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LPTSPL VERSION 6(344) RUNNING ON LPT0
*START* USER RITS (0000,0000) JOB F3 3EQ, 42 DATE 10-SEP-75 08:24:32 MONITOR ALBUQUERQUE SCHOOLS 5075 *START*
REQUEST CREATE0: 10-SEP-75 03:10:00
FILE1 (0000) F3(0000,0000) CREATE0: 10-SEP-75 03:10:00 PRINTED: 10-SEP-75 08:52:43
QUEUE SWITCHES: /FILE=ASCII /COPIES=2 /SPACING=1 /LIMIT=1300 /FORMS=1000000
FILE WILL BE DELETED AFTER PRINTING

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BASIC MCS 8080 GATES/ALLEN/DAVIDOFF MACHO 47(113) 03:12 10-SEP-75 PAGE 1
C 0-SEP-04 03:00 COMMON FILE

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1 00100 SEARCH MCS000 JTIME UNIVERSAL FILE
2 00200 SUBTTL COMMON FILE
3 00300 SALL
4 00400 LENGTH=2 1 0 MEANS 4K, 1 MEANS 8K, 2 MEANS 12K
5 00500 REALIO=1
6 00600 CASS=0 JCASSETTE SWITCH (CSAVE,CLOAD)
7 00700 PUR=0 JON FOR PURE CODE
8 00800 LPTS=0
9 00900 DSKFUN=0 JON TO READ/WRITE
10 01000 CONSS=0
11
12 00001b 01200 CLMHI0="014 JMAKE COMMA COLUMNS FOURTEEN CHARACTERS
13 02000 01300 RAMBOT="02000 JBOTOM LOCATION OF RAM FOR PURE SWITCH
14 00001 01400 CONTR=1 FOLLOW "0
15 01500 IFE REALIO,<
16 01600 LPTS=0 JINSULATOR DEFAULTS
17 01700 CASS=0
18 01800 CONSS=0
19 01900 DSKFUN=0
20 02000 CONTR=0>
21
22 02200 IFE LENGTH,<
23 02300 EXTENC=0 JON MEANS EXTENDED FUNCTIONS
24 02400 MULDI=0 JON MEANS MULTIPLE DIMENSIONED ARRAYS ALLOWED
25 02500 STRING=0 JON MEANS STRINGS ALLOWED
26 02600 CASS=0
27 02700 LPTS=0
28 02800 DSKFUN=0
29 02900 CONSS=0
30 03000 CONTR=0>
31
32 03200 IFE LENGTH=1,<
33 03300 EXTENC=1
34 03400 MULDI=1
35 03500 STRING=1>
36
37 03700 IFE LENGTH=2,<
38 03800 EXTENC=1
39 03900 MULDI=1
40 04000 STRING=1>
41
42 04200 DEFINE SYNCH(A),<RST 1
43 04300 A>
44 04400 DEFINE CHRGET,<RST 2>
45 04500 DEFINE OUTCHR,<RST 3>
46 04600 DEFINE COMPAR,<RST 4>
47 04700 DEFINE PSIGN,<RST 5>
48 04800 DEFINE PUSHM,<RST 6>
49 04900 DEFINE PUSHFM,<PUSHM
50 05000 PUSHM>
51 05100 DEFINE ACRLF,<
52 05200 "013
53 05300 IFN STRING,<"010>>

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54 05400 DEFINE PUSHN,<
55 05500 PUSH 0
56 05600 PUSH 8>
57 05700 DEFINE POPN,<
58 05800 POP 8
59 05900 POP 0>
60 06000 DEFINE MOVRI(0,C,0,E),<
61 06100 X#D "01000,"0001 ;; *LXI 0*
62 06200 EXP C
63 06300 EXP 8
64 06400 X#D "01000,"0021 ;; *LXI 0*
65 06500 EXP E
66 06600 EXP 0>
67
68 06800 IF1,<
69 06900 IFE LENGTH,<PRINTX /SMALL/>
70 07000 IFE LENGTH=1,<PRINTX /MEDIUM/>
71 07100 IFE LENGTH=2,<PRINTX /BIG/>
72 07200 IFE REALIO,<PRINTX /SIMULATE/>
73 07300 IFN REALIO,<PRINTX /ON MACHINE/>
74 07400 IFN CASSW,<PRINTX /CASSETTE/>
75 07500 IFN PURE,<PRINTX /PURE/>
76 07600 IFN LPTM,<PRINTX /LPT/>
77 07700 IFN DSKFUN,<PRINTX /DISK/>
78 07800 IFN CONSSH,<PRINTX /CONSOLE/>
79 07900 PAGE

