC     M,BRAN+1            ; IND<LIM XOR INC<0
206 014E 19E8 A                  JMP     XLOOP1
207 014F 6500 A      PULL:   PULL    IP                  ; RESTORE IP
208 0150 19E6 A                  JMP     XLOOP1
209                  ;
210                  ;******************************************************
211                  ;*          (DO), POPTWO, POP, I                    *
```

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```
212                  ;******************************************************
213                  ;
214 0151 8428 A                  HEAD    ORD,4,LONG,'('/256
215 0152 444F A                  .WORD   'DO',')'+EVEN,XPLOOP-5
    0153 A920 A
    0154 013B A
216 0155 0156 A      XDO:    .WORD   .+1
217 0156 C301 A                  LD      0,1(SP)             ; MOVE LIMIT
218 0157 AC21 A                  DSZ     RP                  ;  TO RETURN
219 0158 B021 A                  ST      0,@RP               ;   STACK
220 0159 C300 A                  LD      0,0(SP)             ; MOVE INITIAL
221 015A AC21 A                  DSZ     RP                  ;  INDEX TO RETURN
222 015B B021 A                  ST      0,@RP               ;   STACK
223 015C 7B01 A      POP2:   AISZ    SP,1                ; POP ONE ITEM
224 015D 7B01 A      POP:    AISZ    SP,1                ; POP ONE ITEM
225 015E 19AA A                  JMP     NEXT
226                  ;
227 015F 81C9 A                  HEAD    ORD,1,SHORT,'I'/256
228 0160 0151 A                  .WORD   XDO-4
229 0161 028A A      I:      .WORD   R+1                 ; GET FROM RTN STACK
230                  ;
```

```
231                 ;****************************************************
232                 ;*                        DIGIT                     *
233                 ;****************************************************
234                 ;
235 0162 8544 A             HEAD      ORD,5,LONG,'D'/256
236 0163 4947 A             .WORD     'IG','IT'+ODD,I-2
    0164 49D4 A
    0165 015F A
237 0166 0167 A     DIGIT:  .WORD     .+1
238 0167 C301 A             LD        0,1(SP)          ; GET ASCII
239 0168 78D0 A             AISZ      0,-0030
240 0169 4B0B A             BOC       M,BAD            ; ASCII < 30
241 016A 9D0C A             SKG       0,NINE
242 016B 1903 A             JMP       CKBASE           ; 30 <= ASCII <= 39
243 016C 78F9 A             AISZ      0,-7
244 016D 9D09 A             SKG       0,NINE
245 016E 1906 A             JMP       BAD              ; 39 < ASCII < 41
246 016F 9F00 A     CKBASE: SKG       0,0(SP)
247 0170 F300 A             SKNE      0,0(SP)
248 0171 1903 A             JMP       BAD              ; ASCII >= BASE
249 0172 D301 A             ST        0,1(SP)          ; PUT DIGIT SECOND
250 0173 5001 A             LI        0,1              ;   AND TRUE FLAG
251 0174 1993 A             JMP       PUT              ;    ON BOTTOM
252 0175 5000 A     BAD:    LI        0,0              ; LEAVE FALSE FLAG
253 0176 98F6 I             JMP       BIN              ;    ON BOTTOM
254 0177 0009 A     NINE:   .WORD     9
255                 ;
256                 ;****************************************************
257                 ;*                       (FIND)                     *
258                 ;****************************************************
259                 ;
260 0178 8628 A             HEAD      ORD,6,LONG,'('/256
261 0179 4649 A             .WORD     'FI','ND',')'+EVEN,DIGIT-4
    017A 4E44 A
```

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```
    017B A920 A
    017C 0162 A
262 017D 017E A     PFIND:  .WORD     .+1
263 017E 6100 A             PUSH      IP               ; SAVE IP
264 017F 7BFF A             AISZ      SP,-1            ; EXTEND STACK
265 0180 CB01 A             LD        X,1(SP)          ; GET NFA
266 0181 A302 A     NEWNAM: LD        0,@2(SP)         ; FIRST WD OF STRING
267 0182 C600 A             LD        1,(X)            ; FIRST WD OF NAME
268 0183 5840 A             RXOR      1,0
269 0184 A923 A             AND       0,X3FFF          ; CLEAR START & PREC
270 0185 B923 A             SKAZ      0,X7F7F          ; CMP LTH, FIRST CHAR
271 0186 1915 A             JMP       MISS             ; IF MISMATCH
272 0187 450C A             BOC       NZ,FOUND         ; IF ONLY ONE CHAR
273 0188 C702 A             LD        1,2(SP)          ; INITIALIZE
274 0189 D700 A             ST        1,0(SP)          ;   STRING POINTER
275 018A 7A01 A     CYCLE:  AISZ      X,1              ; BUMP NAME AND
276 018B 8F00 A             ISZ       0(SP)            ;   STRING POINTERS
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```
277  018C  A300  A              LD      0,@0(SP)              ; NEXT WD OF STRING
278  018D  C600  A              LD      1,(X)                 ; NEXT WD OF NAME
279  018E  5840  A              RXOR    1,0
280  018F  4201  A              BOC     P,.+2                 ; IF HI BYTE IS LAST,
281  0190  A919  A              AND     0,XFF00               ;  CLEAR LOW BYTE
282  0191  B917  A              SKAZ    0,X7F7F               ; COMPARE CHARS
283  0192  1909  A              JMP     MISS                  ; IF MISMATCH
284  0193  41F6  A              BOC     Z,CYCLE               ; IF NO STOP BIT
285  0194  7A03  A      FOUND:  AISZ    X,3                   ; FORM PFA
286  0195  DB02  A              ST      X,2(SP)               ; PUT THIRD ON STACK
287  0196  A301  A              LD      0,@1(SP)              ; FIRST WD OF NAME
288  0197  2C10  A              SHR     0,8,0                 ; GET LENGTH BYTE
289  0198  D301  A              ST      0,1(SP)               ; PUT SECOND ON STACK
290  0199  5001  A              LI      0,1                   ; BOOLEAN TRUE
291  019A  6500  A              PULL    IP                    ; RESTORE IP
292  019B  98F7  I              JMP     PUT                   ; BOOLEAN ON BOTTOM
293  019C  B90E  A      MISS:   SKAZ    0,X8080               ; TEST FOR A STOP BIT
294  019D  1903  A              JMP     ENDNAM                ; IF PRESENT
295  019E  7A01  A              AISZ    X,1                   ; BUMP NAME POINTER
296  019F  C200  A              LD      0,(X)                 ; GET NEXT WORD
297  01A0  19FB  A              JMP     MISS                  ; CONTINUE SCANNING
298  01A1  CA01  A      ENDNAM: LD      X,1(X)                ; FETCH LINK
299  01A2  DB01  A              ST      X,1(SP)               ; NEW NFA
300  01A3  7A00  A              AISZ    X,0                   ; TEST FOR LINK = 0
301  01A4  19DC  A              JMP     NEWNAM                ; IF NOT DONE
302  01A5  DB02  A              ST      X,2(SP)               ; PUT BOOLEAN FALSE
303  01A6  6500  A              PULL    IP                    ; RESTORE IP
304  01A7  19B4  A              JMP     POP2
305                     ;
306  01A8  3FFF  A      X3FFF:  .WORD   03FFF
307  01A9  7F7F  A      X7F7F:  .WORD   07F7F
308  01AA  FF00  A      XFF00:  .WORD   0FF00
309  01AB  8080  A      X8080:  .WORD   08080
310                     ;
311                     ;********************************************************
312                     ;*                        ENCLOSE                       *
313                     ;********************************************************
314                     ;
```

```
315                     ;   SCAN SOURCE STRING, PACKED TWO CHARACTERS/WORD,
316                     ;     FOR DELIMITER ON TOP OF STACK, OR ASCII NULL.
317                     ;
318  01AC  8745  A              HEAD    ORD,7,LONG,'E'/256
319  01AD  4E43  A              .WORD   'NC','LO','SE'+ODD,PFIND-5
     01AE  4C4F  A
     01AF  53C5  A
     01B0  0178  A
320  01B1  01B2  A      ENCL:   .WORD   .+1
321  01B2  6100  A              PUSH    IP                    ; SAVE IP
322  01B3  7BFE  A              AISZ    SP,-2                 ; EXTEND STACK
323  01B4  C302  A              LD      0,2(SP)               ; GET DELIMITER
324  01B5  A932  A              AND     0,RMASK               ; USE LOWER
325  01B6  5D00  A              RCPY    0,1                   ;  BYTE ONLY
```

```
326  01B7  2910  A            SHL     1,8,0            ; DOUBLE UP
327  01B8  6900  A            RADD    0,1              ;   DELIMITER
328  01B9  C303  A            LD      0,3(SP)          ; GET BYTE ADDRESS
329  01BA  3800  A            PFLG    LINK
330  01BB  2403  A            ROR     0,1,1            ; CONVERT ADDRESS
331  01BC  D300  A            ST      0,0(SP)          ; SAVE WORD ADDRESS
332  01BD  5200  A            LI      X,0              ; CLEAR COUNT
333  01BE  A300  A    NEW1:   LD      0,@0(SP)         ; GET NEXT 2 BYTES
334  01BF  5840  A            RXOR    1,0              ; COMPARE WITH DELIMS
335  01C0  4803  A            BOC     LINK,RT1         ; IF START ADDR ODD
336  01C1  B925  A            SKAZ    0,LMASK          ; TEST LEFT BYTE
337  01C2  1908  A            JMP     LNDEL            ; IF NOT DELIM
338  01C3  7A01  A            AISZ    X,1              ; BUMP COUNT
339  01C4  B923  A    RT1:    SKAZ    0,RMASK          ; TEST RIGHT BYTE
340  01C5  1904  A            JMP     RNDEL            ; IF NOT DELIM
341  01C6  7A01  A            AISZ    X,1              ; BUMP COUNT
342  01C7  3800  A            PFLG    LINK             ; LEFT BYTE OF
343  01C8  8F00  A            ISZ     0(SP)            ;   FOLLOWING WORD
344  01C9  19F4  A            JMP     NEW1             ;     IS NEXT
345  01CA  3880  A    RNDEL:  SFLG    LINK             ; REMEMBER WHICH BYTE
346  01CB  DB02  A    LNDEL:  ST      X,2(SP)          ; SET FC OFFSET
347  01CC  4810  A            BOC     LINK,RT2         ; RESUME AT SAME BYTE
348  01CD  A300  A    NEW2:   LD      0,@0(SP)         ; GET DATA
349  01CE  DB01  A            ST      X,1(SP)          ; MAYBE EW OFFSET
350  01CF  B917  A            SKAZ    0,LMASK          ; TEST FOR NULL
351  01D0  1905  A            JMP     NONUL
352  01D1  DB00  A    NUL:    ST      X,0(SP)          ; NC OFFSET
353  01D2  FB02  A            SKNE    X,2(SP)          ; IS NC = FC?
354  01D3  8F01  A            ISZ     1(SP)            ; YES, BUMP EW
355  01D4  6500  A            PULL    IP               ; RESTORE IP
356  01D5  98F8  I            JMP     NEXT
357  01D6  7A01  A    NONUL:  AISZ    X,1              ; BUMP COUNT
358  01D7  5840  A            RXOR    1,0
359  01D8  B90E  A            SKAZ    0,LMASK          ; TEST FOR DELIM
360  01D9  1903  A            JMP     RT2
361  01DA  DB00  A    DELIM:  ST      X,0(SP)          ; NC OFFSET
362  01DB  6500  A            PULL    IP               ; RESTORE IP
363  01DC  98F8  I            JMP     NEXT
364  01DD  5840  A    RT2:    RXOR    1,0
365  01DE  DB01  A            ST      X,1(SP)          ; MAYBE EW
366  01DF  A908  A            AND     0,RMASK
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```
367  01E0  41F0  A            BOC     Z,NUL            ; TEST FOR NULL
368  01E1  7A01  A            AISZ    X,1              ; BUMP COUNT
369  01E2  5840  A            RXOR    1,0
370  01E3  A904  A            AND     0,RMASK
371  01E4  41F5  A            BOC     Z,DELIM          ; TEST FOR DELIM
372  01E5  8F00  A            ISZ     0(SP)            ; BACK FOR
373  01E6  19E6  A            JMP     NEW2             ;   NEXT WORD
374  01E7  FF00  A    LMASK:  .WORD   0FF00
375  01E8  00FF  A    RMASK:  .WORD   000FF
376                          ;
```

```
377                    ;***********************************************
378                    ;*                  TERMINAL VECTORS                  *
379                    ;***********************************************
380                    ;
381                    ;  THESE WORDS VECTOR TO INSTALLATION-SPECIFIC CODE
382                    ;
383 01E9 8445 A                 HEAD      ORD,4,LONG,'E'/256
384 01EA 4D49 A                 .WORD     'MI','T'+EVEN,ENCL-5
    01EB D420 A
    01EC 01AC A
385 01ED 0A49 A       EMIT:     .WORD     PEMIT
386                    ;
387 01EE 834B A                 HEAD      ORD,3,LONG,'K'/256
388 01EF 45D9 A                 .WORD     'EY'+ODD,EMIT-4
    01F0 01E9 A
389 01F1 0A4D A       KEY:      .WORD     PKEY
390                    ;
391 01F2 893F A                 HEAD      ORD,9,LONG,'?'/256
392 01F3 5445 A                 .WORD     'TE','RM','IN','AL'+ODD,KEY-3
    01F4 524D A
    01F5 494E A
    01F6 41CC A
    01F7 01EE A
393 01F8 0A4F A       QTERM:    .WORD     PQTERM
394                    ;
395 01F9 8243 A                 HEAD      ORD,2,LONG,'C'/256
396 01FA D220 A                 .WORD     'R'+EVEN,QTERM-6
    01FB 01F2 A
397 01FC 0A53 A       CR:       .WORD     PCR
398                    ;
399                    ;***********************************************
400                    ;*                        MOVE                        *
401                    ;***********************************************
402                    ;
403                    ;  NOTE THAT THIS WORD MOVES DATA IN 16-BIT UNITS.
404                    ;
405 01FD 844D A                 HEAD      ORD,4,LONG,'M'/256
406 01FE 4F56 A                 .WORD     'OV','E'+EVEN,CR-3
    01FF C520 A
    0200 01F9 A
407 0201 0202 A       MOVE:     .WORD     .+1
408 0202 C300 A                 LD        0,0(SP)         ; GET COUNT
409 0203 410A A                 BOC       Z,MOVE2         ; IF ZERO
410 0204 6100 A                 PUSH      IP              ; SAVE IP
411 0205 5D00 A                 RCPY      0,1
```

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```
412 0206 CB02 A                 LD        X,2(SP)         ; SOURCE ADDRESS
413 0207 C200 A       MOVE1:    LD        0,(X)           ; GET DATA ITEM
414 0208 B301 A                 ST        0,@1(SP)        ; STORE AT DEST
415 0209 7A01 A                 AISZ      X,1             ; INCREMENT
416 020A 8F01 A                 ISZ       1(SP)           ;   ADDRESSES
417 020B 79FF A                 AISZ      1,-1            ; DECREMENT COUNT
418 020C 19FA A                 JMP       MOVE1           ; UNTIL DONE
```

```
419  020D  6500  A              PULL    IP              ; RESTORE IP
420  020E  7B03  A    MOVE2:     AISZ    SP,3            ; POP ARGUMENTS
421  020F  98F8  I              JMP     NEXT
422                   ;
423                   ;**************************************************
424                   ;*                  U*, FOR 16 BITS              *
425                   ;**************************************************
426                   ;
427  0210  8255  A              HEAD    ORD,2,LONG,'U'/256
428  0211  AA20  A              .WORD   '*'+EVEN,MOVE-4
     0212  01FD  A
429  0213  0214  A    USTAR:     .WORD   .+1
430  0214  6100  A              PUSH    IP              ; SAVE IP
431  0215  C300  A              LD      0,0(SP)         ; GET MULTIPLIER
432  0216  5100  A              LI      1,0             ; CLEAR RESULT
433  0217  5210  A              LI      X,16            ; LOOP COUNT
434  0218  7000  A              CAI     0,0             ; COMPLEMENT MPLR
435  0219  6940  A    LP:        RADD    1,1             ; SHIFT LO INTO CRY
436  021A  7400  A              RADC    0,0             ; ROTATE MPLR LEFT
437  021B  4A02  A              BOC     CSET, TEST      ; TEST FOR ADD
438  021C  E701  A              ADD     1,1(SP)         ; ADD IF MPLR BIT=1
439  021D  9105  A              SUBB    0, MINUS1       ; ADD CARRY TO HI
440  021E  7AFF  A    TEST:      AISZ    X,-1            ; DECR LOOP COUNT
441  021F  19F9  A              JMP     LP              ; REPEAT UNTIL LIMIT
442  0220  D701  A              ST      1,1(SP)         ; PUT LO-ORDER SECOND
443  0221  6500  A              PULL    IP              ; RESTORE IP
444  0222  98F7  I              JMP     PUT             ; HI-ORDER ON BOTTOM
445  0223  FFFF  A    MINUS1:    .WORD   -1
446                   ;
447                   ;**************************************************
448                   ;*                  U/, FOR 32 BITS              *
449                   ;**************************************************
450                   ;
451  0224  8255  A              HEAD    ORD,2,LONG,'U'/256
452  0225  AF20  A              .WORD   '/'+EVEN,USTAR-3
     0226  0210  A
453  0227  0228  A    USLASH:    .WORD   .+1
454  0228  6100  A              PUSH    IP              ; SAVE IP
455  0229  C701  A              LD      1,1(SP)         ; HI-ORDER DIVIDEND
456  022A  C302  A              LD      0,2(SP)         ; LO-ORDER DIVIDEND
457  022B  CB00  A              LD      X,0(SP)         ; GET DIVISOR
458  022C  7201  A              CAI     X,1             ; SAVE -(DIVISOR) FOR
459  022D  DB01  A              ST      X,1(SP)         ;   CONVENIENCE
460  022E  5210  A              LI      X,16            ; LOOP COUNT
461  022F  2803  A              SHL     0,1,1           ; SHIFT LO INTO LINK
462  0230  2103  A    POOL:      ROL     1,1,1           ; ROTATE HI WITH LINK
463  0231  2003  A              ROL     0,1,1           ; ROTATE HI INTO QUOT
464  0232  E701  A              ADD     1,1(SP)         ; SUBTR DIVSR FROM HI


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465  0233  9107  A              SUBB    0,MIN1          ; ADD CARRY TO QUOT
466  0234  4301  A              BOC     BIT0,.+2        ; IF QUOT BIT = 0,
467  0235  E700  A              ADD     1,0(SP)         ;   ADD DIVISOR BACK
```

```
468 0236 7AFF A            AISZ    X,-1            ; DECREMENT LOOP CNT
469 0237 19F8 A            JMP     POOL            ; REPEAT UNTIL LIMIT
470 0238 D702 A            ST      1,2(SP)         ; REMAINDER SECOND
471 0239 6500 A            PULL    IP              ; RESTORE IP
472 023A 1967 A            JMP     BIN             ; QUOTIENT ON BOTTOM
473 023B FFFF A    MIN1:   .WORD   -1
474                    ;
475                    ;***********************************************
476                    ;*                   LOGICALS                  *
477                    ;***********************************************
478                    ;
479 023C 8341 A            HEAD    ORD,3,LONG,'A'/256
480 023D 4EC4 A            .WORD   'ND'+ODD,USLASH-3
    023E 0224 A
481 023F 0240 A    AND:    .WORD   .+1
482 0240 C301 A            LD      0,1(SP)         ; GET SECOND
483 0241 AB00 A            AND     0,0(SP)         ;  AND WITH BOTTOM
484 0242 195F A            JMP     BIN             ; REMOVE ARGS
485                    ;
486 0243 824F A            HEAD    ORD,2,LONG,'O'/256
487 0244 D220 A            .WORD   'R'+EVEN,AND-3
    0245 023C A
488 0246 0247 A    OR:     .WORD   .+1
489 0247 C301 A            LD      0,1(SP)         ; GET SECOND
490 0248 A700 A            OR      0,0(SP)         ;  OR WITH BOTTOM
491 0249 1958 A            JMP     BIN             ; REMOVE ARGS
492                    ;
493 024A 8358 A            HEAD    ORD,3,LONG,'X'/256
494 024B 4FD2 A            .WORD   'OR'+ODD,OR-3
    024C 0243 A
495 024D 024E A    XOR:    .WORD   .+1
496 024E C301 A            LD      0,1(SP)         ; GET SECOND
497 024F CB00 A            LD      X,0(SP)         ; GET BOTTOM
498 0250 5880 A            RXOR    X,0             ; FORM EXCLUSIVE OR
499 0251 1950 A            JMP     BIN             ; REMOVE ARGS
500                    ;
501                    ;***********************************************
502                    ;*            STACK INITIALIZATION             *
503                    ;***********************************************
504                    ;
505 0252 8353 A            HEAD    ORD,3,LONG,'S'/256
506 0253 50C0 A            .WORD   'P@'+ODD,XOR-3
    0254 024A A
507 0255 0256 A    SPAT:   .WORD   .+1
508 0256 5CC0 A            RCPY    SP,0            ; STACK POINTER
509 0257 98F9 I            JMP     PUSH            ; PUSH ON STACK
510                    ;
511 0258 8353 A            HEAD    ORD,3,LONG,'S'/256
512 0259 50A1 A            .WORD   'P!'+ODD,SPAT-3
    025A 0252 A
513 025B 025C A    SPSTOR: .WORD   .+1
514 025C C822 A            LD      X,UP            ; GET USER POINTER
```

```
515 025D CE03 A              LD      SP,3(X)           ; FETCH SP0
516 025E 98F8 I              JMP     NEXT
517                  ;
518 025F 8352 A              HEAD    ORD,3,LONG,'R'/256
519 0260 50A1 A              .WORD   'P!'+ODD,SPSTOR-3
    0261 0258 A
520 0262 0263 A  RPSTOR:     .WORD   .+1
521 0263 C822 A              LD      X,UP              ; GET USER POINTER
522 0264 C204 A              LD      0,4(X)            ; FETCH R0
523 0265 D021 A              ST      0,RP              ; SET RETURN POINTER
524 0266 98F8 I              JMP     NEXT
525                  ;
526 0267 823B A              HEAD    ORD,2,LONG,';'/256
527 0268 D320 A              .WORD   'S'+EVEN,RPSTOR-3
    0269 025F A
528 026A 026B A  SEMIS:      .WORD   .+1
529 026B A021 A              LD      0,@RP             ; RESTORE
530 026C 5D00 A              RCPY    0,IP              ;   OLD IP
531 026D 8C21 A              ISZ     RP                ; POP RETURN STACK
532 026E 98F8 I              JMP     NEXT
533                  ;
534                  ;****************************************************
535                  ;*                  RETURN STACK WORDS              *
536                  ;****************************************************
537                  ;
538 026F 854C A              HEAD    ORD,5,LONG,'L'/256
539 0270 4541 A              .WORD   'EA','VE'+ODD,SEMIS-3
    0271 56C5 A
    0272 0267 A
540 0273 0274 A  LEAVE:      .WORD   .+1
541 0274 C821 A              LD      X,RP              ; GET RETURN POINTER
542 0275 C200 A              LD      0,0(X)            ; GET LOOP INDEX
543 0276 D201 A              ST      0,1(X)            ; MAKE LIMIT EQUAL
544 0277 98F8 I              JMP     NEXT
545                  ;
546 0278 823E A              HEAD    ORD,2,LONG,'>'/256
547 0279 D220 A              .WORD   'R'+EVEN,LEAVE-4
    027A 026F A
548 027B 027C A  TOR:        .WORD   .+1
549 027C AC21 A              DSZ     RP                ; EXTEND RETURN STACK
550 027D C300 A              LD      0,(SP)            ; GET DATA ITEM
551 027E B021 A              ST      0,@RP             ; PUT ON RETURN STACK
552 027F 98FA I              JMP     POP               ; POP FROM DATA STACK
553                  ;
554 0280 8252 A              HEAD    ORD,2,LONG,'R'/256
555 0281 BE20 A              .WORD   '>'+EVEN,TOR-3
    0282 0278 A
556 0283 0284 A  FROMR:      .WORD   .+1
557 0284 A021 A              LD      0,@RP             ; GET FROM RETURN STK
558 0285 8C21 A              ISZ     RP                ; POP RETURN STACK
559 0286 98F9 I              JMP     PUSH              ; PUSH ON DATA STACK
560                  ;
561 0287 81D2 A              HEAD    ORD,1,SHORT,'R'/256
562 0288 0280 A              .WORD   FROMR-3
563 0289 028A A  R:          .WORD   .+1
```

```
564 028A A021 A              LD      0,@RP          ; GET NONDESTRUCTIVE
565 028B 98F9 I              JMP     PUSH           ; PUSH ON DATA STACK
566                  ;
567                  ;**********************************************
568                  ;*              TESTS AND LOGICALS            *
569                  ;**********************************************
570                  ;
571 028C 8230 A              HEAD    ORD,2,LONG,'0'/256
572 028D BD20 A              .WORD   '='+EVEN,R-2
    028E 0287 A
573 028F 0290 A      ZEQU:    .WORD   .+1
574 0290 5000 A              LI      0,0            ; RETURN ZERO
575 0291 F300 A              SKNE    0,0(SP)        ;  IF DATA NONZERO
576 0292 5001 A              LI      0,1            ; OTHERWISE RETURN 1
577 0293 98F7 I              JMP     PUT
578                  ;
579 0294 8230 A              HEAD    ORD,2,LONG,'0'/256
580 0295 BC20 A              .WORD   '<'+EVEN,ZEQU-3
    0296 028C A
581 0297 0298 A      ZLESS:   .WORD   .+1
582 0298 5000 A              LI      0,0            ; RETURN ZERO
583 0299 9F00 A              SKG     0,0(SP)        ;  IF DATA <= ZERO
584 029A 98F7 I              JMP     PUT
585 029B 5001 A              LI      0,1            ; OTHERWISE RETURN 1
586 029C 98F7 I              JMP     PUT
587                  ;
588                  ;**********************************************
589                  ;*                MATH, BINARY                *
590                  ;**********************************************
591                  ;
592 029D 81AB A              HEAD    ORD,1,SHORT,'+'/256
593 029E 0294 A              .WORD   ZLESS-3
594 029F 02A0 A      PLUS:    .WORD   .+1
595 02A0 C300 A              LD      0,0(SP)        ; ADD BOTTOM TWO
596 02A1 E301 A              ADD     0,1(SP)        ;  STACK VALUES
597 02A2 7B01 A      BIN:     AISZ    SP,1           ; REMOVE ONE ARG
598 02A3 98F7 I              JMP     PUT            ; REPL OTHER W/RESULT
599                  ;
600 02A4 8244 A              HEAD    ORD,2,LONG,'D'/256
601 02A5 AB20 A              .WORD   '+'+EVEN,PLUS-2
    02A6 029D A
602 02A7 02A8 A      DPLUS:   .WORD   .+1
603 02A8 C303 A              LD      0,3(SP)        ; AUGEND LOW-ORDER
604 02A9 E301 A              ADD     0,1(SP)        ; ADDEND LOW-ORDER
605 02AA D303 A              ST      0,3(SP)        ; SUM LOW-ORDER
606 02AB C302 A              LD      0,2(SP)        ; AUGEND HI-ORDER
607 02AC CB00 A              LD      X,0(SP)        ; ADDEND HI-ORDER
608 02AD 7480 A              RADC    X,0            ; ADD WITH CARRY
609 02AE D302 A              ST      0,2(SP)        ; SUM HI-ORDER
610 02AF 98FB I              JMP     POP2
611                  ;
612 02B0 854D A              HEAD    ORD,5,LONG,'M'/256
613 02B1 494E A              .WORD   'IN','US'+ODD,DPLUS-3
    02B2 55D3 A
    02B3 02A4 A
```

```
614  02B4 02B5 A    MINUS:  .WORD   .+1
615  02B5 C300 A            LD      0,(SP)          ; GET STACK VALUE
616  02B6 7001 A            CAI     0,1             ;  AND FORM 2'S COMP
617  02B7 98F7 I            JMP     PUT
618                 ;
619  02B8 8644 A            HEAD    ORD,6,LONG,'D'/256
620  02B9 4D49 A            .WORD   'MI','NU','S'+EVEN,MINUS-4
     02BA 4E55 A
     02BB D320 A
     02BC 02B0 A
621  02BD 02BE A    DMINUS: .WORD   .+1
622  02BE 3780 A            SFLG    CRY             ; CLEAR BORROW
623  02BF 5000 A            LI      0,0             ; SUBTRACT LO-ORDER
624  02C0 9301 A            SUBB    0,1(SP)         ;  FROM 0
625  02C1 D301 A            ST      0,1(SP)
626  02C2 5000 A            LI      0,0             ; SUBTRACT HI-ORDER
627  02C3 9300 A            SUBB    0,0(SP)         ;  FROM 0 WITH BORROW
628  02C4 98F7 I            JMP     PUT
629                 ;
630                 ;************************************************
631                 ;*            STACK MANIPULATION               *
632                 ;************************************************
633                 ;
634  02C5 844F A            HEAD    ORD,4,LONG,'O'/256
635  02C6 5645 A            .WORD   'VE','R'+EVEN,DMINUS-5
     02C7 D220 A
     02C8 02B8 A
636  02C9 02CA A    OVER:   .WORD   .+1
637  02CA C301 A            LD      0,1(SP)         ; GET SECOND VALUE
638  02CB 98F9 I            JMP     PUSH            ; PUSH ON STACK
639                 ;
640  02CC 8444 A            HEAD    ORD,4,LONG,'D'/256
641  02CD 524F A            .WORD   'RO','P'+EVEN,OVER-4
     02CE D020 A
     02CF 02C5 A
642  02D0 015D A    DROP:   .WORD   POP             ; VECTOR DIRECTLY
643                 ;
644  02D1 8453 A            HEAD    ORD,4,LONG,'S'/256
645  02D2 5741 A            .WORD   'WA','P'+EVEN,DROP-4
     02D3 D020 A
     02D4 02CC A
646  02D5 02D6 A    SWAP:   .WORD   .+1
647  02D6 C301 A            LD      0,1(SP)         ; EXCHANGE TOP
648  02D7 CB00 A            LD      X,0(SP)         ;  TWO STACK
649  02D8 DB01 A            ST      X,1(SP)         ;   VALUES
650  02D9 98F7 I            JMP     PUT
651                 ;
652  02DA 8344 A            HEAD    ORD,3,LONG,'D'/256
653  02DB 55D0 A            .WORD   'UP'+ODD,SWAP-4
     02DC 02D1 A
654  02DD 02DE A    DUP:    .WORD   .+1
655  02DE C300 A            LD      0,0(SP)         ; GET BOTTOM VALUE
656  02DF 98F9 I            JMP     PUSH            ; PUSH A COPY OF IT
657                 ;
```

