Big Dummy's Guide to the Internet

A round trip through Global Networks, Life in Cyberspace, and Everything...
Texinfo Edition 2.2, February 1994

by Adam Gaffin with Jörg Heitkötter

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G'day, folks!

August 27, 1993

I came across this guide while reading "EFFector Online Volume 5 No. 15, 8/20/1993" (A Publication of the Electronic Frontier Foundation, ISSN 1062-9424), that is available via **comp.org.eff.news** and immediately decided to get my hands on it. After browsing through the raw ASCII text file, I thought that such a useful thing, should have a more beautiful "face" (and fewer "bugs").

As Shari points out, the EFF is still "fishing for a publisher." In other words, it's far from being clear when this guide will be available as hard copy, unless you want to print out the "buggy" ASCII file. Thus, I started over to make the bulk a *Texinfo* document, loosely modelled after *Brendan Kehoe*'s *"Zen and the Art of the Internet"*, originally written for Widener University's, Computer Science Department, and later published as:

> **Kehoe, B.P.** (1992) *"Zen and the Art of the Internet: A Beginner's Guide to the Internet."* 2nd Edition (July). Prentice Hall, Englewood Cliffs, NJ. 112 pages. The 1st Edition, (February, 2nd) is still available via anonymous ftp from **ftp.cs.widener.edu** and many other Internet archives.

It was the first comprehensive book on the Internet available. (Despite the "traditional" postings in **news.announce.newusers** originated by ex-**Net.god** *Gene Spafford* `<spaf@cs.purdue.edu>` of Purdue University and the **news.answers** archive maintained by **Net.demi-god** *Jonathan I. Kamens* `<jik@security.ov.com>` of MIT).

Situation has changed dramatically, since. More and more books get into the stores, and hopefully facilitate the life of "newbies" on the Net. Just to mention some IMHO excellent examples:

> **Krol, E.** (1992) *"The Whole Internet: Catalog & User's Guide."* O'Reilly & Associates, Inc., Sebastopol, CA. 376 pages.
>
> **LaQuey, T.** and **Ryer, J.C.** (1992) *"The Internet Companion: A Beginner's Guide to Global Networking."* Addison-Wesley Publishing Co., Reading, MA. 208 pages.
>
> **Gilster, P.** (1993) *"The Internet Navigator: The Essential Guide to Network exploration for the Individual Dial-Up User."* Wiley & Sons, New York, NY. 470 pages.
>
> **Hahn, H.** (1993) *"The Internet Complete Reference"* Osborne McGraw-Hill. 800 pages.

But, "the Net" in its present form would have never been evolved without the hundreds of unpaid voluntary efforts (*de facto* Internet still *is* run on voluntary basis), so here are *my* two cents: The output of several night-shift editing sessions.

> "The *Big Dummy's Guide to the Internet* is now available at your local laser printer..."

See ya on the Net!

p.s.: Although this guide is almost complete, and I really, really, honestly, don't have the time to go over it once again, feel free to report "bugs", or any inconsistencies you find. Drop me "more quotes," further additions, requests for moral support, or "whatever-you-want"... Just an e-mail away.

p.p.s.: I'd like to say a BIG "thank you" to *Shari Steele*, for her immediate excitement on this project. *Adam Gaffin*, who generously accepted my changes to his initial ASCII version. *Howard Rheingold*, who let me include his article, now serving as superb afterword of long-year first hand experience in cyberspace (and yes, I mentioned your new book, Howard `;-)`). And, last not least, thanks to *Bruce Sterling*, who also "gave away" an article for free.

Again, *Bernd Raichle* `<raichle@informatik.uni-stuttgart.de>` courtesy of the University of Stuttgart, provided TEXpertize, when TEXpertize was badly needed (see file '`specials.texi`' for your enlightenment). BTW: Over the past 2 years, we've been doing some such projects, although we haven't met F2F, yet. This is one of the effects of the Net. (It thus should be termed "Net.effect".)

Additional thanks to *Brendan Kehoe* `<brendan@zen.org>` for the *Texinfo* release of *"Zen"*, from which I borrowed this and that. FYI: Brendan works on the 3rd editition of his book, and might be able to release the 2nd to the Net, depending on Prentice-Hall's legal attorneys. So keep your fingers crossed.

