

1
2+
3+
4+ 0010
5+ 0000

ENABLE AMA
RADIX 16
ASECT

COLLEEN OPERATING SYSTEM EQUATE FILE

MODULE ORIGIN TABLE

13+ E000	CHDRG = 0E000 ; CHARACTER SET
14+ E400	VECTBL = 0E400 ; VECTOR TABLE
15+ E480	VCTABL = 0E480 ; RAM VECTOR INITIAL VALUE TABLE
16+ E4A6	CIDORG = 0E4A6 ; CENTRAL I/O HANDLER
17+ E6D5	INTORG = 0E6D5 ; INTERRUPT HANDLER
18+ E944	SIDORG = 0E944 ; SERIAL I/O DRIVER
19+ EDEA	DSKORG = 0EDEA ; DISK HANDLER
20+ EE78	PRNORG = 0EE78 ; PRINTER HANDLER
21+ EF41	CASORG = 0EF41 ; CASSETTE HANDLER
22+ F0E3	MONORG = 0F0E3 ; MONITOR/POWER UP MODULE
23+ F3E4	KBDORG = 0F3E4 ; KEYBOARD/DISPLAY HANDLER

VECTOR TABLE

HANDLER ENTRY POINTS ARE CALLED OUT IN THE FOLLOWING VECTOR TABLE. THESE ARE THE ADDRESSES MINUS ONE.

EXAMPLE FOR EDITOR

E400	OPEN
2	CLOSE
4	GET
6	PUT
8	STATUS
A	SPECIAL
C	JUMP TO POWER ON INITIALIZATION ROUTINE
F	NOT USED

47+ E400	EDITRV = 0E400 ; EDITOR
48+ E410	SCRENV = 0E410 ; TELEVISION SCREEN
49+ E420	KEYBDV = 0E420 ; KEYBOARD
50+ E430	PRINTV = 0E430 ; PRINTER
51+ E440	CASETV = 0E440 ; CASSETTE

JUMP VECTOR TABLE

THE FOLLOWING IS A TABLE OF JUMP INSTRUCTIONS TO VARIOUS ENTRY POINTS IN THE OPERATING SYSTEM.

58+	E450	DISKIV	= 0E450 ; DISK INITIALIZATION
59+	E453	DSKINV	= 0E453 ; DISK INTERFACE
60+	E456	CIOV	= 0E456 ; CENTRAL INPUT OUTPUT ROUTINE
61+	E459	SIOV	= 0E459 ; SERIAL INPUT OUTPUT ROUTINE
62+	E45C	SETVBV	= 0E45C ; SET SYSTEM TIMERS ROUTINE
63+	E45F	SYSVBV	= 0E45F ; SYSTEM VERTICAL BLANK CALCULATIONS
64+	E462	XITVBV	= 0E462 ; EXIT VERTICAL BLANK CALCULATIONS
65+	E465	SIOINV	= 0E465 ; SERIAL INPUT OUTPUT INITIALIZATION
66+	E468	SENDEV	= 0E468 ; SEND ENABLE ROUTINE
67+	E46B	INTINV	= 0E46B ; INTERRUPT HANDLER INITIALIZATION
68+	E46E	CIOINV	= 0E46E ; CENTRAL INPUT OUTPUT INITIALIZATION
69+	E471	BLKBDV	= 0E471 ; BLACKBOARD MODE
70+	E474	WARMSV	= 0E474 ; WARM START ENTRY POINT
71+	E477	COLDSV	= 0E477 ; COLD START ENTRY POINT
72+	E47A	RBLOKV	= 0E47A ; CASSETTE READ BLOCK ENTRY POINT VECTOR
73+	E47D	CSOPIV	= 0E47D ; CASSETTE OPEN FOR INPUT VECTOR
74+	E480	VCTABL	= 0E480
75+			
76+			
77+			
78+			
79+			
80+			
81+	0003		
82+	0005		
83+	0007		
84+	0009		
85+	000B		
86+	000C		
87+	000D		
88+	000E		
89+			
90+			
91+	0011		
92+	0012		
93+	0020		
94+	0021		
95+	0022		
96+	0023		
97+	0024		
98+	0025		
99+	0026		
100+	00FF		
101+			
102+			
103+			
104+	0001		
105+	0002		
106+	0004		
107+	0008		
108+	000C		
109+	0010		
110+	0020		
111+			
112+			
113+	0045		
114+	004B		


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;
;
; OPERATING SYSTEM EQUATES
;
; COMMAND CODES FOR IOCB
OPEN      = 3      ; OPEN FOR INPUT/OUTPUT
GETREC    = 5      ; GET RECORD (TEXT)
GETCHR    = 7      ; GET CHARACTER(S)
PUTREC    = 9      ; PUT RECORD (TEXT)
PUTCHR    = 0B     ; PUT CHARACTER(S)
CLOSE     = 0C     ; CLOSE DEVICE
STATIS    = 0D     ; STATUS REQUEST
SPECIL    = 0E     ; BEGINNING OF SPECIAL ENTRY COMMANDS
;
; SPECIAL ENTRY COMMANDS
DRAWLN    = 011    ; DRAW LINE
FILLIN    = 012    ; DRAW LINE WITH RIGHT FILL
RENAME    = 020    ; RENAME DISK FILE
DELETE    = 021    ; DELETE DISK FILE
FORMAT    = 022    ; FORMAT
LOCKFL    = 023    ; LOCK FILE TO READ ONLY
UNLOCK    = 024    ; UNLOCK LOCKED FILE
POINT     = 025    ; POINT SECTOR
NOTE      = 026    ; NOTE SECTOR
IOCFRE    = 0FF    ; IOCB "FREE"
;
; AUX1 EQUATES
; ( ) INDICATES WHICH DEVICES USE BIT
APPEND    = 01     ; OPEN FOR WRITE APPEND (D), OR SCREEN READ (E)
DIRECT    = 02     ; OPEN FOR DIRECTORY ACCESS (D)
OPNIN     = 04     ; OPEN FOR INPUT (ALL DEVICES)
OPNOT     = 08     ; OPEN FOR OUTPUT (ALL DEVICES)
OPNING    = OPNIN+OPNOT ; OPEN FOR INPUT AND OUTPUT (ALL DEVICES)
MXDMOD    = 010    ; OPEN FOR MIXED MODE (E,S)
INSCLR    = 020    ; OPEN WITHOUT CLEARING SCREEN (E,S)
;
; DEVICE NAMES
SCREDT    = 'E'     ; SCREEN EDITOR (R/W)
KBD       = 'K'     ; KEYBOARD (R ONLY)

