

SPECIAL ISSUE: 25th Anniversary of the Microprocessor

The microprocessor is now in its 25th year of existence. To celebrate this milestone, this issue of Microprocessor Report contains several articles, written by our staff and other experts in the field, discussing the past, present, and future of the microprocessor.

Microprocessors Changing the World 1
 In a brief span of 25 years, the microprocessor has become one of the most important agents of change in the world. Although automation of simple tasks has made life easier, the biggest revolution is in communications. Fax machines, electronic mail, desktop publishing, cellular telephones, and the Web have revolutionized the way we communicate—and all are made possible by the microprocessor.

Editorial: Power Issues May Limit Future CPUs 3
 Both historical data and a basic law of physics point to an increase in processor power consumption over time. Future processors may turn to radically new designs to overcome this problem.

Most Significant Bits 4
 Intel cancels fall price cut for Pentium...After reducing prices for summer; Mobile Pentium-150 pushes thermal envelope; MicroUnity idles fab, seeks chip partners; PowerPC 604e hits 225 MHz; Mitsubishi, IBM strike PowerPC deal; HP licenses Motorola's ColdFire.

CPU Technology Has Deep Roots 9
 Starting with Intel's 4004 in 1971, several early microprocessors pioneered many of the hardware and software techniques in use today, including register windows, glueless multiprocessing, pipelining, on-chip caches and TLBs, and floating-point math.

New Instruction Sets Are Coming 14
 Several techniques—including larger register sets, prefetch instructions, dependency hints, and multiway branches—are available to improve performance, but it isn't clear whether they will provide enough gain to justify the pain of recompiling.

Architects Look to Processors of Future 18
 Leading computer architects Gordon Bell, David Ditzel, Richard Sites, William Dally, and Yale Patt describe their views of the future of microprocessors. They foresee significant performance improvements based on techniques such as processor/DRAM combinations, multithreaded processors, and improved memory interfaces.

Viewpoint: The Case for Reconfigurable Computing 25
 Nick Tredennick believes reconfigurable accelerators based on PLD technology could become popular in future PCs and eventually surpass x86 processors as the key computing engine in the system.

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