IBM Abandons Somerset

The initial era of PowerPC has come to a close as Motorola and IBM agreed to part ways on the Somerset Design Center. Motorola takes ownership of the design center and all future designs, including the G4. IBM will continue to develop its Power processor family, which is mainly aimed at servers, but has no current plans to build or sell the G4. Within two years, we expect this change will leave Apple solely dependent on Motorola's chips.

Somerset was the centerpiece of the original PowerPC agreement (see MPR 10/16/91, p. 1) between the two companies and Apple; jointly staffed by IBM and Motorola, Somerset was tasked to simultaneously design a family of PowerPC processors, including the 601, 603, 604, and 620. After turning out the first three chips with impressive alacrity, Somerset whiffed on the 620. Worse, development of a second generation of cores lagged; seven years after its founding, Somerset has yet to produce a true second-generation part.

As in Arthurian legend, Somerset was the start of a Holy quest: to wrest a significant chunk of the desktop PC market away from Intel. At the time, Apple held 10% of that market, and IBM held about the same. Since then, however, Apple's market share has dwindled to a mere 4%, and IBM's PC group refused to accept the PowerPC chips.

This situation leaves too little volume to support two sources of PowerPC chips. With IBM maintaining its own line of Power processors, it was getting little from Somerset other than a share of Apple's shrinking business. As we pointed out last fall (see MPR 10/6/97, p. 3), Somerset had become superfluous.

IBM will continue to market RS/6000 workstations and servers based on the 604 as well as its Power chips. The 604 suffers in the workstation market due to its 32-bit ISA and modest FP performance. IBM hopes to solve these problems by bringing the Power3 (see MPR 11/17/97, p. 23) into the volume workstation market in 1999. IBM has also introduced a line of Pentium II workstations and is likely to market Merced workstations when that processor is available in 2000 (see MPR 6/22/98, p. 1). These Merced systems will complement IBM's RS/6000 workstation line.

IBM will continue selling processors to Apple in the near term, but without access to the G4, this business will eventually fade away. Ironically, one of Apple's key goals in creating the PowerPC partnership was to create a dual-sourced architecture. By 2000, Apple will be back where it was in the 1980s: solely dependent on Motorola for its CPUs.

Both Motorola and IBM will continue to develop their own PowerPC chips for embedded applications (see MPR 6/22/98, p. 10). But despite their parting on Somerset, they will continue to work together on Book E (see MPR 10/27/97, p. 10), which will define extensions to the current architecture for future embedded processors.

In summary, the future of PowerPC has fractured. IBM will continue to develop its own server chips, which it does not sell openly. Motorola, through its Somerset design team, will develop processors for Apple. And both companies will separately develop embedded PowerPC chips, ensuring compatibility via Book E. The new structure provides a flow of processors for the few remaining system makers, along with the opportunity for both PowerPC chip makers to exploit emerging embedded opportunities. —*L.G.*

New Intel Competitor Rises

Rise Technology *(www.rise.com)*, a new fabless semiconductor startup, has disclosed plans for its first microprocessor. The mP6 is an x86-compatible processor targeted at the sub-$1,000 PC market. With this focus, it will compete head-to-head with IDT's WinChip and Cyrix's highly integrated processors.

The company was founded in 1993 by David Lin and has since grown to more than 80 people. A second division is located in Taiwan, close to many high-volume PC manufacturers. Rise is privately funded by undisclosed first-tier venture capitalists, investment bankers, and PC companies.

Rise's strategy is to zero in on small niches—of a few million units—in the PC industry, where Intel is not focused and where Rise can establish a competitive advantage. Its first target is the low-cost noncorporate notebook PC market. This segment is quite small, as only 20% of all PCs are notebooks, and most of those go to corporate customers, who strongly prefer Intel processors. But Rise hopes this loyalty will erode, as it appears to be doing in the consumer segment.

No technical details about the mP6 will be disclosed until October's Microprocessor Forum, but Rise claims the chip will have Pentium II-class performance and the highest per-clock MMX performance of any processor available. Sources indicate that mP6 does not implement the 3DNow extensions (see MPR 6/1/98, p. 18). Advanced power-reduction techniques were employed to bring the mP6 within the power envelope of a notebook PC.

