

### 3-2. LOADING MINIDISK BASIC

To use Minidisk BASIC, a WRITE PROTECTED Minidisk BASIC Diskette, a bootstrap loader which is available in several different forms, and an Altair 8800 computer with a minimum 24K of memory is required. The various methods and options for loading Minidisk BASIC are listed below. The Drive must be addressed to 0 and a Minidisk BASIC Diskette must be in the Drive before loading is started. If errors occur during loading, see section 3-3.

#### A. Loading Options

##### 1. MDBL PROM (used with 88-PMC)

The MDBL PROM allows loading of Minidisk BASIC by examining its starting location (highest 256 byte block 177400<sub>g</sub>), selecting the desired I/O device by setting the sense switches and pressing the RUN switch on the Altair 8800 front panel. Altair Minidisk BASIC will then load and respond with the initialization dialog (see section 3-5 for initialization dialog explanation). Table 3-A contains the I/O Sense Switch settings for the MDBL PROM.

Table 3-A. Sense Switch Settings

Sense switches (switches A8 through A15) must be set before tape or cassette loading begins. The settings depend on the terminal and input interface boards in use. The low order (rightmost) four switches determine the loading I/O board and the high order four switches determine the terminal I/O board setting. In the table below the setting is given for each I/O board option. The setting is also an octal number which signifies the switch positions. The Terminal Switch and Load Switch columns show the switches that are raised for each of the load and terminal device options.

Device	Sense Switch Setting	Terminal Switches	Load Switches	Channels
2SIO (2 stop bits)	0	none	none	20, 21
2SIO (1 stop bit)	1	A12	A8	20, 21
SIO	2	A13	A9	0, 1
ACR	3	A13, A12	A9, A8	6, 7
4PIO	4	A14	A10	40, 41, 42, 43
PIO	5	A14, A12	A10, A8	4, 5
HSR	6	A14, A13	A10, A9	46, 47
non-standard terminal	14			
no terminal	15			

Example 1:

Input from audio cassette through ACR and CRT terminal through 2SIO with 1 stop bit.

Switch	15	14	13	12	11	10	9	8
Position	0	0	0	1	0	0	1	1

Example 2:

Input from high speed paper tape reader, terminal through SIO.

Switch	15	14	13	12	11	10	9	8
Position	0	0	1	0	0	1	1	0

2. Minidisk Boot Loader on Audio Cassette Tape (used with 88-ACR)

a) Using the MBL PROM (use with 88-PMC)

- (1) Examine Address Location  $177400_8$ .
- (2) Set sense switches for the 88-ACR according to Table 3-A.
- (3) With the tape in the recorder and the recorder connected, start tape in PLAY mode.
- (4) Wait 10 seconds and press RUN switch on the Altair computer front panel.
- (5) The initialization dialog is printed when BASIC is loaded (see section 3-5).

b) Toggling In Loader Program

- (1) Load the following program in the computer:  
Loading from cassette

<u>Octal Address</u>	<u>Octal Data</u>
000	041
001	302
002	077
003	061
004	022
005	000
006	333
007	006
010	017
011	330
012	333
013	007
014	275
015	310
016	055
017	167
020	300
021	351
022	003
023	000

- (2) Examine address 000.
  - (3) Set sense switches (refer to Table 3-A).
  - (4) With tape in recorder and the recorder connected, start tape in PLAY mode.
  - (5) Wait 10 seconds and press RUN switch on the Altair computer front panel.
  - (6) The initialization dialog is printed when BASIC is loaded (see section 3-5).
3. Using the Paper Tape Minidisk Boot Loader
- a) With the MBL PROM (use with 88-PMC)
    - (1) Examine address 000.
    - (2) Set Sense Switches for the input interface board in use (refer to Table 3-A in this section).
    - (3) Start paper tape on leader.
    - (4) Press RUN switch on the Altair computer front panel.
    - (5) BASIC will load and then respond with the initialization dialog (see section 3-5).
  - b) Toggling in the Boot Loader Program

NOTE

It is assumed that the 2SI0 interface board is used. However, if another interface board is used, the loader programs may be found on pages 96 through 99 of the Altair BASIC Reference Manual (version 4.0).

(1) Load the following program in the computer:

Loading with the 2SIO board

<u>Octal Address</u>	<u>Octal</u>
000	076
001	003
002	323
003	020
004	076
005	021 (=2 stop bits, 025=1 stop bit)
006	323
007	020
010	041
011	302
012	077
013	061
014	032
015	000
016	333
017	020
020	017
021	320
022	333
023	021
024	275
025	310
026	055
027	167

- (2) Examine address 000.
- (3) Set sense switches according to Table 3-A in this section.
- (4) Start paper tape on leader.
- (5) Press RUN switch on Altair computer front panel.
- (6) The initialization dialog is printed when BASIC is loaded (see section 3-5).

