Welcome to the NeXT decade

The history of desktop computing has been relatively brief, but hardly dull.

We've seen advances on every level. Some allow us to perform certain tasks better, while others – such as the graphical interface – strike to the very core of the way we use computers.

The truly revolutionary advances are not at all common. In fact, in the last ten years, we've seen only a few. But in the next 24 pages, you're going to see seven.

This is the NeXT™ Computer System.

The NeXT Computer is fundamentally different from other computers. That's a natural result, given the fundamentally different approach with which it was designed.

The mission of NeXT was to create the first computer of the 1990's. A computer that would provide a solution for sophisticated needs today and a base for development well into the next decade.

To accomplish this goal, we worked closely with a number of people whose very business is laying the groundwork for the future: the leaders in Higher Education.

They rank among the most demanding users of technology. In academia, computers are often networked by the thousands. Given the diversity of disciplines, they are pushed to the limit on a daily basis, for complex simulations as well as more traditional uses.

Our collaboration with Higher Education provided the insight needed to visualize the seven breakthroughs that would ultimately define the NeXT Computer:

1. A new architecture optimized for total system throughput, not just individual component benchmarks.

2. A pioneering technology for vast and reliable storage, opening the door for new ways to access and use information.

3. Built-in CD-quality sound, allowing sound to be integrated into applications that are used every day.

4. A unified imaging system – Display PostScript® – for both the display and the printer. So what you see on the screen is unequivocally what you get on paper.

5. An intuitive interface that gives everyone access to UNIX®, with all of its power for networking and multitasking.

6. A multimedia mail system that enables communication combining text, graphics and voice.

7. A new development environment that dramatically cuts the time it takes to create and customize software.

These breakthroughs represent a new yardstick for measuring performance in the 90's. Each is standard in the NeXT Computer System, as are all the features described in these pages.

This is quite important, because it is the standard configuration – common to all users – that serves as the prime target for software developers. The NeXT Computer raises this "lowest common denominator" to an extraordinary level. By doing so, it gives developers the freedom to include richer features and functionality than have ever been available in a general purpose computer.

The story of NeXT, though, is not one of technological achievement alone. Of equal importance are the partnerships we have formed within the industry to ensure a depth of software and the accessibility of NeXT Computers nationwide. As you will see, the effort in these areas has been as intensive as the effort to create the technology itself.

This is your introduction to the NeXT Computer System.

The System

400 dpi Laser Printer. It produces PostScript-generated output with 75% greater resolution than the current 300 dots-per-inch standard – at a price that qualifies it as a personal printer.

Keyboard. 85 keys, for alphanumeric input, system power, display brightness and sound volume.

MegaPixel Display. It measures a full 17 inches diagonally, giving you a workspace that's comfortably large. A million pixels give you clarity and depth you haven't seen on a computer screen before.

Computer. A one-foot cube houses all computing components: the system board, optical drive and power supply. There's room for three additional expansion boards, as well as a large-capacity Winchester drive. The computer connects to the display via a three-meter cord, so it can be placed where convenient.

A mainframe on two chips

If computer speed were determined by processor speed alone, comparisons among machines would be far simpler.

But a computer does more than process a simple stream of information. It must contend with an assortment of input and output devices, such as networks and displays, and pass data to and from memory on behalf of each. Because of this, performance hinges as much on a computer's total design as on the speed of its individual components.

The best measure of performance is "throughput," the amount of information that can be processed through the computer in a mere second. How well a computer performs in this measurement is determined by its architecture: the core design around which the computer is engineered.

Desktop computers offer a variety of architectures, from the most basic PC's to the most advanced workstations. At the high end, throughput is noticeably superior. But even an expensive workstation can bog down when too many devices try to access memory at once. If the network, printer, display, storage and other devices must queue up for access, performance can only be diminished.

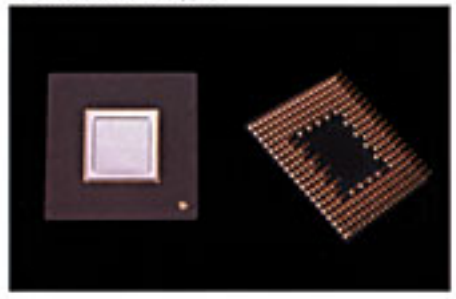
The NeXT Computer acknowledges that throughput is absolutely key to performance. For that reason, we chose not to use the architecture of any existing desktop computer. The desired performance could be found only in a computer of a different class: the mainframe.

Having long shed any self-consciousness over such mundane matters as size and expense, mainframes easily dwarf desktop computers in the measure of throughput.

This is accomplished by a different kind of architecture. Rather than require the attention of the main processor for every task, the mainframe has a legion of separate Input/Output processors, each with a direct channel to memory. It's a scheme that works with ruthless efficiency.

The problem for NeXT, then, was not in finding the proper type of architecture. It was in reducing its bulk so it could sit upon a desk without crushing it – and in making its power more affordable.

The solution was Very Large Scale Integration (VLSI). This technology allowed the shrinking of mainframe architecture, with great economy, onto two chips. One contains 12 Input/Output processors, each with direct access to memory; the other contains the circuitry needed to manage the mass storage.



This unprecedented desktop architecture allows the NeXT Computer to outperform the fastest PC's and many advanced workstations. In the vital measurement of throughput, NeXT technology actually comes within striking distance of a mainframe.

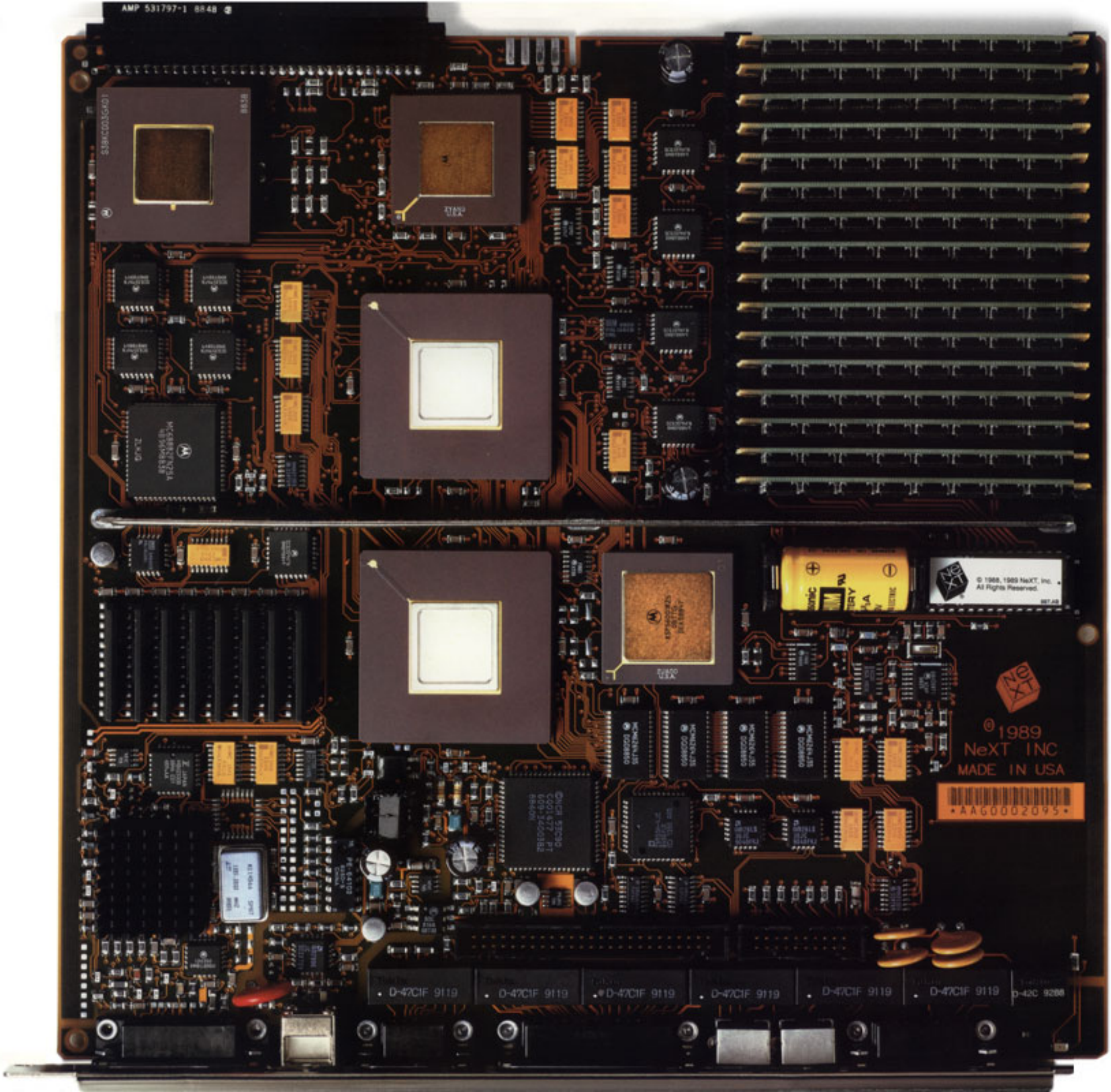
In addition, this drastic reduction in size allowed NeXT to contain the entire system on a single board (pictured to your right). Measuring 11 inches square, it incorporates three processors from Motorola: a 68030 central processing unit, a floating-point unit and – standard for the first time in a desktop computer – a digital signal processing chip capable of producing CD-quality sound. All three operate at a clock speed of 25 MHz. The system board is shipped with eight megabytes of memory, and is expandable to 16 megabytes using 1 MB Single Inline Memory Modules (SIMM's).

