

# Intel Commoditizes 3D Graphics

*Most PC Users Have No Need for Speedy 3D; Integrated Strategy Prevails*



With the introduction of the 810E chip set (see MPR 10/6/99, p. 30), Intel has pushed integrated graphics from the low end to the mainstream of its product line, leaving discrete 3D accelerators for only the most performance-conscious users. By next spring, the majority of new PCs are likely to be using a chip set with integrated 3D graphics—most with Intel's name on them. This represents a huge change from early this year, when nearly all PCs contained a discrete 3D-graphics chip.

While integration has been a powerful force in PC design for years, this transition is unusual: in many cases, PC users will see a decrease in performance when comparing the new integrated parts with older designs. The 3D core built into Intel's 810 and 810E is competitive with the least expensive discrete 3D chips available today but behind the chips typically used in midrange PCs. The success of Intel's integrated devices indicates how few OEMs and PC buyers care about 3D performance.

Intel has helped foster this attitude in the consumer market with the creation of the Celeron brand. Intel believes that anyone buying a low-end PC cares only about megahertz, not actual performance. The success of the Celeron processor, with its slow front-side bus and lack of SSE, substantiates this belief. Buyers in this segment don't seem to care that the 810 chip set has limited 3D performance. They just like the big megahertz number on the CPU.

More sophisticated consumers are looking for good deals on Pentium III systems, which can be found for less than \$1,000. Many of these less expensive Pentium III products will be switching to the 810E in the near future. This change will drive some consumers—particularly gamers—to move up to an 820 system that will probably come with a more powerful, and more expensive, Intel processor.

Most PCs are still bought by businesses, large and small, and few business buyers are interested in 3D performance. There are still no mainstream business applications that have 3D components, and nothing seems likely to appear in the near future. Thus, most business buyers are happy with "checkbox" 3D—as long as the PC has a 3D accelerator, they're happy. For these businesses, the 810 and 810E fit the bill, and carry the Intel brand to boot.

Some business PC buyers have a bit more foresight. Seeking a four-year lifetime for their PCs, they don't want to ignore an area such as 3D performance that could become critical during that period. In addition, the incremental cost

of a more powerful system is a small fraction of the total cost of ownership (TCO) during that system's life. These buyers will be well served by seeking out 820-based systems with moderately priced but powerful 3D accelerators available from a variety of chip makers.

Intel's integration strategy leaves these 3D chip makers to compete in a shrinking market for discrete graphics accelerators. Naturally, the biggest impact has been on market leaders ATI and S3, which have been the vendors of choice for low-cost and midrange 3D chips. These are the very sockets being eliminated by the 810 and 810E. As a result, Intel is likely to become the leading vendor of 3D-graphics accelerators within the next few months.

Intel's flank attack exposes a key fallacy of the 3D market: that performance is the most important factor. Sure, there are a bunch of gamers and a few professional users who care, but without mainstream 3D applications, most PC makers aren't putting a priority on 3D performance. When several vendors offer chips with similar features, OEMs will naturally choose ones with the best performance in their price class. But by integrating 3D into the chip set, Intel has sidestepped this comparison and reduced system cost.

Over time, emerging applications will increase mainstream interest in 3D performance. (Indeed, Intel itself is promoting some of these applications, hoping to boost sales of its high-end CPUs.) Intel must be careful that its brand name does not become associated with inadequate 3D performance. It's quite possible, however, that emerging applications will be satisfied by whatever level of commodity 3D Intel can deliver at the time, making moot any competitive performance issues.

Other 3D vendors must figure out how to compete in this new world. Creating their own integrated chip sets, as Nvidia has done (see MPR 10/6/99, p. 5) and S3 is doing, is the obvious approach, but these vendors will find it difficult to displace the 810 family, given Intel's entrenched position in the chip-set market. The high-end 3D market remains viable and active, but Intel's integration strategy has quickly halved the available market for third-party 3D chips.

If this trend continues, the discrete 3D chip will go the way of the math coprocessor. A high-end niche will remain for quite some time, but to be successful, 3D chip makers must counter Intel's inevitable integration efforts.