

*Rainbow*TM

Memory Test Procedure

digital

EK-RBMXE-IN-CN1



Memory Test Procedure

digital equipment corporation

First Edition, September 1983

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Introduction

This booklet describes the procedure you should follow to test the Rainbow memory board when you first install it, or when you increase the size of the memory. This procedure determines if you installed your memory board correctly, or if you installed the memory upgrade chips correctly. In addition, if you suspect the memory board is faulty, you can use this procedure.

Introduction

Turning on the Computer

Set the power switch to 1 (on).

The first time you turn on your Rainbow computer after installing a memory board or changing its memory size, the computer should display the following message.

See Owner's Manual - MESSAGE 24 - New Memory Size = nnnK

The letters nnnK represent your total memory size.

The computer displays this message only once, and shortly thereafter displays the Main System Menu, as shown below.



Compare the new memory size displayed with the total memory expected. Refer to page 3 from the *Rainbow™ Memory Board Option Installation Guide*.

The computer may display a different message, such as:

See Owner's Manual - MESSAGE 27 - Memory Board
See Owner's Manual - MESSAGE 2 - Main Board

With either of these messages, the Main System Menu is not displayed. To obtain the menu, press the **Set-Up** key, then hold down the **Ctrl** key and press the **Set-Up** key again.

The Main System Menu must be displayed to continue with this test procedure.

NOTE

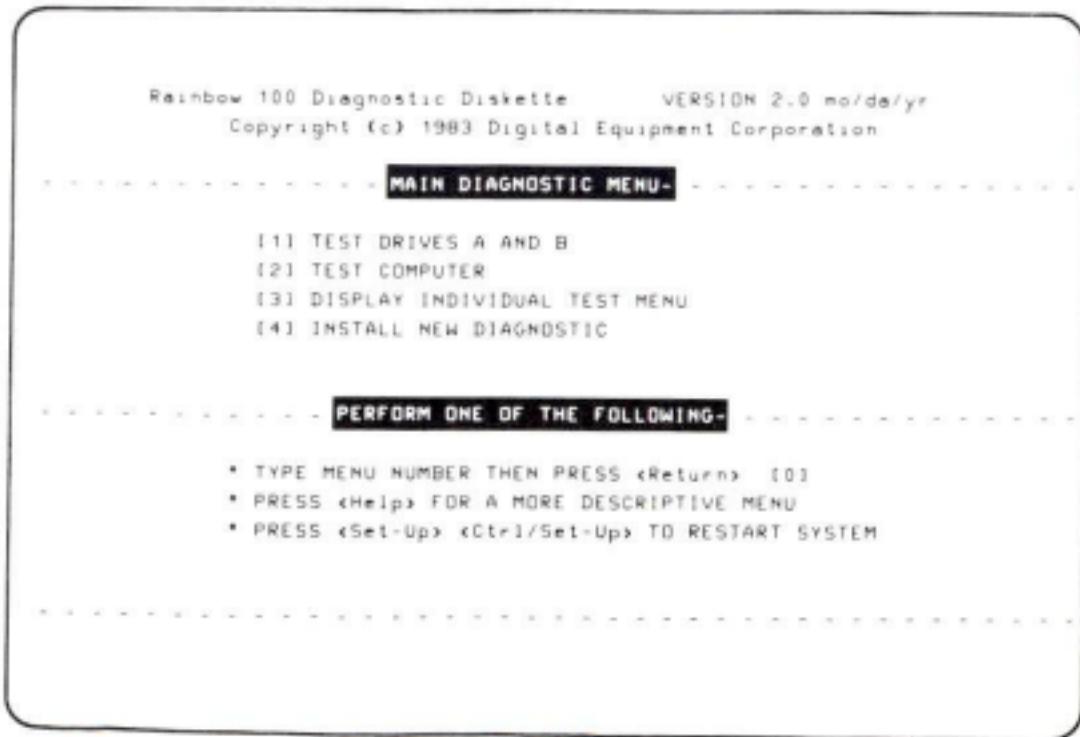
If the computer does not display the Main System Menu, refer to the troubleshooting section in your *Rainbow™ Owner's Manual*.

Test Procedure

Find the Rainbow diagnostic diskette in your system kit. Load this diskette in diskette drive A and close the door.

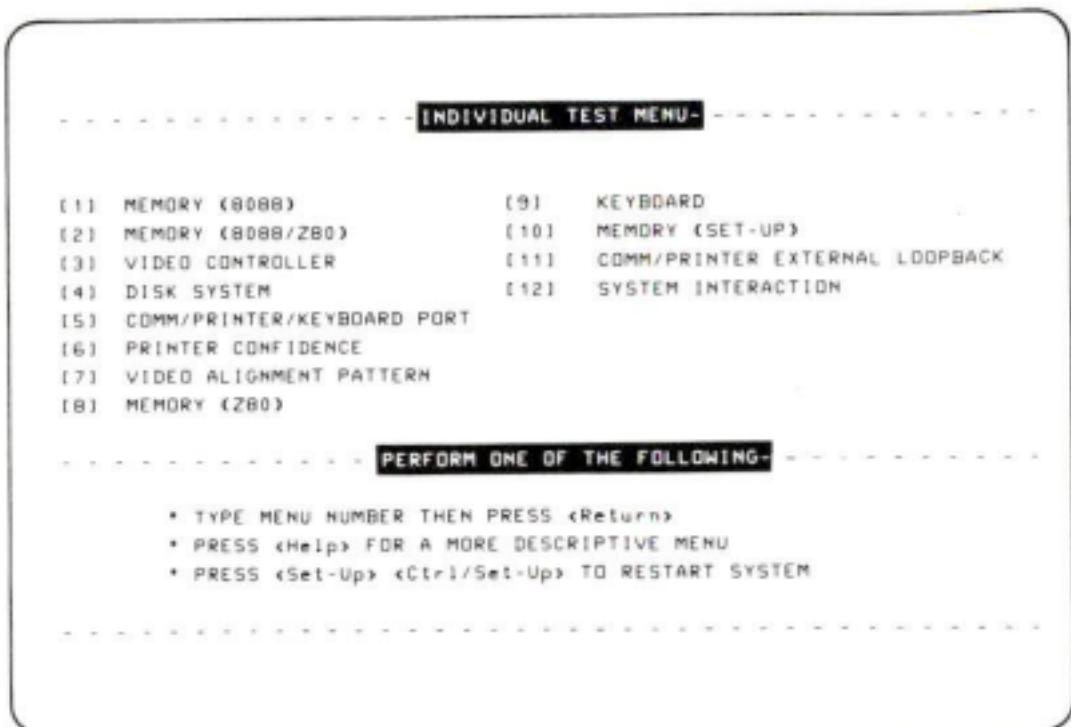
Type **A** and press the **Return** key.

The computer displays the Main Diagnostic Menu.



Test Procedure

Type **3** and press the **Return** key to display the Individual Test Menu.



Type **1** and press the **Return** key to select the first test: Memory (8088).

