Most Significant Bits

MicroSparc-2 Moves to 100 MHz

Sun Technology Business (STB) has announced sampling of MicroSparc-2 (MS-2) chips at 85 and 100 MHz. The low-end SPARC processor was initially announced at 70 MHz *(see 071501.PDF)*, but yields have improved to allow for higher frequencies using the same 0.5-micron CMOS process. The 85-MHz version is set for production in 2Q94, while the faster part will not be shipping until after midyear. The 100-MHz MS-2 will deliver around 70 SPECint92 and 61 SPECfp92; the 85-MHz part is about 15% slower.

STB did not give pricing for either of these chips but did announce that a 70-MHz MS-2 chip set will sell for $540 in 5,000-unit lots. This price includes the 89C100 and 89C105 I/O chips *(see 061403.PDF)*; since MS-2 includes a DRAM controller and an SBus interface, the resulting chip set provides all the basic functions of a SPARC workstation. In contrast, a 50-MHz PowerPC 601 delivers similar performance for about $270 but requires a $73 PCI/ISA chip set and about $50 in peripheral chips to match the features of Sun's chip set.

Sun's hardware arm (SMCC) will use MS-2 in new SparcStation 5 systems, starting at $3,995 for a fully configured 70-MHz system. These systems will provide a nice performance boost to the anemic Sparc Classic but cost about 50% more than a similarly configured 60-MHz Pentium box, which has about the same performance. SMCC also announced workstations using a 60-MHz SuperSparc chip, indicating that TI has finally solved its production problems with this processor, which was announced last summer *(see 0709MSB.PDF)*.

STB also released new support chips and design kits, greatly expanding its offerings. Of particular interest is a chip set for low-cost MicroSparc (or MS-2) notebooks that includes an LCD panel controller, a power-management chip, and an SBus-to-PCMCIA chip. STB, the newest "planet" in Sun's corporate system, says it has seen a sharp increase in SPARC clone shipments as a result of its efforts.

Finally, the company said that SuperSparc-2 is on schedule for a 3Q94 debut and increased estimates for its SPECint92 performance to 135. The next-generation UltraSparc design *(see 070404.PDF)*, due in 1Q95, has an impressive new performance goal of 270 SPECint92, although its SPECfp92 has been cut back to 310. If UltraSparc meets its goals, it will put SPARC among the performance leaders for the first time this decade.

Canon Taps PowerPC via PowerHouse

The PowerPC platform has picked up a major new backer in Canon, a long-time player in desktop systems that is better known for its printer line. Canon's participation with PowerPC will be assisted by a small, wholly owned subsidiary, appropriately named PowerHouse, headquartered in Silicon Valley. Canon plans to market a line of systems based on the Prep specification *(see 071704.PDF)*. Although Prep products are capable of running a variety of operating systems, Canon reportedly will focus on Windows NT.

PowerHouse was formed shortly after Next Computer decided to abandon its system hardware business. A design team at Next had already developed a PowerPC prototype system before being laid off, and many of these designers joined PowerHouse to continue this effort. The new company went to Canon, a major investor in Next, for backing, which enabled it to use the designs developed at Next. Canon has provided all funding to date, but PowerHouse may seek additional investors in time.

PowerHouse said that its designs will be available in 1Q95, six to nine months after the first Prep systems are expected to roll out from IBM. The systems, which will be marketed by Canon and possibly other OEMs, will be priced from $3,000 to $6,000 and include single- and dual-processor systems based on the PowerPC 601, 603, and 604 chips. Additional details will be announced later this year.

Canon, while not a top-tier PC vendor, adds marketing weight to the PowerPC alliance and gives it a Far East presence. By tapping a group of experienced and entrepreneurial designers, Canon has accelerated its ability to bring products to market. The announcement emphasizes the divisions among PowerPC vendors: Apple *(see 080401.PDF)* pushes its own System 7, but IBM plans to promote its Workplace OS (running OS/2) while Canon sells systems with Microsoft's Windows NT. Splintering the PowerPC base among three operating systems will make it more difficult for any one of them to attract enough software to challenge the dominant Windows/x86 platform.

