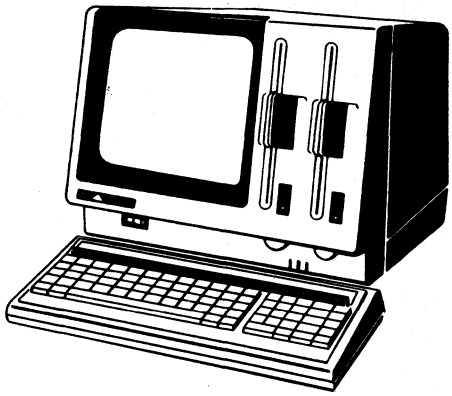
Advanced
Personal Computer



APC-H31/H32 Memory Expansion Unit Installation Guide

NEC
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This guide shows you how to install your new APC-H31 Memory Expansion Unit, and also how to set switches, if necessary, to make the unit compatible with your particular APC system.

To increase your APC's system's memory capacity above 128K bytes to 256K bytes, you can install the standard APC-H31 Memory Expansion Unit. If you wish to further increase the memory capacity of the standard APC-H31, you can install an additional memory kit, the APC-H32, on the APC-H31 board.

APC-H31 MEMORY EXPANSION UNIT

The APC-H31 Memory Expansion Unit is a printed circuit board (PCB), G9SNB, containing 18 dynamic random-access memory (RAM) integrated circuits (ICs) soldered on the board (see Figure 1).

The combined amount of memory provided by these ICs is 128K bytes. Additional memory ICs can be added to the APC-H31 in increments of 128K by installing APC-H32 Memory Kits.

APC-H32 128K MEMORY KIT

Each APC-H32 Memory Kit contains 18 dynamic RAM ICs. Each kit expands the memory capacity of the APC-H31 board by 128K bytes. It is possible to install up to two APC-H32 kits on the APC-H31 board. The ICs in the kit are easily inserted into socket sets 1 and 2 (see Figure 1).

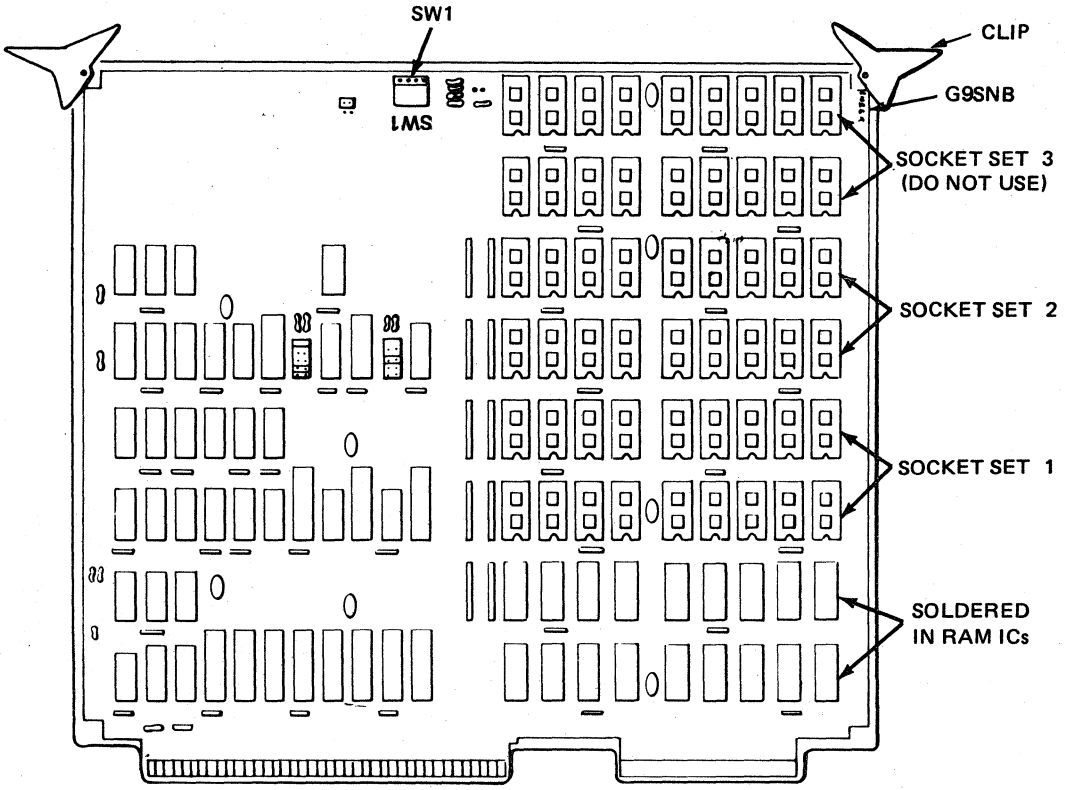


Figure 1. The APC-H31 Memory Expansion Unit PCB (G9SNB)

WHERE TO START

Before you can install the APC-H31/H32 Memory Expansion Unit, you must do the following:

- unpack it
- determine which revision you own
- calculate existing system memory
- add the APC-H32 kit (if you have one)
- check the total system memory
- and set switches, if necessary.