Test Procedure

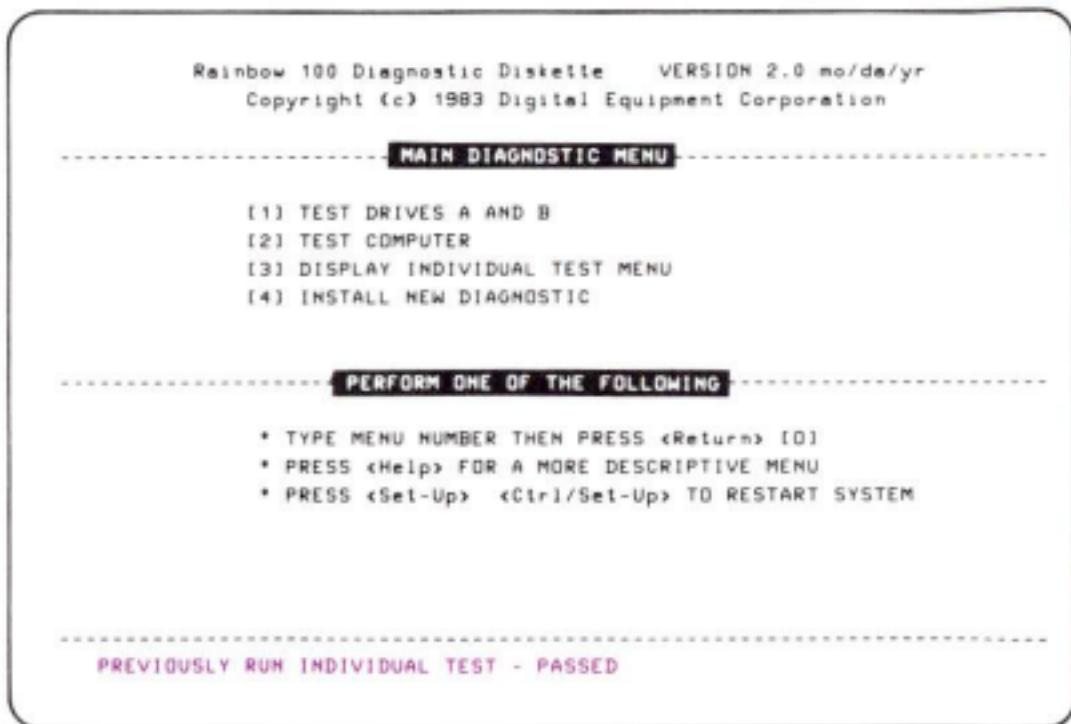
The test begins by sizing the memory and checking for correct installation of the memory chips. The computer displays the following screen.



A Successful Test

If the system memory size displayed is the same as your total memory size and the test is successful, the computer displays the Main Diagnostic Menu with the following message at the bottom of the screen.

PREVIOUSLY RUN INDIVIDUAL TEST - PASSED



NOTE

The memory test may take 30 minutes, depending on the size of your memory.

An Unsuccessful Test

If a memory chip is inserted backward, has a bent leg, is the wrong size, or is faulty, the computer displays a failure message on the bottom of the screen, as shown in the following example. If the memory board has the wrong switch settings, the computer also displays a failure message.

```
INDIVIDUAL DIAGNOSTIC TEST: MEMORY {B088} (REV 2.0)
-----
SYSTEM MEMORY SIZE = nnnk
-----
FAILURE: OPTION MEMORY BOARD: MEMORY STORES DATA INCORRECTLY
*FAILURE CODE = {number}    TYPE CONFIGURATION NUMBER OR
*TYPE P TO PROCEED OR L TO LOOP ON ERROR. THEN PRESS <RETURN>
*PRESS <HELP> FOR MORE INFORMATION.
```

If you see the message:

FAILURE: OPTION MEMORY BOARD:
MEMORY SIZING INCORRECT

type **P** to proceed, as many times as requested, until the test starts.

If "FAILURE CODE = nn" is displayed, record the number below, then go to the next page.

nn = _____

Test Procedure

Determine the Failing Chip

If you have just added a new memory board, your configuration number is either 1 or 2, as found on page 2 of your *Rainbow™ Memory Board Option Installation Guide*. If you have added a set of memory upgrade chips, you must determine a new configuration number. Refer to the Configuration section of this book to determine this number. (See page 21.)

Example:

If your memory board is configuration 2, type **2** and press the **Return** key.

The test checks if a memory chip is in backward, has a bent leg, is the wrong size, or is faulty. The test may also fail if the memory board has the wrong switch settings. The following screen shows an example of a faulty chip in location E26.

Test Procedure

INDIVIDUAL DIAGNOSTIC TEST: MEMORY (8088) (REV 2.0)

SYSTEM MEMORY SIZE = nnnn

CHECK OPTION MEMORY BOARD COMPONENT CHIP NUMBER E26

- *FAILURE CODE = {number} TYPE CONFIGURATION NUMBER OR
- *TYPE P TO PROCEED OR L TO LOOP ON ERROR. THEN PRESS <RETURN>
- *PRESS <HELP> FOR MORE INFORMATION.

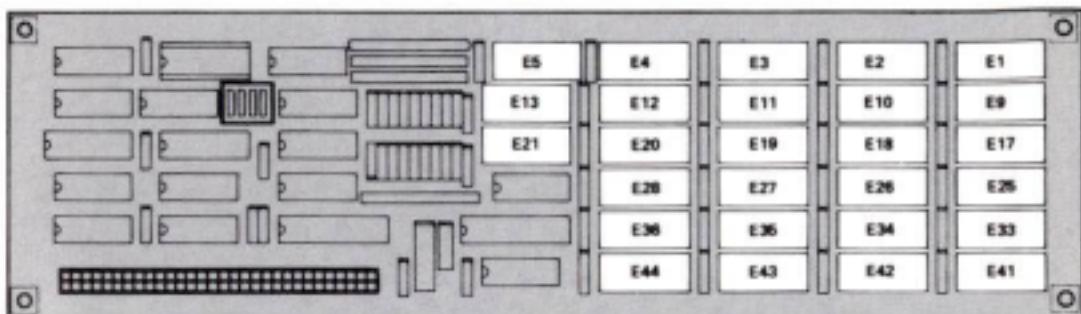
NOTE

If you do not know the configuration of your memory board, you must remove power to the Rainbow computer and remove the memory board from the system module to look at the configuration. (See page 13.)