September 27, 1993

Some more nights have passed, and "GNU Info" format is fully supported, now. You can use either Emacs in INFO mode, or just GNU's `info` browser (also available as `xinfo` for the X window system): type '`info -f bdgtti-2.2.info`' and read "Dummy's" online in hypertextual fashion.

But since edition 1.01, "Dummy's" not only features an "Info" version. It also comes with HTML support, i.e. the HyperText Markup Language format, that is used by the World-Wide Web project (see Section 8.1 [Gophers], page 115 for some more ideas on this). The `bdgtti-2.2*.html` files can thus be browsed using the WWW tools: from within `xmosaic`, e.g. load '`bdgtti-2.2_toc.html`', and there you go!

Finally, some more folks have helped along the way.

Many thanks to *Lionel Cons* `<cons@dxcern.cern.ch>` courtesy of CERN, who immediately updated his '`texi2html`' to make it work for this project. (Note that you need *Larry Wall's* `perl` to run this program.)

Ingo Dreßler `<id@germany.eu.net>` courtesy of EUnet Deutschland, reserved a place on **ftp.germany.eu.net** to distribute the European A4 paper edition of this guide. See under '`/pub/books/big-dummys-guide`' using traditional FTP, or point the Web to: '`ftp://ftp.germany.eu.net/pub/books/big-dummys-guide`'. This will be the default server for the European editions.

> "The *Big Dummy's Guide to the Internet* is now available in a variety of easily convertible formats, *and* at your local laser printer..."

December 17, 1993

Welcome to the Christmas issue of one of the *most read* books on the Internet! This time, we only fix the bugs that have been reported from most the folks listed below.

From this edition on, the standard A4, and US letter size versions are merged into one directory. Moreoever, has the EFF a new online activist, named *Stanton McCandlish* `<mech@eff.org>` who really seems to take care about this project, and has properly set up the EFF's FTP site. So, the "EFF is out of pace" messages from former postings entitled *"FAQ: Big Dummy's Guide, Life and Everything..."*, (that also serves as the README file to the Texinfo release), have become obsolete.

A major rework of this guide, including an extensive overhaul of the World-Wide Web chapter, and the HTML version is planned and scheduled for "mid-of-next-year-or-so". I thus recommend not to hold your breath. You shouldn't expect Texinfo edition 1.04 to come out prior to July '94.

Thanks to all of you, who sent bug fixes, made suggestions, or just dropped a *"Thanks for all the Fish!"* message.

January 1, 1994

Never say never, folks. Adam Gaffin, released version 1.4 of his ASCII version on December 20th, and I just couldn't resist to get the Texinfo edition back into the game, and move it from 1.03 to 1.4. So here it is. Anyway, the statement from above still holds true, it just needs a little bit of "adjustment."

> "I thus recommend not to hold your breath. You shouldn't expect Texinfo *edition 1.5* to come out prior to July '94."

February 2, 1994

I know, I know, and I don't have any excuses this time. Here's edition 2.2. Be happy with it!

> "However, I still recommend not to hold your breath. You shouldn't expect Texinfo *edition 7.0* to come out prior to July 2004. (So God will... ;-)"