These procedures are described in the following paragraphs. To avoid a system failure, perform the six easy preparation procedures in the order given.

UNPACKING

Carefully remove the APC-H31 Memory Expansion Unit PCB from the packing materials.

DETERMINING WHICH REVISION YOU HAVE

To determine whether you own Revision (Rev.) 1 or 2, use the following procedure.

1. Locate the red slider switch SW1 on the APC-H31 PCB (see Figure 1).
   Rev. 1 has four slider switches (see Figure 2).
   Rev. 2 has eight slider switches (see Figure 3).
2. Check the revision you own based on the number of slider switches in SW1.

CHECK HERE	YOU OWN
The board has four slider switches.	Rev. 1
The board has eight slider switches.	Rev. 2.

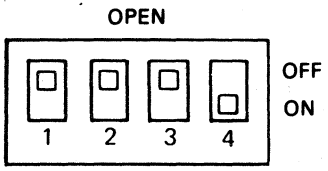


Figure 2 Revision 1 SW1

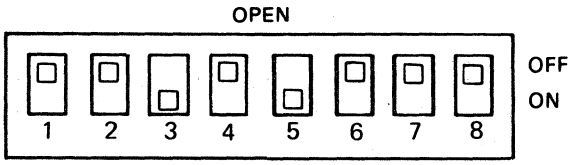


Figure 3 Revision 2 SW1

CALCULATING EXISTING SYSTEM MEMORY

There are two reasons why you must determine your "Existing System Memory" before adding the APC-H31 unit: First, knowing your system's existing memory lets you set the switches properly; second, you will be able to determine the number of memory expansion APC-H32 kits you can install on the APC-H31 PCB without exceeding the 512K system limit.

To calculate the "Existing System Memory" proceed as follows:

1. Check off the memory options your system now supports (see Table 1).
2. Calculate the "Existing System Memory" by multiplying the number of checks by 128K (see Table 1). This total represents the "Existing System Memory" before adding the APC-H31 unit. Notice that the APC base is checked off for you. Include this check in your total.

Table 1 Calculating Existing System Memory

MEMORY UNIT	MEMORY AMOUNT	CHECK HERE
APC BASE	128K	√
APC H08	128K	
APC H11/12	128K	

TOTAL CHECKS (including APC base)	

X 128K

EXISTING SYSTEM MEMORY = _____

NOTE

If you are not adding APC-H32 ICs to the APC-H31 PCB, skip to CHECKING THE TOTAL SYSTEM MEMORY.

ADDING ADDITIONAL MEMORY ICs (APC-H32)

If you wish to install the APC-H32 Memory Kit or kits, check Table 2 to determine the amount of memory you can add to the board.

The total APC system memory must not exceed 512K bytes. Exceeding the 512K limit will cause a system failure. Follow the suggested memory expansion possibilities in Table 2.

Table 2 Possible Memory Expansion

EXISTING SYSTEM MEMORY (From Table 1)	POSSIBLE EXPANSION
128K	Can fill socket sets 1 & 2 (Two APC-H32 128K memory kits)
256K	Can fill socket set 1 (One APC-H32 128K memory kit)
384K	Cannot add APC-H32 ICs to the APC-H31 board

Installing the APC-H32 128K Memory Kit

To install the APC-H32 Memory Kit, do the following procedure.

1. Carefully remove the APC-H32 kit from the packing materials. Each kit contains 18 ICs.
2. Lay the APC-H31 PCB down with the chip side up and the blue clips on top (see Figure 4).

   Notice that there are six rows of blue sockets (nine to a row, 18 to a set).

