

HEWLETT  PACKARD

2100  computers

***basic binary  
loader***

***basic binary  
disc loader***

***basic moving-head  
disc loader***

PREREQUISITE SOP MODULE:

*HP 2100 Front Panel Procedures Module (5951-1371)*

HP MANUAL PART NO. 5951-1376  
MICROFICHE PART NO. 5951-7309

Software Operating Procedures  
April 1974



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# ***Basic Binary Loader (BBL)***

## ***Basic Binary Disc Loader (BBDL)***

### ***Basic Moving-head Disc Loader (BMDL)***

This module consists of an introduction to the BBL, BBDL, and BMDL, a procedure for Examining and Modifying the BBL, BBDL or BMDL and complete listings of the BBL, BBDL and BMDL as they reside in memory.

#### **INTRODUCTION**

The BBL program resides in the last  $64_{10}$  words of memory. The BBL is protected from examination or accidental modification by the computer LOADER switch. BBL can perform three tasks:

1. Load absolute binary program tapes into memory.
2. Read and compare a binary tape with the contents of memory without loading the tape into memory.
3. Perform a checksum operation on a binary program tape without loading the tape into memory.

The BBDL resides in the last  $64_{10}$  words of memory. It is protected from examination or accidental modification by the computer LOADER switch. The BBDL loads absolute binary program tapes into memory, or loads absolute binary programs from disc (fixed-head) into memory.

The BMDL resides in the last  $64_{10}$  word of memory. It is protected from examination or accidental modification by the computer LOADER switch. A separate version of the BMDL exists for each of three classes of moving-head disc, depending on which disc type is supported by the system—HP 7900/7901, HP 2883, or HP 2870. Only one version can reside in main memory at a given time. The BMDL loads absolute binary program tapes into memory, or loads absolute binary programs from disc (moving-head) into memory.

Each computer is shipped with either the BBL, BBDL, or one version of BMDL in memory, depending on the user needs and the hardware configuration.

## **EXAMINING AND MODIFYING THE BBL, BBDL, OR BMDL**

### **Examining**

To examine either the BBL, BBDL, or BMDL to insure that it is in memory or that it is intact, follow the steps outlined below: (A complete listing of the BBL, BBDL and BMDL as it resides in core is shown in the BBL, BBDL, and BMDL LISTING.)

1. Unprotect the BBL, BBDL, or BMDL.
2. Set the address of the desired memory location into the computer.
3. Display the address contents in the computer display registers in the same fashion as any other memory location.
4. Repeat steps 2 and 3 for as many memory locations as desired.
5. Protect the BBL, BBDL, or BMDL.

### **Modifying**

To modify any of the BBL, BBDL, or BMDL instructions in core, follow the steps outlined below:

1. Unprotect the BBL, BBDL, or BMDL.
2. Set the address of the desired memory location into the computer.
3. Load the modified instruction into the memory location specified in the same manner as any other memory location would be modified.
4. Repeat steps 2 and 3 for each memory location that requires modification.
5. Protect the BBL, BBDL, or BMDL.

Table 1. BBL Listing

Address	Contents	Address	Contents
x7700	107700	x7740	102000
x7701	063770	x7741	037775
x7702	106501	x7742	037774
x7703	004010	x7743	027730
x7704	002400	x7744	017753
x7705	006020	x7745	054000
x7706	063771	x7746	027711
x7707	073736	x7747	102011
x7710	006401	x7750	027700
x7711	067773	x7751	102055
x7712	006006	x7752	027700
x7713	027717	x7753	000000
x7714	107700	x7754	017762
x7715	102077	x7755	001727
x7716	027700	x7756	073776
x7717	017762	x7757	017762
x7720	002003	x7760	033776
x7721	027712	x7761	127753
x7722	003104	x7762	000000
x7723	073774	x7763	1037kk
x7724	017762	x7764	1023kk
x7725	017753	x7765	027764
x7726	070001	x7766	1025kk
x7727	073775	x7767	127762
x7730	063775	x7770	173775
x7731	043772	x7771	153775
x7732	002040	x7772	1n0100
x7733	027751	x7773	177765
x7734	017753	x7774	000000
x7735	044000	x7775	000000
x7736	000000	x7776	000000
x7737	002101	x7777	000000

Loader starting address = x7700<sub>g</sub>.

x = 0 for 4K memory, 1 for 8K,  
2 for 12K, 3 for 16K,  
4 for 20K, 5 for 24K,  
6 for 28K, 7 for 32K.

kk = tape input device select code

n = 7 for 4K memory, 6 for 8K,  
5 for 12K, 4 for 16K,  
3 for 20K, 2 for 24K,  
1 for 28K, 0 for 32K