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115+	0053	DISPLY = 'S	; SCREEN DISPLY (R/W)
116+	0050	PRINTR = 'P	; PRINTER (W ONLY)
117+	0043	CASSET = 'C	; CASSETTE
118+	004D	MODEM = 'M	; MODEM
119+	0044	DISK = 'D	; DISK (R/W)
120+			
121+		; SYSTEM EOL (CARRIAGE RETURN)	
122+	009B	CR = 09B	
123+			
124+			
125+		OPERATING SYSTEM STATUS CODES	
126+			
127+	0001	SUCCESS = 001	; SUCCESSFUL OPERATION
128+			
129+	0080	BRKABT = 080	; BREAK KEY ABORT
130+	0081	PRVOPN = 081	; IOCB ALREADY OPEN
131+	0082	NONDEV = 082	; NON-EXISTANT DEVICE
132+	0083	WRONLY = 083	; IOCB OPENED FOR WRITE ONLY
133+	0084	NVALID = 084	; INVALID COMMAND
134+	0085	NOTOPN = 085	; DEVICE OR FILE NOT OPEN
135+	0086	BADIOC = 086	; INVALID IOCB NUMBER
136+	0087	RONLY = 087	; IOCB OPENED FOR READ ONLY
137+	0088	EOFERR = 088	; END OF FILE
138+	0089	TRNRCD = 089	; TRUNCATED RECORD
139+	008A	TIMOUT = 08A	; PERIPHERAL DEVICE TIME OUT
140+	008B	DNACK = 08B	; DEVICE DOES NOT ACKNOWLEDGE COMMAND
141+	008C	FRMERR = 08C	; SERIAL BUS FRAMING ERROR
142+	008D	CRSRDR = 08D	; CURSOR OVERRANGE
143+	008E	OVRRUN = 08E	; SERIAL BUS DATA OVERRUN
144+	008F	CHKERR = 08F	; SERIAL BUS CHECKSUM ERROR
145+			
146+	0090	DERROR = 090	; PERIPHERAL DEVICE ERROR (OPERATION NOT COMPLETED)
147+	0091	BADMOD = 091	; BAD SCREEN MODE NUMBER
148+	0092	FNCNOT = 092	; FUNCTION NOT IMPLEMENTED IN HANDLER
149+	0093	SCRMEM = 093	; INSUFICIENT MEMORY FOR SCREEN MODE
150+			
151+			
152+			
153+			
154+			
155+			
156+		PAGE ZERO RAM ASSIGNMENTS	
157+			
158+		=0000	
159+	0000	LINZB9: = +2	; LINBUG RAM (WILL BE REPLACED BY MONITOR RAM)
160+			
161+		THESE LOCATIONS ARE NOT CLEARED	
162+	0002	CASINI: = +2	; CASSETTE INIT LOCATION
163+	0004	RAMLD: = +2	; RAM POINTER FOR MEMORY TEST
164+	0006	TRAMSZ: = +1	; TEMPORARY REGISTER FOR RAM SIZE
165+	0007	TSTDAT: = +1	; RAM TEST DATA REGISTER
166+			
167+		CLEARED ON COLDSTART ONLY	
168+	0008	WARMST: = +1	; WARM START FLAG
169+	0009	BOOT: = +1	; SUCCESSFUL BOOT FLAG
170+	000A	DOSVEC: = +2	; DISK SOFTWARE START VECTOR
171+	000C	DOSINI: = +2	; DISK SOFTWARE INIT ADDRESS

172+	000E	0010	APPMHI: = +2	APPLICATIONS MEMORY HI LIMIT
173+				
174+				CLEARED ON COLD OR WARM START
175+		0010	INTZBS =	INTERRUPT HANDLER
176+	0010	0011	POKMSK: = +1	SYSTEM MASK FOR POKEY IRQ ENABLE
177+	0011	0012	BRKKEY: = +1	BREAK KEY FLAG
178+	0012	0015	RTCLOK: = +3	REAL TIME CLOCK (IN 16 MSEC UNITS)
179+				
180+	0015	0017	BUFADR: = +2	INDIRECT BUFFER ADDRESS REGISTER
181+				
182+	0017	0018	ICCOMT: = +1	COMMAND FOR VECTOR
183+				
184+	0018	001A	DSKFMS: = +2	DISK FILE MANAGER POINTER
185+	001A	001C	DSKUTL: = +2	DISK UTILITIES POINTER
186+				
187+	001C	001D	PTIMOT: = +1	PRINTER TIME OUT REGISTER
188+	001D	001E	PBPNT: = +1	PRINT BUFFER POINTER
189+	001E	001F	PBUFSZ: = +1	PRINT BUFFER SIZE
190+	001F	0020	PTEMP: = +1	TEMPORARY REGISTER
191+				
192+		0020	ZIOCB =	ZERO PAGE I/O CONTROL BLOCK
193+		0010	IOCBSZ = 16	NUMBER OF BYTES PER IOCB
194+		0080	MAXIOC = 8*IOCBSZ	LENGTH OF THE IOCB AREA
195+		0020	IOCBAS =	
196+	0020	0021	ICHIDZ: = +1	HANDLER INDEX NUMBER (FF = IOCB FREE)
197+	0021	0022	ICDNOZ: = +1	DEVICE NUMBER (DRIVE NUMBER)
198+	0022	0023	ICCOMZ: = +1	COMMAND CODE
199+	0023	0024	ICSTAZ: = +1	STATUS OF LAST IOCB ACTION
200+	0024	0025	ICBALZ: = +1	BUFFER ADDRESS LOW BYTE
201+	0025	0026	ICBAHZ: = +1	
202+	0026	0027	ICPTLZ: = +1	PUT BYTE ROUTINE ADDRESS - 1
203+	0027	0028	ICPTHZ: = +1	
204+	0028	0029	ICBLLZ: = +1	BUFFER LENGTH LOW BYTE
205+	0029	002A	ICBLHZ: = +1	
206+	002A	002B	ICAX1Z: = +1	AUXILIARY INFORMATION FIRST BYTE
207+	002B	002C	ICAX2Z: = +1	
208+	002C	0030	ICSPRZ: = +4	TWO SPARE BYTES (CIO LOCAL USE)
209+		002E	ICIDNO = ICSPRZ+2	IOCB NUMBER X 16
210+		002F	CIOCHR = ICSPRZ+3	CHARACTER BYTE FOR CURRENT OPERATION
211+				
212+	0030	0031	STATUS: = +1	INTERNAL STATUS STORAGE
213+	0031	0032	CHKSUM: = +1	CHECKSUM (SINGLE BYTE SUM WITH CARRY)
214+	0032	0033	BUFRLO: = +1	POINTER TO DATA BUFFER (LO BYTE)
215+	0033	0034	BUFRHI: = +1	POINTER TO DATA BUFFER (HI BYTE)
216+	0034	0035	BFENLO: = +1	NEXT BYTE PAST END OF THE DATA BUFFER (LO BYTE)
217+	0035	0036	BFENHI: = +1	NEXT BYTE PAST END OF THE DATA BUFFER (HI BYTE)
218+	0036	0037	CRETRY: = +1	NUMBER OF COMMAND FRAME RETRIES
219+	0037	0038	DRETRY: = +1	NUMBER OF DEVICE RETRIES
220+	0038	0039	BUFRFL: = +1	DATA BUFFER FULL FLAG
221+	0039	003A	RECVDN: = +1	RECEIVE DONE FLAG
222+	003A	003B	XMTDON: = +1	TRANSMISSION DONE FLAG
223+	003B	003C	CHKSNT: = +1	CHECKSUM SENT FLAG
224+	003C	003D	NOCKSM: = +1	NO CHECKSUM FOLLOWS DATA FLAG
225+				
226+				
227+	003D	003E	BPTR: = +1	
228+	003E	003F	FTYPE: = +1	