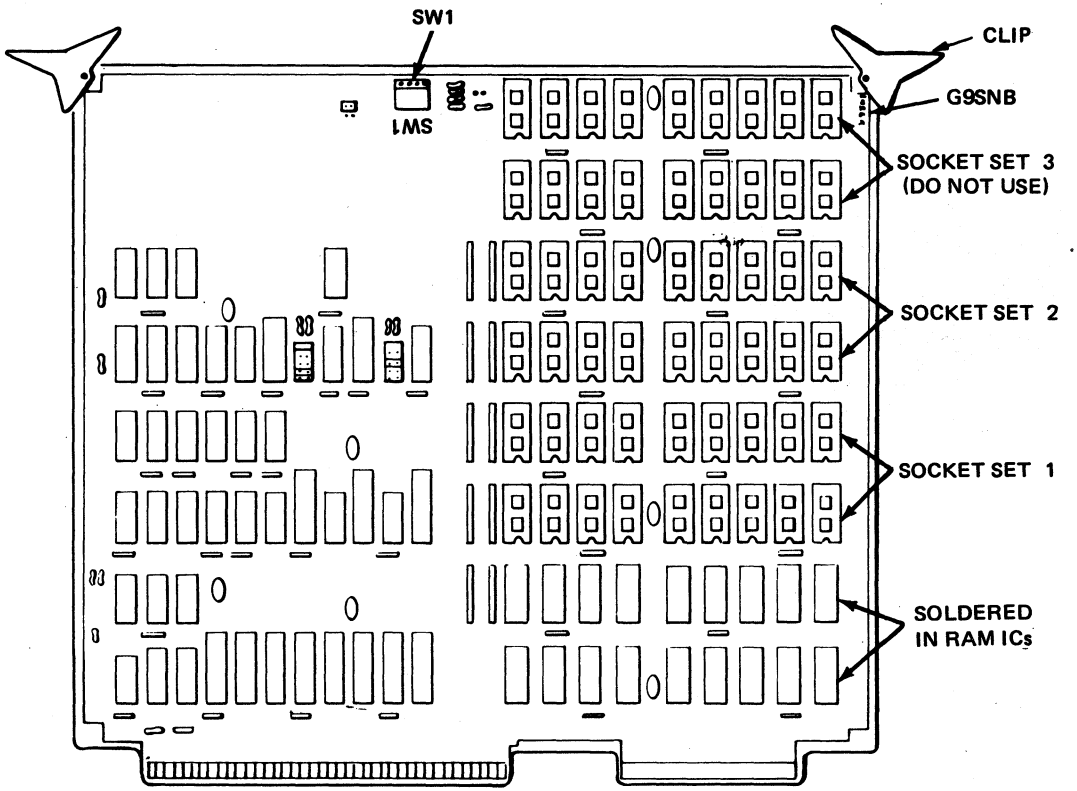


Figure 4 The APC-H31 Memory Expansion Unit PCB (G9SNB)

CAUTION

Static electricity can damage ICs. Avoid static electricity while handling ICs.

3. Gently remove the ICs from the package. Do not bend the pins on the ICs during installation.
4. Align the notch in the IC over the notch in the socket (see Figure 5).

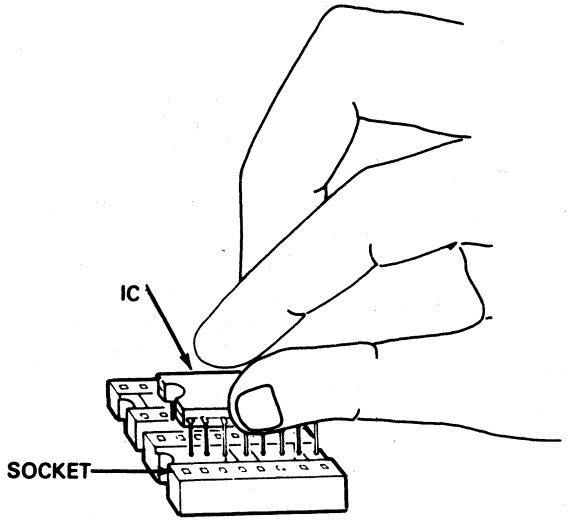


Figure 5 Inserting the IC into the Socket

5. Carefully position the pins on the IC over the holes in the socket before pressing the IC into the position (see Figure 5). Press firmly until the chip is seated in the socket fully.

   Fill rows one and two (socket set 1) with the 18 ICs in the kit.

CAUTION

FILL ONLY AS MANY SOCKET SETS AS INDICATED IN TABLE 2.

Do not fill rows five and six (socket set 3). This can cause a system failure).

6. If you are installing two APC-H32 kits, fill the next two rows (socket set 2) with 18 ICs.

CHECKING THE TOTAL SYSTEM MEMORY

The maximum amount of memory allowed in the APC system is 512K bytes. Use table 3 to determine your total system memory.