Table 2. BBDL Listing

Address	Contents	Address	Contents	
x7700	107700	x7740	102055	Paper tape loader starting address = x7700 <sub>8</sub> ; Fixed-head disc loader starting address = x7760 <sub>8</sub> .
x7701	002401	x7741	027700	
x7702	063726	x7742	000000	x = 0 for 4K memory, 1 for 8K, 2 for 12K, 3 for 16K, 4 for 20K, 5 for 24K, 6 for 28K, 7 for 32K.
x7703	006700	x7743	006600	
x7704	017742	x7744	1037kk	
x7705	007306	x7745	1023kk	
x7706	027713	x7746	027745	
x7707	002006	x7747	1074kk	
x7710	027703	x7750	002041	
x7711	102077	x7751	127742	dd = low priority (higher numbered) disc select code.
x7712	027700	x7752	005767	
x7713	077754	x7753	027744	cc = high priority (lower numbered) disc select code.
x7714	017742	x7754	000000	
x7715	017742	x7755	1n0100	
x7716	074000	x7756	0200cc	n = 7 for 4K memory, 6 for 8K, 5 for 12K, 4 for 16K, 3 for 20K, 2 for 24K, 1 for 28K, 0 for 32K.
x7717	077757	x7757	000000	
x7720	067757	x7760	107700	
x7721	047755	x7761	063756	
x7722	002040	x7762	102606	
x7723	027740	x7763	002700	
x7724	017742	x7764	1026dd	
x7725	040001	x7765	001500	
x7726	177757	x7766	102602	
x7727	037757	x7767	063777	
x7730	000040	x7770	102702	
x7731	037754	x7771	102602	
x7732	027720	x7772	103706	
x7733	017742	x7773	1027cc	
x7734	054000	x7774	067776	
x7735	027702	x7775	074077	
x7736	102011	x7776	024077	
x7737	027700	x7777	177700	



Table 3a. HP 7900/7901 BMDL Listing

Address	Contents	Address	Contents	
x7700	002701	x7740	1023kk	Paper tape loader starting address = x7700 <sub>8</sub> ; Moving-head disc loader starting address = x7750 <sub>8</sub> ("PRESET" must be pressed).
x7701	063722	x7741	027740	
x7702	002307	x7742	1064kk	
x7703	102077	x7743	002041	
x7704	017735	x7744	127735	
x7705	007307	x7745	005767	
x7706	027702	x7746	027737	
x7707	077733	x7747	030000	x = 0 for 4K, 1 for 8K, 2 for 12K, 3 for 16K, 4 for 20K, 5 for 24K, 6 for 28K, <u>7 for 32K</u>
x7710	017735	x7750	002400	
x7711	017735	x7751	1026cc	kk = tape input device select code
x7712	074000	x7752	1037cc	
x7713	077734	x7753	067747	dd = low priority (higher numbered) disc select code <b>16</b>
x7714	067734	x7754	1066dd	
x7715	047777	x7755	1037dd	
x7716	002040	x7756	1066cc	cc = high priority (lower numbered) disc select code <b>16</b>
x7717	102055	x7757	063776	
x7720	017735	x7760	102606	
x7721	040001	x7761	067732	n = 7 for 4K, 6 for 8K, 5 for 12K, 4 for 16K, 3 for 20K, 2 for 24K, 1 for 28K, <u>0 for 32K</u>
x7722	177734	x7762	106602	
x7723	037734	x7763	1037cc	
x7724	000040	x7764	102702	
x7725	037733	x7765	106602	
x7726	027714	x7766	013741	
x7727	017735	x7767	1026dd	
x7730	054000	x7770	1037cc	
x7731	027701	x7771	103706	
x7732	102011	x7772	1037dd	
x7733	000000	x7773	1023dd	
x7734	000000	x7774	027773	
x7735	000000	x7775	127717	
x7736	006600	x7776	1200cc	
x7737	1037kk	x7777	1n0100	





LOADER LOADER **Tape No. 24353-16001**

A. STARTUP FROM SCRATCH

1. Enter instructions shown in table 1-1 via switch register.
2. Place paper tape in reader (be it photoreader or teletype); set P to 3000g.
3. Set switch register to indicate desired loader and select codes per table 1-2.
4. Press PRESET (External and Internal, if applicable), LOADER ENABLE, and RUN. Tape will be read in and new loader placed into top locations of memory.

B. IF PAPER TAPE LOADER EXISTS

Unwind paper tape to first section of blank tape and place paper tape into reader at this blank area. Load tape using existing paper tape loader. Set P to 100g and proceed as in steps 3 and 4 above.

C. PROGRAM HALTS

Memory Data	Meaning
102077	Program completed successfully.
102001	Select code is less than 10g (bad select code displayed in A-reg).
102002	Loader number not implemented yet.
102003	An instruction was not stored correctly - possibly caused by not enabling the loader.

After any program halt, the program may be restarted by resetting the switch register (if necessary) and pressing PRESET (External and Internal, if applicable), LOADER ENABLE, and RUN.

LOADER LOADER (CONT)

Table 1-1. Instructions Entered Via Switch Register

Memory Location	Contents	Source Code
2765	...	READ BSS 1
2766	002500	CLA,CLE
2767	1037XX	STC RDR,C
2770	1023XX	SFS RDR
2771	026770	JMP *-1
2772	001626	ELA,ELA
2773	001626	ELA,ELA
2774	1024XX	MIA RDR
2775	002040	SEZ
2776	126765	JMP READ,I
2777	026767	JMP READ+2
3000	016765	START JSB READ
3001	073003	STA *-2
3002	016765	JSB READ

XX = paper tape reader select code

Table 1-2. Switch Register Options

Loader	Bits 15-12	Bits 11-6	Bits 5-0
BBL	0000	Not used	Reader SC
BBDL	0001	Fixed-head disc SC	Reader SC
BMDL (7900/7901)	0010	Moving-head disc SC	Reader SC
BMDL (2883)	0011	Moving-head disc SC	Reader SC
BMDL (2870)	0100	Moving-head disc SC	Reader SC
MTRS	0101	Magnetic tape SC	Not used

(For two-channel interfaces, use lower select code)

