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Six 2-D QuickDraw accelerators differ in features, price

By: Sean Wagstaff
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By **Sean Wagstaff**

There are many reasons to add to or replace built-in QuickDraw hardware: to support higher monitor resolutions and color-bit depths, to enhance system performance, or to drive a second monitor. In addition, some QuickDraw cards provide special features such as color-management tools and hardware panning and zooming.

We tested several popular PCI-compatible 2-D graphics accelerators for this review: ATI Technologies Inc.'s XClaim GA; Diamond Multimedia Systems Inc.'s Javelin Video 3400XL; Integrated Micro Solutions Inc.'s TwinTurbo 128; Matrox Graphics Inc.'s MGA Millennium; and Village Tronic USA's MacPicasso 520.

Finally, one of the better performing cards was Number Nine Visual Technology Corp.'s Imagine 128, previously available as RasterOps Technology Corp.'s OptiColor 128. RasterOps recently shed its cards due to corporate changes, but the cards are sold by Number Nine, the original developer.

For those needing high-fidelity color and extremely high resolutions, we also looked at Radius Inc.'s ThunderPower 30/1920, an expensive card with unique features (see sidebar). Omitted from this test were Radius' PrecisionColor cards, which the company failed to deliver before our testing deadline. Some of the tested cards are being updated with new multimedia features, such as MPEG playback and QuickTime pixel doubling, but we concentrated on basic bits-to-screen features and performance.

We tested these cards using Ziff-Davis Benchmark Operations' MacBench 4.0, a synthetic test that emphasizes the most commonly used QuickDraw calls, but which doesn't necessarily duplicate real-world use with off-the-shelf applications. All were tested at maximum resolutions up to 1,152 by 870 pixels



at a depth of 24 bits (millions of colors), equivalent to a 17-inch monitor displaying at 72 pixels per inch. This is typically the highest-quality display you'll get from 4 Mbytes of video RAM. Cards with 8 Mbytes of VRAM will normally support resolutions up to 1,600 by 1,280 pixels at 24-bit depths, but we did not test at these higher resolutions. Some of the other cards can also drive monitors at high-definition television resolution (1,920 by 1,080 pixels).

We saw an insignificant performance change between 4-Mbyte and equivalent 8-Mbyte cards, so speed alone is not a reason to buy the higher-priced boards. Users should be prepared to pay quite a bit more - about 50 percent, on average - for the 8-Mbyte versions of the cards.

QuickDraw accelerator vendors offer a variety of features to spice up their offerings. Four of these cards - from ATI, Number Nine, Matrox Graphics and IMS - have hardware pan and zoom, which lets you use a virtual display that is larger than your actual screen. Number Nine's Imagine 128 exhibited superior performance in this regard, with much smoother panning and zooming and without the annoying monitor resynchronization demonstrated by the other cards when switching resolutions.

Gamma and calibration controls allow you to adjust your monitor to more closely match real-world output, or to keep your work looking consistent from one monitor to the next. The MacPicasso 520 was the only card, including built-in Mac video on the 7600, that didn't offer this feature.

ATI's XClaim GA is fairly ubiquitous, as two versions of it came standard in Power Mac 9500 machines. Except for the added presence of a VGA connector and hardware pan and zoom, ATI's XClaim GA card is identical to the faster version available from Apple. While the pan and zoom is a valuable feature to some users, ATI's version blanks the screen before changing resolutions and it isn't nearly as smooth as in some of the more expensive cards. The XClaim GA, as well as Apple's version, were middle performers in our benchmarks, which is good when you consider its low price.

Since we began this review, ATI replaced the XClaim GA with the \$359 XClaim VR (\$269 for 2-Mbyte version), which it says improves performance and adds new features such as 3-D and QuickTime acceleration. In any case, we think the XClaim GA is a good value.

Number Nine's 4- and 8-Mbyte Imagine 128 cards (see 04.01.96, Page 41) were among the fastest in our testing and offered a set of well-implemented features. Our only problem was finding one. First we looked to RasterOps, which had formed a deal with Number Nine to distribute the boards domestically, but RasterOps has gotten out of the card business. The boards are once again available from Number Nine.

We found the hardware pan and zoom of the cards to be among the smoothest in this test. You can zoom up to 400 percent magnification with the 4-Mbyte version of the card, but the 800 percent-zoom menu choice was grayed out. A window dragging feature allows you to move windows with full graphic retention instead of showing ghosted windows as usually happens. We particularly liked the HawkEye control panel that allows you to check the card's ROM version, set up a text cache, set the gamma, enable a screen dimmer and change the cursor size and color.

Both cards are a well worth their cost, and at \$699, the 8-Mbyte version is an exceptional value for a really smooth performing, high-resolution board. Besides

allowing 800 percent zoom, the 8-Mbyte version supports resolutions up to 1,920 by 1,080 in 24-bit color. The 4-Mbyte allows up to 1,152 by 870 pixels in 24-bit color. Number Nine has just released Imagine 128 Series 2. It said the \$799 card, which comes with 8 Mbytes of VRAM, adds acceleration of QuickDraw 3D and QuickTime.