### 3-3. PROBLEMS DURING LOADING

#### A. Error Codes

##### 1. Error Detection

The checksum loader turns on the Interrupt Enable light on the front panel when a loading error occurs. The ASCII Code of the error letter is stored in location 0. In addition, the error letter is sent to all the terminal channels. The error letters are as follows:

- C checksum error. Bad tape data. Indicates a defective Minidiskette (hard error) or alignment problems.
- M memory error. Data will not store properly. Indicates a defective or nonexistent memory location. The address or the bad memory location is stored in locations 1 and 2.
- O overlay error. An attempt was made to load data on top of the loader.
- I invalid load device. Invalid setting on the sense switches.

##### 2. Miscellaneous Difficulties

Check the obvious sources of trouble first. The following is a list of potential problems:

- interconnect cables improperly oriented or not connected
- PC boards not plugged in properly (to check, remove and plug in all boards in bus)
- Drive address incorrect (must be Drive 0 for loading BASIC)
- wrong Minidiskette
- not enough memory (needs 24K minimum)
- I/O or memory boards incorrectly addressed
- power not on or unit not plugged in
- wrong PROM being used. If using MDBL, see listing in section 3-4.
- defective Diskettes or tapes. To verify, use a known good copy.
- sense switches incorrectly set

### 3-4. MDBL PROM LISTING

Program 3-I is a listing of the MDBL PROM program:

#### Program 3-I. MDBL PROM Listing

Address	Code	Address	Code	Address	Code
177400	041	177454	061	177530	020
177401	023	177455	161	177531	365
177402	377	177456	115	177532	325
177403	021	177457	257	177533	305
177404	000	177460	323	177534	325
177405	114	177461	010	177535	021
177406	016	177462	333	177536	206
177407	343	177463	010	177537	200
177410	176	177464	346	177540	041
177411	022	177465	010	177541	343
177412	043	177466	302	177542	114
177413	023	177467	034	177543	333
177414	015	177470	114	177544	011
177415	302	177471	076	177545	037
177416	010	177472	004	177546	332
177417	377	177473	323	177547	120
177420	303	177474	011	177550	114
177421	000	177475	303	177551	346
177422	114	177476	070	177552	037
177423	363	177477	114	177553	270
177424	257	177500	333	177554	302
177425	323	177501	010	177555	120
177426	042	177502	346	177556	114
177427	057	177503	002	177557	333
177430	323	177504	302	177560	010
177431	043	177505	055	177561	267
177432	076	177506	114	177562	372
177433	054	177507	076	177563	134
177434	323	177510	002	177564	114
177435	042	177511	323	177565	333
177436	076	177512	011	177566	012
177437	003	177513	333	177567	167
177440	323	177514	010	177570	043
177441	020	177515	346	177571	035
177442	333	177516	100	177572	302
177443	377	177517	302	177573	134
177444	346	177520	055	177574	114
177445	020	177521	114	177575	341
177446	017	177522	021	177576	021
177447	017	177523	000	177577	346
177450	306	177524	000	177600	114
177451	020	177525	006	177601	001
177452	323	177526	000	177602	200
177453	020	177527	076	177603	000

Address	Code	Address	Code	Address	Code
177604	032	177672	346	177760	172
177605	167	177673	002	177761	274
177606	276	177674	302	177762	300
177607	302	177675	245	177763	173
177610	303	177676	114	177764	275
177611	114	177677	076	177765	311
177612	200	177700	001	177766	000
177613	107	177701	323	177767	000
177614	023	177702	011	177770	000
177615	043	177703	303	177771	000
177616	015	177704	102	177772	000
177617	302	177705	114	177773	000
177620	161	177706	076	177774	000
177621	114	177707	200	177775	000
177622	032	177710	323	177776	000
177623	376	177711	010	177777	000
177624	377	177712	303		
177625	302	177713	000		
177626	210	177714	000		
177627	114	177715	321		
177630	023	177716	361		
177631	032	177717	075		
177632	270	177720	302		
177633	301	177721	106		
177634	353	177722	114		
177635	302	177723	076		
177636	272	177724	103		
177637	114	177725	001		
177640	361	177726	076		
177641	361	177727	115		
177642	052	177730	373		
177643	344	177731	062		
177644	114	177732	000		
177645	315	177733	000		
177646	335	177734	042		
177647	114	177735	001		
177650	322	177736	000		
177651	263	177737	107		
177652	114	177740	076		
177653	004	177741	200		
177654	004	177742	323		
177655	170	177743	010		
177656	376	177744	170		
177657	020	177745	323		
177660	332	177746	001		
177661	104	177747	323		
177662	114	177750	021		
177663	006	177751	323		
177664	001	177752	005		
177665	312	177753	323		
177666	104	177754	043		
177667	114	177755	303		
177670	333	177756	322		
177671	010	177757	114		