

MOST SIGNIFICANT BITS

■ Intel, TI Enter 3D Graphics Market

Affirming that 3D graphics will be an essential part of future PCs, semiconductor giants Intel and Texas Instruments have both formed separate alliances to enter that market. Intel will work with a division of defense contractor Lockheed-Martin to adapt its 3D graphics technology, born in flight simulators, to PCs. TI has reached a long-term licensing agreement with 3Dlabs for the development of 3D products.

Under their agreement, Intel and Martin will jointly develop, market, and sell the upcoming 3D graphics chip. Intel brings its manufacturing capability and PC system knowledge, while Martin supplies its advanced 3D architecture. To form a complete solution, the chip will also incorporate 2D graphics and video acceleration using a design licensed from Chips and Technologies. For high bandwidth, the chip will use Intel's new advanced graphics port (*see 1005MSB.PDF*). The new device, targeted at P6 systems, is expected to appear in 2H97.

These two partnerships are likely to have a great impact on today's fragmented 3D graphics market, which consists mainly of small 3D-focused companies and midsized 2D graphics vendors without fabs. TI is known as a low-cost manufacturer, and Intel's leadership in the motherboard and chip-set areas guarantees a 20–30% market share for its future graphics products. Ultimately, Intel is likely to build 3D graphics right into the system logic. This is bad news for competitors in the 3D market but good news for consumers, who are likely to see prices drop and standards develop more quickly with TI and Intel in the 3D market.

■ Amdahl Picks Pentium Pro

Mainframe-maker Amdahl is entering a new line of business: servers for the Windows NT market. The company plans to bring mainframe features to the NT space, helping integrate NT systems with the corporate mainframe. To accomplish this, the company selected Pentium Pro processors over RISC-based NT engines.

The vast majority of Amdahl's current revenue comes from its System 390-compatible mainframe systems and associated service contracts. The company also resells large SPARC servers for corporate clients that desire a Unix environment. With the emergence of NT as a major player in many corporations, Amdahl wants to be a part of that market as well.

Instead of simply reselling systems, the company has developed its own platforms based on commodity technology. This strategy reduces the development work that would have been required with a RISC platform while offering superior price/performance. The new Envista servers use Intel's Alder motherboard (*see 091501.PDF*), which supports up to four Pentium Pro processors. Up to 32 processors can be connected in clusters of four, with the clusters connected

by a relatively slow but inexpensive 100-Mbps Ethernet link. For high availability, cluster systems can use ISIS software for hot failover.

Envista uses standard PCI peripheral cards for graphics and networking. Amdahl developed a PCI adapter card for ESCON, a common mainframe interconnect. The card, with associated software, allows data to be transferred easily from a mainframe to the NT server for use by many clients. The company also added features for remote management and serviceability, features included on its mainframes.

Most NT vendors have focused on low-cost servers, leaving Amdahl little competition in providing high-end NT servers. Other key selling points are Amdahl's integration skills as well as 24-hour service and support, which most NT system vendors don't offer.

In adopting Pentium Pro for its systems, Amdahl also partnered with Intel for the development of its future 64-bit processors such as Merced. Although the companies would not discuss this alliance in detail, Intel may make some minor changes to Merced to improve System 390 emulation and/or high-reliability computing.

The mainframe vendor sees its new systems not as mainframe replacements but as bridges between the mainframe and low-cost servers. Although Amdahl believes the mainframe market is still strong, overall market revenues have been flat, and many market watchers expect a downturn. The NT market, however, is growing rapidly. With its new systems, Amdahl is positioned to survive even if the mainframe market contracts.

■ PowerPC 823 Focuses on Digital Cameras

Motorola has expanded its peripheral-rich set of embedded PowerPC microprocessors with the MPC823, a new chip aimed at digital still cameras and other imaging applications. At about \$35 in high volume, the 823 is one of the least expensive PowerPC chips, yet it provides competitive performance on both integer code and signal-processing tasks. Volume production is expected to begin in 2Q97.

The new 823 is nearly identical with the 821 (*see 091202.PDF*) but comes with a 24-bit color LCD controller, whereas the 821 can handle only monochrome or 4-bit passive color. In exchange for the color LCD, the 823 gives up some cache and TLB capacity, a pair of DMA channels and timers, a serial channel, and about \$35 in price.

Like the 821, the 823 includes Motorola's communications processor module (CPM), an autonomous 32-bit communications processor similar to those in the 68360 and the PowerPC 860. The CPM on the 821 and 823 chips has been upgraded with a 32-bit MAC (multiply-accumulate) unit to assist with V.32 and V.34 modem protocols. The CPM also manages a bevy of serial ports, including one that is Ethernet-capable. Depending upon the intended applica-

tions, the CPM may actually be more valuable to customers than the chip's PowerPC heart.