In the order the contributors appeared in my mailbox: Shari Steele, Howard Rheingold, Bernd Raichle, Adam Gaffin, Brendan Kehoe, Bruce Sterling, Jonathan I. Kamens, Gene Spafford, Greg Chartrand, Brad Templeton, Olivier M. J. Crepin-Leblond, Ingo Dressler, David Sternlight, Otto Lang, Christopher K. Davis, Iain O'Cain, Lionel Cons, David J. Bianco, Achim Voermanek, Noel Hunter, Martin Schweikert, R. Stewart Ellis, Mark Sanderson, Bo Frese Rasmussen, Chris Varner, Timo Harmo, Rik Harris, James Grinter, Oscar Nierstrasz, Jeremy Payne, David Trueman, Michael P. Urban, Mark Woodward, Iain Lea, David E. Fox, Peter Smulders, Gert C. Van Rooyen, Patrick Nielsen Hayden, Robin Evans, Tim Berners-Lee, Helen Trillian Rose Davis, Jon L. Spear, Alan Legatt, Paul Brown, Larry W. Virden, Ted Shapin, Roman Schwartz, TAKADA Toshihiro, Fred Schimmel, Antony Cooper, Lennat Tower, jr., Jon Bell, John Campbell, Ed Moore, Axel Belinfante, Arthur Secret, Jason Schmit, Uri S. Naishtut, Chris Ruprecht, Dan Brown, Keith Bostic, Clemens Schrimpe, Reinhold Tokar, Jeff Dingbaum, Jim Meyering, Otmar Lendl, Warwick Kau-Choon Chai, Pieter Immelman, Joseph Taylor Potts, Reiner Hoenig, Steve Cisler, James Rice, Stephen C. Trier, James E. Burns, Rodrigo Vanegas, Steve VanDevender, Reinier de Vos, Gerald Malitz, David Mason, Volker Kunert, David Beasley, Anthony Rajakumar, Aniekan Akpaffiong, A. Solomon Eaglstein, Jan Adlington, Elaine Jackson, John Sheckler, Larry W. Virden, David Beasley, Dave Rosselle, Cristine Hollinshead, Wolfhang Banzaf, Stoffel Erasmus, Stanton McCandlish, Robert E. Maas, Susanne Spitzer, Bryan D. Boyle, Paul F. Mende, Michael A. Patton, Joseph E. Sacco, Steinar Kjaernsrod, Luis Ochoa Giraldo, Thomas Gellekum, Moritz D. Klingholz, Benedikt Homann, Holger Hoffstaette, Maray Tamas, Forrest Cook, Shmuel Browns, Roland H. Pesch, Richard Stallman, Dawn Cooley, Rob Kabacoff, Andreas Gehmeyr, John O'Hare, George D. Greenwade, Tony Sprinzl, Sean Lally, Roger Lighty.

Special thanks to Naomi Schulman, my "virtual granny" at Stanford, and to my virtual little sisters: Monika, Oggi, Bettina, Gabi, Nora, Claudia, Christiane, Heidi, Marietta, Martina, Angela, Astrid, Kirsten, Ilke, Kerstin, Renate, Rosie, Jenna, Heike, Nicole, Cornelia, Susanne, Davika, and last not least *Ute*, one of the best things that ever happened to me.

Enjoy the trip!

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26 February 1994

"It's kind of fun to do the impossible."
— **Walt Disney**

"If I have seen farther than others,
it is because I was standing on the shoulders of giants."
— **Sir Isaac Newton**

"A work of art is never finished, only abandoned."
— **Anonymous**

Welcome

Welcome to the Big Dummy's Guide to the Internet, version 2.2.

The Electronic Frontier Foundation (EFF) is proud to have sponsored the production of the *Big Dummy's Guide to the Internet*. EFF is a nonprofit organization based in Washington, D.C., dedicated to ensuring that everyone has access to the newly emerging communications technologies vital to active participation in the events of our world. As more and more information is available online, new doors open up for those who have access to that information. Unfortunately, unless access is broadly encouraged, individuals can be disenfranchised and doors can close, as well. The Big Dummy's Guide to the Internet was written to help open some doors to the vast amounts of information available on the world's largest network, the Internet.

The spark for the *Big Dummy's Guide to the Internet* was ignited in a few informal conversations that included myself and *Steve Cisler* of Apple Computer, Inc., in June of 1991. With the support of Apple Computer, EFF engaged *Adam Gaffin* to write the book and actually took on the project in September of 1991.

The idea was to write a guide to the Internet for people who had little or no experience with network communications. We intended to post this guide to the Net in ASCII and HyperCard formats and to give it away on disk, as well as have a print edition available. We have more than realized our goal. Individuals from as geographically far away as Germany, Italy, Canada, South Africa, Japan, Scotland, Norway, and Antarctica have all sent electronic mail to say that they downloaded the Big Dummy's Guide to the Internet. The guide is now available in a wide array of formats, including ACSCII text, HyperCard, World Wide Web, PostScript and AmigaGuide. And the guide will be published in a printed format by MIT Press in June of 1994.

EFF would like to thank author Adam Gaffin for doing a terrific job of explaining the Net in such a nonthreatening way. We'd also like to thank the folks at Apple, especially Steve Cisler of the Apple Library, for their support of our efforts to bring this guide to you.