The mP6 will also be suitable for use in low-cost desktop PCs. Rise will offer it in Socket 7, allowing the chip to compete directly with other low-cost desktop processors. The mP6 is bucking the integration trend pursued by Cyrix and IDT. Rise says it may develop integrated parts later, and it is planning to license its technology to selected partners that could produce such products.

Rise believes its processor does not infringe any Intel patents, but it is using an Intel-licensed fab to be safe. The startup did not disclose its foundry partner, but possible candidates include IBM, Texas Instruments, and SGS-Thomson.

The mP6 will be available in PGA and BGA packages by the end of the year and is expected to sample this summer. Chip-set vendors Acer, VIA, and Utron have announced they

are working with Rise to ensure compatibility between their Socket 7 chip sets and the Rise processor. No pricing for the mP6 has been announced.

If Rise delivers Pentium II performance within the notebook power envelope (about 8 W), it will be competitive in its chosen niche. On the desktop, however, it will have to compete mainly on price. Rise did not disclose the mP6's die size, but the company will be hard-pressed to match IDT's 58-mm^2 WinChip 2 3D (see MPR 6/1/98, p. 1), its chief competitor in this market. AMD and Cyrix processors are also expected to join the fight for the low-cost desktop market.

IDT has already established its x86 compatibility, which Rise must yet do, and aggressive pursuit of its WinChip roadmap could make life tough for the new vendor. Fortunately for Rise, IDT cannot supply the entire market, which should leave the startup a few openings. —*K.D.*

Intel Accelerates Price Cuts, Katmai, Celeron

Faced with sagging PC demand and increased competition, Intel has responded by accelerating price cuts on its desktop processors by seven weeks. Additional price cuts are likely next month as well, resulting in a large total decrease. The company also pulled in the schedules of its high-end Katmai and low-end Celeron CPUs.

Intel's first Celeron product, the 266-MHz Covington (see MPR 4/20/98, p. 14) did not meet with rave reviews, to put it politely. At 266 MHz, the cacheless Covington delivers lower performance than a 233-MHz Pentium/MMX on PC application benchmarks such as Winstone 98. To improve Celeron's acceptance, Intel has officially added to the mix a 300-MHz version of Covington with immediate availability. Since Covington uses the same Deschutes CPU as Pentium II, producing the higher clock speed is no problem.

The new part, sold as the Celeron-300, delivers better performance than the fastest desktop Pentium/MMX on most benchmarks, making it a more viable option for low-end PCs. Both Celeron products are now shipping, and vendors such as Compaq, Dell, HP, and IBM have announced Celeron-based PCs.

To further compensate for Covington's poor performance, Intel has cut the price of the Celeron-266 by 32% almost before the part began shipping. The 266-MHz processor now lists for $106, the same price as the 233-MHz Pentium/MMX. The Celeron-300 was introduced at $159, filling the price point of the initial Celeron.

Intel's forthcoming Mendocino chip will add a 128K on-chip L2 cache, greatly improving performance. The company plans to deploy 300- and 333-MHz versions of this chip in 4Q98. To distinguish the 300-MHz Mendocino from the same-speed Covington, the former will be marketed as the Celeron-300a. The faster Mendocinos will not use the "a" designation, and the whole issue should quickly become moot as the weaker Covington fades from the market.

While revising its Celeron prices, Intel also trimmed the 1,000-piece list prices of its other desktop chips in an unusual midquarter price cut. As the table below shows, the price cuts, effective June 7, ranged from 16% to 20%, except for the high-end 400-MHz product, which lost only 12%. Intel cut the price of the Pentium II-233 to just $161; PC makers that are unhappy with Celeron can choose this part for only $2 more.

Although these cuts are smaller than Intel's typical quarterly moves, the company plans to cut prices further at the end of July, its normal schedule for price changes. As a result, the total desktop price cuts for this quarter are likely to be significantly larger than usual. The latest price changes do not affect Intel's mobile processors.

