

HP 12998A
8K Memory Module
installation manual



HEWLETT-PACKARD COMPANY
11000 WOLFE ROAD, CUPERTINO, CALIFORNIA, 95014

NOTICE

The information contained in this document is subject to change without notice.

HEWLETT-PACKARD MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied or reproduced without the prior written consent of Hewlett-Packard Company.

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

1. INTRODUCTION

This manual provides installation instructions for the HP 12998A 8K Memory Modules, which are part of the HP 2102 Memory System. When one or more memory modules are to be field installed in an HP 21MX Series Computer or an HP 12990 Memory Extender, it may be necessary to order a new memory system cable.

An HP 2102 Memory System is composed of a memory controller and one or more 8K and/or 16K memory modules. A 4K memory module may also be included in the system but *only one* 4K memory module is allowed in any given memory configuration.

Note: A Hewlett-Packard Dynamic Mapping System must be installed in the computer mainframe when the HP 2102 Memory System exceeds 32K words.

2. MODULE NUMBER ASSIGNMENT

A 16K memory module is equivalent to two contiguous 8K memory modules; therefore, two module numbers must be allocated to each 16K memory module. The 16K memory module numbers must first be an even number followed by the next sequential odd number. Thus, the 8K memory modules must be "configured around" the 16K memory modules as shown in the four examples presented in table 1. Note that when a reconfiguration of memory is required, the 4K memory module (if present) must *always* be assigned the highest module number in memory. Note also in table 1 that there can be no unassigned (vacant) memory module numbers; beginning with module number 0, module numbers must be continuous to the highest used memory module number in the system.

Table 1. Example Memory Configurations

CONFIGURATION 1			CONFIGURATION 2		
MEM MOD	QTY	MOD NO.	MEM MOD	QTY	MOD NO.
8K	3	0,1,4	8K	3	2,3,4
16K	1	2,3	16K	1	0,1
4K*	1	5	4K*	1	5
CONFIGURATION 3			CONFIGURATION 4		
MEM MOD	QTY	MOD NO.	MEM MOD	QTY	MOD NO.
16K	3	0,1,2,3,6,7	16K	3	0,1,2,3,4,5
8K	3	4,5,8	8K	3	6,7,8
4K*	1	9	4K*	1	9

*Must always be highest numbered module in memory.

3. INSTALLATION IN COMPUTER

Install the 8K memory module in the computer memory PCA cage as follows:

CAUTION

All contents of memory will be lost when the mains (line) and battery voltages are both off. Therefore, before proceeding with the installation, ensure that any contents of memory to be saved are stored in another medium for later retrieval.

- On computer rear panel, set ~LINE and BATTERY switches to off.
- Loosen quarter-turn fasteners on computer operator panel and lower it to the access position. Remove memory PCA cage cover by removing the two screws and lockwashers.
- Remove memory system cable from memory controller and existing memory modules.
- Assign module number to 8K memory module and install XW1 jumpers as specified in figure 1. Install 8K memory module in computer.
- Reassign memory module number to displaced 4K memory module (if present) by reconfiguring XW1 jumpers as specified in figure 2.
- Connect memory system cable to memory controller and memory modules. Replace memory PCA cage cover and operator panel.
- On rear panel, set ~LINE and BATTERY switches to ON. On operator panel, set key-operated switch to R (reset) and then to STANDBY.
- Perform checkout as described in paragraph 5.

4. INSTALLATION EXTENDER

Install the 8K memory module in the memory extender as follows:

CAUTION

All contents of memory will be lost when the mains (line) and battery voltages are both off. Therefore, before proceeding with the installation, ensure that any contents of memory to be saved are stored in another medium for later retrieval.

