

LPTPL1 VERSION 6(344) RUNNING ON LPT0  
\*START\* USER HITS [6080,6000] J0B 5 F SEQ, 42 DATE 10-SEP-75 08:24:13Z MONITOR ALBUQUERQUE SCHOOLS 5076 \*START\*  
REQUEST CREATED: 10-SEP-75 03:16:06  
FILE: D\$K6\$1:F15000,60001 CREATED: 10-SEP-75 03:16:00 PRINTED: 10-SEP-75 08:45:24Z  
QUEUE SWITCHES /FILE:ASCII /COPIES=2 /SPACING=1 /LIMIT=1305 /FORMS=NORMAL  
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BASIC MLS 8080 GATES/ALLEN/DAVIDUFF MACRO 47(113) 03:12 10-SEP-75 PAGE  
C 6-SEP-64 03:08 COMMON FILE

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00100 SEARCH MCSB08          ;THE UNIVERSAL FILE
00200 SUBTL COMMON FILE
00300 SALL
00400 LENGTH#==2             ;0 MEANS 4K, 1 MEANS 8K, 2 MEANS 12K
00500 REALLOC#==1            ;CASSSETTE SWITCH (CSAVE,CLOAD)
00600 CSAVE#==0               ;FOR PURE CODE
00700 CLOAD#==0
00800 PUSH#==0
00900 LPTSH#==0
00990 DSKFUN#==0             ;ON TO READ/WRITE
01000 CONSSW#==0

01200 CLMHWD#=="014          ;SHARE COMMA COLUMNS FOURTEEN CHARACTERS
01300 RAMHDT#==020000          ;BOTTOM LOCATION OF RAM FOR PURE SWITCH
01400 CONTRN#==0
01500 IFE
    REALLOC#<
        LPTSH#==0
    JALLOW "#"
01600 CASSW#==0
01800 CONSSW#==0             ;SIMULATOR DEFAULTS
01900 DSKFUN#==0
02000 CONTRN#==0>

02200 IFE LENGTH#<
    EXPFNC#==0                ;ON MEANS EXTENDED FUNCTIONS
    MULDIM#==0                 ;ON MEANS MULTIPLE DIMENSIONED ARRAYS ALLOWED
02300 STRING#==0               ;ON MEANS STRINGS ALLOWED
02400 CASSW#==0
02500 LPTSH#==0
02600 DSUFPR#==0
02700 CONSSW#==0
02800 DSKFUN#==0
02900 CONTRN#==0>

03200 IFE LENGTH#==1,<
    EXPFNC#==1
    MULDIM#==1
    STRING#==1>
03300
03400
03500

03700 IFE LENGTH#==2,<
    EXPFNC#==1
    MULDIM#==1
    STRING#==1>
03800
03900
04000

04200 DEFINE SYNCCHK(A),<RST 1
04300     A>
04400     DEFINE CHRGET,<RST 2>
04500     DEFINE DUTCHK,<RST 3>
04600     DEFINE COMPCHK,<RST 4>
04700     DEFINE FSIGN,<RST 5>
04800     DEFINE PUSHM,<RST 6>
04900     DEFINE PUSHFM,<PUSHM>
05000     PUSHM
05100
05200     DEFINE ACRLF,<
05300         "D13
05400     IFN STRING,<"D10>>
05500

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BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 05:12 10-SEP-75 PAGE 1-1

C 6-SEP-64 03:06 COMMON FILE

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54      05400  DEFINE  PUSHR,<
55          PUSH   D
56          PUSH   B>
57      05500  DEFINE  POPR,<
58          POP    B
59          POP    D>
60      05600  DEFINE  MOVR(B,C,D,E),<
61          XHD   ^U1000,"0081  // MLI 8#
62          EXP    C
63          EXP    B
64      05700  EXP    E
65          EXP    D>
66      05800  EXP    D>
67
68      05800  IF1,<
69          IFE   LENGTH,<PRINTX /SMALL/>
70          IFE   LENGTH=1,<PRINTX /MEDIUM/>
71          IFE   LENGTH=2,<PRINTX /BIG/>
72          IFE   REALIO,<PRINTX /SIMULATE/>
73          IFN   REALIO,<PRINTX /ON MACHINE/>
74          IFN   LPTN,<PRINTX /ASSEMBLE/>
75          IFN   PURE,<PRINTX /PURE/>
76          LPTSW,<PRINTX /LPT/>
77          IFN   DSKFUN,<PRINTX /DISK/>
78          IFN   CONSSH,<PRINTX /CONSOLE/>
79          PAGE
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BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 03:12 10-SEP-75 PAGE 1

