

BASIC 2.0 / BASIC 4.0 Memory Map

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Reference to DOS, MLM, 80-Column, or those marked with an * are for BASIC 4.0 only. There are some differences between usage for the 40- and 80-column machines. 32K BASIC 4.0 Zero Page contents for 4000 and 8000 series machines after power up by Richard Evers. BASIC 2.0 Zero Page contents are mostly identical except for vectors.

Location		Contents				Description
Hex	Dec	4000 Hex Dec	8000 Hex Dec			
00-02	00	0-2	0 4C	76 4C	76	USR jump instruction
	01		1 73	115 73	115	JMP \$C373
	02		2 C3	195 C3	195	
03	03	3	3 22	34 22	34	Search character
04	04	4	4 00	0 00	0	Scan-between-quotes flag
05	05	5	5 5B	91 5B	91	Input buffer pointer
06	06	6	6 00	0 FF	255	Default DIM flag
07	07	7	7 00	0 00	0	Type: \$FF=string, \$00=numeric
08	08	8	8 00	0 00	0	Type: \$80=integer, 00=floating pt
09	09	9	9 04	4 04	4	Flag: DATA scan; LIST quote; memory
0A	0A	10	10 00	0 00	0	Subscript flag; FNx flag
0B	0B	11	11 00	0 00	0	0=INPUT; \$40=GET; \$98=READ
0C	0C	12	12 00	0 FF	255	ATN sign/comparison evaluation flag
0D-0F	0D	13-15	13 00	0 00	0	Disk status DS\$ descriptor
	0F		14 FF	255 FF	255	
	0F		15 00	0 00	0	
10	10	16	16 00	0 00	0	Current I/O prompt flag
11-12	11	17-18	17 72	114 72	114	Integer value (for SYS, GOTO etc.)
	12		18 D4	212 D4	212	
13-15	13	19-21	19 16	22 16	22	Pointers for descriptor stack
	14		20 13	19 13	19	
	15		21 00	0 00	0	
16-1E	16	22-30	22 08	8 08	8	Descriptor stack (temporary strings)
	17		23 12	18 12	18	
	18		24 B3	179 B3	179	
	19		25 00	0 00	0	
1A	1A		26 FF	255 FF	255	
1B	1B		27 00	0 00	0	
1C	1C		28 FF	255 FF	255	
1D	1D		29 00	0 00	0	
1E	1E		30 FF	255 FF	255	
1F-22	1F	31-34	31 40	64 40	64	Utility pointer area
	20		32 B2	178 B2	178	
	21		33 E9	233 E9	233	
	22		34 CE	206 CE	206	
23-27	23	35-39	35 48	72 00	0	Product area for multiplication
	24		36 00	0 FF	255	
	25		37 00	0 00	0	
	26		38 00	0 FF	255	
	27		39 00	0 00	0	
28-29	28	40-41	40 01	1 01	1	Pointer: Start of BASIC
	29		41 04	4 04	4	;0401
2A-2B	2A	42-43	42 03	3 03	3	Pointer: Start of Variables
	2B		43 04	4 04	4	;0403
2C-2D	2C	44-45	44 03	3 03	3	Pointer: Start of Arrays
	2D		45 04	4 04	4	;0403
2E-2F	2E	46-47	46 03	3 03	3	Pointer: End of Arrays
	2F		47 04	4 04	4	;0403
30-31	30	48-49	48 00	0 00	00	Pointer: String Storage (moving down)
	31		49 80	128 80	128	;8000
32-33	32	50-51	50 FE	254 FF	255	Pointer: String Utility
	33		51 7F	127 00	0	
34-35	34	52-53	52 00	0 00	0	Pointer: Limit of Memory
	35		53 80	128 80	128	;8000
36-37	36	54-55	54 14	20 FF	255	Current BASIC line number
	37		55 FF	255 FF	255	
38-39	38	56-57	56 00	0 FF	255	Previous BASIC line number
	39		57 80	128 00	0	
3A-3B	3A	58-59	58 01	1 FF	255	Pointer: BASIC statement for CONT
	3B		59 00	0 00	0	
3C-3D	3C	60-61	60 00	0 FF	255	Current DATA line number
	3D		61 50	80 00	0	
3E-3F	3E	62-63	62 00	0 00	0	Current data address
	3F		63 04	4 04	4	
40-41	40	64-65	64 00	0 FF	255	Input vector
	41		65 00	0 00	0	
42-43	42	66-67	66 04	4 FF	255	Current variable name
	43		67 00	0 00	0	
44-45	44	68-69	68 24	36 24	36	Current variable address
	45		69 04	4 00	0	
46-47	46	70-71	70 82	130 FF	255	Variable pointer for FOR/NEXT
	47		71 04	4 00	0	
48-49	48	72-73	72 FF	255 FF	255	Y-save; op-save; BASIC pointer save
	49		73 00	0 00	0	
4A	4A	74	74 00	0 00	0	Comparison symbol accumulator
4B-50	4B	75-80	75 00	0 00	0	Miscellaneous work area, pointers, etc.