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80 00020 SUBTTL VERSION 3,0 -- MORE FEATURES TO GO
81 00040 TITLE BASIC MCS 8080 GATES/ALLEN/DAVIDOFF
82 00060 IFNDEF LENGTH,<PRINTX !!! MUST HAVE COM !!!
83 00080 END>
84 000000* 00100 MCSSIM(START)
85 00120 COMMENT *
86
87 00160 *****
88 00180 COPYRIGHT 1975 BY BILL GATES AND PAUL ALLEN
89 00200 *****
90
91
92 00260 ORIGINALLY WRITTEN ON THE POP=10 FROM
93 00280 FEBRUARY 9 TO APRIL 9
94
95 00320 BILL GATES WROTE THE RUNTIME STUFF.
96 00340 PAUL ALLEN WROTE THE NON-RUNTIME STUFF.
97 00360 MONTE DAVIDOFF WROTE THE MATH PACKAGE.
98
99
100 00400 THINGS TO DO:
101 00420 GOSUB / INPUT BUG (BUF SMASH)
102 00440 PRINT PUNCTUATION MANDATORY
103 00460 MULTIPLE LET
104 00480 RESTART AT 0 SHOULD GO THROUGH STAINI
105 00500 USER DEFINED FUNCTIONS(MULTI=ARG,MULTI=LINE,STRINGS)
106 00520 MAKE STACK BOUNDARY STUFF EXACT
107 00540 PUNCH,RENUMBER,,,
108 00560 INLINE CONSTANT CONVERSION==MAKE IT WORK
109 00580 *
110 00600 RADIX 10
111 00620 ,P==0
112 00640 NUMLEV==17*LENGTH*2
113 00660 LPTLEN==72
114 00680 LINLEN==72
115 00700 BUFLN==72
116 00720 STRSZ==4
117 00740 IFE LENGTH=2,<STRSZ==3>
118 00760 NUMTMP==3
119 00780 IFE LENGTH=2,<NUMTMP==5>
120 00800
121 00820 C==13
122 00840 CONT==15
123 00860 ODONE==128
124 00880 IDONE==1
125 00900 TTCHN==1
126 00920 TTICH==1
127 00940 LISTEN==0
128 00960 FUNCS==1
129 01000
130 01040 IFN REALIO,<
131 01060 LISTEN==1>
132 01080 IFE LENGTH,<
133 01100 FUNCS==0>

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;THROUGHOUT THE NON-MATH PACKAGE ROUTINES
 ;FOR SIMULATION FIXUPS
 ;NUMBER OF STACK LEVELS RESERVED
 ;WITH AN EXPLICIT CALL TO GETSTK
 ;WIDTH OF LINE-PRINTER
 ;TELETYPE LINE LENGTH
 ;INPUT BUFFER SIZE
 ;NUMBER OF STRING TEMPORARIES
 ;CHARACTER TO SUPPRESS OUTPUT
 ;BIT FOR OUTPUT DONE
 ;BIT FOR INPUT DONE
 ;TELETYPE OUTPUT CHANNEL
 ;TELETYPE INPUT CHANNEL
 ;ON MEANS LISTEN FOR *C
 ;ON MEANS USER FUNCTIONS ALLOWED
 ;! CANNOT BE ON WITH LENGTH=0 (SUBFLG)