F3 MAC 6-SEP-64 03:11 VERSION 3.0 -- MORE FEATURES TO GO

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80      00020  SUBTBL VERSION 3.0 -- MORE FEATURES TO GO
81      00020  TITLE BASIC MCS 8080 GATES/ALLEN/DAVIDOFF
82      00060  IFNDEF LENGTH,<PRINTX III MUST HAVE COM III
83      00080  END>
84      00080  MCSSIM(START)
85      00120  COMMENT *
86
87      00160  **** -----
88      00160  COPYRIGHT 1975 BY BILL GATES AND PAUL ALLEN
89      00200  **** -----
90
91      00260  ORIGINALLY WRITTEN ON THE PDP-10 FROM
92      00260  FEBRUARY 9 TO APRIL 9
93
94      00320  BILL GATES WROTE THE RUNTIME STUFF,
95      00340  PAUL ALLEN WROTE THE NON-RUNTIME STUFF,
96      00360  MONTE DAVIDOFF WROTE THE MATH PACKAGE,
97
98      00400  THINGS TO DO:
99      00420  GOSUB INPUT BUG (BUF SMASH)
100     00430  PRINT POSITION MANDATORY
101     00440  MULTIPLE LET
102     00480  RESTART AT B SHOULD GO THROUGH STKINI
103     00500  USER DEFINED FUNCTIONS(MULTI=ARG,MULTI=LINE,STRINGS)
104     00520  MAKE STACK BOUNDARY STUFF EXACT
105     00540  PUNCH,RENUMBER,,
106     00560  INLINE CONSTANT CONVERSION--MAKE IT WORK
107     00580  *
108      00600  RADIX 10
109      00620  #,##0
110      00625  #,##0*#17*LENGTH#2
111      00640  NUMLEV==#17*LENGTH#2
112      00660
113      00680  LPTLEN==#72
114      00700  LINLEN==#72
115      00720  BUFLEN==#72
116      00740  STRSIZ==#4
117      00760  IFE   LENGTH=2,<STRSIZ==#3>
118      00780  IFE   LENGTH=3,<STRSIZ==#3>
119      00800  IFE   LENGTH=2,<NUMTHMP==5>
120      00820  CH#==#13
121      00840  COUNT#==15
122      00860  DOUNE#==128
123      00880  IDUNE#==1
124      00900  TTUCHN#==1
125      00920  TTICHN#==1
126      00940  LISTEN#==0
127      00960  FUNCTS#==1
128      01000
129      01040  INP   REALIO,<
130      01060  LISTEN#==1>
131      01080  IFE   LENGTH,<
132      01120  FUNCTS#==0>
```

133  
134  
135 01200 INTERNAL .G1,BUF,READY,REASON,SNERR,OMERR,REPINI  
136 01220 INTERNAL STREND,CURLIN,DVØERN,ERROV  
137 01240 IFN REAL10,<  
138 01250 INTERNAL CNLCA1,CNLCA2,CNLCA3>  
139 01280 IFN EXTFNC,  
140 01290 EXTERNAL ATNFIX,COSFIX,SINFIX,TANFIX  
141 01300 EXTERNAL QINT,ZERO,MOVE,FOUT,FIN,FCOMP,FADD,PUSHF,INT,INIT  
142 01340 EXTERNAL MOVR,MUVRF,MUVRH,INPRT,LINPRT  
143 01360 EXTERNAL MUVMF,MUVMF,TSTACK,FLOATRI,FAUDS  
144 01380 INTERNAL ILLFUN,FAC,FACLO,TXTTAB,STROUT,SCRATCH  
145 01400 EXTERNAL INKART,NEG,FLDAT  
146 01420 INTERNAL OUTD,SIRKUI  
147 01430 INTERNAL STKTOP,ERROR,FGERR  
148 01440 IFN STRING,<  
149 01442 INTERNAL VALTYP,TEMPPT  
150 01444 INTERNAL TEMPST,STHLIT  
151 01446 IFN LENGTH=2,<  
152 01448 INTERNAL TMERR  
153 01450 INTERNAL MENSIZ,FRETOP  
154 01452 INTERNAL SIGN  
155 01454 INTERNAL FPWR,FMINUTK,PLUSTR,CRDU,LINGET,INTXT,GINLIN  
156 014580 IFN MULDIM,<INTERNAL BSEHR>  
157 01460 IFN MULDIM,<EXTERNAL UHULT>  
158 01462 IFE LENGTH,<INTERNAL KNDFIX,SQRFIX,SINFIX>  
159 01464 INTERNAL SIGN  
160 01466 EXTERNAL SIGNC,POPHRT  
161 01468 IFN CONTRW,<  
162 01470 INTERNAL CNTWFL>  
163 01472 IFN LPTRW,<  
164 01474 INTERNAL LPTPOS,PRTFLG>  
165 01476 IFE LENGTH=2,<  
166 01478 EXTERNAL CONS1H,VMOVFA,VMOVAF,ISIGN,FPWRQ,CONIA,GETBCD,VSIGN  
167 01480 EXTERNAL VMOVFM,VMOVVF,FRCINT,FRCSNG,FRCDUL,VNEG,PUFOUF,UCXBHT,IADD  
168 01482 EXTERNAL ISUB,IMULT,IOIV,ICOMP,INEG,DADD,DSUB,DMULT,OIV,DCOMP,VINT  
169 01484 EXTERNAL TMERR,MOVE,VALINT,VALSNG,FRCSTR,CHKSTR,MAINT  
170 01486 INTERNAL DFACLO,ARG,ARGLO,VALTYP,ERRTM,TEMP2,TEMP3,GETYPE  
171 01488 PAGE

172 01840 SUBTTL SOME EXPLANATION  
173  
174  
175  
176 01920 ALTAIR BASIC CONFIGURES MEMORY AS FOLLOWS:  
177  
178  
179 01960 LOW LOCATIONS  
180  
181 02000 RST SUBROUTINES  
182 02040 0 STARTUP  
183 02050 INITIALLY A JMP TO THE INITIALIZATION CODE  
184 02060 BUT CHANGED TO A JMP TO READY.  
185 02100 RESTARTING THE MACHINE AT 0 DURING PROGRAM  
186 02120 EXECUTION CAN LEAVE THINGS MESSED UP.  
187  
188 02160 1 SYNCCHK  
189 02180 A CHECK IS MADE TO MAKE SURE THE  
190 02200 CHARACTER POINTER POINTS AT A SPECIFIC  
191 02220 CHARACTER, IF NOT THE "SYNTAX ERROR"  
192 02240 ROUTINE IS CALLED, IF SO,  
193 02260 THE CHRGRET HST IS DROPPED INTO SD  
194 02280 THE CURRENT HST IS DROPPED INTO SD  
195 02300 ONE WILL BE PUT IN [A]  
196 02320 THE CONDITION CODES WILL REFLECT THIS  
197 02340 EXAMPLE: SYNCCHK THENTH (THE MATCH CHARACTER IS  
198 02360 GIVEN IN THE LOCATION AFTER THE RST).  
199 02380 WOULD CHECK TO MAKE SURE [H,L] POINTED TO A THENTH  
200 02400 AND IF SO FETCH THE NEXT CHARACTER INTO [A].  
201 02420 IF NOT, A "SYNTAX ERROR" WOULD BE GIVEN.  
202  
203 02460 2 CHRGRET  
204 02480 USING [H,L] AS THE TEXT POINTER  
205 02500 THE TEXT POINTER IS INCREMENTED  
206 02520 AND THE NEXT CHARACTER IS FETCHED INTO [A]  
207 02540 IF THE CHARACTER IS A " " IT IS SKIPPED  
208 02560 OVER AND THE NEXT CHARACTER IS FETCHED,  
209 02580 THE STATEMENT TERMINATORS ";" AND 0  
210 02600 LEAVE THE ZERO FLAG SET. SEE  
211 02620 THE NUMBER RIGHS "#", THROUGH "#", LEAVE THE CARRY  
212 02640 FLAG SET. THE CURRENT CHARACTER CAN BE  
213 02660 REFETCHED INTO [A] BY DOING A MOV A,M.  
214 02680 IF THE CONDITION CODES MUST BE SET UP AGAIN  
215 02700 DCX H,CHRGRET WILL WORK, IT IS VERY DIFFICULT  
216 02720 TO REEXAMINE THE CHARACTER BEFORE THE CURRENT  
217 02740 ONE SINCE SPACES MAY BE IN-BETWEEN,  
218 02760 DCX H,UCX H,CHRGRET WILL NOT ALWAYS WORK.  
219  
220 02800 3 OUTCHR  
221 02820 THE CHARACTER IN [A] IS PRINTED ON  
222 02840 THE USER'S TERMINAL, [A] AND THE  
223 02860 CONDITION CODES ARE PRESERVED.

225 02900 4 CUMPAR  
226 02920 [D,E] AND [H,L] ARE COMPARED AS UNSIGNED  
227 02940 DOUBLE-BYTE INTEGERS, CARRY IS SET IF  
228 02960 [H,L] IS LESS THAN [D,E], ZERO IS SET IF THEY  
229 02980 ARE EQUAL, [A] IS SHAMED, THE ONLY DEFINITE  
230 03000 THING THAT CAN BE SAID ABOUT [A] ON RETURN  
231 03020 IS THAT IF THE ZERO FLAG IS SET, [A] WILL  
232 03040 EQUAL 0.  
233  
234 03080 5 FSIGN  
235 03100 THE FAC (FLOATING ACCUMULATOR)  
236 03120 WHICH IS USED TO STORE NUMERIC RESULTS  
237 03140 IS CHECKED TO SEE WHAT SIGN ITS  
238 03160 VALUE HAS.  
239  
240 03200 6 PUSHM  
241 03220 A DOUBLE BYTE QUANTITY POINTED  
242 03240 TO BY [H,L] IS PUSHED ONTO THE  
243 03260 STACK, [B,C] IS SET EQUAL TO THE  
244 03280 VALUE PUSHED, [H,L] IS INCREMENTED BY TWO.  
245  
246 03320 7 IN THE 4K VERSION RST 7 IS UNUSED AND THE LOCATIONS  
247 03340 ASSOCIATED WITH IT ARE USED TO CONTINUE  
248 03360 THE CODE FOR RST 6. IN THE 8K A JMP IS MADE  
249 03380 AROUND THE FIRST THREE RST 7 LOCATIONS  
250 03400 DURING RST 6 EXECUTION, RST 7 INITIALLY  
251 03420 CONTAINS A RET, BUT THE USER CAN CHANGE IT TO  
252 03440 A JMP TO AN INTERRUPT SERVICE ROUTINE.  
253  
254 03460 FUNCTION DISPATCH ADDRESSES  
255 03500 FUDSP CONTAINS THE ADDRESSES OF THE  
256 03520 FUNCTION ROUTINES IN THE ORDER OF THE  
257 03540 FUNCTION NAMES IN THE CRUNCH LIST.  
258 03560 THE FUNCTIONS THAT TAKE MORE THAN ONE ARGUMENT  
259 03580 ARE AT THE END, SEE THE EXPLANATION AT ISFUN,  
260  
261 03620 THE OPERATOR TABLE  
262 03640 THE OPTAB TABLE CONTAINS AN OPERATORS PRECEDENCE  
263 03660 PRIORITY, THE ADDRESS OF THE ROUTINE TO PERFORM  
264 03680 THE OPERATION, THE INDEX INTO THE  
265 03700 OPERATOR TABLE IS MADE BY SUBTRACTING OFF THE CRUNCH VALUE  
266 03720 OF THE LOWEST NUMBERED OPERATOR. THE ORDER  
267 03740 OF OPERATORS IN THE CRUNCH LIST AND IN OPTAB IS IDENTICAL.  
268 03760 THE PRECEDENCES ARE ARBITRARY,EXCEPT FOR THEIR  
269 03780 COMPARATIVE SIZES, NOTE THAT THE PRECEDENCE FOR  
270 03800 UNARY OPERATORS SUCH AS NOT AND NEGATION ARE  
271 03820 SETUP SPECIALLY WITHOUT USING A TABLE.  
272  
273  
274 03860 THE RESERVED WORD OR CRUNCH LIST  
275 03880 WHEN A COMMAND OR PROGRAM LINE IS TYPED IN  
276 03900 IT IS STORED IN BUF, AS SOON AS THE WHOLE LINE  
277 03920 HAS BEEN TYPED IN (INLIN RETURNS) CRUNCH IS  
278 03940 CALLED TO CONVERT ALL RESERVED WORDS TO THEIR  
279  
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03960 CRUNCH VALUES, THIS REDUCES THE SIZE OF THE  
03980 PROGRAM AND SPEEDS UP EXECUTION BY ALLOWING  
04000 TABLE DISPATCHES TO PERFORM FUNCTIONS,STATEMENTS,  
04020 AND OPERATIONS, THIS IS BECAUSE ALL THE STATEMENT  
04040 NAMES ARE STORED CONSECUTIVELY IN THE CRUNCH LIST,  
04060 WHEREVER IT IS FOUND BETWEEN A STRING  
04080 OF CHARACTERS AND A WORD IN THE CRUNCH LIST  
04100 THE ENTIRE TEXT OF THE MATCHED WORD IS TAKEN OUT OF  
04120 THE INPUT LINE AND A RESERVED WORD TOKEN IS PUT  
04140 IN ITS PLACE, A RESERVED WORD TOKEN IS ALWAYS EQUAL  
04160 TO OCTAL 200 PLUS THE POSITION OF THE MATCHED WORD  
04180 IN THE CRUNCH LIST,

04220 STATEMENT DISPATCH ADDRESSES  
04240 WHEN A STATEMENT IS TO BE EXECUTED, THE FIRST  
04260 CHARACTER OF THE STATEMENT IS EXAMINED  
04280 TO SEE IF IT IS LESS THAN THE RESERVED  
04300 WORD TOKEN FOR THE LOWEST NUMBERED STATEMENT NAME,  
04320 IF SO, THE "LET" CODE IS CALLED TO  
04340 TREAT THE STATEMENT AS AN ASSIGNMENT STATEMENT,  
04360 OTHERWISE A CHECK IS MADE TO MAKE SURE THE  
04380 RESERVED WORD NUMBER IS NOT TOO LARGE TO BE A  
04400 STATEMENT TYPE, IF IT IS NOT, THE ADDRESS  
04420 TO DISPATCH TO IS FETCHED FROM STDSP (THE STATEMENT  
04440 DISPATCH TABLE) USING THE RESERVED WORD  
04460 NUMBER FOR THE STATEMENT TO CALCULATE AN INDEX INTO  
04480 THE TABLE.

04520 ERROR MESSAGES  
04540 WHEN AN ERROR CONDITION IS DETECTED  
04560 [E] MUST BE SET UP TO INDICATE WHICH ERROR  
04580 MESSAGE IS APPROPRIATE AND A BRANCH MUST BE MADE  
04600 TO ERROR, THE STACK WILL BE RESET AND ALL  
04620 PROGRAM CONTEXT WILL BE LOST, VARIABLES  
04640 VALUES AND THE ACTUAL PROGRAM REMAIN INTACT.  
04660 ONLY THE VALUE OF [E] IS IMPORTANT WHEN  
04680 THE BRANCH IS MADE TO ERROR, [E] IS USED AS AN  
04700 INDEX INTO ERRTAB WHICH GIVES THE TWO  
04720 CHARACTER ERROR MESSAGE THAT WILL BE PRINTED ON THE  
04740 USER'S TERMINAL.

04780 IMPURE STORAGE  
04800 ALL TEMPORARIES,FLAGS,POINTERS, THE BUFFER AREA,  
04820 THE FLOATING ACCUMULATOR,AND ANYTHING ELSE THAT  
04840 IS USED TO STORE A CHANGING VALUE SHOULD BE LOCATED  
04860 IN THIS AREA, CARE MUST BE MADE IN MOVING LOCATIONS  
04880 IN THIS AREA SINCE THE JUXTAPOSITION OF TWO LOCATIONS  
04900 IS OFTEN DEPENDED UPON.

04940 TEXTUAL MESSAGES  
04960 CONSTANT MESSAGES ARE STORED HERE, UNLESS  
04980 THE CODE TO CHECK IF A STRING MUST BE COPIED  
05000 IS CHANGED THESE STRINGS MUST BE STORED ABOVE

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531          05020      DSCTMP, OR ELSE THEY WILL BE COPIED BEFORE
532          05040      THEY ARE PRINTED.

533          05080      FNDFOR
534          05100      MOST SMALL ROUTINES ARE FAIRLY SIMPLE
535          05120      AND ARE DOCUMENTED IN PLACE. FNDFOR IS
536          05140      USED FOR FINDING "FOR" ENTRIES ON
537          05160      THE STACK, WHENEVER A "FOR" IS EXECUTED AN
538          05180      18 BYTE ENTRY IS PUSHED ONTO THE STACK.
539          05200      BEFORE THIS IS DONE, HOWEVER, A CHECK
540          05220      MUST BE MADE TO SEE IF THERE
541          05240      ARE ANY "FOR" ENTRIES ALREADY ON THE STACK.
542          05260      FOR A SMALL LOOP, IT'S POSSIBLE SO THAT "FOR" ENTRY
543          05280      AND ALL OTHER "FOR" ENTRIES THAT WERE MADE AFTER IT
544          05300      ARE ELIMINATED FROM THE STACK. THIS IS SO A
545          05320      PROGRAM THAT JUMPS OUT OF THE MIDDLE
546          05340      OF A "FOR" LOOP AND THEN RESTARTS THE LOOP AGAIN
547          05360      AND AGAIN WON'T USE UP 18 BYTES OF STACK
548          05380      SPACE EVERY TIME. THE "NEXT" CODE ALSO
549          05400      CALLS FNDFOR TO SEARCH FOR A "FOR" ENTRY WITH
550          05420      THE SAME VARIABLE AS THE "FOR".
551          05440      THE "NEXT" AT WHICH EVER POINT A MATCH IS FOUND
552          05460      THE STACK IS RESET. IF NO MATCH IS FOUND A
553          05480      "NEXT WITHOUT FOR" ERROR OCCURS. GOSUB EXECUTION
554          05500      ALSO PUTS A 6 BYTE ENTRY ON STACK.
555          05520      WHEN A <RETURN> IS EXECUTED FNDFOR IS
556          05540      CALLED WITH A VARIABLE POINTER THAT CAN'T
557          05560      BE MATCHED, WHEN "FNDFOR" HAS RUN
558          05580      THROUGH ALL THE "FOR" ENTRIES ON THE STACK
559          05600      IT RETURNS TO THE HERE-BEFORE-MAKES
560          05620      SURE THE ENTRY THAT WAS STOPPED
561          05640      ON IS A GOSUB ENTRY. THIS ASSURES THAT
562          05660      IF YOU GOSUB TO A SECTION OF CODE
563          05680      IN WHICH A FOR LOOP IS ENTERED BUT NEVER
564          05700      EXITED THE RETURN WILL STILL BE
565          05720      ABLE TO FIND THE MOST RECENT
566          05740      GOSUB ENTRY. THE "RETURN" CODE ELIMINATES THE
567          05760      "GOSUB" ENTRY AND ALL "FOR" ENTRIES MADE AFTER
568          05780      THE GOSUB ENTRY.

569          05820      NON-RUNTIME STUFF
570          05840      THE CODE TO INPUT A LINE, CRUNCH IT, GIVE ERRORS,
571          05860      FIND A SPECIFIC LINE IN THE PROGRAM,
572          05880      PERFORM A "NEW", "CLEAR", AND "LIST" ARE
573          05900      ALL IN THIS AREA. GIVEN THE EXPLANATION OF
574          05920      PROGRAM STORAGE GIVEN BELOW THESE ARE
575          05940      ALL STRAIGHTFORWARD.

576          05980      NEWSTT
577          06000      WHENEVER A STATEMENT FINISHES EXECUTION IT
578          06020      DOES A "RET" WHICH TAKES
579          06040      EXECUTION BACK TO NEWSTT, STATEMENTS THAT
580          06060      CREATE OR LOOK AT SEMI-PERMANENT STACK ENTRIES

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584          06080      MUST GET RID OF THE RETURN ADDRESS OF NEWSTT AND
585          06100      JMP TO NEWSTT WHEN DONE. NEWSTT ALWAYS
586          06120      CHARGES THE FIRST CHARACTER AFTER THE STATEMENT
587          06140      NAME BEFORE DISPATCHING, WHEN RETURNING
588          06160      BACK TO NEWSTT THE ONLY THING THAT
589          06180      MUST BE LEFT UP IS THE TEXT POINTER IN
590          06200      [M,L]. NEWSTT WILL CHECK TO MAKE SURE
591          06220      [M,L] IS POINTING TO A STATEMENT TERMINATOR.
592          06240      IF A STATEMENT SHOULDN'T BE PERFORMED UNLESS
593          06260      IT IS PROPERLY FORMATTED (I.E., "NEW"). IT CAN
594          06280      SIMPLY DO A "RNZ" AFTER READING ALL OF
595          06300      ITS ARGUMENTS, SINCE THE ZERO FLAG
596          06320      BEING OFF INDICATES THERE IS NOT
597          06340      A STATEMENT TERMINATOR. NEWSTT WILL
598          06360      DO THE JMP TO THE PSYCHIX ERROR
599          06380      ROUTINE. IF A STATEMENT SHOULD BE STARTED
600          06400      OVER IT CAN DO LHD TEMP,WET SINCE THE [M,L]
601          06420      AT NEWSTT IS ALWAYS STORED IN TEMP, OF COURSE
602          06440      CARE MUST BE TAKEN THAT NO ROUTINE
603          06460      THAT SMASHES TEMP HAS BEEN CALLED.
604          06480      THE "TC" CODE STORES TEMP IN GLDTXT AND CURLIN (THE
605          06500      CURRENT LINE NUMBER) IN OLDDLN SINCE THE "C" CHECK
606          06520      IS PAGE BEFORE THE STATEMENT POINTED TO IS
607          06540      EXECUTED. "STOP" AND "END" STORE THE TEXT POINTER
608          06560      IN [M,L] WHICH POINTS AT THEIR TERMINATING
609          06580      CHARACTER IN GLDTXT.

610          06620      STATEMENT CODE
611          06640      THE INDIVIDUAL STATEMENT CODE COMES
612          06660      NEXT, THE APPROACH USED IN EXECUTING EACH
613          06680      STATEMENT IS DOCUMENTED IN THE STATEMENT CODE
614          06700      ITSELF.

615          06740      FRMEVL, THE FORMULA EVALUATOR
616          06760      GIVEN AN [M,L] POINTING TO THE STARTING
617          06780      CHARACTER OF A FORMULA FRMEVL
618          06800      EVALUATES THE FORMULA AND LEAVES
619          06820      THE VALUE IN THE FLOATING ACCUMULATOR (FAC).
620          06840      [M,L] IS RETURNED POINTING TO THE FIRST CHARACTER
621          06860      THAT COULD NOT BE INTERPRETED AS PART OF THE
622          06880      FORMULA. THE ALGORITHM USES THE STACK
623          06900      TO STORE TEMPORARY RESULTS:

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624          06940      0, PUT A DUMMY PRECEDENCE OF ZERO ON
625          06960      THE STACK.
626          06980      1, READ LEXEME (CONSTANT,FUNCTION,
627          07000      VARIABLE,FORMULA IN PARENCS)
628          07020      AND TAKE THE LAST PRECEDENCE VALUE
629          07040      OFF THE STACK.
630          07060      2, SEE IF THE NEXT CHARACTER IS AN OPERATOR
631          07080      IF NOT, RETURN. THIS MAY CAUSE
632          07100      OPERATOR APPLICATION OR AN ACTUAL
633          07120      RETURN FROM FRMEVL.

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437 07140 3. IF IT IS, SEE WHAT PRECEDENCE IT HAS  
438 07160 AND COMPARE IT TO THE PRECEDENCE  
439 07180 OF THE LAST OPERATOR ON THE STACK  
440 07200 4. IF = OR LESS REMEMBER THE TEXT  
441 07220 PRINTED AT THE START OF THIS OPERATOR  
442 07240 AND ANY RETURNED CALLS  
443 07260 APPLICATION OF THE LAST OPERATOR,  
444 07280 EVENTUALLY RETURN TO STEP 2  
445 07300 BY RETURNING TO RETAD.  
446 07320 5. IF GREATER PUT THE LAST PRECEDENCE  
447 07340 BACK ON, SAVE THE CURRENT  
448 07360 TEMPORARY RESULT, OPERATOR ADDRESS  
449 07380 AND PRECEDENCE AND RETURN TO STEP 1.  
  
450 07428 RELATIONAL OPERATORS ARE ALL HANDLED THROUGH  
451 07440 A COMMON ROUTINE. SPECIAL  
452 07460 CARE IS TAKEN TO DETECT TYPE MISMATCHES SUCH AS 3+FF".  
  
453 EVAL -- THE ROUTINE TO READ A LEXEME  
454 07520 EVAL CHECKS FOR THE DIFFERENT TYPES OF  
455 07540 EXPRESSIONS IT IS SUPPOSED TO DETECT,  
456 07560 LEADING PARENTHESIS, NUMBER, LETTER,  
457 07580 DIGIT, AND "+" CAUSE FIN (FLOATING INPUT)  
458 07600 TO BE CALLED. FUNCTION NAMES CAUSE THE  
459 07620 FORMULA INSIDE THE PARENTHESES TO BE EVALUATED  
460 07640 AND THE FUNCTION ROUTINE TO BE CALLED, VARIABLE  
461 07660 NAMES CAUSE PTGET TO BE CALLED TO GET A POINTER  
462 07680 TO THE VALUE, AND THEN THE VALUE IS PUT INTO  
463 07700 THE FACT. AN OPEN PARENTHESIS CAUSES FRMELV  
464 07720 TO BE CALLED, RETURNING A TEXT POINTER TO  
465 07740 BE CHECKED FOR UNARY OPERATORS (NOT AND  
466 07760 NEGATION). PUT THEIR PRECEDENCE ON THE STACK  
467 07780 AND ENTER FORMULA EVALUATION AT STEP 1, SO  
468 07800 THAT EVERYTHING UP TO AN OPERATOR GREATER THAN  
469 07820 THEIR PRECEDENCE OR THE END OF THE FORMULA  
470 07840 WILL BE EVALUATED, WHEN FRMELV DOES A RETURN  
471 07860 BECAUSE IT SEES AN OPERATOR OF HIGHER PRECEDENCE  
472 07880 IT DOES NOT PASS THE TEXT POINTER IN [M,L], SO  
473 07900 AFTER THE UNARY OPERATION HAS BEEN PERFORMED  
474 07920 ON THE FAC THE TEXT POINTER MUST BE Fetched FROM  
475 07940 A TEMPORARY LOCATION THAT FRMELV USES AND  
476 07960 A RETURN BACK TO FRMELV DONE.  
  
477 DIMENSION AND VARIABLE SEARCHING  
478 08000 SPACE IS ALLOCATED FOR VARIABLES AS THEY ARE  
479 08020 EXECUTED, THUS POINT STATEMENTS MUST BE  
480 08040 EXECUTED TO HAVE EFFECT. 6 BYTES ARE ALLOCATED  
481 08060 FOR EACH SIMPLE VARIABLE. WHETHER IT IS A STRING,  
482 08080 NUMBER OR USER DEFINED FUNCTION, THE FIRST TWO  
483 08100 BYTES GIVE THE NAME OF THE VARIABLE AND THE LAST FOUR  
484 08120 GIVE ITS VALUE, [VARTAB] GIVES THE FIRST LOCATION  
485 08140 WHERE A SIMPLE VARIABLE NAME IS FOUND AND [ARYTAB]  
486 08160 GIVES THE LOCATION TO STOP SEARCHING FOR SIMPLE  
487 08180

490 08200 VARIABLES, A "FOR" ENTRY HAS A TEXT POINTER  
491 08220 AND A POINTER TO A VARIABLE VALUE SO NEITHER  
492 08240 THE PROGRAM OR THE SIMPLE VARIABLES CAN BE  
493 08260 MOVED WHILE THERE ARE ACTIVE "FOR" ENTRIES ON THE STACK,  
494 08280 USER DEFINED FUNCTION VALUES ALSO CONTAIN  
495 08300 POINTERS TO SIMPLE VARIABLES, SINCE SO NO USER-DEFINED  
496 08320 FUNCTION VALUES CAN BE RETAINED IF SIMPLE VARIABLES  
497 08340 ARE MOVED. ADDING A SIMPLE VARIABLE  
498 08360 ADDING SIX TO ARYTAB AND STREND, WHICH TRANSFERS  
499 08380 THE ARRAY VARIABLES UP BY SIX, AND MAKING SURE THE  
500 08400 NEW [STREND] IS NOT TO CLOSE TO THE STACK,  
501 08420 THIS MOVEMENT OF ARRAY VARIABLES MEANS  
502 08440 THAT NO POINTER TO AN ARRAY WILL STAY VALID WHEN  
503 08460 NEW SIMPLE VARIABLES CAN BE ENCOUNTERED. THIS IS  
504 08480 WHY ARRAY VARIABLES ARE NOT ALLOWED "FOR"  
505 08500 LOOP VARIABLES. SETTING UP ANEW ARRAY VARIABLE  
506 08520 MERELY INVOLVES BUILDING THE DESCRIPTOR,  
507 08540 UPDATING STREND, AND MAKING SURE THERE IS  
508 08560 STILL ENOUGH ROOM BETWEEN STREND AND THE  
509 08580 STACK, WITHOUT MULTIPLE DIMENSIONS THE FORMAT  
510 08600 OF AN ARRAY VARIABLE IS SIMPLY:  
511 08620        S     CHARACTER  
