

HEWLETT  PACKARD

INSTALLATION MANUAL
12885A, 12885A-001, 12885A-002,
12885A-003, 12885A-004

MEMORY (8K INCREMENTS) ACCESSORY KITS
(FOR THE 2100 COMPUTER)

3



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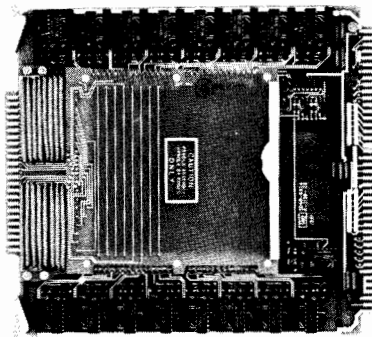
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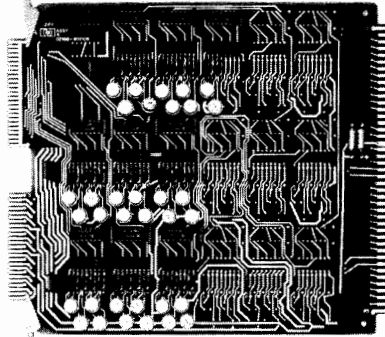
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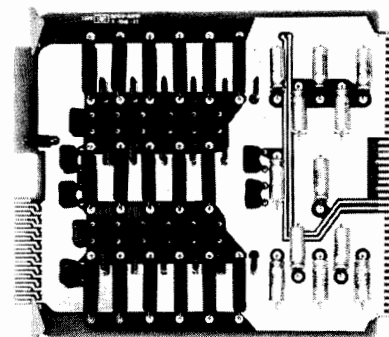
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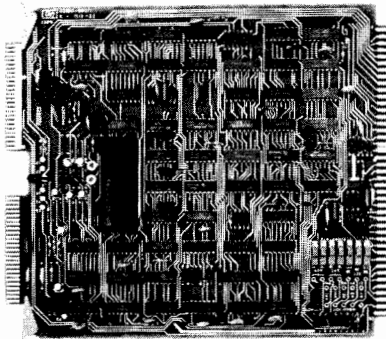
8K CORE STACK/SENSE
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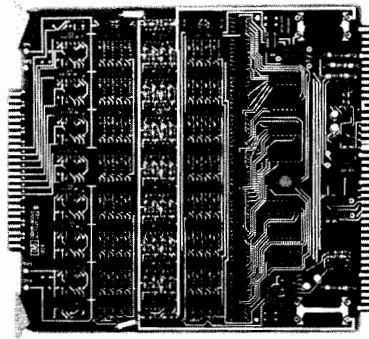
INHIBIT DRIVER CARD
(02100-60008)



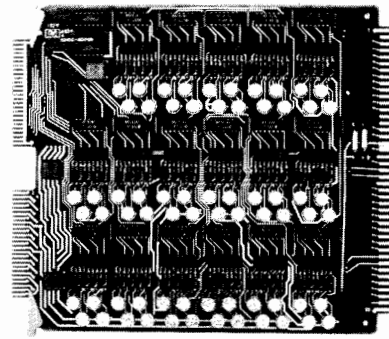
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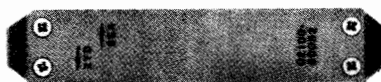
DATA CONTROL CARD
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X-Y DRIVER/SWITCH CARD
(02100-60012)



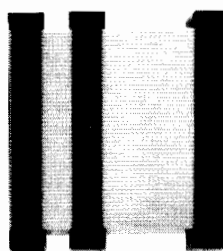
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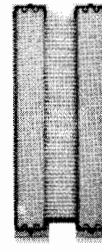
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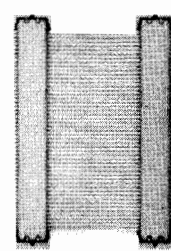
CONNECTOR ASSEMBLY
(02100-60054)



CABLE ASSEMBLY
(02100-60018)



CABLE ASSEMBLY
(02100-60028)



CABLE ASSEMBLY
(02100-60029)

NOTE 1. FOR PRINTED-CIRCUIT CARDS, CONNECTOR ASSEMBLIES, AND CABLE ASSEMBLIES IN EACH KIT, REFER TO TABLE 1-1.

Figure 1-1. HP 12885A, 12885A-001, 12885A-002, 12885A-003, and 12885A-004 Accessory Kits

GENERAL INFORMATION



1-1. INTRODUCTION.

