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Power Macintosh 7500/7600/8500: Video Capture (5/96)

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TOPIC -----

This article contains questions about the video capture capabilities of the Power Macintosh 7500, 7600, and 8500 series computers.

Questions Answered in this Article:

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1) Question: What is the color spacing in the video capture of the Power Macintosh 7500, 7600, and 8500 series computers? Is it 8-bit red + 8-bit green + 8-bit blue, or is it some other combination that provides 24-bit video?

2) Do the Power Macintosh 7500, 7600, and 8500 series computers use the Phillips TDA-8758 analog-to-digital converter chip? I understand that it only offers 8-bit chrominance and 8-bit luminance capabilities. Doesn't this contradict the claim of a 24-bit video subsystem?

3) I ran an AV test that showed the AV ramp to be displaying 30 discrete levels from dark to light and resembling more of a 5-bit capture than 8-bit. Is Apple's video subsystem a true 24-bit?

DISCUSSION -----

1) Question: What is the color spacing in the video capture of the Power Macintosh 7500, 7600 and 8500 series computers? Is it 8-bit red + 8-bit green + 8-bit blue, or is it some other combination that provides 24-bit video?

Answer: The 24-bit color space for the Power Macintosh 7500, 7600, and 8500 series computers is scaled 24 bpp RGB (8-bit Red + 8-bit Green + 8-bit Blue + 8-bit alpha channel)

The Power Macintosh 7500, 7600, and 8500 series computers capture video in millions of colors (24-bit), and are capable of capturing 32-bit color, using 8 bits as an alpha channel.

2) Question: Do the Power Macintosh 7500, 7600, and 8500 series computers use the Phillips TDA-8758 analog-to-digital converter chip? I understand that it only offers 8-bit chrominance and 8-bit luminance capabilities. Doesn't this contradict the claim of a 24-bit video subsystem?

Answer: The Power Macintosh 7500, 7600, and 8500 series computers do use the Phillips TDA-8758 analog-to-digital video interface. However, this does not limit the video capture to 16-bit. This chip provides two 8-bit analog-to-digital converters (ADCs): one for chrominance and one for luminance. However, since there are direct and specific relationships between luminance (Y) and chrominance (C) values and RGB, the separate 8-bit luminance and chrominance data can be supplied to a digital video decoder (which is an SAA 7196 decoder) for conversion into RGB.

The digital video decoder has a chrominance and luminance processor that converts the luminance and chrominance video data into separate 8-bit "Y" and 8-bit "UV" data ("UV" is used to refer to the digital version of chrominance). The "YUV" data is then fed separately into an RGB matrix where the video data is converted from "YUV" to 24 bpp RGB data (24 bpp for the color information and 8-bits for the alpha channel: 8-bit Red + 8-bit Green + 8-bit Blue + 8-bit alpha channel)

3) Question: I ran an AV test that showed the AV ramp to be displaying 30 discrete levels from dark to light and resembling more of a 5-bit capture than 8-bit. Is the video subsystem used on the Power Macintosh 7500, 7600, and 8500 series computers a true 24-bit system?

Yes, the video subsystem used on the Power Macintosh 7500, 7600, and 8500 series computers is a true 24-bit system. If you create a simple white-to-black gradient using a graphics application, then output that image to an NTSC monitor, the NTSC image will be a smooth gradient, without the "stairstepping" you describe in your test.

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