PowerBook 5300 & 190 Series: Internal & External Video (5/96)

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TOPIC ---

This article answers some commonly asked questions about the internal and external video capabilities of the Macintosh PowerBook 190 and 5300 series computers.

How do I connect an external display to a Macintosh PowerBook 190 or 5300 series computer?

When an external monitor is connected can I still run the computer from the battery?

Can I expand the Video RAM (VRAM) in these PowerBook computers?

What is the highest bit depth the Macintosh PowerBook 5300 series computers are capable of using with an external monitor attached?

Which Apple Macintosh displays can I use with these PowerBook computers? And what resolutions can these PowerBook computers output to them?

DISCUSSION ---

Connecting An External Display
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5300 Series

The PowerBook 5300 series computers have the same type VID-14 video output connector as the earlier PowerBook 500 series computers. This adaptor cable will be needed to connect an external display. The Apple part number for the cable is M3927LL/A*. The PowerBook Video Adpaptor cable is not included with the PowerBook 5300 computers.

190 Series

The PowerBook 190 series computers can be upgraded to have the same video out capabilities that are built into the PowerBook 5300 series computers. You need

to order the Macintosh PowerBook 8-Bit Color Video-Out Upgrade Kit (Apple part number M3743LL/A*) to get video out capability. You will use the same video cable mentioned above to attach an external display. The PowerBook Video Adpaptor cable is not included with the PowerBook 190 computers. The PowerBook Video Adaptor cable is included in the Macintosh PowerBook 8-Bit Color Video-Out Upgrade Kit.

Running From The Battery

Unlike previous PowerBook computer models, the PowerBook 190 (with the video-out upgrade) and 5300 series computers can have an external monitor attached while running from the battery.

VRAM Expansion
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All of the PowerBook 5300 and the PowerBook 190 (with the video-out upgrade) series computers have two separate sets of VRAM to support the internal and external displays.

External Display VRAM

All of the PowerBook 5300 and the PowerBook 190 (with the video-out upgrade) series computers have 512K of VRAM soldered on a video card for supporting external displays.

The highest bit depth available for external displays at either 640x480 or 832x624 resolutions is 8 bits per pixel unless you expand the VRAM by replacing the Apple video-out card with a third party video expansion card product. If the VRAM on the third party video card is 1 MB, the computer will be able to output 16 bits per pixel on an external display.

Internal Display VRAM

NOTE: The following descriptions apply only to models sold in the United States. Europe and Asia have models that differ slightly from these configurations.

The Macintosh PowerBook 5300 and 5300cs computers and the 5300c (that comes with 8 MB of RAM) come with 512K VRAM soldered to the logic board for support of the internal LCD Display. It cannot be removed or upgraded.

The Macintosh PowerBook 5300c that comes with 16 MB of RAM on the logic board and the Macintosh PowerBook 5300ce have 1 MB of VRAM. This allows for higher bit depth support on the internal display. It also cannot be removed or upgraded.

Built In Video Support
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Internal Video Support

The following table lists the PowerBook 5300 and 190 (with the Apple video-out

upgrade) series computer models and the amount of VRAM installed in each for use by the computer's internal display and an external display.

Begin_Table

Part #	Model #	Display Type	No. Colors on Int. Disp.	VRAM for Int. Disp	VRAM for Ext. Disp
M3135LL/A* (8 MB RAM 500 MB HD)	5300/100	9.5 inch Passive Matrix Grayscale	16 Grays	512K	512K
M3825LL/A* (8 MB RAM 500 MB HD)	5300cs/100	10.4 inch Dual Scan Passive Matrix Color	256 Colors	512K	512K
M3824LL/A* (16 MB RAM 750 MB HD)	5300cs/100	10.4 inch Dual Scan Passive Matrix Color	256 Colors	512K	512K
M3133LL/A* (8 MB RAM 500 MB HD)	5300c/100	10.4 inch Active Matrix Color	256 Colors•	512K	512K

   •Note: This model displays thousands of colors, but only in the reduced
          screen size mode (640x400).

Part #	Model #	Display Type	No. Colors on Int. Disp.	VRAM for Int. Disp	VRAM for Ext. Disp
M4488LL/A* (16 MB RAM 750 MB HD)	5300c/100	10.4 inch Active Matrix Color	Thousands of Colors	1 MB	512K
M3828LL/A* (32 MB RAM 1.1 GB HD)	5300ce/117	10.4 inch Active Matrix Color	Thousands of Colors	1 MB	512K
M3530LL/A* (4 MB RAM 500 MB HD)	190/66	9.5 inch Backlit Passive Matrix Grayscale	16 Grays	512K	512K (with video card upgrd)
M3531LL/A* (8 MB RAM 500 MB HD)	190/66	9.5 inch Backlit Passive Matrix Grayscale	16 Grays	512K	512K (with video card upgrd)
M4072LL/A* (4 MB RAM 500 MB HD)	190cs/66	10.4 inch Dual Scan Passive Matrix Color	256 Colors	512K	512K (with video card upgrd)
M4073LL/A* (8 MB RAM	190cs/66	10.4 inch Dual Scan	256 Colors	512K	512K (with video

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   500 MB HD)              Passive Matrix                          card upgrd)
                           Color


External Video Support
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The following table lists the Apple Displays supported by the Macintosh
PowerBook 5300 and 190 (with the Apple video-out upgrade) series computers and
the bit depths supported with the standard 512K of VRAM installed.

Display                           Resolution(HxV)      Bits/Pixel
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Macintosh 12-in. RGB Display        512x384            1-8bpp
Macintosh 12-in. Monochrome Display 640x480            1-8bpp
AppleColor High Resolution RGB
  Monitor (13-in.)                  640x480            1-8bpp
All Apple 14-in. displays including
 the AudioVision (with adaptor)     640x480            1-8bpp

Macintosh Portrait Display          640x870            1-4bpp
Macintosh Portrait Display          640x818            1-8bpp

Macintosh 16-in. Color Display      832x624            1-8bpp

Apple Multiple Scan 15 display      640x480            1-8bpp
                                    832x624            1-8bpp

Apple Multiple Scan 17 display      640x480            1-8bpp
                                    832x624            1-8bpp
                                    1024x768           1-4bpp***

Apple Multiple Scan 20 display      640x480            1-8bpp
                                    832x624            1-8bpp
                                    1024x768           1-4bpp***

VGA (60 Hz)                         640x480            1-8bpp**
SuperVGA (56 Hz)                    800x600            1-8bpp**
VESA 1024x768 (60 Hz)               1024x768           1-4bpp***

End_Table

Note: The resolutions and bits/pixel may be different with a third party
      video card. For more information you will need to contact the
      manufacturer of your video card.

* Part numbers mentioned in this article are accurate as of this writing. Before
ordering, verify that they are still correct as they are subject to change.
** VGA and SVGA Monitors require special third-party VGA cables.
*** This is an unsupported resolution. It can only be obtained by holding down
the Option key when pressing the Option button in the Monitors Control Panel. It
may or may not be an available option in future revisions of the Monitors
Control Panel.
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Article Change History:
30 May 1996 - Clarified information on video adaptor cable.
11 Jan 1996 - Added info about 5300c and 1000s of colors and 17" display.
11 Oct 1995 - Clarified information about internal display VRAM.


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