On one edge of the board you'll notice the ports that link the NeXT Computer to the outside world, and to other devices as well. The MegaPixel Display and NeXT 400 dpi Laser Printer are both connected here. A SCSI port, with Macintosh®-compatible pinout, allows the addition of various SCSI devices, such as a hard disk or scanner. There are two RS422 serial ports, which are also Macintosh-compatible, and a thin Ethernet connector (to make use of the full 32-bit Ethernet hardware built onto the board). There is also a special port that allows for direct communication with the digital signal processing chip.

The entire board consists of only 45 integrated circuits. It is manufactured to microscopic tolerances in a roboticized factory in Fremont, California – a factory designed and built entirely by NeXT. Reducing the number of parts on the circuit board results in great economy. But even more important, this design enhances both reliability and ease of servicing.

The system board resides in one of four slots inside the computer cube. The other three, though empty, represent an important commitment by NeXT: Our architecture is wide open for development by the entire computer industry. In the future, you'll be able to add new features, from gigabytes of memory to co-processing capabilities, simply by plugging in an expansion board.

All the computing circuitry for the NeXT Computer is contained on a single system board, shown here actual size.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What the future has in storage

Back in the 70's, the world was content to store its computer information on floppy disks. They were cheap, marginally reliable and easily transported from machine to machine.

With the 80's came a new technology, the Winchester drive. Portability was sacrificed, but in most minds it was for a worthy cause: spectacular gains in storage capacity and access speed.

But the NeXT Computer is focused on the 90's, and demands a new level of performance. It offers a method of storage that is simultaneously vast, reliable, transportable and cost-effective – a combination unmatched by computers of any size.

It's a storage technology that is bound to become the standard technology of the 90's: the read/write/erasable optical disk.

In an optical drive, there is no danger of head crashing; data is both written and read via laser. The optical disk itself can be erased and rewritten over and over, with no degradation over time.

Like a floppy, the optical disk is removable. Not only does it provide simple portability from one machine to the next, it provides a high degree of security, in that a user can maintain personal possession of important work.

A single NeXT optical disk offers 256 megabytes of storage. By providing such a huge capacity to every computer user, NeXT is removing a major obstacle to the everyday use of files containing high-resolution graphics and digital sounds – either of which can display quite an appetite for valuable disk space.

Further, a single optical disk can store a user's entire world. That includes the operating system, applications, fonts, data files, manuals, even a library of reference books. With such a disk, a user can sit down at any NeXT Computer and instantly be working in a personalized computing environment. One disk can literally contain the totality of a student's college work, as well as a complete dictionary, thesaurus and other resources vital to a particular field of study. Or, in a business setting, a single disk can store hundreds of thousands of customer records, along with often-used corporate reference materials.

To say that the optical drive provides infinite storage is not an exaggeration. If one disk eventually becomes full, another can easily be inserted in its place. In this way, optical disks offer an extremely low-cost method of storing massive amounts of data.

The NeXT Computer offers Winchester storage as a supplement to its optical technology. High-capacity hard disks are currently available, so it is possible to configure your NeXT System to allow access to truly enormous amounts of storage – approaching one gigabyte and more – without adding a single external device.

As the first computer to come standard with an optical drive, the NeXT System becomes the first to offer a viable means of getting mass storage in and out, quickly and reliably. With this technology in place, NeXT now brings a new order of magnitude to the things a computer can do.

The Optical Drive: A Guided Tour.
The optical disk rotates at a brisk 3000 revolutions per minute. Like a compact disc, it has a layer of reflective aluminum backing, on top of which is a magneto-optical substrate. This substrate is comprised of the crystals that actually hold the information. True to digital tradition, information on an optical disk exists as either of two values, "0" or "1". The value is determined by the magnetic orientation of the crystals. Unlike a floppy or Winchester disk, an optical disk cannot be altered by a magnetic field alone. At normal temperatures, the orientation of its crystals remains locked.

Read and write operations are performed by a single laser. Before new data is written, an "erase" process takes place. An electromagnetic device activates, preparing to orient susceptible crystals to the "0" position. The laser then focuses on the substrate, heating it to its Curie point. (If your physics is rusty, that's the temperature at which the crystals in the substrate "unlock," and allow themselves to be reoriented in the presence of the magnetic field.) In this manner, all portions of the disk to be written are erased.

Next comes the writing procedure. The magnetic field is reversed so that it will reorient those sections of the substrate that reach the Curie point to the "1" position. Every spot to be set to the "1" value is then heated by the focused laser. Upon completion of the writing procedure, a second pass is made to verify accuracy.

In reading data, the magnetic field is turned off. A low-level laser is aimed at the disk, traveling through the substrate and reflecting off the aluminum backing. Enter the Kerr effect – in which the alignment of the crystals in the substrate alters the polarization of the reflected beam. The beam travels through a polarizing filter to a photodetector, and the intensity of the beam determines whether "0" or "1" was read at that particular spot on the optical disk. Simple.

The NeXT optical disk provides mass storage that is portable, reliable and cost-effective. It is shown here in its actual size.

NeXT breaks the sound barrier

Technology that is truly revolutionary often takes some getting used to. But it soon becomes such an integral part of our lives, it's hard to imagine being without it.

Computer graphics are a good example. Back when the primary tool was the typewriter, words and numbers alone met most users' needs quite nicely. The very idea of graphics seemed needlessly extravagant. Now, of course, graphic images in computers are taken for granted. Anything less is archaic.

From the NeXT point of view, the use of sound has many parallels. Since everyday applications have never really incorporated sound, it isn't considered a necessity by today's standards. But as our use of computers becomes more sophisticated, its potential comes into sharper focus.

Without question, there will come a day when computers without sound seem hopelessly antiquated. The NeXT System brings that day significantly closer.

Built into the computer's basic design, alongside the central processing unit and floating-point unit, is a third processor dedicated to the task of handling digital signals – one common example being sound. Digital signals, by their very nature, present themselves as horrifically large arrays of numbers, and the Digital Signal Processor (DSP) has the horsepower to process them with exceptional speed. The result is that it can produce sound with all the quality of a compact disc: a 44.1 kHz sampling rate, 16-bit resolution and full stereo.

To make the use of sound as convenient as possible, audio signals enter and exit the NeXT Computer at the MegaPixel Display. A microphone jack and speaker are both built in. In addition, the display has a jack for Walkman®-type headphones and gold-plated stereo RCA jacks that allow for connecting to an independent audio system.

Because sound is integral to the system design, producing high-quality sound with a NeXT Computer requires no expensive expansion cards or options. The capability is there for everyone, so developers have the opportunity to feature sound in programs designed for everyday use.

Electronic mail, to cite one example, can now include voice messages. This allows you to communicate not only with the perfect detail of an electronic document, but with the urgency and enthusiasm of the human voice.

Voice annotation is one obvious use for sound, but it's only one in a wide range of uses. NeXT technology makes it possible for applications to include any kind of sound a person can hear or imagine.

Scientific simulations can provide audio, as well as visual, feedback. Businesses can use computers to train employees, with demonstrations that are both seen and heard. Medical students can study anatomical models, hearing the sounds of the human heart and lungs as they would be heard through a stethoscope.

With remarkable realism, the sound chip built into the NeXT Computer can actually synthesize musical instruments from pure mathematics.

None of this would be possible if it weren't for the almost unfathomable speed with which the DSP chip processes complex digitized signals. And it is this great power that makes even more uses possible.

Within this single chip lies the technology required to achieve the functions of a fax machine or a modem. Even more thought-provoking are the possibilities it creates in the area of speech recognition. Today, there is fascinating work being done in business and education to tap the potential of the NeXT System's ability to process and respond to the human voice.

By building this powerful DSP chip into the NeXT Computer's basic architecture, NeXT is casting its vote clearly on the side of the future – with a technology that can be put to exceptional use today.

The Digital Signal Processor. *Of the three processors that reside on the NeXT system board, one is the Motorola DSP56001, an 88-pin CMOS Digital Signal Processing chip running at 10 MIPS. Its principal strength is an ability to handle huge matrix calculations with extreme speed. Because the chip itself is programmable, it can be customized for specific purposes: high-speed modems, image processing, two-dimensional graphics, voice recognition, speech synthesis and real-time laboratory testing and measurement. At the core of the chip are three execution units – a data arithmetic logic unit, an address-generation unit and a program-control unit, all of which operate in parallel to provide maximum throughput. The DSP's instruction set consists of 62 instructions, including math, logical, bit manipulation, loop and program-control instructions. Due to the simultaneous operation of its three execution units, the DSP chip executes all instructions, including math instructions, in a single instruction cycle (two clock cycles).*

image processing

speech

sound

array processing

encryption

modem

music

fax

Projecting the right image

While the evolution of computer technology has been frenetic, one cannot say it's been consistently sensible. The very expense of most laser printers is a testament to that fact.

what computers have come to, and where they should be going. It's the first computer to offer a unified system for generating both on-screen and printed images: the Display PostScript system.

On a purely technological level, there is a valid explanation for the high cost of high-quality output: The best laser printers use the PostScript® language to generate their images, but the computers that drive them do not.

Upon receiving image data from the computer, the PostScript printer is forced to build its image from scratch. It needs its own processor, computing circuitry and laser engine – all of which translates directly into hard currency. It also results in a printed image that can be noticeably different from the one generated on screen.

Thankfully, there are no laws requiring this arrangement. The NeXT Computer System presented an opportunity to re-examine

This imaging system brings to the NeXT Computer all the advantages of the PostScript standard. It allows the merging of text and graphics onto a single page. It provides access to literally hundreds of fonts from the Adobe® type library, including classical and contemporary, foreign languages, scientific symbols and musical notation.

It also makes possible the link between the NeXT Computer and professional typesetting machines based on the PostScript language, such as those from Linotype, which are capable of achieving 2400 dots per inch resolution.

