

Vendors Take Their Best Shots

But Their Own Forecasts Often Go Awry



NexGen Aims to Beat 486 Performance

APRIL, 1989—NexGen Microsystems (San Jose, CA) revealed the first details of their 386-compatible processor implementation at the recent CompCon conference. NexGen remains the only company to have publicly acknowledged plans to build a 386-compatible processor. They are building the chips for their own use only, however; they have no plans to sell the chips to other system vendors. This approach may save them from Intel's wrath.

NexGen originally planned to have systems on the market this year, but delays in the chip design have moved shipment dates into 1990.

NexGen finally began volume shipments of its first x86 processor, the Nx586, in 1994.

Intel Preannounces 586, 686, and 786 ...

SEPTEMBER, 1989—In an apparent attempt to dispel any fears that CISC may be a dead end, [Intel VP] Dave House has previewed the next decade of 386-family developments in two conference presentations. House projected that the 586 will debut in 1993, and will contain 4 million transistors. He went on to project that the 686 will incorporate 22 million transistors and will be introduced in late 1995 or early 1996.

... House used the name "Micro 2000" for a 100-million-transistor chip to appear at the start of the next century. At the recent SCO Forum, he called the chip the i786, and went on to claim that the one-inch-square

[645-mm²] chip would run at 250 MHz, and would include four processing units, two vector processing units, and user-interface logic such as DVI and graphics controllers.

An awesomely accurate forecast. The 586 became Pentium, which debuted in March 1993 with 3.3 million transistors. The 686 became Pentium Pro, which was introduced in November 1995 with 21 million transistors, including the L2 cache chip. The date for the 786 (Merced) is likely to be close, but the other details are likely to be quite different. Dave House is no longer at a microprocessor company.

PowerPC Plan Calls for Four Processors

DECEMBER 26, 1991—Figure 1 shows the four planned PowerPC microprocessors. No scale was provided for the vertical axis. ... While the first, low-cost chip will be derived from the [IBM] RSC design, the three chips targeted for 1993–94 will be completely new designs. ... Clock rates are expected to hit 100 MHz by 1995.

This forecast went fairly well.

OCTOBER 24, 1994—The midpoint of each box is supposed to represent the availability of first samples to the partners (not necessarily general sampling). By this interpretation, the companies have done an admirable job of meeting their original plan. The 601 and 603 are spot on schedule, with the 604 and 620 lagging by a couple of months.

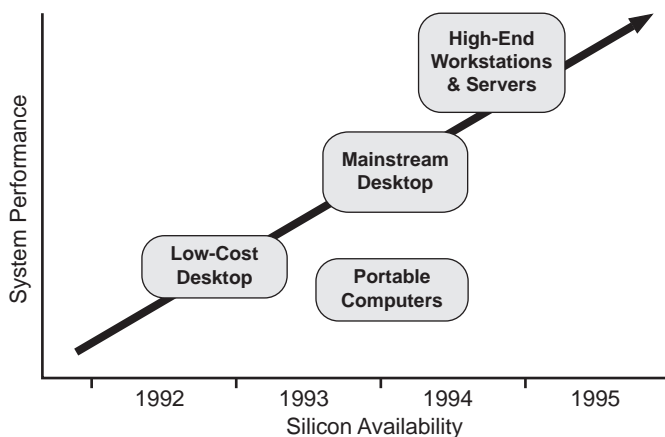


Figure 1. The original PowerPC roadmap published in 1991. The four boxes became the 601 (low cost), 603 (portable), 604 (mainstream), and 620 (high end).

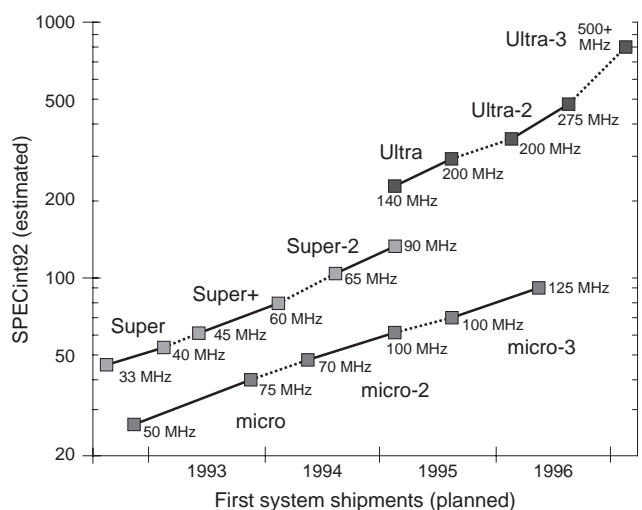


Figure 2. Sun's [1993] plan for future SPARC processors includes the microSPARC, SuperSPARC, and UltraSPARC families.

Since then, the 620 has disappeared into an abyss, but the other three chips have met their targets.

Sun Details Extensive Plan for SPARC CPUs

MARCH 29, 1993—Sun has outlined an ambitious plan to extend the SPARC processor family [see Figure 2]. While the company swears that all of these programs will meet or exceed the expectations outlined here, it has had problems meeting its forecasts in the past. The original SuperSparc program was 12 to 18 months late by some estimates. Worse yet, the frequency declined over time from as high as 80 MHz in initial projections to 36 MHz in first shipments.

... The UltraSparc goals seem aggressive, as they indicate a 50% increase in clock frequency over SuperSparc-2 in the same timeframe, plus a 25% boost in instructions per cycle.

SuperSparc's clock speeds fell behind this plan; UltraSparc met its clock-speed goals but not its schedule, with the first version showing up in 4Q95, UltraSparc-2 in 3Q96, and UltraSparc-3 yet to be seen.

Cyrix Describes Pentium Competitor

OCTOBER 25, 1993—Can a \$70 million company develop a better processor than a \$6 billion giant? At the recent Microprocessor Forum, Cyrix's Peggy Herubin unwrapped the "M1" design, a superscalar, deeply pipelined, x86-compatible CPU that she claims will

outperform both current and future generations of Intel's Pentium processor.

When the M1 began volume shipments in 1Q96 as the 6x86, it slightly outperformed the fastest Pentium chips on the Winstone 96 benchmark.

Visionaries See Beyond Superscalar

DECEMBER 6, 1993—Don Alpert, senior architect at Intel, admits that his company faces a bigger challenge due to its CISC instruction set, but feels that it can be met. "Some people are skeptical that we can build six- or eight-issue x86 machines, but anyone who believes that is underestimating the competition."

We're not holding our breath on this one, unless you count the non-x86 portion of Merced.

PA-8000 Combines Complexity and Speed

NOVEMBER 14, 1994—[HP's] Steve Mangledorf, presenting at last month's Microprocessor Forum, said that the forthcoming PA-8000 will achieve a high clock rate despite the burden of [its complex] feature set, a powerful combination that he claims will create the industry's fastest microprocessor. It will take quite some time, however, to validate this claim; HP does not expect system shipments for nearly 18 months.

When the PA-8000 began shipping in June 1996, it posted better SPEC95 scores than any other shipping microprocessor. ♦