The first memory block must always start at 8K (040). Additional memory, up to 64K, must start where the previous memory block ends. The table below shows the relationship between the memory size and the starting addresses.

Abbreviated Memory Size (Decimal)	Actual Memory Size (Decimal)	Starting Address (high byte — octal)
8K	8,192	040
12K	12,288	060
16K	16,384	100
20K	20,480	120
24K	24,576	140
28K	28,672	160
32K	32,768	200
36K	36,864	220
40K	40,960	240
44K	45,056	260
48K	49,152	300

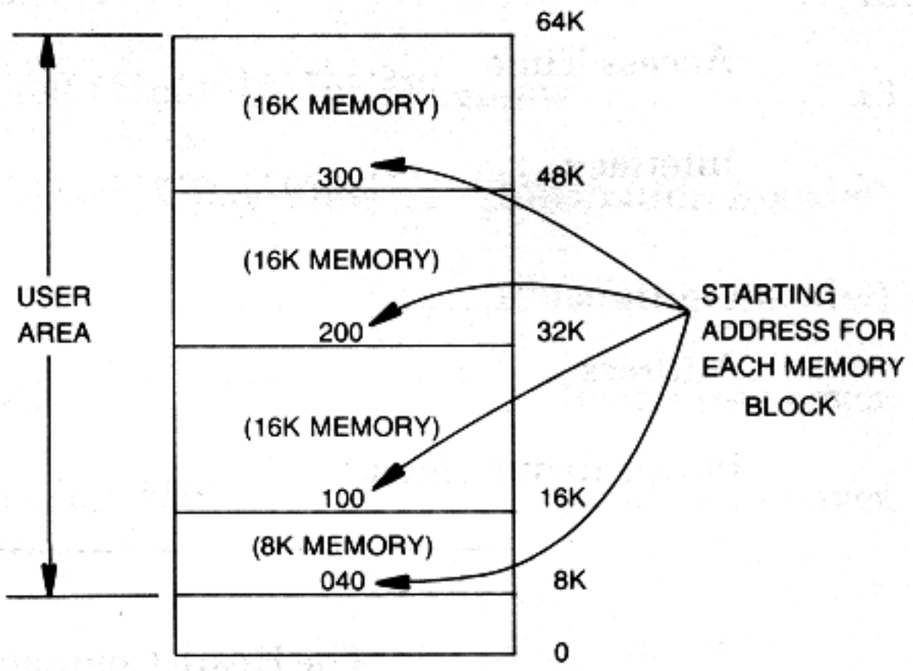
Since the H8 Computer can accommodate only a 64K memory, you can use one 8K and three 16K memory circuit boards:

1 — 8K Static Memory Circuit Board

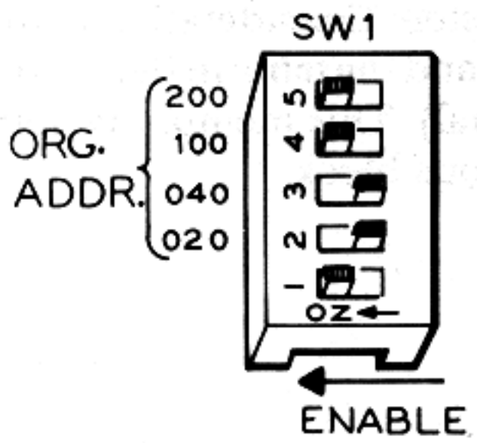
3 — 16K Static Memory Circuit Board

Do not program the starting address of the 16K Static Memory circuit board to start higher than 48K or you will cause memory to wrap around into the ROM area reserved for the H8 front panel monitor.

Install and address them as shown in the following example memory map.



The programming switch assembly (SW1) lets you quickly and easily select the starting address. The lower switch (1) is normally pushed to the left (enabled), to enable the circuit board. Push it to the right if you want to disable the entire circuit board without losing the data stored in memory. The other four switches (020, 040, 100, and 200) select the starting address. The numbers to the left of these switches (020, 040, etc.) are added together to obtain the desired address. For example, if you want the memory to start at the 48K address (300 octal), push the 100 and 200 switches to the left (enable). See Pictorial 1. Leave the 020 and 040 switches to the right (disabled).



PICTORIAL 1

IN CASE OF DIFFICULTY

This section of the Manual will help you locate and correct any difficulties which may occur during the operation of this circuit board.