;***

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```
659                     ;*  MEMORY INCREMENT, COMPLEMENT, ADDRESS CONVERT  *
660                     ;*************************************************
661                     ;
662 02E0 822B A                 HEAD      ORD,2,LONG,'+'/256
663 02E1 A120 A                 .WORD     '!'+EVEN,DUP-3
    02E2 02DA A
664 02E3 02E4 A         PSTORE:  .WORD     .+1
665 02E4 A300 A                 LD        0,@0(SP)          ; GET VALUE
666 02E5 E301 A                 ADD       0,1(SP)           ; ADD INCREMENT
667 02E6 B300 A                 ST        0,@0(SP)          ; STORE AT ADDRESS
668 02E7 98FB I                 JMP       POP2              ; REMOVE BOTH
669                     ;
670                     ;  THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADDRESS
671                     ;
672 02E8 8654 A                 HEAD      ORD,6,LONG,'T'/256
673 02E9 4F47 A                 .WORD     'OG','GL','E'+EVEN,PSTORE-3
    02EA 474C A
    02EB C520 A
    02EC 02E0 A
674 02ED 02EE A         TOGGLE:  .WORD     .+1
675 02EE CB01 A                 LD        X,1(SP)           ; GET BYTE ADDRESS
676 02EF 3800 A                 PFLG      LINK              ; CONVERT TO
677 02F0 2603 A                 ROR       X,1,1             ;  WORD ADDRESS
678 02F1 DB01 A                 ST        X,1(SP)           ; SAVE FOR LATER
679 02F2 C200 A                 LD        0,(X)             ; GET DATA WORD
680 02F3 CB00 A                 LD        X,0(SP)           ; GET BIT PATTERN
681 02F4 4801 A                 BOC       LINK,.+2          ; EVEN BYTE ADDRESS
682 02F5 2A10 A                 SHL       X,8,0             ;  MEANS LEFT BYTE
683 02F6 5880 A                 RXOR      X,0               ; COMPL SELECTED BITS
684 02F7 B301 A                 ST        0,@1(SP)          ; REPLACE DATA WORD
685 02F8 98FB I                 JMP       POP2
686                     ;
687                     ;  THE FOLLOWING WORD CONVERTS A 15-BIT WORD
688                     ;  ADDRESS TO A 16-BIT BYTE PSEUDO-ADDRESS.
689                     ;
690 02F9 8442 A                 HEAD      ORD,4,LONG,'B'/256
691 02FA 5954 A                 .WORD     'YT','E'+EVEN,TOGGLE-5
    02FB C520 A
    02FC 02E8 A
692 02FD 02FE A         BYTE:    .WORD     .+1
693 02FE C300 A                 LD        0,0(SP)           ; GET WORD ADDRESS
694 02FF 6800 A                 RADD      0,0               ; MULTIPLY BY 2
695 0300 98F7 I                 JMP       PUT
696                     ;
697                     ;  THE FOLLOWING WORD CONVERTS A 16-BIT BYTE
698                     ;  PSEUDO-ADDRESS TO A 15-BIT WORD ADDRESS.
699                     ;
700 0301 8443 A                 HEAD      ORD,4,LONG,'C'/256
701 0302 454C A                 .WORD     'EL','L'+EVEN,BYTE-4
    0303 CC20 A
    0304 02F9 A
```

```
702 0305 0306 A   CELL:    .WORD    .+1
703 0306 C300 A            LD       0,0(SP)                 ; GET BYTE ADDRESS
704 0307 2C02 A            SHR      0,1,0                   ; DIVIDE BY 2
705 0308 98F7 I            JMP      PUT
```

```
706                       ;
707                       ;*************************************************
708                       ;*              MEMORY FETCH AND STORE           *
709                       ;*************************************************
710                       ;
711 0309 81C0 A           HEAD     ORD,1,SHORT,'@'/256
712 030A 0301 A           .WORD    CELL-4
713 030B 030C A   AT:     .WORD    .+1
714 030C A300 A           LD       0,@0(SP)                ; GET VALUE
715 030D 98F7 I           JMP      PUT
716                       ;
717                       ;   THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADDRESS
718                       ;
719 030E 8243 A           HEAD     ORD,2,LONG,'C'/256
720 030F C020 A           .WORD    '@'+EVEN,AT-2
    0310 0309 A
721 0311 0312 A   CAT:    .WORD    .+1
722 0312 CB00 A           LD       X,0(SP)                 ; GET BYTE ADDRESS
723 0313 3800 A           PFLG     LINK                    ; CONVERT TO
724 0314 2603 A           ROR      X,1,1                   ;  WORD ADDRESS
725 0315 C200 A           LD       0,(X)                   ; GET DATA WORD
726 0316 4801 A           BOC      LINK,.+2                ; LINK = 0 MEANS
727 0317 2C10 A           SHR      0,8,0                   ;   LEFT BYTE
728 0318 A901 A           AND      0,XFF                   ; CLEAR UNWANTED BYTE
729 0319 98F7 I           JMP      PUT
730 031A 00FF A   XFF:    .WORD    00FF
731                       ;
732 031B 81A1 A           HEAD     ORD,1,SHORT,'!'/256
733 031C 030E A           .WORD    CAT-3
734 031D 031E A   STORE:  .WORD    .+1
735 031E C301 A           LD       0,1(SP)                 ; GET VALUE
736 031F B300 A           ST       0,@0(SP)                ; STORE AT ADDRESS
737 0320 98FB I           JMP      POP2                    ; REMOVE BOTH
738                       ;
739                       ;   THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADRESSS
740                       ;
741 0321 8243 A           HEAD     ORD,2,LONG,'C'/256
742 0322 A120 A           .WORD    '!'+EVEN,STORE-2
    0323 031B A
743 0324 0325 A   CSTORE: .WORD    .+1
744 0325 6100 A           PUSH     IP                      ; SAVE IP
745 0326 CB00 A           LD       X,0(SP)                 ; GET BYTE ADDRESS
746 0327 3800 A           PFLG     LINK                    ; CONVERT TO
747 0328 2603 A           ROR      X,1,1                   ; WORD ADDRESS
748 0329 C10B A           LD       0,X00FF
749 032A C701 A           LD       1,1(SP)                 ; BYTE TO BE
750 032B 5500 A           RAND     0,1                     ;  STORED
751 032C 7000 A           CAI      0,0                     ; SET UP MASK
```

```
752 032D 4802 A          BOC     LINK,.+3              ;   AND CLEAR
753 032E 7000 A          CAI     0,0                   ;   APPROPRIATE
754 032F 2910 A          SHL     1,8,0                 ;    HALF OF WORD
755 0330 AA00 A          AND     0,(X)                 ;      TO STORE INTO
756 0331 6840 A          RADD    1,0                   ; ADD IN BYTE
757 0332 D200 A          ST      0,(X)                 ; STORE ALTERED WORD
758 0333 6500 A          PULL    IP                    ; RESTORE IP
```

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```
759 0334 98FB I          JMP     POP2                  ; REMOVE ARGUMENTS
760 0335 00FF A  XOOFF:  .WORD   00FF
761              ;
762              ;************************************************
763              ;*                      :,;                    *
764              ;************************************************
765              ;
766 0336 C1BA A          HEAD    IMM,1,SHORT,':'/256
767 0337 0321 A          .WORD   CSTORE-3
768 0338 0342 A  COLON:  .WORD   DOCOL,QEXEC,SCSP,CURR,AT,CONT
    0339 04EF A
    033A 04CC A
    033B 0401 A
    033C 030B A
    033D 03FA A
769 033E 031D A          .WORD   STORE,CREATE,RBRAC,PSCODE
    033F 0779 A
    0340 0533 A
    0341 055E A
770              ;
771 0342 AC21 A  DOCOL:  DSZ     RP                    ; EXTEND RETURN STK
772 0343 5C40 A          RCPY    IP,0                  ; SAVE IP ON
773 0344 B021 A          ST      0,@RP                 ; RETURN STACK
774 0345 5101 A          LI      IP,1                  ; POINT IP TO WORD
775 0346 6980 A          RADD    W,IP                  ;  AFTER DOCOL
776 0347 98F8 I          JMP     NEXT
777              ;
778 0348 C1BB A          HEAD    IMM,1,SHORT,';'/256
779 0349 0336 A          .WORD   COLON-2
780 034A 0342 A  SEMI:   .WORD   DOCOL,QCSP,COMPIL,SEMIS
    034B 0505 A
    034C 0521 A
    034D 026A A
781 034E 053E A          .WORD   SMUDGE,LBRAC,SEMIS
    034F 052C A
    0350 026A A
```

```
782                     ;
783                     ;*********************************************
784                     ;*              CONSTANT, VARIABLE, USER       *
785                     ;*********************************************
786                     ;
787  0351  8843  A              HEAD     ORD,8,LONG,'C'/256
788  0352  4F4E  A              .WORD    'ON','ST','AN','T'+EVEN,SEMI-2
     0353  5354  A
     0354  414E  A
     0355  D420  A
     0356  0348  A
789  0357  0342  A      CON:    .WORD    DOCOL,CREATE,SMUDGE,COMMA,PSCODE
     0358  0779  A
     0359  053E  A
     035A  0448  A
     035B  055E  A
790                     ;
791  035C  C201  A      DOCON:  LD       0,1(W)          ; GET PARAMETER
792  035D  98F9  I              JMP      PUSH            ; PUSH ON STACK


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793                     ;
794  035E  8856  A              HEAD     ORD,8,LONG,'V'/256
795  035F  4152  A              .WORD    'AR','IA','BL','E'+EVEN,CON-6
     0360  4941  A
     0361  424C  A
     0362  C520  A
     0363  0351  A
796  0364  0342  A      VAR:    .WORD    DOCOL,CON,PSCODE
     0365  0357  A
     0366  055E  A
797                     ;
798  0367  5001  A      DOVAR:  LI       0,1             ; FORM ADDRESS
799  0368  6880  A              RADD     W,0             ;  OF PARAMETER
800  0369  98F9  I              JMP      PUSH            ; PUSH ON STACK
801                     ;
802  036A  8455  A              HEAD     ORD,4,LONG,'U'/256
803  036B  5345  A              .WORD    'SE','R'+EVEN,VAR-6
     036C  D220  A
     036D  035E  A
804  036E  0342  A      USER:   .WORD    DOCOL,CON,PSCODE
     036F  0357  A
     0370  055E  A
805                     ;
806  0371  C201  A      DOUSER: LD       0,1(W)          ; GET OFFSET
807  0372  E022  A              ADD      0,UP            ; ADD USER POINTER
808  0373  98F9  I              JMP      PUSH            ; PUSH ON STACK
```

```
809                    ;
810                    ;**********************************************
811                    ;*              DEFINED CONSTANTS             *
812                    ;**********************************************
813                    ;
814   0374  81B0  A            HEAD    ORD,1,SHORT,'0'/256
815   0375  036A  A            .WORD   USER-4
816   0376  035C  A    ZERO:   .WORD   DOCON,0
      0377  0000  A
817                    ;
818   0378  81B1  A            HEAD    ORD,1,SHORT,'1'/256
819   0379  0374  A            .WORD   ZERO-2
820   037A  035C  A    ONE:    .WORD   DOCON,1
      037B  0001  A
821                    ;
822   037C  81B2  A            HEAD    ORD,1,SHORT,'2'/256
823   037D  0378  A            .WORD   ONE-2
824   037E  035C  A    TWO:    .WORD   DOCON,2
      037F  0002  A
825                    ;
826   0380  81B3  A            HEAD    ORD,1,SHORT,'3'/256
827   0381  037C  A            .WORD   TWO-2
828   0382  035C  A    THREE:  .WORD   DOCON,3
      0383  0003  A
829                    ;
830   0384  8242  A            HEAD    ORD,2,LONG,'B'/256
831   0385  CC20  A            .WORD   'L'+EVEN,THREE-2
      0386  0380  A
832   0387  035C  A    BL:     .WORD   DOCON,' '/256
```

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```
      0388  0020  A
833                    ;
834   0389  8546  A            HEAD    ORD,5,LONG,'F'/256
835   038A  4952  A            .WORD   'IR','ST'+ODD,BL-3
      038B  53D4  A
      038C  0384  A
836   038D  035C  A    FIRST:  .WORD   DOCON,BUFFS
      038E  1DF0  A
837                    ;
838   038F  854C  A            HEAD    ORD,5,LONG,'L'/256
839   0390  494D  A            .WORD   'IM','IT'+ODD,FIRST-4
      0391  49D4  A
      0392  0389  A
840   0393  035C  A    LIMIT:  .WORD   DOCON,TOPMEM
      0394  2000  A
841                    ;
842   0395  8542  A            HEAD    ORD,5,LONG,'B'/256
843   0396  2F42  A            .WORD   '/B','UF'+ODD,LIMIT-4
      0397  55C6  A
      0398  038F  A
844   0399  035C  A    BBUF:   .WORD   DOCON,BLKSIZ
      039A  0080  A
845                    ;
```

