

Altair-Duino Configuration SetUp for Processor Technology

Altair-Duino Pro Processor Technology Sol-20 Configuration Editor #0, #4 & #8

Enable pro(f)iling : no
Set throttle delay (t/T) : auto adjust
Enable serial (p)anel : no
Enable serial (i)nput : no
Enable serial (d)ebug : no
Configure (m)emory : 64 KB RAM, 0 ROMs
Pro(c)essor : Zilog Z80
Aux1 shortcut program (u/U) : 16k ROM Basic
Configure host (s)erial : Primary: USB Programming Port

(E) Configure serial cards : SIO,2SIO-P1,2SIO-P2 mapped
(D) Configure disk drives : 3 mounted
(H) Configure hard disks : 2 mounted
(V) Configure VDM-1 : On USB Native Port
(I) Configure interrupts : Interrupts connected directly to CPU

[s]

Configure host serial settings

(0) USB Programming Port : 9600 baud
(1) Serial (pin 18/19) : 9600 baud 8N1
(2) USB Native Port : 750000 baud
(3) Serial (pin A6/A7) : 9600 baud 8N1
(4) Serial (RXL/TXL) : 9600 baud 8N1

(P)rimary host serial : USB Programming Port

[E]

Configure serial cards

(1) Configure SIO : Primary (USB Programming Port)
(2) Configure ACR : Serial (pin A6/A7)
(3) Configure 2SIO port 1 : Primary (USB Programming Port)
(4) Configure 2SIO port 2 : Serial (pin A6/A7)
(5) Configure 2nd 2SIO port 1 : Not mapped
(6) Configure 2nd 2SIO port 2 : Not mapped

[1]

Configure serial device SIO

```
Map to host (i)nterface      : Primary (USB Programming Port)
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to     : off
SIO board re(v)ision         : rev1
```

[2]

Configure serial device ACR

```
Map to host (i)nterface      : Not mapped
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to     : off
Enable CLOAD/CSAVE (t)raps   : on
```

[3]

Configure serial device 2-SIO port 1

```
Map to host (i)nterface      : Primary (USB Programming Port)
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to     : off
```

[4]

Configure serial device 2-SIO port 2

```
Map to host (i)nterface      : Serial (pin A6/A7)
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to     : off
```

[5]

Configure serial device 2-SIO2 port 1

```
Map to host (i)nterface      : Not mapped
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
```

[6]

Configure serial device 2-SIO2 port 2

```
Map to host (i)nterface      : Not mapped
Simulated (b)aud rate        : 9600
(F)orce baud rate            : no
Example playback (N)ULs      : 4
Use (7) bits                  : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
```

[D]

Configure disk drive settings

```
(F)orce real-time mode : no
Drive (0) mounted disk image : DISK11.DSK: VDM-1 programs (boots CP/M)
Drive (1) mounted disk image : DISK01.DSK: CP/M (63k)
Drive (2) mounted disk image : DISK13.DSK
Drive (3) mounted disk image : DISK05.DSK: Games (CP/M programs)
```

[H]

Configure hard disk settings

```
(F)orce real-time mode : no
(0) Hard disk unit 1 platter 0 image : HDSK03.DSK: Mike Douglas' 88-HDSK CP/M
(1) Hard disk unit 1 platter 1 image : HDSK04.DSK: Infocom Adventures CP/M
(2) Hard disk unit 1 platter 2 image : none
(3) Hard disk unit 1 platter 3 image : none
(4) Hard disk unit 2 platter 0 image : none
(5) Hard disk unit 2 platter 1 image : none
(6) Hard disk unit 2 platter 2 image : none
(7) Hard disk unit 2 platter 3 image : none
```

[V]

Configure VDM-1 settings

Map to (i)nterface : On USB Native Port
Memory (a)ddress : CC00
DIP switch (1)+2 : off/on (normal video)
DIP switch (3)+4 : off/on (blinking cursor)
DIP switch (5)+6 : on /on (control characters shown, VT-CR blanking off)
Map (k)eyboard to : ACR

Altair-Duino Pro Processor Technology Sol-20 Configuration Editor #1, #5 & 9

Enable pro(f)iling : no
Set throttle delay (t/T) : auto adjust
Enable serial (p)anel : no
Enable serial (i)nput : no
Enable serial (d)ebug : no
Configure (m)emory : 64 KB RAM, 0 ROMs
Pro(c)essor : Zilog Z80
Aux1 shortcut program (u/U) : 16k ROM Basic
Configure host (s)erial : Primary: USB Programming Port