The following "Memory Test Routine" will help you determine whether or not there is a problem on this circuit board.

NOTE: In an extreme case where you are unable to resolve a difficulty, refer to the "Customer Service" information inside the rear cover of this Manual. Your Warranty is located inside the front cover.

MEMORY TEST ROUTINE

You will compare the B register in the Computer with the memory while the HL registers hold the address that is being tested. To start the test, you will write 000 into all memory locations, set the B register to 000, and set HL to the starting address. The HL register then increments up to the ending address as it compares each location with the B register. The B register is then incremented to 001 and each memory location is then incremented and compared with the B register. This process continues until the B register reaches 377 and repeats the test.

If the content of the memory location (that corresponds to the address in the HL register) does not agree with the value in the B register, the test halts and the alarm "beeps." This returns control to the front panel so you can isolate the failure.

Refer to "Use of the Front Panel" in your H8 Operation Manual to enter the following routine. NOTE: A more complete listing of this routine is in your H8 Operation Manual.

To test the 16K Static Memory circuit board:

a. Set the "ORG. ADDR." switches to 040.

b. Remove or disable all other memory circuit boards.

c. Run the memory test, starting with step 1 below.

1. Press MEM and enter 040 100.

2.Press ALTER and enter the following bytes:

ADDRESS	DATA
040 100	041
040 101	160
040 102	040
040 103	021
040 104	260
040 105	137
040 106	066
040 107	000
040 110	315
040 111	147
040 112	040
040 113	043
040 114	302
040 115	106
050 116	040
040 117	006
040 120	000
040 121	052
040 122	101
040 123	040
040 124	004
040 125	064
040 126	176
040 127	270
040 130	312
040 131	135
040 132	040
040 133	166
040 134	000
040 135	315
040 136	147
040 137	040
040 140	043
040 141	302
040 142	125
040 143	040
040 144	303
040 145	121
040 146	040
040 147	172
040 150	254
040 151	300
040 152	173
040 153	255
040 154	311

3. Press MEM.

4. Enter 040 100.

5. Press the + key and verify that you have entered the routine correctly.

6. Press REG.

7. Press PC.

8. Press ALTER.

9. Enter 040 100.

10. Press REG.

11. Press BC.

12. Press GO.

If the test routine is executed without difficulty, the B register (left 3 digits in the display) will increment from 000 to 377. When the display reaches 377, the test is complete and may be halted (press RTM and ∅).

If the test routine fails, the speaker will sound and the B register will indicate the memory **content** at which the test failed. The HL registers (press REG and HL) will display the memory **address** at which the test failed.

Memory failures generally fall in two categories: address and data. In a data failure, a particular number (or group of numbers) between 000 and 377 can not be written and then recalled from the memory. This may be caused by faulty data buffers or defective cells in the memory IC's. Since there are thirty-two memory IC's, one for each bit of each byte, it is possible to write a combination of bytes at the address where the test failed and determine which IC is at fault.

Addressing faults are the most difficult to isolate. They are caused by failures in the memory IC's. Often, more than one address will access the same location. If you recall the way the memory test operates, you can see that a given location will be incremented too often and cause the test to fail. When the memory test halts, try to write the current number (in the B register) into that memory location. If you can write the number into the location, the fault is address related.

These faults are difficult to locate, but a pattern will be evident if you study all of the failed address locations. (When the Computer is displaying the HL register, press the GO button after each failure and the test will proceed to the next failure.)

Write down the contents of the memory location that caused the test to fail. Then convert this octal number to binary. The least significant bit is D0; the most significant bit is D7. Compare the binary number with the previous memory location and with the number in the next memory location. The previous location contains the number as it should be, while the next memory location contains the number as it was previously. Compare the binary bits that caused the problem and the address of the problem to the following table. It will help you isolate the problem to a particular integrated circuit. Obtain the address of a failure from the HL register. Then refer to the table below to determine which IC is at fault.

ADDRESS	BANK	BINARY BIT NUMBER							
		D0	D1	D2	D3	D4	D5	D6	D7
040 000 — 057 377	0	U100	U101	U102	U103	U104	U105	U106	U107
060 000 — 077 377	1	U110	U111	U112	U113	U114	U115	U116	U117
100 000 — 117 377	2	U120	U121	U122	U123	U124	U125	U126	U127
120 000 — 137 000	3	U130	U131	U132	U133	U134	U135	U136	U137