Find your "Existing System Memory" (as determined in Table 1). Then check off the line that represents what you are adding. Your answer is figured for you under "Your Total System Memory Is".

CAUTION

The total system memory must not exceed 512K bytes or a system failure will occur.

Table 3 Total System Memory

LINE #	EXISTING MEMORY (From Table 1)	ADDING H31	ADDING H32	CHECK OFF LINE THAT APPLIES	YOUR TOTAL SYSTEM MEMORY IS
1	128K	YES	NO		256K
2	265K	YES	NO		384K
3	384K	YES	NO		512K
4	128K	YES	ONE		384K
5	128K	YES	TWO		512K
6	256K	YES	ONE		512K
7	384K	YES	NO		512K

NOTE

This section applies to Revision 1 only. Skip to "Revision 2 Switch Settings," if you have Revision 2.

REVISION 1 SWITCH SETTINGS

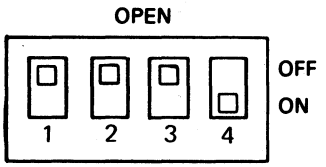
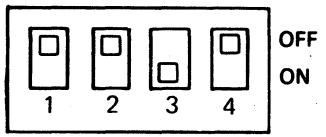
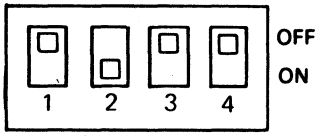
Before installing the APC-H31 Rev. 1 board, you must set slider switches SW1 and move jumper TM3.

Setting Revision 1 Slider Switches

To set the four slider switches SW1, perform the following procedure.

1. Look up your "Existing System Memory" from Table 1.
2. Match your total from Table 1 with the "Existing System Memory" in Table 4.
3. Set switches or verify switch settings that apply to your "Existing System Memory" (see Table 4).

Table 4 Revision 1 Slider Switch SW1 Positions

EXISTING SYSTEM MEMORY	SET SWITCHES
128K	
256	
384	

Moving Jumper TM3

To move jumper TM3, perform the following procedure.

1. Locate jumper TM3 on the APC-H31 PCB Rev. 1 (see Figure 6).

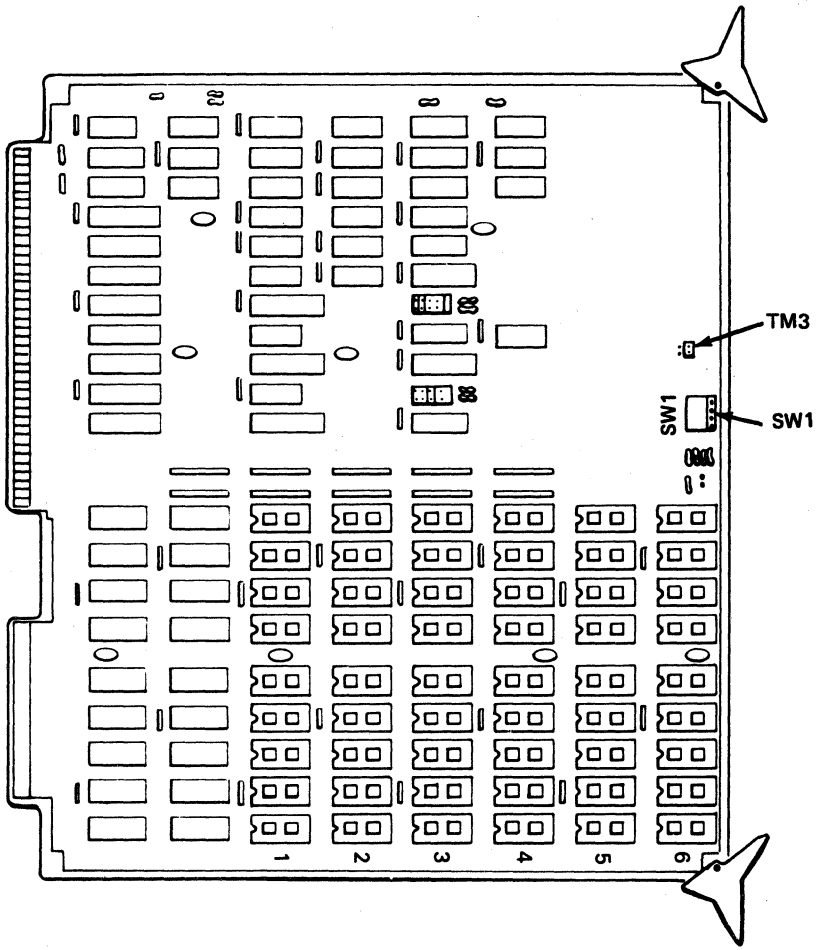


Figure 6 TM3 Jumper Location on the APC-H31 PCB Revision 1

2. Move the plastic cap (jumper) from pins numbered 2-3 to pins 1-4 (see Figure 7).

CAUTION

A system failure may occur if jumper TM3 is not set from pin 1 to pin 4.