1-2. This manual contains general information and field installation procedures for the items supplied in the Hewlett-Packard 12885A, 12885A-001, 12885A-002, 12885A-003, and 12885A-004 Memory (8K Increments) Accessory Kits. Theory of operation, maintenance, parts location and schematic diagrams, replaceable parts, and specifications for the computer memory circuits contained in these kits are contained in other manuals (refer to paragraph 1-4).

1-3. RELATED DOCUMENTATION.

1-4. Theory of operation and maintenance information for the memory circuits are contained in the computer Installation and Maintenance Manual (part no. 02100-90002 for 2100A or part no. 02100-90162 for 2100S). The parts location and schematic diagrams for the printed-circuit cards supplied in the accessory kits are contained in the computer

Diagrams Manual (part no. 02100-90003 for 2100A or part no. 02100-90164 for 2100S). Replaceable parts and ordering information is contained in the computer Illustrated Parts Breakdown Manual (part no. 02100-90004 for 2100A or part no. 02100-90166 for 2100S). Specifications for the computer memory circuits are contained in the computer Reference Manual (part no. 02100-90001 for 2100A or part no. 02100-90160 for 2100S).

1-5. DESCRIPTION.

1-6. The 12885A, 12885A-001, 12885A-002, 12885A-003, and 12885A-004 accessory kits are used for expanding 4K (K=1024 decimal) of memory to 8K, providing the initial 8K of memory, expanding 4K of memory to 12K or 8K of memory to 16K, expanding 16K of memory to 24K, and for expanding 24K of memory to 32K.

1-7. The 12885A accessory kit expands an existing 4K memory to 8K. The 8K core stack/sense amplifier card contained in the kit replaces the existing 4K core stack/

Table 1-1. Accessory Kit Contents

ACCESSORY KIT	CONTENTS	HP PART NO.
12885A	8K Core Stack/Sense Amplifier Card Update Return Form	5060-8324 or 5060-8331 9320-1634
12885A-001	8K Core Stack/Sense Amplifier Card Inhibit Driver Card Inhibit Driver Load Card Data Control Card X-Y Driver/Switch Card Cable Assembly Cable Assembly Connector Assembly	5060-8324 or 5060-8331 02100-60008 02100-60010 02100-60011 02100-60012 02100-60028 02100-60029 02100-60054
12885A-002	8K Core Stack/Sense Amplifier Card Inhibit Driver Card X-Y Driver/Switch Card Connector Assembly Update Return Form	5060-8324 or 5060-8331 02100-60009 02100-60012 02100-60052 9320-1634
12885A-003	8K Core Stack/Sense Amplifier Card Inhibit Driver Card X-Y Driver/Switch Card Cable Assembly (2) Connector Assembly	5060-8324 or 5060-8331 02100-60009 02100-60012 02100-60018 02100-60052
12885A-004	8K Core Stack/Sense Amplifier Card X-Y Driver/Switch Card Connector Assembly	5060-8324 or 5060-8331 02100-60012 02100-60054

sense amplifier card, and the control circuits required for proper operation are provided by the existing cards remaining in the computer memory section.

1-8. The 12885A-001 accessory kit provides the initial 8K of memory to the computer. The kit contains all the storage and control circuits required for operation of an 8K memory.

1-9. The 12885A-002 accessory kit expands an existing 4K of memory to 12K, or 8K of memory to 16K. The 8K core stack/sense amplifier card and the X-Y driver/switch card contained in the kit are added to the computer memory section. The inhibit driver card contained in the kit replaces the existing inhibit driver card.

1-10. The 12885A-003 accessory kit expands an existing 16K of memory to 24K. The 8K core stack/sense amplifier card, inhibit driver card, and X-Y driver/switch card contained in the kit are added to the computer memory section and the cable assemblies for the existing memory are replaced by those in the kit.

1-11. The 12885A-004 accessory kit expands an existing 24K of memory to 32K. The 8K core stack/sense amplifier card and X-Y driver/switch card contained in the kit are added to the computer memory section.

1-12. IDENTIFICATION.

1-13. Printed-circuit cards used for plug-in card assemblies are identified by a letter code, a revision code, and a division code. These codes are stamped or etched on the card (e.g., A-1049-22). The letter code identifies the version of the etched trace pattern on the unloaded card. The revision code (four middle digits) refers to the electrical characteristics of the loaded card. The division code (last two digits) identifies the Hewlett-Packard division that manufactured the card. If the revision code stamped on a printed-circuit card does not agree with the revision code shown on the appropriate schematic diagram in the computer Diagrams Manual, there are differences between your card and the card described in the Diagrams Manual. These differences are described in manual supplements which are available at the nearest HP Sales and Service Office.