Test Procedure

Identify the Chip Location

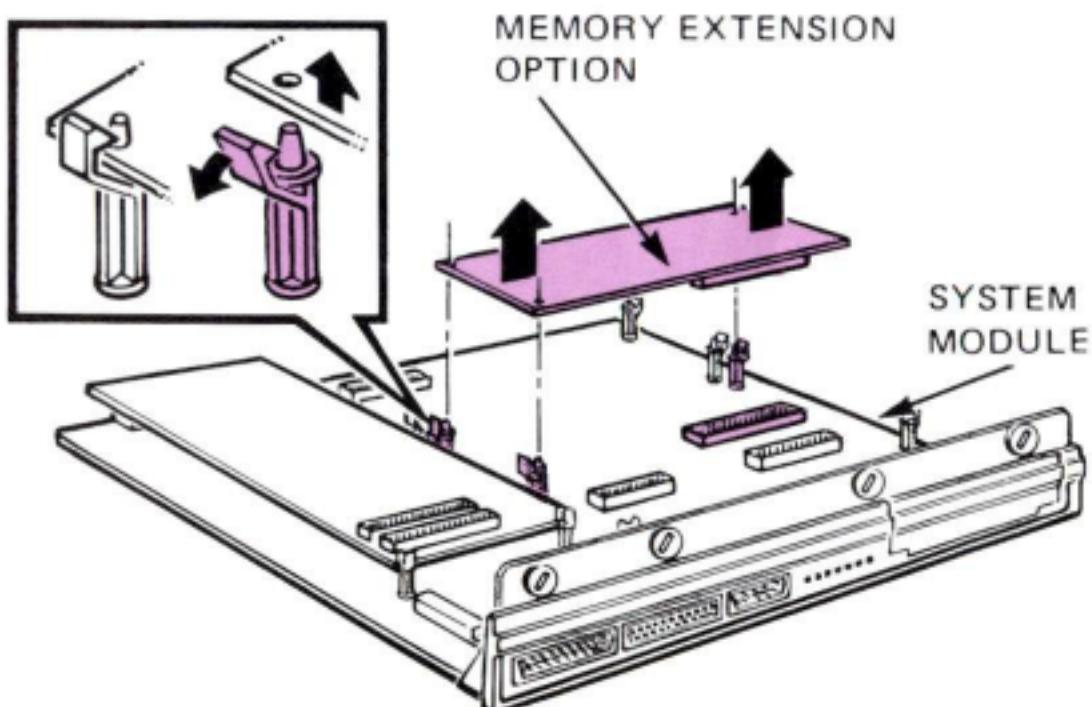
Find the E number displayed on your screen and mark it in the figure below.



Remove the Memory Board

Set the power switch to 0 (off), unplug the power cord, and remove the system module, as described in the *Rainbow™ Memory Board Option Installation Guide*.

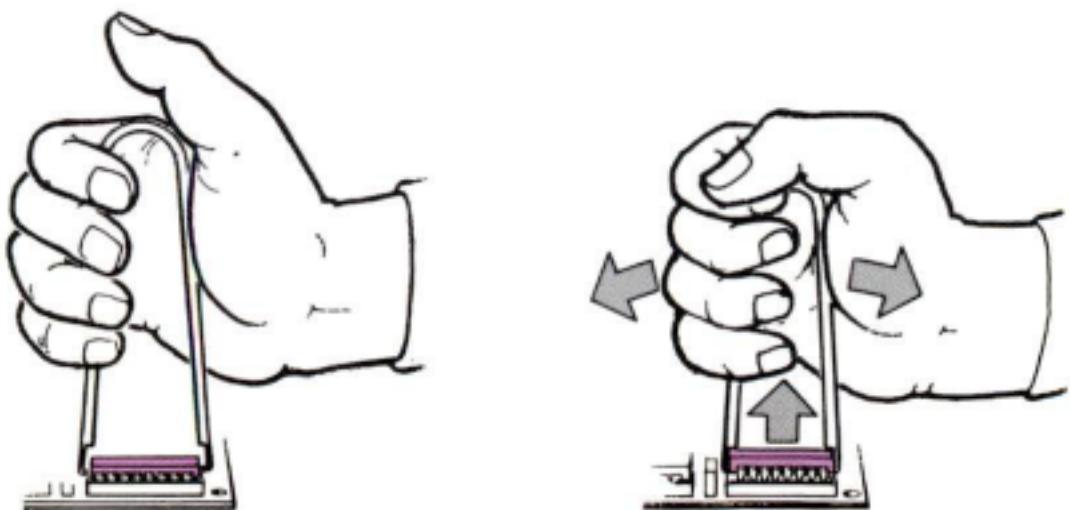
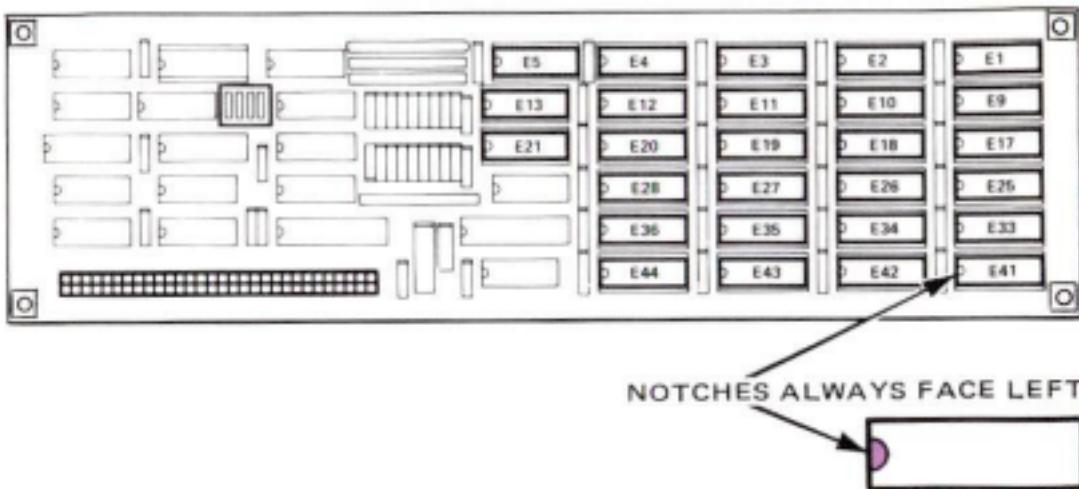
Press outward on the three standoffs and remove the memory board from the system module.



Test Procedure

If the Chip is in Backward

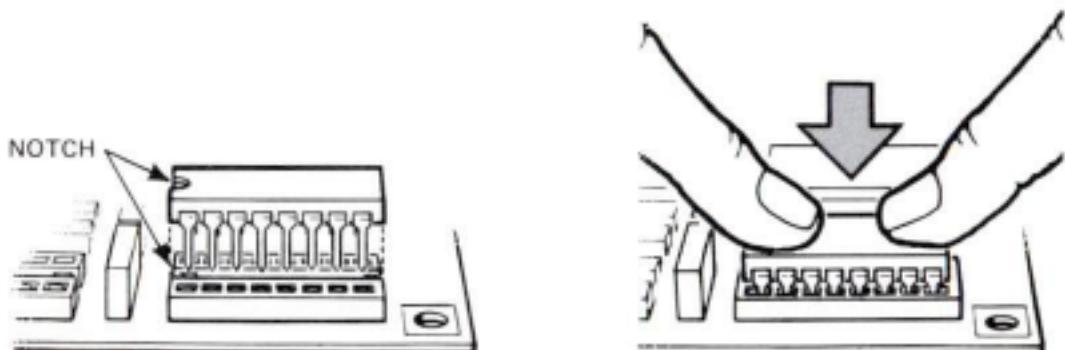
Place the memory board option in front of you as shown below. Locate the notch on the end of the chip. If the notch is facing the opposite direction than the others on the board, use your chip removal tool to remove the chip. Then reinsert it correctly. Check the other eight chips in that bank.