```
846  039B  8542  A              HEAD      ORD,5,LONG,'B'/256
847  039C  2F53  A              .WORD     '/S','CR'+ODD,BBUF-4
     039D  43D2  A
     039E  0395  A
848  039F  035C  A    BSCR:      .WORD     DOCON,1024/BLKSIZ
     03A0  0008  A
849                   ;
850                   ;       THE FOLLOWING WORD EXPECTS A WORD-OFFSET
851                   ;              AND RETURNS A WORD-ADDRESS.
852                   ;
853  03A1  872B  A              HEAD      ORD,7,LONG,'+'/256
854  03A2  4F52  A              .WORD     'OR','IG','IN'+ODD,BSCR-4
     03A3  4947  A
     03A4  49CE  A
     03A5  039B  A
855  03A6  0342  A    PORIG:     .WORD     DOCOL,LIT,ORIG,PLUS,SEMIS
     03A7  0103  A
     03A8  0010  A
     03A9  029F  A
     03AA  026A  A
856                   ;
857                   ;*********************************************
858                   ;*                   USER VARIABLES          *
859                   ;*********************************************
860                   ;
861  03AB  8253  A              HEAD      ORD,2,LONG,'S'/256
862  03AC  B020  A              .WORD     'O'+EVEN,PORIG-5
     03AD  03A1  A
863  03AE  0371  A    SZERO:     .WORD     DOUSER,03
     03AF  0003  A
864                   ;
865  03B0  8252  A              HEAD      ORD,2,LONG,'R'/256
```

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```
866  03B1  B020  A              .WORD     'O'+EVEN,SZERO-3
     03B2  03AB  A
867  03B3  0371  A    RZERO:     .WORD     DOUSER,04
     03B4  0004  A
868                   ;
869  03B5  8354  A              HEAD      ORD,3,LONG,'T'/256
870  03B6  49C2  A              .WORD     'IB'+ODD,RZERO-3
     03B7  03B0  A
871  03B8  0371  A    TIB:       .WORD     DOUSER,05
     03B9  0005  A
872                   ;
873  03BA  8557  A              HEAD      ORD,5,LONG,'W'/256
874
875  03BB  4944  A              .WORD     'ID','TH'+ODD,TIB-3
     03BC  54C8  A
     03BD  03B5  A
876  03BE  0371  A    WIDTH:     .WORD     DOUSER,06
     03BF  0006  A
877                   :
```

```
878   03C0  8757  A                  HEAD      ORD,7,LONG,'W'/256
879   03C1  4152  A                  .WORD     'AR','NI','NG'+ODD,WIDTH-4
      03C2  4E49  A
      03C3  4EC7  A
      03C4  03BA  A
880   03C5  0371  A      WARN:       .WORD     DOUSER,07
      03C6  0007  A
881                      ;
882   03C7  8546  A                  HEAD      ORD,5,LONG,'F'/256
883   03C8  454E  A                  .WORD     'EN','CE'+ODD,WARN-5
      03C9  43C5  A
      03CA  03C0  A
884   03CB  0371  A      FENCE:      .WORD     DOUSER,08
      03CC  0008  A
885                      ;
886   03CD  8244  A                  HEAD      ORD,2,LONG,'D'/256
887   03CE  D020  A                  .WORD     'P'+EVEN,FENCE-4
      03CF  03C7  A
888   03D0  0371  A      DP:         .WORD     DOUSER,09
      03D1  0009  A
889                      ;
890   03D2  8856  A                  HEAD      ORD,8,LONG,'V'/256
891   03D3  4F43  A                  .WORD     'OC','-L','IN','K'+EVEN,DP-3
      03D4  2D4C  A
      03D5  494E  A
      03D6  CB20  A
      03D7  03CD  A
892   03D8  0371  A      VOCL:       .WORD     DOUSER,0A
      03D9  000A  A
893                      ;
894   03DA  8342  A                  HEAD      ORD,3,LONG,'B'/256
895   03DB  4CCB  A                  .WORD     'LK'+ODD,VOCL-6
      03DC  03D2  A
896   03DD  0371  A      BLK:        .WORD     DOUSER,0B
      03DE  000B  A
897                      ;
```

```
898   03DF  8249  A                  HEAD      ORD,2,LONG,'I'/256
899   03E0  CE20  A                  .WORD     'N'+EVEN,BLK-3
      03E1  03DA  A
900   03E2  0371  A      IN:         .WORD     DOUSER,0C
      03E3  000C  A
901                      ;
902   03E4  834F  A                  HEAD      ORD,3,LONG,'O'/256
903   03E5  55D4  A                  .WORD     'UT'+ODD,IN-3
      03E6  03DF  A
904   03E7  0371  A      OUT:        .WORD     DOUSER,0D
      03E8  000D  A
905                      ;
906   03E9  8353  A                  HEAD      ORD,3,LONG,'S'/256
907   03EA  43D2  A                  .WORD     'CR'+ODD,OUT-3
      03EB  03E4  A
908   03EC  0371  A      SCR:        .WORD     DOUSER,0E
      03ED  000E  A
```

```
909                      ;
910 03EE 864F A              HEAD      ORD,6,LONG,'O'/256
911 03EF 4646 A              .WORD     'FF','SE','T'+EVEN,SCR-3
    03F0 5345 A
    03F1 D420 A
    03F2 03E9 A
912 03F3 0371 A   OFFSET:   .WORD     DOUSER,0F
    03F4 000F A
913                      ;
914 03F5 8743 A              HEAD      ORD,7,LONG,'C'/256
915 03F6 4F4E A              .WORD     'ON','TE','XT'+ODD,OFFSET-5
    03F7 5445 A
    03F8 58D4 A
    03F9 03EE A
916 03FA 0371 A   CONT:     .WORD     DOUSER,010
    03FB 0010 A
917                      ;
918 03FC 8743 A              HEAD      ORD,7,LONG,'C'/256
919 03FD 5552 A              .WORD     'UR','RE','NT'+ODD,CONT-5
    03FE 5245 A
    03FF 4ED4 A
    0400 03F5 A
920 0401 0371 A   CURR:     .WORD     DOUSER,011
    0402 0011 A
921                      ;
922 0403 8553 A              HEAD      ORD,5,LONG,'S'/256
923 0404 5441 A              .WORD     'TA','TE'+ODD,CURR-5
    0405 54C5 A
    0406 03FC A
924 0407 0371 A   STATE:    .WORD     DOUSER,012
    0408 0012 A
925                      ;
926 0409 8442 A              HEAD      ORD,4,LONG,'B'/256
927 040A 4153 A              .WORD     'AS','E'+EVEN,STATE-4
    040B C520 A
    040C 0403 A
928 040D 0371 A   BASE:     .WORD     DOUSER,013
    040E 0013 A
```

```
929                      ;
930 040F 8344 A              HEAD      ORD,3,LONG,'D'/256
931 0410 50CC A              .WORD     'PL'+ODD,BASE-4
    0411 0409 A
932 0412 0371 A   DPL:      .WORD     DOUSER,014
    0413 0014 A
933                      ;
934 0414 8346 A              HEAD      ORD,3,LONG,'F'/256
935 0415 4CC4 A              .WORD     'LD'+ODD,DPL-3
    0416 040F A
936 0417 0371 A   FLD:      .WORD     DOUSER,015
    0418 0015 A
937                      ;
```

```
938  0419  8343  A          HEAD      ORD,3,LONG,'C'/256
939  041A  53D0  A          .WORD     'SP'+ODD,FLD-3
     041B  0414  A
940  041C  0371  A   CSP:    .WORD     DOUSER,016
     041D  0016  A
941                     ;
942  041E  8252  A          HEAD      ORD,2,LONG,'R'/256
943  041F  A320  A          .WORD     ','+EVEN,CSP-3
     0420  0419  A
944  0421  0371  A   RNUM:   .WORD     DOUSER,017
     0422  0017  A
945                     ;
946  0423  8348  A          HEAD      ORD,3,LONG,'H'/256
947  0424  4CC4  A          .WORD     'LD'+ODD,RNUM-3
     0425  041E  A
948  0426  0371  A   HLD:    .WORD     DOUSER,018
     0427  0018  A
949                     ;
950                     ;***********************************************************
951                     ;*                       MISCELLANEOUS                     *
952                     ;***********************************************************
953                     ;
954  0428  8231  A          HEAD      ORD,2,LONG,'1'/256
955  0429  AB20  A          .WORD     '+'+EVEN,HLD-3
     042A  0423  A
956  042B  042C  A   ONEP:   .WORD     .+1
957  042C  8F00  A          ISZ       0(SP)            ; ADD ONE
958  042D  98F8  I          JMP       NEXT             ;   TO BOTTOM
959  042E  98F8  I          JMP       NEXT             ;    OF STACK
960                     ;
961  042F  8232  A          HEAD      ORD,2,LONG,'2'/256
962  0430  AB20  A          .WORD     '+'+EVEN,ONEP-3
     0431  0428  A
963  0432  0342  A   TWOP:   .WORD     DOCOL,TWO,PLUS,SEMIS
     0433  037E  A
     0434  029F  A
     0435  026A  A
964                     ;
965  0436  8448  A          HEAD      ORD,4,LONG,'H'/256
966  0437  4552  A          .WORD     'ER','E'+EVEN,TWOP-3
     0438  C520  A
     0439  042F  A


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967  043A  0342  A   HERE:   .WORD     DOCOL,DP,AT,SEMIS
     043B  03D0  A
     043C  030B  A
     043D  026A  A
968                     ;
969  043E  8541  A          HEAD      ORD,5,LONG,'A'/256
970  043F  4C4C  A          .WORD     'LL','OT'+ODD,HERE-4
     0440  4FD4  A
     0441  0436  A
```

```
971 0442 0342 A    ALLOT:    .WORD    DOCOL,DP,PSTORE,SEMIS
    0443 03D0 A
    0444 02E3 A
    0445 026A A
972                     ;
973                     ;    :  ,    HERE  !  1 ALLOT  ;
974                     ;
975 0446 81AC A              HEAD     ORD,1,SHORT,',',/256
976 0447 043E A              .WORD    ALLOT-4
977 0448 0342 A    COMMA:    .WORD    DOCOL,HERE,STORE,ONE,ALLOT,SEMIS
    0449 043A A
    044A 031D A
    044B 037A A
    044C 0442 A
    044D 026A A
978                     ;
979 044E 81AD A              HEAD     ORD,1,SHORT,'-'/256
980 044F 0446 A              .WORD    COMMA-2
981 0450 0451 A    SUB:      .WORD    .+1
982 0451 C301 A              LD       0,1(SP)         ; GET MINUEND
983 0452 3780 A              SFLG     CRY             ; CLEAR BORROW
984 0453 9300 A              SUBB     0,0(SP)         ; SUBTRACT SUBTRAHEND
985 0454 98F6 I              JMP      BIN
986                     ;
987 0455 81BD A              HEAD     ORD,1,SHORT,'='/256
988 0456 044E A              .WORD    SUB-2
989 0457 0342 A    EQUAL:    .WORD    DOCOL,SUB,ZEQU,SEMIS
    0458 0450 A
    0459 028F A
    045A 026A A
990                     ;
991 045B 81BC A              HEAD     ORD,1,SHORT,'<'/256
992 045C 0455 A              .WORD    EQUAL-2
993 045D 0342 A    LESS:     .WORD    DOCOL,SUB,ZLESS,SEMIS
    045E 0450 A
    045F 0297 A
    0460 026A A
994                     ;
995 0461 81BE A              HEAD     ORD,1,SHORT,'>'/256
996 0462 045B A              .WORD    LESS-2
997 0463 0342 A    GREAT:    .WORD    DOCOL,SWAP,LESS,SEMIS
    0464 02D5 A
    0465 045D A
    0466 026A A
998                     ;
999 0467 8352 A              HEAD     ORD,3,LONG,'R'/256
```

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```
1000 0468 4FD4 A              .WORD    'OT'+ODD,GREAT-2
     0469 0461 A
1001 046A 046B A    ROT:      .WORD    .+1
1002 046B C302 A              LD       0,2(SP)         ; GET THIRD
1003 046C CB01 A              LD       X,1(SP)         ; MOVE SECOND
```

```
1004 046D DB02 A          ST      X,2(SP)        ;  TO THIRD
1005 046E CB00 A          LD      X,0(SP)        ; MOVE BOTTOM
1006 046F DB01 A          ST      X,1(SP)        ;  TO SECOND
1007 0470 98F7 I          JMP     PUT            ; PUT THIRD ON BOTTOM
1008              ;
1009 0471 8553 A          HEAD    ORD,5,LONG,'S'/256
1010 0472 5041 A          .WORD   'PA','CE'+ODD,ROT-3
     0473 43C5 A
     0474 0467 A
1011 0475 0342 A  SPACE:  .WORD   DOCOL,BL,EMIT,SEMIS
     0476 0387 A
     0477 01ED A
     0478 026A A
1012              ;
1013 0479 842D A          HEAD    ORD,4,LONG,'-'/256
1014 047A 4455 A          .WORD   'DU','P'+EVEN,SPACE-4
     047B D020 A
     047C 0471 A
1015 047D 047E A  DDUP:   .WORD   .+1
1016 047E C300 A          LD      0,0(SP)        ; GET BOTTOM OF STACK
1017 047F 4101 A          BOC     Z,.+2
1018 0480 98F9 I          JMP     PUSH           ; DUP IF NOT ZERO
1019 0481 98F8 I          JMP     NEXT
1020              ;
1021              ;****************************************************
1022              ;*            VARIABLE LENGTH NAME SUPPORT          *
1023              ;****************************************************
1024              ;
1025 0482 8854 A          HEAD    ORD,8,LONG,'T'/256
1026 0483 5241 A          .WORD   'RA','VE','RS','E'+EVEN,DDUP-4
     0484 5645 A
     0485 5253 A
     0486 C520 A
     0487 0479 A
1027 0488 0342 A  TRAV:   .WORD   DOCOL,SWAP
     0489 02D5 A
1028 048A 02C9 A  TRAV1:  .WORD   OVER,PLUS,LIT,007F
     048B 029F A
     048C 0103 A
     048D 007F A
1029 048E 02C9 A          .WORD   OVER,CAT,LESS,ZBRAN
     048F 0311 A
     0490 045D A
     0491 0124 A
1030 0492 FFF8 A          .WORD   TRAV1-.,SWAP,DROP,SEMIS
     0493 02D5 A
     0494 02D0 A
     0495 026A A
1031              ;
1032 0496 864C A          HEAD    ORD,6,LONG,'L'/256
```

```
1033 0497 4154 A              .WORD    'AT','ES','T'+EVEN,TRAV-6
     0498 4553 A
     0499 D420 A
     049A 0482 A
1034 049B 0342 A    LATEST: .WORD    DOCOL,CURR,AT,AT,SEMIS
     049C 0401 A
     049D 030B A
     049E 030B A
     049F 026A A
1035                ;
1036                ;    : LFA     2   -  ;
1037                ;
1038 04A0 834C A              HEAD     ORD,3,LONG,'L'/256
1039 04A1 46C1 A              .WORD    'FA'+ODD,LATEST-5
     04A2 0496 A
1040 04A3 0342 A    LFA:     .WORD    DOCOL,TWO,SUB,SEMIS
     04A4 037E A
     04A5 0450 A
     04A6 026A A
1041                ;
1042                ;    : CFA     1   -  ;
1043                ;
1044 04A7 8343 A              HEAD     ORD,3,LONG,'C'/256
1045 04A8 46C1 A              .WORD    'FA'+ODD,LFA-3
     04A9 04A0 A
1046 04AA 0342 A    CFA:     .WORD    DOCOL,ONE,SUB,SEMIS
     04AB 037A A
     04AC 0450 A
     04AD 026A A
1047                ;
1048                ;    : NFA     2   -  BYTE   -1   TRAVERSE
1049                ;                         -1   TRAVERSE  CELL   ;
1050                ;
1051 04AE 834E A              HEAD     ORD,3,LONG,'N'/256
1052 04AF 46C1 A              .WORD    'FA'+ODD,CFA-3
     04B0 04A7 A
1053 04B1 0342 A    NFA:     .WORD    DOCOL,TWO,SUB,BYTE,LIT,-1
     04B2 037E A
     04B3 0450 A
     04B4 02FD A
     04B5 0103 A
     04B6 FFFF A
1054 04B7 0488 A              .WORD    TRAV,LIT,-1,TRAV,CELL,SEMIS
     04B8 0103 A
     04B9 FFFF A
     04BA 0488 A
     04BB 0305 A
     04BC 026A A
1055                ;
1056                ;    : PFA    BYTE   1   TRAVERSE   CELL   3   +   ;
1057                ;
1058 04BD 8350 A              HEAD     ORD,3,LONG,'P'/256
1059 04BE 46C1 A              .WORD    'FA'+ODD,NFA-3
     04BF 04AE A
1060 04C0 0342 A    PFA:     .WORD    DOCOL,BYTE,ONE,TRAV
```

```
           04C1  02FD  A
           04C2  037A  A
           04C3  0488  A
    1061   04C4  0305  A                  .WORD      CELL,THREE,PLUS,SEMIS
           04C5  0382  A
           04C6  029F  A
           04C7  026A  A
    1062                      ;
    1063                      ;*************************************************
    1064                      ;*          ERROR PROCEDURES, PER SHIRA          *
    1065                      ;*************************************************
    1066                      ;
    1067   04C8  8421  A               HEAD       ORD,4,LONG,'!'/256
    1068   04C9  4353  A               .WORD      'CS','P'+EVEN,PFA-3
           04CA  D020  A
           04CB  04BD  A
    1069   04CC  0342  A      SCSP:     .WORD      DOCOL,SPAT,CSP,STORE,SEMIS
           04CD  0255  A
           04CE  041C  A
           04CF  031D  A
           04D0  026A  A
    1070                      ;
    1071   04D1  863F  A               HEAD       ORD,6,LONG,'?'/256
    1072   04D2  4552  A               .WORD      'ER','RO','R'+EVEN,SCSP-4
           04D3  524F  A
           04D4  D220  A
           04D5  04C8  A
    1073   04D6  0342  A      QERROR:   .WORD      DOCOL,SWAP,ZBRAN
           04D7  02D5  A
           04D8  0124  A
    1074   04D9  0004  A               .WORD      QERR1-.,ERROR,BRAN
           04DA  0744  A
           04DB  011B  A
    1075   04DC  0002  A               .WORD      QERR2-.
    1076   04DD  02D0  A      QERR1:    .WORD      DROP
    1077   04DE  026A  A      QERR2:    .WORD      SEMIS
    1078                      ;
    1079   04DF  853F  A               HEAD       ORD,5,LONG,'?'/256
    1080   04E0  434F  A               .WORD      'CO','MP'+ODD,QERROR-5
           04E1  4DD0  A
           04E2  04D1  A
    1081   04E3  0342  A      QCOMP:    .WORD      DOCOL,STATE,AT,ZEQU
           04E4  0407  A
           04E5  030B  A
           04E6  028F  A
    1082   04E7  0103  A               .WORD      LIT,0011,QERROR,SEMIS
           04E8  0011  A
           04E9  04D6  A
           04EA  026A  A
    1083                      ;
    1084   04EB  853F  A               HEAD       ORD,5,LONG,'?'/256
    1085   04EC  4558  A               .WORD      'EX','EC'+ODD,QCOMP-4
           04ED  45C3  A
           04EE  04DF  A
    1086   04EF  0342  A      QEXEC:    .WORD      DOCOL,STATE,AT
```

```
        04F0 0407 A
        04F1 030B A
1087    04F2 0103 A                  .WORD    LIT,0012,QERROR,SEMIS
        04F3 0012 A
        04F4 04D6 A
        04F5 026A A
1088                         ;
1089    04F6 863F A                  HEAD     ORD,6,LONG,'?'/256
1090    04F7 5041 A                  .WORD    'PA','IR','S'+EVEN,QEXEC-4
        04F8 4952 A
        04F9 D320 A
        04FA 04EB A
1091    04FB 0342 A    QPAIRS: .WORD    DOCOL,SUB,LIT,0013,QERROR,SEMIS
        04FC 0450 A
        04FD 0103 A
        04FE 0013 A
        04FF 04D6 A
        0500 026A A
1092                         ;
1093    0501 843F A                  HEAD     ORD,4,LONG,'?'/256
1094    0502 4353 A                  .WORD    'CS','P'+EVEN,QPAIRS-5
        0503 D020 A
        0504 04F6 A
1095    0505 0342 A    QCSP:   .WORD    DOCOL,SPAT,CSP,AT,SUB
        0506 0255 A
        0507 041C A
        0508 030B A
        0509 0450 A
1096    050A 0103 A                  .WORD    LIT,0014,QERROR,SEMIS
        050B 0014 A
        050C 04D6 A
        050D 026A A
1097                         ;
1098    050E 883F A                  HEAD     ORD,8,LONG,'?'/256
1099    050F 4C4F A                  .WORD    'LO','AD','IN','G'+EVEN,QCSP-4
        0510 4144 A
        0511 494E A
        0512 C720 A
        0513 0501 A
1100    0514 0342 A    QLOAD:  .WORD    DOCOL,BLK,AT,ZEQU
        0515 03DD A
        0516 030B A
        0517 028F A
1101    0518 0103 A                  .WORD    LIT,0016,QERROR,SEMIS
        0519 0016 A
        051A 04D6 A
        051B 026A A
1102                         ;
1103                         ;****************************************************
1104                         ;*          COMPILE, SMUDGE, HEX, DECIMAL          *
1105                         ;****************************************************
1106                         ;
1107                         ;  : COMPILE   ?COMP   R>   DUP   1+   >R   @   ,   ;
1108                         ;
1109    051C 8743 A                  HEAD     ORD,7,LONG,'C'/256
```