Location		Contents				Description
Hex	Dec	4000 Hex Dec	8000 Hex Dec			
		4C	76	FF 255	FF 255	
		4D	77 16	22 00	00 0	
		4E	78 00	0 FF	255	
		4F	79 00	0 00	0	
		50	80 03	3 03	3	
51-53	51	81-83	81 4C	76 4C	76	Jump vector for functions
	52		82 43	67 FF	255	
	53		83 00	0 00	0	
54-5D	54	84-93	84 FF	255 FF	255	Miscellaneous numeric work area
	55		85 87	135 00	0	
	56		86 04	4 FF	255	
	57		87 80	128 00	0	
	58		88 03	3 FF	255	
	59		89 00	0 00	0	
	5A		90 00	0 00	0	
	5B		91 00	0 00	0	
	5C		92 00	0 00	0	
	5D		93 00	0 00	0	
5E	5E	94	94 90	144 94	144	Accum#1: Exponent
5F-62	5F	95-98	95 00	0 00	0	Accum#1: Mantissa
	60		96 00	0 00	0	
	61		97 D4	212 D4	212	
	62		98 72	114 72	114	
63	63	99	99 00	0 00	0	Accum#1: Sign
64	64	100	100 00	0 00	0	Series evaluation constant pointer
65	65	101	101 00	0 00	0	Accum#1 hi-order (overflow)
66-6B	66	102-107	102 90	144 90	144	Accum#2: Exponent
	67		103 D4	212 D4	212	Accum#2: Mantissa
	68		104 6C	108 6C	108	
	69		105 00	0 00	0	
	6A		106 00	0 00	0	
	6B		107 00	0 00	0	Accum#2: Sign
6C	6C	108	108 00	0 00	0	Sign comparison, Acc#1 vs #2
6D	6D	109	109 00	0 00	0	Accum#1 lo-order (rounding)
6E-6F	6E	110-111	110 0A	10 0A	10	Cassette buff len/series pointer
	6F		111 B3	179 B3	179	
70-87	70	112-135	112 E6	230 E6	230	CHRGET subroutine; get BASIC char
	71		113 77	119 77	119	;INC \$77
	72		114 D0	208 D0	208	;BNE \$0076
	73		115 02	2 02	2	
	74		116 E6	230 E6	230	;INC \$78
	75		117 78	120 78	120	
	76		118 AD	173 AD	173	;LDA \$0202
	77		119 02	2 02	2	
	78		120 02	2 02	2	
	79		121 C9	201 C9	201	;CMP #\$3A
	7A		122 3A	58 3A	58	
	7B		123 B0	176 B0	176	;BCS \$0087
	7C		124 0A	10 0A	10	
	7D		125 C9	201 C9	201	;CMP #\$20
	7E		126 20	32 20	32	
	7F		127 F0	240 F0	240	;BEQ \$0070
	80		128 EF	239 EF	239	
	81		129 38	56 38	56	;SEC
	82		130 E9	233 E9	233	;SBC #\$30
	83		131 30	48 30	48	
	84		132 38	56 38	56	;SEC
	85		133 E9	233 E9	233	;SBC #\$D0
	86		134 D0	208 D0	208	
	87		135 60	96 60	96	;RTS
77-78	77	119-120	119 02	2 02	2	BASIC pointer (within subroutine)
	78		120 02	2 02	2	
88-8C	88	136-140	136 80	128 80	128	Random number seed
	89		137 4F	79 4F	79	
	8A		138 C7	199 C7	199	
	8B		139 52	82 52	82	
	8C		140 F4	244 FF	255	
8D-8F	8D	141-143	141 00	0 00	0	Jiffy clock for TI and TIS
	8E		142 15	21 08	8	
	8F		143 89	137 1F	31	
90-91	90	144-145	144 55	85 55	85	Hardware interrupt vector IRQ
	91		145 E4	228 E4	228	
92-93	92	146-147	146 78	120 78	120	BRK interrupt vector
	93		147 D4	212 D4	212	
94-95	94	148-149	148 FF	255 FF	255	NMI interrupt vector
	95		149 B3	179 B3	179	