Test Procedure

If the Chip has a Bent Leg

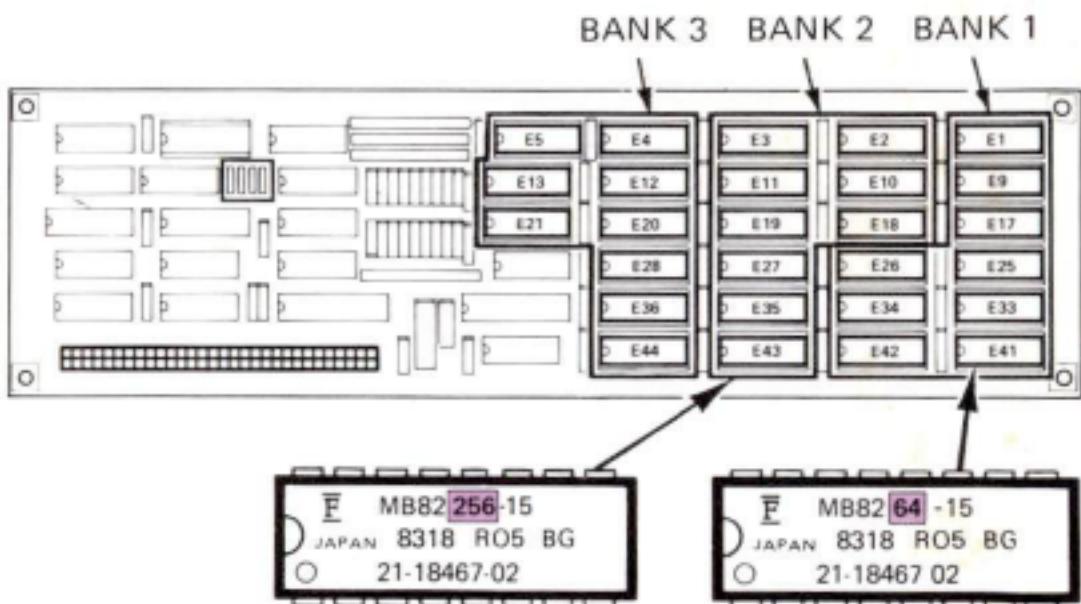
If you find a bent leg on the chip, use your chip removal tool to remove the chip. Straighten each leg of the chip, then reinsert the chip, taking care not to bend the legs.



Test Procedure

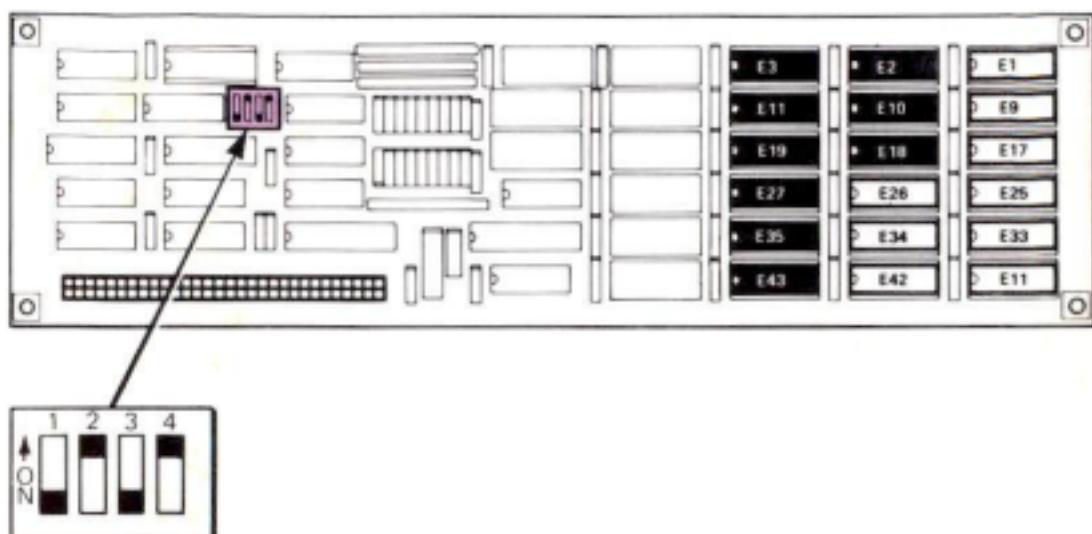
Check That All Nine Chips in Each Bank are the Same Size

Check the number, either 64 or 256, on the chips in each bank. They must be the same size within the bank, but may differ from another bank. For example, 64K chips may be in bank 1, and 256K chips may be in bank 2.



Check the Memory Board Switch for the Correct Setting

- Go to the Configuration section of this book (page 21) to check your switch settings or check your switches with the following table.



Memory Bank	Switch Position	64K Chips	256K Chips
1	1	OFF	ON
2	2	OFF	ON
3	3	OFF	ON
	4*	ON	ON

*Factory set. Must always remain ON.

Test Procedure

If No Visible Problem is Found

If you cannot find any visible problem with the failing chip, exchange the chip with another in the same memory bank. Remember to record the new location (E number) of this chip on page 12.

Install the memory board in your computer and run this test procedure again. Refer to the *Rainbow™ Memory Board Option Installation Guide*, if necessary.

If the test fails at the new memory chip location, return the upgrade kit or memory option to your dealer. Remember to ship the memory board in its original protective packing material and shipping box.

Run the Memory Test Procedure Again

After replacing a faulty chip, return to page 5 and run the Memory (8088) test from the Rainbow diagnostic diskette again. This test will only catch one failure at a time. Therefore, you must correct each chip that causes the test to fail, then run the test again.

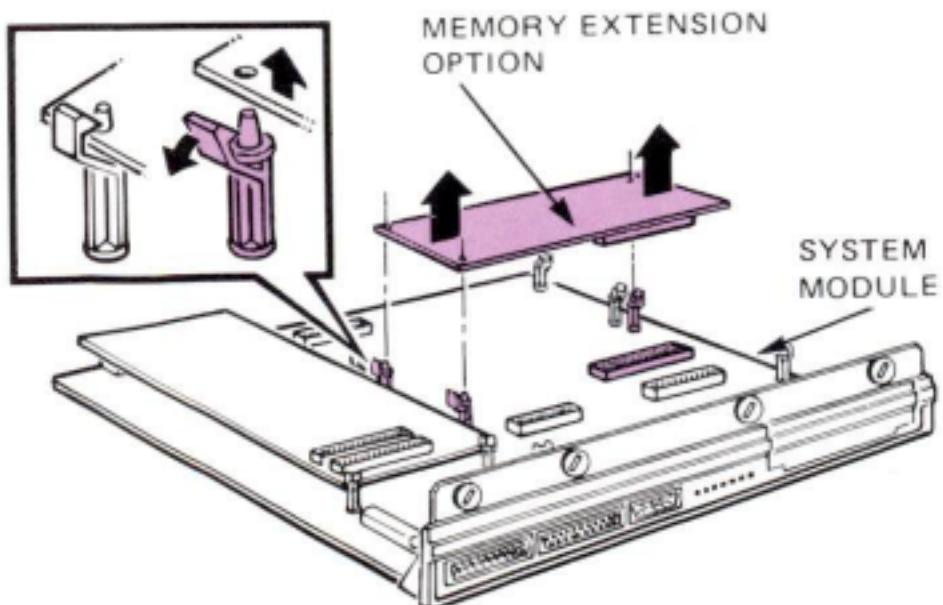
Run the test until it is successful.

Configurations

If you do not know your configuration number, remove the memory board.