229+	003F	0040	FEOF:	= +1	
230+	0040	0041	FREQ:	= +1	
231+	0041	0042	SOUNDR:	= +1	NOISY I/O FLAG (ZERO IS QUIET)
232+	0042	0043	CRITIC:	= +1	DEFINES CRITICAL SECTION (CRITICAL IF NON-ZERO)
233+					
234+	0043	004A	FMSZPO:	= +7	DISK FILE MANAGER SYSTEM ZERO PAGE
235+					
236+					
237+	004A	004B	CKEY:	= +1	FLAG SET WHEN GAME START PRESSED
238+	004B	004C	CASSBT:	= +1	CASSETTE BOOT FLAG
239+	004C	004D	DSTAT:	= +1	DISPLAY STATUS
240+					
241+	004D	004E	ATRACT:	= +1	ATRACT FLAG
242+	004E	004F	DRKMSK:	= +1	DARK ATRACT MASK
243+	004F	0050	COLRSH:	= +1	ATRACT COLOR SHIFTER (EOR'ED WITH PLAYFIELD COLORS)
244+					
245+		0002	LEDGE	= 2	LMARGN'S VALUE AT COLD START
246+		0027	REDGE	= 39	RMARGN'S VALUE AT COLD START
247+	0050	0051	TMPCHR:	= +1	
248+	0051	0052	HOLD1:	= +1	
249+	0052	0053	LMARGN:	= +1	LEFT MARGIN (SET TO 1 AT POWER ON)
250+	0053	0054	RMARGN:	= +1	RIGHT MARGIN (SET TO 38 AT POWER ON)
251+	0054	0055	ROWCRS:	= +1	CURSOR COUNTERS
252+	0055	0057	COLCRS:	= +2	
253+	0057	0058	DINDEX:	= +1	
254+	0058	005A	SAVMSC:	= +2	
255+	005A	005B	OLDROW:	= +1	
256+	005B	005D	OLDCOL:	= +2	
257+	005D	005E	OLDCHR:	= +1	DATA UNDER CURSOR
258+	005E	0060	OLDADR:	= +2	
259+	0060	0061	NEWROW:	= +1	POINT DRAW GOES TO
260+	0061	0063	NEWCOL:	= +2	
261+	0063	0064	LOGCOL:	= +1	POINTS AT COLUMN IN LOGICAL LINE
262+	0064	0066	ADRESS:	= +2	
263+	0066	006B	MLTTMP:	= +2	
264+		0066	OPNTMP	= MLTTMP	FIRST BYTE IS USED IN OPEN AS TEMP
265+	006B	006A	SAVADR:	= +2	
266+	006A	006B	RAMTOP:	= +1	RAM SIZE DEFINED BY POWER ON LOGIC
267+	006B	006C	BUFCNT:	= +1	BUFFER COUNT
268+	006C	006E	BUFSTR:	= +2	EDITOR GETCH POINTER
269+	006E	006F	BITMSK:	= +1	BIT MASK
270+	006F	0070	SHFAMT:	= +1	
271+	0070	0072	ROWAC:	= +2	
272+	0072	0074	COLAC:	= +2	
273+	0074	0076	ENDPT:	= +2	
274+	0076	0077	DELTAR:	= +1	
275+	0077	0079	DELTAC:	= +2	
276+	0079	007A	ROWINC:	= +1	
277+	007A	007B	COLINC:	= +1	
278+	007B	007C	SWPFLG:	= +1	NON-0 IF TXT AND REGULAR RAM IS SWAPPED
279+	007C	007D	HOLDCH:	= +1	CH IS MOVED HERE IN KGETCH BEFORE CNTL & SHIFT PROC
280+	007D	007E	INSDAT:	= +1	
281+	007E	0080	COUNTR:	= +2	
282+					
283+					
284+					
285+					