512 08640        F     FIRST CHARACTER  
513 08660        N     NUMBER OF BYTES USED BY VALUES  
514 08680  
515 08700 THE FORMAT WHEN MULTIPLY DIMENSIONED VARIABLES  
516 08720 ARE ALLOWED IS DESCRIBED IN THE "MULDIM" CODE.  
517 08740 PTGET, THE ROUTINE WHICH RETURNS A POINTER  
518 08760 TO A VARIABLE VALUE, HAS TWO IMPORTANT FLAGS, ONE IS  
519 08780 "DIMFLG" WHICH INDICATES WHETHER A DIMN CALLED PTGET  
520 08800 ONLY TO GET THE DIMN ENTRY FOR A VARIABLE IN  
521 08820 QUESTION SHOULD BE FOUND, AND THE INDEX INDICATES  
522 08840 HOW MUCH SPACE TO SET ASIDE, SIMPLE VARIABLES CAN  
523 08860 BE "DIMENSIONED", BUT THE ONLY EFFECT WILL BE TO  
524 08880 SET ASIDE SPACE FOR THE VARIABLE IF IT HASN'T BEEN  
525 08900 ENCOUNTERED YET, THE OTHER IMPORTANT FLAG IS SUBFLG  
526 08920 WHICH INDICATES WHETHER A SUBSCRIPTED VARIABLE SHOULD BE  
527 08940 ALLOWED IN THE CURRENT CONTEXT, IF SUBFLG IS NON-ZERO  
528 08960 THE OPEN PARENTHESIS FOR A SUBSCRIPTED VARIABLE  
529 08980 WILL NOT BE SCANNED BY PTGET, AND PTGET WILL RETURN  
530 09000 WITH A TEXT POINTER POINTING TO THE "("; IF  
531 09020 THERE WAS ONE.  
  
532 STRINGS  
533 09040 IN THE VARIABLE TABLE STRINGS ARE STORED JUST LIKE  
534 09060 NUMERIC VARIABLES, SIMPLE STRINGS HAVE FOUR VALUE  
535 09080 BYTES WHICH ARE INITIALIZED TO ALL ZEROS (WHICH  
536 09100 REPRESENTS THE NULL STRING). THE ONLY DIFFERENCE  
537 09120 IN HANDLING IS THIS: WHEN PTGET SEES A "\$" AFTER THE  
538 09140 NAME OF A VARIABLE, PTGET SETS THE TYPE BIT ONE AND TURNS  
539 09160 ON THE NSB (MOSTSIGNIFICANT-BIT) OF THE VALUE OF  
540 09180 THE FIRST CHARACTER OF THE VARIABLE NAME,  
541 09200 HAVING THIS BIT ON IN THE NAME OF THE VARIABLE ENSURES  
542 09220 THAT THE SEARCH ROUTINE WILL NOT MATCH

543 09260 \*A\* WITH 'AS' OR 'AS' WITH 'AF', THE MEANING OF  
 544 09280 THE FOUR VALUE BYTES ARE:  
 545 09300 LOW LENGTH OF THE STRING  
 546 09320 UNUSED  
 547 09340 LOW 8 BITS  
 548 09360 HIGH 8 BITS OF THE ADDRESS  
 549 09380 OF THE CHARACTERS IN THE  
 550 09400 STRING IF LENGTH.NE.0,  
 551 09420 MEANINGLESS OTHERWISE.  
 552 09440  
 553 09460 HIGH  
 554 09480 THE VALUE OF A STRING VARIABLE (THESE 8 BYTES)  
 555 09500 IS CALLED A DESCRIPTOR. IT IS DISTRIBISH  
 556 09520 IT FROM THE ACTUAL STRING DATA WHENEVER A  
 557 09540 STRING CONSTANT IS ENCOUNTERED IN A FORMULA OR AS  
 558 09560 PART OF AN INPUT STRING, OR AS PART OF DATA, STRIT  
 559 09580 IS CALLED, CAUSING A DESCRIPTOR TO BE BUILT FOR  
 560 09600 THE STRING. IF THE STRING CONSTANT IS IN BUF (WHICH  
 561 09620 IT WILL BE IF THE STRING IS BEING "INPUT", OR THE  
 562 09640 STRING IS PART OF SOME FORMULA IN A DIRECT STATEMENT)  
 563 09660 THE VALUE IS COPIED INTO STRING SPACE SINCE BUF  
 564 09680 IS ALWAYS CHANGING, \*STCPY\* IS USED TO COPY  
 565 09700 STRINGS.  
 566  
 567 09740 STRING FUNCTIONS AND THE ONE STRING OPERATOR "\*"  
 568 09760 ALWAYS RETURN THEIR VALUES IN STRING SPACE,  
 569 09780 ASSIGNING A STRING A CONSTANT VALUE IN A PROGRAM  
 570 09800 THROUGH A "READ" OR ASSIGNMENT STATEMENT  
 571 09820 WILL NOT USE ANY STRING SPACE SINCE  
 572 09840 THE STRING IS COPIED INTO THE  
 573 09860 PROGRAM ITSELF. IN GENERAL, COPYING IS DONE  
 574 09880 WHEN A STRING VALUE IS IN BUF, OR IT IS IN STRING  
 575 09900 SPACE AND THERE IS AN ACTIVE POINTER TO IT,  
 576 09920 THUS FS#GS WILL CAUSE COPYING IF GS HAS ITS  
 577 09940 STRING DATA IN STRING SPACE, FS#CHR\$(7)  
 578 09960 WILL USE ONE BYTE OF STRING SPACE TO STORE THE  
 579 09980 NEW ONE CHARACTER STRING CREATED BY "CHR\$", BUT  
 580 10000 THE STRING ITSELF WILL CAUSE NO COPYING SINCE  
 581 10020 THE ONLY POINTER TO THE NEW STRING IS  
 582 10040 A TEMPORARY DESCRIPTOR CREATED BY FMEVL WHICH WILL  
 583 10060 GO AWAY AS SOON AS THE ASSIGNMENT IS DONE.  
 584 10080 IT IS THE NATURE OF GARBAGE COLLECTION THAT  
 585 10100 DISALLOUS HAVING TWO STRING DESCRIPTORS POINT TO THE SAME  
 586 10120 AREA IN STRING SPACE. STRING FUNCTIONS AND OPERATORS  
 587 10140 MUST PROCESS AS FOLLOWS:  
 588 10160 1) FIGURE THE LENGTH OF THEIR RESULT  
 589 10180 2) CALL GETSPA TO FIND SPACE FOR THEIR  
 590 10200 RESULT. THE ARGUMENTS TO THE FUNCTION  
 591 10220 OR OPERATOR MAY CHANGE SINCE GARBAGE COLLECTION  
 592 10240 MAY BE INVOKED. THE ONLY THING THAT CAN  
 593 10260 BE SAVED DURING THE CALL TO GETSPA IS A POINTER  
 594 10280 TO THE DESCRIPTORS OF THE ARGUMENTS.  
 595 10300 3) CONSTRUCT THE RESULT DESCRIPTOR IN DSCTMP,

596 10320 GETSPA RETURNS THE LOCATION OF THE AVAILABLE  
 597 10340 SPACE.  
 598 10360 4) CREATE THE NEW VALUE BY COPYING PARTS  
 599 10380 OF THE ARGUMENTS OR WHATEVER.  
 600 10400 5) FREE UP THE ARGUMENTS BY CALLING FRETMP.  
 601 10420 6) JUMP TO PUTNTR TO GET THE DESCRIPTOR IN  
 602 10440 DSCTMP TRANSFERRED INTO A NEW STRING TEMPORARY.  
 603  
 604 10480 THE REASON FOR STRING TEMPORARIES IS THAT GARBAGE  
 605 10500 COLLECTION HAS TO KNOW ABOUT ALL ACTIVE STRING DESCRIPTORS  
 606 10520 SO IT KNOWS WHAT IS AND ISN'T IN USE. STRING TEMPORARIES ARE  
 607 10540 USED TO STORE THE DESCRIPTORS OF STRING EXPRESSIONS.  
 608  
 609 10580 INSTEAD OF HAVING AN ACTUAL VALUE STORED IN THE  
 610 10600 FAC, AND HAVING THE VALUE OF A TEMPORARY RESULT  
 611 10620 BEING SAVED ON THE STACK, AS HAPPENS WITH NUMERIC  
 612 10640 VARIABLES, STRINGS HAVE THE POINTER TO A STRING DESCRIPTOR  
 613 10660 STORED IN THE FAC, AND IT IS THIS POINTER  
 614 10680 THAT GETS SAVED ON THE STACK BY FORMULA EVALUATION.  
 615 10700 STRING FUNCTIONS CANNOT FREE THEIR ARGUMENTS UP RIGHT  
 616 10720 AND SINCE GETSPA MAY FORCE  
 617 10740 GARBAGE COLLECTION ON AND THE ARGUMENT STRINGS  
 618 10760 MAY BE OVER-WRITTEN SINCE GARBAGE COLLECTION  
 619 10780 WILL NOT BE ABLE TO FIND AN ACTIVE POINTER TO  
 620 10800 THEM. FUNCTION AND OPERATOR RESULTS ARE BUILT IN  
 621 10820 DSCTMP SINCE STRING TEMPORARIES ARE ALLOCATED  
 622 10840 (PUTNEW) AND DEALLOCATED (FRETMP) IN A FIFO ORDERING  
 623 10860 (.I.E., A STACK) SO THE NEW TEMPORARY CANNOT  
 624 10880 BE SET UP UNTIL THE OLD(S) ARE FREE'D, TRYING  
 625 10900 TO KILL THE RESULT IN A TEMPORARY AFTER  
 626 10920 FREEING UP THE ARGUMENT TEMPORARIES COULD RESULT  
 627 10940 IN ONE OF THE ARGUMENT TEMPORARIES BEING OVERWRITTEN  
 628 10960 TOO SOON BY THE NEW RESULT.  
 629  
 630 11000 STRING SPACE IS ALLOCATED AT THE VERY TOP  
 631 11020 OF MEMORY, MEMSIZ POINTS BEYOND THE LAST LOCATION OF  
 632 11040 STRING SPACE. STRING ARE STORED IN HIGH LOCATIONS  
 633 11060 FIRST. A MEMORY PTR, SET IN ALLOCATED (GETSPA)  
 634 11080 FRETOP, WHICH IS INITIALIZED TO (MEMSIZ), IS UPDATED  
 635 11100 TO GIVE THE HIGHEST LOCATION IN STRING SPACE  
 636 11120 THAT IS NOT IN USE. THE RESULT IS THAT  
 637 11140 FRETOP GETS SMALLER AND SMALLER, UNTIL SOME  
 638 11160 ALLOCATION WOULD MAKE |FRETOP| LESS THAN OR EQUAL TO  
 639 11180 (STKTOP). THIS MEANS STRING SPACE HAS RUN INTO THE  
 640 11200 STACK AND THAT GARBAGE COLLECTION MUST BE CALLED.  
 641  
 642 11240 GARBAGE COLLECTION:  
 643 11260 1. MINPTR=[STKTOP] [FRETOP]=[MEMSIZ]  
 644 11280 2. REMMIN=0  
 645 11300 2. FOR EACH STRING DESCRIPTOR  
 646 11320 (TEMPORARIES, SIMPLE STRINGS, STRING ARRAYS)  
 647 11340 IF THE STRING IS NOT NULL AND ITS POINTER IS  
 648 11360 .GT. MINPTR AND .LT. FRETOP,

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12400  
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MINPTR#THIS STRING DESCRIPTOR'S POINTER  
REMMIN=POINTER AT THIS STRING DESCRIPTOR  
END  
5. IF REMMIN,NE.,0 (HE FOUND AN UNCOLLECTED STRING)  
BLOCK TRANSFERRED TO THE LOCATION POINTED  
TO IN THE STRING DESCRIPTOR POINTED TO BY REMMIN  
SO THAT THE LAST BYTE OF STRING DATA IS AT  
[FRETUP], UPDATE FRETUP SO THAT IT  
POINTS TO THE LOCATION JUST BELOW THE ONE  
THE STRING DATA HAS MOVED INTO, UPDATE  
THE POINTEE IN THE DESCRIPTOR SO IT POINTS  
TO THE NEW LOCATION OF THE STRING DATA,  
GO TO STEP 1.

AFTER CALLING GARBAGE COLLECTION GETSPA AGAIN CHECKS  
TO SEE IF [A] CHARACTERS ARE AVAILABLE BETWEEN  
[STRTUP] AND [FRETUP], IF NOT AN "OUT OF STRING"  
ERROR IS INVOKED.

MATH PACKAGE  
THE MATH PACKAGE CONTAINS FLOATING INPUT (FIN),  
FLOATING OUTPUT (FOU), FLOATING COMPARE (FCOMP),  
+ ALL THE NUMERIC OPERATIONS AND FUNCTIONS,  
THE FORMATS, CONVENTIONS AND ENTRY POINTS ARE ALL  
DESCRIBED IN THE MATH PACKAGE ITSELF.

INIT -- THE INITIALIZATION ROUTINE  
INITIALIZATION FIRST LOOKS AT THE SWITCH REGISTER  
TO SEE WHAT TYPE OF I/O SHOULD BE DONE,  
AND HOW MUCH MEMORY TO ALLOCATE FOR BASIC.  
TU HE CHANGED THE AMOUNT OF MEMORY,  
TERMINAL WIDTH, AND WHICH FUNCTIONS TO BE RETAINED  
ARE ASCERTAINED FROM THE USER, A ZERO IS PUT DOWN  
AT THE FIRST LOCATION NOT USED BY THE MATH-PACKAGE  
AND TXTTAB IS SET UP TO POINT AT THE NEXT LOCATION.  
THIS DETERMINES WHERE PROGRAM STORAGE WILL START, THE  
HIGHEST MEMORY LOCATION MINUS THE AMOUNT OF DEFaulted  
PROGRAM SPACE (SUBTRACTED THE FIRST LOCATION USED BY THE  
STORAGE SPECIAL CHECKER AND MAKE SURE THERE  
ALL QUESTIONS IN INIT ARE ANSWERED REASONABLY, SINCE  
ONCE INIT FINISHES THE LOCATIONS IT USES ARE  
USED FOR PROGRAM STORAGE, THE LAST THING INIT DOES IS  
CHANGE LOCATION ZERO TO BE A JUMP TO READY instead  
OF INIT, ONCE THIS IS DONE THERE IS NO WAY TO RESTART  
INIT,

STORAGE  
A ZERO.  
POINTER TO NEXT LINE'S POINTER  
LINE # OF THIS LINE (2 BYTES)  
CHARACTERS ON THIS LINE  
ZERO  
POINTER AT NEXT LINE'S POINTER

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12900  
12920 HIGH LOCATIONS  
12960 \*  
12980 PAGE

(POINTED TO BY THE ABOVE POINTER)  
LAST LINE: ... REPEATS ...  
POINTED AT ZERO POINTER  
LINE # OF THIS LINE  
CHARACTERS ON THIS LINE  
ZERO  
DOUBLE ZERO (POINTED TO BY THE ABOVE POINTER)  
SIMPLE VARIABLES, 6 BYTES PER VALUE,  
2 BYTES GIVE THE NAME, 4 BYTES THE VALUE  
... REPEATS ...  
ARRAY VARIABLES, 2 BYTES NAME, 2 BYTES  
LENGTH, VALUE (EXTRA IF MULDIM ON)  
... REPEATS ...  
FREE SPACE  
... REPEATS ...  
MOST RECENT STACK ENTRY  
... REPEATS ...  
FIRST STACK ENTRY  
FREE STRING SPACE  
... REPEATS ...  
STRING SPACE IN USE  
... REPEATS ...  
HIGHEST MACHINE LOCATION  
UNUSED EXCEPT BY THE VAL FUNCTION.

BASIC MCS 8080 GATES/ALLEN/DAVIOUFF F3 MAC 6=SEP-64 03:11 MACRO 47(113) 03:12 10-SEP-75 PAGE 3  
RST ROUTINES

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730          13000  SUBTBL RST ROUTINES
731  000000*  13020  RELOC 0
732  000000*  001000  000293  13040  START: DI
733  000001*  001000  000303  13060  JMP INIT
734  000002*  000000  000000*  13080
735  000003*  000000  000000*  13100
736          13120
737          13140
738          13160  IFN LENGTH=2,<
739          13180  ADR(DEINT)
740          13200  STORE HERE THE ROUTINE
741          13220  J TURN THE FAC INTO
742          13240  A DR(GIVABF)>
743          13260  J A TWO-HYTE SIGNED INTEGER
744          13280  JSTORE HERE THE ADDRESS
745          13300  JOF THE ROUTINE TO CONVERT {A,B}
746          13320  JTO A FLOATING POINT NUMBER IN THE FAC
747          13340  ADR(MAKINT)>
748          13360  JTURN [H,L] INTO A VALUE IN THE FAC
749          13380  ADR(FACINT)
750          13400  JTURN [H,L] INTO AN INTEGER IN {H,L}
751  000007*  000000  000004*  13420
752          13440
753  000010*  13460  ADR(MAKINT)>
754          13480  JSET VALTYP FOR INTEGER
755          13500  RELOC 3
756          13520  J
757          13540  J SYNCRA LOOKS AT THE CURRENT CHARACTER TO MAKE SURE IT
758          13560  J IS A SPECIFIC THING (CONTAINED IN THE LOCATION AFTER THE CALL)
759          13580  J IF NOT IT CALLS THE "SYNTAX ERROR" ROUTINE, OTHERWISE IT GOBBLES
760          13600  J THE NEXT CHARACTER AND RETURNS, (BY FALLING INTO CHRGRT)
761          13620  J ALL REGISTERS ARE PRESERVED EXCEPT {A}#NEW CHAR
762          13640  J AND {H,L} ENDS UP POINTING AT THE CHARACTER AFTER THE ONE
763          13660  J WHICH WAS CHECKED,
764  000010*  001000  000176  13680  MOV A,M
765  000011*  001000  000343  13690  XTHL
766          13700  JGET THE CURRENT CHARACTER
767  000012*  001000  000276  13710  OUTP A, H
768          13720  JPUT CALL ADDRESS INTO {H,L}
769  000013*  001000  000043  13730  CMP M
770  000014*  001000  000343  13740  JSEE IF {A} = CURRENT CHARACTER
771          13750  INX H
772  000015*  001000  000302  13760  XTHL
773  000016*  000000  00267C*  13770  JPUT RETURN ADDRESS BACK AND RESTORE
774  000017*  000000  000005*  13780  JTHE TEXT POINTER,
775          13790  JIF THE CHARACTER WASN'T RIGHT CALL
776          13800
777          13820
778          13840  J
779          13860  J CHRGRT, USING {H,L} AS THE CURRENT TEXT POINTER FETCHES
780          13880  J A NEW CHARACTER INTO {A} AFTER INCREMENTING {H,L}
781          13900  J AND SETS CONDITION CODES ACCORDING TO WHATS IN {A}
782          13920  J C= NUMERIC ("0" THROUGH "9")

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RST ROUTINES

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783          13940  J Z= "?" OR END-OF-LINE (A=0)
784          13960  J
785          13980  J ALL REGISTERS SAVED EXCEPT {A}#NEW CHAR
786          14000  ADR(M,L)=H,L+1
787          14020
788  000020*  14040  RELOC 16
789  000020*  001000  000045  14060  IFE LENGTH,<CHRGTR>
790  000021*  001000  000176  14080  INX H
791  000021*  001000  000176  14100  MOV A,M
792  000022*  001000  000376  14120  CPI ":" JGET NEW CHARACTER
793  000023*  000000  000072  14140  JMAKE ":" HAVE ZERO ON AND
794          14160
795          14180
796          14200  JCALLY OFF
797  000024*  001000  000320  14220  JALL ALPHABETICS & RESERVED
798  000025*  001000  000303  14240  JWORDS GET ZERO & CARRY OFF
799  000026*  000000  003433*  14260  RNC J,GT ":" GO BACK
800  000027*  000000  000016*  14280  JMP CHRCON JNO ROOM FOR WHOLE ROUTINE
801          14300
802          14320  J
803          14340  RELOC 24
804  000030*  14360  OUTDO: PUSH PSW
805          14380  IFN CONTRX,<
806  000031*  001000  000072  14400  LDA CNTWFL JGET SUPPRESS FLAG
807  000030*  001000  000365  14420
808          14440
809  000031*  001000  000072  14460  DRA A>
810  000032*  000000  001541*  14480  LENGTH|CNTWFL|PPTSH,< JSEE IF IT IS SET
811  000033*  000000  000026*  14500  LDA TTPPOS> JUSE RST BYTES, {A}=TTPOS
812  000034*  001000  000067  14520  JMP OUTCON
813          14540
814          14560  J
815  000035*  001000  000303  14580  {H,L} LESS THAN {D,E} SET CARRY
816  000036*  000000  003665*  14600  {H,L} = {D,E} SET ZERO
817  000037*  000000  000032*  14620  J {A} IS THE ONLY REGISTER USED
818          14640
819          14660  RELOC 32
820          14680  MOV A,M
821          14700  SUB D,E
822          14720  RNZ
823          14740  MOV A,L
824          14760  SUB E
825          14780  RET
826  000040*  14800
827  000040*  001000  000174  14820
828  000041*  000000  000226  14840
829  000042*  001000  000000  14860
830  000043*  001000  000175  14880
831  000044*  001000  000223  14900
832  000045*  001000  000511  14920  NULCNT: 1 JSTORE HERE THE NUMBER OF NULLS
833          14940  JTO PRINT AFTER CRLF
834  000046*  000000  000001  14960
835  000046*  000000  000001  14980

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RST ROUTINES

656 000047\* 14860 TTYP0S: BLOCK 1 ;STORE TERMINAL POSITION HERE  
657 14880 J ;  
658 14880 ;THE FSJON RST RETURNS A=1 IF FAC IS LESS THAN 0  
659 14880 ;A0 IF FAC GREATER THAN ZERO  
660 14940 J ;THE CUNDITION CODES REFLECT THE VALUE OF [A]  
661 14980 J AND NO OTHER REGISTERS ARE MODIFIED,  
662 15000 J THIS WORKS ONLY WHEN THE FAC IS A SINGLE OR DOUBLE PRECISION NUMBER  
663 15220 J THE "SIGN" ROUTINE IS MORE GENERAL SINCE  
664 15840 J IT WILL TAKE THE SIGN OF INTEGERS AS WELL  
665 15850 J AND GIVES "TMERK" ON STRINGS,  
666 15860 ;  
667 15880 RELOC 48  
668 000050\* 001000 000072 15100 SIGN1 LDA FAC  
669 000051\* 000000 001042\*  
670 000052\* 000000 000036\*  
671 000053\* 001000 000067 15120 ORA A  
672 000054\* 001000 000032 15140 JNZ SIGNC  
673 000055\* 000000 000000\*  
674 000056\* 000000 000051\*  
675 000057\* 001000 000311 15160 RET  
676 15160 ;  
677 15200 ;THIS IS THE PUSHM RST  
678 15220 ;EFFECT IS:  
679 15240 MOV C,M  
680 15260 INX H  
681 15280 MOV B,M  
682 15300 INX H  
683 15320 PUSH B  
684 15340 ;DIFFICULTY COMES IN BECAUSE OF THE  
685 15360 ;RETURN ADDRESS,  
686 15380 ;  
687 15400 RELOC 48  
688 000060\* 001000 000343 15420 XTHL  
689 000061\* 001000 000042 15440 SHLD PUSHMA+1 ;SWITCH [H,L] AND RETURN ADDRESS  
690 000062\* 000000 000101\*  
691 000063\* 000000 000051\*  
692 000064\* 001000 000341 15460 POP H ;REGAIN [H,L]  
693 000065\* 001000 000303 15480 IFN LENGTH,<  
694 000066\* 000000 000073\* 15500 JHP SCODE+59 ;IN BK ALLOW USER TO HAVE RST ?  
695 000067\* 000000 00006c\*  
696 15520 ;FOR INTERRUPT TRAPPING  
697 000070\* 001000 000311 15540 RELOC 56  
698 15560 RET ;INITIALLY NO INTERRUPT  
699 15580 ;ROUTINE  
700 000071\* 001000 000000 15600 NOP  
701 000072\* 001000 000000 15620 NOP  
702 000073\* 001000 000116 15640 MOV C,M ;GRAB FROM MEMORY  
703 000074\* 001000 000043 15660 INX H  
704 000075\* 001000 000106 15680 MOV B,M  
705 000076\* 001000 000043 15700 INX H  
706 000077\* 001000 000305 15720 PUSH B ;PUSH [B,C] ONTO THE STACK

BASIC MCS 8080 GATES/ALLEN/DAVYDOFF  
F3 MAC 6-SEP-64 03:11

MACRO 47(113) 03:12 10-SEP-75 PAGE 3-3  
RST ROUTINES

699 000100\* 001000 000303 15740 ;  
700 000101\* 000000 000100\* 15760 PUSHMA: JMP PUSHMA ;SINCE IT CONTAINS [M]  
701 000102\* 000000 000066\* 15800 PAGE ;RETURN ADDRESS STORED HERE  
702 000103\* 000000 000067\*  
703 000104\* 000000 000068\*  
704 000105\* 000000 000069\*  
705 000106\* 000000 00006a\*  
706 000107\* 000000 00006b\*  
707 000108\* 000000 00006c\*  
708 000109\* 000000 00006d\*  
709 000110\* 000000 00006e\*  
710 000111\* 000000 00006f\*  
711 000112\* 000000 000070\*  
712 000113\* 000000 000071\*  
713 000114\* 000000 000072\*  
714 000115\* 000000 000073\*  
715 000116\* 000000 000074\*  
716 000117\* 000000 000075\*  
717 000118\* 000000 000076\*  
718 000119\* 000000 000077\*  
719 000120\* 000000 000078\*  
720 000121\* 000000 000079\*  
721 000122\* 000000 00007a\*  
722 000123\* 000000 00007b\*  
723 000124\* 000000 00007c\*  
724 000125\* 000000 00007d\*  
725 000126\* 000000 00007e\*  
726 000127\* 000000 00007f\*  
727 000128\* 000000 000080\*  
728 000129\* 000000 000081\*  
729 000130\* 000000 000082\*  
730 000131\* 000000 000083\*  
731 000132\* 000000 000084\*  
732 000133\* 000000 000085\*  
733 000134\* 000000 000086\*  
734 000135\* 000000 000087\*  
735 000136\* 000000 000088\*  
736 000137\* 000000 000089\*  
737 000138\* 000000 00008a\*  
738 000139\* 000000 00008b\*  
739 000140\* 000000 00008c\*  
740 000141\* 000000 00008d\*  
741 000142\* 000000 00008e\*  
742 000143\* 000000 00008f\*  
743 000144\* 000000 000090\*  
744 000145\* 000000 000091\*  
745 000146\* 000000 000092\*  
746 000147\* 000000 000093\*  
747 000148\* 000000 000094\*  
748 000149\* 000000 000095\*  
749 000150\* 000000 000096\*  
750 000151\* 000000 000097\*  
751 000152\* 000000 000098\*  
752 000153\* 000000 000099\*  
753 000154\* 000000 000100\*  
754 000155\* 000000 000101\*  
755 000156\* 000000 000102\*  
756 000157\* 000000 000103\*  
757 000158\* 000000 000104\*  
758 000159\* 000000 000105\*  
759 000160\* 000000 000106\*  
760 000161\* 000000 000107\*  
761 000162\* 000000 000108\*  
762 000163\* 000000 000109\*  
763 000164\* 000000 000110\*  
764 000165\* 000000 000111\*  
765 000166\* 000000 000112\*  
766 000167\* 000000 000113\*  
767 000168\* 000000 000114\*  
768 000169\* 000000 000115\*  
769 000170\* 000000 000116\*  
770 000171\* 000000 000117\*  
771 000172\* 000000 000118\*  
772 000173\* 000000 000119\*  
773 000174\* 000000 000120\*  
774 000175\* 000000 000121\*  
775 000176\* 000000 000122\*  
776 000177\* 000000 000123\*  
777 000178\* 000000 000124\*  
778 000179\* 000000 000125\*  
779 000180\* 000000 000126\*  
780 000181\* 000000 000127\*  
781 000182\* 000000 000128\*  
782 000183\* 000000 000129\*  
783 000184\* 000000 000130\*  
784 000185\* 000000 000131\*  
785 000186\* 000000 000132\*  
786 000187\* 000000 000133\*  
787 000188\* 000000 000134\*  
788 000189\* 000000 000135\*  
789 000190\* 000000 000136\*  
790 000191\* 000000 000137\*  
791 000192\* 000000 000138\*  
792 000193\* 000000 000139\*  
793 000194\* 000000 000140\*  
794 000195\* 000000 000141\*  
795 000196\* 000000 000142\*  
796 000197\* 000000 000143\*  
797 000198\* 000000 000144\*  
798 000199\* 000000 000145\*  
799 000200\* 000000 000146\*  
800 000201\* 000000 000147\*  
801 000202\* 000000 000148\*  
802 000203\* 000000 000149\*  
803 000204\* 000000 000150\*  
