

98407A 512K-byte Memory Assembly

IMPORTANT

The HP 98407A Memory Assembly is not compatible with most HP 9845B and HP 9845C computers equipped with less than 500 000 bytes of memory UNLESS they have been properly updated with the optional update kits available with the first HP 98407A purchased for a given machine. Before attempting to use the HP 98407A in your computer, be sure it has been updated as explained in this installation note. All HP 9845 computers containing over 500 000 bytes of memory are properly configured for use with the HP 98407A.

Available Options

The following options are available, and should be ordered with the first HP 98407A purchased for a given machine if it does not already have the proper updates installed:

Option 001

This option is for all HP 9845B/C models that have never had more than 500 000 bytes of available memory, and contains the following items:

- Two new ROMs for 09845-66527 RAM/ROM board: 1818-1898 replaces 1818-0838 (CE4 LB); 1818-1899 replaces 1818-0834 (CE4 UB).
- New sticker and white PC board extractor to identify the updated board as 09845-66529.

Option 002

This option is for all HP 9845C computers, and HP 9845B computers equipped with a high-speed monochrome CRT. It includes the following items:

- Two additional replacement ROMs for the 09845-66527 RAM/ROM board: 1818-1591 replaces 1818-1208 (CE1 LB); 1818-1592 replaces 1818-1209 (CE1 UB). These are for use with the HP 9845C ONLY.
- Revision B or later Enhanced Graphics ROM replaces Revision A Color Graphics ROM or Revision A Enhanced Graphics ROM. The new ROM supplied supports both the high-speed monochrome CRT and the color CRT for HP 9845B/C models. The new ROM supplied provides expanded capability over the color graphics ROM.

(Options continued on next page)

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Option 003

This option is for all HP 9845B/C models equipped with an IMAGE/45 Revision B ROM in the left-hand drawer. (If a Rev. A ROM is present, contact your Sales and Service Office for updating information.) A Revision C or newer IMAGE/45 ROM is supplied for the left-hand drawer only.

CAUTION

UNNEEDED PARTS SUPPLIED WITH OPTIONS ARE THE PROPERTY OF HEWLETT-PACKARD COMPANY AND SHOULD BE RETURNED TO THE NEAREST HP SALES AND SERVICE OFFICE. DO NOT ATTEMPT TO USE EXTRA OR REMOVED PARTS, OR IMPROPER OPERATION WILL RESULT.

Installation and Configuration Procedure

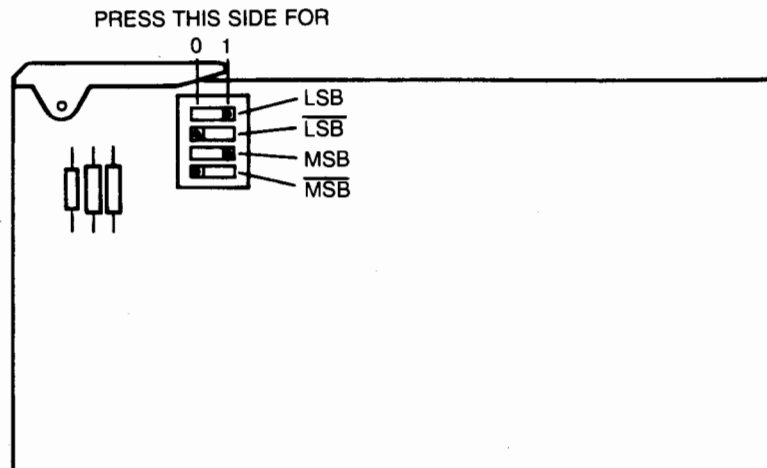
The 98407A Memory Assembly provides 512K bytes of read-write memory for the HP 9845B/C Computer. Up to three boards can be installed in the slots formerly used for 09845-66526 128K-byte memory boards. Installation of the 512K-byte board is identical to installation of 128K-byte boards EXCEPT for configuration.

Operation of the HP 9845B/C is unchanged when larger memory is installed, but any assembly language programs that use the `Get_info` utility may require alteration of the associated BSS storage space. Updated information is contained in Chapter 6 of the January 1982 edition of the Assembly Development ROM manual (09845-91083). The only change is that instead of reserving up to 39 words for the BSS information, up to 93 words can be reserved to accommodate larger arrays.

Memory Address Configuration Procedure

Before any new memory assembly is installed in the HP 9845B/C, it must be set up to respond to the correct block-select address range when selected by the CPU. Three configurations are available, and each board must use one of the three possibilities shown. Any other combination of settings results in improper system behavior. Note that no two boards may be set to the same address range.