286+ 80 - FF ARE RESERVED FOR USER APPLICATIONS

287+

288+

289+

290+

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296+

297+

298+

299+

300+

301+

302+

303+

304+

305+

306+

307+

308+

309+

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315+

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318+

319+

320+

321+

322+

323+

324+

325+

326+

327+

328+

329+

330+

331+

332+

333+

334+

335+

336+

337+

338+

339+

340+

341+

342+

PAGE 1 - STACK

PAGE TWO RAM ASSIGNMENTS

=0200

INTABS	=	:	INTERRUPT RAM
VDSLST	= +2	:	DISPLAY LIST NMI VECTOR
VPRCED	= +2	:	PROCEED LINE IRQ VECTOR
VINTER	= +2	:	INTERRUPT LINE IRQ VECTOR
VBREAK	= +2	:	SOFTWARE BREAK (00) INSTRUCTION IRQ VECTOR
VKEYBD	= +2	:	POKEY KEYBOARD IRQ VECTOR
VSERIN	= +2	:	POKEY SERIAL INPUT READY IRQ
VSEROR	= +2	:	POKEY SERIAL OUTPUT READY IRQ
VSEROC	= +2	:	POKEY SERIAL OUTPUT COMPLETE IRQ
VTIMR1	= +2	:	POKEY TIMER 1 IRQ
VTIMR2	= +2	:	POKEY TIMER 2 IRQ
VTIMR4	= +2	:	POKEY TIMER 4 IRQ
VIMIRG	= +2	:	IMMEDIATE IRQ VECTOR
CDTMV1	= +2	:	COUNT DOWN TIMER 1
CDTMV2	= +2	:	COUNT DOWN TIMER 2
CDTMV3	= +2	:	COUNT DOWN TIMER 3
CDTMV4	= +2	:	COUNT DOWN TIMER 4
CDTMV5	= +2	:	COUNT DOWN TIMER 5
VVBLK1	= +2	:	IMMEDIATE VERTICAL BLANK NMI VECTOR
VVBLKD	= +2	:	DEFERRED VERTICAL BLANK NMI VECTOR
CDTMA1	= +2	:	COUNT DOWN TIMER 1 JSR ADDRESS
CDTMA2	= +2	:	COUNT DOWN TIMER 2 JSR ADDRESS
CDTMF3	= +1	:	COUNT DOWN TIMER 3 FLAG
SRTIMR	= +1	:	SOFTWARE REPEAT TIMER
CDTMF4	= +1	:	COUNT DOWN TIMER 4 FLAG
INTMP	= +1	:	IAN'S TEMP (RENAMED FROM T1 BY POPULAR DEMAND)
CDTMF5	= +1	:	COUNT DOWN TIMER FLAG 5
SDMCTL	= +1	:	SAVE DMACTL REGISTER
SDLSTL	= +1	:	SAVE DISPLAY LIST LOW BYTE
SDLSTH	= +1	:	SAVE DISPLAY LIST HI BYTE
SSKCTL	= +1	:	SKCTL REGISTER RAM
	= +1	:	
LPENH	= +1	:	LIGHT PEN HORIZONTAL VALUE
LPENV	= +1	:	LIGHT PEN VERTICAL VALUE
	= +2	:	SPARE BYTES
	= +2	:	SPARE
CDEVIC	= +1	:	COMMAND FRAME BUFFER - DEVICE

343+	023B	023C	CCOMND:	= +1	/	COMMAND
344+	023C	023D	CAUX1:	= +1	/	COMMAND AUX BYTE 1
345+	023D	023E	CAUX2:	= +1	/	COMMAND AUX BYTE 2
346+						
347+	023E	023F	TEMP:	= +1	/	NOTE: MAY NOT BE THE LAST WORD ON A PAGE ; TEMPORARY RAM CELL
348+						
349+	023F	0240	ERRFLG:	= +1	/	NOTE: MAY NOT BE THE LAST WORD ON A PAGE ; ERROR FLAG - ANY DEVICE ERROR EXCEPT TIME OUT
350+						
351+	0240	0241	DFLAGS:	= +1	/	; DISK FLAGS FROM SECTOR ONE
352+	0241	0242	DBSECT:	= +1	/	; NUMBER OF DISK BOOT SECTORS
353+	0242	0244	BOOTAD:	= +2	/	; ADDRESS WHERE DISK BOOT LOADER WILL BE PUT
354+	0244	0245	COLDST:	= +1	/	; COLDSTART FLAG (1=IN MIDDLE OF COLDSTART)
355+						
356+		0246		= +1	/	; SPARE
357+						
358+	0246	0247	DSKTIM:	= +1	/	; DISK TIME OUT REGISTER
359+						
360+	0247	026F	LINBUF:	= +40	/	; CHAR LINE BUFFER
361+						
362+	026F	0270	GPRIOR:	= +1	/	; GLOBAL PRIORITY CELL
363+						
364+	0270	0271	PADDL0:	= +1	/	; POTENTIOMETER 0 RAM CELL
365+	0271	0272	PADDL1:	= +1	/	
366+	0272	0273	PADDL2:	= +1	/	
367+	0273	0274	PADDL3:	= +1	/	
368+	0274	0275	PADDL4:	= +1	/	
369+	0275	0276	PADDL5:	= +1	/	
370+	0276	0277	PADDL6:	= +1	/	
371+	0277	0278	PADDL7:	= +1	/	
372+	0278	0279	STICK0:	= +1	/	; JOYSTICK 0 RAM CELL
373+	0279	027A	STICK1:	= +1	/	
374+	027A	027B	STICK2:	= +1	/	
375+	027B	027C	STICK3:	= +1	/	
376+	027C	027D	PTRIG0:	= +1	/	; PADDLE TRIGGER 0
377+	027D	027E	PTRIG1:	= +1	/	
378+	027E	027F	PTRIG2:	= +1	/	
379+	027F	0280	PTRIG3:	= +1	/	
380+	0280	0281	PTRIG4:	= +1	/	
381+	0281	0282	PTRIG5:	= +1	/	
382+	0282	0283	PTRIG6:	= +1	/	
383+	0283	0284	PTRIG7:	= +1	/	
384+	0284	0285	STRIG0:	= +1	/	; JOYSTICK TRIGGER 0
385+	0285	0286	STRIG1:	= +1	/	
386+	0286	0287	STRIG2:	= +1	/	
387+	0287	0288	STRIG3:	= +1	/	
388+						
389+	0288	0289	CSTAT:	= +1	/	
390+	0289	028A	WMODE:	= +1	/	
391+	028A	028B	BLIM:	= +1	/	
392+						
393+		0290		= +5	/	; SPARE
394+						
395+						
396+						
397+						
398+	0290	0291	TXTRW:	= +1	/	; TEXT ROWCRS
399+	0291	0293	TXTCOL:	= +2	/	; TEXT COLCRS