804 000205\* 000000 000151\*  
805 000206\* 000000 000152\*  
806 000207\* 000000 000153\*  
807 000208\* 000000 000154\*  
808 000209\* 000000 000155\*  
809 000210\* 000000 000156\*  
810 000211\* 000000 000157\*  
811 000212\* 000000 000158\*  
812 000213\* 000000 000159\*  
813 000214\* 000000 000160\*  
814 000215\* 000000 000161\*  
815 000216\* 000000 000162\*  
816 000217\* 000000 000163\*  
817 000218\* 000000 000164\*  
818 000219\* 000000 000165\*  
819 000220\* 000000 000166\*  
820 000221\* 000000 000167\*  
821 000222\* 000000 000168\*  
822 000223\* 000000 000169\*  
823 000224\* 000000 000170\*  
824 000225\* 000000 000171\*  
825 000226\* 000000 000172\*  
826 000227\* 000000 000173\*  
827 000228\* 000000 000174\*  
828 000229\* 000000 000175\*  
829 000230\* 000000 000176\*  
830 000231\* 000000 000177\*  
831 000232\* 000000 000178\*  
832 000233\* 000000 000179\*  
833 000234\* 000000 000180\*  
834 000235\* 000000 000181\*  
835 000236\* 000000 000182\*  
836 000237\* 000000 000183\*  
837 000238\* 000000 000184\*  
838 000239\* 000000 000185\*  
839 000240\* 000000 000186\*  
840 000241\* 000000 000187\*  
841 000242\* 000000 000188\*  
842 000243\* 000000 000189\*  
843 000244\* 000000 000190\*  
844 000245\* 000000 000191\*  
845 000246\* 000000 000192\*  
846 000247\* 000000 000193\*  
847 000248\* 000000 000194\*  
848 000249\* 000000 000195\*  
849 000250\* 000000 000196\*  
850 000251\* 000000 000197\*  
851 000252\* 000000 000198\*  
852 000253\* 000000 000199\*  
853 000254\* 000000 000200\*  
854 000255\* 000000 000201\*  
855 000256\* 000000 000202\*  
856 000257\* 000000 000203\*  
857 000258\* 000000 000204\*  
858 000259\* 000000 000205\*  
859 000260\* 000000 000206\*  
860 000261\* 000000 000207\*  
861 000262\* 000000 000208\*  
862 000263\* 000000 000209\*  
863 000264\* 000000 000210\*  
864 000265\* 000000 000211\*  
865 000266\* 000000 000212\*  
866 000267\* 000000 000213\*  
867 000268\* 000000 000214\*  
868 000269\* 000000 000215\*  
869 000270\* 000000 000216\*  
870 000271\* 000000 000217\*  
871 000272\* 000000 000218\*  
872 000273\* 000000 000219\*  
873 000274\* 000000 000220\*  
874 000275\* 000000 000221\*  
875 000276\* 000000 000222\*  
876 000277\* 000000 000223\*  
877 000278\* 000000 000224\*  
878 000279\* 000000 000225\*  
879 000280\* 000000 000226\*  
880 000281\* 000000 000227\*  
881 000282\* 000000 000228\*  
882 000283\* 000000 000229\*  
883 000284\* 000000 000230\*  
884 000285\* 000000 000231\*  
885 000286\* 000000 000232\*  
886 000287\* 000000 000233\*  
887 000288\* 000000 000234\*  
888 000289\* 000000 000235\*  
889 000290\* 000000 000236\*  
890 000291\* 000000 000237\*  
891 000292\* 000000 000238\*  
892 000293\* 000000 000239\*  
893 000294\* 000000 000240\*  
894 000295\* 000000 000241\*  
895 000296\* 000000 000242\*  
896 000297\* 000000 000243\*  
897 000298\* 000000 000244\*  
898 000299\* 000000 000245\*  
899 000300\* 000000 000246\*

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6=SEP=64 03:11

MACRO AT(113) 05:12 10=SEP=75 PAGE 4  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

895  
896  
897 000103\* 000000 000000\*  
898 000104\* 000000 000101\*  
899  
900 000105\* 000000 000000\*  
901 000106\* 000000 000103\*  
902 000107\* 000000 000000\*  
903 000110\* 000000 000105\*  
904 000112\* 000000 000105\*  
905 000113\* 000000 000105\*  
906 000114\* 000000 000107\*  
907 000115\* 000000 000153\*  
908 000116\* 000000 000111\*  
909 000117\* 000000 000111\*  
910 000112\* 000000 210712\*  
911 000115\* 000000 000115\*  
912 000117\* 000000 007406\*  
913 000120\* 000000 000115\*  
914 000120\* 000000 000115\*  
915 000121\* 000000 000115\*  
916 000122\* 000000 000117\*  
917 000123\* 000000 000006\*  
918 000124\* 000000 000121\*  
919  
920 000125\* 000000 000000\*  
921 000126\* 000000 000123\*  
922 000127\* 000000 000000\*  
923 000128\* 000000 000125\*  
924 000129\* 000000 000125\*  
925 000132\* 000000 000127\*  
926 000133\* 000000 000000\*  
927 000134\* 000000 000131\*  
928  
929 000135\* 000000 000000\*  
930 000135\* 000000 000135\*  
931 000137\* 000000 000000\*  
932 000140\* 000000 000135\*  
933  
934 000141\* 000000 011314\*  
935 000142\* 000000 000137\*  
936  
937 000143\* 000000 010501\*  
938 000143\* 000000 000137\*  
939 000143\* 000000 007584\*  
940 000144\* 000000 000143\*  
941 000147\* 000000 211842\*  
942 000147\* 000000 16480  
943 000150\* 000000 000145\*  
944 000151\* 000000 010515\*  
945 000152\* 000000 000147\*  
946 000153\* 000000 010532\*  
947 000154\* 000000 000151\*  
15820 SUBTBL DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT  
15860 FUNDSP: ADR(\$RN)  
15880 IFN LENGTH=2,<  
15900 ADR(INT)>  
15920 IFE LENGTH=2,<  
15940 ADR(VINT)>  
15960 ADR(ABS)  
15980 USRLOC: ADR(L1LLFUN) INITIALLY NO USER ROUTINE  
16000 IFN LENGTH,<ADR(FRE)  
16020 ADR(FNINP)  
16040 IFN LPTSW,<ADR(LPDS)>  
16060 ADR(PUS)>  
16080 SQRFIX: ADR(SQR)  
16100 RNDFIX: ADR(RND)  
16120 IFN EXTFLNC,<  
16140 ADR(LDG)  
16160 ADR(EXP)  
16180 COSFLX: ADR(COS)>  
16200 SINFLX: ADR(SIN)  
16220 IFN EXTFLNC,<  
16240 TANFLX: ADR(TAN)  
16260 ATNFLX: ADR(ATN)>  
16280 IFN LENGTH,<  
16300 ADR(PEA)>  
16320 IFN DSKFUN,<ADR(DSK1\$)>  
16340 IFN STRING,<  
16360 ADR(LEN)  
16380 ADR(STRS)  
16400 ADR(VAL)  
16420 ADR(ASC)  
16440 ADR(CHRS)

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6=SEP=64 03:11

MACRO AT(113) 05:12 10=SEP=75 PAGE 4=1  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

948 000155\* 000000 010556\*  
949 000156\* 000000 000153\*  
950 000157\* 000000 010831\*  
951 000160\* 000000 000155\*  
952 000161\* 000000 010645\*  
953 000162\* 000000 000157\*  
954  
955 000163\* 000000 000171  
956  
957 000164\* 000000 000171  
958 000165\* 000000 000173  
959  
960  
961 000166\* 000000 000173  
962 000167\* 000000 000177  
963  
964 000168\* 000000 000177  
965  
966 000169\* 000000 000173  
967  
968 000167\* 000000 000177  
969  
970  
971 000170\* 000000 000120  
972  
973 000171\* 000000 000106  
974  
975  
976  
977  
978  
979  
980  
981 000177  
982  
983  
984  
985  
986 000200  
987 000201  
988 000203  
989 000210  
990 000212  
991 000214  
992 000216  
993  
994 000220  
995  
996  
997  
998 000231  
999  
1000  
16460 ADR(LEFT\$)  
16480 IFE LENGTH=2,<  
16500 DEFINE ADRP(X),<ADR(X)>  
16520 OPTAB: 121  
16540 DEFINE ADRP(X),<ADR(X)>  
16560 IFE LENGTH=2,<  
16580 DEFINE ADRP(X),>>  
16600 OPTAB: 121  
16620  
16640 ADR(PADDIT)  
16660 I21  
16700 ADR(PSUBT)  
16720 I23  
16740 ADR(PMULTT)  
16760 I23  
16780 ADR(PDIVT)  
16800 IFN EXTFLNC,<IDT  
16820 ADR(PMRT)>  
16840 IFN LENGTH,<  
16860 80  
16880 ADR(PAND)  
16900 70  
16920 ADR(POR)>  
16940 ;  
16960 ; TOKENS FOR RESERVED WORDS ALWAYS HAVE THE MOST  
16980 ; SIGNIFICANT BIT ON  
17000 ; THE LIST OF RESERVED WORDS  
17040 ;  
17060 Q#128#1  
17080 DEFINE DCI(A),<#QQ#1  
17090 XLIST  
17100 DC(A)  
17110 LL>  
17130 ENDTK#0  
17150 FORTK#0  
17240 DATATK#0  
17360 GOTOTK#0  
17420 IFTK#0  
17480 GOSUTK#0  
17540 REMTK#0  
17660 IFE LENGTH=2,<  
17700 ELETCK#0  
17780 IFN DSKFUN,<DCI"DSK1\$">  
17800 IFN LPTSW,<DCI"LPRTN">  
17820 IFN LENGTH,<  
17880 PRINTK#0  
17940 IFE REALIO,<  
17960 DCI"DDTH">

OPERATOR TABLE CONTAINS  
PRECEDENCE FOLLOWED BY  
THE ROUTINE ADDRESS

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF F3 MAC 6-SEP-64 05111

MACRO 47(113) 03:12 10-SEP-75 PAGE 4-2  
DISPATCH TABLES, RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1001 18000 IFN LPTSW,<0C1"LLIST">  
1002 18000 IFN CASSW,<0C1"CLOAD"  
1003 18000 DCI<"SAVE">  
1004 18100 IFN CONSSW,<0C1"CONSOLE">  
1005 18100 SCRATCHQ  
1006 18100 ; END OF COMMAND LIST  
1007 18100 "T"  
1008 18200 "A"  
1009 18200 "B"  
1010 18200 "C"  
1011 18200 "#128  
1012 18200 QEQ1  
1013 18200 TABTK=Q  
1014 18200 TOTK=Q  
1015 18300 LENGTH,<  
1016 18300 "S"  
1017 18300 "P"  
1018 18400 "C"  
1019 18400 "#128  
1020 18400 QEQ1  
1021 18400 SPCTK=U  
1022 18400 PFC=U  
1023 18500 USINTK=Q>  
1024 18500 THENTK=U  
1025 18600 LENGTH,<  
1026 18600 NOTTK=U>  
1027 18600 STEPTK=Q  
1028 18700 PLUSTK=U  
1029 18700 MINUTK=Q  
1030 18800 LSTOPK=Q+1-PLUSTK  
1031 18900 19000 ; CRUNCH # OF HIGHEST OP+1-PLUSTK  
1032 18900 19000 ; A GREATER THAN SIGN  
1033 18900 19000 GREATK=Q  
1034 18900 19000 EQLUTK=Q  
1035 19000 19000 188  
1036 19000 19000 QEQ1  
1037 19000 19040 LESSTK=Q  
1038 19050 ; NOTE DANGER OF ONE RESERVED WORD BEING A PART  
1039 19100 ; OF ANOTHER  
1040 19100 ; IE ... IF 2 GREATER THAN F OR T=S THEN...  
1041 19100 ; WILL NOT WORK!!! SINCE "FOR" WILL BE CRUNCHED!!  
1042 19100 ; IN ANY CASE MAKE SURE THE SMALLER WORD APPEARS  
1043 19100 ; SECOND IN THE RESERVED WORD TABLE ("INP" AND "INPUT")  
1044 19100 ; ANOTHER EXAMPLE: IF T OR Q THEN ... , "TO" IS CRUNCHED  
1045 19200 ;  
1046 200262 19200 ONEFUN=Q  
1047 19300 IFN LPTSW,<0C1"LPUSM">  
1048 200271 19400 SORTK=<  
1049 200300 19400 IFN EXTFCN,<  
1050 200300 19400 ATNTK=Q>  
1051 200300 19400 LENGTH,<  
1052 200300 19400 DSFKUN,<0C1"DSK1S">  
1053 200300 19400 STRING,<

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF F3 MAC 6-SEP-64 05111

MACRO 47(113) 03:12 10-SEP-75 PAGE 4-3  
DISPATCH TABLES, RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1054 000306 19800 LASNUM=Q  
1055 000306 19820 ; NUMBER OF LAST FUNCTION  
1056 000563\* 000000 19800 ; THAT TAKES ONE ARG  
1057 000563\* 000000 19800 ; MARKS END OF RESERVED WORD LIST  
1058 000564\* 000000 001574\* 19940 STMDSP: ADR(END)  
1059 000565\* 000000 00151\* 19960 ADR(FOR)  
1060 000566\* 000000 00154\* 19960 ADR(FOR)  
1061 000567\* 000000 000564\* 19960 ADR(NEXT)  
1062 000570\* 000000 000525\* 19960 ADR(DATA)  
1063 000571\* 000000 000566\* 19960 ADR(IF)  
1064 000572\* 000000 000407\* 20000 ADR(LET)  
1065 000573\* 000000 000570\* 20000 ADR(INPUT)  
1066 000574\* 000000 00151\* 20020 ADR(GOTO)  
1067 000575\* 000000 000572\* 20020 ADR(GOTO)  
1068 000576\* 000000 000560\* 20040 ADR(DIM)  
1069 000577\* 000000 000574\* 20120 ADR(RUN)  
1070 000600\* 000000 000476\* 20060 ADR(READ)  
1071 000601\* 000000 000576\* 20060 ADR(LET)  
1072 000602\* 000000 001431\* 20080 ADR(GOTO)  
1073 000603\* 000000 000606\* 20100 ADR(GOTO)  
1074 000604\* 000000 000607\* 20100 ADR(GOTO)  
1075 000605\* 000000 000608\* 20100 ADR(GOTO)  
1076 000606\* 000000 001754\* 20120 ADR(RUN)  
1077 000607\* 000000 000604\* 20120 ADR(LET)  
1078 000610\* 000000 000432\* 20140 ADR(IF)  
1079 000611\* 000000 000606\* 20160 ADR(RESTORE)  
1080 000612\* 000000 003446\* 20160 ADR(RESTORE)  
1081 000613\* 000000 000610\* 20180 ADR(GOSUB)  
1082 000614\* 000000 003776\* 20180 ADR(GOSUB)  
1083 000615\* 000000 000612\* 20200 ADR(GOSUB)  
1084 000616\* 000000 000604\* 20200 ADR(RETUR)  
1085 000617\* 000000 000614\* 20200 ADR(RETUR)  
1086 000626\* 000000 000674\* 20220 ADR(REM)  
1087 000621\* 000000 000616\* 20240 ADR(STOP)  
1088 000622\* 000000 003472\* 20240 ADR(STOP)  
1089 000623\* 000000 000620\* 20240 ADR(STOP)  
1090 000624\* 000000 000630\* 20260 IFE LENGTH=2,<  
1091 000624\* 000000 000674\* 20280 ADR(ELSE)  
1092 000625\* 000000 000622\* 20280 ADR(TON)  
1093 000626\* 000000 003604\* 20300 ADR(TON)  
1094 000627\* 000000 000624\* 20300 ADR(TOFF)  
1095 000630\* 000000 003605\* 20320 ADR(TOFF)  
1096 000631\* 000000 000626\* 20340 ADR(EDIT)>  
1097 000632\* 000000 000600\* 20340 ADR(EDIT)>  
1098 000633\* 000000 000630\* 20360 IFN LENGTH,<ADR(FNOUT)>  
1099 000634\* 000000 0010725\* 20360 IFN LENGTH,<ADR(FNOUT)>  
1100 000635\* 000000 000635\* 20380 ADR(ONGOTO)  
1101 000636\* 000000 004271\* 20380 ADR(ONGOTO)  
1102 000637\* 000000 000634\* 20400 ADR(NULL)  
1103 000640\* 000000 003566\* 20400 ADR(NULL)  
1104 000641\* 000000 000636\* 20420 ADR(FNWAIT)>  
1105 000642\* 000000 0010733\* 20420 ADR(FNWAIT)>  
1106 000643\* 000000 000640\*

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6=SEP=b4 05:11

MACRO #7(113) 05:112 10=SEP=75 PAGE 4=4  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1107 20440 IFN DSKFUN,<ADR(DSKUS)>  
1108 20460 IFN LPTSH,<ADR(LPRINT)>  
1109 20480 IFN LENGTH,<ADR(PKEY)>  
1110 20520 ADR(PRINT)  
1111 000644\* 000000 001323\*  
1112 000645\* 000000 000646\*  
1113 000647\* 000000 000648\*  
1114 000650\* 000000 007411\*  
1115 000651\* 000000 000646\*  
1116  
1117 000652\* 000000 003542\*  
1118 000653\* 000000 000656\*  
1119  
1120 000654\* 000000 011672\*  
1121 000655\* 000000 000652\*  
1122  
1123 000656\* 000000 011645\*  
1124 000657\* 000000 000654\*  
1125 000660\* 000000 003703\*  
1126 000661\* 000000 000656\*  
1127  
1128 000662\* 000000 002421\*  
1129 000663\* 000000 000660\*  
1130  
1131  
1132  
1133 000664\* 000000 000600\*  
1134 000665\* 000000 000662\*  
1135 000666\* 000000 000664\*  
1136 000667\* 000000 000664\*  
1137 000668\* 000000 000664\*  
1138 000669\* 000000 000600\*  
1139 000671\* 000000 000666\*  
1140  
1141 20800 IFE LENGTH=2,<  
1142 20820 FRCTBL: ADR(FRCUBL)  
1143  
1144 20840 ADR(FRCINT)  
1145  
1146 000672\* 000000 000600\*  
1147 000673\* 000000 000670\*  
1148 000674\* 000000 000600\*  
1149 000675\* 000000 000672\*  
1150 000676\* 000000 000600\*  
1151 000677\* 000000 000674\*  
1152 000678\* 000000 000600\*  
1153 000679\* 000000 000657\*  
1154 000679\* 000000 000670\*  
1155 000679\* 000000 000600\*  
1156 000679\* 000000 000702\*  
1157 000679\* 000000 000600\*  
1158 000679\* 000000 000704\*  
1159 000679\* 000000 000600\*  
1160  
1161 000711\* 000000 000706\*  
1162 000711\* 000000 000600\*  
1163 000713\* 000000 000710\*  
1164 000713\* 000000 000600\*  
1165 000715\* 000000 0006712\*  
1166 000715\* 000000 000600\*  
1167 000717\* 000000 000714\*  
1168 000720\* 000000 000600\*  
1169 000721\* 000000 000716\*  
1170 000722\* 000000 000600\*  
1171 000723\* 000000 000729\*  
1172 000724\* 000000 000600\*  
1173 000725\* 000000 000722\*  
1174 000726\* 000000 000600\*  
1175 000727\* 000000 000724\*  
1176  
1177 777777 777776 21320 Q#2  
1178 21340 DEFINE DCL(X),<  
1179 21360 DEFINE DCE(X),<Q#2>  
1180 21370 XLIST  
1181 21380 DC(X)  
1182 21390 LIST>  
1183  
1184 000730\*  
1185 000730\* 000000 000600  
1186 000730\* 000000 000600  
1187 000731\* 000000 000130  
1188 000731\* 000000 000134  
1189 000731\* 000000 000134  
1190 000731\* 000000 000134  
1191 000731\* 000000 000134  
1192 000731\* 000000 000134  
1193 000731\* 000000 000116  
1194 000731\* 000000 000116  
1195 000732\* 000000 000105  
1196 000733\* 000000 000130  
1197 000733\* 000000 000134  
1198 000734\* 000000 000134  
1199 000735\* 000000 000134  
1200 000736\* 000000 000127  
1201 000737\* 000000 000111  
1202 000740\* 000000 000124  
1203 000741\* 000000 000110  
1204 000742\* 000000 000117  
1205 000743\* 000000 000125  
1206 000744\* 000000 000124  
1207 000745\* 000000 000100  
1208 000746\* 000000 000106  
1209 000747\* 000000 000117  
1210 000750\* 000000 000122  
1211 000750\* 000000 000322  
1212 000751\* 000000 000000  
1213 000751\* 000001 21640 ERRNF#Q

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6=SEP=b4 05:11

MACRO #7(113) 05:112 10=SEP=75 PAGE 4=5  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1160 000711\* 000000 000706\*  
1161 000711\* 000000 000600\*  
1162 000713\* 000000 000710\*  
1163 000713\* 000000 000600\*  
1164 000715\* 000000 0006712\*  
1165 000715\* 000000 000600\*  
1166 000717\* 000000 000714\*  
1167 000720\* 000000 000600\*  
1168 000721\* 000000 000716\*  
1169 000722\* 000000 000600\*  
1170 000723\* 000000 000729\*  
1171 000724\* 000000 000600\*  
1172 000725\* 000000 000722\*  
1173 000726\* 000000 000600\*  
1174 000727\* 000000 000724\*  
1175  
1176 777777 777776 21320 Q#2  
1177 21340 DEFINE DCL(X),<  
1178 21360 DEFINE DCE(X),<Q#2>  
1179 21370 XLIST  
1180 21380 DC(X)  
1181 21390 LIST>  
1182  
1183 000730\*  
1184 000730\* 000000 000600  
1185 000730\* 000000 000600  
1186 000730\* 000000 000600  
1187 000731\* 000000 000130  
1188 000731\* 000000 000134  
1189 000731\* 000000 000134  
1190 000731\* 000000 000134  
1191 000731\* 000000 000134  
1192 000731\* 000000 000134  
1193 000731\* 000000 000116  
1194 000731\* 000000 000116  
1195 000732\* 000000 000105  
1196 000733\* 000000 000130  
1197 000733\* 000000 000134  
1198 000734\* 000000 000134  
1199 000735\* 000000 000134  
1200 000736\* 000000 000127  
1201 000737\* 000000 000111  
1202 000740\* 000000 000124  
1203 000741\* 000000 000110  
1204 000742\* 000000 000117  
1205 000743\* 000000 000125  
1206 000744\* 000000 000124  
1207 000745\* 000000 000100  
1208 000746\* 000000 000106  
1209 000747\* 000000 000117  
1210 000750\* 000000 000122  
1211 000750\* 000000 000322  
1212 000751\* 000000 000000  
1213 000751\* 000001 21640 ERRNF#Q

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF  
F3 MAC 6-SEP-64 03:11

MACRO 47(113) 03:12 10-SEP-75 PAGE 4-6  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1213 000752' 000000 000123 21660 DCE"SN"  
1214 000753' 000000 000131 21680 DCL"SYNTAX ERROR"  
1215 000754' 000000 000125  
1217 000755' 000000 000124  
1218 000756' 000000 000121  
1219 000757' 000000 000130  
1220 000760' 000000 000040  
1221 000761' 000000 000105  
1222 000762' 000000 000122  
1223 000763' 000000 000122  
1224 000764' 000000 000107  
1225 000765' 000000 000122  
1226 000766' 000000 000022  
1227 000767' 000000 000000  
1228 000768' 000000 000002 21700 EERRSN==W  
1229 000769' 000000 000122 21720 DCE"RG"  
1230 000770' 000000 000122 21740 DCL"RETURN WITHOUT GOSUB"  
1231 000771' 000000 000105  
1232 000772' 000000 000124  
1233 000773' 000000 000105  
1234 000774' 000000 000116  
1235 000775' 000000 000040  
1237 000776' 000000 000127  
1238 000777' 000000 000111  
1239 001000' 000000 000124  
1240 001001' 000000 000110  
1241 001002' 000000 000117  
1242 001003' 000000 000125  
1243 001004' 000000 000124  
1244 001005' 000000 000040  
1245 001006' 000000 000107  
1246 001007' 000000 000117  
1247 001010' 000000 000123  
1248 001011' 000000 000125  
1249 001012' 000000 000102  
1250 001013' 000000 000122  
1251 001013' 000000 000000  
1252 001014' 000000 000003 21760 EERRNG==Q  
1253 001015' 000000 000125 21780 DCE"ODD"  
1254 001014' 000000 000117 21800 DCL"OUT OF DATA"  
1255 001015' 000000 000125  
1256 001015' 000000 000124  
1257 001015' 000000 000146  
1258 001020' 000000 000117  
1259 001021' 000000 000106  
1260 001022' 000000 000040  
1261 001023' 000000 000104  
1262 001024' 000000 000101  
1263 001025' 000000 000124  
1264 001026' 000000 000101  
1265 001026' 000000 000301

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF  
F3 MAC 6-SEP-64 03:11

MACRO 47(113) 03:12 10-SEP-75 PAGE 4-7  
DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

1266 001027' 000000 000000  
1267 001028' 000000 000004 21820 ERRDOD==Q  
1268 001029' 000000 000000 21840 DCE"FC"  
1269 001030' 000000 000111 21860 DCL"ILLEGAL FUNCTION CALL"  
1270 001031' 000000 000114  
1271 001032' 000000 000114  
1272 001033' 000000 000105  
1273 001034' 000000 000107  
1274 001035' 000000 000101  
1275 001036' 000000 000114  
1276 001037' 000000 000040  
1277 001040' 000000 000106  
1278 001041' 000000 000125  
1279 001042' 000000 000115  
1280 001043' 000000 000115  
1281 001044' 000000 000124  
1282 001045' 000000 000111  
1283 001046' 000000 000117  
1284 001047' 000000 000116  
1285 001050' 000000 000040  
1286 001051' 000000 000103  
1287 001052' 000000 000101  
1288 001053' 000000 000114  
1289 001054' 000000 000114  
1290 001054' 000000 000314  
1291 001055' 000000 000000  
1292 001056' 000000 000005 21880 EERRFC==Q  
1293 001056' 000000 000117 21900 DCE"OV"  
1294 001056' 000000 000117 21920 DCL"OVERFLOW"  
1295 001057' 000000 000126  
1296 001057' 000000 000115  
1297 001061' 000000 000122  
1298 001062' 000000 000106  
1299 001063' 000000 000114  
1300 001064' 000000 000117  
1301 001065' 000000 000127  
1302 001065' 000000 000327  
1303 001066' 000000 000000  
1304 001066' 000000 000006 21940 EERROV==Q  
1305 001067' 000000 000117 21960 DCE"OH"  
1306 001067' 000000 000117 21980 DCL"OUT OF MEMORY"  
1307 001070' 000000 000125  
1308 001071' 000000 000124  
1309 001072' 000000 000040  
1310 001073' 000000 000117  
1311 001074' 000000 000106  
1312 001075' 000000 000040  
1313 001076' 000000 000115  
1314 001077' 000000 000105  
1315 001100' 000000 000115  
1316 001101' 000000 000117  
1317 001102' 000000 000122  
1318 001103' 000000 000131

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 05:12 10-SEP-75 PAGE 4-8  
F3 MAC 6\*SEP=64 05:11 DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

