

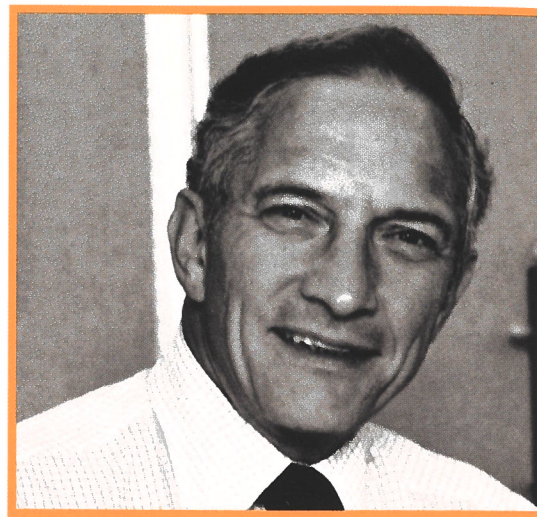
*Evolution of the
Microprocessor*

The History of the Tiny Miracle That Changed the World

intel®

“Don’t be encumbered by history. Go off and do something wonderful!”

Robert Noyce, Intel Co-Founder





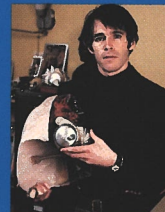

Most of us have memories of what life was like before the microprocessor. Smelling the sharp, distinctive odor of freshly mimeographed paper in grade school. Laboring to learn the nuances of using a slide rule to solve a complex math problem. Or penciling your name on a library card, at the bottom of a long list of prior readers.

Youngsters, of course, will have no recollection of hammering out term papers using equal parts typewriter ribbon and White Out*. Of squinting at an impossibly thin vein of mercury in a thermometer. Or of organizing documents by sequestering them in paper files and then cramming them into overflowing cabinets.

The advent of the age of the microprocessor has meant many things to

multitudes of people, including laser printers, calculators, bar codes and digital medical instruments. But its rise has been gradual, taking a full 25 years to work its way into the prominence it now enjoys. Like a good friend we have known for many years, there is danger in taking it for granted.

For a review of some of the remarkable advances made possible by the microprocessor since 1971, have a

CHIP MILESTONES	Intel develops the 4004 chip (the world's first microprocessor). 	National Semiconductor enters the microprocessor market by launching the IMP-16 chip.	The "bunny suit" first appears at Intel—in Fab 3 in Livermore, Calif. 	The microprocessor market heats up with the introduction by Motorola of the 6800 chip.	Intel's original fab (factory) in Penang, Malaysia, burns to the ground. 	The first 16-bit microprocessor, the TMS 9900, is released by Texas Instruments.	Intel staffing hires its 10,000th employee. 	Fledgling company Texas Instruments, one of the few high-tech companies not located in what would become known as "Silicon Valley," launches the TMS-4164, a 64-kilobyte (KB) memory chip.	Intel launches the 8088 processor, which contains a record 29,000 transistors. 	Intel launches the 8087, the first math coprocessor, and opens a new office: Intel Semiconductor, Ltd., in Hong Kong.	IBM launches its first PC, based on the Intel 8088 chip. 	Intel launches the 80286 processor, which features 134,000 transistors and a 16-bit data bus. 	Intel builds the first wafer containing 25 million bits of information. 	
	NEWS OF THE DAY	President Richard M. Nixon is selected <i>Time</i> magazine's "Man of the Year." 	Eleven Israeli Olympic athletes are killed by terrorists at the Olympic Games in Munich.	Four aides to President Richard M. Nixon resign as the Watergate scandal rocks the U.S. government. Accusations against the President mount, despite vehement denials of wrongdoing from Nixon.	President Nixon resigns from office. 	Some 140,000 South Vietnamese refugees are airlifted to the U.S. after the fall of Saigon.	Apple Computer is founded by Steve Jobs and Steve Wozniak. William Gates drops out of Harvard to launch a product for which there is, as yet, no market.	A nuclear proliferation pact is signed by 15 countries, including the United States and then-U.S.S.R.	Israel's Menachem Begin and Egypt's Anwar Sadat sign the Camp David Peace Accords. 	Margaret Thatcher becomes Great Britain's first female Prime Minister.	A trade union of Polish shipbuilders is started in Gdansk. The group is headed by Lech Walesa, who would later serve as President of Poland. 	Iran's Ayatollah Khomeini releases 52 U.S. hostages after a 444-day standoff and a failed rescue attempt.	Barney Clark is the first recipient of an artificial heart, designed by Richard Jarvik (below). 	Sally Ride becomes the first U.S. female astronaut in space aboard the space shuttle Challenger.
		INVENTIONS/DISCOVERIES	The video cassette recorder (VCR) is launched. Few foresee the multi-million-dollar industry it is destined to spawn. 	The computerized axial tomography (CAT) scanner provides physicians with images that are 100 times more detailed than traditional X-rays. 	The DuPont Chemical Company develops a plastic compound tough enough to be used to make soft drink bottles.	A bar code scanner is used commercially for the first time by a young, dazzled checkout clerk in Troy, Ohio, to ring up a package of Wrigley's Chewing Gum* for an equally dazzled store patron.	Michael Shrayor develops the first word processing program—the "Electronic Pencil"—for the Altair computer.	i-Com launches the "Frugal Floppy," an 8-inch drive that retails for \$1,200. 	Hungarian Erno Rubik patents a unique puzzle consisting of interlocking cubes. More than 100 million are eventually sold worldwide. 	In-vitro fertilization becomes a reality and brings parenthood to thousands who were formerly unable to conceive.	Dr. Spencer Silver develops the Post-it* note, which eventually changes the complexion of busy offices forever. 	Philips Electronics launches the compact disc (CD) after 15 painstaking years of development. 	Gerd Binnig and Heinrich Rohrer, both of IBM, collaborate to develop the scanning tunneling microscope, a device that can resolve atomic structures.	Digital Equipment Corporation releases the first dual-architecture computer, the Rainbow 100, which incorporates both Intel 8088 and Zilog Z-80 processors. The machine can run both CP/M and DOS operating systems.
1971			1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983