At 50 MHz, that heart pumps out over 60 Dhrystone MIPS in Motorola's simulations. The chip requires split supplies for the CPU core (2.0 V) and the peripheral logic (3.3 V), which keeps power consumption down to about 200 mW at 25 MHz, according to the company.

The digital-imaging market is one that has recently captured the imagination of a number of vendors. Fujitsu's 86933H SparcLite chip gained an early toehold here, driving the moderately priced Epson PhotoPC digital camera. Intel has also expressed its intent to tailor the 960 for imaging applications. With PCs and consumer electronics all converging on digital image storage and transmission standards, processor prospects in imaging look bright.

■ Hyundai Adds SPARC to DVD Controller

Hyundai Digital Media has sprung another SPARC-based microcontroller onto the consumer-electronics market with a new chip designed for DVD (digital video disk) decoding and playback. The new HDM8111P is built around the company's previously announced 8211 MPEG-2 decoder chip (see [0905MSB.PDF](#)), which is also SPARC-based. Hyundai hopes to ignite demand for DVD in home entertainment systems and set-top boxes by merging nearly all the necessary functions into a single device.

The 8111P handles all the audio and video decompression and synchronization tasks required of a DVD player, including MPEG-1 and -2 video (main level, main profile), two-channel audio, Dolby AC-3 audio, video synchronization, and a 16-color graphics overlay for menus and logos. A complete subsystem requires a simple microcontroller, 2M of DRAM, an audio DAC, and an NTSC/PAL video converter. Hyundai figures the 8111P can replace up to four logic chips in current DVD designs.

The 5-V part consumes about 1.5 W, making it cool enough for use without a fan. Samples will be available in June; Hyundai expects production to begin in 4Q96, with pricing around \$45. The company has arranged alliances with a number of set-top and potential DVD manufacturers, although none of the relationships is public. Such alliances will be necessary for Hyundai to make its way in the fiercely competitive battles for the world's living rooms.

■ S3 Targets Business PCs with Trio64V2

The leading vendor of desktop graphics accelerators, S3, will next week launch the newest member of its Trio64 family. The Trio64V2 graphics and multimedia accelerator builds on the popular Trio64V+ with several new features, including better memory-bandwidth management, faster memory access, and faster memory clocking.

Instead of the more common 135-MHz RAMDAC, the Trio64V2 integrates a 170-MHz RAMDAC. This enables the new chip to support faster refresh rates and higher resolutions. The accelerator provides up to $1280 \times 1024 \times 16$ -bit

Peter Christy Joins MDR

I am pleased to announce that Peter Christy has joined MicroDesign Resources, publisher of *Microprocessor Report*, as president. Peter most recently was the senior director of developer products at Apple Computer; his more than 25 years of prior experience includes technical management roles at Sun, Rolm, Hewlett-Packard, and Digital. He was also a cofounder of MasPar.



I founded MicroDesign Resources in 1987 to launch *Microprocessor Report*. Since that time, the company has grown to 22 employees, with a product line that includes two major industry conferences each year, the Technology Roadmap PC technology analysis service, Technical Library reports, consulting services, and on-site seminars. Along the way, I sold the company to Ziff-Davis (in 1992) but have continued to run it as an independent subsidiary. We are continuing to expand our offerings, especially in the area of personal computer technology analysis, and will—like any self-respecting company these days—be providing more and more information via the Web.

All this growth has been gratifying, but it has also been very demanding. Managing the company is a full-time job—as are my other jobs of editorial director, conference organizer, analyst, consultant, and lecturer. I have chosen to relinquish the position of president so I can focus on the areas where I can make the biggest contribution (and have the most fun)—on the content side.

Peter is responsible for the company's operations, planning, finance, marketing, and product development. He will be spending time with many of our customers, helping us better understand how we can serve them best. His deep knowledge of the computer industry and close contact with its technology leaders will be invaluable in driving MDR's growth.

I will concentrate my time on writing for *Microprocessor Report* and Technology Roadmap, presenting seminars, and developing our Web presence. I look forward to the increased focus I will be able to bring to my continuing roles as editorial director for all the company's products, director of the conference programs, and publisher of *Microprocessor Report*.

Please join me in welcoming Peter to the MDR team. You can reach him via e-mail at pchristy@mdr.zd.com or by phone at 415.917.3050.

resolution at 85 Hz, which is important for a high degree of interactivity and fast system response times.

S3 realizes the Internet, as well as corporate intranets, will soon provide a great opportunity for graphics and multimedia vendors. We believe the Trio64V2's feature set gives it an edge in the business PC market. Besides just raw performance, the new chip supports color and chroma keying, arithmetic blending with on-the-fly stretching, blending of video streams, improved secondary stream decimation and contrast, horizontal and vertical interpolation, and saturation and brightness controls. It also supports hardware double buffering for seamless and tear-free video playback. This combination of features will assist business applications such as desktop videoconferencing, intracompany video broadcasts, groupware, publishing, and video on demand.