400+	0293	0294	TINDEX:	= +1	TEXT INDEX
401+	0294	0296	TXTMSC:	= +2	FOOLS CONVRT INTO NEW MSC
402+	0296	029C	TXTOLD:	= +6	OLDROW & OLD COL FOR TEXT (AND THEN SOME)
403+	029C	029D	TMPIX1:	= +1	
404+	029D	029E	HOLD3:	= +1	
405+	029E	029F	SUBTMP:	= +1	
406+	029F	02A0	HOLD2:	= +1	
407+	02A0	02A1	DMASK:	= +1	
408+	02A1	02A2	TMPLBT:	= +1	
409+	02A2	02A3	ESCFLG:	= +1	ESCAPE FLAG
410+	02A3	02B2	TABMAP:	= +15	
411+	02B2	02B6	LOGMAP:	= +4	LOGICAL LINE START BIT MAP
412+	02B6	02B7	INVFLG:	= +1	INVERSE VIDEO FLAG (TOGGLED BY ATARI KEY)
413+	02B7	02B8	FILFLG:	= +1	RIGHT FILL FLAG FOR DRAW
414+	02B8	02B9	TMPCOL:	= +1	
415+	02B9	02BB	TMPCOL:	= +2	
416+	02BB	02BC	SCRFLG:	= +1	SET IF SCROLL OCCURS
417+	02BC	02BD	HOLD4:	= +1	TEMP CELL USED IN DRAW ONLY
418+	02BD	02BE	HOLD5:	= +1	DITTO
419+	02BE	02BF	SHFLOK:	= +1	
420+	02BF	02C0	BOTSCR:	= +1	BOTTOM OF SCREEN : 24 NORM 4 SPLIT
421+					
422+					
423+	02C0	02C1	PCOLR0:	= +1	P0 COLOR
424+	02C1	02C2	PCOLR1:	= +1	P1 COLOR
425+	02C2	02C3	PCOLR2:	= +1	P2 COLOR
426+	02C3	02C4	PCOLR3:	= +1	P3 COLOR
427+	02C4	02C5	COLOR0:	= +1	COLOR 0
428+	02C5	02C6	COLOR1:	= +1	
429+	02C6	02C7	COLOR2:	= +1	
430+	02C7	02C8	COLOR3:	= +1	
431+	02C8	02C9	COLOR4:	= +1	
432+					
433+					
434+	02E0			= +23	SPARE
435+					
436+					
437+					
438+	02E0		GLBABS	=	GLOBAL VARIABLES
439+					
440+	02E4			= +4	SPARE
441+					
442+	02E4	02E5	RAMSIZ:	= +1	RAM SIZE (HI BYTE ONLY)
443+	02E5	02E7	MEMTOP:	= +2	TOP OF AVAILABLE USER MEMORY
444+	02E7	02E9	MEMLO:	= +2	BOTTOM OF AVAILABLE USER MEMORY
445+		02EA		= +1	SPARE
446+	02EA	02EE	DVSTAT:	= +4	STATUS BUFFER
447+	02EE	02EF	CBAUDL:	= +1	CASSETTE BAUD RATE LOW BYTE
448+	02EF	02F0	CBAUDH:	= +1	
449+					
450+	02F0	02F1	CRSINH:	= +1	CURSOR INHIBIT (00 = CURSOR ON)
451+	02F1	02F2	KEYDEL:	= +1	KEY DELAY
452+	02F2	02F3	CH1:	= +1	
453+					
454+	02F3	02F4	CHACT:	= +1	CHACTL REGISTER RAM
455+	02F4	02F5	CHBAS:	= +1	CHBAS REGISTER RAM
456+					

457+	02FA		= +5	SPARE BYTES
458+				
459+	02FA	02FB	CHAR:	= +1
460+	02FB	02FC	ATACHR:	= +1 ; ATASCII CHARACTER
461+	02FC	02FD	CH:	= +1 ; GLOBAL VARIABLE FOR KEYBOARD
462+	02FD	02FE	FILDAT:	= +1 ; RIGHT FILL DATA (DRAW)
463+	02FE	02FF	DSPFLG:	= +1 ; DISPLAY FLAG : DISPLAY CNTLS IF NON-ZERO
464+	02FF	0300	SSFLAG:	= +1 ; START/STOP FLAG FOR PAGING (CNTL 1). CLEARED BY BREAK