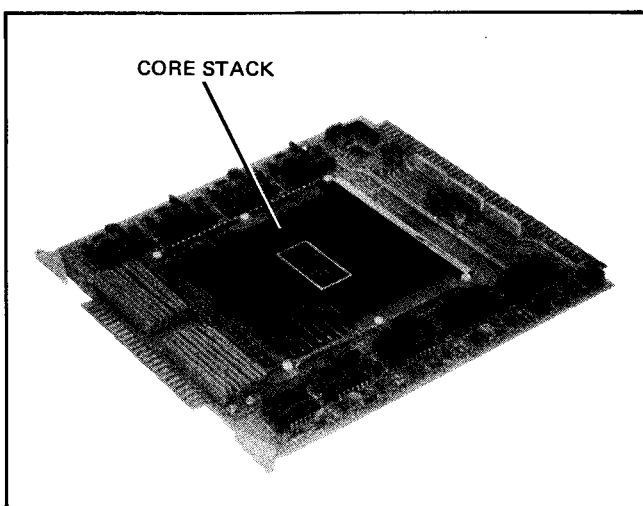
2-1. INTRODUCTION.

2-2. This section contains instructions for unpacking and inspection, reshipment, and installation of the accessory kits.

2-3. UNPACKING AND INSPECTION.

CAUTION

During unpacking and inspection, handle the core stack/sense amplifier card by the edges and take extreme care to prevent any pressure on the sensitive core stack assembly. See figure 2-1.



2165-2

Figure 2-1. Core Stack Area of the Core Stack/Sense Amplifier Card

2-4. If the shipping carton is damaged upon receipt, request that the carrier's agent be present when the accessory kit is unpacked. Inspect the items comprising the accessory kit for damage (cracks, lifted traces, broken parts, etc.). If any of the items are damaged and fail to meet specifications, notify the carrier and the nearest HP Sales and Service Office immediately. (Sales and Service Offices are listed at the back of this manual.) Retain the shipping carton and the packing material for the carrier's inspection. The HP Sales and Service Office will arrange for the repair or replacement of the damaged items without waiting for claims against the carrier to be settled.

2-5. RESHIPMENT.

2-6. If an item of the kit is to be shipped to Hewlett-Packard for service or repair, attach a tag to the item

identifying the owner and indicating the service or repair to be accomplished. Include the model number of the kit.

2-7. Package the item in the original factory packaging material, if available. If the original material is not available, standard factory packaging material can be obtained from a local Hewlett-Packard Sales and Service Office.

CAUTION

Due to the special handling requirements of the core stack/sense amplifier card, special shipping cartons (part numbers 9211-1696 and 9211-1697) are required to pack the card for reshipment. If any other packing material is used to pack the core stack/sense amplifier card, damage may result.

2-8. If standard factory packing material cannot be obtained for items other than the core stack/sense amplifier card, wrap the item in Air Cap TH-240 cushioning (or equivalent), manufactured by Sealed Air Corp., Hawthorne, N.J., and place in a corrugated carton (200 pound test material). Seal the shipping carton securely and mark it "FRAGILE" to ensure careful handling.

Note: In any correspondence, identify the kit by model number. Refer any questions to the nearest Hewlett-Packard Sales and Service Office.

2-9. INSTALLATION PROCEDURES.

2-10. Before installing the accessory kit, check whether or not the additional printed-circuit cards will impose an excessive load on the computer power supply with the existing I/O interface cards installed. (Refer to section I of the computer Installation and Maintenance Manual for power supply currents available to the I/O section with various memory sizes installed.)

2-11. Install the accessory kit as follows:

CAUTION

Always turn the power off at the front panel of the computer before extracting or installing plug-in cards. Use extreme care not to damage protruding components or traces on the card being installed or removed, or on adjacent cards. The cards are keyed to prevent upside-down or 180-degree rotated installation, but are

not keyed to prevent installation in the wrong slot. Therefore, make sure that the cards are installed in the proper slots and that the plug-on assemblies are attached to the proper cards as shown in figures 2-2 through 2-6. Damage may result if an item is incorrectly installed.