```

1519 001103* 000000 000331
1520 001104* 000000 000000
1521 001105* 000000 000007 22000 ERROM=U
1522 001106* 000000 000007 22020 DCE="US"
1523 001107* 000000 000125 22040 DCL"UNDEFINED STATEMENT"
1524 001108* 000000 000116
1525 001109* 000000 000104
1526 001110* 000000 000105
1527 001111* 000000 000106
1528 001112* 000000 000111
1529 001113* 000000 000116
1530 001114* 000000 000109
1531 001115* 000000 000104
1532 001116* 000000 000040
1533 001117* 000000 000123
1534 001120* 000000 000124
1535 001121* 000000 000101
1536 001122* 000000 000124
1537 001123* 000000 000105
1538 001124* 000000 000115
1539 001125* 000000 000105
1540 001126* 000000 000116
1541 001127* 000000 000124
1542 001127* 000000 000324
1543 001130* 000000 000000
1544 001131* 000000 00010 22060 ERRUS==Q
1545 001131* 000000 000123 22080 DCE="BS"
1546 001132* 000000 000125 22100 DCL"SUBSCRIPT OUT OF RANGE"
1547 001133* 000000 000102
1548 001134* 000000 000123
1549 001135* 000000 000103
1551 001136* 000000 000122
1552 001137* 000000 000111
1553 001140* 000000 000120
1554 001142* 000000 000124
1555 001143* 000000 000100
1556 001143* 000000 000117
1557 001144* 000000 000125
1558 001145* 000000 000124
1559 001146* 000000 000040
1560 001147* 000000 000117
1561 001150* 000000 000106
1562 001151* 000000 000040
1563 001152* 000000 000122
1564 001155* 000000 000111
1565 001154* 000000 000116
1566 001155* 000000 000107
1567 001156* 000000 000105
1568 001156* 000000 000305
1569 001157* 000000 000000
1570 000011 22120 ERRBS==U
1571 000011 22140 DCE="DU"
```

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 05:12 10-SEP-75 PAGE 4-9  
F3 MAC 6\*SEP=64 05:11 DISPATCH TABLES,RESERVED WORDS, ERROR TEXT,,, ALL CONSTANT

```

1572 001160* 000000 000122 22160 DCL"REDIMENSIONED ARRAY"
1573 001161* 000000 000105
1574 001162* 000000 000104
1575 001163* 000000 000111
1576 001164* 000000 000115
1577 001165* 000000 000105
1578 001166* 000000 000116
1579 001167* 000000 000123
1580 001170* 000000 000111
1581 001171* 000000 000117
1582 001172* 000000 000116
1583 001173* 000000 000105
1584 001174* 000000 000040
1585 001175* 000000 000040
1586 001176* 000000 000101
1587 001177* 000000 000122
1588 001200* 000000 000122
1589 001201* 000000 000101
1590 001202* 000000 000131
1591 001202* 000000 000351
1592 001203* 000000 000000
1593 000012 22180 ERROD=U
1594 000012 22200 DCE="0"
1595 001204* 000000 000104 22220 DCL"DIVISION BY ZERO"
1596 001205* 000000 000111
1597 001206* 000000 000126
1598 001207* 000000 000111
1599 001210* 000000 000125
1600 001211* 000000 000111
1601 001212* 000000 000111
1602 001213* 000000 000116
1603 001214* 000000 000040
1604 001215* 000000 000102
1605 001216* 000000 000131
1606 001217* 000000 000240
1607 001220* 000000 000132
1608 001221* 000000 000105
1609 001222* 000000 000122
1610 001223* 000000 000117
1611 001224* 000000 000317
1612 001224* 000000 000000
1613 000013 22240 ERROV0==Q
1614 000013 22260 DCE="10"
1615 001225* 000000 000111 22280 DCL"ILLEGAL DIRECT"
1616 001226* 000000 000114
1617 001227* 000000 000114
1618 001230* 000000 000105
1619 001231* 000000 000107
1620 001232* 000000 000101
1621 001233* 000000 000114
1622 001234* 000000 000040
1623 001235* 000000 000104
1624 001236* 000000 000111
```

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF MACRO 47(113) 05:12 10-SEP-75 PAGE 4-10  
 F3 MAC 6\*SEP=64 05:11 DISPATCH TABLES,RESERVED WORDS, ERROR TEXT..., ALL CONSTANT

```

1425 001237* 000000 000122
1426 001240* 000000 000105
1427 001241* 000000 000123
1428 001242* 000000 000124
1429 001242* 000000 000524
1430 001243* 000000 000000
1431 000000 00014 22300 ERRID==0
1432 000000 000124 22320 IFN STRING,<
1433 000000 000131 22340 DCE"TM"
1434 000000 000130 22360 DCL"TYPE MISMATCH"
1435 001245* 000000 000131
1436 001246* 000000 000105
1437 001247* 000000 000105
1438 001250* 000000 000040
1439 001251* 000000 000115
1440 001252* 000000 000111
1441 001253* 000000 000123
1442 001254* 000000 000115
1443 001255* 000000 000101
1444 001256* 000000 000124
1445 001257* 000000 000105
1446 001260* 000000 000110
1447 001260* 000000 000310
1448 001261* 000000 000000
1449 000000 00015 22380 ERRIN==0
1450 000000 000117 22400 DCE"OS"
1451 001262* 000000 000117 22420 DCL"OUT OF STRING SPACE"
1452 001263* 000000 000125
1453 001264* 000000 00014
1454 001265* 000000 000140
1455 001266* 000000 000117
1456 001267* 000000 000106
1457 001270* 000000 000040
1458 001271* 000000 000123
1459 001272* 000000 000124
1460 001273* 000000 000122
1461 001274* 000000 000111
1462 001275* 000000 000116
1463 001276* 000000 000107
1464 001277* 000000 000040
1465 001300* 000000 000123
1466 001301* 000000 000120
1467 001302* 000000 000101
1468 001303* 000000 000103
1469 001304* 000000 000105
1470 001304* 000000 000305
1471 001305* 000000 000000
1472 000000 000016 22440 ERRSO==0
1473 000000 000123 22460 DCE"LS"
1474 001306* 000000 000123 22480 DCL"STRING TOO LONG"
1475 001307* 000000 000124
1476 001310* 000000 000122
1477 001311* 000000 000111

```

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 05:12 10-SEP-75 PAGE 4-11  
 F3 MAC 6\*SEP=64 05:11 DISPATCH TABLES,RESERVED WORDS, ERROR TEXT..., ALL CONSTANT

```

1478 001312* 000000 000116
1479 001313* 000000 000107
1480 001314* 000000 000040
1481 001315* 000000 000124
1482 001316* 000000 000117
1483 001317* 000000 000117
1484 001320* 000000 000040
1485 001321* 000000 000114
1486 001322* 000000 000117
1487 001323* 000000 000116
1488 001324* 000000 000107
1489 001324* 000000 000307
1490 001325* 000000 000000
1491 000000 000017 22500 ERRLS==0
1492 000000 000123 22520 DCE"SI"
1493 001326* 000000 000124 22540 DCL"STRING FORMULA TOO COMPLEX"
1494 001327* 000000 000124
1495 001330* 000000 000122
1496 001331* 000000 000111
1497 001332* 000000 000116
1498 001333* 000000 000127
1499 001334* 000000 000046
1500 001335* 000000 000108
1501 001336* 000000 000117
1502 001337* 000000 000122
1503 001340* 000000 000115
1504 001341* 000000 000125
1505 001342* 000000 000114
1506 001343* 000000 000101
1507 001344* 000000 000040
1508 001345* 000000 000124
1509 001346* 000000 000117
1510 001347* 000000 000117
1511 001350* 000000 000040
1512 001351* 000000 000103
1513 001352* 000000 000117
1514 001353* 000000 000115
1515 001354* 000000 000104
1516 001355* 000000 000115
1517 001356* 000000 000105
1518 001357* 000000 000130
1519 001357* 000000 000330
1520 001360* 000000 000000
1521 000000 000020 22560 ERRTS==0>
1522 000000 000103 22580 IFN LENGTH,<
1523 000000 000101 22600 DCE"CN"
1524 001361* 000000 000103 22620 DCL"CAN'T CONTINUE"
1525 001362* 000000 000101
1526 001363* 000000 000116
1527 001364* 000000 000047
1528 001365* 000000 000124
1529 001366* 000000 000040
1530 001367* 000000 000103

```

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6-SEP-64 03:11

MACRO 47(113) 03:12 10-SEP-75 PAGE 4-12  
DISPATCH TABLES, RESERVED WORDS, ERROR TEXT... ALL CONSTANT