Processor	4/15/98	6/7/98	%CHG
Pentium II-400	$824	$722	–12%
Pentium II-350	$621	$519	–16%
Pentium II-333	$492	$412	–16%
Pentium II-300	$375	$305	–19%
Pentium II-266	$246	$198	–20%
Pentium II-233	$198	$161	–19%
Celeron-300	n/a	$159	n/a
Celeron-266	$155	$106	–32%
Pentium/MMX-233	$134	$106	–21%
Pentium/MMX-200	$95	$95	0%

Intel further disclosed that the first silicon of its Katmai processor is looking good enough that the company now expects to ship the part in 1Q99, a bit earlier than previously scheduled. This change will help reduce the gap between Intel's Pentium II-450, expected to ship in 3Q98, and Katmai, avoiding a long plateau in high-end performance.

The company said Katmai will ship initially at clock speeds of up to 500 MHz. This extra speed, along with some expected minor core changes, will allow it to offer a small performance advantage over Pentium II on typical PC applications and a large advantage on applications that use the multimedia extensions known as Katmai new instructions.

Overall, these product changes address weaknesses in Intel's low-end strategy. The Covington-300 should improve Celeron's acceptance, and the plan to replace that part with the Mendocino-based "300a" should quickly sweep Covington under the rug by early 1999. With Katmai and Mendocino coming on strong at that time, Intel should be well positioned in 1H99. —*L.G.*

Ross Technology Prepares for Shutdown

Facing deepening financial problems, Ross Technology *(www.ross.com)* has laid off 40% of its workforce and placed all products on "end of life" status. The company lost more than $40 million over the past two years and reports that sales of its 32-bit SPARC processors are "deteriorating." During the past several years, most SPARC system makers have abandoned the architecture in favor of the x86 family, limiting sales opportunities.

Founded by Roger Ross (who led the development of Motorola's 88000) in 1988, the eponymous company began by redesigning the cache and MMU for Cypress's original

601 SPARC CPU (see MPR 1/89, p. 10). The company then developed a new processor, originally known as Pinnacle (see MPR 3/25/92, p. 15) and later as HyperSparc.

At the start, Ross hoped to exploit the growing market for SPARC processors, which were used by several companies. But the biggest SPARC vendor, Sun, continually spurned Ross's designs for its own in-house processors. For a brief period, Sun sold a few HyperSparc machines (see MPR 11/14/94, p. 4), as its own SuperSparc had fallen behind in performance. Once Sun moved to UltraSparc, however, it dropped the Ross chip, leaving HyperSparc to address a dwindling market.

Ross began as a subsidiary of Cypress, but Fujitsu purchased a majority stake in 1993. When the Japanese company was flush with cash, it could afford to cover both Ross and Hal Computer, another SPARC chip house. Now facing its own financial problems, Fujitsu is no longer willing to fund Ross's losses. Ross is hoping to find a buyer, but prospects are bleak, even with the company's stock trading for just $^1/_{16}$, or $6^1/_4$ cents a share. Unless it finds a buyer, the company plans to shut down by the end of the year. —*L.G.*

Samsung Forms Alpha Processor Inc.

As PowerPC fades, Alpha is stepping to the plate to challenge Intel in the PC market. With Compaq's acquisition of Digital (see MPR 2/16/98, p. 4) now officially complete, Samsung has taken up the Alpha torch. To bolster its presence in the market, the Korean company has formed a U.S. subsidiary, Alpha Processor Inc., to sell Alpha chips to PC makers.

Compaq/Digital will continue to own and maintain the Alpha architecture. That company will also continue to design new Alpha cores, such as the future 21364. Although Samsung has the right to design its own Alpha chips, Alpha Processor will not undertake any chip design work, at least initially.

This leaves the point of the new company unclear. Samsung believes it has created a new business model, but Alpha Processor appears to be simply a U.S. marketing arm for Samsung. The key challenge for Samsung is to find more buyers for its Alpha products; Alpha Processor is merely a new brand for the same chips. —*L.G.*

Equator Sees Light

After years of secrecy, Equator Technologies *(www.equator.com)*, the media-processor startup founded by Multiflow cofounder John O'Donnell (see MPR 6/2/97, p. 4), has finally identified its corporate partners and its plans for the VLIW processors it is developing.