Because NeXT's on-screen image is generated by Display PostScript, you can enjoy many of the benefits of PostScript immediately, instead of having to wait until you see them in print. Whatever font, type size, degree of rotation or magnification – your work is always displayed clearly.

With the screen data already in PostScript form, producing laser output becomes a much simpler process. The NeXT Computer just re-images the screen data to match the printer's resolution and sends it along. Having eliminated the redundant computing hardware, the NeXT Laser Printer is available at a price that actually qualifies it as a personal printer.

At the same time, it raises the quality of laser printing to 400 dots per inch, compared to the industry-standard 300. That's an improvement in overall resolution of more than 75% (160,000 dots per square inch vs. 90,000). The NeXT Laser Printer is also capable of 300 dpi quality, only now you can think of it as draft mode.

There are other features to make printing more efficient, as well. The paper tray is adjustable to accommodate a variety of paper and envelope sizes. And a straight paper path lowers the risk of paper jams associated with more circuitous routes.

While laser printers have come and gone, the quality standard has remained at 300 dots per inch.

The NeXT Computer System is designed to be exactly that – a complete system. Placing a printer of such quality on your desktop means an end to having to walk down the hall to retrieve documents from a shared printer. Or wasting time in line as others print before you.

Now laser printing is economically feasible for the individual, and at a higher quality than has ever been possible. This is the future of personal printing.

About the Display PostScript system.
The screen imaging system used by the NeXT Computer is Display PostScript – an extension of Adobe's PostScript page description language. For the user, it provides immediate and practical benefits, as described above. For the programmer, it offers still more advantages. The display portion of programs written for Display PostScript will function perfectly on any computer supporting Display PostScript (though NeXT is the first, others will surely follow). So important routines need not be rewritten when ported to other environments. It's also device-independent, in that an image defined in Display PostScript as a certain size and shape will print in precisely that size and shape on any PostScript-based printer, no matter who manufactures it. With these advantages, and speed as well, Display PostScript is quickly gaining support as the standard imaging system for the 90's.

The NeXT 400 dots per inch Laser Printer gives you 75% better resolution.

UNIX for mere mortals

As computers have proliferated, so has the number of operating systems that power them. Each, of course, has its own set of supporters and detractors.

Despite the debate, UNIX is widely considered the winner in two categories: raw power for multi-tasking and networking. And depth of obscurity for even the simplest commands.

As a result, UNIX has built an enthusiastic following, but primarily among those with a high degree of computer expertise – the scientists, engineers and academicians of the world. Certainly there are simpler and more intuitive systems. The problem is, they lack the power inherent in UNIX.

Choosing the operating system for the NeXT Computer was a key decision. Given the capabilities of UNIX, it was also an obvious one. The marriage of NeXT and UNIX provides an exceptional base for the networking and multitasking needs of the 90's.

But no amount of power has any relevance if it can't be put to use. The challenge for NeXT was to remove the mystery from UNIX, to make it usable by every level of user. The result is one of our biggest breakthroughs: a new user interface that is intuitive and graphical, and at the same time allows full access to the features of UNIX.

This interface makes it possible to access sophisticated functions simply by pointing with the mouse. It also makes it possible for expert UNIX users to work exactly as they are accustomed. If you are so inclined, you can summon a "command-line" window and deal directly with UNIX, with all of its native warmth intact.

On the assumption that you do not have a NeXT Computer in front of you at present, the screen to the right will provide a simple demonstration of how easy it is to interact with our machine. It's exactly what you would see when using the computer: the NeXT workspace.

The multiple windows reflect the multitasking nature of UNIX, and perhaps its greatest single benefit. Simultaneously, you can run as many programs as memory will allow (NeXT's standard eight megabytes will allow quite a few). Though you might leave one program to work on another, that first program is capable of continuing with its task.

In practical terms, this means you can send or receive mail as you compose a document, while another program is busy recalculating an elaborate spreadsheet. It also permits "cooperating applications": One program (a spreadsheet, for example) can call upon another (such as Mathematica™) to perform a function (a complex calculation) for which the second program is better suited. Only when you work with true multitasking can you appreciate how confining a computer can be without it.

As for the graphical interface itself, the NeXT workspace introduces several significant innovations.

The window in the right corner of the screen is called the Directory Browser. Rather than viewing all your files and programs as icons (the optical disk lets you store hundreds, if not thousands, of files), the Browser gives you an easy way to navigate through your work. Pick a folder in the left column and what's inside appears one column to the right. Pick a folder from this column, and its contents appear in the third column. And so on. The current selection appears as an icon on the right side of the Browser.

On the far right side of the screen is the dock, which lets you quickly access your most frequently used applications with a simple double-click. Drag the application icon here from the Browser, and it "snaps" into place. The dock can't be covered by any window, so the applications you place there will always be accessible. And every time you start the computer, the dock will appear just as it was when you last used it.

The NeXT System also makes a major improvement in the way menus are handled. On a big screen, it isn't convenient to go to the top line every time you want to make a menu selection. So in the NeXT workspace, you can locate your menus anywhere. Even though you may work with many windows in multitasking, the current menu will always rise to the top for easy access. Submenus can be torn off and placed where they are more accessible. And when you need more space, a single click will send any submenu away.

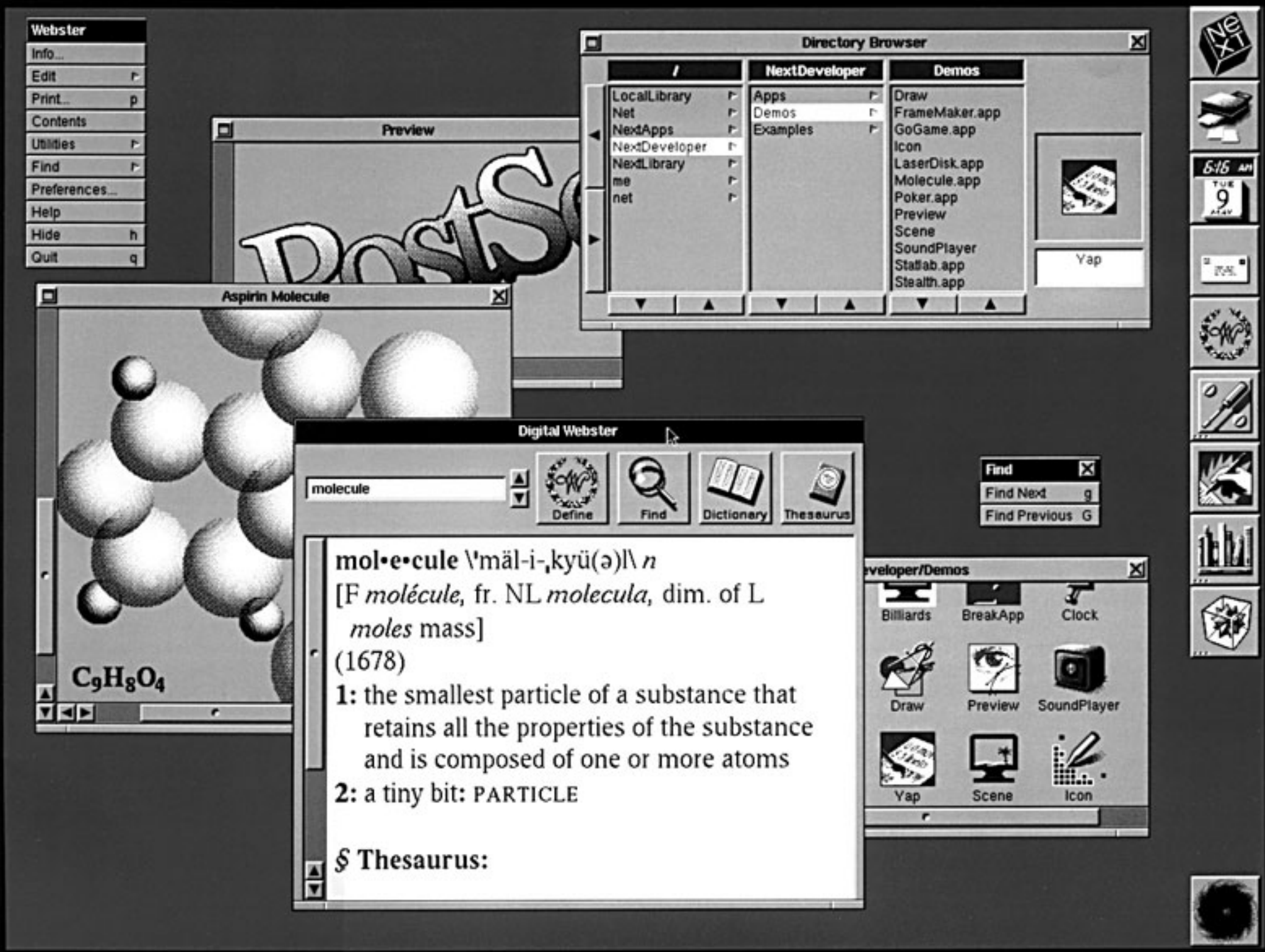
As for your unwanted files, you will notice there is no trash can in the NeXT workspace. Technology has advanced to the point where you can now safely dispose of your trash in a "black hole." It's located on the bottom right of the screen, though it too can be placed where most convenient.

These examples alone should convey a sense of how NeXT has revolutionized UNIX. Because in a raw UNIX environment, accomplishing just these simple tasks would would have required a healthy working knowledge of a very technical language.

Now UNIX is truly a tool for every level of user. With this breakthrough interface, the enormous power of the NeXT Computer System can easily be wielded by anyone. And for those in the mainstream of education and business, that power can have a startling impact.

About NeXT UNIX. As any UNIX guru will tell you, UNIX exists in practically countless different forms. After extensive study, NeXT chose the Mach UNIX kernel developed at Carnegie Mellon University. Mach is compatible with the Berkeley Standard Distribution UNIX Version 4.3, but has a host of enhancements: shared memory, fast inter-process communication and potential multi-processing support through the use of threads. But that's a subject for a brochure all its own.