```

1531 001370* 000000 000117
1532 001371* 000000 000116
1533 001372* 000000 000124
1534 001373* 000000 000111
1535 001374* 000000 000116
1536 001375* 000000 000125
1537 001376* 000000 000105
1538 001377* 000000 000505
1539 001377* 000000 000000
1540 001400* 000000 000125
1541 001421* 000000 000116
1542 001422* 000000 000104
1543 001423* 000000 000105
1544 001424* 000000 000106
1545 001425* 000000 000111
1546 001429* 000000 000111
1547 001430* 000000 000116
1548 001431* 000000 000105
1549 001432* 000000 000116
1550 001437* 000000 000105
1551 001440* 000000 000104
1552 001441* 000000 000048
1553 001442* 000000 000125
1554 001443* 000000 000125
1555 001444* 000000 000105
1556 001445* 000000 000122
1557 001447* 000000 000040
1558 001447* 000000 000106
1559 001420* 000000 000125
1560 001421* 000000 000116
1561 001422* 000000 000105
1562 001423* 000000 000124
1563 001424* 000000 000111
1564 001425* 000000 000117
1565 001426* 000000 000116
1566 001427* 000000 000316
1567 001427* 000000 000000
1568 001428* 000000 000000
1569 001429* 000000 000000
1570 001429* 000000 000000

```

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6-SEP-64 03:11

MACRO 47(113) 03:12 10-SEP-75 PAGE 5

LOW SEGMENT -- RAM -- IE THIS STUFF IS NOT CONSTANT

```

1571          22780 SUBTTL LOW SEGMENT -- RAM -- IE THIS STUFF IS NOT CONSTANT
1572          22800 ;
1573          22820 ; THIS IS THE "VOLATILE" STORAGE AREA AND NONE OF IT
1574          22840 ; CAN BE KEPT IN ROM, ANY CONSTANTS IN THIS AREA CANNOT
1575          22860 ; BE KEPT IN A ROM, BUT MUST BE LOADED IN BY THE
1576          22880 ; PROGRAM INSTRUCTIONS IN ROM.
1577          22900 ;
1578
1579 001430* 000000 000054 22940 BUFMIN: 44                FA COMMA (PRELOAD OR ROM)
1580          22960 ; FUSED BY INPUT STATEMENT SINCE THE
1581          22980 ; IDATA POINTER ALWAYS STARTS ON A
1582          23000 ; FCOMMA OR TERMINATOR
1583 001431* 23020 BUFI    BLOCK  BUFLEN
1584          23040 ; DIRECT STATEMENTS EXECUTE OUT OF
1585          23060 ; THERE, REMEMBER INPUT SHASHES BUF,
1586          23080 ; MUST BE AT A LOWER ADDRESS
1587          23100 ; THAN DSCTMP OR ASSIGNMENT OF STRING
1588          23120 ; VALUES IN DIRECT STATEMENTS WON'T COPY
1589          23140 ; INTO STRING SPACE -- WHICH IT MUST
1590          23160 IFN    LPTSW,<
1591          23180 LPTPOS: BLOCK  1   ;POSITION OF LPT PRINT HEAD
1592          23200 PKTFLG: BLOCK 1>  ;WHETHER OUTPUT GOES TO LPT
1593          23220 ;
1594          23240 IFN    CONTRH,<
1595 001541* 23260 CNTFLG: BLOCK 1>  ;SUPPRESS OUTPUT FLAG
1596 001542* 23280 DIMFLG: BLOCK 1   ;IN GETTING PTR TO A VARIABLE
1597          23300 ; IT IS IMPORTANT TO REMEMBER WHETHER IT
1598          23320 ; IS BEING DONE FOR "DIM" OR NOT
1599          23340 ; DIMFLG AND VALTPY MUST BE
1600          23360 ; INCONSECUTIVE LOCATIONS
1601          23380 IFN    STRING,<
1602 001543* 23400 VALTPY: BLOCK 1   ;TYPE INDICATOR
1603          23420 ;
1604 001544* 23440 UPRITY: ;IN THE 8K $NUMERIC 1=STRING
1605          23460 ;FUSED TO OPERATOR NUMBER
1606          23480 ;
1607 001544* 23500 DORES: BLOCK 1   ;IN THE EXTENDED MOMEMTANILY BEFORE
1608          23520 ;OPERATOR APPLICATION
1609          23540 ;WHETHER CAN OR CAN'T CRUNCH RES'D WORDS
1610          23560 ;TURNED ON IN THE 8K WHEN "DATA"
1611          23580 ;BEING SCANNED BY CRUNCH SO UNQUOTED
1612 001545* 23600 MERSIZ: BLOCK 2   ;ISTRINGS WON'T BE CRUNCHED,
1613 001545* 23620 TEMPST: BLOCK 2   ;HIGHEST LOCATION IN MEMORY
1614          23640 ;POINTER TO TEMP DESCRIPTOR
1615 001551* 23660 TEMPST: BLOCK STRSIZ+NUMTMP ;INITIALIZED TO POINT TO TEMPST
1616 001570* 23680 DSCTMP: BLOCK STRSIZ ;ISTRORAGE FOR NUMTMP TEMP DESCRIPTORS
1617          23700 FRETOP: BLOCK 2> ;ISTRINGS FUNCTIONS BUILD ANSWER DESCRIPTOR HERE
1618 001575* 23720 IFN    LENGTH,STRING,<
1619          23740 TEMP3: BLOCK 2>  ;FUSED TO MOLD VARS # OF HIGH LOC FOUND
1620          23760 ;FIN GARBAGE COLLECTION
1621          23780 ;FUSED USED MOMENTANILY BY FRMHEV
1622          23800 ;FUSED IN EXTENDED BY FOUT
1623          23820 IFN    LENGTH,< ;FAKRAY VARIABLE HANDLING TEMPORARY

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BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6-SEP-64 05111

MACRO 47(113) 03112 10-SEP-75 PAGE 5-1  
LOW SEGMENT -- RAM -- IE THIS STUFF IS NOT CONSTANT

1624 001577' 23760 DATLIN: BLOCK 2 ;DATA LINE # -- REMEMBER FOR ERRORS  
1625 001601' 23800 SUBFLG: BLOCK 1> ;FFLAG WHETHER SUBSCRIPTED VARIABLE ALLOWED  
1626 23840 ;FOR POINTERS PER DEFINITION  
1627 23860 ;THIS ON BEFORE CALLING PTRGET  
1628 23880 ;JSO ARRAYS WON'T BE DETECTED,  
1629 23900 ;\$TKINI AND PINGET CLEAR IT,  
1630 23920 FFLGINP: BLOCK 1> ;FFLAGS WHETHER WE ARE DOING INPUT  
1631 001602' 23940 ;FOR A READ  
1632 23960 TEMP: BLOCK 2 ;TEMPORARY FOR STATEMENT CODE  
1633 001603' 23980 ;NEWSTT SAVES [H,L] HERE FOR INPUT AND "C  
1634 24000 ;FOR C, WHICH NEEDS A VARIABLE  
1635 24020 ;POINTERS HERE FOR "FOUT"  
1636 24040 ;INNEXT SAVES ITS TEXT POINTER HERE  
1637 24060 ;CLEAR SAVE [H,L] HERE  
1638 24080 TEMP2: BLOCK 2 ;FORMULA EVALUATOR TEMP  
1639 001605' 24100 ;MUST BE PRESERVED BY OPERATORS  
1640 24120 ;USED IN EXTENDED BY FOUT  
1641 24140 ;FARRAY VARIABLE HANDLER TEMPORARY  
1642 24160 CURLIN: BLOCK 2 ;CURRENT LINE #  
1643 24180 ;SET TO 65535 WHEN DIRECT STATEMENTS EXECUTE  
1644 24200 IFN LENGTH,< ;FOLD LINE NUMBER  
1645 001611' 24220 OLDDIN: BLOCK 2 ;FOLD TEXT POINTER  
1646 24240 OLDDTXT: BLOCK 2> ;POINTS AT STATEMENT TO BE EXECUTED NEXT  
1647 001613' 24260 STKTOP: BLOCK 2 ;FTOP LOCATION TO USE FOR THE STACK  
1648 24280 ;INITIALLY SET UP BY INIT  
1649 001615' 24300 ;ACCORDING TO MEMORY SIZE  
1650 24320 ;FTO ALLOW FOR 56 BYTES OF STRING SPACE,  
1651 24340 ;CHANGER OF A CLEAR COMMAND WITH  
1652 24360 ;AN ARGUMENT.  
1653 001617' 24380 VXTTAB: BLOCK 2 ;POINTER TO BEGINNING OF TEXT  
1654 24400 ;DOESN'T CHANGE AFTER BEING  
1655 24420 ;SETUP BY INIT,  
1656 24440 ;POINTER TO START OF SIMPLE  
1657 001621' 24460 VARTAB: BLOCK 2 ;VARIABLE SPACE  
1658 24480 ;EQUALS ONE PLUS THE SIZE OF THE  
1659 24500 ;PROGRAM CHANGES, SET TO [VXTTAB]  
1660 24520 ;BY SCRATCH ("NEW"),  
1661 24540 ;POINTER TO BEGINNING OF ARRAY  
1662 24560 ARYTAB: BLOCK 2 ;TABLE  
1663 001623' 24580 ;INCREMENTED BY 6 WHENEVER  
1664 24600 ;A NEW SIMPLE VARIABLE IS FOUND, AND  
1665 24620 ;SET TO [VARTAB] BY CLEARC,  
1666 24640 ;END OF STORAGE IN USE  
1667 24660 STREND: BLOCK 2 ;INCASE A NEWER NEW ARRAY  
1668 001625' 24680 ;OR SIMPLE VARIABLE IS ENCOUNTERED  
1669 24700 ;SET TO [VARTAB] BY CLEARC  
1670 24720 ;POINTER TO DATA INITIALIZED TO POINT  
1671 24740 IFE LENGTH=2,< ;AT THE ZERO IN FRONT OF [VXTTAB]  
1672 001627' 24760 DATPTR: BLOCK 2  
1673 24780 IFE LENGTH=2,<  
1674 24800 TRCFLG: BLOCK 1> ;I0 MEANS NO TRACE IN PRUGRESS  
1675 001631' 24820  
1676 24840

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF  
F3 MAC 6-SEP-64 05111

MACRO 47(113) 03112 10-SEP-75 PAGE 5-2  
LOW SEGMENT -- RAM -- IE THIS STUFF IS NOT CONSTANT

1677 24840 ;THE FLOATING ACCUMULATOR  
1678 24860 IFE LENGTH=2,<  
1679 001632' 24880 BLOCK 1 ;[TEMPORARY LEAST SIGNIFICANT BYTE]  
1680 001633' 24900 DFACLO: BLOCK 4> ;[FIRST LOWEST ORDERS FOR DOUBLE PRECISION]  
1681 001637' 24920 FACLO: BLOCK 3 ;LOW ORDER OF MANTISSA  
1682 24940 ;MIDDLE ORDER OF MANTISSA  
1683 24960 ;HIGH ORDER OF MANTISSA  
1684 001642' 24980 FAC: BLOCK 2 ;[EXPONENT]  
1685 25000 ;[TEMPORARY COMPLEMENT OF SIGN IN MSB]  
1686 25020 IFE LENGTH=2,<  
1687 001644' 25030 BLOCK 1 ;[TEMPORARY LEAST SIGNIFICANT BYTE]  
1688 001645' 25040 ARGLO: BLOCK 7 ;[LOCATION OF SECOND ARGUMENT FOR DOUBLE  
1689 001654' 25060 ARG: BLOCK 1> ;PRECISION  
1690 001655' 25080 FBUFFR: BLOCK 13 ;FBUFFER FOR FOUT  
1691 001672' 25100 IFE LENGTH=2,<BLOCK 35=13>  
1692 25120 PAGE

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF  
F3 MAC 6\*SEP\*64 05111

MACHO 47(113) 03112 10-SEP-75 PAGE 6  
TEXT CONSTANTS FOR PRINT OUT

1693 25140 SUBTTL TEXT CONSTANTS FOR PRINT OUT  
1694 25160 ;  
1695 25168 ; NEEDED FOR MESSAGES IN ALL VERSIONS  
1696 25200 ; MUST BE STORED ABOVE DSCTMP OR ELSE STRLT  
1697 25220 ; WILL COPY THEM BEFORE STRPRT PRINTS THEM, THIS IS BAD, SINCE IF THE  
1698 25240 ; USER IS OUT OF STRING SPACE BASIC WILL LOOP GETTING "OUT OF STRING SPACE"  
1699 25260 ; ERRORS,  
1700 25280 ;  
1701 25300 IFN LENGTH=2,  
1702 25320 ERR: DC" ERROR"  
1703 25340 B>  
1704 25360 INTXT: DC" IN "  
1705 001720\* 000000 000041  
1706 001721\* 000000 000111  
1707 001722\* 000000 000116  
1708 001723\* 000000 000040  
1709 001724\* 000000 000000  
1710 001725\* 000000 000015  
1711 001726\* 000000 000012  
1712 001727\* 000000 000117  
1713 001728\* 000000 000015  
1714 001729\* 000000 000313  
1715 001731\* 000000 000015  
1716 001732\* 000000 000012  
1717 001733\* 000000 000006  
1718 001734\* 000000 000015  
1719 001735\* 000000 000012  
1720 001736\* 000000 000004  
1721 001737\* 000000 000012  
1722 001740\* 000000 000105  
1723 001741\* 000000 000101  
1724 001742\* 000000 000113  
1725 001743\* 000000 000313  
1726 001744\* 000000 000006  
1727 25540 B>  
1728 25560 PAGE  
1729

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF  
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MACHO 47(113) 03112 10-SEP-75 PAGE 7  
GENERAL STORAGE MANAGEMENT ROUTINES

1730 25600 SUBTTL GENERAL STORAGE MANAGEMENT ROUTINES  
1731 25620 ;  
1732 25640 ; FIND A FOR ENTRY ON THE STACK WITH THE VARIABLE POINTER  
1733 25660 ; PASSED IN [D,E],  
1734 25680 ;  
1735 001744\* 001000 000041  
1736 001745\* 000000 000004\*  
1737 001746\* 000000 000725\*  
1738 25720 ; AND THE RETURN ADDRESS OF THIS  
1739 25740 DAD SP ;SUBROUTINE, SET [H,L]\*SP  
1740 001750\* 001000 000176 ;SEE WHAT TYPE OF THING IS ON THE STACK  
1741 001751\* 001000 000043  
1742 001752\* 001000 000376  
1743 001753\* 000000 000201  
1744 001754\* 001000 000300  
1745 25820 RNZ ;NO SO OK  
1746 25840 IFE LENGTH,<  
1747 25860 PUSHM ;GET VARIABLE NAME  
1748 25880 XTHL>  
1749 001755\* 001000 000116  
1750 001756\* 001000 000043  
1751 001757\* 001000 000056  
1752 001758\* 001000 000043  
1753 001761\* 001000 000345  
1754 001762\* 001000 000151  
1755 001763\* 001000 000140  
1756 001764\* 001000 000172  
1757 001765\* 001000 000263  
1758 001766\* 001000 000353  
1759 001767\* 001000 000512  
1760 001768\* 001000 000147\*  
1761 001771\* 000000 001745\*  
1762 001772\* 001000 000553  
1763 001773\* 001000 000347  
1764 001774\* 001000 000601  
1765 001775\* 000000 000015\*  
1766 001776\* 000000 001770\*  
1767 001777\* 001000 000341  
1768 002000\* 001000 000310  
1769 002001\* 001000 000311  
1770 002002\* 001000 000303  
1771 002003\* 001000 001756\*  
1772 002004\* 000000 001775\*  
1773 26280 ;  
1774 26300 ; THIS IS THE BLOCK TRANSFER ROUTINE  
1775 26320 ; IT MAKES SPACE BY SHOVING EVERYTHING FORWARD  
1776 26340 ;  
1777 26360 ; [H,L] = DESTINATION OF HIGH ADDRESS  
1778 26380 ; [D,E] = LOW ADDRESS TO BE TRANSFERRED  
1779 26400 ; [B,C] = HIGH ADDRESS TO BE TRANSFERRED  
1780 26420 ;  
1781 26440 ; A CHECK IS MADE TO MAKE SURE A REASONABLE AMOUNT  
1782 26460 ; OF SPACE REMAINS BETWEEN THE TOP OF THE STACK AND THE HIGHEST LOCATION

BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 03:12 10-SEP-75 PAGE 7-1  
 F3 MAC 6-SEP=64 03:11 GENERAL STORAGE MANAGEMENT ROUTINES