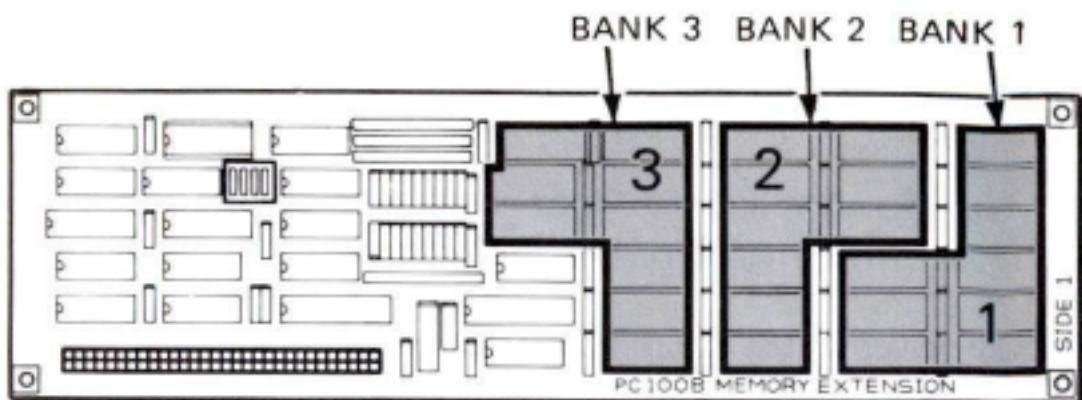
Set the power switch to 0 (off), unplug the power cord, and remove the system module, as described in the *Rainbow™ Memory Board Option Installation Guide*.

Press outward on the three standoffs and remove the memory board from the system module.

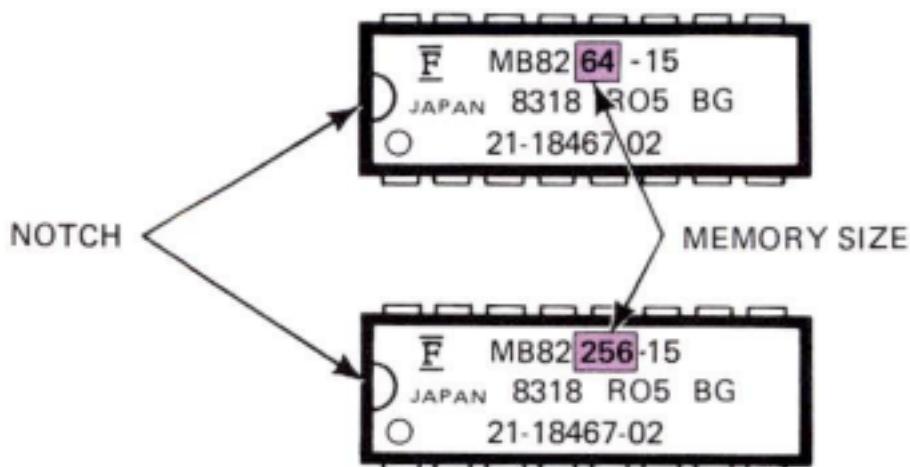


Configurations

Place the memory board in front of you as shown.



Determine the size of the memory chips in each bank by comparing them to the following illustrations.



NOTE

The exact letters and numbers on the chips and their locations may be different on your memory board.

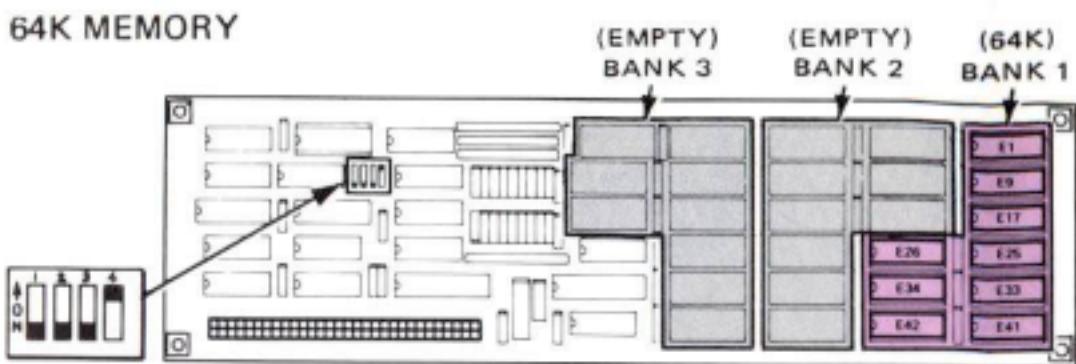
Compare your memory board chip sizes and locations to the eight configurations shown on the following pages.

Once you find your configuration number, write it down on page 2 of your *Rainbow™ Memory Board Option Installation Guide* for future reference.