The NeXT workspace is large and clear. In fact, the display shown here is 93% of its actual size on the MegaPixel Display.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1: the smallest particle of a substance that retains all the properties of the substance and is composed of one or more atoms
2: a tiny bit: PARTICLE
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We built a library that's physically impossible

Imagine a library where you could find every occurrence of a given word without turning a single page. Where a thought in one book leads directly to a related thought in another. Where every book could be turned inside out, so its information appears in whatever order it's needed.

Those are just a few of the advantages you would enjoy if you were to visit a Digital Library – something that's built into every NeXT Computer.

The Digital Library is a means of storing, accessing and using information that goes far beyond the physical limitations of books. It's made possible by two NeXT innovations.

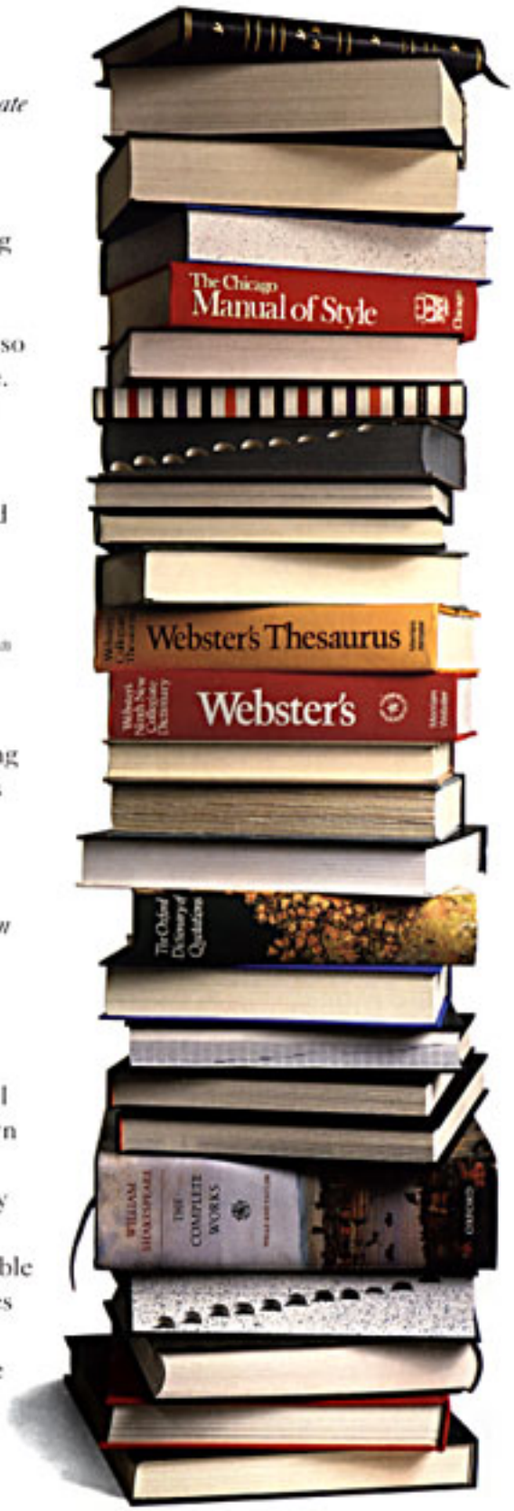
The first is the optical drive, which easily provides storage on the scale needed to store a "library" of books. The second is powerful new cataloging and searching software called the Digital Librarian™.

As you'll find as you read further, the optical disk that ships with the NeXT Computer contains an unprecedented number of programs and resources – including the fully functional Digital Library. The books that comprise this library were chosen primarily to give you an idea of the power of a book in digital form.

There's *Webster's Ninth New Collegiate Dictionary*®, which includes all the definitions, pronunciations, etymologies and illustrations you grew accustomed to in your analog years. All the original typefaces are intact (you can set your preference to any size you'd like), so it all appears quite dictionary-like. But in the digital dictionary you'll find that listings are much more understandable. Different definitions appear on separate lines, and you view each listing outside the traditional sea of small dictionary type. The dictionary is linked with Merriam-Webster's *Collegiate*® *Thesaurus*, which is every bit as complete. So when you look up a word, you have the option of seeing its dictionary listing, its thesaurus listing or both.

Also included are *The Oxford Dictionary of Quotations* and *William Shakespeare: The Complete Works*.

You're hardly limited, though, by the books included on the NeXT optical disk. Other companies will soon be making available their own additions to the Digital Library. Dow Jones, for example, is already demonstrating the digital edition of *The Wall Street Journal*®. Accessible via disk (a single optical disk stores an entire year of *Journal* articles) or direct connection, this resource will let you locate any article with just a few keystrokes.

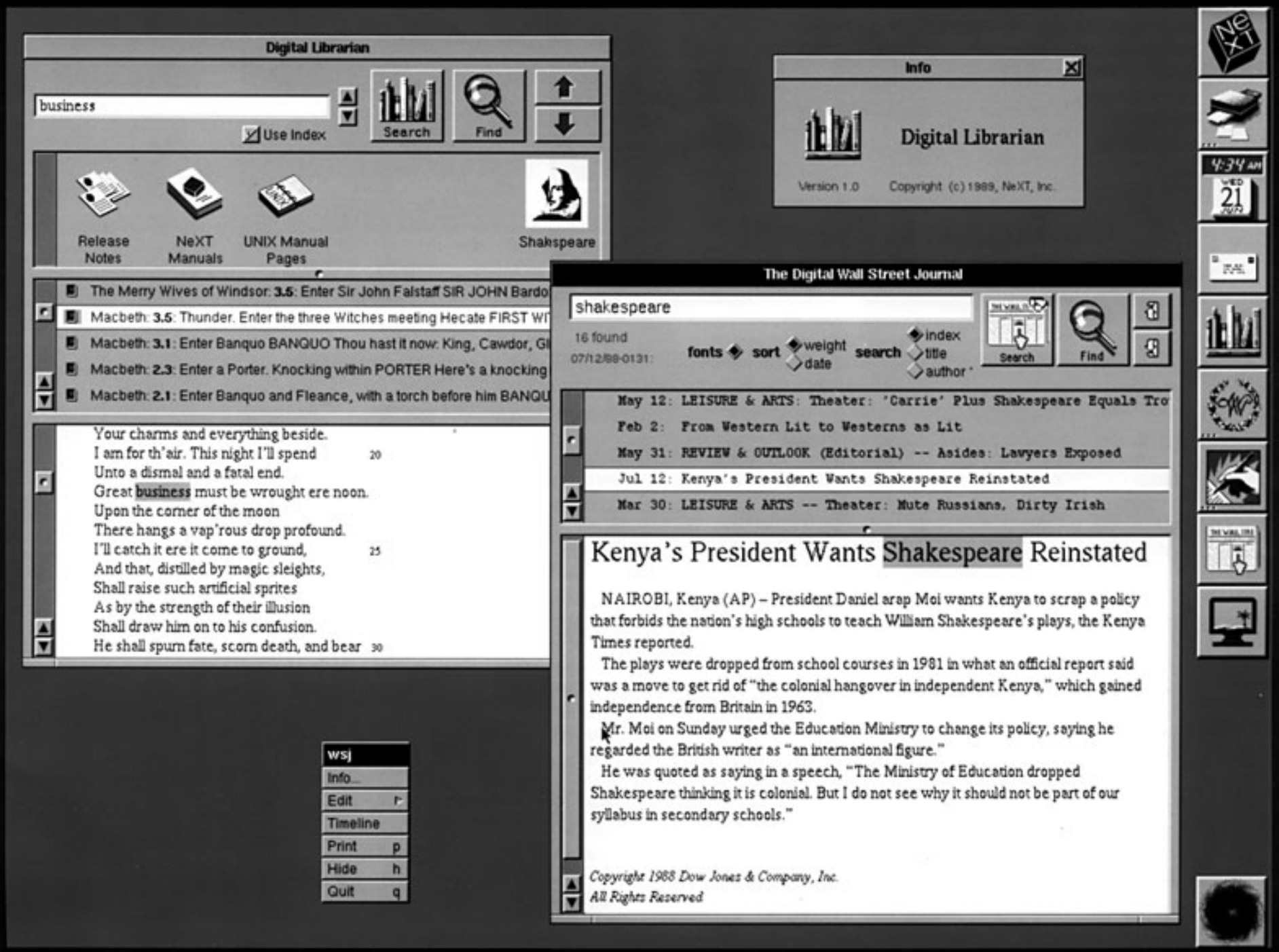


Type in a key word, such as a person or a company, and in seconds you see a list of all the articles containing that word – any of which can be summoned with one click. You can narrow your search by typing more than one word, in which case only articles containing all of your key words will appear.

The NeXT System also makes it easy to create your own libraries. The Digital Librarian's cataloging function lets you enter large amounts of information, while automatically creating an index of key words for you. This index then allows you to search your own information – a new "book" in the Digital Library – the same way you would search the dictionary.

As for the kinds of Digital Libraries you can create, there are no limitations. Professors, for example, might build libraries containing a history of their own collected writings. A legal or medical office might construct a library of often-used reference materials, while a business might build a reference library of contracts and forms.

A personalized Digital Library is an immensely powerful tool. Yet, thanks to the Digital Librarian, the process of creating one is accessible to everyone.