PAGE THREE RAM ASSIGNMENTS

474+	0300		DCB	=	DEVICE CONTROL BLOCK
475+	0300	0301	DDEVIC:	= +1	PERIPHERAL UNIT 1 BUS I. D. NUMBER
476+	0301	0302	DUNIT:	= +1	UNIT NUMBER
477+	0302	0303	DCOMND:	= +1	BUS COMMAND
478+	0303	0304	DSTAT:	= +1	COMMAND TYPE/STATUS RETURN
479+	0304	0305	DBUFLO:	= +1	DATA BUFFER POINTER LOW BYTE
480+	0305	0306	DBUFHI:	= +1	
481+	0306	0307	DTIMLO:	= +1	DEVICE TIME OUT IN 1 SECOND UNITS
482+	0307	0308	DUNUSE:	= +1	UNUSED BYTE
483+	0308	0309	DBYTLO:	= +1	NUMBER OF BYTES TO BE TRANSFERRED LOW BYTE
484+	0309	030A	DBYTHI:	= +1	
485+	030A	030B	DAUX1:	= +1	COMMAND AUXILIARY BYTE 1
486+	030B	030C	DAUX2:	= +1	
487+					
488+	030C	030E	TIMER1:	= +2	INITIAL TIMER VALUE
489+	030E	030F	ADDCOR:	= +1	ADDITION CORRECTION
490+	030F	0310	CASFLG:	= +1	CASSETTE MODE WHEN SET
491+	0310	0312	TIMER2:	= +2	FINAL TIMER VALUE. THESE TWO TIMER VALUES
492+					ARE USED TO COMPUTE INTERVAL FOR BAUD RATE
493+	0312	0314	TEMP1:	= +2	TEMPORARY STORAGE REGISTER
494+	0314	0315	TEMP2:	= +1	TEMPORARY STORAGE REGISTER
495+	0315	0316	TEMP3:	= +1	TEMPORARY STORAGE REGISTER
496+	0316	0317	SAVID:	= +1	SAVE SERIAL IN DATA PORT
497+	0317	0318	TIMFLO:	= +1	TIME OUT FLAG FOR BAUD RATE CORRECTION
498+	0318	0319	STACKP:	= +1	SIO STACK POINTER SAVE CELL
499+	0319	031A	TSTAT:	= +1	TEMPORARY STATUS HOLDER
500+					
501+					
502+					
503+	031A	0340	HATABS:	= +38	HANDLER ADDRESS TABLE
504+		0021	MAXDEV	= -HATABS-5	MAXIMUM HANDLER ADDRESS INDEX
505+					
506+					
507+					
508+	0340	0340	IOCB:	=	I/O CONTROL BLOCKS
509+	0340	0341	ICHID:	= +1	HANDLER INDEX NUMBER (FF = IOCB FREE)
510+	0341	0342	ICDNO:	= +1	DEVICE NUMBER (DRIVE NUMBER)
511+	0342	0343	ICCOM:	= +1	COMMAND CODE
512+	0343	0344	ICSTA:	= +1	STATUS OF LAST IOCB ACTION
513+	0344	0345	ICBAL:	= +1	BUFFER ADDRESS LOW BYTE

NOTE : THE ENTIRE IOCB DEFINITIONS HAVE BEEN MODIFIED

514+	0345	0346	ICBAH:	= +1	
515+	0346	0347	ICPTL:	= +1	; PUT BYTE ROUTINE ADDRESS - 1
516+	0347	0348	ICPTH:	= +1	
517+	0348	0349	ICBLL:	= +1	; BUFFER LENGTH LOW BYTE
518+	0349	034A	ICBLH:	= +1	
519+	034A	034B	ICAX1:	= +1	; AUXILIARY INFORMATION FIRST BYTE
520+	034B	034C	ICAX2:	= +1	
521+	034C	0350	ICSPR:	= +4	; FOUR SPARE BYTES
522+		03C0		= +MAXIOC-IOCBSZ	
523+					
524+	03C0	03EB	PRNBUF:	= +40.	; PRINTER BUFFER
525+					
526+		03FD		= +21.	; SPARE BYTES
527+					
528+					
529+					
530+					
531+					
532+					
533+					
534+					PAGE FOUR RAM ASSIGNMENTS
535+					
536+	03FD	0480	CASBUF:	= +131.	; CASSETTE BUFFER
537+					
538+					; USER AREA STARTS HERE AND GOES TO END OF PAGE FIVE
539+	0480	0500	USAREA:	= +128.	; SPARE
540+					
541+					
542+					
543+					
544+					
545+					
546+					
547+					PAGE FIVE RAM ASSIGNMENTS
548+					
549+					PAGE FIVE IS RESERVED AS A USER WORK SPACE
550+					
551+					NOTE: SEE FLOATING POINT SUBROUTINE AREA FOR PAGE FIVE CELLS
552+					
553+					
554+					PAGE SIX RAM ASSIGNMENTS
555+					
556+					PAGE SIX IS RESERVED AS A USER'S USER WORK SPACE
557+					
558+					
559+					
560+					
561+					FLOATING POINT SUBROUTINES
562+					
563+	0006		FPREC	=	6
564+					; FLOATING PT PRECISION (# OF BYTES)
565+	D800		AFP	=	0D800
566+					; IF CARRY USED THEN CARRY CLEAR => NO ERROR, CARRY SET => ERR
567+	D8E6		FASC	=	0D8E6
568+	D9AA		IFP	=	0D9AA
569+					; ASCII->FLOATING POINT (FP)
570+	D9D2		FPI	=	0D9D2
					INBUFF+CIX -> FRO, CIX, CARRY
					; FP -> ASCII FRO-> LBUFF (INBUFF)
					; INTEGER -> FP
					0-OFFFF (LSB,MSB) IN FRO, FRO+1->FRO
					; FP -> INTEGER FRO -> FRO, FRO+1, CARRY