er look at the "Then/Now" table on the facing page.

g- Here at Intel, we've had a ring-side seat for many of these dramatic changes. After all, Intel scientists gave rise to the phenomenon. And in the process of doing so, we put in motion some sweeping internal changes of our own. Changes in how we design and build products, in how we market them, and in the PC itself—the end product of

much of our hard work.

It's interesting to look back at the Intel of 25 years ago and compare it to today. In many ways, the history of our company is the history of the high-tech revolution.

Join us, then, as we look back on the first quarter-century of the life of the microprocessor, the little wonder that has changed the world.

**Other brands and names are the property of their respective owners.*



1996—Stanley Mazor, Federico Faggin and Marcian E. "Ted" Hoff are inducted into the Inventors Hall of Fame in Akron, Ohio.

THEN

NOW

Teachers relied on dated, worn-out textbooks to inspire students to learn.

The most popular electronic device in the home is the television.

Virtually every household appliance, from stove timers and wall clocks to wristwatches, were analog (using moving parts).

Cars were controlled and operated through various hydraulic pumps and mechanical linkages.

Complex chemical and biochemical structures and formulas were tediously modeled by hand.

The cold war made the hazards of nuclear testing a fact of life.

Room-sized computing devices like ENIAC were used by a select few at major institutions.

More than 25 percent of U.S. public schools are equipped with CD-ROMs and modems, and connectivity to the Internet promises to put the sum of human knowledge at our children's fingertips.

Worldwide shipments of PCs will soon surpass sales of all TVs.

Nearly everything from microwaves to breadmakers and espresso machines are digitally controlled by microprocessors.

Microprocessors control virtually every aspect of an automobile's functions, from emission control systems to airbags and anti-lock brakes.

Scientists use computers to map human chromosomes, unlocking the secrets of life.

A computer built by Intel for the Department of Energy could eliminate the need for further nuclear testing.

Rapidly falling prices and ready availability make PCs accessible to virtually everyone.

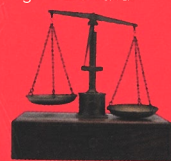
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Motorola launches the 68010 microprocessor.

Intel/AMD/National Semiconductor file a joint anti-dumping petition against Japanese chip manufacturers.

Intel launches the i386™ processor.

As a result of a legal dispute between Intel and NEC, a U.S. court rules that micro-code is protected and that Intel's copyrights are valid.