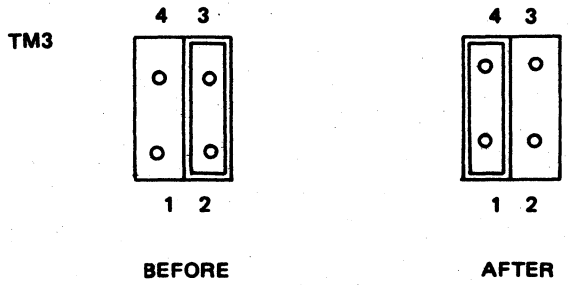


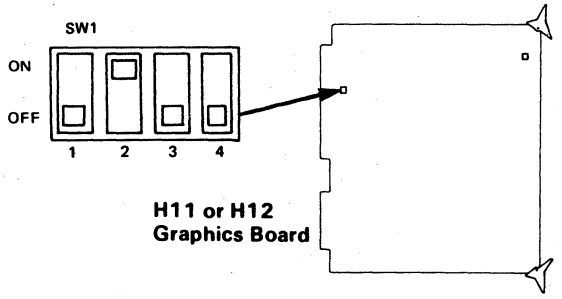
Figure 7 TM3 Jumper Position

Setting Additional Switches

NOTE

If your APC contains either a monochrome (APC-H11) or color (APC-H12) Graphics Subsystem Board with memory, you must verify the settings of slider switch SW1 on the H11/H12 PCB (see Figure 8).

SWITCH SETTINGS FOR THE APC-H11 OR APC-H12 WHEN THE APC CONTAINS AN H-08 EXPANSION MEMORY BOARD (G9PTV).



SWITCH SETTINGS FOR THE APC-H11 OR H-12 WHEN THE APC DOES NOT CONTAIN AN H-08 EXPANSION MEMORY BOARD (G9PTV).

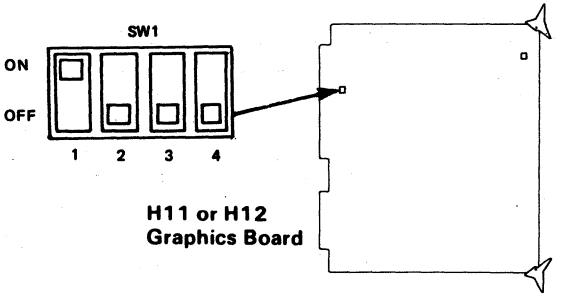


Figure 8 Switch Positions for the APC-H11/H12

Revision 1 Switch Setting Checklist

Did you set SW1?

Move TM3?

Check your Graphics Subsystem Switch Settings?

When you have answered yes to the above three questions, you can install your APC-H31 Memory Expansion Unit (see INSTALLING THE APC-H31 MEMORY EXPANSION UNIT PCB).

REVISION 2 SWITCH SETTINGS

NOTE

This section applies to Revision 2 only. Refer to "Revision 1 Switch Settings," if you have Revision 1.

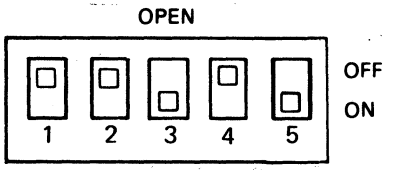
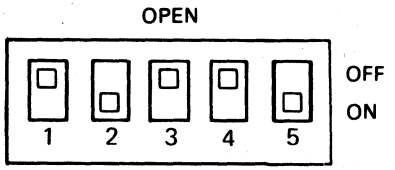
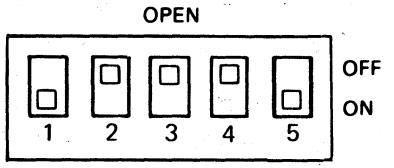
Before installing the APC-H31 Rev. 2 board, you must set the eight slider switches in SW1.

Setting Revision 2 Switches SW1-1 Through SW1-5

To set the first five slider switches in SW1, perform the following procedure.