To set the block address for each board, position the appropriate address switches in the upper left corner of the board as indicated in the table which follows. There are two pairs of switches in the cluster, and each switch within a pair must be set OPPOSITE to the other as shown. Configure the boards, starting with Block 20 and adding Block 40 and 60 up to the maximum memory being installed. Be sure switch rockers are firmly sealed in their proper positions.



Block Select Configuration Switches

Blocks	MSB	$\overline{\text{MSB}}$	LSB	$\overline{\text{LSB}}$
20-36	0	1	1	0
40-56	1	0	0	1
60-76	1	0	1	0

Note that if the 512K-byte board is being used together with one or more 128K-byte boards, the 128K-byte boards do not require any alteration. After all boards have been properly configured for block select addresses, they are ready to install.

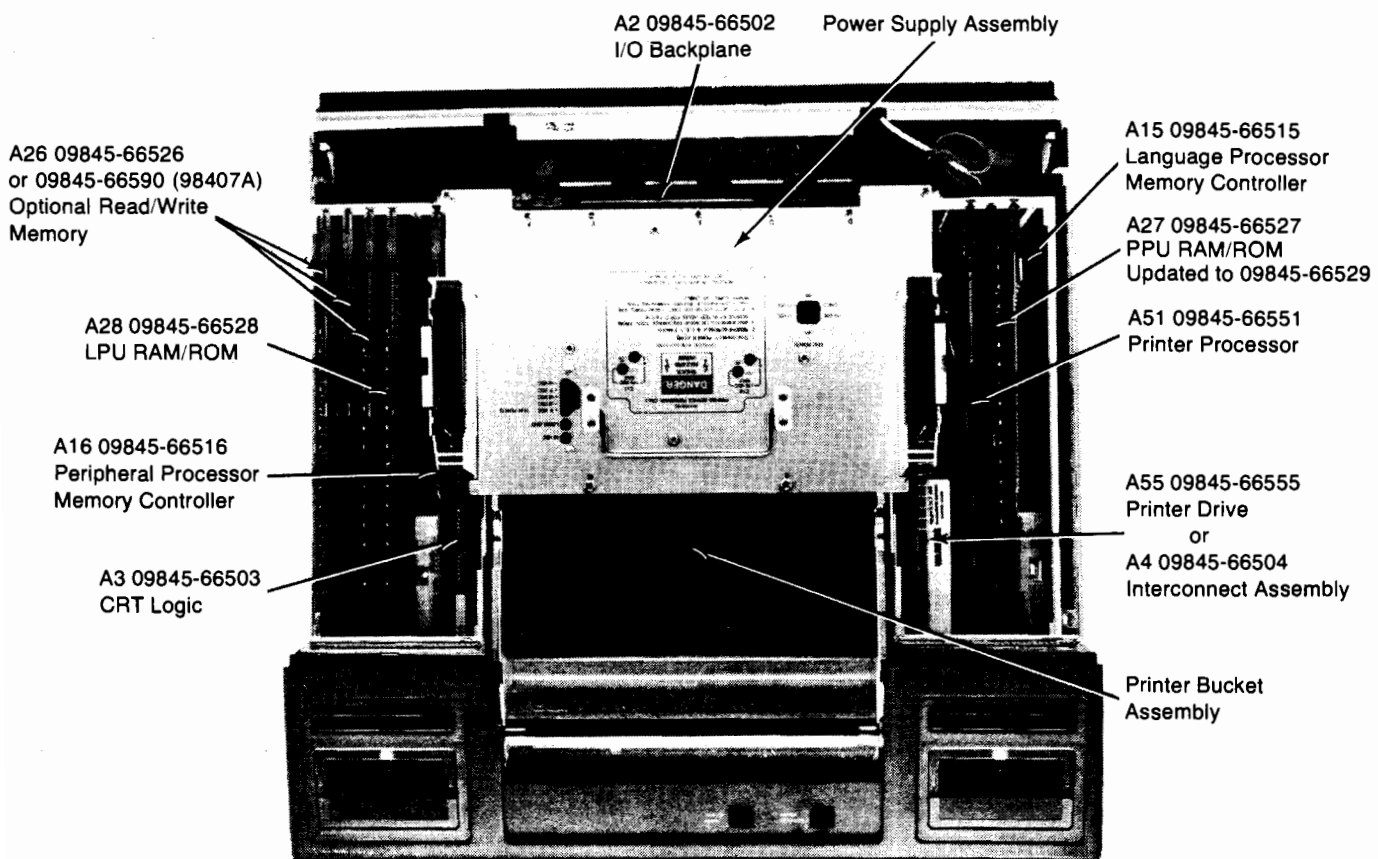
Installation and Test

If the computer already has more than 500K bytes of memory, no modifications are required. Install the memory board(s) as when installing the 09845-66526 128K-byte memory boards. Be sure the boards are fully seated, then re-install the retainer clip and screw.