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 1783          26480 ; TRANSFERRED INTO
 1784          26500 ;
 1785          26520 ; ON EXIT [H,L]=[D,E]=LOW [B,C]=LOCATION LOW WAS MOVED INTO
 1786          26540 ;
 1787
 1788 002005* 001000 000315          26580 BLTU: CALL REASON      ;CHECK DESTINATION TO MAKE
 1789 002006* 001000 002045*          26600
 1790 002007* 001000 002003*          26620 BLTUC: PUSH B           ;SURE THE STACK WON'T BE OVERRUN
 1791          26640 XTHL B           ;EXCHANGE [B,C] AND [H,L]
 1792 002010* 001000 000305          26660
 1793 002011* 001000 000345          26680 BLTLOP1 COMPARE      ;SEE IF WE ARE DONE
 1794 002012* 001000 000347          26700 MOV A,M             ;GET THE WORD TO TRANSFER
 1795 002014* 001000 000176          26720 STAX B             ;TRANSFER IT
 1796 002015* 001000 000002          26740 RZ
 1797 002016* 001000 000310          26760 DCX B             ;BACKUP FOR NEXT GUY
 1798 002017* 001000 000013          26780 DCX H
 1799 002020* 001000 000053          26800 JMP BLTLOP
 1800          26820
 1801 002021* 001000 000303          26840 ; THIS ROUTINE IS USED TO MAKE SURE A CERTAIN NUMBER
 1802 002022* 001000 002013*          26860 ; OF LOCATIONS REMAIN AVAILABLE FOR THE
 1803          26880 ; STACK, THE CALL IS :
 1804          26900 ; CALL GETSTK
 1805          26920 ; NUMBER OF 2 BYTE ENTRIES NECESSARY
 1806          26940 ;
 1807          26960 ; THIS ROUTINE MUST BE CALLED BY ANY ROUTINE WHICH PUTS
 1808          26980 ; AN ARBITRARY AMOUNT OF STUFF ON THE STACK
 1809          27000 ; (I.E., ANY RECURSIVE ROUTINE LIKE FRHEV)
 1810          27020 ; IT IS ALSO CALLED BY ROUTINES SUCH AS GOSUB AND FOR
 1811          27040 ; WHICH MAKE PERMANENT ENTRIES ON THE STACK
 1812          27060 ;
 1813          27080 ; ROUTINES WHICH MERELY USE AND FREE UP THE GUARANTEED
 1814          27100 ; NUMLEV STACK LOCATIONS NEED NOT CALL THIS
 1815          27120 ;
 1816          27140 ;
 1817          27160 GETSTK: XTHL C,M           ;GET ARGUMENT INTO [C]
 1818 002024* 001000 000343          27180 MOV C,M
 1819 002025* 001000 000116          27200 INX H           ;PUT BACK RETURN ADDRESS
 1820          27240 XTHL H           ;SAVE [H,L]
 1821 002026* 001000 000043          27260 PUSH H
 1822 002027* 001000 000345          27280 LMHD STREND
 1823          27300 MVI B,B
 1824 002028* 001000 000152          27320 DAD B           ;SEE IF WE CAN HAVE THIS MANY
 1825 002029* 001000 000153*          27340 DAD B
 1826 002030* 001000 000200          27360 CALL REASON
 1827 002031* 001000 000315          27380
 1828 002032* 001000 000006          27400 RET
 1829
 1830          27440 ;
 1831 002042* 001000 002032*          27460 ; [H,L]= SOME ADDRESS
 1832 002043* 001000 000341          27480 ; [H,L] IS EXAMINED TO MAKE SURE AT LEAST NUMLEV
 1833 002044* 001000 000311          27500 ; LOCATIONS REMAIN BETWEEN IT AND THE TOP OF THE STACK
 1834          27520 ;
 1835 002045* 001000 000325          27560 REASON: PUSH D           ;SAVE [D,E]
 1836 002046* 001000 000353          27580 XCHG H,E           ;PUT [H,L] IN [D,E]
 1837 002047* 001000 000041          27600 LXI H,SCODE+65536=2*NUMLEV ;SETUP OFFSET OF GUARANTEED
 1838 002050* 001000 000006          27620
 1839 002051* 001000 000241*          27640 DAD SP           ;LOCATIONS
 1840          27660 COMPAR             ;[M,L]=STACK POINTER + OFFSET
 1841          27680 XCHG H,E           ;SEE IF THIS IS ,GT, ENTERING [H,L]
 1842          27700 PUP D             ;RESTORE [H,L] FROM [D,E]
 1843          27720 RNC E             ;GET [D,E] BACK
 1844          27740 DMERR: MVI E,ENROM   ;WAS OK?
 1845          27760 IFE LENGTH,<    ;OUT OF MEMORY"
 1846          27780 XHD *01000,1>     ;"LXI B," OVER THE NEXT 2
 1847          27800 IFN LENGTH,<
 1848          27820 JMP ERROR>
 1849          27840 PAGE
  
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BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACRO 47(113) 03:12 10-SEP-75 PAGE 7-2  
 F3 MAC 6-SEP=64 03:11 GENERAL STORAGE MANAGEMENT ROUTINES

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 1850 002052* 001000 000071          27860
 1851 002053* 001000 000347          27880
 1852 002054* 001000 000353          27900
 1853 002055* 001000 000321          27920
 1854 002056* 001000 000320          27940
 1855 002057* 001000 000006          27960
 1856 002058* 001000 000007          27980
 1857 002059* 001000 000056          28000
 1858 002060* 001000 000007          28020
 1859          28040 IFE LENGTH,<
 1860          28060 XHD *01000,1>     ;"LXI B," OVER THE NEXT 2
 1861          28080 IFN LENGTH,<
 1862 002061* 001000 000303          28100
 1863 002062* 001000 002102*          28120
 1864 002063* 001000 002056*          28140
 1865          28160
 1866          28180 PAGE
  
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BASIC MCS 8080 GATES/ALLEN/DAVIDUFF F3 MAC 6=SEP=64 03111 MACHO 47(113) 03112 10-SEP-75 PAGE 8  
 ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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1866          27860 SUBTLL ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN
1867          27880 IFN LENGTH,<
1868          27900 DATSNE: LHLD DATLIN      ;GET DATA LINE
1869          0020064* 001000 000056
1870          0020065* 001000 001577*
1871          0020066* 001000 002062*
1872          0020067* 001000 000042
1873          0020071* 001000 002656*
1874          0020072* 001000 000036
1875          0020073* 001000 000002
1876          0020074* 001000 000001
1877          0020075* 001000 000036
1878          0020076* 001000 000013
1879          27920 SHLD CURLIN> ;MAKE IT CURRENT LINE
1880          27940 SNERR: MVI E,ERRSN  ;"SYNTAX ERROR"
1881          27960 XHD "U1000,1
1882          27980 DIVERR: MVI E,ERRDO ;DIVISION BY ZERO
1883          28000 IFN LENGTH,<
1884          28020 XHD "U1000,1
1885          28040 NFERR: MVI E,ERRNF> ;"NEXT WITHOUT FOR" ERROR
1886          28060 ERROUR: CALL STKINI ;RESET THE STACK AND FLAGS
1887          28080 IFN CONTRH,<
1888          28100 XRA A
1889          28120 STA CNTHFL> ;FORCE OUTPUT
1890          002107* 001000 001541*
1891          002111* 001000 000315
1892          002112* 001000 004523*
1893          002113* 001000 002107*
1894          002114* 001000 000441
1895          002115* 001000 000736
1896          002116* 001000 002112*
1897          28140 CALL CRDU ;CRLF
1898          28160 LXI H,ERRTAB ;GET START OF ERROR TABLE
1899          002117* 001000 000315
1900          002120* 001000 004674*
1901          002121* 001000 002115*
1902          002122* 001000 000035
1903          002123* 001000 000043
1904          002124* 001000 000052
1905          002125* 001000 000852
1906          002126* 001000 000736
1907          002127* 001000 000315
1908          002128* 001000 007745*
1909          002129* 001000 002126*
1910          28240 IFE LENGTH=2,<
1911          28260 LEPSKP: CALL REM ;SKIP AN ERROR MESSAGE
1912          28280 OCR E ;DECREMENT ERROR COUNT
1913          28300 INX H ;SKIP OVER THIS ERROR MESSAGE
1914          28320 JNZ LEPSKP> ;SKIP SOME MORE
1915          28340 IFN LENGTH=2,<
1916          28360 MOV D,A ;GET ZERO INTO D
1917          28380 MVI A,"?" ;START OF ERROR MESSAGE
1918          28400 OUTCHR D ;TYPE IT
1919          28420 MOV A,M ;FADe IN ERROR CODE
1920          28440 OUTCHR A,M ;GET FIRST ERROR CHARACTER
1921          28460 CHRGET ;TYPE IT
1922          28480 LXI H,ERR> ;GET POINTER TO "ERROR"
1923          28500 ERRFIN: CALL STROUT ;TYPE IT
    