Location		Contents		Description				
Hex	Dec	4000 Hex Dec	8000 Hex Dec					
96	96	150	150	00	0	00	0	Status word ST
97	97	151	151	FF	255	FF	25	Which key down; 255 = no key
98	98	152	152	00	0	00	0	Shift key; 1 if depressed
99 -9A	99	153-154	153	19	25	D5	213	Correction clock
9A	9A	154	02	2	00	0		
9B	9B	155	155	FF	255	FF	255	Keyswitch PIA: STOP and RVS flags
9C	9C	156	156	00	0	00	0	Timing constant for tape
9D	9D	157	157	00	0	00	0	Load = 0, Verify = 1
9E	9E	158	158	00	0	00	0	* of chars in keyboard buffer
9F	9F	159	159	00	0	00	0	Screen reverse flag
A0	A0	160	160	FF	255	FF	255	IEEE output; 255 = character pending
A1	A1	161	161	1E	30	20	32	End-of-line-for-input pointer
A2	A2	162	162	00	0	00	0	Not used
A3 -A4	A3	163-164	163	0A	10	0A	10	Cursor log (row, column)
A4	A4	164	1E	30	20	32		
A5	A5	165	165	1E	30	20	32	IEEE output buffer
A6	A6	166	166	FF	255	FF	255	Key image
A7	A7	167	167	01	1	01	1	0 = flash cursor
A8	A8	168	168	02	2	02	2	Cursor timing countdown
A9	A9	169	169	20	32	20	32	Character under cursor
AA	AA	170	170	00	0	00	0	Cursor in blink phase
AB	AB	171	171	00	0	00	0	EOT received from tape
AC	AC	172	172	00	0	00	0	Input from screen/from keyboard
AD	AD	173	173	00	0	00	0	X save
AE	AE	174	174	00	0	00	0	How many open files
AF	AF	175	175	00	0	00	0	Input device, normally 0
B0	B0	176	176	03	3	03	3	Output CMD device, normally 3
B1	B1	177	177	00	0	00	0	Tape character parity
B2	B2	178	178	00	0	00	0	Byte received flag
B3	B3	179	179	00	0	00	0	Logical address temporary save
B4	B4	180	180	07	7	07	7	Tape buffer character; MLM command
B5	B5	181	181	00	0	00	0	File name pointer; MLM flag, counter
B6	B6	182	182	00	0	00	0	Function not known
B7	B7	183	183	00	0	00	0	Serial bit count
B8	B8	184	184	00	0	00	0	Unused
B9	B9	185	185	00	0	00	0	Cycle counter
BA	BA	186	186	00	0	00	0	Tape writer countdown
BB -BC	BB	187-188	187	00	0	00	0	Tape buffer pointers, *1 and *2
BC	BC	188	00	0	00	0		
BD	BD	189	189	00	0	00	0	Write leader count; read pass 1/2
BE	BE	190	190	00	0	00	0	Write new byte; read error flag
BF	BF	191	191	00	0	00	0	Write start bit; read bit seq error
C0 -C1	C0	192-193	192	00	0	00	0	Error log pointers, pass 1/2
C1	C1	193	00	0	00	0		
C2	C2	194	194	00	0	00	0	0 = scan/1-15 = count/\$40 = load \$80 = end
C3	C3	195	195	00	0	00	0	Write leader length; read checksum
C4 -C5	C4	196-197	196	90	144	20	32	Pointer to screen line
C5	C5	197	81	129	83	131		
C6	C6	198	198	1E	31	21	33	Position of cursor on above line
C7 -C8	C7	199-200	199	C7	199	C7	199	Utility pointer: tape, scroll
C8	C8	200	00	0	00	0		
C9 -CA	C9	201-202	201	00	0	24	36	Tape end addr/end of current prog
CA	CA	202	01	1	10	16		
CB -CC	CB	203-204	203	00	0	00	0	Tape timing constants
CC	CC	204	00	0	00	0		
CD	CD	205	205	00	0	00	0	0 = direct cursor, else programmed
CE	CE	206	206	00	0	00	0	Tape read timer 1 = enabled
CF	CF	207	207	00	0	00	0	EOT received from tape
D0	D0	208	208	00	0	00	0	Read character error
D1	D1	209	209	0D	13	0F	15	* characters in file name
D2	D2	210	210	00	0	00	0	Current file logical address
D3	D3	211	211	61	97	61	97	Current file secondary address
D4	D4	212	212	08	8	08	8	Current file device number
D5	D5	213	213	27	39	4F	79	Right-hand window or line margin
D6 -D7	D6	214-215	214	00	0	00	0	Pointer: Start of Tape Buffer

