Intel Drops Pentium II to $268

With Christmas just past, Intel was in a giving mood, dropping the list prices of its Pentium II products today by about 30% and those of its Pentium/MMX chips by as much as 40% (see MPR 1/26/98, p. 31). Notebook users got the biggest gift, with across-the-board price cuts averaging 45% on Intel's mobile processors. Intel even extended unusual generosity by making its Pentium II-233 price cut effective on 12/28, four weeks earlier than for the rest of its products.

These changes bring the price of the Pentium II-233 down to $268, moving the former high-end chip close to the sweet spot of Intel's line. At this price, we expect Pentium II unit volume will exceed Pentium shipments in the next quarter; by 2H98, Pentium II will dominate (see MPR 1/26/98, p. 1). The high end of the Pentium II line is the new 333-MHz version (see MPR 1/26/98, p. 7), priced at $722.

With Pentium II reaching the mainstream, the fastest Pentium/MMX chip has dropped to $193, with the 166-MHz part reaching $95. These MMX chips are now cheap enough for sub-$1,000 PCs, as evidenced by HP's $799 Pavilion 3260. Intel is no longer selling the classic (non-MMX) Pentium except into embedded applications.

The entry-level product for notebooks is now the 150-MHz Pentium/MMX, at a list price of $106. The drastic cuts in mobile prices bring the 200-MHz Pentium/MMX (Tillamook) down to $230, and even the 266-MHz Tillamook (see MPR 1/26/98, p. 8) now lists for $466, dropping 29% just a few weeks after its announcement. This pricing leaves room for the forthcoming Mobile Deschutes, expected to appear in the next couple of months at prices of $500 to $750.

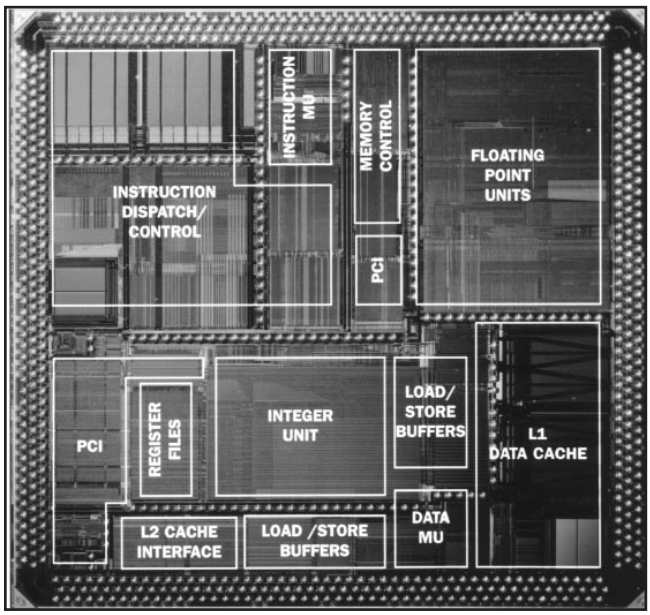

Figure 1. UltraSparc-2i measures 150 mm^2 in Texas Instruments' 0.29-micron five-layer-metal CMOS process.

The deeper-than-usual price cuts are not due to charity, of course. With AMD and Cyrix gearing up for high production of Socket 7 parts in 1998, Intel wants to move its product line away from Socket 7 as quickly as possible; thus, the emphasis on Pentium II. Intel's huge cuts in its mobile prices come just as AMD begins shipping its first mobile K6 chips (see MPR 1/26/98, p. 10). Intel is also benefiting from a fast ramp of its 0.25-micron process, enabling higher volumes of its faster chips. The fierce competition and Intel's production ramp will both continue throughout the year, setting the stage for more price slashing in the coming quarters. —*L.G.*

Low-Cost UltraSparc-2i Appears

Sun has announced volume availability of systems based on UltraSparc-2i (see MPR 10/7/96, p. 1), a highly integrated derivative of UltraSparc-2. Sun Microelectronics (SME) will also sell US-2i both as a standalone processor and on a module with 512K of external cache. The new chip is built in the same 0.29-micron process as UltraSparc-2 and, like that device, runs at 300 MHz. The cost savings come from the integrated DRAM, UPA bus, and PCI bus interfaces. These new features consume about 16% of the 150-mm^2 die, as Figure 1 shows.

At the same clock speed, UltraSparc-2i delivers nearly the same integer performance as US-2 but much lower floating-point performance. On SPECint95 (base), the new chip achieves a score of 9.5, just 9% less than its predecessor. The difference is due mainly to a smaller L2 cache (512K versus 2M) and lower main-memory bandwidth. These changes have a greater impact on SPECfp95, where US-2i's score of 12.1 is 30% lower than that of UltraSparc-2. The new chip also lacks the multiprocessor capabilities of its predecessor, making it suited only to low-cost uniprocessor workstations.

SME is selling the 300-MHz UltraSparc-2i for $470 in quantities of 1,000, or $890 in the module with 512K of cache. Intel's 266-MHz Pentium II offers similar SPECint95 performance and sells for just $375 with 512K of cache. The Sun chip, however, offers 50% better SPECfp95 performance. It also includes the integrated system interfaces, although comparable system logic for Pentium II can be found for less than $50.

Sun's new "Darwin" workstations take advantage of UltraSparc-2i to greatly improve performance at the low end. The Ultra 5 system, using a 270-MHz CPU, carries a list price of $3,895 with 64M of DRAM, a 4G hard drive, three PCI slots, and a 17-inch color monitor. The Ultra 10 minitower, with a 300-MHz processor and one extra PCI slot, lists for $6,495 in the same configuration. These prices include a graphics chip, the now-obsolete PCI-based Rage II+ from ATI, that delivers far less performance than AGP-based PC graphics chips from ATI and others. The systems accept standard PCI cards but require Solaris drivers.

