■ THE EDITORIAL VIEW

3D Chips Take Larger Bite of PC Budget

Higher Performance Justifies Greater Share of Materials Cost in New PCs

Be prepared to spend more for your next graphics card. The latest round of 3D-chip announcements (see MPR 6/2/97, p. 16, and MPR 6/23/97, p. 1) shows most priced between $35 and $45, significantly higher than the 2D and "free-D" chips common in today's systems. Costs for other components in the graphics subsystem are going up as well. For best performance, the new 3D chips require 100-MHz SGRAM, which is roughly 30% more expensive than the commodity 40-MHz EDO DRAM used by most PCs in 1996—and they need more of it, with base configurations increasing from 2M to 4M and a typical upper limit of 8M to 16M.

Be prepared to get more for your money, as well. The newest 3D chips are twice as fast on 2D tasks and as much as four times faster than year-old designs for demanding 3D entertainment software.

This combination of more performance at a higher price puts manufacturers of multimedia PCs in a difficult position. Users who care about 3D performance will insist on the latest chip technology, but OEMs can't expect these users to pay more for their systems. The sweet spot of the market remains about $1,500, and while system vendors can play games of their own to yield slight increases in average selling price, higher prices will continue to translate to lower sales volume.

Because of these factors, we expect graphics subsystems to account for an increased fraction of the total build cost of multimedia PCs in 2H97, often at the expense of the central processor. These effects will be felt across the full range of the market. Today's low-end machines typically include inexpensive 2D graphics chips like S3's Trio64. With 1M to 2M of inexpensive EDO DRAM, these parts cost OEMs only $20–$25 for the complete graphics subsystem. With S3 and other chip vendors promising to phase out their 2D product lines in favor of 3D accelerators, the low end of the market will be forced to move to more expensive solutions. The cheapest of today's 3D chips cost $25 in moderate quantities; 4M of SGRAM will add $25 to that, yielding a subsystem cost 2.5× higher than last year's model.

Some OEMs will try to stick with 2D chips and some will mismatch fast 3D chips with slow memory devices, but our advice is to yield to the inevitable. The arrival of 3D applications and benchmarks makes good 3D performance essential even for inexpensive systems. Vendors that scrimp on this part of the budget will see their consumer systems at the bottom of the lists in comparative reviews and, soon thereafter, on the clearance shelf of the local discount warehouse. Midrange systems will face similar pressures.

At the high end of the home-PC market, the demand for 3D performance will be greatest. Just as millions of systems in the early 1990s were sold solely on the basis of their Graphics WinMark scores, consumers this Christmas will use 3D WinBench as their litmus test of value. Triple-digit results will be mandatory, restricting OEMs to perhaps a half-dozen choices out of the 35+ alternatives in the 3D-chip market. These 3D accelerators typically will be purchased as add-in cards with 8M of 100-MHz SGRAM for about $120 in volume, more than twice as much as OEMs are used to paying for high-end 2D motherboard implementations.

Some system vendors will try to pinch pennies, saving the cost of an AGP add-in card and connectors in favor of motherboard implementations—but this is a bad decision. Magazine reviewers will note that such systems cannot provide an AGP expansion slot due to AGP's electrical loading limits, forever precluding any improvement in graphics performance. Users paying extra for performance will expect upgradability to be part of the bargain; most will pass by these systems, sending them to the bargain basement as well.

CPUs are the logical victim of this inside-the-PC struggle for funding. Instead of going up to the next processor speed grade, wise OEMs will spend the differential on better graphics performance and reap the rewards in the retail channel. While similar savings could be achieved by selecting a cheaper hard disk or slightly less main memory, these choices would have a more detrimental effect on benchmarks, both for 3D and general-purpose applications.

Going from one Intel speed grade to the next faster part improves performance by less than 10% but adds between $50 and $150 to the cost of the system. Applying that money to the graphics subsystem instead can double the effective performance of the 3D and multimedia applications that consumers care about, greatly increasing the desirability of the system.

Fast CPUs remain indispensable for high-end CAD applications that depend more on floating-point geometry calculations than rendering performance, but in the coming years, the addition of 3D-geometry acceleration to graphics chips will break this link between CPU and 3D performance, giving OEMs a broader choice of processors for their systems and further increasing the value, and the cost, of 3D chips. M

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