Location		Contents		Description				
Hex	Dec	4000 Hex Dec	8000 Hex Dec					
D7	D7	215	00	0	00	0		
D8	D8	216	216	0A	10	0A	10	Line where cursor lives
D9	D9	217	217	0D	13	0D	13	Last key/checksum/misc.
DA -DB	DA	218-219	218	09	9	09	9	File name pointers
DB	DB	219	02	2	02	2		
DC	DC	220	220	00	0	00	0	Number of INSERTs outstanding
DD	DD	221	221	00	0	00	0	Write shift word/read character in
DE	DE	222	222	00	0	00	0	Tape blocks remaining to write/read
DF	DF	223	223	00	0	00	0	Serial word buffer
E0 -F8	E0	224-248	224	80	128			
E1	E1	225	80	128				
E2	E2	226	80	128				
E3	E3	227	80	128				
E4	E4	228	80	128				
E5	E5	229	80	128				
E6	E6	230	80	128				
E7	E7	231	81	129				
E8	E8	232	81	129				
E9	E9	233	81	129				
EA	EA	234	81	129				
EB	EB	235	81	129				
EC	EC	236	81	129				
ED	ED	237	82	130				
EE	EE	238	82	130				
EF	EF	239	82	130				
F0	F0	240	82	130				
F1	F1	241	82	130				
F2	F2	242	82	130				
F3	F3	243	82	130				
F4	F4	244	83	131				
F5	F5	245	83	131				
F6	F6	246	83	131				
F7	F7	247	83	131				
F8	F8	248	83	131				
E0	E0	224	224		00	0		(80 column) Screen top window
E1	E1	225	225		18	24		(80 column) Screen bottom window
E2	E2	226	226		00	0		(80 column) Left window margin
E3	E3	227	227		09	9		(80 column) Limit of keyboard buffer
E4	E4	228	228		00	0		(80 column) Key repeat flag
E5	E5	229	229		0E	14		(80 column) Repeat countdown
E6	E6	230	230		10	16		(80 column) New key marker
E7	E7	231	231		10	16		(80 column) Chime time
E8	E8	232	232		00	0		(80 column) HOME count
E9 -EA	E9	233-234	233		1D	29		(80 column) Input vector
EA	EA	234	234		E1	225		
EB -EC	EB	235-236	235		0C	12		(80 column) Output vector
EC	EC	236	236		E2	226		
ED -F7	ED	237-247	237		00	0		(80 column) Not used
EE	EE	238			00	0		
EF	EF	239			00	0		
F0	F0	240			00	0		
F1	F1	241			00	0		
F2	F2	242			00	0		
F3	F3	243			00	0		
F4	F4	244			00	0		
F5	F5	245			00	0		
F6	F6	246			00	0		
F7	F7	247			00	0		
F8	F8	248	248		00	0		(80 column) Counter to speed T1 by 4.5
F9 -FA	F9	249-250	249	00	0	00	0	Cassette status, *1 and *2
FA	FA	250	00	0	00	0		
FB -FC	FB	251-252	251	00	0	00	0	MLM pointer/tape start address
FC	FC	252	00	0	00	0		
FD -FE	FD	253-254	253	00	0	24	36	MLM, DOS pointer, misc.
FE	FE	254	01	1	10	16		
FF	FF	255	255	00	0	00	0	Unused

(40-column) screen wrap table

0100 -010A	256-266	STR\$ work area/MLM work
0100 -013E	256-318	Tape read error log
0100 -01FF	256-511	Processor stack
0200 -0250	512-592	MLM work area; Input buffer
0251 -025A	593-602	File logical address table
025B -0264	603-612	File device number table
0265 -026E	613-622	File secondary addr table
026F -0278	623-632	Keyboard input buffer
027A -0339	634-825	Tape*1 input buffer
033A -03F9	826-1017	Tape*2 input buffer
033A	826	DOS character pointer
033B	827	DOS drive 1 flag
033C	828	DOS drive 2 flag
033D	829	DOS length/write flag
033E	830	DOS syntax flags
033F -0340	831-832	DOS disk ID
0341	833	DOS command string count
0342 -0352	834-850	DOS file name buffer

0353 -0380	851-896	DOS command string buffer
03EE -03F7	1006-1015	(80-column) Tab stop table
03FA -03FB	1018-1019	Monitor extension vector
03FC	1020	IEEE timeout defeat* \$FF - disable
0400 -7FFF	1024-32767	Available RAM including expansion
8000 -83FF	32768-33791	(40-column) Video RAM
8000 -87FF	32768-34815	(80-column) Video RAM
9000 -AFFF	36864-45055	Available ROM expansion area* (2.0: -BFFF, -49151)
B000 -DFFF	45056-57343	Basic, DOS, Machine Lang Monitor (2.0: Basic, C000-E0F8, 49152-57592)
E000 -E7FF	57344-59391	Screen, Keyboard, Interrupt programs (2.0: E0F9-)
E810 -E813	59408-59411	PIA 1 - Keyboard I/O
E820 -E823	59424-59427	PIA 2 - IEEE-488 I/O
E840 -E84F	59456-59471	VIA - I/O and timers
E880 -E881	59520-59521	(80-column) CRT Controller
F000 -FFFF	61440-65535	Reset, I/O handlers, Tape routines