```
1110 051D 4F4D A              .WORD    'OM','PI','LE'+ODD,QLOAD-6
     051E 5049 A
     051F 4CC5 A
     0520 050E A
1111 0521 0342 A   COMPIL:   .WORD    DOCOL,QCOMP,FROMR,DUP
     0522 04E3 A
     0523 0283 A
     0524 02DD A
1112 0525 042B A              .WORD    ONEP,TOR,AT,COMMA,SEMIS
     0526 027B A
     0527 030B A
     0528 0448 A
     0529 026A A
1113               ;
1114 052A C1DB A              HEAD     IMM,1,SHORT,'['/256
1115 052B 051C A              .WORD    COMPIL-5
1116 052C 0342 A   LBRAC:    .WORD    DOCOL,ZERO,STATE,STORE,SEMIS
     052D 0376 A
     052E 0407 A
     052F 031D A
     0530 026A A
1117               ;
1118 0531 81DD A              HEAD     ORD,1,SHORT,']'/256
1119 0532 052A A              .WORD    LBRAC-2
1120 0533 0342 A   RBRAC:    .WORD    DOCOL,LIT,00C0
     0534 0103 A
     0535 00C0 A
1121 0536 0407 A              .WORD    STATE,STORE,SEMIS
     0537 031D A
     0538 026A A
1122               ;
1123               ;    : SMUDGE    LATEST   BYTE   20   TOGGLE   ;
1124               ;
1125 0539 8653 A              HEAD     ORD,6,LONG,'S'/256
1126 053A 4D55 A              .WORD    'MU','DG','E'+EVEN,RBRAC-2
     053B 4447 A
     053C C520 A
     053D 0531 A
1127 053E 0342 A   SMUDGE:   .WORD    DOCOL,LATEST,BYTE
     053F 049B A
     0540 02FD A
1128 0541 0103 A              .WORD    LIT,0020,TOGGLE,SEMIS
     0542 0020 A
     0543 02ED A
     0544 026A A
1129               ;
1130 0545 8348 A              HEAD     ORD,3,LONG,'H'/256
1131 0546 45D8 A              .WORD    'EX'+ODD,SMUDGE-5
     0547 0539 A
1132 0548 0342 A   HEX:      .WORD    DOCOL,LIT,0010,BASE,STORE,SEMIS
     0549 0103 A
     054A 0010 A
     054B 040D A
     054C 031D A
     054D 026A A
```

```
1133                      ;
1134 054E 8744 A                  HEAD      ORD,7,LONG,'D'/256
1135 054F 4543 A                  .WORD     'EC','IM','AL'+ODD,HEX-3
     0550 494D A
     0551 41CC A
     0552 0545 A
1136 0553 0342 A   DEC:   .WORD     DOCOL,LIT,0A,BASE,STORE,SEMIS
     0554 0103 A
     0555 000A A
     0556 040D A
     0557 031D A
     0558 026A A
1137                      ;
1138                      ;**********************************************
1139                      ;*                         ;CODE                *
1140                      ;**********************************************
1141                      ;
1142 0559 8728 A                  HEAD      ORD,7,LONG,'('/256
1143 055A 3B43 A                  .WORD     ';C','OD','E)'+ODD,DEC-5
     055B 4F44 A
     055C 45A9 A
     055D 054E A
1144 055E 0342 A   PSCODE: .WORD   DOCOL,FROMR,LATEST
     055F 0283 A
     0560 049B A
1145 0561 04C0 A                  .WORD     PFA,CFA,STORE,SEMIS
     0562 04AA A
     0563 031D A
     0564 026A A
1146                      ;
1147                      ;
1148 0565 C53B A                  HEAD      IMM,5,LONG,';'/256
1149 0566 434F A                  .WORD     'CO','DE'+ODD,PSCODE-5
     0567 44C5 A
     0568 0559 A
1150 0569 0342 A   SEMIC:  .WORD   DOCOL,QCSP,COMPIL,PSCODE
     056A 0505 A
     056B 0521 A
     056C 055E A
1151 056D 052C A                  .WORD     LBRAC,SMUDGE,SEMIS
     056E 053E A
     056F 026A A
1152                      ;
1153                      ;**********************************************
1154                      ;*                  <BUILDS, DOES>              *
1155                      ;**********************************************
1156                      ;
1157 0570 873C A                  HEAD      ORD,7,LONG,'<'/256
1158 0571 4255 A                  .WORD     'BU','IL','DS'+ODD,SEMIC-4
     0572 494C A
     0573 44D3 A
     0574 0565 A
1159 0575 0342 A   BUILDS: .WORD   DOCOL,ZERO,CON,SEMIS
     0576 0376 A
     0577 0357 A
```

```
       0578 026A A
1160                        ;
1161 0579 8544 A                        HEAD        ORD,5,LONG,'D'/256
1162 057A 4F45 A                        .WORD       'OE','S>'+ODD,BUILDS-5
     057B 53BE A
     057C 0570 A
1163 057D 0342 A  DOES:     .WORD       DOCOL,FROMR,LATEST,PFA,STORE,PSCODE
     057E 0283 A
     057F 049B A
     0580 04C0 A
     0581 031D A
     0582 055E A
1164                        ;
1165 0583 AC21 A  DODOES: DSZ           RP                      ; EXTEND RETURN STACK
1166 0584 5C40 A          RCPY          IP,0
1167 0585 B021 A          ST            0,@RP                   ; PUSH IP
1168 0586 C601 A          LD            1,1(W)                  ; LOAD IP FROM PARAM
1169 0587 5002 A          LI            0,2                     ; POINT BOTTOM
1170 0588 6880 A          RADD          W,0                     ;   OF STACK
1171 0589 98F9 I          JMP           PUSH                    ;     TO PFA+1
1172                        ;
1173                        ;**************************************************
1174                        ;*                    TEXT OUTPUTS                 *
1175                        ;**************************************************
1176                        ;
1177                        ;   : COUNT     BYTE   DUP   1+   SWAP   C@   ;
1178                        ;
1179 058A 8543 A                        HEAD        ORD,5,LONG,'C'/256
1180 058B 4F55 A                        .WORD       'OU','NT'+ODD,DOES-4
     058C 4ED4 A
     058D 0579 A
1181 058E 0342 A  COUNT:    .WORD       DOCOL,BYTE,DUP,ONEP,SWAP,CAT,SEMIS
     058F 02FD A
     0590 02DD A
     0591 042B A
     0592 02D5 A
     0593 0311 A
     0594 026A A
1182                        ;
1183 0595 8454 A                        HEAD        ORD,4,LONG,'T'/256
1184 0596 5950 A                        .WORD       'YP','E'+EVEN,COUNT-4
     0597 C520 A
     0598 058A A
1185 0599 0342 A  TYPE:     .WORD       DOCOL,DDUP,ZBRAN
     059A 047D A
     059B 0124 A
1186 059C 000C A            .WORD       TYPE2-.,OVER,PLUS,SWAP,XDO
     059D 02C9 A
     059E 029F A
     059F 02D5 A
     05A0 0155 A
1187 05A1 0161 A  TYPE1:    .WORD       I,CAT,EMIT,XLOOP
     05A2 0311 A
     05A3 01ED A
     05A4 012F A
```

```
1188 05A5 FFFC A                .WORD   TYPE1-.,BRAN
     05A6 011B A
1189 05A7 0002 A                .WORD   TYPE3-.
1190 05A8 02D0 A   TYPE2:  .WORD   DROP
1191 05A9 026A A   TYPE3:  .WORD   SEMIS
1192                        ;
1193 05AA 892D A                HEAD    ORD,9,LONG,'-'/256
1194 05AB 5452 A                .WORD   'TR','AI','LI','NG'+ODD,TYPE-4
     05AC 4149 A
     05AD 4C49 A
     05AE 4EC7 A
     05AF 0595 A
1195 05B0 0342 A   DTRAIL: .WORD   DOCOL,DUP,ZERO,XDO
     05B1 02DD A
     05B2 0376 A
     05B3 0155 A
1196 05B4 02C9 A   DTRA1:  .WORD   OVER,OVER,PLUS,ONE,SUB
     05B5 02C9 A
     05B6 029F A
     05B7 037A A
     05B8 0450 A
1197 05B9 0311 A                .WORD   CAT,BL,SUB,ZBRAN
     05BA 0387 A
     05BB 0450 A
     05BC 0124 A
1198 05BD 0004 A                .WORD   DTRA2-.,LEAVE,BRAN
     05BE 0273 A
     05BF 011B A
1199 05C0 0003 A                .WORD   DTRA3-.
1200 05C1 037A A   DTRA2:  .WORD   ONE,SUB
     05C2 0450 A
1201 05C3 012F A   DTRA3:  .WORD   XLOOP
1202 05C4 FFF0 A                .WORD   DTRA1-.,SEMIS
     05C5 026A A
1203                        ;
1204                        ;   : (.")   R   COUNT   DUP   CELL   1+
1205                        ;           R>   +   >R   TYPE   ;
1206                        ;
1207 05C6 8428 A                HEAD    ORD,4,LONG,'('/256
1208 05C7 2E22 A                .WORD   '."',')'+EVEN,DTRAIL-6
     05C8 A920 A
     05C9 05AA A
1209 05CA 0342 A   PDOTQ:  .WORD   DOCOL,R,COUNT,DUP,CELL,ONEP
     05CB 0289 A
     05CC 058E A
     05CD 02DD A
     05CE 0305 A
     05CF 042B A
1210 05D0 0283 A                .WORD   FROMR,PLUS,TOR,TYPE,SEMIF
     05D1 029F A
     05D2 027B A
     05D3 0599 A
     05D4 026A A
1211                        ;
1212                        ;   : ."   22   STATE   @   IF   COMPILE   (.")   WORD:
```

```
1213                      ;          HERE  BYTE   C@  CELL  1+  ALLOT   ELSE
1214                      ;          WORD  HERE   COUNT  TYPE   ENDIF   ;
1215                      ;              IMMEDIATE
1216                      ;
1217  05D5 C22E A                    HEAD     IMM,2,LONG,'.'/256
1218  05D6 A220 A                    .WORD    '"'+EVEN,PDOTQ-4
      05D7 05C6 A
1219  05D8 0342 A         DOTQ:      .WORD    DOCOL,LIT,'"'/256,STATE,AT,ZBRAN
      05D9 0103 A
      05DA 0022 A
      05DB 0407 A
      05DC 030B A
      05DD 0124 A
1220  05DE 000C A                    .WORD    DOTQ1-.,COMPIL,PDOTQ,WORD
      05DF 0521 A
      05E0 05CA A
      05E1 06A8 A
1221  05E2 043A A                    .WORD    HERE,BYTE,CAT,CELL,ONEP,ALLOT,BRAN
      05E3 02FD A
      05E4 0311 A
      05E5 0305 A
      05E6 042B A
      05E7 0442 A
      05E8 011B A
1222  05E9 0005 A                    .WORD    DOTQ2-.
1223  05EA 06A8 A         DOTQ1:     .WORD    WORD,HERE,COUNT,TYPE
      05EB 043A A
      05EC 058E A
      05ED 0599 A
1224  05EE 026A A         DOTQ2:     .WORD    SEMIS
1225                      ;
1226                                 .LIST    PART=2
      05ED 0599 A
1224  05EE 026A A         DOTQ2:     .WORD    SEMIS
1225                      ;
1226                      024  05EE 026A A   DOTQ2:   .WORD    SEMIS
1225                      ;
1226                      PACE ASSEMBLER REV-A 05/23/75
FORTH NUCLEUS FOR PACE
```

```
1227          ;
1228          ;*************************************************
1229          ;*                 TERMINAL INPUT                *
1230          ;*************************************************
1231          ;
1232          ;    : EXPECT    OVER  +  OVER  DO  KEY  DUP
1233          ;               07  +ORIGIN  @  =  IF  DROP  08
1234          ;               OVER  I  =  DUP  R>  2  -  +  >R  -
1235          ;               ELSE  DUP  0D  =
1236          ;                 IF  LEAVE  DROP  BL  0  ELSE  DUP
1237          ;                 ENDIF  I  C!  0  I  1+  C!
1238          ;               ENDIF  EMIT  LOOP  DROP  ;
1239          ;
1240 05EF 8645 A          HEAD      ORD,6,LONG,'E'/256
1241 05F0 5850 A          .WORD     'XP','EC','T'+EVEN,DOTQ-3
     05F1 4543 A
     05F2 D420 A
     05F3 05D5 A
1242 05F4 0342 A  EXPECT: .WORD     DOCOL,OVER,PLUS,OVER,XDO
     05F5 02C9 A
     05F6 029F A
     05F7 02C9 A
     05F8 0155 A
1243 05F9 01F1 A  EXPEC1: .WORD     KEY,DUP,LIT,07,PORIG,AT,EQUAL,ZBRAN
     05FA 02DD A
     05FB 0103 A
     05FC 0007 A
     05FD 03A6 A
     05FE 030B A
     05FF 0457 A
     0600 0124 A
1244 0601 0010 A          .WORD     EXPEC2-.,DROP,LIT,08,OVER,I,EQUAL
     0602 02D0 A
     0603 0103 A
     0604 0008 A
     0605 02C9 A
     0606 0161 A
     0607 0457 A
1245 0608 02DD A          .WORD     DUP,FROMR,TWO,SUB,PLUS,TOR,SUB,BRAN
     0609 0283 A
     060A 037E A
     060B 0450 A
     060C 029F A
     060D 027B A
     060E 0450 A
```