1. Look up your "Existing System Memory" from Table 1.
2. Match your "Existing System Memory" in Table 5.
3. Set switches, or verify switch settings, that apply to your "Existing System Memory" (see Table 5).

Table 5 Revision 2 Slider Switches SW1-1 Through SW1-5 Positions

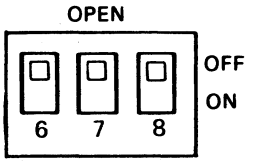
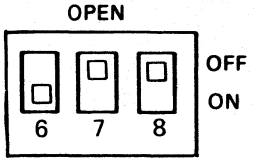
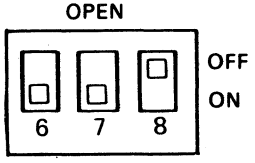
EXISTING SYSTEM MEMORY (From Table 1)	SET SWITCHES
128K	
256K	
384K	

Setting Switches SW1-6 Through SW1-8

Slider switches SW1-6 through SW1-8 are set according to the amount of memory installed on the APC-H31 PCB.

To set these slider switches, refer to Table 6.

Table 6 Revision 2 Slider Switches SW1-6 through SW1-8 Positions

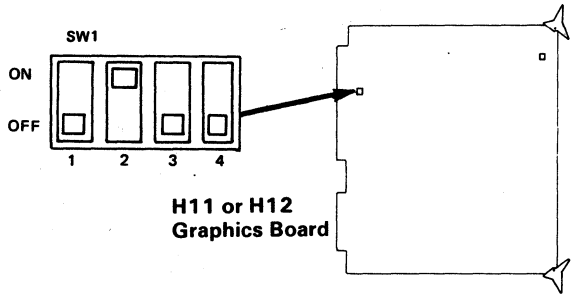
MEMORY ON APC-H31 PCB (Refer to Table 3)	SET SWITCHES
Standard APC-H31 PCB (soldered ICs only) APC-H31 board memory is 128K Lines 1, 2, 3, or 7 from Table 3	 (VERIFY FACTORY SETTING)
APC-H31 with one APC-H32 kit (socket set 1 filled) APC-H31 Board Memory is 256K Line 4 or 6 from Table 3	
APC-H31 with two APC-H32 Kits (socket sets 1 & 2 filled) APC-H31 board memory is 384K Line 5 from Table 3	

Setting Additional Switches

NOTE

If your APC contains either a monochrome (APC-H11) or color (APC-H11) or color (APC-H12) Graphics Subsystem Board with memory, you must verify the settings of slider switch SW1 on the H11/H12 PCB (see Figure 9).

SWITCH SETTINGS FOR THE APC-H11 OR APC-H12 WHEN THE APC CONTAINS AN H-08 EXPANSION MEMORY BOARD (G9PTV).



SWITCH SETTINGS FOR THE APC-H11 OR H-12 WHEN THE APC DOES NOT CONTAIN AN H-08 EXPANSION MEMORY BOARD (G9PTV).

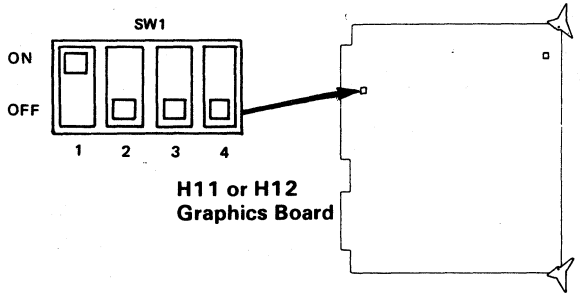


Figure 9 Switch Positions for the APC-H11/H12

Revision 2 Switch Setting Checklist

Did you set switches SW1-1 through SW1-5?

Did you set switches SW1-6 through SW1-8?

Check your Graphics Subsystem Switch Settings?

When you have answered yes to the above three questions, you can install your APC-H31 Memory Expansion Unit (see INSTALLING THE APC-H31 MEMORY EXPANSION UNIT PCB).

INSTALLING THE APC-H31 MEMORY EXPANSION UNIT PCB

Before installing the APC-H31 PCB, make sure that you have followed all the preparation procedures.

To install the APC-H31 PCB, first do the following procedure.

1. Turn off and unplug the APC.
2. Loosen the screws that hold the latch locks in place (see Figure 10). Make sure that the locks hang straight down from the screws.