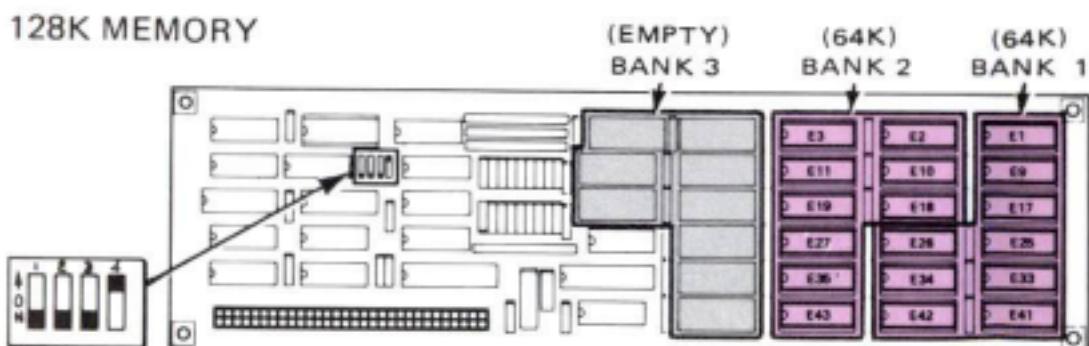
Configurations

Configuration 1

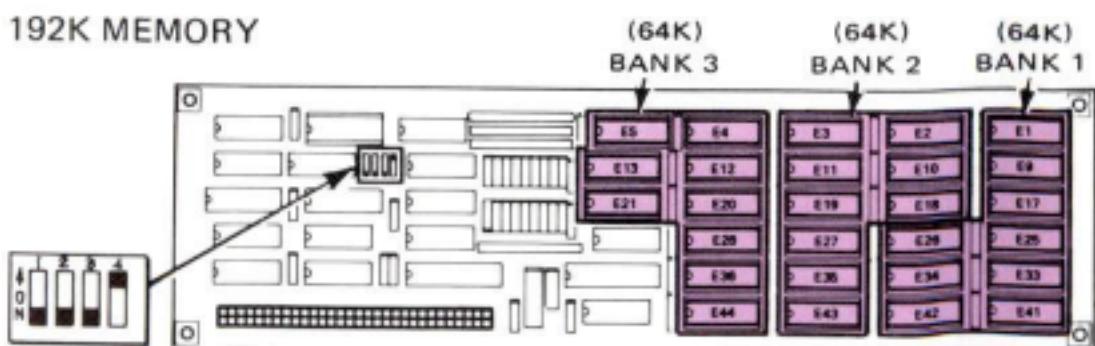
64K MEMORY



128K MEMORY



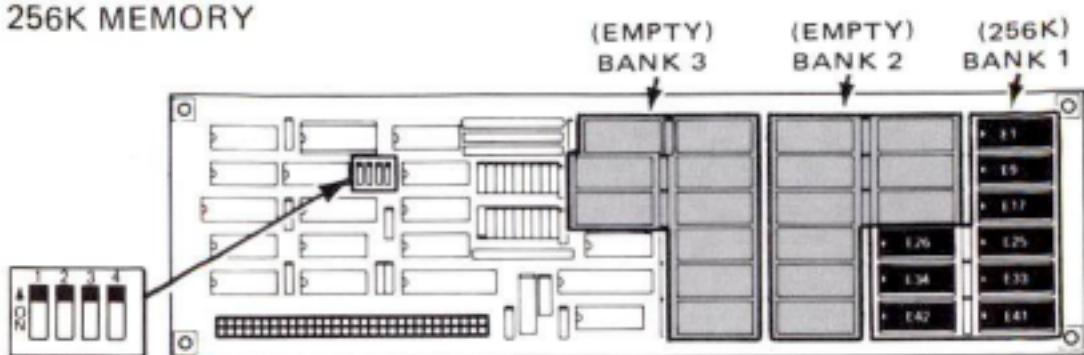
192K MEMORY



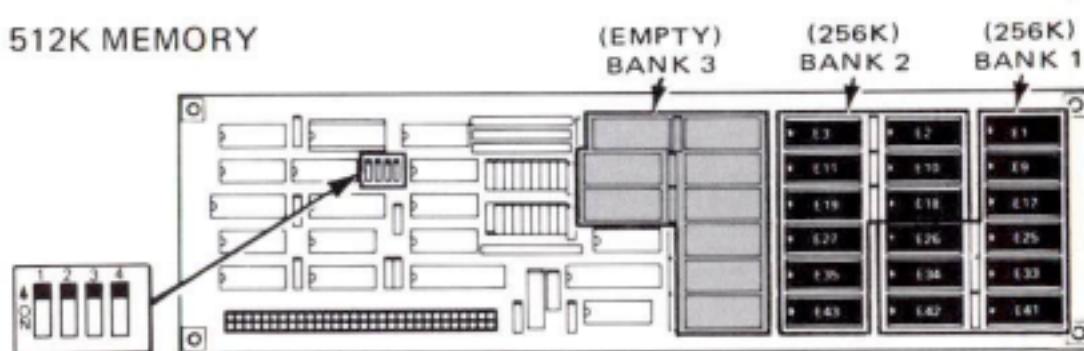
EMPTY 64K CHIP 256K CHIP

Configuration 2

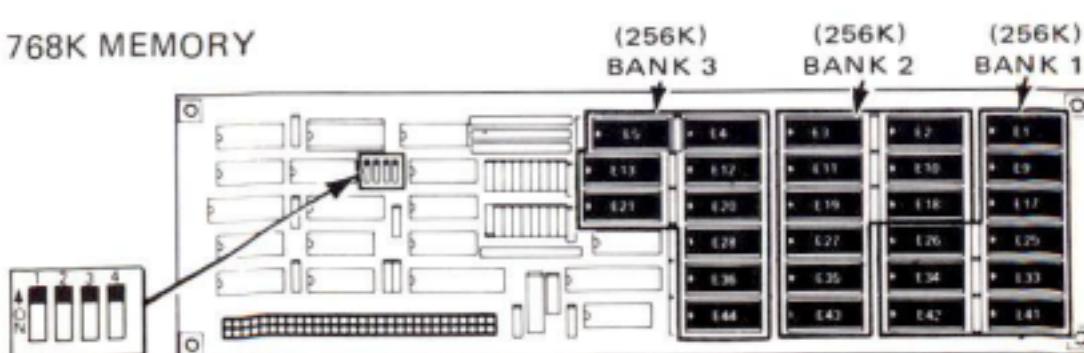
256K MEMORY



512K MEMORY



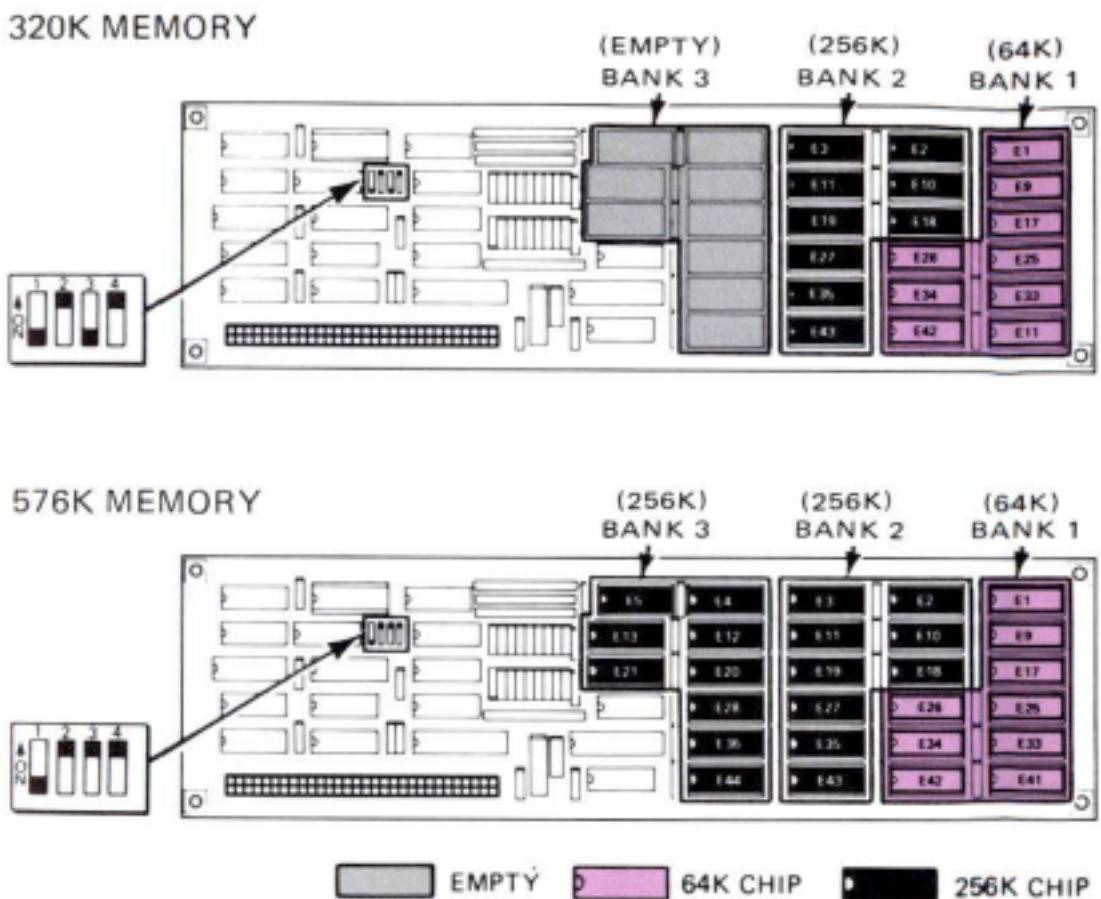
768K MEMORY



■ EMPTY ■ 64K CHIP ■ 256K CHIP

Configurations

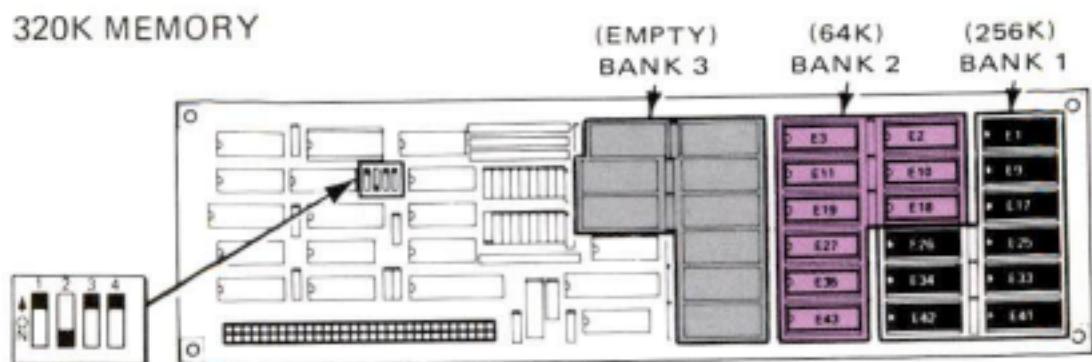
Configuration 3



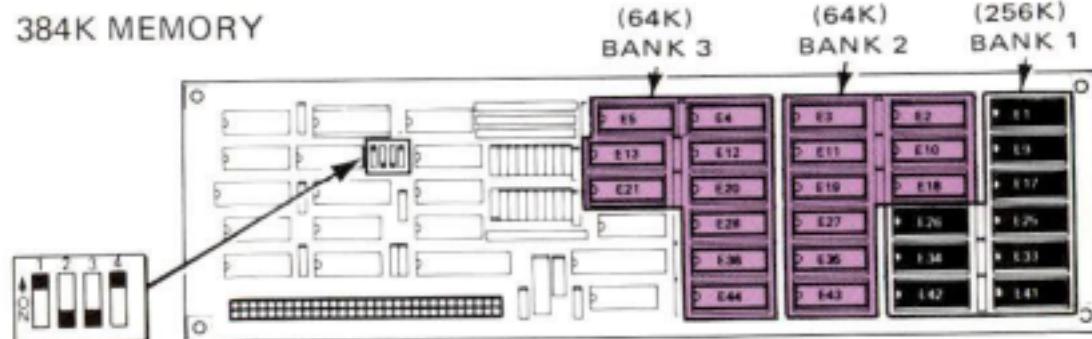
Configurations

Configuration 4

320K MEMORY



384K MEMORY

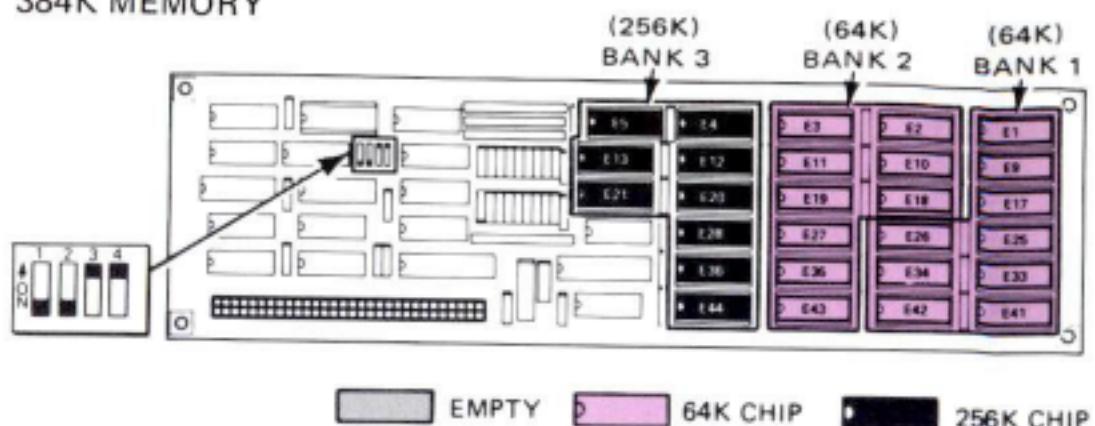


■ EMPTY ■ 64K CHIP ■ 256K CHIP

Configurations

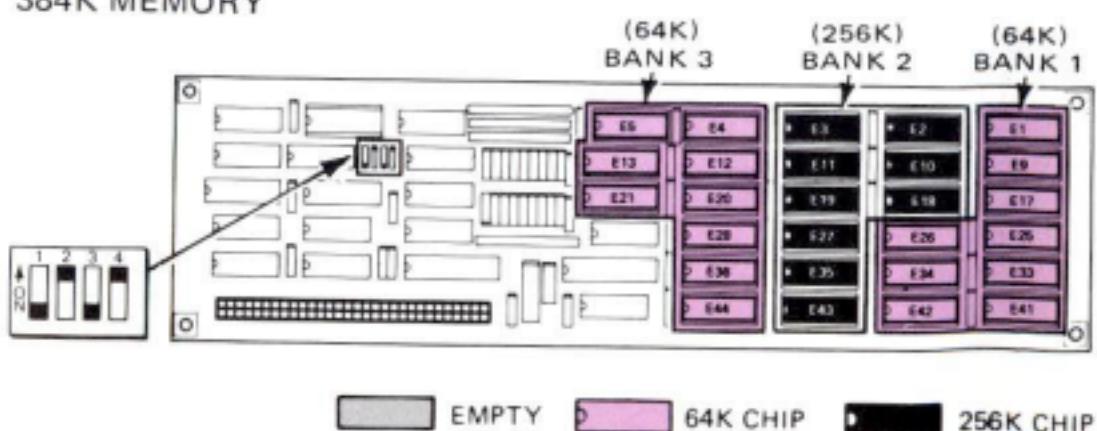
Configuration 5

384K MEMORY



Configuration 6

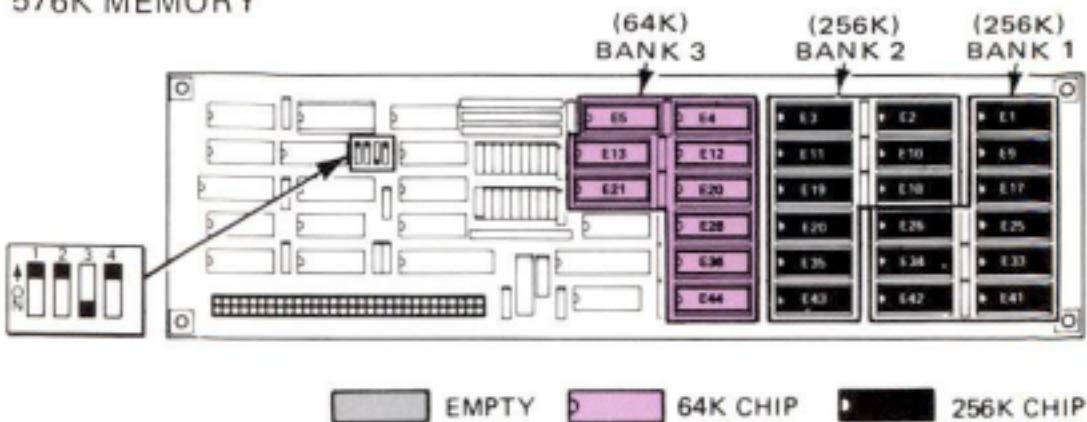
384K MEMORY



Configurations

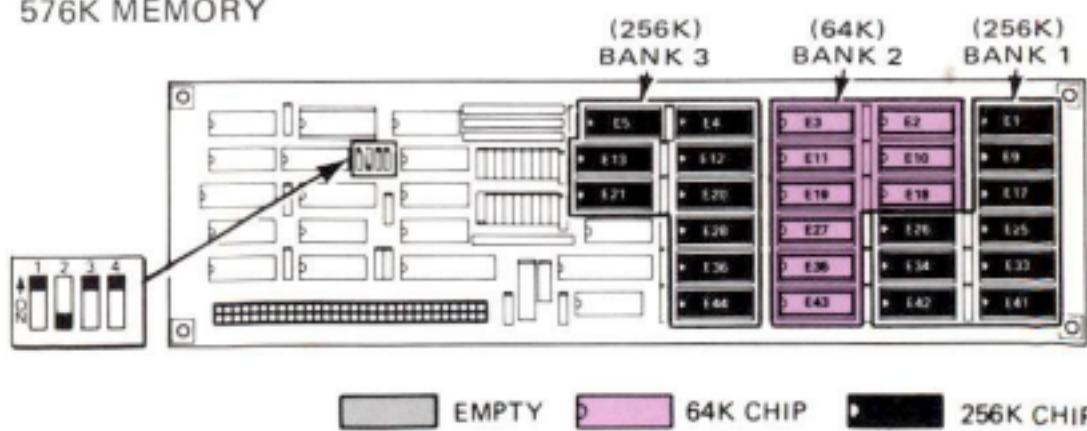
Configuration 7

576K MEMORY



Configuration 8

576K MEMORY



Failure Code Key

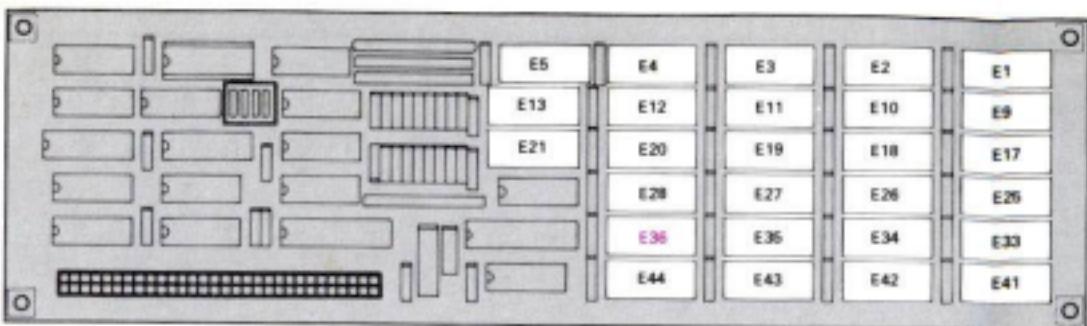
The failure code table is provided for the user who has just removed the memory board to determine its configuration. You do not have to install the memory board and run the memory test again. If you know:

1. your configuration code, and,
2. your failure code number (you recorded it on page 12),

you can isolate the failing chip by following the instructions on the next page.

Failure Code Key