```
        060F 011B A
1246 0610 0014 A                .WORD    EXPEC5-.
1247 0611 02DD A  EXPEC2: .WORD    DUP,LIT,0D,EQUAL,ZBRAN
     0612 0103 A
     0613 000D A
     0614 0457 A
     0615 0124 A
1248 0616 0007 A                .WORD    EXPEC3-.,LEAVE,DROP,BL,ZERO,BRAN
     0617 0273 A
     0618 02D0 A
     0619 0387 A
     061A 0376 A
     061B 011B A
1249 061C 0002 A                .WORD    EXPEC4-.
1250 061D 02DD A  EXPEC3: .WORD    DUP
1251 061E 0161 A  EXPEC4: .WORD    I,CSTORE,ZERO,I,ONEP,CSTORE
     061F 0324 A
     0620 0376 A
     0621 0161 A
     0622 042B A
     0623 0324 A
1252 0624 01ED A  EXPEC5: .WORD    EMIT,XLOOP
     0625 012F A
1253 0626 FFD3 A                .WORD    EXPEC1-.,DROP,SEMIS
     0627 02D0 A
     0628 026A A
1254                        ;
1255                        ;   : QUERY   TIB  @  BYTE  50  EXPECT  0  IN  !  ;
1256                        ;
1257 0629 8551 A                HEAD     ORD,5,LONG,'Q'/256
1258 062A 5545 A                .WORD    'UE','RY'+ODD,EXPECT-5
     062B 52D9 A
     062C 05EF A
1259 062D 0342 A  QUERY:  .WORD    DOCOL,TIB,AT,BYTE,LIT,0050
     062E 03B8 A
     062F 030B A
     0630 02FD A
     0631 0103 A
     0632 0050 A
1260 0633 05F4 A                .WORD    EXPECT,ZERO,IN,STORE,SEMIS
     0634 0376 A
     0635 03E2 A
     0636 031D A
     0637 026A A
1261                        ;
1262 0638 C180 A                HEAD     IMM,1,SHORT,00              ; NULL
1263 0639 0629 A                .WORD    QUERY-4
1264 063A 0342 A  NULL:   .WORD    DOCOL,BLK,AT,ZBRAN
     063B 03DD A
     063C 030B A
     063D 0124 A
1265 063E 0013 A                .WORD    NULL2-.
1266 063F 037A A                .WORD    ONE,BLK,PSTORE,ZERO,IN,STORE
     0640 03DD A
     0641 02E3 A
```

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          0642 0376 A
          0643 03E2 A
          0644 031D A
1267 0645 03DD A                    .WORD    BLK,AT,BSCR,MOD,ZEQU,ZBRAN
          0646 030B A
          0647 039F A
          0648 0919 A
          0649 028F A
          064A 0124 A
1268 064B 0004 A                    .WORD    NULL1-.,QEXEC,FROMR,DROP
          064C 04EF A
          064D 0283 A
          064E 02D0 A
1269 064F 011B A     NULL1:    .WORD    BRAN
1270 0650 0003 A               .WORD    NULL3-.
1271 0651 0283 A     NULL2:    .WORD    FROMR,DROP
          0652 02D0 A
1272 0653 026A A     NULL3:    .WORD    SEMIS
1273                      ;
1274                      ;***********************************************
1275                      ;*       FILL, ERASE, BLANKS, HOLD, PAD, CMOVE        *
1276                      ;***********************************************
1277                      ;
1278                      ;         NOTE THAT THE NEXT THREE WORDS FILL
1279                      ;                 16-BIT WORDS, NOT BYTES.
1280                      ;
1281                      ;    : FILL    SWAP    >R   OVER    !   DUP   1+
1282                      ;              R>    1    -    MOVE   ;
1283                      ;
1284 0654 8446 A               HEAD     ORD,4,LONG,'F'/256
1285 0655 494C A               .WORD    'IL','L'+EVEN,NULL-2
          0656 CC20 A
          0657 0638 A
1286 0658 0342 A     FILL:    .WORD    DOCOL,SWAP,TOR,OVER,STORE,DUP
          0659 02D5 A
          065A 027B A
          065B 02C9 A
          065C 031D A
          065D 02DD A
1287 065E 042B A               .WORD    ONEP,FROMR,ONE,SUB,MOVE,SEMIS
          065F 0283 A
          0660 037A A
          0661 0450 A
          0662 0201 A
          0663 026A A
1288                      ;
1289 0664 8545 A               HEAD     ORD,5,LONG,'E'/256
1290 0665 5241 A               .WORD    'RA','SE'+ODD,FILL-4
          0666 53C5 A
          0667 0654 A
1291 0668 0342 A     ERASE:   .WORD    DOCOL,ZERO,FILL,SEMIS
          0669 0376 A
          066A 0658 A
          066B 026A A
1292                      ;
```

```
1293                    ;    : BLANKS    2020   FILL   ;
1294                    ;
1295 066C 8642 A             HEAD      ORD,6,LONG,'B'/256
1296 066D 4C41 A             .WORD     'LA','NK','S'+EVEN,ERASE-4
     066E 4E4B A
     066F D320 A
     0670 0664 A
1297 0671 0342 A    BLANKS: .WORD     DOCOL,LIT,02020,FILL,SEMIS
     0672 0103 A
     0673 2020 A
     0674 0658 A
     0675 026A A
1298                    ;
1299 0676 8448 A             HEAD      ORD,4,LONG,'H'/256
1300 0677 4F4C A             .WORD     'OL','D'+EVEN,BLANKS-5
     0678 C420 A
     0679 066C A
1301 067A 0342 A    HOLD:   .WORD     DOCOL,LIT,-1,HLD,PSTORE
     067B 0103 A
     067C FFFF A
     067D 0426 A
     067E 02E3 A
1302 067F 0426 A             .WORD     HLD,AT,CSTORE,SEMIS
     0680 030B A
     0681 0324 A
     0682 026A A
1303                    ;
1304                    ;            NOTE THAT PAD IS A WORD ADDRESS.
1305                    ;
1306                    ;    : PAD    HERE   22   +   ;
1307                    ;
1308 0683 8350 A             HEAD      ORD,3,LONG,'P'/256
1309 0684 41C4 A             .WORD     'AD'+ODD,HOLD-4
     0685 0676 A
1310 0686 0342 A    PAD:    .WORD     DOCOL,HERE,LIT,0022,PLUS,SEMIS
     0687 043A A
     0688 0103 A
     0689 0022 A
     068A 029F A
     068B 026A A
1311                    ;
1312                    ;    : CMOVE     -DUP   IF   OVER   +   SWAP   DO
1313                    ;                DUP   C@   I   C!   1+   LOOP
1314                    ;                ELSE   DROP   ENDIF   DROP   ;
1315                    ;
1316 068C 8543 A             HEAD      ORD,5,LONG,'C'/256
1317 068D 4D4F A             .WORD     'MO','VE'+ODD,PAD-3
     068E 56C5 A
     068F 0683 A
1318 0690 0342 A    CMOVE:  .WORD     DOCOL,DDUP,ZBRAN
     0691 047D A
     0692 0124 A
1319 0693 000E A             .WORD     CMOVE2-.,OVER,PLUS,SWAP,XDO
     0694 02C9 A
     0695 029F A
```

```
           0696 02D5 A
           0697 0155 A
1320  0698 02DD A   CMOVE1: .WORD    DUP,CAT,I,CSTORE,ONEP,XLOOP
           0699 0311 A
           069A 0161 A
           069B 0324 A
           069C 042B A
           069D 012F A
1321  069E FFFA A           .WORD    CMOVE1-.,BRAN
           069F 011B A
1322  06A0 0002 A           .WORD    CMOVE3-.
1323  06A1 02D0 A   CMOVE2: .WORD    DROP
1324  06A2 02D0 A   CMOVE3: .WORD    DROP,SEMIS
           06A3 026A A
1325                     ;
1326                     ;*****************************************************
1327                     ;*                          WORD                     *
1328                     ;*****************************************************
1329                     ;
1330                     ;   : WORD    BLK  @   IF   BLK   @   BLOCK   ELSE   TIB   @
1331                     ;                ENDIF  BYTE   IN   @   +   SWAP   ENCLOSE
1332                     ;                HERE  11   BLANKS   IN   +!   OVER   -   >R
1333                     ;                R   HERE   BYTE   C!   +   HERE   BYTE   1+
1334                     ;                R>   CMOVE   ;
1335                     ;
1336  06A4 8457 A           HEAD     ORD,4,LONG,'W'/256
1337  06A5 4F52 A           .WORD    'OR','D'+EVEN,CMOVE-4
           06A6 C420 A
           06A7 068C A
1338  06A8 0342 A   WORD:   .WORD    DOCOL,BLK,AT,ZBRAN
           06A9 03DD A
           06AA 030B A
           06AB 0124 A
1339  06AC 0006 A           .WORD    WORD1-.,BLK,AT,BLOCK,BRAN
           06AD 03DD A
           06AE 030B A
           06AF 09B6 A
           06B0 011B A
1340  06B1 0003 A           .WORD    WORD2-.
1341  06B2 03B8 A   WORD1:  .WORD    TIB,AT
           06B3 030B A
1342  06B4 02FD A   WORD2:  .WORD    BYTE,IN,AT,PLUS,SWAP,ENCL
           06B5 03E2 A
           06B6 030B A
           06B7 029F A
           06B8 02D5 A
           06B9 01B1 A
1343  06BA 043A A           .WORD    HERE,LIT,17,BLANKS,IN,PSTORE
           06BB 0103 A
           06BC 0011 A
           06BD 0671 A
           06BE 03E2 A
           06BF 02E3 A
1344  06C0 02C9 A           .WORD    OVER,SUB,TOR,R,HERE,BYTE,CSTORE
           06C1 0450 A
```

```
          06C2 027B A
          06C3 0289 A
          06C4 043A A
          06C5 02FD A
          06C6 0324 A
     1345 06C7 029F A              .WORD    PLUS,HERE,BYTE,ONEP
          06C8 043A A
          06C9 02FD A
          06CA 042B A
     1346 06CB 0283 A              .WORD    FROMR,CMOVE,SEMIS
          06CC 0690 A
          06CD 026A A
     1347                 ;
     1348                 ;*********************************************
     1349                 ;*              (NUMBER), NUMBER, -FIND      *
     1350                 ;*********************************************
     1351                 ;
     1352 06CE 8828 A              HEAD     ORD,8,LONG,'('/256
     1353 06CF 4E55 A              .WORD    'NU','MB','ER',')'+EVEN,WORD-4
          06D0 4D42 A
          06D1 4552 A
          06D2 A920 A
          06D3 06A4 A
     1354 06D4 0342 A     PNUMB:   .WORD    DOCOL
     1355 06D5 042B A     PNUMB1:  .WORD    ONEP,DUP,TOR,CAT,BASE,AT,DIGIT,ZBRAN
          06D6 02DD A
          06D7 027B A
          06D8 0311 A
          06D9 040D A
          06DA 030B A
          06DB 0166 A
          06DC 0124 A
     1356 06DD 0016 A              .WORD    PNUMB3-.,SWAP,BASE,AT,USTAR
          06DE 02D5 A
          06DF 040D A
          06E0 030B A
          06E1 0213 A
     1357 06E2 02D0 A              .WORD    DROP,ROT,BASE,AT,USTAR
          06E3 046A A
          06E4 040D A
          06E5 030B A
          06E6 0213 A
     1358 06E7 02A7 A              .WORD    DPLUS,DPL,AT,ONEP,ZBRAN
          06E8 0412 A
          06E9 030B A
          06EA 042B A
          06EB 0124 A
     1359 06EC 0004 A              .WORD    PNUMB2-.,ONE,DPL,PSTORE
          06ED 037A A
          06EE 0412 A
          06EF 02E3 A
     1360 06F0 0283 A     PNUMB2:  .WORD    FROMR,BRAN
          06F1 011B A
     1361 06F2 FFE3 A              .WORD    PNUMB1-.
     1362 06F3 0283 A     PNUMB3:  .WORD    FROMR,SEMIS
```

```
       06F4 026A A
1363                        ;
1364                        ;    : NUMBER    BYTE   0   0   ROT   DUP   1+   C@
1365                        ;           2D   =   DUP   >R   +   -1
1366                        ;           BEGIN   DPL   !   (NUMBER)   DUP   C@   BL   -
1367                        ;           WHILE   DUP   C@   2E   -   0   ?ERROR   0   REPEAT
1368                        ;           DROP   R>   IF   DMINUS   ENDIF   ;
1369                        ;
1370   06F5 864E A                HEAD     ORD,6,LONG,'N'/256
1371   06F6 554D A                .WORD    'UM','BE','R'+EVEN,PNUMB-6
       06F7 4245 A
       06F8 D220 A
       06F9 06CE A
1372   06FA 0342 A    NUMB:   .WORD    DOCOL,BYTE,ZERO,ZERO
       06FB 02FD A
       06FC 0376 A
       06FD 0376 A
1373   06FE 046A A            .WORD    ROT,DUP,ONEP,CAT,LIT
       06FF 02DD A
       0700 042B A
       0701 0311 A
       0702 0103 A
1374   0703 002D A            .WORD    '-'/256,EQUAL,DUP,TOR,PLUS,LIT,-1
       0704 0457 A
       0705 02DD A
       0706 027B A
       0707 029F A
       0708 0103 A
       0709 FFFF A
1375   070A 0412 A    NUMB1:  .WORD    DPL,STORE,PNUMB,DUP,CAT,BL,SUB,ZBRAN
       070B 031D A
       070C 06D4 A
       070D 02DD A
       070E 0311 A
       070F 0387 A
       0710 0450 A
       0711 0124 A
1376   0712 000B A            .WORD    NUMB2-.,DUP,CAT,LIT,'.'/256
       0713 02DD A
       0714 0311 A
       0715 0103 A
       0716 002E A
1377   0717 0450 A            .WORD    SUB,ZERO,QERROR,ZERO,BRAN
       0718 0376 A
       0719 04D6 A
       071A 0376 A
       071B 011B A
1378   071C FFEE A            .WORD    NUMB1-.
1379   071D 02DD A    NUMB2:  .WORD    DROP,FROMR,ZBRAN
       071E 0283 A
       071F 0124 A
1380   0720 0002 A            .WORD    NUMB3-.,DMINUS
       0721 02BD A
1381   0722 026A A    NUMB3:  .WORD    SEMIS
1382                        ;
```

```
1383 0723 852D A              HEAD       ORD,5,LONG,'-'/256
1384 0724 4649 A              .WORD      'FI','ND'+ODD,NUMB-5
     0725 4EC4 A
     0726 06F5 A
1385 0727 0342 A   DFIND:     .WORD      DOCOL,BL,WORD,HERE,CONT,AT
     0728 0387 A
     0729 06A8 A
     072A 043A A
     072B 03FA A
     072C 030B A
1386 072D 030B A              .WORD      AT,PFIND,DUP,ZEQU,ZBRAN
     072E 017D A
     072F 02DD A
     0730 028F A
     0731 0124 A
1387 0732 0005 A              .WORD      DFIND1-.,DROP,HERE,LATEST,PFIND
     0733 02D0 A
     0734 043A A
     0735 049B A
     0736 017D A
1388 0737 026A A   DFIND1:    .WORD      SEMIS
1389               ;
1390               ;*****************************************************
1391               ;*                 ERROR HANDLER                    *
1392               ;*****************************************************
1393               ;
1394                            .FORM      STRING,8,8
1395               ;
1396 0738 8728 A              HEAD       ORD,7,LONG,'('/256
1397 0739 4142 A              .WORD      'AB','OR','T)'+ODD,DFIND-4
     073A 4F52 A
     073B 54A9 A
     073C 0723 A
1398 073D 0342 A   PABORT:    .WORD      DOCOL,ABORT,SEMIS
     073E 0874 A
     073F 026A A
1399               ;
1400 0740 8545 A              HEAD       ORD,5,LONG,'E'/256
1401 0741 5252 A              .WORD      'RR','OR'+ODD,PABORT-5
     0742 4FD2 A
     0743 0738 A
1402 0744 0342 A   ERROR:     .WORD      DOCOL,WARN,AT,ZLESS,ZBRAN
     0745 03C5 A
     0746 030B A
     0747 0297 A
     0748 0124 A
1403 0749 0002 A              .WORD      ERROR1-.,PABORT
     074A 073D A
1404 074B 043A A   ERROR1:    .WORD      HERE,COUNT,TYPE,PDOTQ
     074C 058E A
     074D 0599 A
     074E 05CA A
1405 074F 0420 A              STRING     4,' '/256
1406 0750 203F A              .ASCII     ' ? '
     0751 2020 A
```

```
1407  0752  0A05  A              .WORD    MESS,SPSTOR,IN,AT
      0753  025B  A
      0754  03E2  A
      0755  030B  A
1408  0756  03DD  A              .WORD    BLK,AT,QUIT,SEMIS
      0757  030B  A
      0758  085C  A
      0759  026A  A
1409                      ;
1410                      ;    : ID.    PAD   010   5F5F   FILL   DUP   PFA   LFA
1411                      ;            OVER   -   PAD   SWAP   MOVE   PAD   COUNT
1412                      ;            01F   AND   TYPE   SPACE   ;
1413                      ;
1414  075A  8349  A              HEAD     ORD,3,LONG,'I'/256
1415  075B  44AE  A              .WORD    'D.'+ODD,ERROR-4
      075C  0740  A
1416  075D  0342  A      IDDOT:   .WORD    DOCOL,PAD,LIT,0010,LIT,05F5F
      075E  0686  A
      075F  0103  A
      0760  0010  A
      0761  0103  A
      0762  5F5F  A
1417  0763  0658  A              .WORD    FILL,DUP,PFA,LFA,OVER,SUB
      0764  02DD  A
      0765  04C0  A
      0766  04A3  A
      0767  02C9  A
      0768  0450  A
1418  0769  0686  A              .WORD    PAD,SWAP,MOVE,PAD,COUNT
      076A  02D5  A
      076B  0201  A
      076C  0686  A
      076D  058E  A
1419  076E  0103  A              .WORD    LIT,001F,AND,TYPE,SPACE,SEMIS
      076F  001F  A
      0770  023F  A
      0771  0599  A
      0772  0475  A
      0773  026A  A
1420                      ;
1421                      ;****************************************************
1422                      ;*                      CREATE                      *
1423                      ;****************************************************
1424                      ;
1425                      ;    : CREATE   SP@   HERE   50   +   <   2   ?ERROR   -FIND
1426                      ;            IF   DROP   NFA   ID.   4   MESSAGE   SPACE
1427                      ;            ENDIF   HERE   DUP   BYTE   DUP   C@
1428                      ;            WIDTH   @   MIN   DUP   CELL   1+   ALLOT
1429                      ;            OVER   A0   TOGGLE   +   80   TOGGLE
1430                      ;            LATEST   ,   CURRENT   @   !
1431                      ;            HERE   1+   ,   ;
1432                      ;
1433  0774  8643  A              HEAD     ORD,6,LONG,'C'/256
1434  0775  5245  A              .WORD    'RE','AT','E'+EVEN,IDDOT-3
      0776  4154  A
```

```
        0777 C520 A
        0778 075A A
1435    0779 0342 A    CREATE: .WORD    DOCOL,SPAT,HERE,LIT,0050,PLUS
        077A 0255 A
        077B 043A A
        077C 0103 A
        077D 0050 A
        077E 029F A
1436    077F 045D A            .WORD    LESS,TWO,QERROR,DFIND,ZBRAN
        0780 037E A
        0781 04D6 A
        0782 0727 A
        0783 0124 A
1437    0784 0008 A            .WORD    CREAT1-.,DROP,NFA,IDDOT
        0785 02D0 A
        0786 04B1 A
        0787 075D A
1438    0788 0103 A            .WORD    LIT,4,MESS,SPACE.
        0789 0004 A
        078A 0A05 A
        078B 0475 A
1439    078C 043A A    CREAT1: .WORD    HERE,DUP,BYTE,DUP,CAT,WIDTH,AT
        078D 02DD A
        078E 02FD A
        078F 02DD A
        0790 0311 A
        0791 03BE A
        0792 030B A
1440    0793 08CF A            .WORD    MIN,DUP,CELL,ONEP,ALLOT,OVER
        0794 02DD A
        0795 0305 A
        0796 042B A
        0797 0442 A
        0798 02C9 A
1441    0799 0103 A            .WORD    LIT,00A0,TOGGLE,PLUS,LIT,0080
        079A 00A0 A
        079B 02ED A
        079C 029F A
        079D 0103 A
        079E 0080 A
1442    079F 02ED A            .WORD    TOGGLE,LATEST,COMMA,CURR,AT
        07A0 049B A
        07A1 0448 A
        07A2 0401 A
        07A3 030B A
1443    07A4 031D A            .WORD    STORE,HERE,ONEP,COMMA,SEMIS
        07A5 043A A
        07A6 042B A
        07A7 0448 A
        07A8 026A A
1444                    ;
1445                    ;**************************************************
1446                    ;*           [COMPILE], LITERAL, DLITERAL         *
1447                    ;**************************************************
1448                    ;
```

```
1449  07A9  C95B  A              HEAD      IMM,9,LONG,'['/256
1450  07AA  434F  A              .WORD     'CO','MP','IL','E]'+ODD,CREATE-5
      07AB  4D50  A
      07AC  494C  A
      07AD  45DD  A
      07AE  0774  A
1451  07AF  0342  A    BCOMP:    .WORD     DOCOL,DFIND,ZEQU,ZERO,QERROR
      07B0  0727  A
      07B1  028F  A
      07B2  0376  A
      07B3  04D6  A
1452  07B4  02D0  A              .WORD     DROP,CFA,COMMA,SEMIS
      07B5  04AA  A
      07B6  0448  A
      07B7  026A  A
1453                       ;
1454  07B8  C74C  A              HEAD      IMM,7,LONG,'L'/256
1455  07B9  4954  A              .WORD     'IT','ER','AL'+ODD,BCOMP-6
      07BA  4552  A
      07BB  41CC  A
      07BC  07A9  A
1456  07BD  0342  A    LITER:    .WORD     DOCOL,STATE,AT,ZBRAN
      07BE  0 D7  A
      07BF  030B  A
      07C0  0124  A
1457  07C1  0004  A              .WORD     LITER1-.,COMPIL,LIT,COMMA
      07C2  0521  A
      07C3  0103  A
      07C4  0448  A
1458  07C5  026A  A    LITER1:   .WORD     SEMIS
1459                       ;
1460  07C6  C844  A              HEAD      IMM,8,LONG,'D'/256
1461  07C7  4C49  A              .WORD     'LI','TE','RA','L'+EVEN,LITER-5
      07C8  5445  A
      07C9  5241  A
      07CA  CC20  A
      07CB  07B8  A
1462  07CC  0342  A    DLITER:   .WORD     DOCOL,STATE,AT,ZBRAN
      07CD  0407  A
      07CE  030B  A
      07CF  0124  A
1463  07D0  0004  A              .WORD     DLITE1-.,SWAP,LITER,LITER
      07D1  02D5  A
      07D2  07BD  A
      07D3  07BD  A
1464  07D4  026A  A    DLITE1:   .WORD     SEMIS
1465                       ;
1466                       ;   : ?STACK    SO  @  SP@  <  L: ?ERROR
1467                       ;               SP@  HERE  42 + < 7 ?ERROR  ;
1468                       ;
1469  07D5  863F  A              HEAD      ORD,6,LONG,'?'/256
1470  07D6  5354  A              .WORD     'ST','AC','K'+EVEN,DLITER-6
      07D7  4143  A
      07D8  CB20  A
      07D9  07C6  A
```

```
 1471 07DA 0342 A   QSTACK: .WORD    DOCOL,SZERO,AT,SPAT,LESS
      07DB 03AE A
      07DC 030B A
      07DD 0255 A
      07DE 045D A
 1472 07DF 037A A           .WORD    ONE,QERROR,SPAT,HERE,LIT,0042
      07E0 04D6 A
      07E1 0255 A
      07E2 043A A
      07E3 0103 A
      07E4 0042 A
 1473 07E5 029F A           .WORD    PLUS,LESS,LIT,7,QERROR,SEMIS
      07E6 045D A
      07E7 0103 A
      07E8 0007 A
      07E9 04D6 A
      07EA 026A A
 1474                ;
 1475                ;**********************************************
 1476                ;*                   INTERPRET                *
 1477                ;*****************************************************
 1478                ;
 1479 07EB 8949 A           HEAD     ORD,9,LONG,'I'/256
 1480 07EC 4E54 A           .WORD    'NT','ER','PR','ET'+ODD,QSTACK-5
      07ED 4552 A
      07EE 5052 A
      07EF 45D4 A
      07F0 07D5 A
 1481 07F1 0342 A   INTER:  .WORD    DOCOL
 1482 07F2 0727 A   INTER1: .WORD    DFIND,ZBRAN
      07F3 0124 A
 1483 07F4 000F A           .WORD    INTER4-.,STATE,AT,LESS,ZBRAN
      07F5 0407 A
      07F6 030B A
      07F7 045D A
      07F8 0124 A
 1484 07F9 0005 A           .WQRD    INTER2-.,CFA,COMMA,BRAN
      07FA 04AA A
      07FB 0448 A
      07FC 011B A
 1485 07FD 0003 A           .WORD    INTER3-.
 1486 07FE 04AA A   INTER2: .WORD    CFA,EXEC
      07FF 0112 A
 1487 0800 07DA A   INTER3: .WORD    QSTACK,BRAN
      0801 011B A
 1488 0802 000E A           .WORD    INTER7-.
 1489 0803 043A A   INTER4: .WORD    HERE,NUMB,DPL,AT,ONEP,ZBRAN
      0804 06FA A
      0805 0412 A
      0806 030B A
      0807 042B A
      0808 0124 A
 1490 0809 0004 A           .WORD    INTER5-.,DLITER,BRAN
      080A 07CC A
      080B 011B A
```

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1491 080C 0003 A                   .WORD    INTER6-.
1492 080D 02D0 A   INTER5: .WORD    DROP,LITER
     080E 07BD A
1493 080F 07DA A   INTER6: .WORD    QSTACK
1494 0810 011B A   INTER7: .WORD    BRAN
1495 0811 FFE1 A                   .WORD    INTER1-.,SEMIS
     0812 026A A
1496               ;
1497               ;************************************************
1498               ;*   IMMEDIATE, VOCABULARY, DEFINITIONS, FORTH, (  *
1499               ;************************************************
1500               ;
1501               ;   : IMMEDIATE    LATEST  BYTE  40  TOGGLE   ;
1502               ;
1503 0813 8949 A           HEAD     ORD,9,LONG,'I'/256
1504 0814 4D4D A           .WORD    'MM','ED','IA','TE'+ODD,INTER-6
     0815 4544 A
     0816 4941 A
     0817 54C5 A
     0818 07EB A
1505 0819 0342 A   IMMED:  .WORD    DOCOL,LATEST,BYTE
     081A 049B A
     081B 02FD A
1506 081C 0103 A           .WORD    LIT,0040,TOGGLE,SEMIS
     081D 0040 A
     081E 02ED A
     081F 026A A
1507               ;
1508               ;   : VOCABULARY    <BUILDS  81A0   ,   CURRENT  @
1509               ;           CFA  ,  HERE  VOC-LINK  @  ,  VOC-LINK  !
1510               ;           DOES>  1+  CONTEXT  !  ;
1511               ;
1512 0820 8A56 A           HEAD     ORD,10,LONG,'V'/256
1513 0821 4F43 A           .WORD    'OC','AB','UL','AR','Y'+EVEN,IMMED-6
     0822 4142 A
     0823 554C A
     0824 4152 A
     0825 D920 A
     0826 0813 A
1514 0827 0342 A   VOCAB:  .WORD    DOCOL,BUILDS,LIT,081A0,COMMA
     0828 0575 A
     0829 0103 A
     082A 81A0 A
     082B 0448 A
1515 082C 0401 A           .WORD    CURR,AT,CFA,COMMA,HERE,VOCL
     082D 030B A
     082E 04AA A
     082F 0448 A
     0830 043A A
     0831 03D8 A
1516 0832 030B A           .WORD    AT,COMMA,VOCL,STORE,DOES
     0833 0448 A
     0834 03D8 A
     0835 031D A
     0836 057D A
```

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1517 0837 042B A    DOVOC:   .WORD    ONEP,CONT,STORE,SEMIS
     0838 03FA A
     0839 031D A
     083A 026A A
1518                ;
1519 083B C546 A             HEAD     IMM,5,LONG,'F'/256
1520 083C 4F52 A             .WORD    'OR','TH'+ODD,VOCAB-7
     083D 54C8 A
     083E 0820 A
1521 083F 0583 A    FORTH:   .WORD    DODOES,DOVOC,081A0,TASK-4,0
     0840 0837 A
     0841 81A0 A
     0842 0C65 A
     0843 0000 A
1522                ;
1523 0844 8B44 A             HEAD     ORD,11,LONG,'D'/256
1524 0845 4546 A             .WORD    'EF','IN','IT','IO','NS'+ODD,FORTH-4
     0846 494E A
     0847 4954 A
     0848 494F A
     0849 4ED3 A
     084A 083B A
1525 084B 0342 A    DEFIN:   .WORD    DOCOL,CONT,AT,CURR,STORE,SEMIS
     084C 03FA A
     084D 030B A
     084E 0401 A
     084F 031D A
     0850 026A A
1526                ;
1527 0851 C1A8 A             HEAD     IMM,1,SHORT,'('/256
1528 0852 0844 A             .WORD    DEFIN-7
1529 0853 0342 A    PAREN:   .WORD    DOCOL,LIT,')'/256,WORD,SEMIS
     0854 0103 A
     0855 0029 A
     0856 06A8 A
     0857 026A A
1530                ;
1531                ;********************************************************
1532                ;*                    QUIT, ABORT                      *
1533                ;********************************************************
1534                ;
1535 0858 8451 A             HEAD     ORD,4,LONG,'Q'/256
1536 0859 5549 A             .WORD    'UI','T'+EVEN,PAREN-2
     085A D420 A
     085B 0851 A
1537 085C 0342 A    QUIT:    .WORD    DOCOL,ZERO,BLK,STORE,LBRAC
     085D 0376 A
     085E 03DD A
     085F 031D A
     0860 052C A
1538 0861 0262 A    QUIT1:   .WORD    RPSTOR,CR,QUERY,INTER
     0862 01FC A
     0863 062D A
     0864 07F1 A
1539 0865 0407 A             .WORD    STATE,AT,ZEQU,ZBRAN
```