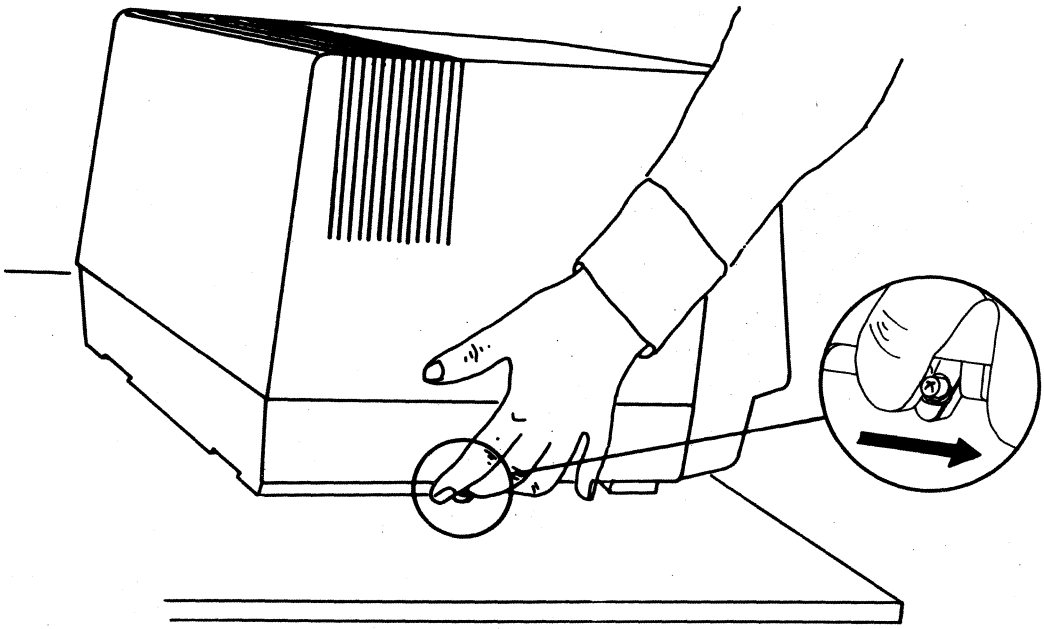


Figure 10 Removing the APC Top Cover

3. Pull the latch levers forward and lift the top cover up and off the computer.
4. Choose an empty slot in the card cage (see Figure 11) for the APC-H31 PCB.

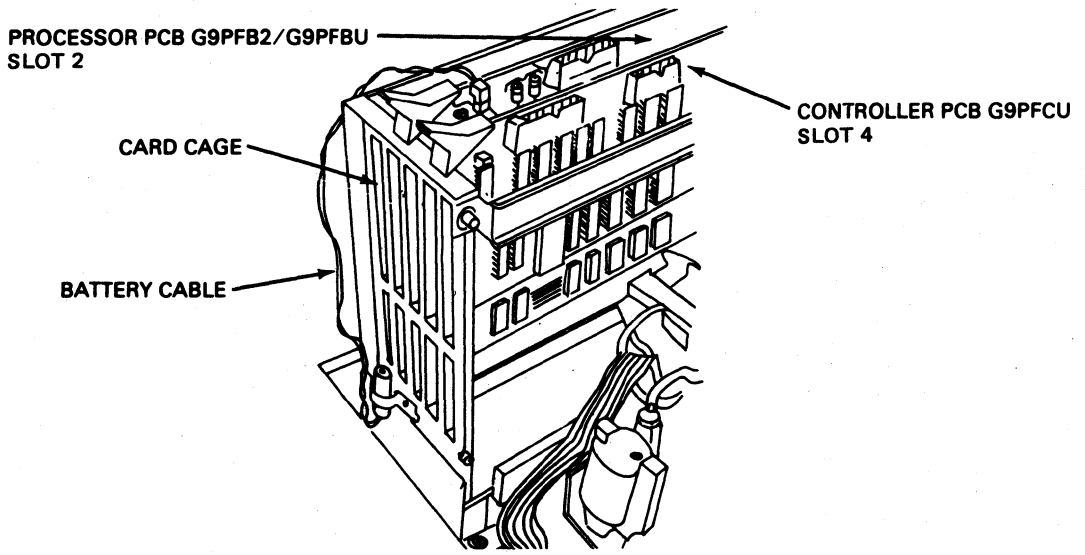


Figure 11 Card Cage (Front View)

CAUTION

The processor PCB (G9PFB2/G9PFBU) has a small battery cable attached to the left side. DO NOT DISCONNECT THE BATTERY CABLE.

5. Disconnect any cables (other than the battery cable) in the way of the available slot.

   To disconnect a cable, press down on the small clips and lift the cables up (see Figure 12).