To use the table, look for your configuration number at the top of the table. Below that number, find your failure code. Then go to the far right of the failure code and locate the failing E number. The location of the E number for this example is shown below.



Example:

- If you have configuration 3, look for the column head #3.
- Look down this column for your failure code, which in this example is 70.
- Go to the far right column from this number. This E number shows the chip that failed on the memory board.
- Examine chip E36 to see if it is in backward, has a bent leg, or is the wrong size.

Once you have corrected your failing chip, install your memory board and run this memory test procedure again until it is successful.

Failure Code Key

Failure Code Table

COMPONENT CONFIGURATION NUMBERS									E NUM
#1	#2	#3	#4	#5	#6	#7	#8		
20	20 30 40 50	20	20 30 40 50	20	20	20 30 40 50	20 30 40 50	34	
21	21 31 41 51	21	21 31 41 51	21	21	21 31 41 51	21 31 41 51	26	
22	22 32 42 52	22	22 32 42 52	22	22	22 32 42 52	22 32 42 52	41	
23	23 33 43 53	23	23 33 43 53	23	23	23 33 43 53	23 33 43 53	33	
24	24 34 44 54	24	24 34 44 54	24	24	24 34 44 54	24 34 44 54	25	
25	25 35 45 55	25	25 35 45 55	25	25	25 35 45 55	25 35 45 55	17	
26	26 36 46 56	26	26 36 46 56	26	26	26 36 46 56	26 36 46 56	9	
27	27 37 47 57	27	27 37 47 57	27	27	27 37 47 57	27 37 47 57	1	
28	28 38 48 58	28	28 38 48 58	28	28	28 38 48 58	28 38 48 58	42	
30	60 70 80 90	30 40 50 60	60	30	30 40 50 60	60 70 80 90	60	35	
31	60 70 80 90	31 41 51 61	61	31	31 41 51 61	61 71 81 91	61	27	