If this is the first time a 98407A memory board is being installed, several changes are required before the computer can function properly. The 98407A Option 001 is used for first-time installation, and includes a set of replacement parts to update the computer for larger memory capability. These parts are installed as follows:

1. Remove the 09845-66527 RAM/ROM assembly from the right side of the computer and replace the two following ROMs:
 - Remove CE4 LB (1818-0838) and replace it with an 1818-1898 ROM.
 - Remove CE4 UB (1818-0834) and replace it with an 1818-1899 ROM.
2. If the computer is a 9845C, two additional ROMs must be replaced:
 - Remove CE1 LB (1818-1208) and replace it with an 1818-1591 ROM.
 - Remove CE1 UB (1818-1209) and replace it with an 1818-1592 ROM.

3. Install a new label over the current label identifying the board as a 09845-66529. Remove the violet card extractor by pushing the pin out with a pin punch or other suitable tool. Replace the extractor with the white one provided. Plug the assembly back into the computer, then re-install the retainer clip and screw.
4. After the memory boards and updated RAM/ROM board have been installed, replace the cover and CRT.
5. Some computer configurations also require replacement of certain option ROMs. The configurations and changes required are as follows:
 - 9845B Option 1xx: (Computer does not have bit-slice processor nor high-speed black/white CRT) No changes required.
 - 9845B Option 2xx: (Computer has bit-slice processor AND high-speed black/white CRT) Remove Enhanced Graphics ROM, and replace with new ROM supplied.
 - 9845C All Options: Remove Color Graphics ROM (or Enhanced Graphics ROM) and replace with the Enhanced Graphics ROM supplied.
 - IMAGE/45: If the computer includes an IMAGE/45 ROM, remove the IMAGE ROM from the left-hand drawer, and replace it with the Revision C IMAGE/45 ROM supplied.



PC Board Location Guide

CAUTION

UNUSED PARTS SUPPLIED IN THE UPDATE KIT REMAIN THE PROPERTY OF HEWLETT-PACKARD COMPANY. THEY SHOULD BE RETURNED TO THE NEAREST HP SALES AND SERVICE OFFICE AFTER COMPLETING THE UPDATE. **OLD PARTS REMOVED FROM THE COMPUTER SHOULD BE DISCARDED OR RETURNED WITH THE UNUSED NEW PARTS. DO NOT ATTEMPT TO USE EXTRA OR REMOVED PARTS. IMPROPER EQUIPMENT OPERATION WILL RESULT.**

To test the new installation, install a Revision C Test ROM as explained in the HP 9845B/C Service Manual. To perform full memory tests, use a **Revision C1** Test Binary tape. The earlier Revision C TBIN program cannot address the new, higher memory blocks. The MEMTST program on the customer Exerciser tape (09845-92041 Rev E) can also be used to perform memory tests. A full memory test requires extensive time to run to completion.

Verification of System Operation

If a test ROM is unavailable, correct memory installation can be verified by the AVAILABLE MEMORY listing after memory test is complete at system power-up. With memory installed, the available memory corresponding to installed capacities should match the following values within about 2 or 3 thousand bytes if no 128K-byte memory boards (09845-66526) are installed:

Memory Installed	Memory Available
512K bytes	578 000
1024K bytes	1 103 000
1536K bytes	1 626 000

Actual available memory varies, depending on how many and which option ROMs have been installed. If an incorrect (usually MUCH lower) value appears, make sure that no two memory boards are set to the same block select address. If all switches are correctly set, replace suspected boards until the defective memory board (including the 09845-66529) is isolated.

The memory test performed at power-up is not a comprehensive test. The TBIN and MEMTST programs mentioned earlier are more sophisticated, and result in a higher confidence, although they are not comprehensive either.

Note

Memory test and SCRATCH A take longer to execute with large memory installations. Be careful when using STORE ALL, and be sure the mass storage media has sufficient file space available. Data cartridges and single-sided floppy discs are too small for full memory configurations.