(E) Configure serial cards : SIO,2SIO-P1,2SIO-P2 mapped
(D) Configure disk drives : 3 mounted
(H) Configure hard disks : 2 mounted
(V) Configure VDM-1 : On USB Native Port
(I) Configure interrupts : Interrupts connected directly to CPU

[s]

Configure host serial settings

(0) USB Programming Port : 9600 baud
(1) Serial (pin 18/19) : 9600 baud 8N1
(2) USB Native Port : 750000 baud
(3) Serial (pin A6/A7) : 9600 baud 8N1
(4) Serial (RXL/TXL) : 9600 baud 8N1

(P)rimary host serial : Serial (pin 18/19) (current: USB Programming Port)

[E]

Configure serial cards

(1) Configure SIO : Primary (USB Programming Port)
(2) Configure ACR : Serial (pin A6/A7)
(3) Configure 2SIO port 1 : Primary (USB Programming Port)
(4) Configure 2SIO port 2 : Serial (pin A6/A7)
(5) Configure 2nd 2SIO port 1 : Not mapped
(6) Configure 2nd 2SIO port 2 : Not mapped

[1]

Configure serial device SIO

```
Map to host (i)nterface      : Primary (USB Programming Port)
Simulated (b)aud rate        : 9600
(F)orce baud rate           : no
Example playback (N)ULs     : 4
Use (7) bits                 : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
SIO board re(v)ision        : rev1
```

[2]

Configure serial device ACR

```
Map to host (i)nterface      : Not mapped
Simulated (b)aud rate        : 9600
(F)orce baud rate           : no
Example playback (N)ULs     : 4
Use (7) bits                 : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
Enable CLOAD/CSAVE (t)raps  : on
```

[3]

Configure serial device 2-SIO port 1

```
Map to host (i)nterface      : Primary (USB Programming Port)
Simulated (b)aud rate        : 9600
(F)orce baud rate           : no
Example playback (N)ULs     : 4
Use (7) bits                 : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
```

[4]

Configure serial device 2-SIO port 2

```
Map to host (i)nterface      : Serial (pin A6/A7)
Simulated (b)aud rate        : 9600
(F)orce baud rate           : no
Example playback (N)ULs     : 4
Use (7) bits                 : autodetect
Serial input (u)ppercase     : autodetect
Translate (B)ackspace to    : off
```

[5]

Configure serial device 2-SIO2 port 1

Map to host (i)nterface : Not mapped
Simulated (b)aud rate : 9600
(F)orce baud rate : no
Example playback (N)ULs : 4
Use (7) bits : autodetect
Serial input (u)ppercase : autodetect
Translate (B)ackspace to : off

[6]

Configure serial device 2-SIO2 port 2

Map to host (i)nterface : Not mapped
Simulated (b)aud rate : 9600
(F)orce baud rate : no
Example playback (N)ULs : 4
Use (7) bits : autodetect
Serial input (u)ppercase : autodetect
Translate (B)ackspace to : off

[D]

Configure disk drive settings

(F)orce real-time mode : no
Drive (0) mounted disk image : DISK11.DSK: VDM-1 programs (boots CP/M)
Drive (1) mounted disk image : DISK01.DSK: CP/M (63k)
Drive (2) mounted disk image : DISK05.DSK: Games (CP/M programs)
Drive (3) mounted disk image : DISK17.DSK:

[H]

Configure hard disk settings

(F)orce real-time mode : no
(0) Hard disk unit 1 platter 0 image : HDSK03.DSK: Mike Douglas' 88-HDSK CP/M
(1) Hard disk unit 1 platter 1 image : HDSK04.DSK: Infocom Adventures CP/M
(2) Hard disk unit 1 platter 2 image : none
(3) Hard disk unit 1 platter 3 image : none
(4) Hard disk unit 2 platter 0 image : none
(5) Hard disk unit 2 platter 1 image : none
(6) Hard disk unit 2 platter 2 image : none
(7) Hard disk unit 2 platter 3 image : none

[V]

Configure VDM-1 settings

Map to (i)nterface : On USB Native Port
Memory (a)ddress : CC00
DIP switch (1)+2 : off/on (normal video)
DIP switch (3)+4 : off/on (blinking cursor)
DIP switch (5)+6 : on /on (control characters shown, VT-CR blanking off)
Map (k)eyboard to : ACR

HARDWARE SetUp

Start with your ReConfigured: Altair-Duino as the configuration Editor setup above.

