

HP 2100 LOW MEMORY ADDRESS TEST AND HP 2100 HIGH MEMORY ADDRESS TEST



HP Product No. HP 24211
and
HP Product No. HP 24212



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Diagnostic Program Procedure
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HP 2100 MEMORY ADDRESS TESTS

These two diagnostic programs, the HP 2100 Low Memory Address Test and the HP 2100 High Memory Address Test, check the memory address register of an HP 2100 computer and any user-specified area of core. The Low-Test occupies lower memory to test upper memory addresses, while the High-Test occupies upper memory to test lower memory addresses.

HARDWARE CONFIGURATION



These diagnostic programs are run on an HP 2100 computer only. A punched tape reader is the only peripheral device used, when possible, to load the selected program into core. Errors are reported by displays in the computer front panel registers.

When either program is run, the P.E. switch (S2) on the I/O buffer board should be set to HALT.

FUNCTIONAL AND OPERATIONAL CHARACTERISTICS

Either the Low- or the High- Memory Address Test may be run first, followed by the other. The Basic Binary Loader (if useable) places each program into core at the desired time; otherwise, either program may be loaded through the front panel.

When the Low-Test is used, operation is started at location 0100_8 to test any user-specified area in the range of addresses 0144_8 through the upper limit of memory. (The program resides in locations 0100_8 through 0143_8 .)

When the High-Test is used, operation is started at location 3600_8 to test any user-specified area below address 3600_8 (except address 0 and 1) or above 3643_8 . (The program resides in locations 3600_8 through 3643_8 .)

After the desired Memory Address Test has been loaded, the user specifies the first then the last address to be tested.

NOTE: Neither Memory Address Test program checks the limits of the first and last addresses specified. The user should take care to avoid destruction of the program or the Basic Binary Loader.

The program then runs continuously until an error is detected or the user changes control either to terminate the program or to change the area to be tested. The EXTEND button light changes state every 20 program cycles to show that the program is looping successfully.

To test each address in the area specified, the program begins by writing the address number into each location throughout the test area. Then it returns to the first address to start a continuous loop in which each address is tested by reading the content and checking for a difference between the address and the content. The loop runs through the last address then returns to the first address.

If a difference is detected, the program halts with MEMORY DATA 102077₈ in the computer DISPLAY REGISTER, the current address in the A-Register (press A to display) and the content of that address in the B-Register (press B to display). To resume the program, the user presses RUN again.

OPERATING INSTRUCTIONS

- a. Set the P.E. switch (S2) on the I/O buffer board to HALT.
- b. Use the Basic Binary Loader (BBL) to load the desired Memory Address Test. Or, if the BBL is not useable, load the program manually through the front panel* from the listing on page MAT-4 or MAT-5.
- c. If the Low Memory Address Test was just loaded, set the starting address 100₈; otherwise, set the starting address 3600₈.

*The required steps are described in the *SOFTWARE OPERATING PROCEDURES* manual.

- d. Press INTERNAL and EXTERNAL PRESET then press RUN. The program halts with MEMORY DATA 102000₈ displayed.
- e. Press S, set the DISPLAY REGISTER to the first address to be tested, then press RUN. The program halts with MEMORY DATA 102001₈ displayed.
- f. Press S, set the DISPLAY REGISTER to the last address to be tested, then press RUN. The program runs until a difference is detected or the user changes control.
- g. The user may change control of the program either to terminate execution (press HALT) or to change the first and last addresses to be tested (set switch register* bit 15 on). If bit 15 is set on, the program halts with MEMORY DATA 102000₈ displayed. Now perform steps e through g again.
- h. When this program is terminated, set the P.E. switch (S2) on the I/O buffer board to the desired position.



*While a program is running, the HP 2100 computer S button is lit to indicate the switch register is controlled through the DISPLAY REGISTER. Thus, to set a switch register bit press that bit in the DISPLAY REGISTER.

