

Most Significant Bits

Cyrix Builds Scalar M1 for Notebooks

Even as the company is testing the first silicon of its Pentium-class M1 processor (*see 081601.PDF*), Cyrix has taped out the first derivative of that design. The new chip—alternatively known as the M9, M1 SC, or Chili—is a scalar version of the M1 aimed at lower-cost applications. Because of its smaller die size, the M9 should be a more potent weapon than M1 in competing in the volume PC market during 1995. Indeed, sources at IBM Microelectronics (which, along with SGS-Thomson, will build the M1 and M9 for Cyrix) expect the M1 to be primarily a server chip during 1995, with the M9 leading the desktop challenge.

Cyrix remains officially mum on the M9, but CEO Jerry Rogers spoke about it at some length at the recent PC Outlook Conference. Rogers said that a 100-MHz M9 will outperform a 75-MHz Pentium with less than half its power consumption. He said the chip will retain the 16K cache used in the M1 and will be offered in both 32- and 64-bit pinouts. The 32-bit version, pin-compatible with a DX4, will be aimed at portables, with the 64-bit part offering a Pentium pin-compatible alternative for midrange desktop systems. The M9 is about two months behind the M1 schedule, suggesting that volume system shipments aren't likely until 4Q95.

Cyrix Makes Sweeping Legal Gains

Santa Claus came early to Cyrix, delivering two positive court rulings in the company's conflict with Intel along with a favorable settlement of its dispute with Texas Instruments (*see 071702.PDF*). TI had sued to obtain the rights to Cyrix's 486DX and M1 designs, which it claimed were included in the contract between the two vendors. Cyrix argued that, because TI did not adequately fulfill its contractual obligations to produce chips for Cyrix, TI was not entitled to receive these designs.

Apparently, TI was forced to see things from Cyrix's point of view. Under the agreement, TI will not receive rights to M1 or any derivative product. TI will retain the right to continue marketing its 486 chips that are based on Cyrix designs, although it will pay Cyrix \$15 million for past and future royalties on these chips. TI will also obtain the rights to an unspecified future 486 product on 3/1/95. Both companies will withdraw their lawsuits and have agreed to terminate the original contract.

The agreement avoids TI's worst-case scenario by allowing it to continue to sell 486 chips. The market life of these designs, however, is only another year or two. TI has a large effort under way to develop its own x86 core, which it hopes to bring to market in early 1996.

In the Intel case, the district court in Sherman, Texas ruled that IBM's patent cross-license with Intel

applies to chips produced for Cyrix, paving the way for IBM to continue serving as Cyrix's primary foundry. Intel plans to appeal the decision. The court has not yet decided whether SGS-Thomson, Cyrix's other foundry, can use its Intel patent license for chips built at its Agrate, Italy plant (*see 080202.PDF*).

Separately, a court of appeals for the federal circuit affirmed a lower court ruling that Cyrix's system customers do not infringe the '338 "Crawford" patent. Intel had attempted to block importation of systems made by Twinhead, a Taiwanese PC maker, on the basis that the system-level portions of '338 were not covered by the chip maker's license (*see 061502.PDF*).

Barring an unlikely Supreme Court appeal and victory by Intel, it appears that Intel's ill-fated attempt to enforce '338 on system makers has ended. The company has used its experience with '338 to improve more recent patents, which it is likely to try to enforce in the future. Cyrix CEO Jerry Rogers called Intel's lawsuits "just another expression of Intel's monopolistic, customer-be-damned attitude."

P24T Slips into 1995

Intel says that it will not announce the P24T upgrade for 486 systems by the end of the year, as the company previously promised (*see 081503.PDF*). Aside from the obvious problems of promoting a Pentium upgrade during the uproar about the Pentium FPU bug, technical problems with the chip appear to be lingering. A January announcement is now planned, but only for the 63-MHz version (an upgrade for 25-MHz 486 systems). The 83-MHz version (an upgrade for 33-MHz systems) won't ship until later in the year. Because the chip uses the same process as the 90-MHz Pentium, this suggests that heat dissipation issues remain troublesome.

PowerPC 603+ Set for 3Q95 Shipments

Apple has confirmed that Motorola and IBM will produce an enhanced version of the PowerPC 603 chip with 32K of cache, twice that of the current 603. This version has been referred to as the 603+, although the partners may call it simply the 603. Apple expects to receive volume shipments of the 603+ in 3Q95. Neither IBM nor Motorola would comment on the unannounced CPU.

The 603+ will be produced in a 0.5-micron CMOS process, probably CMOS-5S. This change will provide some reduction in size from the current 0.65-micron CMOS-5L process, but the increase in cache size will probably make up for the shrink, leaving the new die size about the same or even slightly larger. The new process will also boost the clock speed to about 100 MHz. The new chip could outperform a 601 at the same clock

speed. Other than the increase in cache size, no functional changes are planned. The limiting factor to the schedule appears to be Motorola's ramp for the CMOS-5S process, which it is also using for the PowerPC 620.