You might be wondering about the “Configuration Editor #4 & #8 and #5 & #9 ...

This is my backup scheme of the configurations so IF I screw something up later, I can recover faster than starting over from scratch.

Add the Gary Kaufman upgraded Geoff Graham ASCII VT-100 Terminal Emulator

<https://hackaday.io/project/173216-ascii-video-terminal>

I did the Gary Kaufman upgraded ASCII VT-100 Terminal so I could use the USB Keyboard port.

Next do the PICMX250F128B-I/SP firmware update

<https://github.com/dhansel/VDM1/tree/master/PIC32/firmware>

I used the VDM-1 programmer .hex with my PICKit4 Programmer and MPLAB X IDE 5.50

Downloaded the entire set: <https://github.com/dhansel/VDM1>

Next you need one keyboard, two VGA monitors (I use monitors I buy from a local thrift store for \$3 each.)

One monitor will be plugged into the back of the Altair-Duino along with the keyboard on the keyboard port.

The other monitor plugs into the ASCII VT-100 Terminal Emulator updated for VDM-1.

I have a 60cm/2ft. USB extension cable coming off the **Native Port** inside on the Arduino DUE board going out the back of the Altair-Duino Pro connected to the USB keyboard port on the Gary Kaufman VDM-1 Terminal. I don't have the lid bolted down on the Altair-Duino Pro computer so the cable fits nicely in the rear center nut slot.

With all the hardware and firmware supt, you're ready to play with your Sol-20 computer!

Load & Run Processor Technology VDM-1 System

```
Address & Data Switch Settings for VDM-1  
A AAA NNN NDD DDD DDD  
0 001 000 000 010 000  
AUX1 DOWN
```

This Loads & Runs the CUTER ROM in memory at C000_h

**At this point your Altair-Duino is a
Processor Technology computer**

>

Neat setup, but more difficult to use. So next we add BOOTing to CP/M

Load & Run Processor Technology CP/M System

```
Address & Data Switch Settings for VDM-1
A AAA NNN NDD DDD DDD
0 001 000 000 010 000
AUX1 DOWN
```

This Loads & Runs the CUTER ROM in memory at C000_h

At this point your Altair-Duino is a Processor Technology computer

Now GOTO CP/M

```
Address & Data Switch Settings to MOUNT A:
A AAA NNN NDD DDD DDD
0 001 000 000 010 001
AUX2 DOWN
```

This MOUNTS the Processor Technology CP/M as Drive 0

```
Address & Data Switch Settings to MOUNT B:
A AAA NNN NDD DDD DDD
0 001 000 100 000 001
AUX2 DOWN
```

This MOUNTS 00001) DISK01.DSK: CP/M (63k) as Drive 1

```
Address & Data Switch Settings to MOUNT C:
A AAA NNN NDD DDD DDD
0 001 001 000 000 101
AUX2 DOWN
```

**This MOUNTS 00101) DISK05.DSK:
Games (CP/M programs) as Drive 2**

```
Address & Data Switch Settings to MOUNT D:
A AAA NNN NDD DDD DDD
0 001 001 100 010 111
AUX2 DOWN
```

This MOUNTS DISK17.DSK as Drive 3

Now STOP – RESET then:

```
Address & Data Switch Settings to BOOT
A AAA NNN NDD DDD DDD
0 001 000 000 001 000
AUX1 DOWN
```

This BOOTS the Processor Technology CP/M System

VDM-1 Terminal Display shows the "A:" CP/M Prompt

```

A>DIR
A:PIP          COM : PCGET          COM : CHASE          COM : LS          COM
A:TARGET      COM : DEFLECT       COM : READEME      TXT : LIFE8      COM
A:PONG        COM : CHECKERS       COM : TARGET1     COM : TREK80     COM
A:MSBASIC     COM : PATTERN       COM : CHESS       COM : BASIC5     COM
A:RAIDERS     COM : EXTBASIC     COM : GALAXY     COM : TRAIN      COM
A:LIFE        COM : PIRANHA     COM : BIOS       ASM
A>







```

Do you want to play a game? Try TREK80
A>TREK80

```

File Edit Retouch Help
Wd          WARP DIRECTION "d"
Id/s/      IMPULSE DIRECTION "d" USING SPEED "s"
           If no speed is given, use the last selected speed.
Pd          FIRE PHASORS DIRECTION "d"
Td          FIRE PHOTON TORPEDO DIRECTION "d"
And/s/     LAUNCH ANTIMATTER POD NUMBER "n",
           DIRECTION "d" AT SPEED "s"
Xn         EXPLODE ANTIMATTER POD NUMBER "n"
-80                - 10 -