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01200 INTERNAL      ,C1,BUF,READY,REASON,SNERR,UMERR,REPINI
01220 INTERNAL      STREND,CURLIN,DVDBRR,ERRDVB
01240 IFN          REALIO,<
01260 INTERNAL      CNLCA1,CNLCA2,CNLCA3>
01280 IFN          EXTPNC,<INTERNAL      ATNFIX,COSFIX,SINFIX,TANFIX
01300 EXTERNAL      FPMR,EXP>
01320 EXTERNAL      GINT,ZERO,MOVE,FOUT,FIN,FCOMP,FAOD,PUSHF,INT,INIT
01340 EXTERNAL      MOVFM,MOVFM,MOVFM,INPRT,LINPRT
01360 EXTERNAL      MOVFM,MOVFM,ISTACK,FLATRI,FAODS
01380 INTERNAL      ILLFUN,FAC,FAULO,TXTTAB,STROUT,SCRTCH
01400 EXTERNAL      INHART,NEG,FLCAT
01420 INTERNAL      OUTDQ,SIMDUI
01440 INTERNAL      STATOP,ERROR,FCERR
01460 IFN          STRING,<
01480 INTERNAL      VALTYP,TEMPPT
01464 INTERNAL      TEMPST,STRLIT
01466 IFN          LENGTH=2,<
01468 INTERNAL      TMERR>
01480 INTERNAL      MENSIZ,PRETOP
01500 EXTERNAL      SIGNS>
01520 INTERNAL      PBUFH,MINUTK,PLUSTK,CROD,LINGET,INTXT,GINLIN
01540 IFN          MULDIM,<INTERNAL      BSERR>
01560 IFN          MULDIM,<EXTERNAL      UMULT>
01580 IFE          LENGTH,<INTERNAL      RNDFIX,SINFIX>
01600 INTERNAL      SIGN
01620 EXTERNAL      SIGNC,POPHRT
01640 IFN          CONTRN,<
01660 INTERNAL      CNTWFL>
01680 IFN          LPTSR,<
01700 INTERNAL      LPTPOS,PRTFLG>
01720 IFE          LENGTH=2,<
01730 EXTERNAL      CONSH,VMOVFA,VMOVAF,ISIGN,FPMRD,CONIA,GETBCD,VSIGN
01740 EXTERNAL      VMOVFM,VMOVFM,FCINT,FRCSNG,FCRUBL,VNEG,PUFOUT,UCXBRT,IAOD
01760 EXTERNAL      ISUB,IMULT,IOLV,ICOMP,INEG,DAOD,DSUB,DMULT,DDIV,DCOMP,VINT
01780 EXTERNAL      THERM,MOVE,VALINT,VALSNG,FRCSH,CHASTR,MAKINT
01800 INTERNAL      DFACLO,ARG,ARGLO,VALTYP,ERRTR,TEMP2,TEMP3,GETYPE>
01820 PAGE

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01840 SUBTTL SOME EXPLANATION
01880 COMMENT *
01920 ALTAIR BASIC CONFIGURES MEMORY AS FOLLOWS:
01960 LOW LOCATIONS
02000 RST      SUBROUTINES
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225	02900	4	COMPAR
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 SHASED, 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	F SIGN
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	
247	03340		IN THE 4K VERSION RST 7 IS UNUSED AND THE LOCATIONS
248	03360		ASSOCIATED WITH IT ARE USED TO CONTINUE
249	03380		THE CODE FOR RST 6, IN THE 8K A JMP IS MADE
250	03400		AROUND THE FIRST THREE RST 7 LOCATIONS
251	03420		DURING RST 6 EXECUTION, RST 7 INITIALLY
252	03440		CONTAINS A RET, BUT THE USER CAN CHANGE IT TO
253			A JMP TO AN INTERRUPT SERVICE ROUTINE.
254	03480		FUNCTION DISPATCH ADDRESSES
255	03500		FUNDSP 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		FOLLOWED BY 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 OPERATIONS SUCH AS NOT AND NEGATION ARE
271	03820		SETUP SPECIALLY WITHOUT USING A TABLE.
272			
273	03860		THE RESERVED WORD OR CRUNCH LIST
274	03900		WHEN A COMMAND OR PROGRAM LINE IS TYPED IN
275	03900		IT IS STORED IN BUF, AS SOON AS THE WHOLE LINE
276	03920		HAS BEEN TYPED IN (INLIN RETURNS) CRUNCH IS
277	03940		CALLED TO CONVERT ALL RESERVED WORDS TO THEIR

