Windows CE 2.0 Handhelds Swap CPUs

Coincident with the release of Windows CE 2.0, several new handheld PC (HPC) units were demonstrated at the recent Comdex trade show. Along with a few new companies entering the market for the first time, two of the six original HPC makers switched horses, at the expense of Hitachi.

Philips, Compaq, and newcomer Samsung will all use Philips's 31700 MIPS processor (aka TwoChip PIC; see MPR 5/12/97, p. 13) in their new HPCs. Casio, LG, and now Ericsson have allied with Hitachi, using that company's SH7709 processor (see MPR 8/4/97, p. 4), as does Hitachi itself. NEC's newer MobilePro units are based on the R4102 (see MPR 4/21/97, p. 4), an upgrade from the R4101 chip.

Of the initial six HPC makers anointed by Microsoft, two—Compaq and HP—have defected from the Hitachi camp. The first Compaq unit was merely a rebadged Casio HPC based on Hitachi's SH7708; the new Compaq HPC was designed from scratch in concert with Philips. HP, which came to market later than the others but with a larger display, is expected to adopt the StrongArm-1100, leaving behind the SH7709 chip now used by Hitachi's newer partners.

Philips and Hitachi have each gained one new customer, both of them first-timers to the HPC market, while Digital scored its first HPC design win. But only Hitachi lost existing customers to other architectures. From its initial 4–2 lead, Hitachi's SuperH architecture is now locked in a 4–4 tie with MIPS going into the first quarter of 1998. On technical merit, the SH parts have better code density, but the MIPS chips have more suppliers and a clearer upgrade path. Hitachi will start moving upscale with its SH-4 parts, which may put some of the luster back into the company's high-selling product line.   —*J.T.*

NKK Debuts Integrated R4650 MIPS Chip

Little-known MIPS processor vendor NKK Micro Devices (*www.nkk.co.jp/LSI*) has released its first significantly differentiated product, the mellifluously named N3PR460LBG. The high-end device is aimed at embedded PowerPC and i960 devices, and it is the first MIPS processor with PCI.

The '460LBG, mercifully code-named Pluto, is based on the R4650, jointly owned by IDT, NKK, and QED. To that 64-bit core NKK added a pair of 8K caches; a memory controller for EDO, page-mode, or synchronous DRAMs; a four-channel DMA controller; two serial ports; two parallel ports; a PCMCIA controller; and a 32-bit PCI interface. The whole unit is packaged in a 256-contact BGA.

NKK is asking $78 for a 133-MHz part; a 167-MHz version is due in 2Q98 and will be priced at $98 (both in quantities of 1,000). The slower version will begin sampling in January. At these prices, the NKK parts are about twice as expensive as their nonintegrated twins from IDT and QED, which is reasonable. The prices are comparable to those for the i960RP and 'RD, but at 133 MHz and up, the MIPS chips are faster than even Intel's top-of-the-line i960HT. Motorola's integrated PowerPCs have focused on communication, where the '460LBG has no special features. The '460LBG is not specialized for any particular application but should make a good processor for high-end embedded systems such as printers, Internet terminals, and network boxes.   —*J.T.*

VLSI Shrinks GSM Logic to Single Chip

VLSI Technology has shrunk its two-chip set for GSM mobile telephones to a single chip. Peculiarly named OneC, the device combines ARM7 processor and Oak DSP cores with a plethora of analog, digital, and RF circuitry. The OneC is expected to sell for "under $15 in large quantities" when it enters production in 2H98, according to the company.

The OneC improves on previous generations of GSM chips from VLSI by reducing the package count from two to one and the voltage from 5 V to 3.3 V. For normal GSM operation, the ARM7 runs at 13 MHz while the Oak DSP runs at 39 MHz. Raising the frequency of the two cores to 26 and 52 MHz, respectively, increases leftover processing power enough to let designers build in additional features (limited voice recognition, for example). In addition to the two processor cores, the OneC includes voice-band and RF circuitry, an LCD display driver, keypad-scanning logic, DRAM, PROM, timers, and power management.

Reducing the physical footprint, power consumption, and cost of the internal logic are the three overriding concerns of digital-mobile-telephone makers, and VLSI's OneC succeeds admirably on all three fronts. The company claims to have shipped more than 30 million GSM chips to date, with VLSI logic appearing in about 30% of all digital cell phones worldwide. At the current rate of expansion, this market will be a lucrative one for companies like VLSI that have ASIC, DSP, and low-power CPU experience.   —*J.T.*

Philips Licenses R4300 From NEC

Philips has licensed NEC's R4300 and expects to use the midrange core in specialized integrated processors that are outside of NEC's normal markets. Terms of the deal were not disclosed, nor would Philips outline specifically what parts it might develop, or when.

Philips joins Toshiba and NEC (which developed the chip in conjunction with MIPS Technologies and Nintendo) as R4300 builders. The part has been an extremely successful one for NEC, appearing in several recent laser printers and network boxes as well as the famous video game. Its high performance, integrated FPU, large caches, and moderate die size have made the R4300 a price/performance leader. The part is not suited for low power, however, which has been the thrust of some recent Philips products. It appears that Philips is contemplating expanding its

semiconductor focus into midrange line-powered consumer equipment.   —*J.T.*

■ Vadem Turns x86 Board Into iPump

Following the footsteps of others making Internet connectivity a no-brainer, Vadem has developed iPump, a small daughterboard with a processor, modem, and software. At $25 in large quantities, iPump is only slightly more expensive than many modem chips alone.

The board includes Vadem's VG330 microprocessor—a 32-MHz rendition of NEC's 8086-compatible V30MX processor core—coupled with controllers for LCD, keyboard, memory (DRAM, SRAM, and flash), PCMCIA, and serial ports. The processor is paired with a Rockwell modem chip, 512K of DRAM, and 512K of ROM; customers can choose from 14.4-, 28.8-, or 33.6-kbps modems. The ROM includes a DOS-compatible operating system with SLIP and PPP drivers for a dial-up Internet connection.

Vadem's approach is exactly the opposite of that taken by iReady (see MPR 10/6/97, p. 14), which vends a hardware-only Internet "tuner" that can do away with an embedded microprocessor. Whereas the iReady product is aimed at getting ASIC developers to spend a few more gates on the Internet interface, Vadem takes the quick-and-dirty route, getting customers up and running with a minimum of fuss. Both companies are banking on Internet access becoming as prevalent as power cords in midrange embedded systems.   —*J.T.*

■ IBM 403GCX Runs Windows CE

IBM has announced that Windows CE now runs on its embedded PowerPC chips. Specifically, the comparatively compact Microsoft operating system runs on IBM's 403GC (see MPR 9/11/95, p. 9) and its faster twin, the 403GCX (see MPR 3/10/97, p. 5).

Neither chip has remarkably low power consumption, so IBM is not aiming at the handheld PC (HPC) market. Instead, the company hopes its low-cost PowerPC parts will push further into midrange consumer electronics than the television set-top boxes where the 403 series got its start. Microsoft, of course, has similar plans for its newly acquired WebTV line (which uses MIPS processors). While it's good to have Microsoft backing the concept, it must also be intimidating to have the company as a competitor.   —*J.T.*

■ Clarification: NEC R41xx

In a previous *Embedded News* item (see MPR 10/27/97, p. 11), we used some ambiguous wording in describing potential changes to NEC's product line. The item was not meant to suggest that NEC would discontinue its entire low-power R41xx family, only certain members within that family, such as the R4100 and R4101.   —*J.T.* ◨