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          0866 030B A
          0867 028F A
          0868 0124 A
1540 0869 0004 A              .WORD    QUIT2-.,PDOTQ
          086A 05CA A
1541 086B 0320 A              STRING   3,' '/256
1542 086C 4F4B A              .ASCII   'OK'
1543 086D 011B A   QUIT2:     .WORD    BRAN
1544 086E FFF3 A              .WORD    QUIT1-.,SEMIS
          086F 026A A
1545                  ;
1546                  ;   : ABORT   SP!  DECIMAL   DRO  CR
1547                  ;              ." PACE FORTH   V 4.0"   [COMPILE]
1548                  ;              FORTH   DEFINITIONS   QUIT   ;
1549                  ;
1550 0870 8541 A              HEAD     ORD,5,LONG,'A'/256
1551 0871 424F A              .WORD    'BO','RT'+ODD,QUIT-4
          0872 52D4 A
          0873 0858 A
1552 0874 0342 A   ABORT:     .WORD    DOCOL,SPSTOR,DEC,DRONE,CR,PDOTQ
          0875 025B A
          0876 0553 A
          0877 097F A
          0878 01FC A
          0879 05CA A
1553 087A 1150 A              STRING   17,'P'/256
1554 087B 4143 A              .ASCII   'ACE FORTH   V 4.0'
          087C 4520 A
          087D 464F A
          087E 5254 A
          087F 4820 A
          0880 2056 A
          0881 2034 A
          0882 2E30 A
1555 0883 083F A              .WORD    FORTH,DEFIN,QUIT,SEMIS
          0884 084B A
          0885 085C A
          0886 026A A
1556                  ;
1557                  ;*****************************************************
1558                  ;*                    COLD START                    *
1559                  ;*****************************************************
1560                  ;
1561 0887 8443 A              HEAD     ORD,4,LONG,'C'/256
1562 0888 4F4C A              .WORD    'OL','D'+EVEN,ABORT-4
          0889 C420 A
          088A 0870 A
1563 088B 088C A   COLD:      .WORD    .+1
1564 088C 1423 A   CENT:      JSR      INIT          ; (INSTALL. DEPEND.)
1565 088D C912 A              LD       X,ORGPTR      ; PTR TO STARTUP LITS
1566 088E C206 A              LD       0,06(X)       ; INITIALIZE
1567 088F D1B2 A              ST       0,FORTH+3     ;   FORTH VOCABULARY
1568 0890 5108 A              LI       1,08          ; INIT 8 USER VARS
1569 0891 1902 A              JMP      LDUP
1570 0892 5105 A   WENT:      LI       1,05          ; INIT 5 USER VARS
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1571 0893 C90C A                 LD      X,ORGPTR        ; PTR TO STARTUP LITS
1572 0894 CE08 A      LDUP:      LD      Y,08(X)         ; INITIALIZE
1573 0895 DC22 A                 ST      Y,UP            ;  USER POINTER
1574 0896 C209 A      LDUVS:     LD      0,09(X)         ; MOVE FROM LITERAL
1575 0897 D303 A                 ST      0,03(Y)         ;  AREA TO USER AREA
1576 0898 7A01 A                 AISZ    X,1
1577 0899 7B01 A                 AISZ    Y,1
1578 089A 79FF A                 AISZ    1,-1
1579 089B 19FA A                 JMP     LDUVS
1580 089C C502 A                 LD      IP,IP0          ; POINT IP TO ABORT
1581 089D 9900 A                 JMP     @START          ; START AT RP!
1582 089E 0263 A      START:     .WORD   RPSTOR+1
1583 089F 0875 A      IP0:       .WORD   ABORT+1
1584 08A0 0010 A      ORGPTR:    .WORD   ORIG            ; START OF LITERALS
1585                  ;
1586                  ;***********************************************
1587                  ;*               MATH UTILITY                 *
1588                  ;***********************************************
1589                  ;
1590 08A1 8453 A                 HEAD    ORD,4,LONG,'S'/256
1591 08A2 2D3E A                 .WORD   '->','D'+EVEN,COLD-4
     08A3 C420 A
     08A4 0887 A
1592 08A5 08A6 A      STOD:      .WORD   .+1
1593 08A6 5000 A                 LI      0,0
1594 08A7 9F00 A                 SKG     0,0(SP)
1595 08A8 98F9 I                 JMP     PUSH
1596 08A9 50FF A                 LI      0,-1
1597 08AA 98F9 I                 JMP     PUSH
1598                  ;
1599 08AB 822B A                 HEAD    ORD,2,LONG,'+'/256
1600 08AC AD20 A                 .WORD   '-'+EVEN,STOD-4
     08AD 08A1 A
1601 08AE 0342 A      PMI:       .WORD   DOCOL,ZLESS,ZBRAN
     08AF 0297 A
     08B0 0124 A
1602 08B1 0002 A                 .WORD   PMI1-.,MINUS
     08B2 02B4 A
1603 08B3 026A A      PMI1:      .WORD   SEMIS
1604                  ;
1605 08B4 8344 A                 HEAD    ORD,3,LONG,'D'/256
1606 08B5 2BAD A                 .WORD   '+-'+ODD,PMI-3
     08B6 08AB A
1607 08B7 0342 A      DPMI:      .WORD   DOCOL,ZLESS,ZBRAN
     08B8 0297 A
     08B9 0124 A
1608 08BA 0002 A                 .WORD   DPMI1-.,DMINUS
     08BB 02BD A
1609 08BC 026A A      DPMI1:     .WORD   SEMIS
1610                  ;
1611 08BD 8341 A                 HEAD    ORD,3,LONG,'A'/256
1612 08BE 42D3 A                 .WORD   'BS'+ODD,DPMI-3
     08BF 08B4 A
1613 08C0 0342 A      ABS:       .WORD   DOCOL,DUP,PMI,SEMIS
     08C1 02DD A
```

```
        08C2 08AE  A
        08C3 026A  A
1614                        ;
1615 08C4 8444  A              HEAD     ORD,4,LONG,'D'/256
1616 08C5 4142  A              .WORD    'AB','S'+EVEN,ABS-3
        08C6 D320  A
        08C7 08BD  A
1617 08C8 0342  A  DABS:       .WORD    DOCOL,DUP,DPMI,SEMIS
        08C9 02DD  A
        08CA 08B7  A
        08CB 026A  A
1618                        ;
1619 08CC 834D  A              HEAD     ORD,3,LONG,'M'/256
1620 08CD 49CE  A              .WORD    'IN'+ODD,DABS-4
        08CE 08C4  A
1621 08CF 08D0  A  MIN:        .WORD    .+1
1622 08D0 C300  A              LD       0,0(SP)          ; GET BOTTOM
1623 08D1 9F01  A              SKG      0,1(SP)          ; COMPARE WITH SECOND
1624 08D2 98F6  I              JMP      BIN              ; IF BOTTOM <= SECOND
1625 08D3 98FA  I              JMP      POP              ; IF BOTTOM > SECOND
1626                        ;
1627 08D4 834D  A              HEAD     ORD,3,LONG,'M'/256
1628 08D5 41D8  A              .WORD    'AX'+ODD,MIN-3
        08D6 08CC  A
1629 08D7 08D8  A  MAX:        .WORD    .+1
1630 08D8 C300  A              LD       0,0(SP)          ; GET BOTTOM
1631 08D9 9F01  A              SKG      0,1(SP)          ; COMPARE WITH SECOND
1632 08DA 98FA  I              JMP      POP              ; IF BOTTOM <= SECOND
1633 08DB 98F6  I              JMP      BIN              ; IF BOTTOM > SECOND
1634                        ;
1635                        ;**********************************************************
1636                        ;                   SIGNED MATH
1637                        ;**********************************************************
1638                        ;
1639 08DC 824D  A              HEAD     ORD,2,LONG,'M'/256
1640 08DD AA20  A              .WORD    '*'+EVEN,MAX-3
        08DE 08D4  A
1641 08DF 0342  A  MSTAR:      .WORD    DOCOL,OVER,OVER,XOR,TOR
        08E0 02C9  A
        08E1 02C9  A
        08E2 024D  A
        08E3 027B  A
1642 08E4 08C0  A              .WORD    ABS,SWAP,ABS,USTAR
        08E5 02D5  A
        08E6 08C0  A
        08E7 0213  A
1643 08E8 0283  A              .WORD    FROMR,DPMI,SEMIS
        08E9 08B7  A
        08EA 026A  A
1644                        ;
1645 08EB 824D  A              HEAD     ORD,2,LONG,'M'/256
1646 08EC AF20  A              .WORD    '/'+EVEN,MSTAR-3
        08ED 08DC  A
1647 08EE 0342  A  MSLASH:     .WORD    DOCOL,OVER,TOR,TOR
        08EF 02C9  A
```

```
           08F0 027B A
           08F1 027B A
     1648  08F2 08C8 A              .WORD    DABS,R,ABS,USLASH
           08F3 0289 A
           08F4 08C0 A
           08F5 0227 A
     1649  08F6 0283 A              .WORD    FROMR,R,XOR,PMI,SWAP
           08F7 0289 A
           08F8 024D A
           08F9 08AE A
           08FA 02D5 A
     1650  08FB 0283 A              .WORD    FROMR,PMI,SWAP,SEMIS
           08FC 08AE A
           08FD 02D5 A
           08FE 026A A
     1651                  ;
     1652  08FF 81AA A              HEAD     ORD,1,SHORT,'*'/256
     1653  0900 08EB A              .WORD    MSLASH-3
     1654  0901 0342 A    STAR:     .WORD    DOCOL,USTAR,DROP,SEMIS
           0902 0213 A
           0903 02D0 A
           0904 026A A
     1655                  ;
     1656  0905 842F A              HEAD     ORD,4,LONG,'/'/256
     1657  0906 4D4F A              .WORD    'MO','D'+EVEN,STAR-2
           0907 C420 A
           0908 08FF A
     1658  0909 0342 A    SLMOD:    .WORD    DOCOL,TOR,STOD,FROMR,MSLASH,SEMIS
           090A 027B A
           090B 08A5 A
           090C 0283 A
           090D 08EE A
           090E 026A A
     1659                  ;
     1660  090F 81AF A              HEAD     ORD,1,SHORT,'/'/256
     1661  0910 0905 A              .WORD    SLMOD-4
     1662  0911 0342 A    SLASH:    .WORD    DOCOL,SLMOD,SWAP,DROP,SEMIS
           0912 0909 A
           0913 02D5 A
           0914 02D0 A
           0915 026A A
     1663                  ;
     1664  0916 834D A              HEAD     ORD,3,LONG,'M'/256
     1665  0917 4FC4 A              .WORD    'OD'+ODD,SLASH-2
           0918 090F A
     1666  0919 0342 A    MOD:      .WORD    DOCOL,SLMOD,DROP,SEMIS
           091A 0909 A
           091B 02D0 A
           091C 026A A
     1667                  ;
     1668  091D 852A A              HEAD     ORD,5,LONG,'*'/256
     1669  091E 2F4D A              .WORD    '/M','OD'+ODD,MOD-3
           091F 4FC4 A
           0920 0916 A
     1670  0921 0342 A    SSMOD:    .WORD    DOCOL,TOR,MSTAR,FROMR,MSLASH,SEMIS
```

```
        0922 027B  A
        0923 08DF  A
        0924 0283  A
        0925 08EE  A
        0926 026A  A
1671                       ;
1672 0927 822A  A                   HEAD      ORD,2,LONG,'*'/256
1673 0928 AF20  A                   .WORD     '/'+EVEN,SSMOD-4
     0929 091D  A
1674 092A 0342  A          SSLASH:  .WORD     DOCOL,SSMOD,SWAP,DROP,SEMIS
     092B 0921  A
     092C 02D5  A
     092D 02D0  A
     092E 026A  A
1675                       ;
1676 092F 854D  A                   HEAD      ORD,5,LONG,'M'/256
1677 0930 2F4D  A                   .WORD     '/M','OD'+ODD,SSLASH-3
     0931 4FC4  A
     0932 0927  A
1678 0933 0342  A          MSMOD:   .WORD     DOCOL,TOR,ZERO,R,USLASH,FROMR
     0934 027B  A
     0935 0376  A
     0936 0289  A
     0937 0227  A
     0938 0283  A
1679 0939 02D5  A                   .WORD     SWAP,TOR,USLASH,FROMR,SEMIS
     093A 027B  A
     093B 0227  A
     093C 0283  A
     093D 026A  A
1680                       ;
1681                       ;******************************************************
1682                       ;*              DISC UTILITY, GENERAL USE             *
1683                       ;******************************************************
1684                       ;
1685 093E 8355  A                   HEAD      ORD,3,LONG,'U'/256
1686 093F 53C5  A                   .WORD     'SE'+ODD,MSMOD-4
     0940 092F  A
1687 0941 0367  A          USE:     .WORD     DOVAR,BUFFS
     0942 1DF0  A
1688                       ;
1689 0943 8450  A                   HEAD      ORD,4,LONG,'P'/256
1690 0944 5245  A                   .WORD     'RE','V'+EVEN,USE-3
     0945 D620  A
     0946 093E  A
1691 0947 0367  A          PREV:    .WORD     DOVAR,BUFFS
     0948 1DF0  A
1692                       ;
1693 0949 842B  A                   HEAD      ORD,4,LONG,'+'/256
1694 094A 4255  A                   .WORD     'BU','F'+EVEN,PREV-4
     094B C620  A
     094C 0943  A
1695 094D 0342  A          PBUF:    .WORD     DOCOL,LIT,BLKSIZ/2+2,PLUS
     094E 0103  A
     094F 0042  A
```

```
          0950  029F  A
1696      0951  02DD  A                  .WORD     DUP,LIMIT,EQUAL,ZBRAN
          0952  0393  A
          0953  0457  A
          0954  0124  A
1697      0955  0003  A                  .WORD     PBUF1-.,DROP,FIRST
          0956  02D0  A
          0957  038D  A
1698      0958  02DD  A      PBUF1:      .WORD     DUP,PREV,AT,SUB,SEMIS
          0959  0947  A
          095A  030B  A
          095B  0450  A
          095C  026A  A
1699                        ;
1700      095D  8655  A                  HEAD      ORD,6,LONG,'U'/256
1701      095E  5044  A                  .WORD     'PD','AT','E'+EVEN,PBUF-4
          095F  4154  A
          0960  C520  A
          0961  0949  A
1702      0962  0342  A      UPDATE:     .WORD     DOCOL,PREV,AT,AT,LIT,08000
          0963  0947  A
          0964  030B  A
          0965  030B  A
          0966  0103  A
          0967  8000  A
1703      0968  0246  A                  .WORD     OR,PREV,AT,STORE,SEMIS
          0969  0947  A
          096A  030B  A
          096B  031D  A
          096C  026A  A
1704                        ;
1705      096D  8D45  A                  HEAD      ORD,13,LONG,'E'/256
1706      096E  4D50  A                  .WORD     'MP','TY','-B','UF'
          096F  5459  A
          0970  2D42  A
          0971  5546  A
1707      0972  4645  A                  .WORD     'FE','RS'+ODD,UPDATE-5
          0973  52D3  A
          0974  095D  A
1708      0975  0342  A      MTBUF:      .WORD     DOCOL,FIRST,LIMIT
          0976  038D  A
          0977  0393  A
1709      0978  02C9  A                  .WORD     OVER,SUB,ERASE,SEMIS
          0979  0450  A
          097A  0668  A
          097B  026A  A
1710                        ;
1711      097C  8344  A                  HEAD      ORD,3,LONG,'D'/256
1712      097D  52B1  A                  .WORD     'R1'+ODD,MTBUF-8
          097E  096D  A
1713      097F  0342  A      DRONE:      .WORD     DOCOL,ZERO,OFFSET,STORE,SEMIS
          0980  0376  A
          0981  03F3  A
          0982  031D  A
          0983  026A  A
```

PACE ASSEMBLER REV-A 05/23/75
FORTH NUCLEUS FOR PACE
DICTIONARY

```
1714                         ;
1715 0984 8344 A                     HEAD     ORD,3,LONG,'D'/256
1716 0985 52B2 A                     .WORD    'R2'+ODD,DRONE-3
     0986 097C A
1717 0987 0342 A     DRTWO:  .WORD    DOCOL,LIT,2000
     0988 0103 A
     0989 07D0 A
1718 098A 03F3 A                     .WORD    OFFSET,STORE,SEMIS
     098B 031D A
     098C 026A A
1719                         ;
1720                         ;*********************************************
1721                         ;*                    BUFFER                  *
1722                         ;*********************************************
1723                         ;
1724                         ;   : BUFFER   USE  @   DUP  >R  BEGIN  +BUF  UNTIL
1725                         ;       USE  !  R  @  0<  IF  R  1+  R  @   7FFF
1726                         ;                        AND  0  R/W  ENDIF
1727                         ;       R  !  R  PREV  !  R>  1+  ;
1728                         ;
1729 098D 8642 A                     HEAD     ORD,6,LONG,'B'/256
1730 098E 5546 A                     .WORD    'UF','FE','R'+EVEN,DRTWO-3
     098F 4645 A
     0990 D220 A
     0991 0984 A
1731 0992 0342 A     BUFFER: .WORD    DOCOL,USE,AT,DUP,TOR
     0993 0941 A
     0994 030B A
     0995 02DD A
     0996 027B A
1732 0997 094D A     BUFF1:  .WORD    PBUF,ZBRAN
     0998 0124 A
1733 0999 FFFE A                     .WORD    BUFF1-.,USE,STORE
     099A 0941 A
     099B 031D A
1734 099C 0289 A                     .WORD    R,AT,ZLESS,ZBRAN
     099D 030B A
     099E 0297 A
     099F 0124 A
1735 09A0 000A A                     .WORD    BUFF2-.,R,ONEP,R,AT
     09A1 0289 A
     09A2 042B A
     09A3 0289 A
     09A4 030B A
1736 09A5 0103 A                     .WORD    LIT,07FFF,AND,ZERO,RW
     09A6 7FFF A
     09A7 023F A
     09A8 0376 A
     09A9 0A63 A
1737 09AA 0289 A     BUFF2:  .WORD    R,STORE,R,PREV,STORE
     09AB 031D A
     09AC 0289 A
     09AD 0947 A
     09AE 031D A
1738 09AF 0283 A                     .WORD    FROMR,ONEP,SEMIS
```

```
       09B0 042B A
       09B1 026A A
1739                    ;
1740                    ;************************************************
1741                    ;*                    BLOCK                      *
1742                    ;************************************************
1743                    ;
1744                    ;   : BLOCK    OFFSET   @   +   >R
1745                    ;      PREV  @  DUP  @  R  -  DUP  +
1746                    ;      IF  BEGIN  +BUF  0=
1747                    ;          IF  DROP  R  BUFFER
1748                    ;          DUP  R  1  R/W  1  -  ENDIF
1749                    ;          DUP  @  R  -  DUP  +  0=  UNTIL
1750                    ;      DUP  PREV  !  ENDIF  R>  DROP  1+  ;
1751                    ;
1752   09B2 8542 A          HEAD     ORD,5,LONG,'B'/256
1753   09B3 4C4F A          .WORD    'LO','CK'+ODD,BUFFER-5
       09B4 43CB A
       09B5 098D A
1754   09B6 0342 A  BLOCK:  .WORD    DOCOL,OFFSET,AT,PLUS,TOR
       09B7 03F3 A
       09B8 030B A
       09B9 029F A
       09BA 027B A
1755   09BB 0947 A          .WORD    PREV,AT,DUP,AT,R
       09BC 030B A
       09BD 02DD A
       09BE 030B A
       09BF 0289 A
1756   09C0 0450 A          .WORD    SUB,DUP,PLUS,ZBRAN
       09C1 02DD A
       09C2 029F A
       09C3 0124 A
1757   09C4 001A A          .WORD    BLOCK3-.
1758   09C5 094D A  BLOCK1: .WORD    PBUF,ZEQU,ZBRAN
       09C6 028F A
       09C7 0124 A
1759   09C8 000A A          .WORD    BLOCK2-.,DROP,R,BUFFER
       09C9 02D0 A
       09CA 0289 A
       09CB 0992 A
1760   09CC 02DD A          .WORD    DUP,R,ONE,RW,ONE,SUB
       09CD 0289 A
       09CE 037A A
       09CF 0A63 A
       09D0 037A A
       09D1 0450 A
1761   09D2 02DD A  BLOCK2: .WORD    DUP,AT,R,SUB,DUP
       09D3 030B A
       09D4 0289 A
       09D5 0450 A
       09D6 02DD A
1762   09D7 029F A          .WORD    PLUS,ZEQU,ZBRAN
       09D8 028F A
       09D9 0124 A
```