Orion Matches R4400 Performance

As expected, IDT has announced availability of a 133-MHz version of its R4600 "Orion" processor *(see 0714MSB.PDF)*. The company rates the new chip at 92 SPECint92 and 82 SPECfp92, about the same as the fastest R4400 workstation. With a 1,000-piece price of $460, the 133-MHz chip is about half the price of a 150-MHz R4400. IDT is sampling the fast R4600 now and expects it to be in volume production in April.

The company also offers the R4600 in a 100-MHz speed grade, priced at $300 in the same quantity. This version, rated at 74 SPECint92 and 63 SPECfp92, is in production now. Toshiba also markets both versions of the R4600.

The speed increase is achieved using the same IC process as the original chip; characterization revealed additional headroom in the design. The performance numbers show the superiority of a fast, simple pipeline over the complexity of the superpipelined R4400. The low price, made possible by Orion's 486-like die size, obsoletes the R4400SC for all but the highest-end designs, which will move to the forthcoming 200-MHz R4400. Ultimately, MIPS Technologies will establish a new high end with its T5 processor, due at the end of the year.

The R4600 also stacks up well against Pentium for Windows NT systems, offering performance equivalent to that of the 90-MHz P54C at about half the price.

Intel Matches AMD's 486SX2…

Within a few weeks of AMD's announcement of a 50-MHz 486SX2, Intel has quietly matched that announcement with a similar chip. Intel's version, available immediately, is priced at $189 in 1,000-unit quantities, 15% higher than AMD's $165 price *(see 0803MSB.PDF)*. Although Intel has been forcing customers to move to the 486DX line to reach 50 MHz and beyond, this announcement shows that the company will not tolerate a competitor exploiting this strategy to offer a differentiated product. AMD's recent court victory *(see 080402.PDF)* gives it the right to compete with Intel, but to be successful in this competition, AMD must offer unique products—a task that Intel will make as difficult as possible.

…and Reveals Low-Power 486 Plans

At the recent Mobile94 conference, Intel VP Mike Aymar revealed that the company will announce, late this year or early next year, a very low power 486 chip that is now in development at Intel's Japanese design center. Presumably using dynamic power-control techniques similar to those that have dramatically cut the typical power consumption of the P54C *(see 080301.PDF)*, the new 486 chip will consume only a few hundred milliwatts at 33 MHz, according to Aymar.

Aymar also conceded that 486 performance will probably be required to provide the responsiveness users expect in a handheld computer—a mobile companion, in Intel's lingo. The future low-power 486 would be a perfect mate for the Draco chip set in development at VLSI Technology. This two-chip set is the 486-based follow-on to the 386-based Polar design *(see 071302.PDF)*; Draco will require a separate 486 processor rather than integrating a 486 core.

Apple Improves Newton, Drops Price

Responding to criticism of its initial Newton Message-Pad, Apple has announced that Newton will offer improved handwriting recognition, better desktop connectivity, extended battery life, and a lower price—all without changing the basic hardware design. The new MessagePad 100 is physically identical to the original $699 Newton but contains new software and costs $499. The Model 110 has a new mechanical design as well and uses AA batteries to extend the battery life fivefold over the Model 100; it is priced at $599. The 110 also increases the on-board RAM to 1M from 640K.

The new software includes a "letter-by-letter" mode that will recognize names and other words not in the internal dictionary, making it easier to write new words. Apple also updated its Connection Kit to copy data to and from standard desktop calendars and databases into the Newton, simplifying the task of synchronizing a large amount of information, such as names and phone numbers, between a PC (or a Macintosh) and a Newton.

The new devices continue to use the 20-MHz ARM-610 CPU at 5 V. Gaston Bastiaens, head of the Newton division, says that Apple does not plan to move to 3.3 V until it combines an ARM710 CPU with a Cirrus chip set *(see 0705MSB.PDF)*, around 1Q95. The company does not plan to deploy the faster ARM710 before then despite its imminent availability, possibly because it would require modifications to the existing system-logic chip.

Although the Newton has not been a big hit in the consumer market, Apple sees major sales in vertical applications, particularly among mobile professionals such as doctors and salespeople. Specialized software for these markets uses little or no handwriting recognition, relying on customized lists of terms and simple numerical input. The company has sold 80,000 devices in five months, many seeding development of these applications. Success in the consumer market may take longer to achieve.

