

HOMEBREW

COMPUTER CRIB CARD

Memotech MTX

Developers Edition v0.1

- RST 10
- VDP Memory Map (TI9929A)
- VDP Registers
- VDP Programming
- ASSEM
- Sprite Attribute Table
- Sound (SN76489A)
- Keyboard
- CTC
- Memory Pager
- Hardware Ports
- System Variables

EVERYTHING YOU NEED AT
YOUR FINGERTIPS

RST 10

Write Byte	0	0	c	<-	5 bits	->
Virtual Screen	0	1	c	* cls	<-	3 bits ->
Write String	1	0	c	<-	5 bits	->
Write From BC	1	1	*	*	*	*

c – continue. * - Don't care

Cmd Bytes

1	plot	x byte, y byte
2	line	x1 byte, y1 byte, x2 byte, y2 byte
3	cursor	x byte, y byte
4	paper	col
5	EoL	
6	ink	col
7	bell	
8	Backspace	
9	Tab	
10	Csr down	
11	Csr up	
12	cls	
13	cr	
14	ctlspr	p, n
15	genpat	p, n, d0, d1, d2, d3, d4, d5, d6, d7
16	colour	p, n
17	adspr	p, n, v
18	sprite	n, p, lsb xp, msb xp, lsb yp, msb yp,
xs,		ys, col
19	movspr	p, n, d
20	view	dir, dis
21	insert	
22	delete	
23	backtab	
24		
25	tab	
26	home	
27	Esc	
28	Scrollmode	
29	Pagemode	
30	Csr on	
31	Csr off	

VDP Memory Map

Text Mode			
Addr Range	Title	Reg	Val
1800 - 1BFF	Pattern Generator Table	4	02
1C00 - 1FBF	Pattern Name Table	2	07
1FC0 - 1FFF	Unused		

Graphic Mode II

Addr Range	Title	Reg	Val
0000 - 17FF	Pattern Generator Table	4	00
2000 - 37FF	Colour Generator Table	3	80
3800 - 3BBF	Sprite Pattern Table	6	07
3C00 - 3EFF	Pattern Name Table	2	0F
3F00 - 3F7F	Sprite Attribute Table	5	7E
3F80 - 3FFF	Unused		

VDP Registers

Reg	Meaning
0	0 0 0 0 0 M3 EV
1	4/16K IE M1 M2 0 SIZE MAG
2	0 0 0 0 Name Table Base Address
3	Colour Table Base Address
4	0 0 0 0 Pattern Generator Base Address
5	0 Sprite Attribute Table Base Address
6	0 0 0 0 Sprite Pattern Generator Base Ad- dress
7	<Text Colour1> <Backdrop / Text Colour 0>
Status	F 5S C Firth Sprite Number

VDP Programming

Set Address	out (2), MSB & 0x3f out (2), LSB
Write byte	out (1), data
Read byte	in (1)
Write register	out (2), data Out (2), reg & 0x80
Read Register	in (2)

Sprite Attribute Table

Byte	Meaning
00	Distance from top of screen
01	Distance from left of screen
02	Sprite Pattern Pointer
03	"Early Clock" / "Colour"

Early Clock - Shift sprite 32 pixels left

Sound

Set Attenuation
OUT (6), 0x80 | <attn reg> | <vol 0x00 - 0x0f>

Set Freq
OUT (6), 0x80 | <freq reg> | <data & 0x0f>
OUT (6), <data >> 4> & 0x3F

Noise Control
OUT (6), 0xE0 | X FB NF1 NFO

Each OUT needs to be followed by an IN (3)

Attn Reg	0x10, 0x30, 0x50, 0x70
Freq Reg	0x00, 0x20, 0x40
FB	0 for Periodic. 1 for White.
NF1 NFO	0 0 for Noise/512 0 1 for Noise/1024 1 0 for Noise/2048 1 1 for Chn 2

Keyboard

Bit	Chars
0	1 3 5 7 9 - \ Pge Brk F1
1	Esc 2 4 6 8 0 ^ Eol BS F5
2	Ctl W R Y I P [Up Tab F2
3	Q E T U O @ LnF Lf Del F6
4	Alp S F H K ;] Rg F7
5	A D G J L : Ret Hme F3
6	Sht X V N , / Sht Dn F8
7	Z C B M . _ Ins Cls Spc F4

CTC

Set Interrupt table address
LD I, 0xFF
OUT (CTC Port), 0xF0 (low 3 bits zero)

fff0	Chn 0 Interrupt ptr
fff2	Chn 1 Interrupt ptr
fff4	Chn 2 Interrupt ptr
fff6	Chn 3 Interrupt ptr

Reset CTC Channel
OUT (CTC Port), 3
OUT (CTC Port), 3 (incase CTC expecting const)

Control Word
1 = Control Word
0 = Vector (table lsb by byte)
1 = Soft reset
0 = Continued operation
1 = No timer const to follow
0 = Timer const to follow
1 = Clock/Trigger pulse starts timer
0 = Start on receiving time const
1 = Trigger on rising edge
0 = Trigger on falling edge
1 = Prescaler of 256
0 = Prescaler of 16
1 = Counter mode
0 = Timer mode
1 = Interrupt enabled
0 = Interrupt disabled

Useful Control Words
c5 Used for VDP interrupt on chn 0

Memory PAGER

ROM based
0 R2 R1 R0 P3 P2 P1 P0

RAM based
1 X X X P3 P2 P1 P0

Hardware Ports

Port	IN	OUT
00	Prntr Strobe	Memory PAGER
01	VDP read mode 0	VDP write mode 0
02	VDP read mode 1	VDP write mode 1
03	Snd Strobe	Cass I/F
04	Prntr Status	Prntr Data
05	Keyb LSB bits	Keyb Data
06	Keyb MSB bits	Snd Data
07	PIO read	PIO write
08	CTC VDPINT	CTC None
09	CTC 4Mhz/13	CTC DART ser clk 0
0A	CTC 4Mhz/13	CTC DART ser clk 1
0B	CTC Csstte Edge	CTC None
0C	DART	DART
0D	DART	DART
0E	DART	DART
0F	DART	DART

ASSEM

Start	ASSEM <line No>	
Ret to BASIC	<CLS><RET>	
List	L<RET>	L \$nnnn
	L nnnnn	L Label
Insert	<RET>	\$nnnn
	nnnnn	Label
Edit	E<RET>	E \$nnnn
	E nnnnn	E Label
Print	P<RET>	P \$nnnn
	P nnnnn	P Label
Delete Line	<EOL><RET>	
Move to Top	T	