278	03960		CRUNCH VALUES, THIS REDUCES THE SIZE OF THE
279	03980		PROGRAM AND SPEEDS UP EXECUTION BY ALLOWING
280	04000		TABLE DISPATCHES TO PERFORM FUNCTIONS, STATEMENTS,
281	04020		AND OPERATIONS, THIS IS BECAUSE ALL THE STATEMENT
282	04040		NAMES ARE STORED CONSECUTIVELY IN THE CRUNCH LIST.
283	04060		WHEN A MATCH IS FOUND BETWEEN A STRING
284	04080		OF CHARACTERS AND A WORD IN THE CRUNCH LIST
285	04100		THE ENTIRE TEXT OF THE MATCHED WORD IS TAKEN OUT OF
286	04120		THE INPUT LINE AND A RESERVED WORD TOKEN IS PUT
287	04140		IN ITS PLACE, A RESERVED WORD TOKEN IS ALWAYS EQUAL
288	04160		TO OCTAL 200 PLUS THE POSITION OF THE MATCHED WORD
289	04180		IN THE CRUNCH LIST.
290			
291	04220		STATEMENT DISPATCH ADDRESSES
292	04240		WHEN A STATEMENT IS TO BE EXECUTED, THE FIRST
293	04260		CHARACTER OF THE STATEMENT IS EXAMINED
294	04280		TO SEE IF IT IS LESS THAN THE RESERVED
295	04300		WORD TOKEN FOR THE LOWEST NUMBERED STATEMENT NAME.
296	04320		IF SO, THE NEXT CODE IS CALLED TO
297	04340		TREAT THE STATEMENT AS AN ASSIGNMENT STATEMENT,
298	04360		OTHERWISE A CHECK IS MADE TO MAKE SURE THE
299	04380		RESERVED WORD NUMBER IS NOT TOO LARGE TO BE A
300	04400		STATEMENT TYPE NUMBER, IF NOT THE ADDRESS
301	04420		TO DISPATCH TO IS FETCHED FROM STODSP (THE STATEMENT
302	04440		DISPATCH TABLE) USING THE RESERVED WORD
303	04460		NUMBER FOR THE STATEMENT TO CALCULATE AN INDEX INTO
304	04480		THE TABLE.
305			
306	04520		ERROR MESSAGES
307	04540		WHEN AN ERROR CONDITION IS DETECTED
308	04560		(E) MUST BE SET UP TO INDICATE WHICH ERROR
309	04580		MESSAGE IS APPROPRIATE AND A BRANCH MUST BE MADE
310	04600		TO ERROR, THE STACK WILL BE RESET AND ALL
311	04620		PROGRAM CONTEXT WILL BE LOST, VARIABLES
312	04640		VALUES AND THE ACTUAL PROGRAM REMAIN INTACT,
313	04660		ONLY THE VALUE OF (E) IS IMPORTANT WHEN
314	04680		THE BRANCH IS MADE TO ERROR, (E) IS USED AS AN
315	04700		INDEX INTO ERTTAB WHICH GIVES THE TWO
316	04720		CHARACTER ERROR MESSAGE THAT WILL BE PRINTED ON THE
317	04740		USER'S TERMINAL.
318			
319	04780		IMPURE STORAGE
320	04800		ALL TEMPORARIES, FLAGS, POINTERS, THE BUFFER AREA,
321	04820		THE FLOATING ACCUMULATOR, AND ANYTHING ELSE THAT
322	04840		IS USED TO STORE A CHANGING VALUE SHOULD BE LOCATED
323	04860		IN THIS AREA, CARE MUST BE MADE IN MOVING LOCATIONS
324	04880		IN THIS AREA SINCE THE JUXTAPosition OF TWO LOCATIONS
325	04900		IS OFTEN DEPENDENT UPON.
326			
327	04940		TEXTUAL MESSAGES
328	04960		CONSTANT MESSAGES ARE STORED HERE, UNLESS
329	04980		THE CODE TO CHECK IF A STRING MUST BE COPIED
330	05000		IS CHANGED THESE STRINGS MUST BE STORED ABOVE