Digital Librarian
business
Use Index
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Release Notes
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UNIX Manual Pages
Shakspeare
The Merry Wives of Windsor: 3.5: Enter Sir John Falstaff SIR JOHN Bardo
Macbeth: 3.5: Thunder. Enter the three Witches meeting Hecate FIRST WI
Macbeth: 3.1: Enter Banquo BANQUO Thou hast it now: King, Cawdor, Gl
Macbeth: 2.3: Enter a Porter. Knocking within PORTER Here's a knocking
Macbeth: 2.1: Enter Banquo and Fleance, with a torch before him BANQU
Your charms and everything beside.
I am for th'air. This night I'll spend
Unto a dismal and a fatal end.
Great business must be wrought ere noon.
Upon the corner of the moon
There hangs a vap'rous drop profound.
I'll catch it ere it come to ground,
And that, distilled by magic sleights,
Shall raise such artificial sprites
As by the strength of their illusion
Shall draw him on to his confusion.
He shall spurn fate, scorn death, and bear
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May 12: LEISURE & ARTS: Theater: 'Carrie' Plus Shakespeare Equals Tro
Feb 2: From Western Lit to Westerns as Lit
May 31: REVIEW & OUTLOOK (Editorial) -- Asides: Lawyers Exposed
Jul 12: Kenya's President Wants Shakespeare Reinstated
Mar 30: LEISURE & ARTS -- Theater: Mute Russians, Dirty Irish
Kenya's President Wants Shakespeare Reinstated
NAIROBI, Kenya (AP) – President Daniel arap Moi wants Kenya to scrap a policy that forbids the nation's high schools to teach William Shakespeare's plays, the Kenya Times reported.
The plays were dropped from school courses in 1981 in what an official report said was a move to get rid of "the colonial hangover in independent Kenya," which gained independence from Britain in 1963.
Mr. Moi on Sunday urged the Education Ministry to change its policy, saying he regarded the British writer as "an international figure."
He was quoted as saying in a speech, "The Ministry of Education dropped Shakespeare thinking it is colonial. But I do not see why it should not be part of our syllabus in secondary schools."
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WSJ
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Timeline
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Hide h
Quit q

Our most important promise is in the mail

In most people's minds, desktop publishing established a high point for computing in the 80's. It provided a dramatically new day-to-day use for technology. As we move into the 90's, it's likely that we'll see another application with a similar impact on the way people communicate: Mail.

Of course, electronic mail already exists today, but on the NeXT System, it functions at a level that can reshape the relationship between person and computer. It draws upon all of NeXT's technological breakthroughs to produce a unique and powerful tool.

NeXT Mail is an integral part of the machine, so no additional investment is required. The software is included on the optical disk packaged with the system and the protocols for Ethernet and TCP/IP are built in.

With its innate talent for multitasking, the NeXT Computer can monitor your messages, even if you aren't currently working in your Mail window. The Mail icon in the dock lets you know if there are any messages waiting. The multitasking environment also allows you to access Mail at any moment, without having to end your work session in another program. That may sound like a simple pleasure, but it is one that becomes increasingly important as you use Mail more. And for many, Mail is the most frequently used application.

NeXT Mail is so intuitive, most people will be able to use it without even touching a manual. But as simple as it is to operate, it offers sophisticated functions not found together in any other computer.

Ours is a multimedia mail system. It allows you to send and receive documents of any kind, whether they contain text, graphics, sound, voice or any combination thereof.

To send a document, for example, you would simply select the document from your list of files, attach a memo (if desired) and choose a recipient from your address list.

NeXT Mail allows you to easily incorporate voice messages into your communication. It works like a simple tape recorder, allowing you to start and stop recording, even edit your finished product. When you are satisfied with your recording, you simply place it inside your Mail message. You can attach any number of voice annotations. When the message is complete, sending it is only a matter of clicking the Deliver button.

While in certain circles it is better to give than receive, NeXT Mail offers tangible benefits to those at both ends of the transaction. The screen to your right demonstrates many of its advantages by showing how you would view incoming messages on the NeXT Computer.

In its top area, the Mail window presents you with a list of unopened communications, if any. Each is identified by the date, sender and subject of message. When you click the message of your choice, it appears in the lower section of the window.

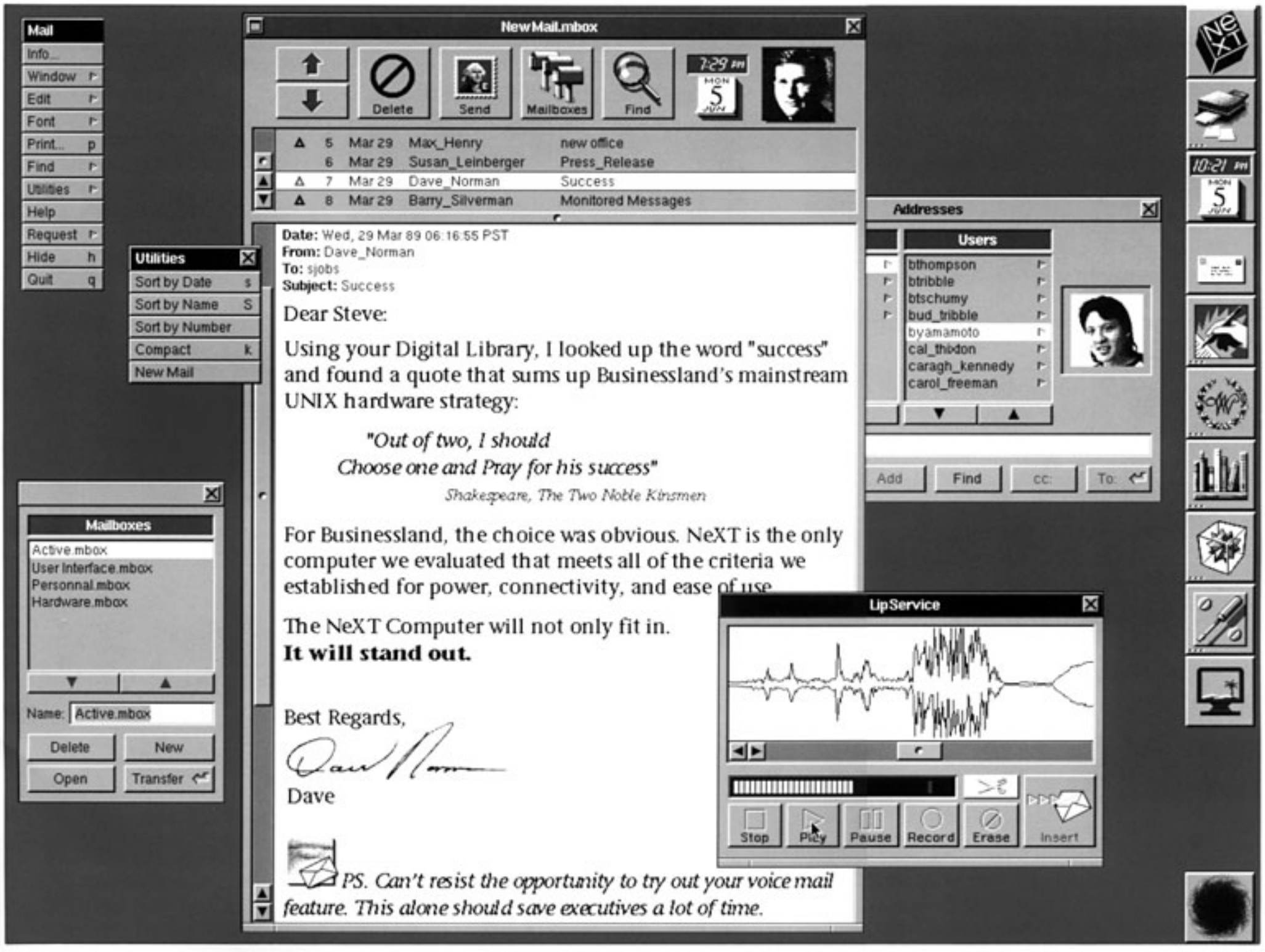
As you see, a message can contain many different elements. The text itself can be enriched with different type styles, which is a tremendous improvement over the single monotonous style offered in most other forms of electronic communication. Graphic images can be included as part of the message for further enhancement. And voice memos add another important dimension.

NeXT Mail doesn't confine you to a single mailbox. Rather, it allows the creation of multiple mailboxes, to better organize your personal communications.

It's all part of the simplicity that NeXT Mail brings to an application available today, but greatly underused. Yet its simplicity does not diminish its power. In fact, a NeXT Computer not only makes a perfect mail station on a network, it can become a dedicated server – efficiently serving an entire group of people. As a server, it can become the central storage point for the mail system, as well as a storage area for commonly used work files.

Because of its design, the NeXT System fits comfortably into a multivendor environment. You can communicate from one NeXT Computer to another, or from a NeXT Computer to many other systems. Of course, a NeXT Computer communicating with its own kind allows you to use Mail with all of its richness of features, including voice mail.

Mail is a perfect example of the leaps made possible by the power of the NeXT Computer System. By adding new layers of functionality, it transforms E-Mail into a completely new kind of tool – an intuitive means of multimedia communication.


Mail
Info...
Window
Edit
Font
Print... p
Find
Utilities
Help
Request
Hide h
Quit q
NewMail.mbox
Delete
Send
Mailboxes
Find
7:29 PM
MON 5 JUN
5 Mar 29 Max_Henry new office
6 Mar 29 Susan_Leinberger Press_Release
7 Mar 29 Dave_Norman Success
8 Mar 29 Barry_Silverman Monitored Messages
Date: Wed, 29 Mar 89 06:16:55 PST
From: Dave_Norman
To: sjobs
Subject: Success
Dear Steve:
Using your Digital Library, I looked up the word "success" and found a quote that sums up Businessland's mainstream UNIX hardware strategy:
"Out of two, I should
Choose one and Pray for his success"
Shakespeare, The Two Noble Kinsmen
For Businessland, the choice was obvious. NeXT is the only computer we evaluated that meets all of the criteria we established for power, connectivity, and ease of use.
The NeXT Computer will not only fit in.
It will stand out.
Best Regards,
Dave
PS. Can't resist the opportunity to try out your voice mail feature. This alone should save executives a lot of time.
Utilities
Sort by Date $
Sort by Name S
Sort by Number
Compact k
New Mail
Addresses
Users
bthompson
btribble
btschumy
bud_tribble
byamamoto
cal_thixton
caragh_kennedy
carol_freeman
Add
Find
cc:
To:
Mailboxes
Active.mbox
User Interface.mbox
Personnal.mbox
Hardware.mbox
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Delete
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MON 5 JUN

A revolution for developers

There are two sides to every computer story. One involves the people who use it, the other involves the people who program it.