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571+      DA60      FSUB      =      ODA60      ; FRO <- FRO - FR1 , CARRY
572+      DA66      FADD      =      ODA66      ; FRO <- FRO + FR1 , CARRY
573+      DADB      FMUL      =      ODA6B      ; FRO <- FRO * FR1 , CARRY
574+      DB2B      FDIV      =      ODB2B      ; FRO <- FRO / FR1 , CARRY
575+      DD89      FLDOR      =      ODD89      ; FLOATING LOAD REGO FRO <- (X,Y)
576+      DD8D      FLDGP      =      ODD8D      ; " " " FRO <- (FLPTR)
577+      DD9B      FLD1R      =      ODD9B      ; " " REG1 FR1 <- (X,Y)
578+      DD9C      FLD1P      =      ODD9C      ; " " " FR1 <- (FLPTR)
579+      DDA7      FSTOR      =      ODDA7      ; FLOATING STORE REGO (X,Y) <- FRO
580+      DDAB      FSTOP      =      ODDAB      ; " " " (FLPTR) <- FRO
581+      DDB6      FMOVE      =      ODDB6      ; FR1 <- FRO
582+      DD40      PLYEVL      =      ODD40      ; FRO <- P(Z) = SUM(I=N TO 0) (A(I)*Z**I) CARRY
583+      ;          ;          ;          ; INPUT: (X,Y) = A(N), A(N-1) ... A(0) -> PLYARG
584+      ;          ;          ;          ; ACC = # OF COEFFICIENTS = DEGREE+1
585+      ;          ;          ;          ; FRO = Z
586+      DDC0      EXP      =      ODDC0      ; FRO <- E**FRO = EXP10(FRO * LOG10(E)) CARRY
587+      DDCC      EXP10      =      ODDCC      ; FRO <- 10**FRO CARRY
588+      DECD      LDG      =      ODECD      ; FRO <- LN(FRO) = LOG10(FRO)/LOG10(E) CARRY
589+      DED1      LDG10      =      ODED1      ; FRO <- LOG10 (FRO) CARRY
590+
591+      ;          ;          ;          ; THE FOLLOWING ARE IN BASIC CARTRIDGE.
592+      ; SIN      =      ODB81      ; FRO <- SIN(FRO) DEGFLG=0 =>RADS, 6=>DEG. CARRY
593+      ; COS      =      OBD73      ; FRO <- COS(FRO) CARRY
594+      BE43      ATAN      =      OBE43      ; FRO <- ATAN(FRO) CARRY
595+      BEB1      SQR      =      OBEB1      ; FRO <- SQUAREROOT(FRO) CARRY
596+
597+
598+      ; FLOATING POINT ROUTINES ZERO PAGE (NEEDED ONLY IF F.P. ROUTINES ARE CALLED)
599+      ;=OD4
600+      00D4      00DA      FRO:      = +FPREC      ; FP REGO
601+      00DA      00E0      FRE:      = +FPREC
602+      00E0      00E6      FR1:      = +FPREC      ; FP REG1
603+      00E6      00EC      FR2:      = +FPREC
604+      00EC      00ED      FRX:      = +1      ; FP SPARE
605+      00ED      00EE      EEXP:      = +1      ; VALUE OF E
606+      00EE      00EF      NSIGN:      = +1      ; SIGN OF #
607+      00EF      00F0      ESIGN:      = +1      ; SIGN OF EXPONENT
608+      00F0      00F1      FCHRFLG:      = +1      ; 1ST CHAR FLAG
609+      00F1      00F2      DIGRT:      = +1      ; # OF DIGITS RIGHT OF DECIMAL
610+      00F2      00F3      CIX:      = +1      ; CURRENT INPUT INDEX
611+      00F3      00F5      INBUFF:      = +2      ; POINTS TO USER'S LINE INPUT BUFFER
612+      00F5      00F7      ZTEMP1:      = +2
613+      00F7      00F9      ZTEMP4:      = +2
614+      00F9      00FB      ZTEMP3:      = +2
615+      00FB      DEGFLG:      = +1      ; 0=RADIANS, 6=DEGREES
616+      00FB      RADFLG:      = +1      ; INDICATES RADIANS
617+      0000      RADON      =      0      ; INDICATES DEGREES
618+      0006      DEGON      =      6      ; INDICATES DEGREES
619+      00FC      FLPTR:      = +2      ; POINTS TO USER'S FLOATING PT NUMBER
620+      00FE      FPTR2:      = +2
621+
622+      ; FLOATING PT ROUTINES' NON-ZERO PAGE RAM (NEEDED ONLY IF F.P. ROUTINES CALLED)
623+      ;=057E
624+      057E      057F      LBPR1:      = +1      ; LBUFF PREFIX 1
625+      057F      0580      LBPR2:      = +1      ; LBUFF PREFIX 2
626+      0580      0600      LBUFF:      = +128      ; LINE BUFFER
627+      05E0      PLYARG      =      LBUFF+060      ; POLYNOMIAL ARGUMENTS

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628+      05E6      FPSCR =      PLYARG+FPREC
629+      05EC      FPSCR1 =     FPSCR+FPREC
630+      05E6      FSCR  =      FPSCR
631+      05EC      FSCR1 =      FPSCR1
632+      05FF      LBFEND =      -1      ; END OF LBUFF
633+
634+
635+
636+
637+
638+
639+
640+
641+
642+
643+

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COLLEEN MNEMONICS

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644+      D200      POKEY  =      OD200      ; VBLANK ACTION:      DESCRIPTION:
645+      D200      POT0   =      POKEY+0      ; POT0-->PADDL0      0-227 IN RAM CELL
646+      D201      POT1   =      POKEY+1      ; POT1-->PADDL1      0-227 IN RAM CELL
647+      D202      POT2   =      POKEY+2      ; POT2-->PADDL2      0-227 IN RAM CELL
648+      D203      POT3   =      POKEY+3      ; POT3-->PADDL3      0-227 IN RAM CELL
649+      D204      POT4   =      POKEY+4      ; POT4-->PADDL4      0-227 IN RAM CELL
650+      D205      POT5   =      POKEY+5      ; POT5-->PADDL5      0-227 IN RAM CELL
651+      D206      POT6   =      POKEY+6      ; POT6-->PADDL6      0-227 IN RAM CELL
652+      D207      POT7   =      POKEY+7      ; POT7-->PADDL7      0-227 IN RAM CELL
653+      D208      ALLPOT =      POKEY+8      ; ???
654+      D209      KBCODE =      POKEY+9
655+      D20A      RANDOM =      POKEY+10
656+      D20B      POTG0  =      POKEY+11      ; STROBED
657+      D20D      SERIN  =      POKEY+13
658+      D20E      IRGST  =      POKEY+14
659+      D20F      SKSTAT =      POKEY+15
660+      D200      AUDF1  =      POKEY+0
661+      D201      AUDC1  =      POKEY+1
662+      D202      AUDF2  =      POKEY+2
663+      D203      AUDC2  =      POKEY+3
664+      D204      AUDF3  =      POKEY+4
665+      D205      AUDC3  =      POKEY+5
666+      D206      AUDF4  =      POKEY+6
667+      D207      AUDC4  =      POKEY+7
668+      D208      AUDCTL =      POKEY+8      ; NONE      AUDCTL<--[SIO]
669+      D209      STIMER =      POKEY+9
670+      D20A      SKRES  =      POKEY+10      ; NONE      SKRES<--[SIO]
671+      D20D      SEROUT =      POKEY+13      ; NONE      SEROUT<--[SIO]
672+      D20E      IRGEN  =      POKEY+14      ; POKMSK-->IRGEN (AFFECTED BY OPEN S OR E)
673+      D20F      SKCTL  =      POKEY+15      ; SSKCTL-->SKCTL      SSKCTL<--[SIO]
674+
675+      D000      CTIA   =      OD000      ; VBLANK ACTION:      DESCRIPTION:
676+      D000      HPOSP0 =      CTIA+0
677+      D001      HPOSP1 =      CTIA+1
678+      D002      HPOSP2 =      CTIA+2
679+      D003      HPOSP3 =      CTIA+3
680+      D004      HPOSM0 =      CTIA+4
681+      D005      HPOSM1 =      CTIA+5
682+      D006      HPOSM2 =      CTIA+6
683+      D007      HPOSM3 =      CTIA+7
684+      D008      SIZEP0 =      CTIA+8