Intel co-founder Robert Noyce receives the National Medal of Honor from President Ronald Reagan.

Intel embarks on a joint venture with the People's Republic of China to manufacture 16- and 32-bit microprocessors.



Intel launches a technological milestone: the i486™ microprocessor, featuring some 1.2 million transistors.

Advanced Micro Devices (AMD) acknowledges it is actively developing a clone of Intel's i386 chip.



Intel launches the Intel Inside® ad campaign.

Cyrix launches a series of microprocessors that are compatible with Intel chips.

Intel launches the Pentium® processor.

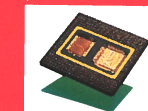


Dataquest, a noted market research firm, ranks Intel as the world's largest producer of semiconductors—the first time a U.S. firm had the distinction since 1984.

Apple launches its first PCs based on Motorola's new PowerPC™ processor: the Power Macintosh® 6100, 7100 and 8100.

Intel launches its first OverDrive® chip—the P24T.

Intel introduces the Pentium® Pro processor.



By mid-1995, an exploding Internet links more than 7 million computers and tens of millions of users worldwide.

Ted Hoff, Stan Mazor and Federico Faggin, co-inventors of the microprocessor, are inducted into the Inventors Hall of Fame.

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Geraldine Ferraro becomes the first female candidate for U.S. Vice President from a major political party.



Mikhail Gorbachev becomes the Secretary General of the Soviet Union's Communist Party—and begins the process of decentralizing the Russian government.



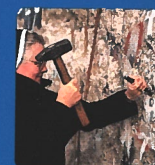
A major nuclear accident occurs at Russia's Chernobyl Power Plant, irradiating hundreds of square miles.

Great Britain's Prime Minister Margaret Thatcher wins a rare third term.



Corrupt Panamanian strongman General Manuel Noriega is convicted by a Grand Jury in Miami, Fla., of drug trafficking charges.

Thousands of protestors—many of them students—are killed by Chinese soldiers in Tienanmen Square in Beijing.



Berlin Wall crumbles, setting in motion the collapse of communism in Europe's Eastern Bloc.

The U.S. launches operation Desert Storm in response to Iraq's occupation of Kuwait.

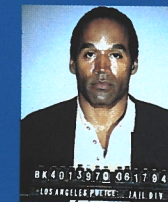
U.S. President George Bush and Russian President Boris Yeltsin declare the "cold war" over.



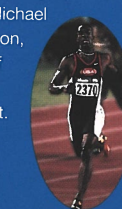
The Palestine Liberation Organization (PLO) signs a peace accord with Israel.

Dr. Thomas Nicely of Lynchburg College discovers that some Pentium processors produce floating-point errors when performing certain calculations.

Sports hero O.J. Simpson is acquitted in the slaying of his former wife, Nicole Brown, and Ronald Goldman.



The 1996 Summer Olympics in Atlanta features gutsy performances by Kerry Strug, one of the smallest Olympians, and Michael Johnson, one of the fastest.



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Apple launches the Macintosh® personal computer.



The Nintendo Entertainment System (NES) is launched to legions of eager game enthusiasts in the United States.

NEC releases the first in a series of high-end "Multisync" monitors for PCs.



Scientists perfect genetic fingerprinting, arming authorities worldwide with another weapon against crime.



Tandy launches a new erasable CD system that is compatible with music, video and data.

The 8-bit Sound Blaster® audio PC card is introduced by Creative Labs, adding rich audio features to a fast-growing number of multimedia PCs.

Microsoft launches Russian MS-DOS 4.01 for the Soviet market.

Microsoft launches a unique ballpoint mouse that uses mouse and track-ball technologies to deliver a pointing device for laptop computers.

IBM launches its ThinkPad® line of laptop computers.

Apple demonstrates its first-generation Newton Personal Digital Assistant (PDA) at a consumer electronics show.



Trying to cover all bases, Apple launches the Macintosh Quadra® 610, a DOS-compatible computer that contains Motorola and Intel chips.

After 15 grim years, preliminary research by scientists indicates a new class of drugs, called protease inhibitors, may someday turn AIDS into a manageable disease.



Organic material on a Martian meteorite provides, for the first time, physical evidence that life may exist elsewhere in the universe.

1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996