```

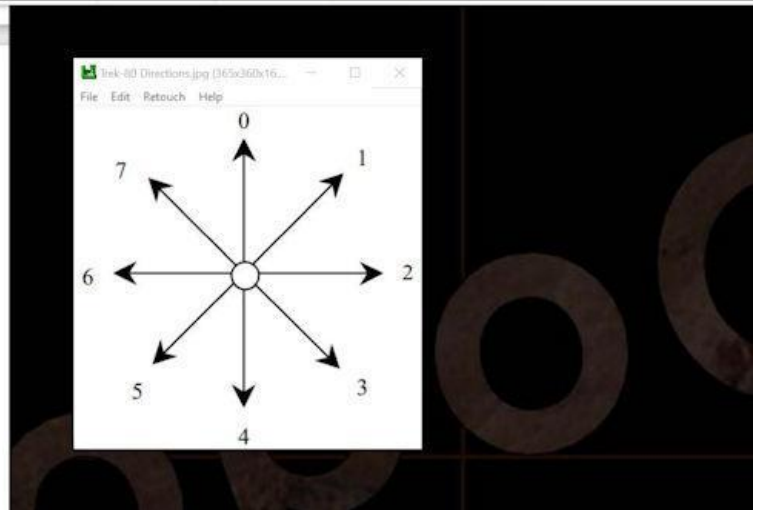
trek-80 Objects.jpg (957x439x16.7 million) - IView (Pro 1.02/32)			
File	Edit	Retouch	Help
Unknown Object			These objects are not identified and have not, as yet, been known to attack; however, when shot at, unpredictable results have been reported.
Stars			Stars are hot! ! Glide past, not through them .
Starbase			A welcome sight! Refuel and get your weapons refurbished.
Triton Mine			DO NOT FOLD, BEND, MUTILATE or SPINDLE. These things wipe out the entire quadrant and all the occupants therein.
Klingon Mini-Tart			A fine ship with rather adequate weapons. The captains of these ships are known to be intelligent but very rude. DESTROY ON SIGHT.
Klingon Battle Cruiser			A deadly ship and hard to destroy. Count how many times you run away.

EX 0

D(W, L, S, D, P, T)n DISTRIBUTE POWER TO THE SELECTED DEVICE IN AMOUNT "n" WHERE:

W = WARP DRIVE
L = LONG RANGE SCANNER
S = SHORT RANGE SCANNER
D = DEFLECTORS
P = PHASER TUBES
T = PHOTON TORPEDO TUBES

S INITIATE SELF-DESTRUCT SEQUENCE
E FIRE EXPERIMENTAL RAY
L LEAVE TREK 80



> END OF PROCESSOR TECHNOLOGY <

> SetUp <

Standard ASCII USB Keyboard to Sol-20 NFO

Lower Case

DEC	96	49	50	51	52	53	54	55	56	57	48	45	61
ASCII	`	1	2	3	4	5	6	7	8	9	0	-	=
Sol-20		1	2	3	4	5	6	7	8	9	0	-	=

	113	119	101	114	116	121	117	105	111	112	91	93	92
TAB	q	w	e	r	t	y	u	i	o	p	[]	\
	q	w	e	r	t	y	u	i	o	p	[]	\

97	115	100	102	103	104	106	107	108	59	39			
a	s	d	f	g	h	j	k	l	;	'			
a	s	d	f	g	h	j	k	l	;	'			

122	120	99	118	98	110	109		46	47				
z	x	c	v	b	n	m	,	.	/				
z	x	c	v	b	n	m	,	.	/				

Upper Case

126	33	64	35	36	37	94	38	42	40	41	95	43	
~	!	@	#	\$	%	^	&	*	()	_	+	
~	!	@	#	\$	%	^	&	*	()	_	+	

91	81	87	69	82	84	89	85	73	79	80	123	125	124
TAB	Q	W	E	R	T	Y	U	I	O	P	{	}	
	Q	W	E	R	T	Y	U	I	O	P	{	}	

65	83	68	70	71	72	74	75	76	58				
A	S	D	F	G	H	J	K	L	:	"			
A	S	D	F	G	H	J	K	L	:				

90	88	67	86	66	78	77	60	62	63				
Z	X	C	V	B	N	M	<	>	?				
Z	X	C	V	B	N	M	<	>	?				