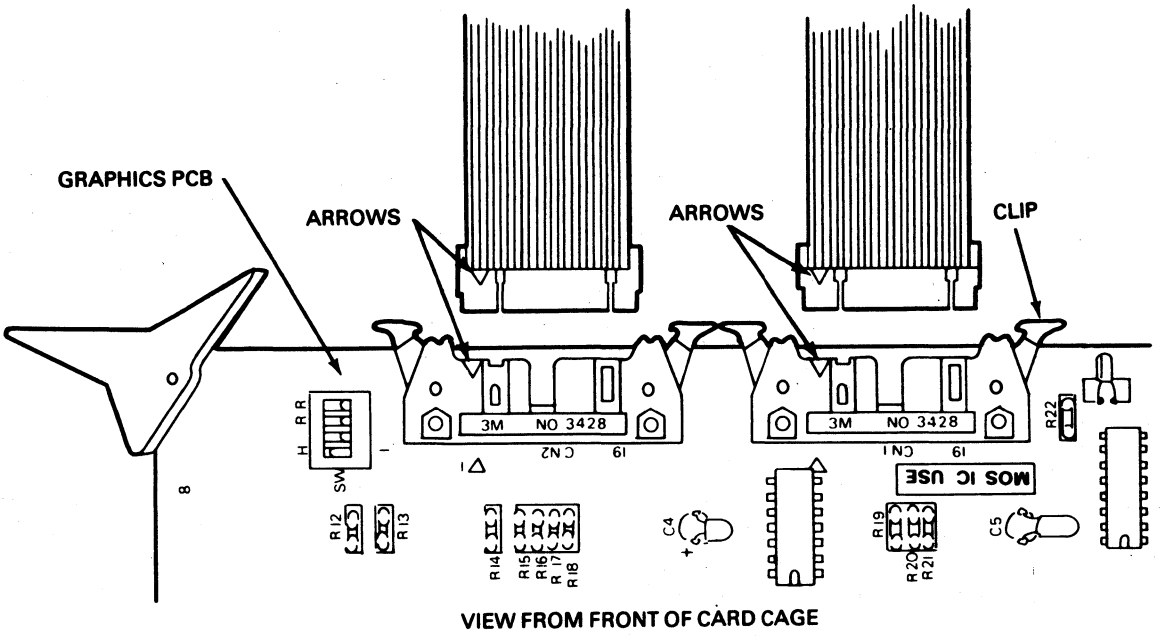


Figure 12 Disconnected Cables

6. Hold the board with the IC side facing the front of the card cage (see Figure 13).
7. Firmly press the PCB into place.

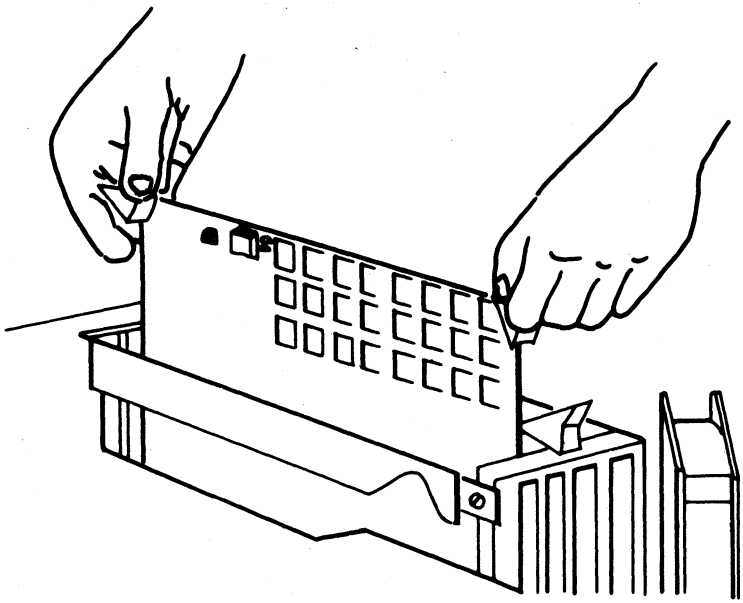


Figure 13 Inserting the APC-H31 PCB in the card cage

8. Reconnect any cables that you disconnected in step 5.
9. Align, lower, and latch the computer cover into place.
10. Lastly, tighten the screws that hold the latches in place.

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USER'S COMMENTS FORM

Document: APC-H31/H32 Memory Expansion Unit Installation Guide

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