

■ Sega Announces Katana as Dreamcast

Returning from Saturn's obit (er, orbit), Sega revealed the first details of its next-generation home video-game console. Officially called Dreamcast, the system that was previously code-named Katana (and Dural and Black Belt before that) repairs many of the mistakes that cost Saturn its life in North America, but it repeats others.

As expected, Dreamcast will use Hitachi's SH7750 microprocessor (see MPR 12/29/97, p. 12), NEC's PowerVR graphics controller (see MPR 7/14/97, p. 5), an ARM-based Yamaha sound chip, and a modified version of Microsoft's Windows CE operating system (see MPR 6/2/97, p. 5).

The single-processor design will make Dreamcast far easier to program (and manufacture) than the four-processor Saturn. It also drastically cuts Hitachi's volume to Sega drastically, although revenue may not decrease much, considering how inexpensive Saturn's SH-2 chips have become.

The SH7750's new 3D geometry instructions (see MPR 10/28/96, p. 32) will be complemented by a second-generation PowerVR accelerator designed by Videologic and built by NEC (see MPR 3/9/98, p. 16). This puts NEC in the enviable position of supplying two out of three video-game titans. In addition to Dreamcast's graphics, NEC also provides CPUs and Rambus-compatible DRAMs to Nintendo. Only the Sony PlayStation has eluded NEC's grasp.

Dreamcast goes on sale November 20 in Japan but won't be available in North America until almost a year later. At first, Sega will offer only five titles for Dreamcast, one of the shortcomings that doomed Saturn. But because the system relies on Microsoft's Win32 and DirectX APIs, porting games back and forth between Dreamcast and PCs will be far easier than it is with any current game console.

After being singed by Saturn, wary software developers are much more likely to write games for Dreamcast, knowing that a PC version will be relatively easy to produce. Conversely, PC programmers can enter the console market with much less effort than before. Technical issues aside, Sega will probably still enforce an exclusivity period on Dreamcast titles before they can be made available on the PC.

Dreamcast's modem and Internet protocols position the box as an alternative to WebTV and other Internet appliances. Its low selling price (expected to be about \$200 in Japan) and obvious alternative function make the system far more interesting to most consumers than a single-purpose Internet appliance or set-top box. Whether buyers choose WebTV or Dreamcast, Microsoft wins either way. —*J.T.*

■ ColdFire 5206e Increases Speed, Cache

Motorola's new version of its ColdFire 5206 processor (see MPR 9/11/95, p. 12) offers more performance for less money. The new 5206e ramps the speed of the company's most

popular ColdFire chip to 54 MHz, helped along by a much larger cache and more on-chip SRAM.

The 5206e enhances its predecessor in several ways. The instruction cache grows from 512 bytes to 4K (the chip still has no data cache); the on-chip SRAM also swells drastically from 512 bytes, to 8K in size; a two-channel DMA controller has been added; and the chip now has hardware support for multiply-accumulate and division. Despite the new hardware, the 5206e does not use the ColdFire v3 core (see MPR 9/16/96, p. 1); it is simply a v2 core with MAC/DIV instructions added.

The 5206e is housed in the same package as the 5206, making the two pin-compatible. A shift to 0.35-micron fabrication forces a move to 3.3 V. The original 5206 runs on 5 V, so PC boards may have to be redesigned to accommodate the different power supply. To maintain pin compatibility, the new DMA controller's request pins are multiplexed with those of one of the timers.

The 5206e runs at 40 MHz and 54 MHz, a nice step up from the 33-MHz peak speed of the original 5206. Even so, the price of the chip has dropped. In quantities of 10,000, Motorola's suggested price is \$8.29 for the 40-MHz part and \$10.28 for the 54-MHz chip. (The unusual clock speed is a multiple of the NTSC television scan frequency.) This is even cheaper than the \$12.77 price for the 33-MHz 5206, making the original part suddenly very unattractive for any but existing designs.

For new designs, the 5206e is a good general-purpose processor with an attractive ratio of price to performance. It's not as compelling as, say, IDT's new RC32364 (see MPR 6/1/98, p. 12), but it's on a par with IBM's slower PowerPC 401GF chips. NEC's VR4305 is faster and has floating-point, but it is also a bit more expensive and has no I/O at all. Like all ColdFire chips to date, the 5206e emphasizes price over performance, and that's not a bad value proposition to offer. —*J.T.*

■ HP's Embedded Java Rides on Four RTOSs

Hewlett-Packard has announced the first four licensees of its Java runtime environment for embedded systems (see MPR 4/20/98, p. 8). Integrated Systems (ISI), QNX, Lynx, and Microware have all agreed to integrate the HP product with their real-time operating systems (pSOS, QNX, LynxOS, and OS-9, respectively). The deal is the first of its kind for HP and a blow to Sun's JavaOS for Consumer and JavaOS for Embedded alternatives (see MPR 4/20/98, p. 8).

As we reported previously, HP's JVM currently runs on Wind River's VxWorks operating system, which was curiously absent from the list of HP licensees. The code has been ported to the 68K, MIPS, and x86 instruction sets. HP is "providing assistance" to its licensees in porting to ARM,

PowerPC, and i960. Such ports are the licensees' responsibility, however, as HP will not push these projects ahead on its own.

HP's business model is to provide underlying technology to established vendors of real-time operating systems rather than to sell its JVM directly to customers. HP reserves the right, however, to make deals with high-volume OEMs that do not use a commercial operating system. HP also has to find a name for its product. As Intel and Motorola have done recently, the company is searching for a synthetic name it can trademark, something with more zing than "Hewlett-Packard embedded run-time environment." —*J.T.*

■ Matsushita Licenses ARM7TDMI

Adding another feather to what is becoming a full headdress, ARM Holdings (the new name for the newly public Advanced RISC Machines) has signed Matsushita, a Japanese consumer-electronics conglomerate, as its newest licensee. Matsushita becomes the 27th ARM licensee to be identified and the 31st overall by our count.

Matsushita's stated intent in signing the ubiquitous license agreement is to use the ARM7TDMI core in two kinds of products, GSM cellular telephones for the Asian market and "multimedia Internet appliances." Matsushita controls the Panasonic, Technics, and Quasar brand names, all popular and well-known to consumers around the world.

Matsushita's Internet appliances could appear as a Panasonic television or set-top box, for example.

An ARM7TDMI is underpowered for any serious media processing, so Matsushita will likely pair the core with another media processor and use the ARM for control functions, à la Samsung's ill-fated MSP (see MPR 6/2/97, p. 11). Matsushita may develop the media process on its own, or it may try to license one of several existing designs. —*J.T.*

■ Mobile Pentium II Module Goes Embedded

With a wave of its magic wand, Intel has transformed its 266-MHz Mobile Pentium II Module (see MPR 4/20/98, p. 14) from a notebook PC product to an embedded product. The module itself is the same; only its life span has changed. As an embedded product, Intel guarantees embedded customers a longer product life than PC makers have come to expect.

The mobile/embedded module is the first P6 processor to join Intel's embedded lineup. Its form factor and connector placement make it incompatible with the previous two embedded Pentium modules (see MPR 6/23/97, p. 10) and with mobile Pentium modules for PC laptops. The module stands only 0.39 inches high, making it low enough to stack on standard VMEbus or CompactPCI cards. Pricing (\$718 in 1,000-unit quantities) is unchanged from the PC version. We expect the 266-MHz module will soon be followed by many of the other P6 notebook modules by year-end. —*J.T.* 