We invite you to join with EFF in our fight to ensure that equal access to the networks and free speech are protected in newly emerging technologies. We are a membership organization, and through donations like yours, we can continue to sponsor important projects to make communications easier. Information about the Electronic Frontier Foundation and some of the work that we do can be found at the end of this book.

We hope that the *Big Dummy's Guide to the Internet* helps you learn about whole new worlds, where new friends and experiences are sure to be yours. Enjoy!

Mitch Kapor
`<mkapor@eff.org>`
Chairman of the Board
Electronic Frontier Foundation
February 20, 1994

For comments, questions, or requests regarding EFF or the Big Dummy's Guide to the Internet, send a note to `<ask@eff.org>`

"Not all German hackers work for the Russian KGB.
Some even work for the American EFF!"
— **Anonymous**

Foreword

By *Mitchell Kapor* <mkapor@eff.org>
Co-founder, Electronic Frontier Foundation.

New communities are being built today. You cannot see them, except on a computer screen. You cannot visit them, except through your keyboard. Their highways are wires and optical fibers; their language a series of ones and zeroes.

Yet these communities of cyberspace are as real and vibrant as any you could find on a globe or in an atlas. Those are real people on the other sides of those monitors. And freed from physical limitations, these people are developing new types of cohesive and effective communities - ones which are defined more by common interest and purpose than by an accident of geography, ones on which what really counts is what you say and think and feel, not how you look or talk or how old you are.

The oldest of these communities is that of the scientists, which actually predates computers. Scientists have long seen themselves as an international community, where ideas were more important than national origin. It is not surprising that the scientists were the first to adopt the new electronic media as their principal means of day-to-day communication.

I look forward to a day in which everybody, not just scientists, can enjoy similar benefits of a global community.

But how exactly does community grow out of a computer network? It does so because the network enables new forms of communication.

The most obvious example of these new digital communications media is electronic mail, but there are many others. We should begin to think of mailing lists, newsgroups, file and document archives, etc. as just the first generation of new forms of information and communications media. The digital media of computer networks, by virtue of their design and the enabling technology upon which they ride, are fundamentally different from the now dominant mass media of television, radio, newspapers and magazines. Digital communications media are inherently capable of being more interactive, more participatory, more egalitarian, more decentralized, and less hierarchical.

As such, the types of social relations and communities which can be built on these media share these characteristics. Computer networks encourage the active participation of individuals rather than the passive non-participation induced by television narcosis.

In mass media, the vast majority of participants are passive recipients of information. In digital communications media, the vast majority of participants are active creators of information as well as recipients. This type of symmetry has previously only been found in media like the telephone. But while the telephone is almost entirely a medium for private one-to-one communication, computer network applications such as electronic mailing lists, conferences, and bulletin boards, serve as a medium of group or "many-to-many" communication.

The new forums atop computer networks are the great levelers and reducers of organizational hierarchy. Each user has, at least in theory, access to every other user, and an equal chance to be heard. Some U.S. high-tech companies, such as Microsoft and Borland, already use this to good advantage: their CEO's – *Bill Gates* and *Philippe Kahn* – are directly accessible to all employees via electronic mail. This creates a sense that the voice of the individual employee really matters. More generally, when corporate communication is facilitated by electronic mail, decision-making processes can be far more inclusive and participatory.

Computer networks do not require tightly centralized administrative control. In fact, decentralization is necessary to enable rapid growth of the network itself. Tight controls strangle growth. This decentralization promotes inclusiveness, for it lowers barriers to entry for new parties wishing to join the network.

Given these characteristics, networks hold tremendous potential to enrich our collective cultural, political, and social lives and enhance democratic values everywhere.

And the Internet, and the UUCP and related networks connected to it, represents an outstanding example of a computer network with these qualities. It is an open network of networks, not a single unitary network, but an ensemble of interconnected systems which operate on the basis of multiple implementations of accepted, non-proprietary protocols, standards and interfaces.

One of its important characteristics is that new networks, host systems, and users may readily join the network – the network is open to all.

The openness (in all senses) of the Internet reflects, I believe, the sensibilities and values of its architects. Had the Internet somehow been developed outside the world of research and education, it's less likely to have had such an open architecture. Future generations will be indebted to this community for the wisdom of building these types of open systems.