Macintosh made computer history by revolutionizing the user interface. But while the users reaped tremendous benefits, the programmers paid the price. From their point of view, that interface symbolized not only progress, but hundreds of complex routines and serious delays in software development.

The NeXT Computer System is unique in its planning, in that it addresses the needs of both users and programmers. In fact, in many instances, it actually begins to blur the distinction between the two.

We've created a radically different environment in which software can be developed: NextStep®. This new environment cuts development time to a fraction of what it's been in the past, largely because it allows much of a programmer's work to be done graphically.

In designing a program, for example, you would use an extraordinary tool called Interface Builder™. It provides you with a palette of interface elements (windows, menus, buttons, etc.) that can easily be arranged to make your program look just the way you want it to.

NextStep is a world of such "objects." Each is pre-programmed for its own look and function, and ready to plug into new applications. A programmer can use the objects that come with NextStep or create brand-new objects. Existing objects can also be customized to fit precisely into a programmer's vision.

Then, simply by connecting objects, new programs can be created or existing ones customized – often with little new programming. And often at the hand of someone who has never before been considered a programmer.

Objects exist conveniently in kits. The Application Kit™ contains approximately forty objects that represent the core of any application, including the user interface. But new kits, devoted to specific areas of interest, will provide users with tools they never had before.

A physics professor could construct a myriad of experiments using a Physics Lab Kit. It would contain all the familiar objects in the laboratory, from test tubes to analysis equipment. Interface Builder would make it possible to construct different experiments simply by selecting the appropriate objects and establishing the connections between them.

The same concept would apply to every discipline. Only now, instead of taking months to develop customized software for classroom use, it would be a matter of days, perhaps hours. So professors and their assistants could realistically create software within the confines of their busy schedules.

In business, NextStep has equally far-reaching potential. For the first time, applications will not only be much easier to develop, they'll be far easier to maintain and upgrade. Because objects can be modified in appearance or function with minimal new programming.

And one other very important thing to know about NextStep: It's such a remarkable technology, IBM has licensed it for use in their UNIX-based computers. And the fact is, any program developed on one computer using NextStep can easily be ported to another. That adds up to even more good news for the people who will ultimately benefit from this new programming environment: the users.

NextStep ensures that we will see more programs, and more powerful programs, in a shorter period of time than has ever been possible on a revolutionary platform.

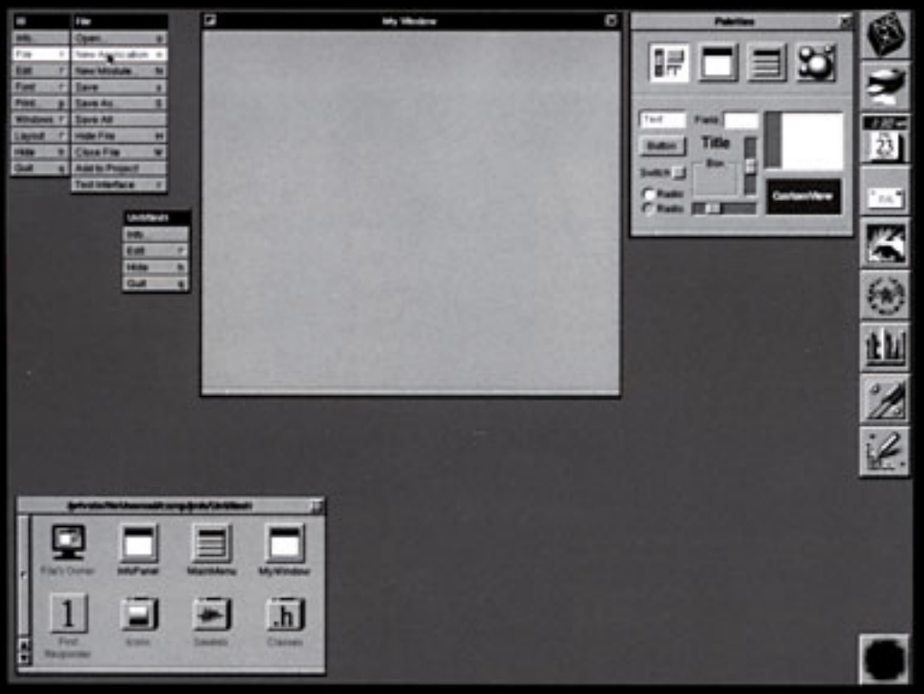
About NextStep. *Our goal in creating NextStep was to speed development time and free the programmer from the time-consuming job of constructing and debugging the user interface. To look at it one way, NextStep is actually made up of four layers that sit atop the UNIX operating system:*

The Window Server, which keeps an eye on events such as mouse movement and keyboard input, then either handles the event or passes it to the appropriate program; the Workspace Manager™, which oversees the graphical interface to the UNIX operating system; the Application Kit, which consists of the programming objects common to most applications; and Interface Builder, which allows the programmer to graphically design an application interface and define the relationship between objects.

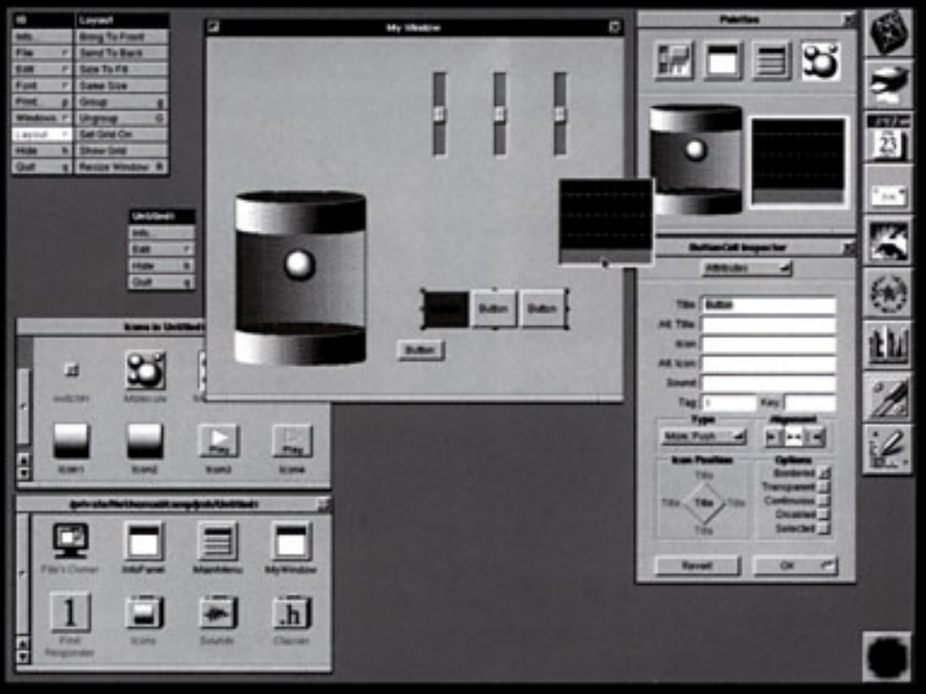
Within the Window Server layer is the Display PostScript interpreter, which manages the placement of text and graphics within a window for each program.

The NeXT Computer comes with a full development environment, including an ANSI C Compiler with extensions to support Objective-C™ and a source level debugger.

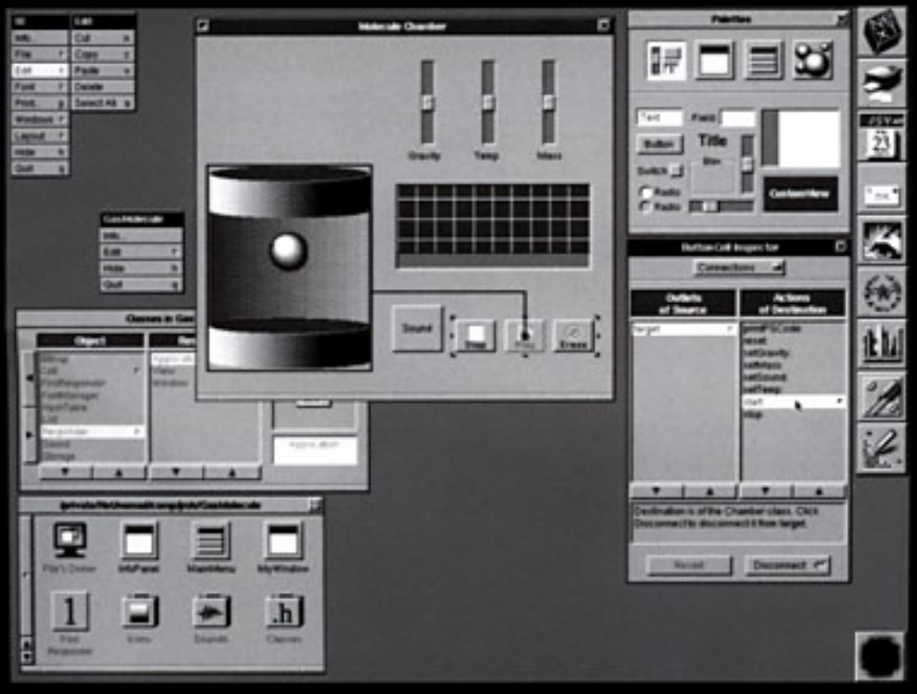
The foundation for a future of software that's more quickly developed and more easily customized.