Like Apple's version of the ATI card, Diamond's Javelin is a basic, no-frills QuickDraw accelerator. It supports resolutions up to 1,152 by 870 pixels at 24-bit resolution, but for some reason doesn't support 832-by-670 (16-inch) resolution. The card has a single 15-pin Mac display connector and ships with a Mac-to-VGA adapter. The box also includes a note promising drivers for QuickTime acceleration when QuickTime 2.1 ships, but that version is long-obsolete; Diamond said that the card now supports that version. The card offers good performance, despite its Spartan features, and the upgradable 2-Mbyte, \$248 version (known as the Javelin 3240XL) is the best buy in town for those with 17-inch or smaller monitors.

Matrox Graphics' MGA Millennium has two connectors, one for a 9-pin VGA cable and the other that looks like a standard 15-pin Mac connector, but is actually a custom connector. To plug into a Mac monitor, the company provides an adapter cable that plugs into the card's VGA connector.

PowerDesk, Matrox Graphics' control panel software, is easy to use. It lets you switch between any of the supported resolutions and frequencies and to set the extended Desktop modes for panning and zooming. You can zoom between 100 percent, 200 percent and 400 percent magnifications through the control panel or a user-defined hot key. The software caused a lag and a jerkiness to the cursor, as well as the dreaded monitor resync. You can upgrade the 4-Mbyte version to 8 Mbytes by adding a window RAM daughtercard.

The MGA Millennium was the first third-party QuickDraw 3D accelerator on the market, but when we first reviewed it (see 04.01.96, Page 41), it lacked texture-mapping capability, which made its usefulness for 3-D graphics marginal. Nevertheless, it's a respectable performer for 2-D uses and a very good value.

Like the MGA Millennium, the IMS TwinTurbo is also available in 4-Mbyte and 8-Mbyte versions; the high-end version drives monitors at HDTV resolution. It features both 15-pin Mac and 9-pin VGA connectors. (A newer "MV2" version, which we didn't review, offers lower resolution, but adds an NTSC encoder and connector for playing through a television.)

While its performance is very good, its price (\$799 for the 8-Mbyte board) is high enough to render it only a fair value in this highly competitive field. The TwinTurbo offers hardware zoom through a hot key, but like lower-cost cards, causes an annoying monitor resync at each resolution change.

The MacPicasso 520, from Village Tronic USA, the U.S. division of a German vendor, is another low-cost board with respectable features, including hardware pan and zoom. Unfortunately, it could not be included in our high-resolution publishing benchmark because the maximum 24-bit resolution of the 4-Mbyte version is only 1,016 by 768 pixels: not enough to drive a standard 17-inch monitor at 72 pixels per inch. Also, it doesn't support gamma adjustment beyond 256 colors, so we recommend you choose another card if you want to do any serious color-publishing work.

The card offers the standard connectors - 9-pin VGA and 15-pin Mac - and its price is in the right neighborhood for a lower-end card. But given its limited

resolution and lack of gamma control, we think it's only a fair value.

For most users, the bottom line for performance is whether a card delivers a high-quality display at the target resolution and is fast enough to make day-to-day operations feel smooth and fast. The good news is that, depending on the resolution of your monitor, all of the cards accomplish this goal.

Those who need extremely accurate color for pre-press work, or those who are working with very complex and demanding graphics files, may want to pay close attention to the features and performance differences we found here. The majority, however, could pick almost any one of these cards and scarcely notice a difference in performance or display quality.

Jeffrey K. Milstead of MacWEEK Labs performed the testing for this review.

ATI Technologies Inc.

Overall value: 3 (Good)

List price: 2-Mbyte \$299, 4-Mbyte \$399

* Discontinued, but still available in the channel. Replaced with the XClaim VR.

ATI Technologies Inc., of East Thornhill, Ontario, can be reached at (905) 882-2600; fax (905) 882-2620; sales@atitech.ca; <http://www.atitech.com/>.

Diamond Multimedia Systems Inc.

Overall value: 4 (Very good)

List price: 2-Mbyte \$248, 4-Mbyte \$349

Diamond Multimedia Systems Inc. of San Jose, Calif., can be reached at (408) 325-7000 or (800)468-5846; fax (408) 325-7070; sales4u@diamondmm.com; <http://www.diamondmm.com/>.

Integrated Micro Solutions

Overall value: 3 (Good)

List price: 4-Mbyte \$499, 8-Mbyte \$799

Integrated Micro Solutions, of San Jose, Calif., can be reached at (408) 369-8282 or (888) 467-8282; fax (408) 369-0128; <http://www.integratedmicro.com/>.

Matrox Graphics Inc.

Overall value: 3 (Good)

List price: 4-Mbyte \$299, 8-Mbyte \$498

Matrox Graphics Inc., of Dorval, Quebec, can be reached at (514) 682-2630; fax (514) 685-2853 <http://www.matrox.com/mga/>.

Number Nine Visual Technology Corp.

Overall value: 4 (Very good)

List price: 4-Mbyte \$499, 8-Mbyte \$699

Number Nine Visual Technology Corp., of Lexington, Mass., can be reached at (617) 674-0009 or (800) 438-6463; fax (617) 674-2919; <http://www.nine.com/>.

Village Tronic USA

Overall value: 3 (Good)

List price: 2-Mbyte \$199, 4-Mbyte \$249

Village Tronic USA, of Santa Clara, Calif., can be reached at (888) 826-7466; fax (408) 980-8999.

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