Still, the fundamental qualities of the Net, such as its decentralization, also pose problems. How can full connectivity be maintained in the face of an ever-expanding number of connected networks, for example? What of software bugs that bring down computers, or human crackers who try to do the same? But these problems can and will be solved.

Digital media can be the basis of new forms of political discourse, in which citizens form and express their views on the important public issues of the day. There is more than one possible vision of such electronic democracy, however. Let's look at some examples of the potential power, and problems, of the new digital media.

The idea of something called an "electronic town meeting" received considerable attention in 1992 with *Ross Perot*'s presidential campaign (or, at least, its first incarnation).

Perot's original vision, from 20 or so years ago, was that viewers would watch a debate on television and fill out punch cards which would be mailed in and collated. Now we could do it with 800 telephone numbers.

In the current atmosphere of disaffection, alienation and cynicism, anything that promotes greater citizen involvement seems a good idea. People are turned off by politicians in general – witness the original surge of support for Perot as outsider who would go in and clean up the mess – and the idea of going right to the people is appealing,

What's wrong with this picture? The individual viewer is a passive recipient of the views of experts. The only action taken by the citizen is in expressing a preference for one of three pre-constructed alternatives. While this might be occasionally useful, it's unsophisticated and falls far short of the real potential of electronic democracy. We've been reduced to forming our judgments on the basis of mass media's portrayal of the personality and character of the candidates.

All this is in contrast to robust political debates already found on various on-line computer systems, from CompuServe to Usenet. Through these new media, the issues of the day, ranging from national security in the post-Cold War era to comparative national health care systems, are fiercely discussed in a wide variety of bulletin boards, conferences, and newsgroups.

What I see in online debate are multiple active participants, not just experts, representing every point of view, in discussions that unfold over extended periods of time. What this shows is that, far from being alienated and disaffected from the political process, people like to talk and discuss – and take action – if they have the opportunity to do so. Mass media don't permit that. But these new media are more akin to a gathering around the cracker barrel at the general store – only extended over hundreds, thousands of miles, in cyberspace, rather than in one physical location.

Recent years have shown the potential power of these new media. We have also seen several examples of where talk translated into action.

In 1987, the Federal Communications Commission proposed changing the way certain online providers paid for access to local phone service. Online, this quickly became known as the "modem tax" and generated a storm of protest. The FCC withdrew the idea, but not quickly enough: the "modem tax" has penetrated so deeply into the crevices of the Net that it has taken up a permanent and ghostly residence as a kind of virtual or cognitive virus, which periodically causes a re-infection of the systems and its users. FCC commissioners continue to receive substantial mail on this even though the original issue is long dead; in fact, it has generated more mail than any other issue in the history of the FCC.

More recently, *Jim Manzi*, chairman of Lotus Development Corp., received more than 30,000 e-mail messages when the company was getting ready to sell a database containing records on tens of millions of Americans. The flood of electronic complaints about the threat to privacy helped force the company to abandon the project. Issues of narrow but vital interest to the online community give a hint of the organizing power of the Net.

In August, 1991, the managers of a Soviet computer network known as Relcom stayed online during an abortive coup, relaying eyewitness accounts and news of actions against the coup to the West and to the rest of Russia.

And many public interest non-profit organizations and special interest groups already use bulletin boards heavily as a means of communicating among their members and organizing political activity.

But all is not perfect online. The quality of discourse is often very low. Discussion is often trivial and boring and bereft of persuasive reason. Discourse often sinks to the level of "flaming," of personal attacks, instead of substantive discussion. Flaming. Those with the most time to spend often wind up dominating the debate – a triumph of quantity of time available over quality of content.

It seems like no place for serious discussion. Information overload is also a problem. There is simply far too much to read to keep up with. It is all without organization. How can this be addressed?

Recent innovations in the design of software used to connect people to the Net and the process of online discussion itself reveal some hope.

Flaming is universal, but different systems handle it in different ways. Both the technology and cultural norms matter.

On Usenet, for instance, most news reader applications support a feature known as a "killfile," which allows an individual to screen out postings by a particular user or on a particular subject. It is also sometimes referred to as "the bozo filter." This spares the user who is sufficiently sophisticated from further flamage, but it does nothing to stop the problem at its source.