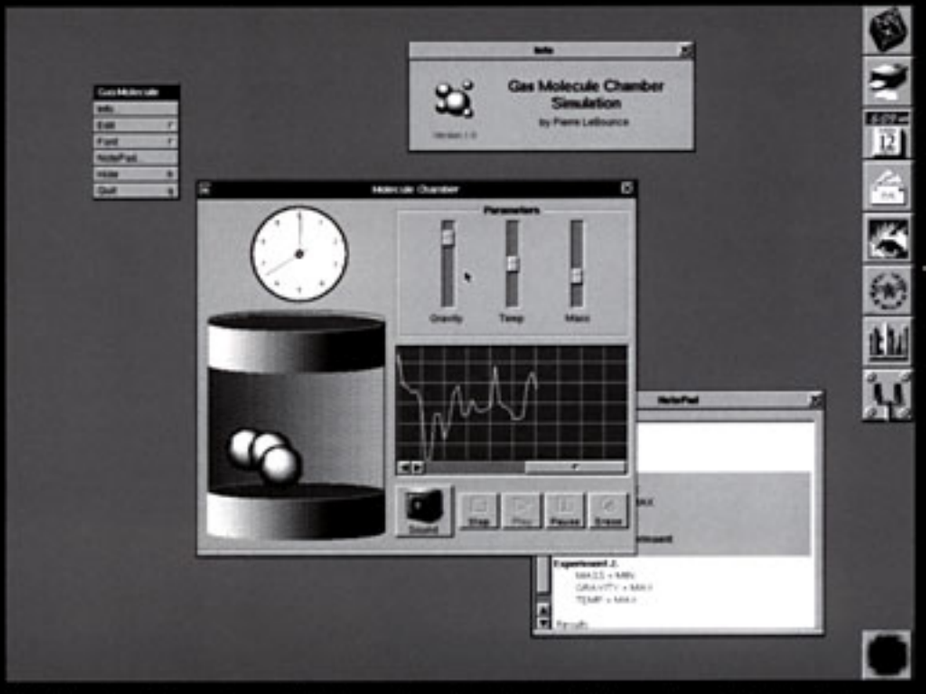
Interface Builder allows anyone, programmer or not, to design a sophisticated graphical interface. You begin with an empty window and a palette of interface objects.



From the palette, select whatever objects you need – buttons, labels, menus, and so on. Simply drag these objects (or any custom objects created by yourself or others) into the application window and arrange them as you please.



Once you've designed your application interface, Interface Builder lets you establish links so that actions on one object can have an effect on another. Links are created graphically.



With the interface design complete and links between objects defined, Interface Builder produces a finished application – one that can easily be modified in the future with little or no programming effort.

Unlimited partnerships

Making a computer an effective tool requires much more than simply making a computer. It requires establishing partnerships across the industry – to ensure that the best software is developed quickly, and that there is widespread access to the technology. What you see in the NeXT Computer today demonstrates how effective the right partnerships can be.

As an example, NeXT may not be the biggest computer company, but it does have the largest and most impressive research lab of all: Higher Education.

It was our alliance with the leaders in academia that helped NeXT develop a vision of what a new-generation computer could be. Even before its general release, the NeXT Computer was alive and functioning on campuses nationwide – in science labs, in engineering labs, on professors' desks and in students' hands.

What we learned there, from uses as diverse as the university community itself, has helped make the NeXT Computer as powerful and usable as it is today. Further, our collaboration with academia has encouraged some of the nation's most adventurous minds to begin developing applications for the NeXT System. As this relationship flourishes, NeXT will continue to provide innovative products for universities – many of which will have an impact far beyond the campus boundaries.

To make our technology available across the country, NeXT has formed another important partnership – with Businessland. This organization maintains a sales force of over 700 people to meet the computing needs of the *Fortune*® 1000. It also maintains over 150 locations nationwide.

One particular strength of Businessland is its experience in the area of networking. Having successfully connected more desktops than anyone in the industry, Businessland has the expertise to ensure that the NeXT Computer fits into any environment, and works well with existing equipment.

Businessland has achieved its success largely because of its commitment to helping customers after the sale. They can provide full training, along with complete technical support. As an indication of the importance Businessland attaches to its customers' post-purchase success, the company employs more system engineers than it does salespeople.

Businessland is NeXT's exclusive authorized dealer.

Of course, there is another partnership that's absolutely crucial to providing a useful product: NeXT and the software developers. NeXT has been working closely with the software industry – something that should be immediately apparent in the unprecedented amount of software bundled with the system.

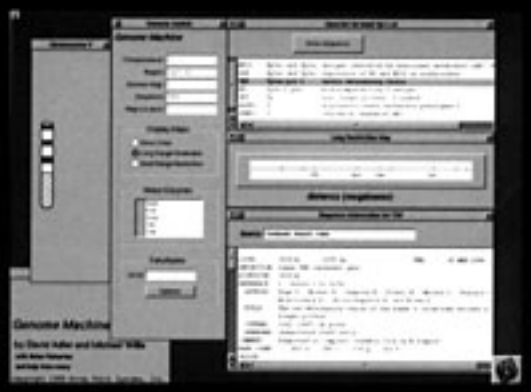
There's WriteNow™, for word processing. A powerful SQL Database Server from Sybase. Mathematica, a symbolic mathematics program. Objective-C®, a programming language. Allegro CL® Common Lisp, for development of artificial intelligence applications. And NeXT's own Digital Library, Mail and NextStep, complete with programming kits for sound and music.

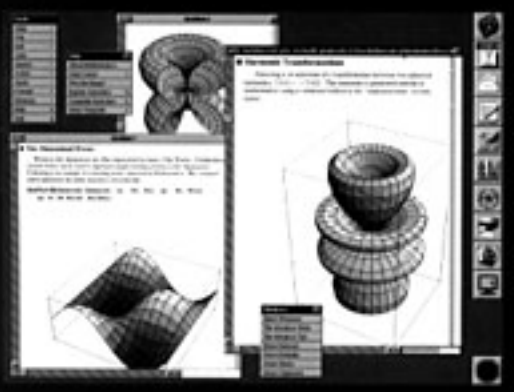
In addition, many of the major developers have already announced their plans to create software for the NeXT System. Ashton-Tate, Lotus and Aldus all expect to ship exciting new products. Informix will deliver their innovative graphic spreadsheet, Wingz™, integrated with Informix-SQL, a high-performance relational database.

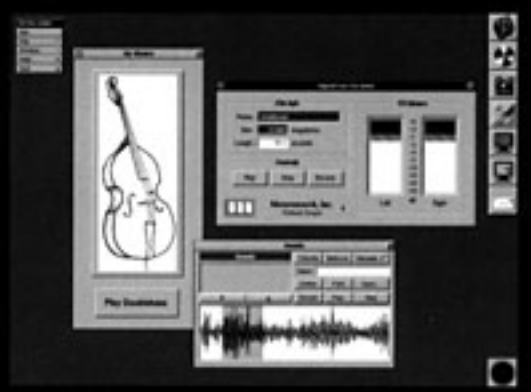
Adobe is preparing Illustrator®, which harnesses the power of Display PostScript to create camera-ready art. Frame Technology will offer FrameMaker™, a feature-laden professional publishing package. And Media Logic is developing Artisan™, an advanced high-resolution grayscale painting, drawing and image processing system.

Hardware developers are working with NeXT as well. Cayman Systems will be producing GatorBox™, a gateway to link Macintosh to NeXT, and vice versa. And Dayna Communications is working on DaynaFILE™, an external SCSI disk drive that can read and write standard UNIX disks, as well as disks created in MS-DOS® and Macintosh environments (in either 5.25" or 3.5" disk sizes).

The partnerships established by NeXT have resulted in a machine that is poised for the future, but quite functional today. Those who have committed themselves to NeXT technology have done so with a vengeance, and the enthusiasm has been gratifying. Of course, we continue to cultivate new partnerships. Because as powerful as our engineers made the NeXT Computer, these partnerships make it more powerful still.

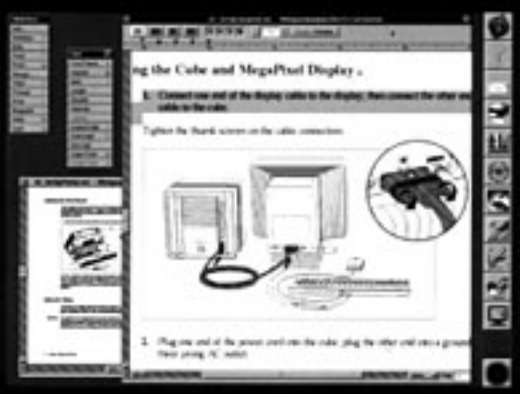






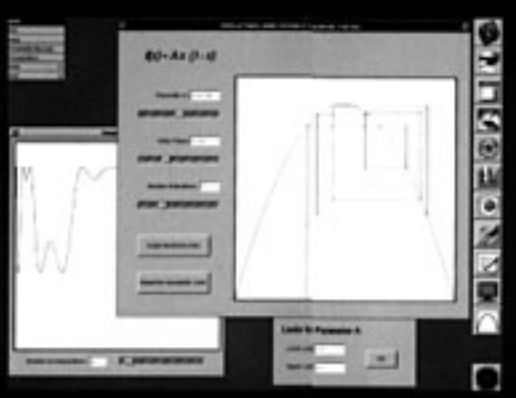

Shadow
STAFFORD
This is an example
of the Smart Art effect
Movie Title Text
TEXT
Distance Text
Faded
BANDED
Neon
Drop Shadow


FORTRAN 77
to
Object-Oriented FORTRAN




ClickArt EPS Artwork
by T/Maker Company


HOMEOWNER'S GUIDE TO



CAPITOL
NEWS

GRADATION

The 1990's: Enter here

One of the most important considerations in selecting a computer is the way it performs today. Of equal importance is the room it allows for growth in the future.

