

THE EDITOR'S VIEW

Number Two Doesn't Always Try Harder

Intel Benefits from Poor Planning, Squabbling Among Competitors

Intel's dominance of the x86 market leaves other vendors vying for the number two position and hoping to make enough sales to put a dent in Intel's lead. Even as the competition in this market heats up, the contenders look more like pretenders, and none has put together the right combination to seriously threaten the x86 leader.

AMD holds the number two spot right now and has made a lot of noise lately about its big deal with Compaq, its recent legal victories, its new foundry partner, and its exciting new products. But where's the beef? AMD's 486 volumes are still a small part of the overall 486 market and put no pricing pressure on Intel.

We're talking about the only company that builds and sells processors identical to Intel's, using the same design and manufacturing technology. It has every conceivable advantage except one: enough fab capacity to build its breadwinner chip. The billion-dollar firm, the fifth largest U.S. semiconductor company, has only a single, small factory with 0.8-micron capability, a process widely used throughout the industry for the past two years. AMD is investing heavily in 0.6-micron capacity, but this new fab won't be on line until 1995.

Having left this gap in its fab capacity, the company searched for nine months to find an outside foundry before finally making an agreement with Digital. It will be nine more months before Digital starts producing significant numbers of 486 chips. Thus, AMD's impact on the 486 market has been delayed for a year and a half due to its inability to close the fab gap.

AMD also shot itself in the foot with its microcode problems. Although the company uses Intel's 486 chip design, the rights to Intel's microcode continue to be disputed. AMD said that it would develop clean-room microcode to solve this problem but wasted valuable months getting the project started. When the final results became available, AMD was forced to admit that they were tainted (*see 0713MSB.PDF*) and had to start over. Furthermore, even the tainted version has no floating-point code, so AMD has been selling lower-margin SX parts instead of more profitable DX chips.

AMD's deal with Compaq made big news, but at least one analyst, Mike Feibus, thinks that Compaq is simply using AMD for leverage against Intel, as it once used MIPS and ACE, and the projected \$80 million in purchases may never materialize. Compaq has yet to announce a system using an AMD processor, and why should it? AMD's idea of a unique product is the 486SX2,

a chip that one Intel official said could be created "using a word processor." Last fall, AMD hinted that it was developing 486 chips with higher clock speeds and larger on-chip caches, but Intel has already started shipping similar (DX4) chips well before AMD will be able to ship its own versions.

Cyrix really is trying harder—after all, it had to design its own 486 CPU from scratch. But there are limits to what a \$70-million company can do. With much fanfare, Cyrix previewed its Pentium competitor, the M1, last fall but apparently has not been able to keep that program on schedule; we now don't expect volume shipments until 1Q95. The fabless vendor is also struggling with its foundry partners to produce 66-MHz 486s, even as Intel pushes its own 486 to 100 MHz.

The feud between Cyrix and Texas Instruments has escalated to eye poking and nose twisting. The former x86 partners are now suing each other just as they are making legal headway against their common foe, Intel.

TI is the hardest to figure out. It has both excess fab capacity and an Intel patent license—a rare and valuable combination in today's environment. Yet TI has been unwilling or unable to provide x86 chips to Cyrix, ruining their relationship. TI has the fewest x86 design resources of these companies, yet it could lose its 486 core, or the future M1, because of the Cyrix lawsuit.

One thing that could worry Intel would be if TI agreed to build AMD's 486 chips. But these vendors seem intent on pursuing their own strategies, leaving them to pursue Intel from a far inferior position.

Compared with these pikers, Intel looks like a genius for moving its CPUs to a 0.6-micron process ahead of the pack. On the RISC side, however, Digital, NEC, IDT, Toshiba, and IBM already have processors in production at 0.6 micron or better.

IBM is the one company that has the fab capacity and the processor design expertise (including x86 designs) to go head-to-head with Intel. So far, Big Blue has been held back by its agreement not to sell x86 chips on the open market, but it may choose to combat Intel with a clean-room x86 design or with PowerPC—or both. The specter of competition from the world's largest computer company may be the only thing that can scare the world's largest processor vendor. ♦