- a. Turn the computer power off.
- b. Remove the top access cover to expose the card cage assembly. (Refer to the Illustrated Parts Breakdown Manual for part locations.)
- c. Remove the printed-circuit card retainer and add or replace the cards in the slots as shown in figures 2-2 through 2-6, depending on the memory accessory kit being installed. For any replaced cards (see paragraphs 1-7 and 1-9) fill in the applicable blanks of the Update Return form (part no. 9320-1634) included in the applicable kit. Package the card according to paragraph 2-7 and return both the card and completed form to Hewlett-Packard.
- d. Remove data control card A107 and reposition red-colored jumper W1 so that it is compatible with the new memory size (refer to figure 2-7 for the proper positions of jumper W1).
- e. Reposition the pin-diodes so that they are compatible with the new memory size (refer to figure 2-7 for the positions of the pin-diodes).
- f. Reinstall data control card A107.
- g. Check whether or not jumpers W1 through W6 on all the X-Y driver/switch cards are in the 8K position (except for the X-Y driver/switch card associated with the 4K core stack/sense amplifier card in a 12K application). Change any jumpers that are incorrectly positioned.
- h. Install the cable and connector assemblies supplied with the accessory kit. (Refer to table 1-1 and figures 2-2 through 2-6).

Note: The connector assemblies jumper the 48-pin edge of the core stack/sense amplifier card to like-numbered or lettered pins on the 48-pin edge of the X-Y driver/switch card. The cable assemblies jumper the 50-pin edge of the inhibit driver card to like-numbered or lettered pins on the 50-pin edge of the inhibit driver load card and data control card. The cable assemblies are provided in three different lengths. See figures 2-2 and 2-5.

- i. Re-install the printed-circuit card retainer and top access cover.

2-12. INSTALLATION CHECKOUT.

2-13. Checkout of the installed accessory kit requires voltage checks and, if necessary, adjustments of the power supply voltage regulators. In addition, an absolute loader program must be stored in the protected area of memory (highest 64 locations), and the memory address and memory pattern diagnostic tests performed. The procedures are specified in the following paragraphs.

2-14. POWER SUPPLY VOLTAGE CHECKS AND ADJUSTMENTS.

2-15. Perform the power supply voltage checks described in the power supply portion of the computer documentation. If necessary, perform the voltage regulator adjustments.

2-16. ABSOLUTE LOADER PROGRAM.

2-17. Perform the loading procedures described in section IV of the computer Installation and Maintenance Manual. Be sure to use the correct values of variables listed in these procedures for the new expanded memory.

2-18. MEMORY ADDRESS TESTS.

2-19. Perform the Diagnostic Program Procedure for the high and low memory test, part no. 02100-90219, in the Manual of Diagnostics.

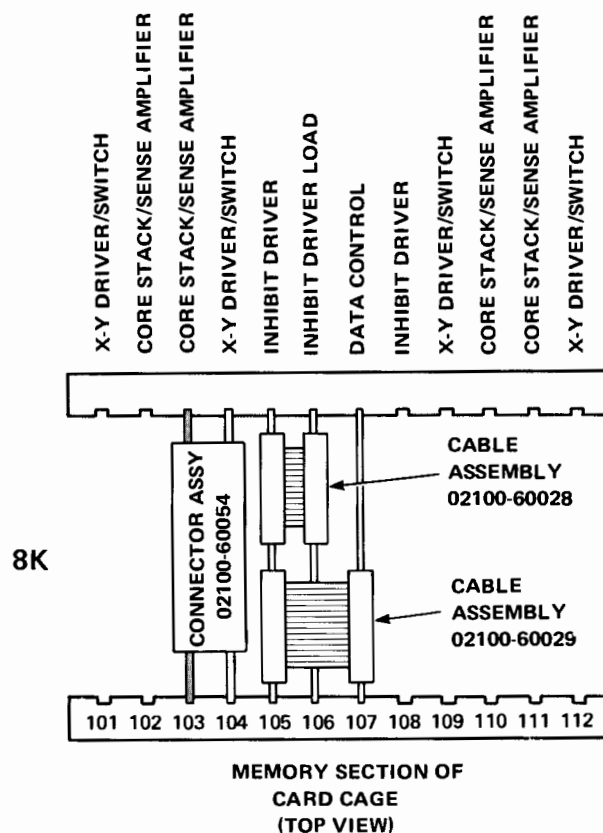
2-20. MEMORY PATTERN TESTS.

2-21. Perform the Diagnostic Program Procedure for the high and low memory test, part no. 02100-90219, in the Manual of Diagnostics.

Note: While running the memory pattern tests, rotate the 20-volt regulator adjustment of the computer power supply through a plus and minus 1.5-volt variation (e.g., +18.5 to +21.5 volts at 25°C). The pattern tests should continue to run error-free during the voltage variation. Make a final measurement of the regulated voltages and readjust, if required, as described in the paragraphs pertaining to adjustments in the power supply documentation.