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685+	D009	SIZEP1	=	CTIA+9		
686+	D00A	SIZEP2	=	CTIA+10		
687+	D00B	SIZEP3	=	CTIA+11		
688+	D00C	SIZEM	=	CTIA+12		
689+	D00D	GRAFP0	=	CTIA+13		
690+	D00E	GRAFP1	=	CTIA+14		
691+	D00F	GRAFP2	=	CTIA+15		
692+	D010	GRAFP3	=	CTIA+16		
693+	D011	GRAFM	=	CTIA+17		
694+	D012	COLPM0	=	CTIA+18	; PCOLR0-->COLPM0	WITH ATTRACT MODE
695+	D013	COLPM1	=	CTIA+19	; PCOLR1-->COLPM1	WITH ATTRACT MODE
696+	D014	COLPM2	=	CTIA+20	; PCOLR2-->COLPM2	WITH ATTRACT MODE
697+	D015	COLPM3	=	CTIA+21	; PCOLR3-->COLPM3	WITH ATTRACT MODE
698+	D016	COLPF0	=	CTIA+22	; COLOR0-->COLPF0	WITH ATTRACT MODE
699+	D017	COLPF1	=	CTIA+23	; COLOR1-->COLPF1	WITH ATTRACT MODE
700+	D018	COLPF2	=	CTIA+24	; COLOR2-->COLPF2	WITH ATTRACT MODE
701+	D019	COLPF3	=	CTIA+25	; COLOR3-->COLPF3	WITH ATTRACT MODE
702+	D01A	COLBK	=	CTIA+26	; COLOR4-->COLBK	WITH ATTRACT MODE
703+	D01B	PRIOR	=	CTIA+27	; (ON OPEN S: OR E:)	GPRIOR-->PRIOR
704+	D01C	VDELAY	=	CTIA+28		
705+	D01D	GRCTL	=	CTIA+29		
706+	D01E	HITCLR	=	CTIA+30		
707+	D01F	CONSOL	=	CTIA+31	; 008-->CONSOL	TURN OFF SPEAKER
708+	D000	M0PF	=	CTIA+0		
709+	D001	M1PF	=	CTIA+1		
710+	D002	M2PF	=	CTIA+2		
711+	D003	M3PF	=	CTIA+3		
712+	D004	P0PF	=	CTIA+4		
713+	D005	P1PF	=	CTIA+5		
714+	D006	P2PF	=	CTIA+6		
715+	D007	P3PF	=	CTIA+7		
716+	D008	M0PL	=	CTIA+8		
717+	D009	M1PL	=	CTIA+9		
718+	D00A	M2PL	=	CTIA+10		
719+	D00B	M3PL	=	CTIA+11		
720+	D00C	P0PL	=	CTIA+12		
721+	D00D	P1PL	=	CTIA+13		
722+	D00E	P2PL	=	CTIA+14		
723+	D00F	P3PL	=	CTIA+15		
724+	D010	TRIG0	=	CTIA+16	; TRIG0-->STRIG0	
725+	D011	TRIG1	=	CTIA+17	; TRIG1-->STRIG1	
726+	D012	TRIG2	=	CTIA+18	; TRIG2-->STRIG2	
727+	D013	TRIG3	=	CTIA+19	; TRIG3-->STRIG3	
728+						
729+	D400	ANTIC	=	OD400	; VBLANK ACTION	DESCRIPTION
730+	D400	DMACTL	=	ANTIC+0	; DMACTL<--SDMCTL	ON OPEN S: OR E:
731+	D401	CHACTL	=	ANTIC+1	; CHACTL<--CHACT	ON OPEN S: OR E:
732+	D402	DLISTL	=	ANTIC+2	; DLISTL<--SDLSTL	ON OPEN S: OR E:
733+	D403	DLISTH	=	ANTIC+3	; DLISTH<--SDLSTH	ON OPEN S: OR E:
734+	D404	HSCROL	=	ANTIC+4		
735+	D405	VSCROL	=	ANTIC+5		
736+	D407	PMBASE	=	ANTIC+7		
737+	D409	CHBASE	=	ANTIC+9	; CHBASE<--CHBAS	ON OPEN S: OR E:
738+	D40A	WSYNC	=	ANTIC+10		
739+	D40B	VCOUNT	=	ANTIC+11		
740+	D40C	PENH	=	ANTIC+12		
741+	D40D	PENV	=	ANTIC+13		

742+	D40E	NMIEN	=	ANTIC+14.	; NMIEN<--40	POWER ON AND [SETVBV]
743+	D40F	NMIRES	=	ANTIC+15.	; STROBED	
744+	D40F	NMIST	=	ANTIC+15.		
745+	D300	PIA	=	OD300	; VBLANK ACTION	DESCRIPTION
746+	D300	PORTA	=	PIA+0	; PORTA-->STICK0,1	X-Y CONTROLLERS
747+	D301	PORTB	=	PIA+1	; PORTB-->STICK2,3	X-Y CONTROLLERS
748+	D302	PACTL	=	PIA+2	; NONE	PACTL<--3C [INIT]
749+	D303	PBCTL	=	PIA+3	; NONE	PBCTL<--3C [INIT]
750+						
751+						
752+						
753+				.END		
755	0010			RADIX 16		
756				ENABLE AMA		
757	0600			ASECT		