```

BASIC MCS 8080 GATES/ALLEN/DAVIDUFF F3 MAC 6=SEP=64 03111 MACHO 47(113) 03112 10-SEP-75 PAGE 8-1  
 ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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1919          002125* 001000 000052
1920          002126* 001000 001607*
1921          002127* 001000 002130*
1922          002128* 001000 000174
1923          002129* 001000 000052
1924          002130* 001000 000074
1925          002140* 001000 000280
1926          002141* 001000 000060*
1927          002142* 001000 002135*
1928          28480 LHLD CURLIN ;CURRENT LINE #
1929          28500 MOV A,H ;SEE IF IN DIRECT MODE
1930          28520 ANA L
1931          28540 INR A ;ZERO SAYS DIRECT MODE
1932          28560 CNZ INPRT ;PRINT LINE NUMBER IN [H,L]
1933          28580 IFE LENGTH=2,<
1934          28600 ;
1935          28620 ; FOR "LIST" COMMAND STOPPING
1936          28640 ;
1937          28660 IFE LENGTH,<
1938          28680 XHD "U1000,1 ;"LXI B," OVER THE NEXT 2
1939          28700 END: ;END
1940          28720 STOP: RNZ ;MAKE SURE HE TERMINATED IT
1941          28740 SSEND1: POP B ;GET RID OF "NEWSTT" RETURN ADDRESS
1942          28760 ENDCON:>
1943          28780 IFE LENGTH=2,<
1944          28800 ;
1945          28820 ; FOR "LIST" COMMAND STOPPING
1946          28840 IFE LENGTH,<
1947          28860 XHD "U1000,1 ;"LXI B," OVER THE NEXT 2
1948          28880 END: ;END
1949          28900 STOP: RNZ ;MAKE SURE HE TERMINATED IT
1950          28920 SSEND1: POP B ;GET RID OF "NEWSTT" RETURN ADDRESS
1951          28940 INR A ;SEE IF 0 SAVING THE CARRY FLAG
1952          28960 DCR A ;IF SO, A BLANK LINE WAS INPUT
1953          28980 JZ MAIN
1954          29000 REPINI: CALL INIT ;PRINT IT, REPLACED BY CALL STROUT
1955          29020 MAIN: CALL INLIN ;BY THE INIT CODE, THIS IS HERE SO AFTER
1956          29040 JZ MAIN ;JERRORS DURING INIT, INIT IS RESTARTED
1957          29060 GET A LINE FROM TTY
1958          29080 ;
1959          29100 ;
1960          29120 ;
1961          29140 MAIN: CALL INLIN ;GET THE FIRST
1962          29160 JZ MAIN ;SEE IF 0 SAVING THE CARRY FLAG
1963          29180 GET A LINE FROM TTY
1964          29200 INR A ;SAVE STATUS INDICATOR FOR 1ST CHARACTER
1965          29220 DCR A ;READ IN A LINE #
1966          29240 JZ MAIN
1967          29260 ;
1968          29280 ;
1969          29300 ;
1970          29320 ;
1971          29340 ;
    
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BASIC MCS 8080 GATES/ALLEN/DAVIDUFF MACRO 47(113) 05112 10-SEP-75 PAGE 8-2  
F3 MAC 6-SEP-64 05111 ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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1972 002230* 001000 003642*          29860  PUSH D           FSAVE LINE #
1973 0022301* 001000 002174*          29860  CALL CRUNCH      FCRUNCH THE LINE DOWN
1974 002232* 001000 000325            29860
1975 002233* 001000 000315            29880  PUSH D           FSAVE LINE #
1976 002234* 001000 000335*          29880  CALL CRUNCH      FCRUNCH THE LINE DOWN
1977 002235* 001000 002200*          29880
1978 002266* 001000 000107            29100  MOV B,A          J#2 AFTER CRUNCH, [B,C]=CHAR COUNT FOR NODEL
1979 002267* 001000 000321            29120  POP D           RESTORE LINE #
1980 002210* 001000 000361            29140  POP PSW          IF WAS THERE A LINE #?
1981 002211* 001000 000322            29160  JNC GUNE         IF NOT ITS A DIRECT STATEMENT
1982 002212* 001000 000337*          29160
1983 002213* 001000 000344*          29180  PUSH D           J#2 AFTER CRUNCH, [B,C]=CHAR COUNT FOR NODEL
1984 002214* 001000 000325            29180
1985 002215* 001000 000305            29200  PUSH B           FSAVE LINE # AND CHARACTER COUNT
1986 002216* 001000 000327            29220  CHRGET          REMEMBER IF THIS LINE IS
1987 002217* 001000 000365            29240  PUSH PSW          JBLANK SO WE DON'T INSERT IT
1988 002220* 001000 000315            29260  CALL FNDLIN      GET A POINTER TO THE LINE
1989 002221* 001000 0002371*          29260
1990 002222* 001000 0002212*          29280  PUSH B           FSAVE THE POINTER
1991 002223* 001000 000305            29300  IFE LENGTH=2,*      FDELETE THE LINE
1992 002224* 001000 000334            29320  CC DEL>          LENGTH>2,* AND CHARACTER COUNT
1993 002225* 001000 011271*          29320
1994 002226* 001000 002221*          29340  IFN LENGTH=2,<
1995 002227* 001000 000224*          29360  JNC NODEL        NO MATCH SO DON'T DELETE
1996 002228* 001000 000224*          29380  XCHG            [D,E] NOW HAS THE POINTER TO THE LINE
1997 002229* 001000 000224*          29400
1998 002230* 001000 000361            29420  LHLD VARTAB      COMPACTIFYING TO VARTAB
1999 002231* 001000 000312            29440  LHLD LOAN        VARTAB
2000 002232* 001000 0002276*          29460  STAX B           ISHIFTING DOWN TO ELIMINATE A LINE
2001 002233* 001000 000225*          29480  INX B
2002 002234* 001000 000225*          29500  INX D
2003 002235* 001000 000225*          29520  COMPAR          COMPARE
2004 002236* 001000 000225*          29540  JNC MLOOP      DONE COMPACTIFYING?
2005 002237* 001000 000225*          29560  MOV H,B          H,B
2006 002238* 001000 000225*          29580  MOV L,C          L,C
2007 002239* 001000 000225*          29600  INX H
2008 002240* 001000 000225*          29620  SHLD VARTAB>    FNEW VARTAB
2009 002241* 001000 000225*          29640  NODEL POP D     FPOP POINTER AT PLACE TO INSERT
2010 002242* 001000 000225*          29660  POP PSW          FSEE IF THIS LINE HAD
2011 002243* 001000 000225*          29680  ANYTHING ON IT
2012 002244* 001000 000225*          29700  JZ FINI         IF NOT DON'T INSERT
2013 002245* 001000 000225*          29720  LHLD VARTAB      FCURRENT END
2014 002246* 001000 000225*          29740  XTHL            [H,L]=CHARACTER COUNT, VARTAB
2015 002247* 001000 000225*          29760  JONTO THE STACK
2016 002248* 001000 000225*          29780  POP B           [B,C]=OLD VARTAB
2017 002249* 001000 000225*          29800  DAD B
2018 002240* 001000 000545            29820  PUSH H           FSAVE NEW VARTAB

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2025 002245* 001000 000315            29840  CALL BLTU         FBLTU
2026 002246* 001000 002605*          29840
2027 002245* 001000 002235*          29860  POP H           FPOP OFF VARTAB
2028 002246* 001000 000341            29860  SHLD VARTAB      FUPDATE VARTAB
2029 002247* 001000 000200*          29880
2030 002251* 001000 00021*           29880
2031 002251* 001000 000224*          29900  XCHG            FDOOL CHEAD WITH NON-ZERO LINK
2032 002252* 001000 000553            29920  MOV M,H          FSO IT DOESN'T THINK
2033 002253* 001000 000168            29920  INX H
2034 002254* 001000 000043            29940  INX M          FTTHIS LINK IS THE
2035 002255* 001000 000043            29960  INX H          FEND OF THE PROGRAM
2036 002256* 001000 000043            29980
2037 002255* 001000 000043            30000  INX H
2038 002255* 001000 000521            30020  POP D           FGET LINE # OFF STACK
2039 002255* 001000 00053*          30040  MOV M,E          FPUT DOWN LINE #
2040 002260* 001000 000043            30060  INX H
2041 002261* 001000 001662            30080  MOV M,D          F
2042 002262* 001000 000043            30100  INX H
2043 002263* 001000 000021            30140  LXI D,BUF       FMOVE LINE FROM BUF TO PROGRAM AREA
2044 002264* 001000 0001431*          30140
2045 002265* 001000 000225*          30160  MLOOP: LDAX D   FNOW TRANSFERING LINE
2046 002266* 001000 000032*          30180  FINI             FIN FROM BUF
2047 002267* 001000 000021            30200
2048 002267* 001000 000167*          30200  MOV M,A          F
2049 002267* 001000 0002443*          30220  INX H
2050 002270* 001000 0002443*          30240  INX D
2051 002271* 001000 000023*          30260  ORA A           FZERO MARKS THE END
2052 002272* 001000 0002657*          30280  JNZ MLOOPK      F
2053 002273* 001000 000302            30280
2054 002274* 001000 0002266*          30300  FINI: CALL RUNC  FDD CLEAR & SET UP STACK
2055 002275* 001000 0000315            30300
2056 002276* 001000 0002437*          30300
2057 002277* 001000 0002274*          30300
2058 002304* 001000 0002274*          30320  JZ MAIN         FALSO SETS [H,L] TO [TXTTAB]-1
2059 002301* 001000 000043            30340  INX H
2060 002302* 001000 000124            30360  ; F
2061 002303* 001000 000135            30380  ; F CHEAD GOES THROUGH PROGRAM STORAGE AND FIXES
2062 002304* 001000 000176            30400  ; F UP ALL THE LINKS, THE END OF EACH
2063 002305* 001000 000265*          30420  ; F LINE IS FOUND BY SEARCHING FOR THE ZERO AT THE END.
2064 002306* 001000 000266            30440  ; F THE DOUBLE ZERO LINK IS USED TO DETECT THE END OF THE PROGRAM
2065 002307* 001000 000312            30460
2066 002308* 001000 000231*          30480  CHEAD: MOV D,H  F[D,E]=[M,L]
2067 002309* 001000 000124            30500  MOV E,L           F
2068 002309* 001000 000135            30520  MOV A,M          FSEE IF END OF CHAIN
2069 002309* 001000 000176            30540  INX H
2070 002305* 001000 0002443*          30560  ORA M           FBUMP POINTER
2071 002306* 001000 000266            30580  JZ MAIN         F2ND BYTE
2072 002307* 001000 000312            30580
2073 002311* 001000 000255*          30600  INX H           FIF H TO START OF TEXT
2074 002312* 001000 0002277*          30620  INX H
2075 002312* 001000 000043            30640  INX H
2076 002313* 001000 000043            30640
2077 002314* 001000 000043            30640

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ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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2076 002315* 001000 000257      30660 XRA A           ;SEARCHING FOR A ZERO IN MEMORY
2079 002316* 001000 000276      30669 CZLOOP: CMP M       ;TO MARK THE END OF THIS LINE
2080 002317* 001000 000043      30700 INX H           ;BUMP POINTER
2082 002318* 001000 000162      30720 JNZ CZLOOP     ;END OF LINE
2083 002319* 000000 002316*      30740 XCHG M,E        ;SWITCH TEMP
2085 002320* 001000 000355      30760 MOV M,E        ;DD FIRST BYTE OF FIXUP
2086 002325* 001000 000043      30780 INX H           ;ADVANCE POINTER
2087 002326* 001000 000162      30800 MOV M,D        ;2ND BYTE OF FIXUP
2088 002327* 001000 000353      30820 XCHG M,D        ;AND BACK AGAIN
2089 002330* 001000 000303      30840 JMP CHEAD     ;KEEP CHAINING TIL DONE
2090 002331* 000000 002302*      30860 IFE LENGTH=2,<
2091 002332* 000000 002321*      30880 ;  

2093 ;  

2094 ; SCNLIN SCANS A LINE RANGE OF  

2095 ; THE FORM #*-# OR #-# OR #-# OR BLANK  

2096 ; AND THEN FINDS THE FIRST LINE IN THE RANGE  

2097 ;  

2098 002333* 001000 000251      30960 SCNLIN: LXI D,SCODE    ;ASSUME START LIST AT ZERO
2099 002334* 000000 000000*      31000 PUSH D          ;SAVE INITIAL ASSUMPTION
2100 002335* 000000 002351*      31020 JZ ALLST       ;IF FINISHED, LIST IT ALL
2101 002336* 001000 000252      31040 POP D          ;WE ARE GOING TO GRAB A #
2102 002337* 001000 000312      31060 CALL LINGET   ;GET A LINE #, IF NONE, RETURNS ZERO
2103 002340* 000000 002354*      31080 PUSH D          ;SAVE FIRST
2104 002341* 000000 002354*      31100 JZ ONELIN     ;IF ONLY # THEN DONE,
2105 002342* 001000 000321      31120 SYNCMD MINUTK  ;MUST BE A DASH,
2106 002343* 001000 000315      31140 ALLST: LXI D,SCODE+0D5529 ;ASSUME MAX END OF RANGE
2107 002344* 000000 000000*      31160 CNZ LINGET   ;GET THE END OF RANGE
2108 002345* 000000 002346*      31180 JNZ SNEH      ;MUST BE TERMINATOR
2109 002346* 001000 000325      31200 ONELIN: XCHG ;[M,L] = FINAL
2110 002347* 001000 000312      31220 POP D          ;GET INITIAL IN [D,E]
2111 002350* 000000 002365*      31240 XTHL D          ;PUT MAX ON STACK, RETURN ADDR TO [H,L]
2112 002351* 000000 002344*      31260 PUSH H>        ;SAVE RETURN ADDRESS BACK
2113 002352* 001000 000317      31280 ;  

2114 002354* 001000 000251      31300 ; FNDLIN SEARCHES THE PROGRAM TEXT FOR THE LINE
2115 002355* 001000 000302      31320 ; WHOSE LINE # IS PASSED IN [D,E], [D,E] IS PRESERVED,
2116 002355* 000000 177771*      31340 ;  

2117 002356* 000000 002350*      31360 ;  

2118 002357* 001000 000304      31380 ;  

2119 002360* 000000 003642*      31400 ;  

2120 002361* 000000 002355*      31420 ;  

2121 002362* 001000 000302      31440 ;  

2122 002363* 000000 002672*      31460 ;  

2123 002364* 000000 000000*      31480 ;  

2124 002365* 001000 000355      31500 ;  

2125 002366* 001000 000321      31520 ;  

2126 002367* 001000 000243*      31540 ;  

2127 002370* 001000 000345      31560 ;  

2128 ;  

2129 ;  

2130 ;  


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ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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2131 ; THERE ARE THREE POSSIBLE RETURNS:  

2132 ;  

2133 ; 1) ZERO FLAG SET, CARRY NOT SET, LINE NOT FOUND,  

2134 ; NO LINE IN PROGRAM GREATER THAN ONE SOUGHT,  

2135 ; (B,C) POINTS TO TWO ZERO BYTES AT END OF PROGRAM,  

2136 ; [H,L]=[B,C]  

2137 ;  

2138 ; 2) ZERO, CARRY SET,  

2139 ; (H,C) POINTS TO THE LINK FIELD IN THE LINE  

2140 ; WHICH IS THE LINE SEARCHED FOR,  

2141 ; (M,L) POINTS TO THE LINK FIELD IN THE NEXT LINE,  

2142 ;  

2143 ; 3) NON-ZERO, CARRY NOT SET,  

2144 ; LINE NOT FOUND, (B,C) POINTS TO LINE IN PROGRAM  

2145 ; GREATER THAN ONE SEARCHED FOR,  

2146 ; (M,L) POINTS TO THE LINK FIELD IN THE NEXT LINE,  

2147 ;  

2148 002371* 001000 000056      31580 FNDLIN: LHLD TXTTAB ;GET POINTER TO START OF TEXT
2149 002372* 000000 001617*      31600 LOOP: MOV B,H ;IF EXITING BECAUSE OF END OF PROGRAM,
2150 002373* 000000 002363*      31620 JSET [B,C] TO POINT TO DOUBLE ZEROS,
2151 002374* 001000 000104      31700 LOOP: MOV B,H ;  

2152 002375* 001000 000115      31720 JSET WORD POINTER TO
2153 002376* 001000 000176      31740 MOV CYL ;  

2154 002377* 001000 0002643      31760 MOV A,H ;GET WORD POINTER
2155 002400* 001000 000266*      31780 INX H ;BUMP POINTER
2156 002401* 001000 000053*      31800 ORA M ;GET 2ND BYTE
2157 002402* 001000 000310      31820 DCX H ;GO BACK
2158 002403* 001000 000305      31840 RZ A ;IF ZERO THEN DONE
2159 002404* 001000 000367*      31860 PUSH B ;PUSH LINK
2160 002405* 001000 000367*      31880 PUSH B ;PUSH BINARY LINE #
2161 002406* 001000 000341      31900 POP H ;POP HERE
2162 002407* 001000 000341      31920 COMPAR ;COMPARE [D,E] TO [H,L]
2163 002407* 001000 000347      31940 POP H ;GET LINK
2164 002410* 001000 000341      31960 POP B ;GET POINTER TO THIS LINE IN [B,C]
2165 002411* 001000 000301      31980 CMC ;TURN CARRY ON
2166 002412* 001000 000277      32000 ;EQUAL RETURN
2167 002413* 001000 000310      32020 RZ ;EQUAL RETURN
2168 002414* 001000 000077*      32040 CMC ;MAKE CARRY ZERO
2169 002415* 001000 000320      32060 RNC ;NO MATCH RETURN (GREATER)
2170 002416* 001000 000303      32080 JMP LOOP ;KEEP LOOPING
2171 002417* 000000 002374*      32100 ;  

2172 002420* 000000 002372*      32120 ; THE "NEW" COMMAND CLEARS THE PROGRAM TEXT AS WELL
2173 ;  

2174 ; AS VARIABLE SPACE  

2175 ;  

2176 ;  

2177 002421* 001000 000500      32160 SCRATCH: RNZ ;MAKE SURE THERE IS A TERMINATOR
2178 002422* 001000 000056*      32180 SCRATCH: LHLD TXTTAB
2179 002423* 000000 001617*      32200 SCRATCH: RNC ;  

2180 002424* 000000 002417*      32220 IFN LENGTH=2,<
2181 ;  

2182 ;  

2183 ;  


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ERRUM HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

2184 002425\* 001000 000515 32280 CALL TUFF> ;TURN OFF TRACE, SET [A]=0.  
2185 002426\* 001000 003605\*  
2186 002427\* 001000 000515\*  
2187 002430\* 001000 000157 32380 MOV M,A ;SAVE AT END OFF TEXT  
2188 002431\* 001000 000045 32320 INX H ;BUMP POINTER  
2189 002432\* 001000 000157 32340 MOV M,A ;SAVE ZERO  
2190 002433\* 001000 000045 32360 INX H ;BUMP POINTER  
2191 002434\* 001000 000042 32380 SHLD VARTAB ;NEW START OF VARIABLE  
2192 002435\* 001000 001621\*  
2193 002436\* 001000 002426\*  
2194 5 32400 IFE LENGTH,<  
2195 32420 RINI RNZ> ;CHECK FOR A TERMINATOR  
2196 002437\* 001000 000052 32440 RUNC1 LHLD TXTTAB ;POINT AT THE START OF TEXT  
2197 002440\* 001000 001617\*  
2198 002441\* 001000 002435\*  
2199 002442\* 001000 000053 32460 DCX H  
2200 5 32480 ;  
2201 32500 ; CLRINI IS A SUBROUTINE WHICH INITIALIZES THE VARIABLE AND  
2202 ; ARRAY SPACE BY RESETTING ARYTAB [THE END OF SIMPLE VARIABLE SPACE]  
2203 ; AND STREN([THE END OF ARRAY STORAGE], IT FALLS INTO STKINI  
2204 ; WHICH RESETS THE STACK, [H,L] IS PRESERVED,  
2205 ;  
2206 32560 ;  
2207 002443\* 001000 000042 32620 IFE STRING,<CLEAR> ;SAVE [H,L] IN TEMP  
2208 002444\* 001000 001610\*  
2209 002445\* 001000 002446\*  
2210 32640 IFN STRING,<  
2211 002446\* 001000 000052 32660 LHLD MEMSIZ  
2212 002447\* 001000 001545\*  
2213 002450\* 001000 002446\*  
2214 002451\* 001000 000042 32680 SHLD FRTOP> ;FREE UP STRING SPACE  
2215 002452\* 001000 001575\*  
2216 002453\* 001000 002447\*  
2217 002454\* 001000 000315 32700 CALL RESTORE ;RESTORE DATA  
2218 002455\* 001000 003446\*  
2219 002456\* 001000 002456\*  
2220 002457\* 001000 000315\*  
2221 002458\* 001000 001621\*  
2222 002461\* 001000 002455\*  
2223 002462\* 001000 000042  
2224 002463\* 001000 001623\*  
2225 002464\* 001000 002461\*  
2226 002465\* 001000 000042 32760 SHLD STREN ;END OF VARIABLE STORAGE  
2227 002466\* 001000 001623\*  
2228 002467\* 001000 002463\*  
2229 32780 ;  
2230 32800 ; STKINI RESETS THE STACK POINTER ELIMINATING  
2231 ; GOSUB & FOR CONTEXT, STRING TEMPORARIES ARE FREED  
2232 ; UP, SUBFLG IS RESET, CONTINUING IS DISALLOWED,  
2233 ; AND A DUMMY ENTRY IS PUT ON THE STACK, THIS IS SO  
2234 ; FNDFOR WILL ALWAYS FIND A NON-"FOR" ENTRY AT THE BOTTOM  
2235 ; OF THE STACK, [A]=0 AND [D,E] IS PRESERVED,  
2236 32920 ;

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ERRUM HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

2237 002470\* 001000 000301 32940 STKINI: PUP B ;GET RETURN ADDRESS HERE  
2238 002471\* 001000 000052 32960 LHLD STKTUP ;[H,L] POINTER TO END OF MEMORY  
2239 002472\* 001000 001615\*  
2240 002473\* 001000 002466\*  
2241 002474\* 001000 000371 32980 SPHL ;INITIALIZE STACK  
2242 33000 IFN STRING,<  
2243 002475\* 001000 000041 33020 LXI H,TEMPST  
2244 002476\* 001000 001551\*  
2245 002477\* 001000 002476\*  
2246 002500\* 001000 000042 33040 SHLD TEMPPT> ;INITIALIZE STRING TEMPORARIES  
2247 002501\* 001000 001547\*  
2248 002524\* 001000 002476\*  
2249 002530\* 001000 000041 33060 LXI H,SCODE ;PUT ZERO (NON NEXT, FOR, GOSUB TOKEN)  
2250 002530\* 001000 000000\*  
2251 002530\* 001000 002501\*  
2252 002506\* 001000 008345 33080 PUSH H ;ON STACK  
2253 002507\* 001000 000042 33100 IFN LENGTH,<SHLD OLDTXT> ;MAKE CONTINUING ILLEGAL  
2254 002510\* 001000 001615\*  
2255 002511\* 001000 002504\* 33120 IFN LPTSH,<  
2256 33140 CALL FINLPT>  
2257 002512\* 001000 000052 33160 LHLD TEMP ;GET SAVED [H,L]  
2258 002513\* 001000 001603\*  
2259 002514\* 001000 002510\*  
2260 33180 IFN LENGTH,<  
2261 33200 IFE CONTRW,<XRA A> ;FOLLOW SUBSCRIPTS  
2262 002515\* 001000 000062 33220 STA SUBFLG  
2263 002516\* 001000 001601\*  
2264 002517\* 001000 002513\*  
2265 002520\* 001000 000005 33240 PUSH B ;PUT RETURN ADDRESS BACK ON  
2266 002521\* 001000 000311 33260 RET ;GO BACK  
2267 33280 IFN LENGTH,<  
2268 002522\* 001000 000076 33300 QINLIN: MVI A,"?" ;GET A QMARK  
2269 002523\* 001000 000077  
2270 002524\* 001000 000537 33320 OUTCHR ;TYPE IT  
2271 002525\* 001000 000076 33340 MVI A," " ;SPACE  
2272 002526\* 001000 000040  
2273 002527\* 001000 000037 33360 OUTCHR ;TYPE IT TOO  
2274 002528\* 001000 0000305 33380 IFE STRING,<CALL INLIN> ;IN THE NON-STRING VERSIONS ALL  
2275 002529\* 001000 002776\* 33400 INPUT ;INPUT IS CRUNCHED  
2276 33420 INX H> ;GET A LINE OF INPUT FROM TTY  
2277 002530\* 001000 000305 33440 IFN STRING,<JMP INLIN> ;NO CRUNCHING IN THIS CASE  
2278 002531\* 001000 002776\*  
2279 002532\* 001000 002516\*  
2280 33460 ;  
2281 33520 ; ALL "RESERVED" WORDS ARE TRANSLATED INTO SINGLE  
2282 ; BYTES WITH THE MSB ON, THIS SAVES SPACE AND TIME  
2283 ; BY ALLOWING FOR TABLE DISPATCH DURING EXECUTION,  
2284 ; THEREFORE ALL STATEMENTS APPEAR TOGETHER IN THE  
2285 ; RESERVED WORD LIST IN THE SAME  
2286 ; ORDER THEY APPEAR IN IN STMDSR,  
2287 ;  
2288 33640 ;  
2289 002533\* 33700 CRUNCH: IFN STRING,<

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 F3 MAC 6-SEP-64 05111 ERROR HANDLER, READY, COMPACTIFICATION, NEW, CLEAR, MAIN

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2290 002533# 001000 000257 33720 XHA A DURES> FALLOW CRUNCHING
2291 002534# 001000 000662 33740 STA DURES>
2292 002535# 001000 001544# 33760 MVI C,5 COUNT OF CHARS AT LEAST 5
2293 002536# 001000 0002531# 33780 LXI D,BUF ISETUP DESTINATION POINTER
2294 002537# 001000 000111 33760 MVI C,5 COUNT OF CHARS AT LEAST 5
2295 002540# 001000 000005 33780 LXI D,BUF ISETUP DESTINATION POINTER
2296 002541# 001000 000821 33780 LXI D,BUF ISETUP DESTINATION POINTER
2297 002542# 001000 001431# 33780 LXI D,BUF ISETUP DESTINATION POINTER
2298 002543# 001000 002535# 33800 KLUDUP: MOV A,M IGET CHARACTER FROM BUF
2299 002544# 001000 000176 33820 CPI "# " IIS IT A SPACE WE WANT TO SAVE
2300 002545# 001000 000376 33840 JZ STUFFH IYES, STUFF IN DESTINATION LINE,
2301 002546# 001000 000046 33860 MOV B,A IGET A CHARACTER FROM THE LINE
2302 002547# 001000 000114 33880 CPI 34 ISETUP B WITH A QUOTE IF IT IS A STRING
2303 002548# 001000 00241# 33900 CPI 34 IQUOTE SIGN?
2304 002551# 001000 00254# 33920 JZ STRNG IYES, GO TO SPECIAL STRING HANDLING
2305 002552# 001000 000107 33860 MOV B,A IGET A CHARACTER FROM THE LINE
2306 33880 CPI 34 ISETUP B WITH A QUOTE IF IT IS A STRING
2307 002555# 001000 000376 33900 CPI 34 IQUOTE SIGN?
2308 002554# 001000 000042 33920 JZ STRNG IYES, GO TO SPECIAL STRING HANDLING
2309 002555# 001000 000312 33940 ORA A END OF LINE?
2310 002556# 001000 000251# 33960 JZ CRDONE IYES, DONE CRUNCHING
2311 002557# 001000 00025# 33980 IFN STRING,< ITHEN USE A "PRINT" TOKEN
2312 002560# 001000 000267 34000 LDA DURES IIN DATA STATEMENT AND NO CRUNCH?
2313 002561# 001000 000312 34020 ORA A IINITIALIZE RESERVED WORD COUNT
2314 002562# 001000 00275# 34040 MOV A,M IGET THE CHARACTER AGAIN
2315 002563# 001000 00256# 34060 JNZ STUFFH IF NO CRUNCHING JUST STORE
2316 34080 IFN STRING,< ITHEN USE A "PRINT" TOKEN
2317 002564# 001000 000072 34100 CPI "# " IGET CHARACTER
2318 002565# 001000 001544# 34120 CPI "# " INOT FOR 4K VERSION
2319 002566# 001000 00025# 34140 CPI "# " IA MARKZ
2320 002567# 001000 000077 34160 MVI A,PRINTK
2321 002570# 001000 000107 34180 HLT STOP
2322 002571# 001000 000176 34200 MOV A,M
2323 002572# 001000 000302 34220 CPI "# " ISKIP NUMERICS
2324 002573# 001000 000266# 34240 JC MUSTCH ISINCE CRUNCHING IS SLOW
2325 002574# 001000 000256# 34260 CPI 60 IF ":" ALSO PUT IN QUICKLY
  
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2326 002614# 001000 000332 34280 JC STUFFH
2327 002615# 001000 002667# 34300 MUSTCR: >
2328 002616# 001000 002210# 34300 PUSH D ISAVE STORE POINTER
2329 002617# 001000 000325 34320 IFE STRING,< IINIT RESERVED WORD COUNT
2330 002618# 001000 000076 34340 MVI B,0 IINIT TO RESERVED WORD LIST
2331 002620# 001000 000021 34360 LXI D,RESLST-1
2332 002621# 001000 000171# 34380 CPI "# " IGET CHAR FROM LINE
2333 002622# 001000 0002615# 34400 XWD #01000,"076 IPUT A BYTETO RESLST
2334 002623# 001000 000345 34420 CHRGET IGET CHAR FROM LINE
2335 002624# 001000 000076 34440 NXTRST: CHRGET IGET CHAR FROM LINE
2336 002625# 001000 000327 34460 INX D IUMP DEPOSIT POINTER
2337 002626# 001000 000053 34480 RESER: LDAX D IGET A BYTE FROM RESERVED WORD LIST
2338 002627# 001000 000052 34500 ANI 127 IGET RID OF SIGN BIT
2339 002628# 001000 0002620# 34520 JZ TABEND IEND OF RESERVED WORD TABLE
2340 002629# 001000 000074 34540 CMP M TWO CHARS THE SAME?
2341 002630# 001000 0002621# 34560 JNZ NTHIS IEND, DIFFERENT
2342 002631# 001000 000074 34580 LDAX D IGET RESERVED WORD BYTE
2343 002632# 001000 0002621# 34600 ORA A ISET CONDITION CODES
2344 002633# 001000 0000562 34620 JP NXTRST IF SIGN SET, RESERVED WORD FOUND
2345 002640# 001000 0002625# 34640 FOUND: POP PSH TAKE OFF GARBAGE ORIG POINTER
2346 002641# 001000 000361 34660 MOV A,B IGET RESERVED WORD #
2347 002642# 001000 000267 34680 ORI 128 ISET NSB TO FLAG AS RESERVED WORD
2348 002643# 001000 0000562 34700 XWD #01000,"0562 IPUT A BYTETO RESLST
2349 002644# 001000 000263# 34720 TABEND: POP H IGET BACK ORIG POINTER
2350 002645# 001000 0000562 34740 MOV A,M IGET BACK ORIG CHAR
2351 002646# 001000 000262# 34760 POP D IGET STUFF POINTER BACK
2352 002647# 001000 000263# 34780 IFE LENGTH=2,< I[1,L]=STUFF POINTER
2353 002648# 001000 0000555 34800 XCHG CPI ELSETK IHAVE TO PUT A HIDDEN
2354 002649# 001000 0000220 34820 CPI ELSETK IHAVE TO PUT A HIDDEN
2355 002650# 001000 0000220 34840 MVI M," " ICOLON IN FRONT OF "ELSE"
2356 002651# 001000 000066 34860 CPI "#," " ISTORE IT
2357 002652# 001000 0000672 34880 CZ INXHRT## IADVANCE POINTER ON "ELSE"
2358 002653# 001000 000514 34900 I50 ONLY ON "ELSE" THE COLON IS NOT OVERWRITTEN
2359 002654# 001000 000000* 34920 XCHG M,[0,E] STUFF POINTER
2360 002655# 001000 000000* 34940 STUFFH: INX M IENTRY TO BUMP (H,L)
2361 002656# 001000 000000* 34960 STAX D ISAVE CHARACTER IN CRUNCHED LINE
2362 002657# 001000 0000023 34980 INX D IUMP SAVE POINTER
  
```