

THE EDITOR'S VIEW

PowerPC Delivers Beef, But No Sizzle

Without a Killer Product, No Reason for x86 Users to Switch

Today begins the second leg of PowerPC's journey into the personal computer market, as Apple introduces its first 604-based systems and IBM rolls out its first PCs incorporating PowerPC processors (*see 090803.PDF*). While the first Power Macintoshes, introduced a year ago, were full of promise, the new products fail to move PowerPC into the PC mainstream, leaving any serious competition with Intel-based PCs in the unrealized future.

The essential promise of PowerPC is to deliver twice the performance of x86 at any given price. Other RISCs have made this claim, but none has delivered. Somehow, we thought that PowerPC would be different, that the best minds from IBM and Motorola could bring RISC design to its full glory. The 601 was a good start: a fair match for Pentium, the chip sells for half of Intel's price despite only slight advantages in manufacturing cost.

But the 601 could never establish an integer performance edge over Pentium. The 604 was supposed to solve that problem, delivering 60% more performance than Pentium at the same clock speed. But the chip required an excruciating series of bug fixes that delayed shipments by six months. In the meantime, Pentium jumped from 100 to 120 to 133 MHz; combined with software and system enhancements, these increases have pushed Pentium to 155 SPECint92 (*see 0908MSB.PDF*).

Now that the 604 has arrived, we see that it really delivers only 15% better integer performance than a Pentium of the same clock speed. The delay has allowed the 604 to move up to 133 MHz, matching Intel's speeds, but this increase still leaves the performance difference at a negligible amount. The partners have placed low price tags on the 604 to make up for this shortfall, but that still leaves PowerPC without a real high-end part.

The other high-end PowerPC chip, the 620, was as big a disappointment as the 604. Slated to deliver just 15% more performance than the P6, the 620 will do little to solve PowerPC's high-end performance problem, although it should do well in the server market.

The PowerPC partners' infamous ad, showing RISC performance diverging from the CISC curve at an exponential rate, is clearly refuted. RISC and CISC integer performance continue to increase along parallel lines, and the only question is how wide the gap is. In the case of PowerPC, it looks to be about 15%.

Another disappointment has been the PowerPC system vendors' failure to translate the 2:1 price/performance advantage of the midrange PowerPC chips into

an advantage at the system level. Apple slapped an attention-getting price on its entry-level Power Macintosh a year ago but added roughly \$1,000 for each 20% increase in CPU performance. Even the entry-level model has become uncompetitive, as Apple has done little to cut its price even as Pentium-based system prices have dropped rapidly in the past year.

The new 604 systems show the same rapacious pricing: at an entry price of \$4,699, they are irrelevant to the volume PC market. IBM's 604-based PCs start a bit lower, about \$3,700 for a complete system, but are still far too expensive for the mainstream and, until OS/2 is ready late this year, run only Unix and Windows NT.

On the other hand, the partners have done several things well. With more than 1.5 million units sold, the Power Macintosh has quickly surpassed the sales of all other RISC systems. Despite some pundits' predictions, Apple has made it halfway through a difficult product transition without losing market share. In addition, the aggressive pricing of the PowerPC chips has exposed Intel's Achilles' heel—its high margins. The 601, 603, and now the 604 satisfy the same performance points as the Pentium line, which is to say the performance needs of the vast majority of PC users, at much lower prices.

So far, PowerPC has displaced only 680x0 processors from the market, with negligible impact on x86 sales. PowerPC needs a compelling product to convince x86 users to switch. This dream machine would be reasonably priced, high in performance, and compatible with PC operating systems and applications. In reality, the PowerPC alliance has not delivered in any of these areas.

Over time, the alliance hopes to address these issues. OS/2 for PowerPC offers some PC compatibility. As PC memory configurations head toward 16M, Windows NT or a portable successor to Windows 95 may become a mainstream operating system in 1997 or so. The so-called PowerPC 615 emulation technology, which remains on the drawing board, is needed to deliver competitive performance on x86-based PC applications.

Increased competition will lower system prices, even in the Macintosh market. The partners hope that a reorganization at Somerset (*see 0908MSB.PDF*) will help avoid the problems that the 604 and 620 have encountered. Future PowerPC processors will have to deliver more than a 15% advantage to convince PC users to give up their x86 machines. ♦

