Macintosh IIvx: Internal Video Support

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TOPIC ----------

This article describes the Macintosh IIvx internal video monitor support.

DISCUSSION ----------

The following chart lists the monitors supported by Macintosh IIvx internal video:

MON ID 3 2 1	Monitor Selected	Cols/ Rows	Vertical Refresh	Horizontal Refresh	Bandwidth
0 0 1	reserved				
0 1 0	12" RGB	512 x 384	60.15 Hz	24.48 KHz	15.6672 MHz
1 1 0	12" B/W, 13" RGB	640 x 480	66.67 Hz	35.0 KHz	30.24 MHz
0 0 0	reserved				
0 1 1	VGA	640 x 480	59.94 Hz	31.47 kHz	25.18 MHz
1 0 0	reserved				
1 0 1	reserved				
1 1 1	no monitor connected				

* 640 x 480 displays are supported at 8 bits/pixel with 512K VRAM and 16 bits/pixel with 1MB of VRAM

Note: The monitor ID pins 3, 2, and 1 refer to pins 10, 7, and 4 on the

DB-15 external video port.

The monitor ID must be asserted in the monitor by grounding lines for 0's and leaving no connection for 1's. No connects are pulled high by pullup resistors on the Macintosh IIvx logic board.

Standard Macintosh video timing calls for a 30.24 MHz pixel clock for 640 x 480 displays. Macintosh IIvx deviates from the standard by using the CPU clock, at 31.3344 MHz, as a pixel clock for those displays. This results in an extra 32 pixels per horizontal line. The active pixels are center in the active video field with 16 extra pixels on each side. Horizontal and vertical scan rates remain unchanged. The effect of this change is that square pixels are visually 3% thinner. The Macintosh 12" Monochrome Display compensates for this aberration, but the 13" Color Display does not. Monitor ID 2 is grounded within Macintosh IIvx which triggers the 12" Monochrome Display to realize that it is connected to a Macintosh IIvx and allows the monitor to compensate for the slightly different timing.

VGA monitors use the monitor ID of 011, which is the same as the Two-page Monochrome Monitor. VGA monitors use the extended monitor sense codes, which is enabled by tying the ID 3 and ID 2 lines together at the monitor end. The extended sense for a VGA monitor is 01 01 11.

One other anomaly in Macintosh IIvx is that it does not support 1 bit/pixel mode on 512 x 384 monitors.

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