Loading Basic with the 2SIO Board

Martin Eberhard 30 Nov 2011

This is the standard Altair Basic 3.X and 4.X loader, to be toggled in via the front panel. If your paper tape has my modified checksum loader, then you can also load from the 2SIO's second port, as shown below. Note that the byte at address 011 changes with the version of Basic, and the byte at 012H changes for different sizes of Basic. Note also that the sense switches are set differently depending on the version of Basic.

2SIO Bootstrap Loader

Octal Address	2SIO Port 0 Octal Data	2SIO Port 1[1] Octal Data	
000	076	076	
001	003	003	
002	323	323	
003	020	**022**	
004	076	076	
005	*025*	*025*	(025 for 1 stop bit, 021 for 2 stop bits)
006	323	323	
007	020	**022**	
010	041	041	
011	*302*	*302*	(256 for Basic 3.X, 302 for Basic 4.X)
012	*077*	*077*	(017 for 4K, 037 for 8K, 077 for Extended Basic)
013	061	061	
014	032	032	
015	000	000	
016	333	333	
017	020	**022**	
020	017	017	
021	320	320	
022	333	333	
023	021	**023**	
024	275	275	
025	310	310	
026	055	055	
027	167	167	
030	300	300	
031	351	351	
032	013	013	
033	000	000	

---

[1] Requires modified Checksum Loader on the Basic tape

Basic 3.X Sense Switch Settings

The Basic 3.X loader uses the same port for loading Basic and for the Console.

Load & Console	A15	A14	A13	A12	A11	A10	A9	A8
SIOA,B,C (not rev 0)	0	0	0	0	0	0	0	0
SIOA,B,C (rev 0)	0	1	0	0	0	0	0	0
88-PIO	0	0	1	0	0	0	0	0
4PIO	0	0	0	1	0	0	0	0
2SIO-0 (1 stop bit)	0	0	0	0	1	1	0	0
2SIO-0(2 stop bits)	0	0	0	0	1	0	0	0

Basic 4.X Sense Switch Settings

The Basic 4.X loader makes a distinction between the Load Source and the Console Device, allowing you to load from one device, and use another for the Basic console.

Load Source	A11	A10	A9	A8	Console Device	A16	A15	A14	A13
2SIO-0 (2 stop bits)	0	0	0	0	2SIO-0 (2 stop bits)	0	0	0	0
2SIO-0 (1 stop bit)	0	0	0	1	2SIO-0 (1 stop bit)	0	0	0	1
SIO	0	0	1	0	SIO	0	0	1	0
ACR	0	0	1	1	(not allowed)	0	0	1	1
4PIO	0	1	0	0	4PIO	0	1	0	0
PIO	0	1	0	1	PIO	0	1	0	1
HSR [1]	0	1	1	0	(not allowed)	0	1	1	0

(1) Martin Eberhard modification: this setting will load from 2SIO port 1 with 1 stop bit, for example to load from a high-speed paper tape reader such as the Ghielmetti FER204A.

4.X Loader Error Messages

Error Code	Meaning
C	Checksum error. Bad tape data.
M	Memory error. Data won't store properly.
O	Overlay error. Attempt to overwrite checksum loader.
I	Invalid Load source. Illegal sense -switch setting.

Basic 4.X Initialization Dialog

4K Basic
MEMORY SIZE? (<RETURN> to use all memory. Basic uses 3.4K.)
TERMINAL WIDTH? (<RETURN> for 72 columns)
SIN? (Y saves SIN, SQR and RND. N deletes SIN and brings next question.)
SQR? (Y saves SQR and RND. N deletes SQR and brings next question.)
RND? (Y saves RND, N deletes RND.)

8K Basic
MEMORY SIZE? (<RETURN> to use all memory. Basic uses 6.2K.)
TERMINAL WIDTH? (<RETURN> for 72 columns)
WANT SIN-COS-TAN-ATN? (Y or N)

Extended Basic
MEMORY SIZE? (<RETURN> to use all memory. Basic uses 14.6K.)
LINEPRINTER? (O for 80LP, C for C700, Q for Q70)
WANT SIN-COS-TAN-ATN? (Y or N)