```
1763  09DA  FFEB  A                .WORD    BLOCK1-.,DUP,PREV,STORE
      09DB  02DD  A
      09DC  0947  A
      09DD  031D  A
1764  09DE  0283  A    BLOCK3:     .WORD    FROMR,DROP,ONEP,SEMIS
      09DF  02D0  A
      09E0  042B  A
      09E1  026A  A
1765                   ;
1766                   ;**********************************************
1767                   ;*              TEXT OUTPUT FORMATTING        *
1768                   ;**********************************************
1769                   ;
1770                   ;   : (LINE)    >R   40   B/BUF  */MOD  R>   B/SCR   *
1771                   ;               +  BLOCK   BYTE   +   40   ;
1772                   ;
1773  09E2  8628  A                HEAD     ORD,6,LONG,'('/256
1774  09E3  4C49  A                .WORD    'LI','NE',')'+EVEN,BLOCK-4
      09E4  4E45  A
      09E5  A920  A
      09E6  09B2  A
1775  09E7  0342  A    PLINE:      .WORD    DOCOL,TOR,LIT,64,BBUF,SSMOD
      09E8  027B  A
      09E9  0103  A
      09EA  0040  A
      09EB  0399  A
      09EC  0921  A
1776  09ED  0283  A                .WORD    FROMR,BSCR,STAR,PLUS,BLOCK
      09EE  039F  A
      09EF  0901  A
      09F0  029F  A
      09F1  09B6  A
1777  09F2  02FD  A                .WORD    BYTE,PLUS,LIT,64,SEMIS
      09F3  029F  A
      09F4  0103  A
      09F5  0040  A
      09F6  026A  A
1778                   ;
1779  09F7  852E  A                HEAD     ORD,5,LONG,'.'/256
1780  09F8  4C49  A                .WORD    'LI','NE'+ODD,PLINE-5
      09F9  4EC5  A
      09FA  09E2  A
1781  09FB  0342  A    DLINE:      .WORD    DOCOL,PLINE,DTRAIL,TYPE,SEMIS
      09FC  09E7  A
      09FD  05B0  A
      09FE  0599  A
      09FF  026A  A
1782                   ;
1783  0A00  874D  A                HEAD     ORD,7,LONG,'M'/256
1784  0A01  4553  A                .WORD    'ES','SA','GE'+ODD,DLINE-4
      0A02  5341  A
      0A03  47C5  A
      0A04  09F7  A
1785  0A05  0342  A    MESS:       .WORD    DOCOL,WARN,AT,ZBRAN
      0A06  03C5  A
```

```
       0A07 030B A
       0A08 0124 A
 1786  0A09 000E A              .WORD     MESS2-.,DDUP,ZBRAN
       0A0A 047D A
       0A0B 0124 A
 1787  0A0C 0009 A              .WORD     MESS1-.,LIT,4,OFFSET,AT
       0A0D 0103 A
       0A0E 0004 A
       0A0F 03F3 A
       0A10 030B A
 1788  0A11 039F A              .WORD     BSCR,SLASH,SUB,DLINE
       0A12 0911 A
       0A13 0450 A
       0A14 09FB A
 1789  0A15 011B A     MESS1:   .WORD     BRAN
 1790  0A16 0007 A              .WORD     MESS3-.
 1791  0A17 05CA A     MESS2:   .WORD     PDOTQ
 1792  0A18 064D A              STRING    6,'M'/256
 1793  0A19 5347 A              .ASCII    'SG , '
       0A1A 2023 A
       0A1B 2020 A
 1794  0A1C 0BD5 A              .WORD     DOT
 1795  0A1D 026A A     MESS3:   .WORD     SEMIS
 1796                  ;
 1797                  ;*****************************************************
 1798                  ;*                        LOAD, -->                  *
 1799                  ;*****************************************************
 1800                  ;
 1801  0A1E 844C A              HEAD      ORD,4,LONG,'L'/256
 1802  0A1F 4F41 A              .WORD     'OA','D'+EVEN,MESS-5
       0A20 C420 A
       0A21 0A00 A
 1803  0A22 0342 A     LOAD:    .WORD     DOCOL,BLK,AT,TOR,IN,AT,TOR
       0A23 03DD A
       0A24 030B A
       0A25 027B A
       0A26 03E2 A
       0A27 030B A
       0A28 027B A
 1804  0A29 0376 A              .WORD     ZERO,IN,STORE,BSCR,STAR,BLK,STORE
       0A2A 03E2 A
       0A2B 031D A
       0A2C 039F A
       0A2D 0901 A
       0A2E 03DD A
       0A2F 031D A
 1805  0A30 07F1 A              .WORD     INTER,FROMR,IN,STORE
       0A31 0283 A
       0A32 03E2 A
       0A33 031D A
 1806  0A34 0283 A              .WORD     FROMR,BLK,STORE,SEMIS
       0A35 03DD A
       0A36 031D A
       0A37 026A A
 1807                  ;
```

0A38 - 0A58

ARROW	0A3B	A
PEMIT	0A49	A
PKEY	0A4D	A
PQTERM	0A4F	A
PCR	0A53	A

```
1850  0A59  035C  A    HI:        .WORD    DOCON,HIBLK
      0A5A  3FC0  A
1851                    ;
1852  0A5B  824C  A               HEAD     ORD,2,LONG,'L'/256
1853  0A5C  CF20  A               .WORD    'O'+EVEN,HI-3
      0A5D  0A56  A
1854  0A5E  035C  A    LO:        .WORD    DOCON,LOBLK
      0A5F  2000  A
1855                    ;
1856                    ;    : R/W    >R   DUP   0<   6   ?ERROR    ( BLOCK, < 0 ? )
1857                    ;             B/BUF   CELL   *   LO   +     ( FWA OF BLOCK )
1858                    ;             DUP   HI   >   6   ?ERROR     ( TOO HIGH ? )
1859                    ;             R>   IF   SWAP   ENDIF        ( TO OR FROM ? )
1860                    ;             B/BUF   CELL   MOVE  ;        ( TRANSFER DATA )
1861                    ;
1862  0A60  8352  A               HEAD     ORD,3,LONG,'R'/256
1863  0A61  2FD7  A               .WORD    '/W'+ODD,LO-3
      0A62  0A5B  A
1864  0A63  0342  A    RW:        .WORD    DOCOL,TOR,DUP,ZLESS
      0A64  027B  A
      0A65  02DD  A
      0A66  0297  A
1865  0A67  0103  A               .WORD    LIT,6,QERROR,BBUF,CELL
      0A68  0006  A
      0A69  04D6  A
      0A6A  0399  A
      0A6B  0305  A
1866  0A6C  0901  A               .WORD    STAR,LO,PLUS,DUP,HI,GREAT
      0A6D  0A5E  A
      0A6E  029F  A
      0A6F  02DD  A
      0A70  0A59  A
      0A71  0463  A
1867  0A72  0103  A               .WORD    LIT,6,QERROR,FROMR,ZBRAN
      0A73  0006  A
      0A74  04D6  A
      0A75  0283  A
      0A76  0124  A
1868  0A77  0002  A               .WORD    RW1-.,SWAP
      0A78  02D5  A
1869  0A79  0399  A    RW1:       .WORD    BBUF,CELL,MOVE,SEMIS
      0A7A  0305  A
      0A7B  0201  A
      0A7C  026A  A
1870                    ;
1871                    ;*************************************************
1872                    ;*                      ', FORGET                *
1873                    ;*************************************************
1874                    ;
1875  0A7D  C1A7  A               HEAD     IMM,1,SHORT,''''/256
1876  0A7E  0A60  A               .WORD    RW-3
1877  0A7F  0342  A    TICK:      .WORD    DOCOL,DFIND,ZEQU,ZERO
      0A80  0727  A
      0A81  028F  A
      0A82  0376  A
```

```
1878 0A83 04D6 A                .WORD    QERROR,DROP,LITER,SEMIS
     0A84 02D0 A
     0A85 07BD A
     0A86 026A A
1879                      ;
1880                      ;*********************************** (((((((((*****
1881                      ;    : FORGET   CURRENT  @  CONTEXT  @   ( IS VOCAB )
1882                      ;            -  18  ?ERROR           ( NON-AMBIGUOUS ? )
1883                      ;         [COMPILE]  '  NFA ( HD OF WORD TO FORGET )
1884                      ;         DUP  FENCE  @  <  15  ?ERROR  ( CMP FENCE )
1885                      ;         >R  VOC-LINK  @ ( START WITH LATEST VOCAB)
1886                      ;         BEGIN   R  OVER  <  ( FORGET ENTIRE VOCAB? )
1887                      ;         WHILE  [COMPILE]  FORTH  DEFINITIONS
1888                      ;                 @  DUP  VOC-LINK !  ( UNLINK VOCAB )
1889                      ;         REPEAT
1890                      ;         BEGIN  DUP  2  -  ( START AT PHANTOM NAME )
1891                      ;                 BEGIN  PFA  LFA  @  ( HEAD OF WORD )
1892                      ;                 DUP  R  <  ( FORGETTING IT ? )
1893                      ;             UNTIL
1894                      ;             OVER  1  -  !  ( NEW HEAD OF VOCAB )
1895                      ;             @  -DUP  0=  ( END OF VOCAB LIST ? )
1896                      ;         UNTIL
1897                      ;         R>  DP  !  ;      ( NEW DICTIONARY POINTER )
1898                      ;
1899 0A87 8646 A         HEAD     ORD,6,LONG,'F'/256
1900 0A88 4F52 A         .WORD    'OR','GE','T'+EVEN,TICK-2
     0A89 4745 A
     0A8A D420 A
     0A8B 0A7D A
1901 0A8C 0342 A  FORGET: .WORD   DOCOL,CURR,AT,CONT,AT
     0A8D 0401 A
     0A8E 030B A
     0A8F 03FA A
     0A90 030B A
1902 0A91 0450 A         .WORD    SUB,LIT,0018,QERROR
     0A92 0103 A
     0A93 0018 A
     0A94 04D6 A
1903 0A95 0A7F A         .WORD    TICK,NFA,DUP,FENCE,AT,LESS
     0A96 04B1 A
     0A97 02DD A
     0A98 03CB A
     0A99 030B A
     0A9A 045D A
1904 0A9B 0103 A         .WORD    LIT,0015,QERROR,TOR,VOCL,AT
     0A9C 0015 A
     0A9D 04D6 A
     0A9E 027B A
     0A9F 03D8 A
     0AA0 030B A
1905 0AA1 0289 A  FORG1:  .WORD   R,OVER,LESS,ZBRAN
     0AA2 02C9 A
     0AA3 045D A
     0AA4 0124 A
1906 0AA5 0009 A         .WORD    FORG2-.,FORTH,DEFIN
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        0AA6 083F A
        0AA7 084B A
1907    0AA8 030B A                  .WORD    AT,DUP,VOCL,STORE,BRAN
        0AA9 02DD A
        0AAA 03D8 A
        0AAB 031D A
        0AAC 011B A
1908    0AAD FFF4 A                  .WORD    FORG1-.
1909    0AAE 02DD A    FORG2:        .WORD    DUP,TWO,SUB
        0AAF 037E A
        0AB0 0450 A
1910    0AB1 04C0 A    FORG3:        .WORD    PFA,LFA,AT,DUP,R,LESS,ZBRAN
        0AB2 04A3 A
        0AB3 030B A
        0AB4 02DD A
        0AB5 0289 A
        0AB6 045D A
        0AB7 0124 A
1911    0AB8 FFF9 A                  .WORD    FORG3-.,OVER,ONE,SUB,STORE
        0AB9 02C9 A
        0ABA 037A A
        0ABB 0450 A
        0ABC 031D A
1912    0ABD 030B A                  .WORD    AT,DDUP,ZEQU,ZBRAN
        0ABE 047D A
        0ABF 028F A
        0AC0 0124 A
1913    0AC1 FFED A                  .WORD    FORG2-.,FROMR,DP,STORE,SEMIS
        0AC2 0283 A
        0AC3 03D0 A
        0AC4 031D A
        0AC5 026A A
1914                   ;
1915                   ;*********************************************
1916                   ;*        CONDITIONAL COMPILER, PER SHIRA        *
1917                   ;*********************************************
1918                   ;
1919    0AC6 8442 A                  HEAD     ORD,4,LONG,'B'/256
1920    0AC7 4143 A                  .WORD    'AC','K'+EVEN,FORGET-5
        0AC8 CB20 A
        0AC9 0A87 A
1921    0ACA 0342 A    BACK:         .WORD    DOCOL,HERE,SUB,COMMA,SEMIS
        0ACB 043A A
        0ACC 0450 A
        0ACD 0448 A
        0ACE 026A A
1922                   ;
1923    0ACF C542 A                  HEAD     IMM,5,LONG,'B'/256
1924    0AD0 4547 A                  .WORD    'EG','IN'+ODD,BACK-4
        0AD1 49CE A
        0AD2 0AC6 A
1925    0AD3 0342 A    BEGIN:        .WORD    DOCOL,QCOMP,HERE,ONE,SEMIS
        0AD4 04E3 A
        0AD5 043A A
        0AD6 037A A
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          0AD7 026A A
1926                      ;
1927 0AD8 C545 A                    HEAD      IMM,5,LONG,'E'/256
1928 0AD9 4E44 A                    .WORD     'ND','IF'+ODD,BEGIN-4
     0ADA 49C6 A
     0ADB 0ACF A
1929 0ADC 0342 A  ENDIF:   .WORD    DOCOL,QCOMP,TWO,QPAIRS,HERE
     0ADD 04E3 A
     0ADE 037E A
     0ADF 04FB A
     0AE0 043A A
1930 0AE1 02C9 A                    .WORD     OVER,SUB,SWAP,STORE,SEMIS
     0AE2 0450 A
     0AE3 02D5 A
     0AE4 031D A
     0AE5 026A A
1931                      ;
1932 0AE6 C454 A                    HEAD      IMM,4,LONG,'T'/256
1933 0AE7 4845 A                    .WORD     'HE','N'+EVEN,ENDIF-4
     0AE8 CE20 A
     0AE9 0AD8 A
1934 0AEA 0342 A  THEN:    .WORD    DOCOL,ENDIF,SEMIS
     0AEB 0ADC A
     0AEC 026A A
1935                      ;
1936 0AED C244 A                    HEAD      IMM,2,LONG,'D'/256
1937 0AEE CF20 A                    .WORD     'O'+EVEN,THEN-4
     0AEF 0AE6 A
1938 0AF0 0342 A  DO:      .WORD    DOCOL,COMPIL,XDO
     0AF1 0521 A
     0AF2 0155 A
1939 0AF3 043A A                    .WORD     HERE,THREE,SEMIS
     0AF4 0382 A
     0AF5 026A A
1940                      ;
1941 0AF6 C44C A                    HEAD      IMM,4,LONG,'L'/256
1942 0AF7 4F4F A                    .WORD     'OO','P'+EVEN,DO-3
     0AF8 D020 A
     0AF9 0AED A
1943 0AFA 0342 A  LOOP:    .WORD    DOCOL,THREE,QPAIRS,COMPIL
     0AFB 0382 A
     0AFC 04FB A
     0AFD 0521 A
1944 0AFE 012F A                    .WORD     XLOOP,BACK,SEMIS
     0AFF 0ACA A
     0B00 026A A
1945                      ;
1946 0B01 C52B A                    HEAD      IMM,5,LONG,'+'/256
1947 0B02 4C4F A                    .WORD     'LO','OP'+ODD,LOOP-4
     0B03 4FD0 A
     0B04 0AF6 A
1948 0B05 0342 A  PLOOP:   .WORD    DOCOL,THREE,QPAIRS,COMPIL
     0B06 0382 A
     0B07 04FB A
     0B08 0521 A
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1949 0B09 0140 A                .WORD   XPLOOP,BACK,SEMIS
     0B0A 0ACA A
     0B0B 026A A
1950                    ;
1951 0B0C C555 A                HEAD    IMM,5,LONG,'U'/256
1952 0B0D 4E54 A                .WORD   'NT','IL'+ODD,PLOOP-4
     0B0E 49CC A
     0B0F 0B01 A
1953 0B10 0342 A        UNTIL:  .WORD   DOCOL,ONE,QPAIRS,COMPIL
     0B11 037A A
     0B12 04FB A
     0B13 0521 A
1954 0B14 0124 A                .WORD   ZBRAN,BACK,SEMIS
     0B15 0ACA A
     0B16 026A A
1955                    ;
1956 0B17 C345 A                HEAD    IMM,3,LONG,'E'/256
1957 0B18 4EC4 A                .WORD   'ND'+ODD,UNTIL-4
     0B19 0B0C A
1958 0B1A 0342 A        END:    .WORD   DOCOL,UNTIL,SEMIS
     0B1B 0B10 A
     0B1C 026A A
1959                    ;
1960 0B1D C541 A                HEAD    IMM,5,LONG,'A'/256
1961 0B1E 4741 A                .WORD   'GA','IN'+ODD,END-3
     0B1F 49CE A
     0B20 0B17 A
1962 0B21 0342 A        AGAIN:  .WORD   DOCOL,ONE,QPAIRS,COMPIL
     0B22 037A A
     0B23 04FB A
     0B24 0521 A
1963 0B25 011B A                .WORD   BRAN,BACK,SEMIS
     0B26 0ACA A
     0B27 026A A
1964                    ;
1965 0B28 C652 A                HEAD    IMM,6,LONG,'R'/256
1966 0B29 4550 A                .WORD   'EP','EA','T'+EVEN,AGAIN-4
     0B2A 4541 A
     0B2B D420 A
     0B2C 0B1D A
1967 0B2D 0342 A        REPEAT: .WORD   DOCOL,TOR,TOR,AGAIN,FROMR
     0B2E 027B A
     0B2F 027B A
     0B30 0B21 A
     0B31 0283 A
1968 0B32 0283 A                .WORD   FROMR,TWO,SUB,ENDIF,SEMIS
     0B33 037E A
     0B34 0450 A
     0B35 0ADC A
     0B36 026A A
1969                    ;
1970 0B37 C249 A                HEAD    IMM,2,LONG,'I'/256
1971 0B38 C620 A                .WORD   'F'+EVEN,REPEAT-5
     0B39 0B28 A
1972 0B3A 0342 A        IF:     .WORD   DOCOL,COMPIL,ZBRAN,HERE
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        0B3B 0521 A
        0B3C 0124 A
        0B3D 043A A
1973    0B3E 0376 A              .WORD    ZERO,COMMA,TWO,SEMIS
        0B3F 0448 A
        0B40 037E A
        0B41 026A A
1974                    ;
1975    0B42 C445 A              HEAD     IMM,4,LONG,'E'/256
1976    0B43 4C53 A              .WORD    'LS','E'+EVEN,IF-3
        0B44 C520 A
        0B45 0B37 A
1977    0B46 0342 A    ELSE:     .WORD    DOCOL,TWO,QPAIRS,COMPIL
        0B47 037E A
        0B48 04FB A
        0B49 0521 A
1978    0B4A 011B A              .WORD    BRAN,HERE,ZERO,COMMA
        0B4B 043A A
        0B4C 0376 A
        0B4D 0448 A
1979    0B4E 02D5 A              .WORD    SWAP,TWO,ENDIF,TWO,SEMIS
        0B4F 037E A
        0B50 0ADC A
        0B51 037E A
        0B52 026A A
1980                    ;
1981    0B53 C557 A              HEAD     IMM,5,LONG,'W'/256
1982    0B54 4849 A              .WORD    'HI','LE'+ODD,ELSE-4
        0B55 4CC5 A
        0B56 0B42 A
1983    0B57 0342 A    WHILE:    .WORD    DOCOL,IF,TWOP,SEMIS
        0B58 0B3A A
        0B59 0432 A
        0B5A 026A A
1984                    ;
1985                    ;************************************************
1986                    ;*           NUMERIC PRIMITIVES               *
1987                    ;************************************************
1988                    ;
1989    0B5B 8653 A              HEAD     ORD,6,LONG,'S'/256
1990    0B5C 5041 A              .WORD    'PA','CE','S'+EVEN,WHILE-4
        0B5D 4345 A
        0B5E D320 A
        0B5F 0B53 A
1991    0B60 0342 A    SPACES:   .WORD    DOCOL,ZERO,MAX,DDUP,ZBRAN
        0B61 0376 A
        0B62 08D7 A
        0B63 047D A
        0B64 0124 A
1992    0B65 0006 A              .WORD    SPACE2-.,ZERO,XDO
        0B66 0376 A
        0B67 0155 A
1993    0B68 0475 A    SPACE1:   .WORD    SPACE,XLOOP
        0B69 012F A
1994    0B6A FFFE A              .WORD    SPACE1-.
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1995 0B6B 026A A    SPACE2: .WORD    SEMIS
1996                    ;
1997                    ;    : <,    PAD   BYTE   HLD   !   ;
1998                    ;
1999 0B6C 823C A            HEAD     ORD,2,LONG,'<'/256
2000 0B6D A320 A            .WORD    ','+EVEN,SPACES-5
     0B6E 0B5B A
2001 0B6F 0342 A    BDIGS:  .WORD    DOCOL,PAD,BYTE,HLD,STORE,SEMIS
     0B70 0686 A
     0B71 02FD A
     0B72 0426 A
     0B73 031D A
     0B74 026A A
2002                    ;
2003                    ;    : ,>    DROP   DROP   HLD   @
2004                    ;           PAD    BYTE   OVER  +   ;
2005                    ;
2006 0B75 8223 A            HEAD     ORD,2,LONG,','/256
2007 0B76 BE20 A            .WORD    '>'+EVEN,BDIGS-3
     0B77 0B6C A
2008 0B78 0342 A    EDIGS:  .WORD    DOCOL,DROP,DROP,HLD,AT
     0B79 02D0 A
     0B7A 02D0 A
     0B7B 0426 A
     0B7C 030B A
2009 0B7D 0686 A            .WORD    PAD,BYTE,OVER,SUB,SEMIS
     0B7E 02FD A
     0B7F 02C9 A
     0B80 0450 A
     0B81 026A A
2010                    ;
2011 0B82 8453 A            HEAD     ORD,4,LONG,'S'/256
2012 0B83 4947 A            .WORD    'IG','N'+EVEN,EDIGS-3
     0B84 CE20 A
     0B85 0B75 A
2013 0B86 0342 A    SIGN:   .WORD    DOCOL,ROT,ZLESS,ZBRAN
     0B87 046A A
     0B88 0297 A
     0B89 0124 A
2014 0B8A 0004 A            .WORD    SIGN1-.,LIT,'-'/256,HOLD
     0B8B 0103 A
     0B8C 002D A
     0B8D 067A A
2015 0B8E 026A A    SIGN1:  .WORD    SEMIS
2016                    ;
2017 0B8F 81A3 A            HEAD     ORD,1,SHORT,','/256
2018 0B90 0B82 A            .WORD    SIGN-4
2019 0B91 0342 A    DIG:    .WORD    DOCOL,BASE,AT,MSMOD,ROT
     0B92 040D A
     0B93 030B A
     0B94 0933 A
     0B95 046A A
2020 0B96 0103 A            .WORD    LIT,9,OVER,LESS,ZBRAN
     0B97 0009 A
     0B98 02C9 A
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       0B99 045D A
       0B9A 0124 A
2021   0B9B 0004 A                 .WORD     DIG1-.,LIT,7,PLUS
       0B9C 0103 A
       0B9D 0007 A
       0B9E 029F A
2022   0B9F 0103 A   DIG1:         .WORD     LIT,0030,PLUS,HOLD,SEMIS
       0BA0 0030 A
       0BA1 029F A
       0BA2 067A A
       0BA3 026A A
2023                 ;
2024   0BA4 8223 A                 HEAD      ORD,2,LONG,',',/256
2025   0BA5 D320 A                 .WORD     'S'+EVEN,DIG-2
       0BA6 0B8F A
2026   0BA7 0342 A   DIGS:         .WORD     DOCOL
2027   0BA8 0B91 A   DIGS1:        .WORD     DIG,OVER,OVER,OR,ZEQU,ZBRAN
       0BA9 02C9 A
       0BAA 02C9 A
       0BAB 0246 A
       0BAC 028F A
       0BAD 0124 A
2028   0BAE FFFA A                 .WORD     DIGS1-.,SEMIS
       0BAF 026A A
2029                 ;
2030                 ;************************************************
2031                 ;*                  OUTPUT OPERATORS           *
2032                 ;************************************************
2033                 ;
2034   0BB0 8344 A                 HEAD      ORD,3,LONG,'D'/256
2035   0BB1 2ED2 A                 .WORD     '.R'+ODD,DIGS-3
       0BB2 0BA4 A
2036   0BB3 0342 A   DDOTR:        .WORD     DOCOL,TOR,SWAP,OVER,DABS
       0BB4 027B A
       0BB5 02D5 A
       0BB6 02C9 A
       0BB7 08C8 A
2037   0BB8 0B6F A                 .WORD     BDIGS,DIGS,SIGN,EDIGS,FROMR
       0BB9 0BA7 A
       0BBA 0B86 A
       0BBB 0B78 A
       0BBC 0283 A
2038   0BBD 02C9 A                 .WORD     OVER,SUB,SPACES,TYPE,SEMIS
       0BBE 0450 A
       0BBF 0B60 A
       0BC0 0599 A
       0BC1 026A A
2039                 ;
2040   0BC2 822E A                 HEAD      ORD,2,LONG,'.'/256
2041   0BC3 D220 A                 .WORD     'R'+EVEN,DDOTR-3
       0BC4 0BB0 A
2042   0BC5 0342 A   DOTR:         .WORD     DOCOL,TOR,STOD,FROMR,DDOTR,SEMIS
       0BC6 027B A
       0BC7 08A5 A
       0BC8 0283 A
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          0BC9 0BB3 A
          0BCA 026A A
2043                          ;
2044 0BCB 8244 A                      HEAD    ORD,2,LONG,'D'/256
2045 0BCC AE20 A                      .WORD   '.'+EVEN,DOTR-3
     0BCD 0BC2 A
2046 0BCE 0342 A    DDOT:             .WORD   DOCOL,ZERO,DDOTR,SPACE,SEMIS
     0BCF 0376 A
     0BD0 0BB3 A
     0BD1 0475 A
     0BD2 026A A
2047                          ;
2048 0BD3 81AE A                      HEAD    ORD,1,SHORT,'.'/256
2049 0BD4 0BCB A                      .WORD   DDOT-3
2050 0BD5 0342 A    DOT:              .WORD   DOCOL,STOD,DDOT,SEMIS
     0BD6 08A5 A
     0BD7 0BCE A
     0BD8 026A A
2051                          ;
2052 0BD9 81BF A                      HEAD    ORD,1,SHORT,'?'/256
2053 0BDA 0BD3 A                      .WORD   DOT-2
2054 0BDB 0342 A    QUES:             .WORD   DOCOL,AT,DOT,SEMIS
     0BDC 030B A
     0BDD 0BD5 A
     0BDE 026A A
2055                          ;
2056 0BDF 8255 A                      HEAD    ORD,2,LONG,'U'/256
2057 0BE0 AE20 A                      .WORD   '.'+EVEN,QUES-2
     0BE1 0BD9 A
2058 0BE2 0342 A    UDOT:             .WORD   DOCOL,ZERO,DDOT,SEMIS
     0BE3 0376 A
     0BE4 0BCE A
     0BE5 026A A
2059                          ;
2060                          ;*******************************************
2061                          ;*          PROGRAM DOCUMENTATION          *
2062                          ;*******************************************
2063                          ;
2064 0BE6 844C A                      HEAD    ORD,4,LONG,'L'/256
2065 0BE7 4953 A                      .WORD   'IS','T'+EVEN,UDOT-3
     0BE8 D420 A
     0BE9 0BDF A
2066 0BEA 0342 A    LIST:             .WORD   DOCOL,CR,DUP,SCR,STORE,PDOTQ
     0BEB 01FC A
     0BEC 02DD A
     0BED 03EC A
     0BEE 031D A
     0BEF 05CA A
2067 0BF0 0653 A                      STRING  6,'S'/256
2068 0BF1 4352 A                      .ASCII  'CR , '
     0BF2 2023 A
     0BF3 2020 A
2069 0BF4 0BD5 A                      .WORD   DOT,LIT,16,ZERO,XDO
     0BF5 0103 A
     0BF6 0010 A
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          0BF7 0376 A
          0BF8 0155 A
     2070 0BF9 01FC A    LIST1:   .WORD    CR,I,ZERO,THREE,DDOTR,SPACE
          0BFA 0161 A
          0BFB 0376 A
          0BFC 0382 A
          0BFD 0BB3 A
          0BFE 0475 A
     2071 0BFF 0161 A             .WORD    I,SCR,AT,DLINE,XLOOP
          0C00 03EC A
          0C01 030B A
          0C02 09FB A
          0C03 012F A
     2072 0C04 FFF5 A             .WORD    LIST1-.,CR,SEMIS
          0C05 01FC A
          0C06 026A A
     2073                    ;
     2074 0C07 8549 A             HEAD     ORD,5,LONG,'I'/256
     2075 0C08 4E44 A             .WORD    'ND','EX'+ODD,LIST-4
          0C09 45D8 A
          0C0A 0BE6 A
     2076 0C0B 0342 A    INDEX:   .WORD    DOCOL,LIT,000C,EMIT
          0C0C 0103 A
          0C0D 000C A
          0C0E 01ED A
     2077 0C0F 01FC A             .WORD    CR,ONEP,SWAP,XDO
          0C10 042B A
          0C11 02D5 A
          0C12 0155 A
     2078 0C13 01FC A    INDEX1:  .WORD    CR,I,ZERO,THREE,DDOTR,SPACE
          0C14 0161 A
          0C15 0376 A
          0C16 0382 A
          0C17 0BB3 A
          0C18 0475 A
     2079 0C19 0376 A             .WORD    ZERO,I,DLINE,QTERM,ZBRAN
          0C1A 0161 A
          0C1B 09FB A
          0C1C 01F8 A
          0C1D 0124 A
     2080 0C1E 0002 A             .WORD    INDEX2-.,LEAVE
          0C1F 0273 A
     2081 0C20 012F A    INDEX2:  .WORD    XLOOP
     2082 0C21 FFF2 A             .WORD    INDEX1-.,SEMIS
          0C22 026A A
     2083                    ;
     2084 0C23 8554 A             HEAD     ORD,5,LONG,'T'/256
     2085 0C24 5249 A             .WORD    'RI','AD'+ODD,INDEX-4
          0C25 41C4 A
          0C26 0C07 A
     2086 0C27 0342 A    TRIAD:   .WORD    DOCOL,LIT,000C,EMIT,THREE
          0C28 0103 A
          0C29 000C A
          0C2A 01ED A
          0C2B 0382 A
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2087 0C2C 0911 A                .WORD    SLASH,THREE,STAR,THREE
     0C2D 0382 A
     0C2E 0901 A
     0C2F 0382 A
2088 0C30 02C9 A                .WORD    OVER,PLUS,SWAP,XDO
     0C31 029F A
     0C32 02D5 A
     0C33 0155 A
2089 0C34 01FC A    TRIAD1: .WORD    CR,I,LIST,XLOOP
     0C35 0161 A
     0C36 0BEA A
     0C37 012F A
2090 0C38 FFFC A                .WORD    TRIAD1-.,CR,LIT,000F
     0C39 01FC A
     0C3A 0103 A
     0C3B 000F A
2091 0C3C 0A05 A                .WORD    MESS,CR,SEMIS
     0C3D 01FC A
     0C3E 026A A
2092                  ;
2093                  ;***********************************************
2094                  ;*                     TOOLS                    *
2095                  ;***********************************************
2096                  ;
2097 0C3F 8556 A                HEAD     ORD,5,LONG,'V'/256
2098 0C40 4C49 A                .WORD    'LI','ST'+ODD,TRIAD-4
     0C41 53D4 A
     0C42 0C23 A
2099 0C43 0342 A    VLIST:  .WORD    DOCOL,LIT,0080,OUT,STORE
     0C44 0103 A
     0C45 0080 A
     0C46 03E7 A
     0C47 031D A
2100 0C48 03FA A                .WORD    CONT,AT,AT
     0C49 030B A
     0C4A 030B A
2101 0C4B 03E7 A    VLIST1: .WORD    OUT,AT,LIT,0040,GREAT,ZBRAN
     0C4C 030B A
     0C4D 0103 A
     0C4E 0040 A
     0C4F 0463 A
     0C50 0124 A
2102 0C51 0005 A                .WORD    VLIST2-.,CR,ZERO,OUT,STORE
     0C52 01FC A
     0C53 0376 A
     0C54 03E7 A
     0C55 031D A
2103 0C56 02DD A    VLIST2: .WORD    DUP,IDDOT,SPACE,SPACE
     0C57 075D A
     0C58 0475 A
     0C59 0475 A
2104 0C5A 04C0 A                .WORD    PFA,LFA,AT,DUP,ZEQU
     0C5B 04A3 A
     0C5C 030B A
     0C5D 02DD A
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        0C5E 028F A
2105    0C5F 01F8 A              .WORD     QTERM,OR,ZBRAN
        0C60 0246 A
        0C61 0124 A
2106    0C62 FFE9 A              .WORD     VLIST1-.,DROP,SEMIS
        0C63 02D0 A
        0C64 026A A
2107                       ;
2108    0C65 8454 A              HEAD      ORD,4,LONG,'T'/256
2109    0C66 4153 A              .WORD     'AS','K'+EVEN,VLIST-4
        0C67 CB20 A
        0C68 0C3F A
2110    0C69 0342 A   TASK:      .WORD     DOCOL,SEMIS
        0C6A 026A A
2111
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                              .PAGE
2112                    ;
2113       088C    FIN:     .END     CENT
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        00F6 02A2 A
        00F7 0108 A
        00F8 0109 A
        00F9 0107 A
        00FA 015D A
        00FB 015C A
        00FC 7E44 A
        00FD 7E3B A
        00FE 7ECC A
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ABORT	0874	A		ABS	08C0	A		AGAIN	0B21	A
ALLOT	0442	A		AND	023F	A		ARROW	0A3B	A
AT	030B	A		BACK	0ACA	A		BACKSP	0017	A*
BAD	0175	A		BASE	040D	A		BBUF	0399	A
BCOMP	07AF	A		BDIGS	0B6F	A		BEGIN	0AD3	A
BIN	02A2	A		BITO	0003	A		BL	0387	A
BLANKS	0671	A		BLK	03DD	A		BLKSIZ	0080	A
BLOCK	09B6	A		BLOCK1	09C5	A		BLOCK2	09D2	A
BLOCK3	09DE	A		BRAN	011B	A		BSCR	039F	A
BUFF1	0997	A		BUFF2	09AA	A		BUFFER	0992	A
BUFFS	1DF0	A		BUFMEM	0210	A		BUILDS	0575	A
BYTE	02FD	A		CAT	0311	A		CELL	0305	A
CENT	088C	A		CFA	04AA	A		CKBASE	016F	A
CMOVE	0690	A		CMOVE1	0698	A		CMOVE2	06A1	A
CMOVE3	06A2	A		COLD	088B	A		COLON	0338	A
COMMA	0448	A		COMPIL	0521	A		CON	0357	A
CONT	03FA	A		COUNT	058E	A		CPU	0014	A*
CR	01FC	A		CREAT1	078C	A		CREATE	0779	A
CRY	0007	A		CSET	000A	A		CSP	041C	A
CSTORE	0324	A		CURR	0401	A		CYCLE	018A	A
DABS	08C8	A		DDOT	0BCE	A		DDOTR	0BB3	A
DDUP	047D	A		DEC	0553	A		DEFIN	084B	A
DELIM	01DA	A		DFIND	0727	A		DFIND1	0737	A
DICT	0100	A		DIG	0B91	A		DIG1	0B9F	A
DIGIT	0166	A		DIGS	0BA7	A		DIGS1	0BA8	A
DLINE	09FB	A		DLITE1	07D4	A		DLITER	07CC	A
DMINUS	02BD	A		DO	0AF0	A		DOCOL	0342	A
DOCON	035C	A		DODOES	0583	A		DOES	057D	A
DOT	0BD5	A		DOTQ	05D8	A		DOTQ1	05EA	A
DOTQ2	05EE	A		DOTR	0BC5	A		DOUSER	0371	A
DOVAR	0367	A		DOVOC	0837	A		DP	03D0	A
DP0	001F	A*		DPL	0412	A		DPLUS	02A7	A
DPMI	08B7	A		DPMI1	08BC	A		DRONE	097F	A
DROP	02D0	A		DRTWO	0987	A		DTRA1	05B4	A
DTRA2	05C1	A		DTRA3	05C3	A		DTRAIL	05B0	A
DUP	02DD	A		EDIGS	0B78	A		ELSE	0B46	A
EMIT	01ED	A		ENCL	01B1	A		END	0B1A	A
ENDIF	0ADC	A		ENDNAM	01A1	A		EQUAL	0457	A
ERASE	0668	A		ERROR	0744	A		ERROR1	074B	A