These new systems should help Sun slow its losses in workstation sales to low-cost Pentium II/Windows NT systems from Compaq and others. The Sun workstations run only Solaris, which is appealing to Sun's installed base but not to new customers seeking a cross-platform solution like NT. In addition, the Pentium II systems will be moving up to 400 MHz and beyond over the course of this year, putting pressure on Sun to quickly boost the speed of its own chips. —*L.G.*

ATI's New Rage IIC Fits In Rage Pro Footprint

Expanding its line of pin-compatible graphics controllers, ATI *(www.atitech.com)* introduced the Rage IIC AGP. The new chip provides all the features of ATI's current Rage II+ but adds better 2D and 3D performance, power management, and improved testability. The new device uses the same 256-contact BGA package as the company's current high-end Rage Pro AGP 2X as well as the Rage Pro AGP 1X, which can also be used for PCI-bus applications.

The Rage IIC is also available in a 208-pin PQFP PCI version compatible with the earlier Rage and ATI-264VT products. Users of the latter chip can also upgrade to the new ATI-264VT4, which also fits in the same 208-pin package. The VT4 offers 2D graphics and motion-video acceleration.

ATI has priced the Rage IIC AGP at $20 in 10,000-unit quantities; the Rage IIC PCI version lists for $15, while the less-capable ATI-264VT costs less in the same quantities.

By offering motherboard OEMs three chips with the same footprint, ATI facilitates product differentiation without imposing additional board-design costs. This should help the company extend its claimed lead in shipments of AGP graphics chips, though most of these chips have gone into ATI's own add-in cards. —*P.N.G.*

Intel Buys Into Real3D, Closes C&T Deal

The Real3D group of Lockheed Martin, Intel's partner in the development of the i740 graphics chip, has been spun off into a separate company. Lockheed Martin will retain an 80% ownership of the new venture—currently about 180 employees and valued at about $200 million—while Intel has taken a 20% interest and a nonvoting seat on Real3D's board.

Real3D got its start as a unit of GE Aerospace, developing graphics technology for military-combat and space-flight simulators. More than 40 3D patents owned by Lockheed Martin have been transferred to the new company, giving it an advantage over some of its competitors in the 3D market. Intel has a royalty-bearing license to Real3D's patent portfolio, allowing it to share that advantage.

In addition to its work with Intel, Real3D *(www.real3D.com)* is developing arcade-game products for Sega. The company also has its own line of 3D-graphics chips, boards, and subsystems for vertical markets such as CAD and visual simulation. The new spinoff plans to open an office in San Jose (Calif.) to support product development, marketing, and sales efforts.

Real3D is currently working with Chips & Technologies to develop a 2D/3D/video chip for the notebook market. This chip, the 65570, is scheduled to debut in 1998.

Intel's effort to acquire Chips & Technologies (see MPR 8/25/97, p. 4), long delayed by the U.S. Federal Trade Commission, has finally been completed. Earlier this month, the FTC announced it would not block the deal, but the agency left open the door for including issues related to the acquisition in its broader ongoing investigation into Intel's business practices (see MPR 12/29/97, p. 3). —*P.N.G.*

RISC System Growth Stalls

The total revenue from RISC system sales grew only 1% in 1997, according to industry analyst Andrew Allison *(www.aallison.com)*. Revenue from both RISC workstations and Macintosh systems declined significantly over the past year, offsetting gains in sales of RISC servers. RISC workstations are under heavy attack from x86-based Windows NT workstations, particularly at the low end. Growth in the Internet, however, has spurred interest in high-end servers, where the x86/NT combination is weak.

As the table below shows, share among the RISC processor architectures stayed nearly constant, as the system vendors sold mainly to their existing customers. After years of torrid growth (due mostly to VAX replacements), Alpha sales have leveled off, leaving that architecture stuck in fifth place. PowerPC lost a small amount of share due to declining Macintosh revenues, while SPARC gained the most share due to Sun's strong server sales. RISC architectures other than the top five have essentially disappeared from the market.

	1997		1996		Annual Growth
	Share	Revenue	Share	Revenue	
1) PA-RISC	30%	$15.5 B	30%	$15.3 B	+1%
2) PowerPC*	26%	$13.4 B	27%	$14.1 B	–5%
3) SPARC	19%	$10.2 B	17%	$8.8 B	+16%
4) MIPS	16%	$8.4 B	16%	$8.2 B	+2%
5) Alpha	9%	$4.8 B	9%	$4.6 B	+5%
6) Other**	0%	$0.0 B	1%	$0.6 B	–100%
	100%	**$52.3 B**	**100%**	**$51.7 B**	**+1%**

*includes POWER **includes i860, 88K, and others

With all the major RISC workstation vendors except Sun also offering Intel-based workstations, the erosion of RISC sales is likely to continue in 1998. RISC servers may continue to be a high point, but later this year these systems will face tougher competition: eight-processor NT systems using 400-MHz "Slot 2" Pentium II modules with a 100-MHz bus. Sun's sole focus on RISC may give it a short-term boost in RISC market share, but this myopia could cause the company's overall sales to falter in the long run. —*L.G.*

Erratum: Acer Aladdin V

Our last issue (see MPR 12/26/97, p. 4) incorrectly specified the memory-bus speed of Acer Labs' Aladdin V chip set. The chip set runs the memory bus at the same speed as the CPU bus, up to a maximum of 100 MHz. M