2-22. TROUBLESHOOTING.

2-23. If an error halt is encountered in the course of running a diagnostic test program, use the information presented in the diagnostic program procedure to determine which instruction, or sequence of instructions, was not processed by the computer. Refer to section IV of the computer Installation and Maintenance Manual for information on troubleshooting the circuit associated with the improperly processed instructions.



NOTE: SHADED AREA DENOTES COMPONENTS ADDED IF MEMORY IS EXPANDED FROM 4K BY USING 12885A ACCESSORY KIT.

CARD SLOT	DESCRIPTION	HP PART NO.
103	*8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
104	*X-Y Driver/Switch Card	02100-60012
105	*Inhibit Driver Card	02100-60008
106	*Inhibit Driver Load Card	02100-60010
107	*Data Control Card	02100-60011
103 to 104	*Connector Assembly	02100-60054
105 to 106	*Cable Assembly	02100-60028
105 to 107	*Cable Assembly	02100-60029

* Denotes items added by 12885A-001 accessory kit if memory is the initial 8K. †

Figure 2-2. 8K Memory Loading Configuration

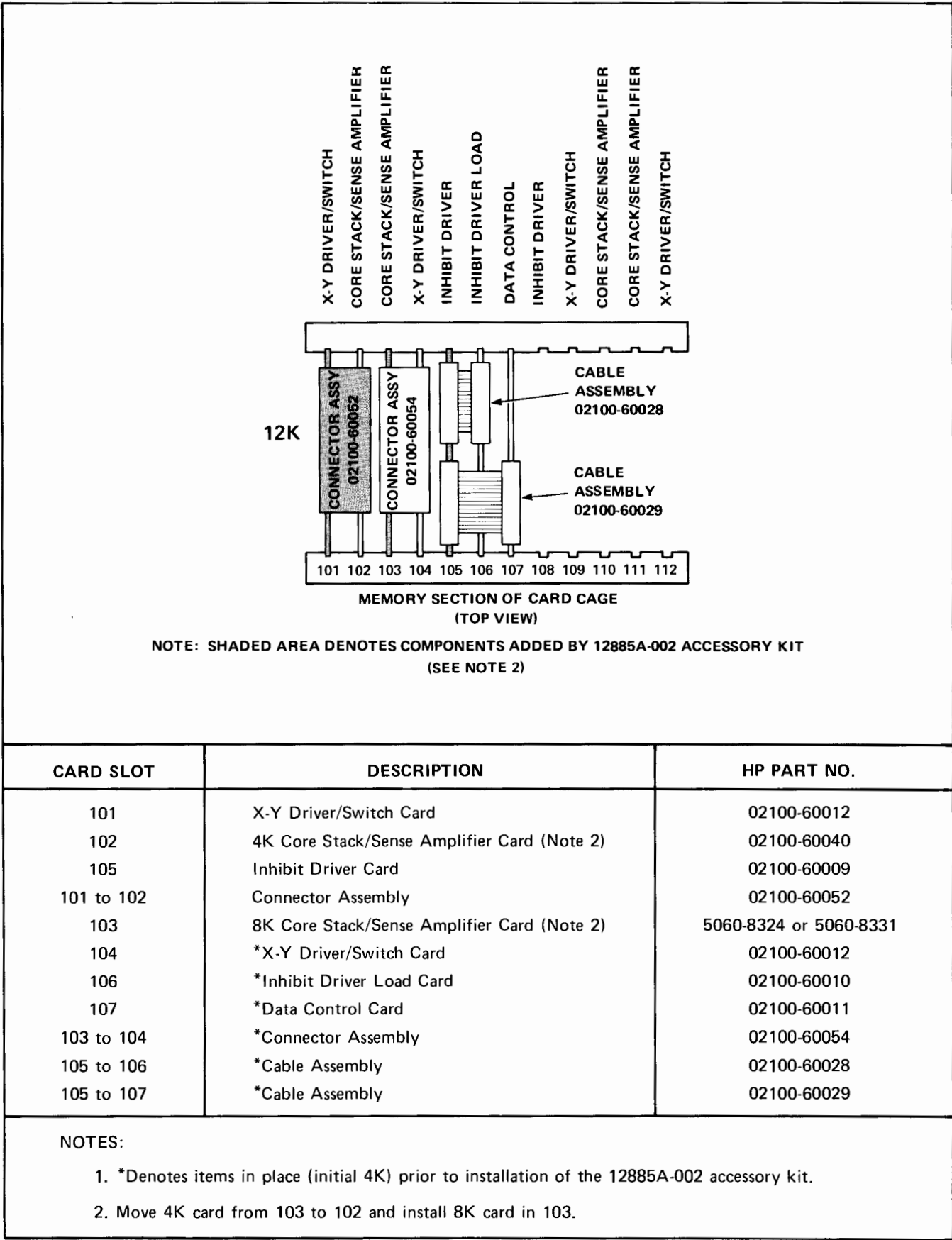
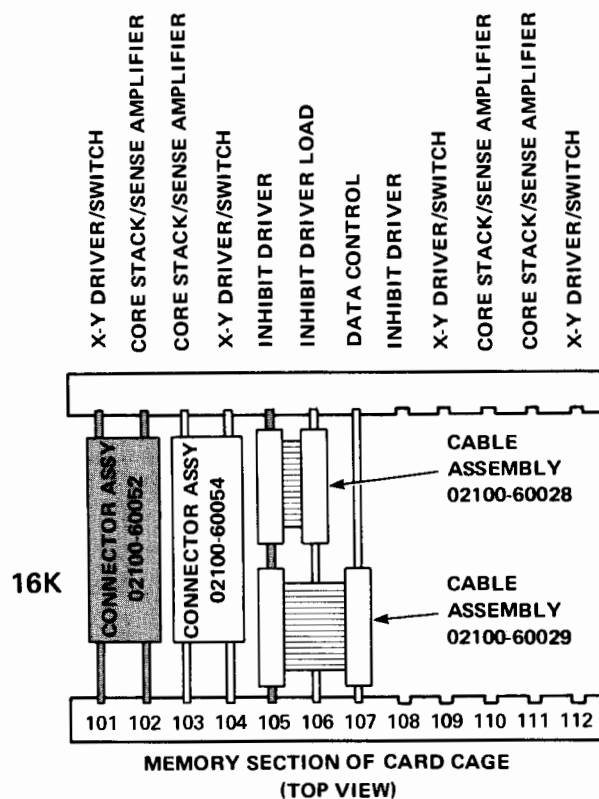