- a. On extender rear panel, set ~LINE switch to OFF. If an internal battery is installed, set BATTERY switch to EXT; if an external battery is employed, set BATTERY switch to INT.
 - b. Loosen quarter-turn fasteners on memory extender front panel and lower it to the access position. Remove memory PCA cage cover by removing the two screws and lockwashers.
 - c. On computer rear panel, set ~LINE and BATTERY switches to OFF.
 - d. Loosen quarter-turn fasteners on computer operator panel and lower it to the access position. Remove memory PCA cage cover by removing the two screws and lockwashers.
 - e. Remove memory system cable from memory controller and existing memory modules in computer and extender.
- Note: It is recommended that the nine memory extender slots be filled before adding memory to the computer mainframe. At least one memory module (4K, 8K, or 10K) must be installed in the computer mainframe for power supply loading.
- f. Assign memory module number to 8K memory module and install XW1 jumpers as specified in figure 1. Install 8K memory module in extender.
 - g. Reassign memory module number to displaced 4K memory module (if present) by reconfiguring XW1 jumpers as specified in figure 2.
 - h. Connect memory system cable to the memory controller (highest numbered slot in the computer memory PCA cage) and the memory modules.
 - i. Replace memory PCA cage cover in the computer and the extender. Replace computer operator panel and extender front panel.
 - j. On extender rear panel, set ~LINE switch to ON. If an internal battery is installed, set BATTERY switch to INT; if an external battery is employed, set BATTERY switch to EXT.
 - k. On computer rear panel, set ~LINE and BATTERY switches to ON. On operator panel, set key-operated switch to R (reset) and then to STANDBY.
 - l. Perform checkout as described in paragraph 5.

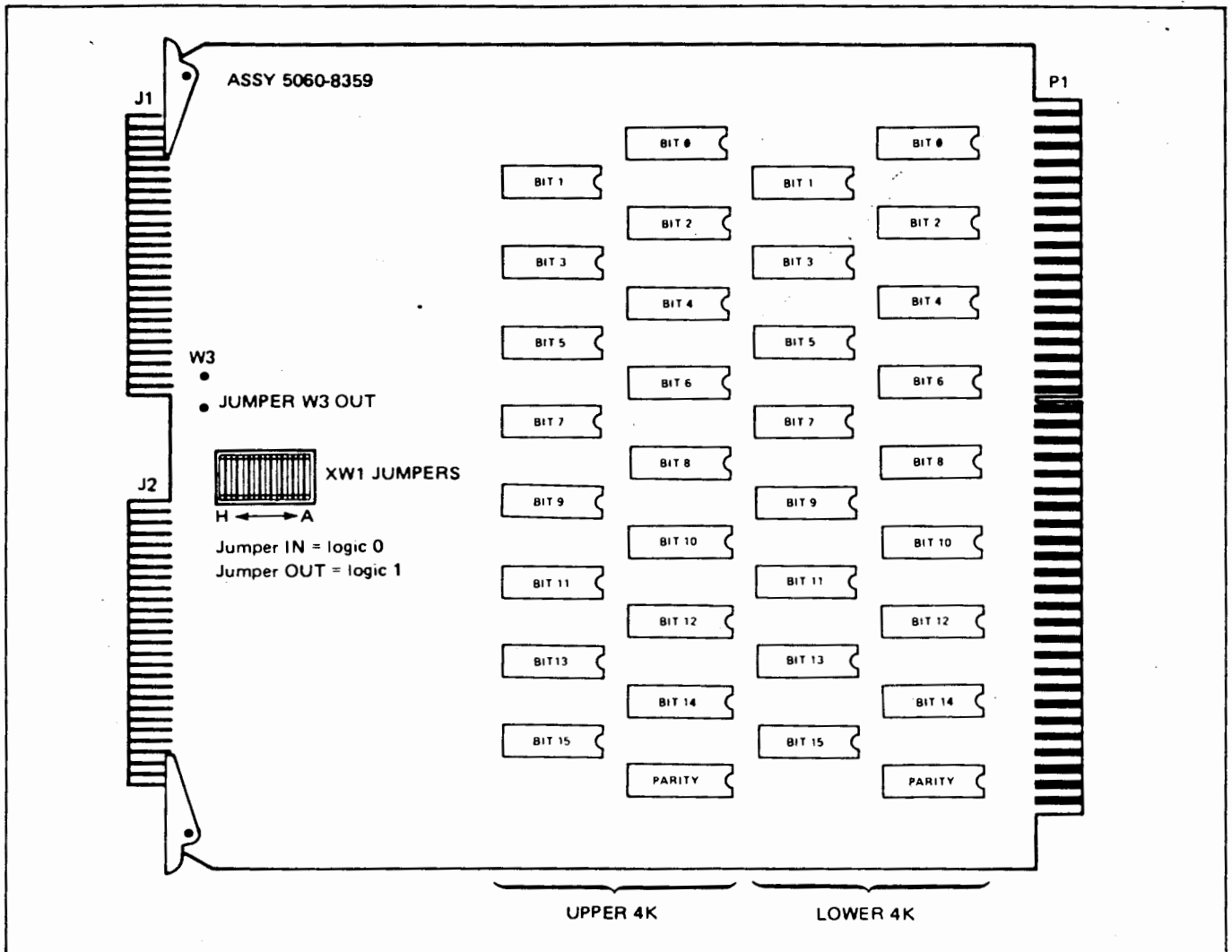
5. CHECKOUT

After installing the 8K memory module(s), verify proper operation by performing the semiconductor memory and memory parity diagnostic tests. Part numbers for the diagnostic manuals and diagnostic tapes are listed below:

DIAGNOSTIC	MANUAL	PAPER TAPE*
Semiconductor Memory Diagnostic Test	24395-90001	24395-16001
Memory Parity Diagnostic Test	02100-90221	24325-16001

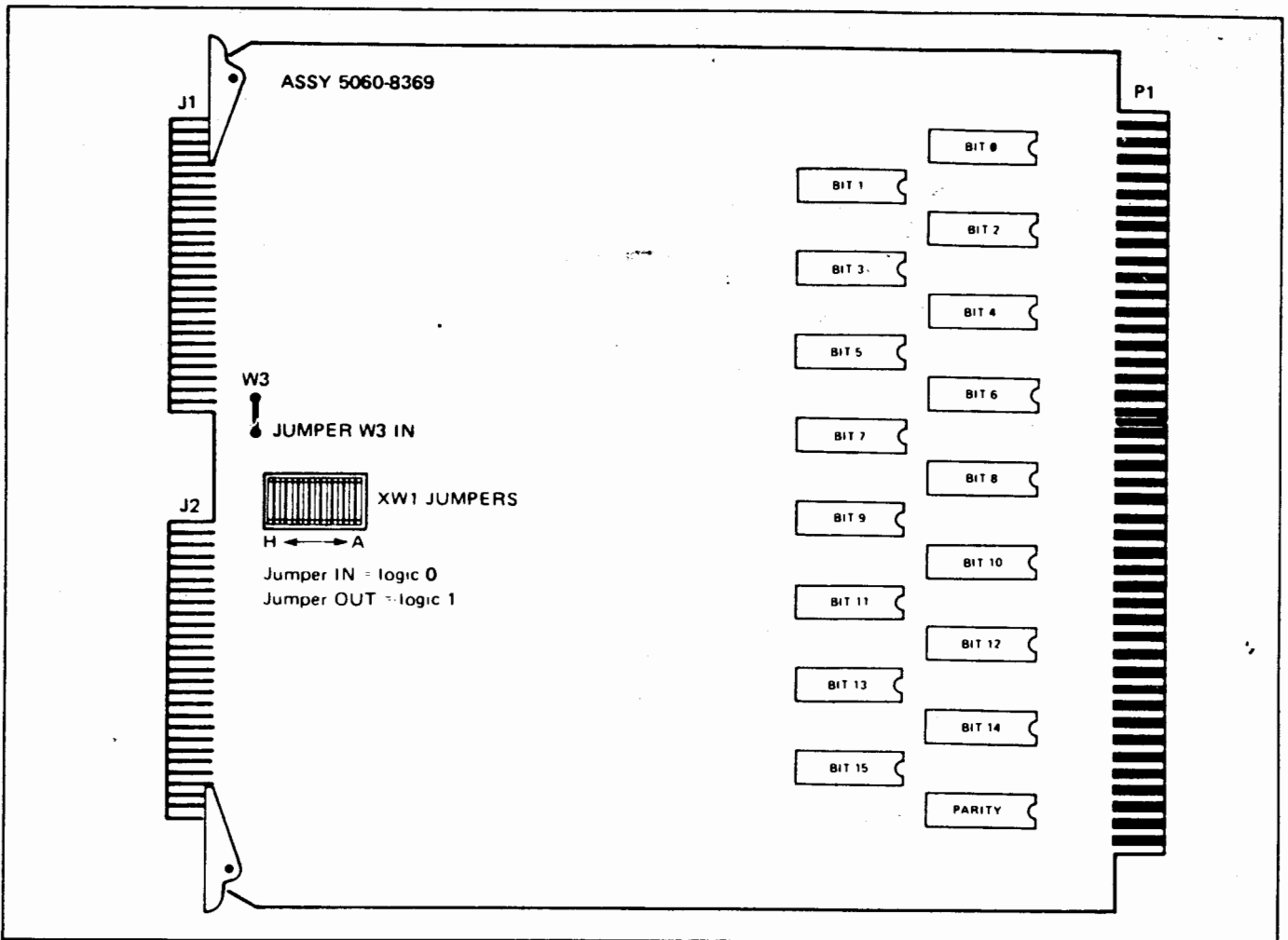
*The absolute binary code for this diagnostic is contained on one or more media (e.g., paper tape, cartridge tape, disc, and magnetic tape). The binaries also exist on single as well as multiple files. For the current date code(s) associated with these media, refer to appendix A in the *Diagnostic Configurator Manual*, part no. 02100-90157, dated August 1976 or later.