The Trio64V2 comes in two versions: one supports EDO DRAM as its frame buffer and the other supports SDRAM and SGRAM for improved performance. Both are software compatible with the Trio64V+, while the EDO version is also pin-compatible with the older chip. This compatibility enables a no-cost system upgrade for Trio64V+ customers.

Samples of the Trio64V2 are available now in a 208-pin PQFP, with production shipments planned for 3Q96. The EDO-based Trio64V2 is priced at \$25 in 10,000-unit lots, while the SDRAM/SGRAM version carries a \$3 premium.

■ PicoPower Improves Docking Chip Set

PicoPower, recently sold by Cirrus Logic to National Semiconductor, plans to announce SmartDock-II in the third quarter. The new chip set will add PCI 2.1 compliance, burst support, concurrency, and multilevel bridging to PicoPower's previous SmartDock chip set (see [0911MSB.PDF](#)), also known as Vesuvius (the system controller) and Nile (the dock chip).

The SmartDock products take a different approach than Intel's 380 Dock Set (see [1005MSB.PDF](#)). Intel's approach puts the PCI-to-PCI bridge, plus isolation logic, into the notebook itself, simplifying and lowering the cost of the dock. A SmartDock notebook includes only the system controller chip. The primary PCI bus is brought out to the docking connector, and the dock includes the PCI-to-PCI bridge. This design allows OEMs to ship the notebook before the dock chip is ready and minimizes cost to end users who buy the notebook but not a dock.

Unlike the 380, SmartDock and SmartDock-II also support a transparent bridge mode that eliminates the need for BIOS enumeration of secondary PCI buses. The OEM can choose to make all the PCI peripherals in the dock appear logically on the primary PCI bus, which simplifies reconfiguration at docking time.

Contrary to our earlier report, PicoPower has been shipping its original SmartDock chip set for a few months, but to date, no shipping docks use the Nile chip. Nile-based docks should emerge shortly, followed by upgraded SmartDock-II systems by the end of the year.

■ Motorola DSPs Reach Low Voltages

Motorola has spun off yet another version of its burgeoning 56000 DSP product lineup, this time with a low-voltage family intended for cellular phones and personal communicators. The 56602, the first member of the company's new 56600 family, shares the same 24-bit instruction words as the 56300 family (see [091605.PDF](#)) but with a narrower 16-bit internal data path.

The new family is characterized for lower voltages than its predecessor, from a high of 3.3 V to a low of 1.8 V. At the higher voltage, the chip runs at 60 MHz; Motorola has not yet characterized the '602 at 1.8 V but expects it to reach 30–35 MHz. Static operation is also supported.

Architecturally, the new 56600 family is no different from the 56300 chips, apart from its 16-bit registers and data path. The two families are binary compatible and are even pin-compatible within the same package style. Because the 56300 chips are rated for 3.3 V and above while the 56602 is designed for 3.3 V and below, designers can swap between families, trading off power consumption and price for 24-bit precision and higher clock rates.

Motorola expects volume production of the 56602 in 3Q96 and will list the part at \$24.50 in high volume. With 48K of ROM and 8K of RAM, the chip is competitively priced, and its tolerance for low voltage should make vendors of handheld equipment happy.

■ IBM Reveals High-Speed SiGe Technology

IBM Microelectronics has developed a new IC manufacturing process that provides a 200–300% increase in transistor speed with a minimal rise in production cost. The advance involves adding small amounts of germanium (Ge) to the base region of a bipolar transistor. IBM has prototyped hundreds of wafers using an SiGe version of its 0.35-micron CMOS-5X process and claims it is ready for volume production. The germanium is implanted using standard techniques, adding only a few extra process steps.

To date, IBM has used the SiGe process to build only small analog circuits, for which the fast transistors are ideal. For example, the company developed a 12-bit DAC that operates at 1 GHz, well beyond the speed of commercially available parts. SiGe can also reduce the power of bipolar circuits running at "normal" speed. No SiGe products have been announced, but IBM has partnered with Hughes Electronics to develop and market such analog components.

The new technique is not as useful for large digital components such as microprocessors, because it improves only bipolar transistors, not the FETs used in CMOS devices. SiGe transistors could be used to extend the life of BiCMOS design, which most vendors have turned away from due to the minimal gains for bipolar devices at geometries below 0.35 microns. IBM Microelectronics has no immediate plans to develop SiGe microprocessors, but the new technology could allow faster, less power hungry versions of current bipolar components. ■