Figure 2-3. 4K to 12K Memory Expansion Loading Configuration

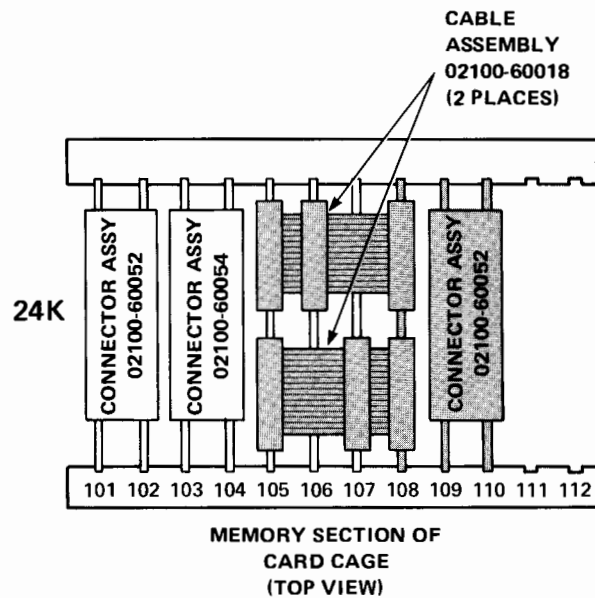


NOTE: SHADED AREA DENOTES COMPONENTS ADDED BY 12885A-002 ACCESSORY KIT

CARD SLOT	DESCRIPTION	HP PART NO.
101	X-Y Driver/Switch Card	02100-60012
102	8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
105	Inhibit Driver Card	02100-60009
101 to 102	Connector Assembly	02100-60052
103	*8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
104	*X-Y Driver/Switch Card	02100-60012
106	*Inhibit Driver Load Card	02100-60010
107	*Data Control Card	02100-60011
103 to 104	*Connector Assembly	02100-60054
105 to 106	*Cable Assembly	02100-60028
105 to 107	*Cable Assembly	02100-60029

*Denotes items in place (initial 8K) prior to installation of the 12885A-002 accessory kit.

Figure 2-4. 8K to 16K Memory Expansion Loading Configuration



NOTES: SHADED AREA DENOTES COMPONENTS ADDED BY 12885A-003 ACCESSORY KIT.