If the diagnostic tests are completed without an error halt, the memory PCA is operating correctly. If the diagnostic tests indicate an error halt, notify your nearest HP Sales and Service Office. A list of the HP Sales and Service Offices is given in the appropriate *Computer Series Reference Manual*, and *Computer Series Installation and Service Manual*.



MEMORY MODULE NO.	W3	XW1 JUMPERS								
		A	B (2 ⁰)	C (2 ¹)	D (2 ²)	E (2 ³)	F (2 ⁴)	G (2 ⁵)	H (2 ⁶)	
0	ALWAYS OUT	DON'T CARE	IN	IN	IN	IN	IN	IN	IN	IN
1			OUT	IN	IN	IN	IN	IN	IN	IN
2			IN	OUT	IN	IN	IN	IN	IN	IN
3			OUT	OUT	IN	IN	IN	IN	IN	IN
4			IN	IN	OUT	IN	IN	IN	IN	IN
5			OUT	IN	OUT	IN	IN	IN	IN	IN
6			IN	OUT	OUT	IN	IN	IN	IN	IN
7			OUT	OUT	OUT	IN	IN	IN	IN	IN
8			IN	IN	IN	IN	OUT	IN	IN	IN
9			OUT	IN	IN	IN	OUT	IN	IN	IN
10			IN	OUT	IN	OUT	IN	IN	IN	IN
11			OUT	OUT	IN	OUT	IN	IN	IN	IN
12			IN	IN	OUT	OUT	IN	IN	IN	IN
13			OUT	IN	OUT	OUT	IN	IN	IN	IN
14			IN	OUT	OUT	OUT	IN	IN	IN	IN
15			OUT	OUT	OUT	OUT	IN	IN	IN	IN
16	IN	IN	IN	IN	IN	OUT	IN	IN		

Figure 1. 8K Memory Module Number Jumpers



MEMORY MODULE NO.	W3	XW1 JUMPERS									
		A	B (2 ⁰)	C (2 ¹)	D (2 ²)	E (2 ³)	F (2 ⁴)	G (2 ⁵)	H (2 ⁶)		
0	ALWAYS IN	ALWAYS IN	IN	IN	IN	IN	IN	IN	IN	IN	
1			OUT	IN	IN	IN	IN	IN	IN	IN	IN
2			IN	OUT	IN	IN	IN	IN	IN	IN	IN
3			OUT	OUT	IN	IN	IN	IN	IN	IN	IN
4			IN	IN	OUT	IN	IN	IN	IN	IN	IN
5			OUT	IN	OUT	OUT	IN	IN	IN	IN	IN
6			IN	OUT	OUT	OUT	IN	IN	IN	IN	IN
7			OUT	OUT	OUT	OUT	IN	IN	IN	IN	IN
8			IN	IN	IN	IN	OUT	IN	IN	IN	IN
9			OUT	IN	IN	IN	OUT	IN	IN	IN	IN
10			IN	OUT	IN	IN	OUT	IN	IN	IN	IN
11			OUT	OUT	IN	OUT	OUT	IN	IN	IN	IN
12			IN	IN	OUT	OUT	OUT	IN	IN	IN	IN
13			OUT	IN	OUT	OUT	OUT	IN	IN	IN	IN
14			IN	OUT	OUT	OUT	OUT	IN	IN	IN	IN
15			OUT	OUT	OUT	OUT	OUT	IN	IN	IN	IN
16	IN	IN	IN	IN	IN	OUT	IN	IN	IN		

Note: This 4K module must be assigned the highest used memory module number regardless of the memory configuration. Only one 4K module allowed per configuration.

Figure 2. 4K Memory Module Number Jumpers