EVEN	8000	A	EXEC	0112	A	EXPEC1	05F9	A
EXPEC2	0611	A	EXPEC3	061D	A	EXPEC4	061E	A
EXPEC5	0624	A	EXPECT	05F4	A	FENCE	03CB	A
FENCE0	001E	A*	FILL	0658	A	FIN	0C6B	A
FIRST	038D	A	FLD	0417	A	FORG1	0AA1	A
FORG2	0AAE	A	FORG3	0AB1	A	FORGET	0A8C	A
FORTH	083F	A	FORTH0	0016	A*	FOUND	0194	A
FROMR	0283	A	GETC	7E3B	A	GREAT	0463	A
HEAD	FORM		HERE	043A	A	HEX	0548	A
HI	0A59	A	HIBLK	3FC0	A	HLD	0426	A
HOLD	067A	A	I	0161	A	IDDOT	075D	A
IF	0B3A	A	IMM	0001	A	IMMED	0819	A
IN	03E2	A	INDEX	0C0B	A	INDEX1	0C13	A
INDEX2	0C20	A	INIT	0023	A	INTER	07F1	A
INTER1	07F2	A	INTER2	07FE	A	INTER3	0800	A
INTER4	0803	A	INTER5	080D	A	INTER6	080F	A
INTER7	0810	A	INTEST	7ECC	A	IP	0001	A
IP0	089F	A	KEY	01F1	A	LATEST	049B	A
LBRAC	052C	A	LDUP	0894	A	LDUVS	0896	A
LEAVE	0273	A	LESS	045D	A	LFA	04A3	A
LIMIT	0393	A	LINK	0008	A	LIST	0BEA	A
LIST1	0BF9	A	LIT	0103	A	LITER	07BD	A
LITER1	07C5	A	LMASK	01E7	A	LNDEL	01CB	A
LO	0A5E	A	LOAD	0A22	A	LOBLK	2000	A
LONG	0000	A	LOOP	0AFA	A	LP	0219	A
M	000B	A	MAX	08D7	A	MESS	0A05	A
MESS1	0A15	A	MESS2	0A17	A	MESS3	0A1D	A
MIN	08CF	A	MIN1	023B	A	MINUS	02B4	A
MINUS1	0223	A	MISS	019C	A	MOD	0919	A
MOVE	0201	A	MOVE1	0207	A	MOVE2	020E	A
MSLASH	08EE	A	MSMOD	0933	A	MSTAR	08DF	A
MTBUF	0975	A	NBUF	0008	A	NEW1	01BE	A
NEW2	01CD	A	NEWNAM	0181	A	NEXT	0109	A
NFA	04B1	A	NINE	0177	A	NONUL	01D6	A
NUL	01D1	A	NULL	063A	A	NULL1	064F	A
NULL2	0651	A	NULL3	0653	A	NUMB	06FA	A
NUMB1	070A	A	NUMB2	071D	A	NUMB3	0722	A
NZ	0005	A	ODD	0080	A	OFFSET	03F3	A
ONE	037A	A	ONEP	042B	A	OR	0246	A
ORD	0000	A	ORGPTR	08A0	A	ORIG	0010	A
OUT	03E7	A	OVER	02C9	A	P	0002	A
PABORT	073D	A	PAD	0686	A	PAREN	0853	A
PART	0002	A	PBUF	094D	A	PBUF1	0958	A
PCR	0A53	A	PDOTQ	05CA	A	PEMIT	0A49	A
PFA	04C0	A	PFIND	017D	A	PKEY	0A4D	A
PLINE	09E7	A	PLOOP	0B05	A	PLUS	029F	A
PMI	08AE	A	PMI1	08B3	A	PNUMB	06D4	A
PNUMB1	06D5	A	PNUMB2	06F0	A	PNUMB3	06F3	A
POOL	0230	A	POP	015D	A	POP2	015C	A
PORIG	03A6	A	PQTERM	0A4F	A	PREV	0947	A
PSCODE	055E	A	PSTORE	02E3	A	PULL	014F	A
PUSH	0107	A	PUT	0108	A	PUTC	7E44	A
QCOMP	04E3	A	QCSP	0505	A	QERR1	04DD	A
QERR2	04DE	A	QERROR	04D6	A	QEXEC	04EF	A
QLOAD	0514	A	QPAIRS	04FB	A	QSTACK	07DA	A

QTERM	01F8	A	QUAD	0000	A	QUERY	062D	A
QUES	0BDB	A	QUIT	085C	A	QUIT1	0861	A
QUIT2	086D	A	R	0289	A	R0	001A	A*
RBRAC	0533	A	REPEAT	0B2D	A	REV	0015	A*
RMASK	01E8	A	RNDEL	01CA	A	RNUM	0421	A
ROT	046A	A	RP	0021	A	RPSTOR	0262	A
RT1	01C4	A	RT2	01DD	A	RW	0A63	A
RW1	0A79	A	RZERO	03B3	A	S0	0019	A*
SCR	03EC	A	SCSP	04CC	A	SEMI	034A	A
SEMIC	0569	A	SEMIS	026A	A	SHORT	0001	A
SIGN	0B86	A	SIGN1	0B8E	A	SLASH	0911	A
SLMOD	0909	A	SMUDGE	053E	A	SP	0003	A
SPACE	0475	A	SPACE1	0B68	A	SPACE2	0B6B	A
SPACES	0B60	A	SPAT	0255	A	SPSTOR	025B	A
SSLASH	092A	A	SSMOD	0921	A	STAR	0901	A
START	089E	A	STATE	0407	A	STOD	08A5	A
STORE	031D	A	STRING	FORM		SUB	0450	A
SWAP	02D5	A	SZERO	03AE	A	TASK	0C69	A
TEST	021E	A	THEN	0AEA	A	THREE	0382	A
TIB	03B8	A	TIB0	001B	A*	TICK	0A7F	A
TOGGLE	02ED	A	TOPMEM	2000	A	TOR	027B	A
TRAV	0488	A	TRAV1	048A	A	TRIAD	0C27	A
TRIAD1	0C34	A	TWO	037E	A	TWOP	0432	A
TYPE	0599	A	TYPE1	05A1	A	TYPE2	05A8	A
TYPE3	05A9	A	U0	0018	A*	UDOT	0BE2	A
UNTIL	0B10	A	UP	0022	A	UPDATE	0962	A
USE	0941	A	USER	036E	A	USLASH	0227	A
USTAR	0213	A	UVARS	1DD0	A	VAR	0364	A
VLIST	0C43	A	VLIST1	0C4B	A	VLIST2	0C56	A
VOCAB	0827	A	VOCL	03D8	A	VOCL0	0020	A*
W	0002	A	WARN	03C5	A	WARN0	001D	A*
WENT	0892	A	WHILE	0B57	A	WIDTH	03BE	A
WIDTH0	001C	A*	WORD	06A8	A	WORD1	06B2	A
WORD2	06B4	A	X	0002	A	X00FF	0335	A
X3FFF	01A8	A	X7F7F	01A9	A	X8080	01AB	A
XDO	0155	A	XFF	031A	A	XFF00	01AA	A
XLOOP	012F	A	XLOOP1	0137	A	XOR	024D	A
XPLOOP	0140	A	Y	0003	A	Z	0001	A
ZBRAN	0124	A	ZEQU	028F	A	ZERO	0376	A
ZLESS	0297	A						

NO ERROR LINES
SOURCE CHECKSUM : E77A
  A   ZEQU   028F A   ZERO   0376 A