CARD SLOT	DESCRIPTION	HP PART NO.
108	Inhibit Driver Card	02100-60009
109	X-Y Driver/Switch Card	02100-60012
110	8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
105 to 106 to 108	Cable Assembly	02100-60018
105 to 107 to 108	Cable Assembly	02100-60018
109 to 110	Connector Assembly	02100-60052
101	*X-Y Driver/Switch Card	02100-60012
102	*8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
103	*8K Core Stack/Sense Amplifier Card	5060-8324 or 5060-8331
104	*X-Y Driver/Switch Card	02100-60012
105	*Inhibit Driver Card	02100-60009
106	*Inhibit Driver Load Card	02100-60010
107	*Data Control Card	02100-60011
101 to 102	*Connector Assembly	02100-60052
103 to 104	*Connector Assembly	02100-60054

* Denotes items in place (initial 16K) prior to installation of the 12885A-003 accessory kit.

Figure 2-5. 16K to 24K Memory Expansion Loading Configuration

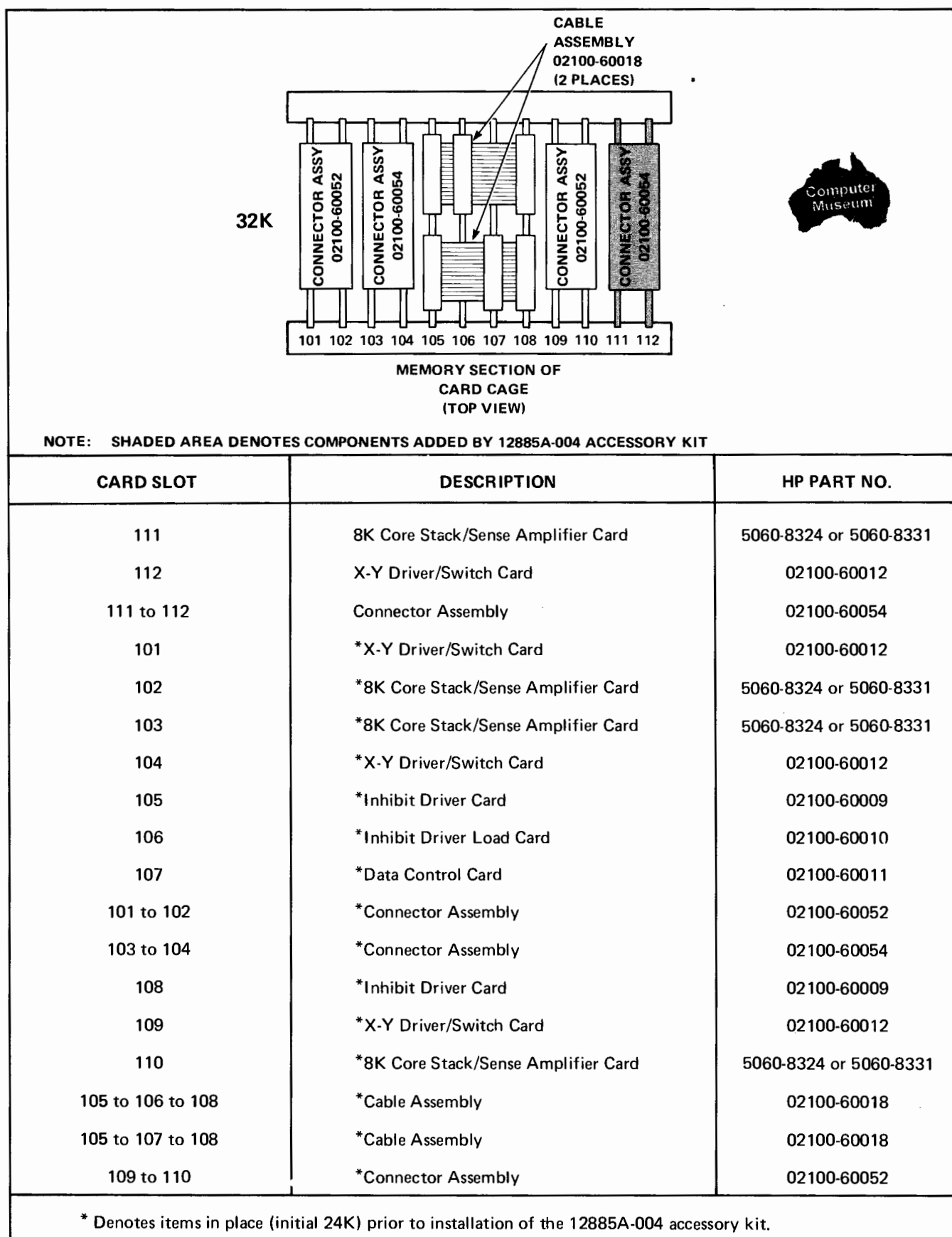


Figure 2-6. 24K to 32K Memory Expansion Loading Configuration

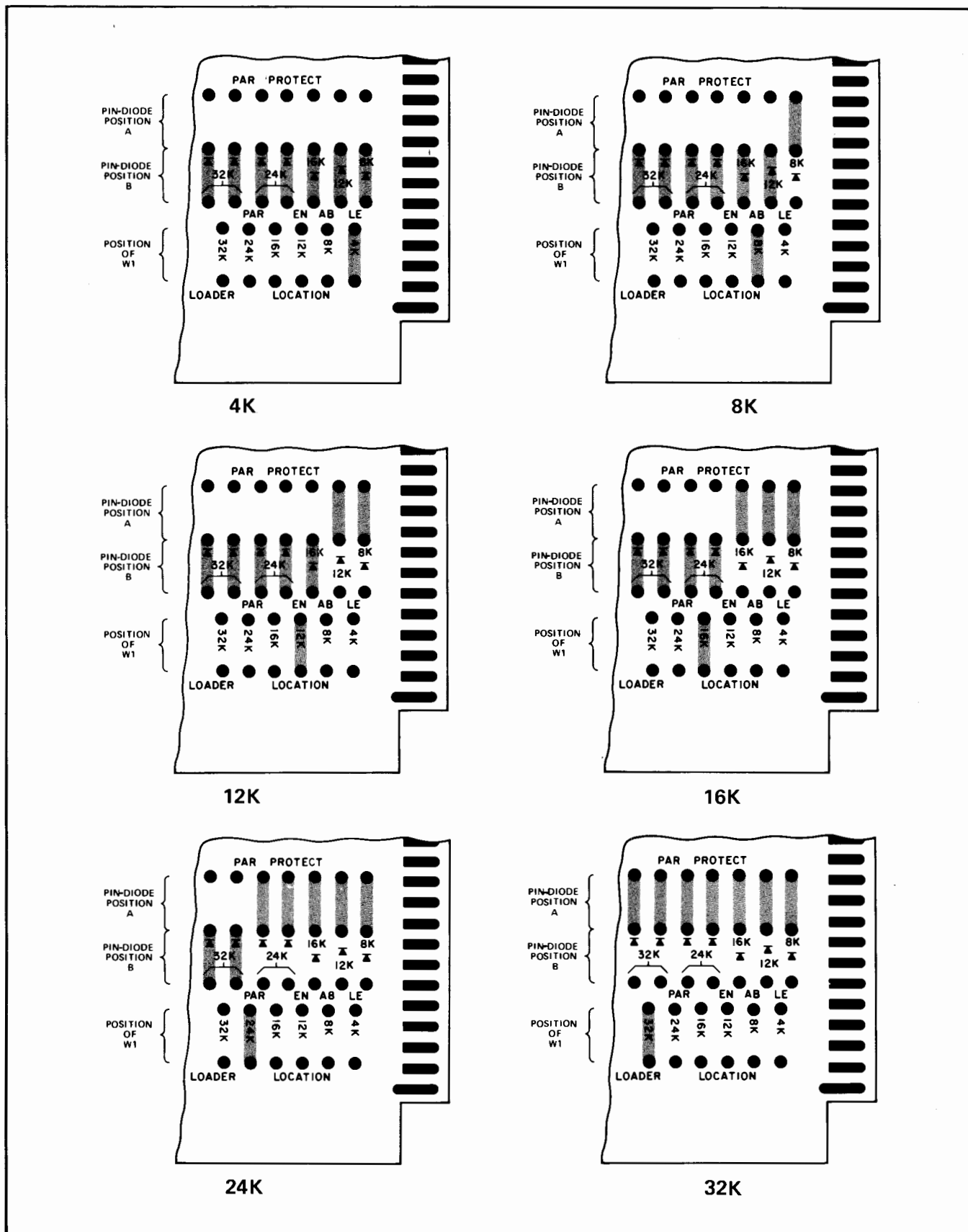


Figure 2-7. Data Control Card (A107) Pin-Diode and Jumper Configurations for Different Memory Sizes



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CERTIFICATION

Products, materials, parts, and services furnished on this order have been provided in accordance with all applicable Hewlett-Packard specifications. Actual inspection and test data pertaining to this order is on file and available for examination.

Hewlett-Packard's calibration measurements are traceable to the National Bureau of Standards to the extent allowed by the Bureau's calibration facilities.

The Hewlett-Packard Quality Program satisfies the requirements of MIL-Q-9858, MIL-I-45208, and MIL-C-45662.



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