By this, we do not refer to a physical ability to accommodate extra memory chips or expansion cards. Rather, we address the greater issue of "headroom": whether the machine itself is capable of absorbing major innovation, or has already reached its peak.

In the preceding pages, you've seen how the NeXT Computer offers a technology that can be put to full use today. You've also seen how it provides a platform for future development with seven breakthroughs.

The NeXT Computer's architecture achieves new levels of throughput, allowing the machine to perform simultaneous operations efficiently – in much the same way as a mainframe does.

Its optical drive makes it possible for day-to-day applications to call upon vast resources, to manipulate not just pages of information, but entire books' worth.

Its ability to produce CD-quality sound means we will see applications that let us interact with the computer in entirely new ways, using sound cues as well as visual ones.

The unified imaging system allows the user to reap benefits on the screen that have previously only been available on the printed page.

The NeXT Computer's graphical, intuitive UNIX interface allows even a novice user to sit down at the computer and immediately enjoy the advantages of a full multitasking environment.

The expansion of Mail into multi-media communication allows electronic messages to be every bit as complete as human communication, right down to the spoken word.

And the NextStep development environment brings the power of the graphical interface to the programmers themselves, to allow faster design, creation and modification of applications.

All of these breakthroughs combine to create almost unimaginable room for growth.

A developer about to create software for the NeXT Computer will see more potential than in any computer ever designed for popular use. With these features standard in every NeXT System, new levels of performance can be built into applications without requiring the user to invest in a single piece of additional equipment. That alone removes one of the greatest roadblocks to the creation of more powerful software. And the potential for the developer is transferred directly to the user.

The future aside, though, NeXT technology allows for a very productive present.

The partnerships that NeXT has formed with Higher Education, software developers and Businessland all contribute to the usability of NeXT technology today. Literally out of the box, the NeXT Computer runs more software than has ever run on a revolutionary new platform – without requiring even a single visit to a software store. And many other major developers have already announced their commitment to releasing software for NeXT users.

Those who choose to put NeXT technology to work will find an immediate source of equipment and technical support in Businessland, with its many locations nationwide. Not only does Businessland have the resources to meet individual and corporate needs, its years of experience in networking ensure that NeXT Computers can be completely integrated into environments of mixed manufacturers.

Now that you're more familiar with NeXT technology, we invite you to experience it firsthand. If you are part of a university community already using NeXT Computers, contact your campus computer center. Otherwise, simply visit your nearest Businessland location.

As many will enthusiastically confirm, your first experience with the NeXT Computer System will be as captivating as the first time you ever used a computer.

A personal demonstration will give you an opportunity to explore, and provide ample evidence that the NeXT decade has already begun.

The image here (93% of the actual size) has been taken directly from the NeXT MegaPixel Display. Resolution: 92 dpi.


5:57 PM
FRI
30
JULY

Specifications

Computer

Processors
Motorola 68030 25 MHz CPU
Motorola 68882 25 MHz floating-point unit
Motorola 56001 25 MHz Digital Signal Processor
Integrated Channel Processor
- 12 DMA channels
- 32 MB/sec bandwidth

Optical Storage Processor

Random Access Memory
8 MB to 16 MB of memory
User-expandable in 4-MB increments

Communications and Interfaces
Thin-wire Ethernet, IEEE 802.3a compatible
Two RS422 serial ports
SCSI interface with transfer rate of 4.8 MB/sec (burst rate)
Three NextBus expansion slots
Printer port (for NeXT 400 dpi Laser Printer only)
Digital Signal Processor port

Dimensions
One-foot (305 mm) die cast magnesium cube
Space for two full-height, 5.25-inch mass storage devices
29 lbs. to 37 lbs. (13 kg to 17 kg)

Power
Powers up to four slots with 20 W each
90 V to 270 V, 47 Hz to 63 Hz
5 A, 300 W maximum (including MegaPixel Display)

Operating Environment
Ambient temperature: 32° F to 104° F (0° C to 40° C)
Relative humidity: 10% to 90%
Altitude: 0 to 15,000 ft. (0 to 4,572 m)

Regulations
UL Listed and CSA Certified
Complies with FCC Part 15 Class A requirements

MegaPixel Display

Monitor
17-inch monochrome
Flat screen
1120 x 832 x 2 resolution (92 dpi)
Four colors (black, white and two levels of gray)
Refresh rate of 68 Hz noninterlace
Integrated tilt and swivel stand

Interfaces
8-bit, 8012.8 Hz analog-to-digital converter
- input via microphone miniphone jack (mono)

16-bit, 44.1 kHz digital-to-analog converter
- output via:
  - Headphone miniphone jack (stereo)
  - Gold-plated RCA line-out jacks (stereo)
  - Integrated speaker (mono)

Keyboard and Mouse
85 keys including:
- Cursor keys, numeric pad, monitor brightness, sound volume, power on/off

Two-button opto-mechanical mouse

Dimensions
16 in. (w) x 17.3 (h) x 14 (d)
408 mm (w) x 440 (h) x 354 (d)
50 lbs. (23 kg)

Mass Storage

256 MB Optical Drive (formatted)
NeXT interface using Optical Storage Processor
92 ms average seek time
88 ms average seek time within 3 MB range
4.6 MB/sec raw burst transfer rate
800 kB/sec raw sustained transfer rate
Magneto-optical technology
Read/write/erasable and removable media
Primary disk and/or backup

Internal 330 MB Hard Disk (formatted)
SCSI interface
14.8 ms average seek time
45 kB dual-ported FIFO buffer
4.8 MB/sec raw burst transfer rate
1.4 MB/sec raw sustained transfer rate

Internal 660 MB Hard Disk (formatted)
SCSI interface
16.5 ms average seek time
45 kB dual-ported FIFO buffer
4.8 MB/sec raw burst transfer rate
1.4 MB/sec raw sustained transfer rate

400 dpi Laser Printer

Resolution and Speed
300/400 dots per inch (software-selectable)
8 pages per minute
Minimum top, bottom and side margins of 0.2 in.
High-speed serial interface

Duty Cycle
No monthly page limit
300,000-page life expectancy
Uses standard EP-S toner cartridge

Paper
150-sheet paper cassette
Adjustable width for A4, letter-size, and envelopes
Auto and manual feed
Straight paper path
50-sheet output tray

Dimensions
14.3 in. (w) x 7 (h) x 16.7 (d)
- 32.3 in. (w) with paper trays

363 mm (w) x 180 (h) x 423 (d)
- 820 mm (w) with paper trays

38 lbs. (17 kg)

Power
115/220 V switchable power supply
110 W at 115 V in standby mode
5 A, 640 W at 115 V peak power while printing

Environment
Ambient temperature: 50° F to 90° F (10° C to 32° C)
Relative humidity: 10% to 80%
Altitude: 0 to 8,000 ft. (0 to 2,438 m)

Regulations
UL Listed and CSA Certified
Complies with FCC Part 15 Class A requirements
Conforms with CDRH radiation performance standard, 21 CFR Chapter 1, Subchapter J

Bundled Software

System Software
Mach/UNIX® (4.3BSD compatible)
Networking
- TCP/IP
- NFS™

NextStep®
- Window Server
- NeXT Window System
- Display PostScript™
- Application Kit™
- Interface Builder™
- Workspace Manager™

Objective-C® 4.0
GNU C Compiler
GNU GDB Debugger
GNU Emacs
Allegro CL® Common Lisp
Ariel Bug-56™, symbolic DSP debugger
Motorola ASM5600™ DSP Assembler
NeXT SQL Database Server from Sybase, Inc.
Sound Kit™, Music Kit™
TransScript™
Berkeley UNIX utilities
NextStep programming examples and demos

Applications
Mail, electronic mail with voice mail
Edit, a window-based program/text editor
WriteNow™, full-featured word processing
Mathematica™, a mathematics application from Wolfram Research, Inc.
Digital Librarian™, a search and indexing tool
Terminal, VT 100 terminal emulator
TeX, a typesetting application
Digital Library
- Webster's Ninth New Collegiate Dictionary®
- Webster's Collegiate® Thesaurus
- The Oxford® Dictionary of Quotations
- The Oxford University Press®
  - Edition of William Shakespeare: The Complete Works
- NeXT technical documentation and user manuals
- Documentation for bundled applications

This brochure was created by the NeXT design team. All photos are by Cheryl Rossum, except for page 4, the mainframe photo, by Stephen Frisch, and page 25, the screen photo, by Imtek Imagineering.
Part 0136.00 Printed in U.S.A.

For more information about the NeXT Computer System, contact:

NeXT, Inc.
900 Chesapeake Drive
Redwood City, CA 94063
800 848 NeXT


1
4
282


DSP
A–Serial–B
SCSI
Printer
E net
Display
NeXT
Computer
Model No: N1000
Part No: 23.00
AAK0001361
© 1988 NeXT, Inc. Palo Alto, California. NeXT and the NeXT logo are trademarks of NeXT, Inc. Patent applied for.
Verified to comply with the requirements in Part 15 of FCC Rules for a Class A computing device.
Operation of this equipment in a residential area may cause unacceptable interference to
radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.
Made in U.S.A.
~ 50–60 Hz
100-240 VAC
300 Watts 5 Amps
33Z4
Listed EDP
equipment
LR61104
Certified Only to the Canadian
Electrical Code
Certifié en vertu du Code Canadien de
l'Electricité Seulement