32	62 72 82 92	32 42 52 62	62	32	32 42 52 62	62 72 82 92	62	19	
33	63 73 83 93	33 43 53 63	63	33	33 43 53 63	63 73 83 93	63	11	
34	64 74 84 94	34 44 54 64	64	34	34 44 54 64	64 74 84 94	64	3	
35	65 75 85 95	35 45 55 65	65	35	35 45 55 65	65 75 85 95	65	18	
36	66 76 86 96	36 46 56 66	66	36	36 46 56 66	66 76 86 96	66	10	
37	67 77 87 97	37 47 57 67	67	37	37 47 57 67	67 77 87 97	67	2	
38	68 78 88 98	38 48 58 68	68	38	38 48 58 68	68 78 88 98	68	13	
40	A0 B0 C0 D0	70 80 90 A0	70	40 50 60 70	70	A0	70 80 90 A0	36	
41	A1 B1 C1 D1	71 81 91 A1	71	41 51 61 71	71	A1	71 81 91 A1	28	
42	A2 B2 C2 D2	72 82 92 A2	72	42 52 62 72	72	A2	72 82 92 A2	20	
43	A3 B3 C3 D3	73 83 93 A3	73	43 53 63 73	73	A3	73 83 93 A3	12	
44	A4 B4 C4 D4	74 84 94 A4	74	44 54 64 74	74	A4	74 84 94 A4	4	
45	A5 B5 C5 D5	75 85 95 A5	75	45 55 65 75	75	A5	75 85 95 A5	21	
46	A6 B6 C6 D6	76 86 96 A6	76	46 56 66 76	76	A6	76 86 96 A6	13	
47	A7 B7 C7 D7	77 87 97 A7	77	47 57 67 77	77	A7	77 87 97 A7	5	
48	A8 B8 C8 D8	78 88 98 A8	78	48 58 68 78	78	A8	78 88 98 A8	44	

Date _____

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Please make suggestions for improvement.

Did you find errors in this manual? If so, specify the errors and their page numbers.

How would you rate this manual?

Excellent Good Fair Poor

Please check the boxes that most nearly describe your position.

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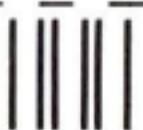
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