More System Makers Reveal PDA Plans

NEC, Olivetti, Sharp, and Zenith Data Systems recently announced plans to build WinPad devices, joining previously announced licensees Compaq, Toshiba, and Motorola. Although Compaq has slipped its planned introduction date from this summer to early '95, Microsoft says that it will ship the software in the second half of this year; thus, Compaq may no longer be the first to ship a WinPad device.

In separate announcements, Toshiba revealed that it has obtained licenses for both Apple's Newton technology and General Magic's PDA technology. The Japanese vendor had already licensed Eo's PenPoint and Microsoft's WinPad, but with the demise of PenPoint *(see 0803MSB.PDF)* and WinPad's schedule slip, Toshiba apparently wants to keeps its PDA options open so it can quickly deliver whichever design becomes popular. The company announced no specific product plans but is rumored to be developing a Newton device that could ship as early as 4Q94.

General Magic picked up another licensee in Fujitsu, one of the few computer makers that hadn't yet signed up for a PDA design. This pair of announcements

brings the number of General Magic licensees to eight, although only Motorola has announced a product based on Magic Cap *(see 080404.PDF)*. With the collapse of the Hobbit/PenPoint platform, the other three major PDA contenders all are picking up momentum.

Winbond Samples Low-Cost MPEG Decoder
Taiwanese chip vendor Winbond announced that it is sampling its first MPEG decoder chip, the W9920, which decodes an MPEG-1 video stream with a single chip. The company will sell samples at $40 and volume shipments, expected in 2Q94, for just $25 in 1,000-unit orders. This price sets a new low for a chip of this type.

The W9920 incorporates an ISA bus interface, further reducing cost when it is used in a standard PC system. MPEG-1 is becoming popular for video stored on CD-ROM and displayed on multimedia PCs, and the Winbond chip can be used to build an inexpensive add-in card that performs real-time decoding. The chip requires 512K of external DRAM to calculate and display SIF resolution (352 ×240) images.

Winbond built the W9920 around a proprietary 32-bit RISC core (not using the PA-RISC architecture that the company has licensed from HP), adding several special function units for accelerating inverse discrete cosine transformations (IDCTs), variable-length decoding, dequantization, and other special calculations used by the MPEG algorithms. An on-board ROM holds the RISC instructions for the MPEG-1 decoding function.

Because of the flexible design of the W9920, Winbond expects to bring future variations of this product to market quickly, including support for audio, MPEG-2, and video compression. Given the aggressive pricing of the initial design, the company should do well with this product. Winbond is working closely with many Taiwanese board vendors, which produce large numbers of PC add-in cards, and its geographic ties bode well for gaining design wins in this area.

Intel Unveils Second-Generation PCI Chip Sets
Intel has announced a trio of new PCI system-logic chip sets to support its P54C and DX4 processors and to move PCI into entry-level 486DX2 and DX4 systems. The company also announced a PCI-to-PCMCIA interface chip but did not introduce a PCI chip set designed for portables. The new chip sets promise to broaden the use of PCI; bugs in Intel's original PCI chip sets, which Intel says have now been corrected, considerably delayed the emergence of the first PCI systems.

The 82430NX "Neptune" chip set enhances the "Mercury" chip set used in today's Pentium PCI systems *(see 070403.PDF)* to support the new 3.3-V Pentium. The PCI/ISA chip set is priced at $80.30, and the EISA version costs $107.25. The 82420ZX "Saturn II" chip set improves upon Intel's original "Saturn" chip set *(see 061602.PDF)* for high-end 486 systems and is priced at $38.50. All prices are in quantities of 10,000, and all these chip sets are in production now.

The 82420EX "Aries" chip set, consisting of only two chips, aims to bring PCI to entry-level systems. The Aries chip set does not allow the PCI and host buses to run concurrently, and it has fewer FIFO buffers between buses, resulting in 3–5% lower performance than Saturn II, according to Intel's benchmarks. Samples are available now, with production planned for the second quarter; pricing is $25.20 in quantities of 10,000. ♦