0001			ASMB, A, B, L, T, C	
0003	00100		ORG 100B	
0004	00100	002500	BEGIN CLA, CLF	
0005	00101	070142	STA CNT	RESET F REGISTER INDICATOR
0006	00102	102000	HLT 0	HALT TO GET STARTING ADDRESS
0007	00103	102501	LIA 1	INPUT AND
0008	00104	070140	STA FWA	SAVE STARTING ADDRESS
0009	00105	102001	HLT 1	HALT TO GET ENDING ADDRESS
0010	00106	106501	LIR 1	INPUT AND
0011	00107	074141	STB LWA	SAVE ENDING ADDRESS
0012	00110	060140	WRITE LDA FWA	
0013	00111	170000	WRITE STA A, I	IN EACH LOCATION IN THE RANGE,
0014	00112	050141	CPA LWA	STORE IT'S ADDRESS
0015	00113	024116	JMP READ	
0016	00114	002004	INA	
0017	00115	024111	JMP WRITE	
0018	00116	060140	READ LDA FWA	FROM EACH CORE LOCATION IN THE
0019	00117	164000	READ1 LDB A, I	RANGE, READ IT'S CONTENTS &
0020	00120	050001	CPA B	CHECK THAT IT IS THE SAME AS
0021	00121	002001	RSS	IT'S ADDRESS
0022	00122	102077	HLT 77B	ERROR: A=ADDRESS, B=BAD CONTENTS
0023	00123	050141	CPA LWA	
0024	00124	024127	JMP FNSH	
0025	00125	002004	INA	
0026	00126	024117	JMP READ1	
0027	00127	060142	FNSH LDA CNT	
0028	00130	002004	INA	STEP COUNTER
0029	00131	050143	CPA .20	IF 20, RESET IT & CHANGE E
0030	00132	002600	CLA, CME	
0031	00133	070142	STA CNT	
0032	00134	102501	LIA 1	
0033	00135	002020	SSA	CHECK SWITCH 15
0034	00136	024100	JMP BEGIN	SET - GET NEW ADDRESSES
0035	00137	024110	JMP WRITE	CLEAR - DO ANOTHER LOOP
0036*				
0037	00140	000000	FWA NOP	FIRST WORD ADDRESS
0038	00141	000000	LWA NOP	LAST WORD ADDRESS
0039	00142	000000	CNT NOP	COUNTER
0040	00143	000024	.20 DEC 20	
0041	00000		A EQU 0	A REGISTER
0042	00001		B EQU 1	B REGISTER
0043			END	

★★ NO ERRORS★



0001		ASMB,A,B,L,T,C		
0003	03600		ORG 3600B	
0004	03600	002500	BEGIN CLA,CLE	
0005	03601	073642	STA CNT	RESET F REGISTER INDICATOR
0006	03602	102000	HLT 0	HALT TO GET STARTING ADDRESS
0007	03603	102501	LIA 1	INPUT AND
0008	03604	073640	STA FWA	SAVE STARTING ADDRESS
0009	03605	102001	HLT 1	HALT TO GET ENDING ADDRESS
0010	03606	106501	LIR 1	INPUT AND
0011	03607	077641	STB LWA	SAVE ENDING ADDRESS
0012	03610	063640	WRITE LDA FWA	
0013	03611	170000	WRIT1 STA A,I	IN EACH LOCATION IN THE RANGE,
0014	03612	053641	CPA LWA	STORE IT'S ADDRESS
0015	03613	027616	JMP READ	
0016	03614	002004	INA	
0017	03615	027611	JMP WRIT1	
0018	03616	063640	READ LDA FWA	FROM EACH CORE LOCATION IN THE
0019	03617	164000	READ1 LDR A,I	RANGE, READ IT'S CONTENTS &
0020	03620	050001	CPA B	CHECK THAT IT IS THE SAME AS
0021	03621	002001	RSS	IT'S ADDRESS
0022	03622	102077	HLT 77B	ERROR: A=ADDRESS, B=BAD CONTENTS
0023	03623	053641	CPA LWA	
0024	03624	027627	JMP FNSH	
0025	03625	002004	INA	
0026	03626	027617	JMP READ1	
0027	03627	063642	FNSH LDA CNT	
0028	03630	002004	INA	STEP COUNTER
0029	03631	053643	CPA .20	IF 20, RESET IT & CHANGE E
0030	03632	002600	CLA,CME	
0031	03633	073642	STA CNT	
0032	03634	102501	LIA 1	
0033	03635	002020	SSA	CHECK SWITCH 15
0034	03636	027600	JMP BEGIN	SET = GET NEW ADDRESSES
0035	03637	027610	JMP WRITF	CLEAR = DO ANOTHER LOOP
0036*				
0037	03640	000000	FWA NOP	FIRST WORD ADDRESS
0038	03641	000000	LWA NOP	LAST WORD ADDRESS
0039	03642	000000	CNT NOP	COUNTER
0040	03643	000024	.20 DEC 20	
0041	00000		A EQU 0	A REGISTER
0042	00001		B EQU 1	B REGISTER
0043			END	

** NO ERRORS*