Despite rumors that the 603's small caches restrict emulation performance, Apple still plans to roll out 603-based Power Macintosh desktops late in 1Q95. PowerPC-based notebooks, however, have been delayed until 3Q95. Apple says that this delay is not related to the CPU, but it will allow the new PowerBooks to incorporate the 603+ rather than the 603. Apple's desktop systems will incorporate the 603+ at a later date.

Exponential to Build PowerPC Processor

Secretive startup Renaissance Semiconductor, backed by Gordon Campbell (from Chips & Technologies), has changed its name to Exponential Technology. Venture capital firm Venrock Associates is also a backer. John Payne, an IDT alumnus who recently served as president of Star Semiconductors, is Exponential's president. According to the newsletter *ClieNT Server News*, Motorola and NEC will build the company's chips.

The company declines to discuss its plans, but numerous rumors have circulated that the company is developing a high-speed PowerPC microprocessor using BiCMOS technology. Lending credence to this report is the fact that one of the company's chief technologists is George Taylor, who led the ECL R6000 project at MIPS and also worked on high-end systems at Sun.

Apple reportedly is one of the company's backers. It is not clear whether Apple will have exclusive access to Exponential's products. With numerous CPUs under development at Somerset, as well as separate efforts at IBM and Motorola, it seems odd that yet another PowerPC design group would be funded. But given the disappointing performance of the PowerPC 620 (see [081402.PDF](#)), Exponential's device could fill out the high end of the PowerPC line.

Corollary Sweeps Pentium MP Systems

Corollary's C-bus II multiprocessor system architecture is poised to become the dominant merchant-market approach for Pentium systems with more than two processors. Olivetti, Intergraph, and IBM all demonstrated C-bus II systems at Comdex. Fujitsu, Hitachi, Samsung, and SuperComputers International (a startup led by ex-Cray researcher Stephen Chen) also have announced plans for C-bus II systems.

The C-bus II chip set (see MPR 8/21/91, p. 1) supports up to eight Pentium processors with a 400-Mbyte/s bus using GTL signal levels. LSI Logic and Vitesse have also announced MP chip sets for Pentium but have not demonstrated systems. Neither provides the degree of support offered by Corollary, which offers a complete system design as a starting point for its OEMs. The

company recently began offering motherboards and complete systems for OEMs as well. The initial board-level product includes a 13-slot EISA backplane and supports up to six P54C Pentiums.

Servers running Windows NT are likely to be the primary application for these systems, which Corollary expects will sell for \$20,000 to \$100,000. Both Windows NT and SCO UNIX are supported on the system today; support for IBM OS/2 SMP, Novell NetWare and UnixWare, and SunSoft Solaris is in development.

Corollary will face a bigger challenge in repeating its success with the P6 generation. Intel's P6 is expected to include a second-level cache with the CPU, using two chips in a single package, and to provide glueless MP for at least four processors. Corollary and others may provide chip sets for larger clusters of P6 processors.

Fujitsu Releases Lighter SparcLite

Fujitsu Microelectronics has announced the new baby in its embedded SPARC line. At less than \$20 in volume, the new MB86933H is the lowest-cost SPARC processor available. The design is based on the same core as the company's other SparcLite chips and includes some basic peripheral functions useful for embedded applications. It supplies 18 Dhrystone MIPS at 20 MHz; a 25-MHz version, due out in the first half of 1995, should produce 23 Dhrystone MIPS.

On-chip functions include a page-mode DRAM controller, an address decoder with programmable chip-selects and wait-state generator, and a 16-bit timer. A 1K direct-mapped instruction cache improves performance over a cacheless design without the complexity of set associativity. The chip's 160-pin QFP includes a multiplexed 32-bit bus that also supports 8- and 16-bit devices.

The '933H extends the low end of Fujitsu's SparcLite family. For designers of office-automation equipment, video games, or even cameras, who have a taste for SPARC, this may be just the ticket.

General Magic Gains Momentum

Five new partners have joined the General Magic alliance: Oki, Mitsubishi, Northern Telecom, Sanyo, and the Cable and Wireless Federation, a London-based international alliance of 38 communications companies. All five have also made minority investments in General Magic itself, which is preparing for a public offering. The new partners have not disclosed specific plans; some may use the company's Telescript technology but not its Magic Cap operating system (see [080102.PDF](#)).

So far, only Sony is shipping a Magic Cap device, with Motorola's Envoy delayed until early 1995. But the slow roll-out of the products does not seem to have dampened enthusiasm for the company's technology. The lineup of new partners emphasizes the broad backing and global scope of General Magic's partnerships. ♦