Equator is codeveloping its architecture with Hitachi's Information Systems Development Lab in Japan. Hitachi will also fab parts based on the architecture and contribute "all-format decoding" digital-TV software. While Equator has not named the new architecture or specified details of the first parts, it plans to target the digital-TV and 3D arcade-game markets.

Equator hopes to distinguish itself from other media-processor vendors by providing highly efficient C-language compilers for its processors, allowing developers to realize the full potential of the new architecture without manually optimizing assembly language. TriMedia provides a basic C compiler for its TM-1 media processor (see MPR 11/13/95, p. 22), but O'Donnell's background in compiler design for Multiflow's VLIW machines suggests Equator's compiler may be significantly more powerful, giving it a unique advantage over its competition. —*P.N.G.*

VM Labs Reveals Project X Media Processor

VM Labs *(www.vmlabs.com)* has revealed new details about its own media-processor plans. Like Equator's design, the company's "Project X" architecture—no relation to Micron's Socket X (see MPR 6/1/98, p. 4)—is intended for applications in consumer electronics.

VM Labs plans to replace the hardwired MPEG-2 decoding logic in DVD players and digital satellite receivers with its Project X media processor. The Project X chip will perform these functions in software, and it can also run 3D games and other entertainment applications. By merging the DVD player and the game platform, VM Labs hopes to achieve an even higher penetration of the consumer-electronics market than either device could individually.

VM Labs has allied itself with Motorola's Semiconductor Product Group, which has a minority investment in the company and will fab the chips. Thomson Consumer Electronics (the maker of RCA, GE, and ProScan products) and Toshiba's consumer-electronics group say they will use the Project X chip.

Eleven developers of entertainment software—including major names such as Activision, Capcom, and Psygnosis—have signed up to develop titles for Project X. This show of hardware and software support seems to give VM Labs a leg up on Equator, but shipments of both product families are at least a year away, and much can happen between now and then. —*P.N.G.*

Conspiracy Speeds 3D Geometry

Plugging a small gap in its x86 product line, IBM Microelectronics has teamed with Rendition, Fujitsu, and Hercules Technology to produce Conspiracy, the first mainstream 3D card with hardware geometry acceleration. Since IBM will not offer a processor with 3DNow (see MPR 6/1/98, p. 18) this year, it needed another way to address the CPU bottleneck on 3D transform and lighting calculations.

At about $15, Fujitsu's FGX-1 is the only geometry processor priced for mainstream PC buyers. IBM worked with Fujitsu and Rendition to define a single-board solution combining geometry acceleration and rendering acceleration in the form of Rendition's V2200 2D/3D engine (see MPR 6/23/97, p. 1). Hercules will manufacture the unique card, which is expected to retail this month for about $149.

Unfortunately, there are serious problems with this plan. Today, Quake and other OpenGL-based titles are the

only 3D games that can take immediate advantage of hardware geometry acceleration, which is not supported in Microsoft's Direct3D (D3D). While Rendition and Fujitsu have developed ways to patch D3D applications to use the FGX-1, this technique is not supported by Microsoft and will not help most D3D titles. Geometry acceleration is also not supported by 3Dfx's Glide API, which is used by many 3D games to drive 3Dfx's popular Voodoo adapters.

More important, the FGX-1 performs geometry operations only about as fast as a 266-MHz Pentium II processor, so the new Hercules card will be of interest only to end users with older Socket 7 systems—most particularly, those that cannot be upgraded to use the latest Socket 7 processors. For more modern Socket 7 motherboards, an AMD K6-2 or IDT WinChip 2 3D processor would probably match the 3D performance of the FGX-1 and would provide a substantial speedup for non-3D applications as well.

Geometry acceleration is likely to become an important part of the PC 3D market in 1999, when Microsoft provides the necessary hooks in Direct3D, but the software compatibility and performance of Fujitsu's FGX-1 is clearly inadequate for most of today's users. —*P.N.G.*