Censorship would be one solution. But what else can be done without resorting to unacceptably heavy-handed tactics of censorship? There is a great tradition of respect for free speech on these systems, and to censor public postings or even ban a poster for annoying or offensive content is properly seen as unacceptable, in my opinion.

Some systems use cultural norms, rather than software, to deal with flame wars. These online communities have developed practices which rely more on a shared, internalized sense of appropriate behavior than on censorship, for instance. The WELL (Whole Earth 'Lectronic Link) is a relatively small online conferencing system based in the San Francisco Bay area. On the WELL, individuals who get into a fight are encouraged to move the discussion out of the public conference and into e-mail. The encouragement is provided not only by the host of the conference, but also by the users. It is part of the culture, not part of the technology.

WELL hosts are volunteers who facilitate the discussion of a particular subject. While they have the power to censor individual postings, the power is very rarely used and only as a last resort, as it has been found that dispute resolution by talking it out among the parties is a superior method of problem solving in the long run.

It is not an accident that the WELL has a uniquely high quality of conversation. Nor is it coincidental that it developed as a small and originally isolated community (now on the Net) which gave it a chance to develop its own norms or that key management of the system came from "The Farm," a large, successful commune of the 1960's and 1970's led by *Stephen Gaskin*.

We still know very little about the facilitation of online conversations. It is a subject well worth further formal study and experimentation.

Some problems have to do with the unrefined and immature format and structure of the discussion medium itself. The undifferentiated stream of new messages marching along in 80 columns of ASCII text creates a kind of hypnotic trance. Compare this with the typical multiplicity of type fonts, varied layouts, images, and pictures of the printed page.

New media take time to develop and to be shaped. Reading text on a terminal reminds me of looking at the Gutenberg Bible. The modern book took a century to develop after the invention of printing with movable type and the first Western printed books. *Aldus Manutius* and the inventions of modern typefaces, pagination, the table of contents, the index, all of which gave the book its modern form, came later, were done by different people, and were of a different order than the invention of printing with movable type itself. The new electronic media are undergoing a similar evolution.

Key inventions are occurring slowly, for example, development of software tools that will allow the dissemination of audio and video across the Net. This type of software has usually been done so far by volunteers who have given away the results. It's a great thing, but it's not sufficient, given how hard it is to develop robust software. Innovation in the application space will also be driven by entrepreneurs and independent software vendors at such point as they perceive a business opportunity to create such products (it would be nice if creators did it for art's sake but this seems unlikely).

There are some requirements to provide incentives to attract additional software development. This requires a competitive free market in network services at all levels to serve the expanding user demand for network services. It requires a technologically mature network able to support these services.

And there must be a user population, current or prospective, interested in paying for better applications – and not just the current base of technically sophisticated users and students, though they will absolutely benefit.

There are multiple classes of new application opportunities. E-mail is overloaded because there aren't readily available alternatives yet. New and different kinds of tools are needed for collaborative work. Computer conferencing, as it evolves, may be sufficient for discussion and debate. But by itself, it cannot really support collaborative work, in the sense of readily enabling a group to make decisions efficiently, represent and track the status of its work process. Trying to run an organization via e-mail mailing list is very different than trying to have a discussion.

Computer networks can only fully realize their potential as innovative communications media in an environment which encourages free and open expression.

In some countries, legal principles of free speech protect freedom of expression in traditional media such as the printed word. But once communication moves to new digital media and crosses international borders, such legal protections fall away. As *John Perry Barlow*, the co-founder of EFF puts it: "In Cyberspace, the First Amendment is a local ordinance." There is no international legal authority which protects free expression on trans-national networks. Article 19 of the Universal Declaration of Human Rights calls for the protection of free expression in all media, but the declaration falls far short of being binding.

And if we're to take seriously the idea of the electronic online forum, we have to deal with the access issue. If the only people with access to the medium are well-educated, affluent, techno-literate elite, it won't be sufficiently inclusive to represent all points of view.

We also need, fundamentally, a better infrastructure (the highway system for information). As we move from the high-speed Internet to the even more powerful National Research and Education Network, we need to look at how to bring the power of these new media into the homes of everybody who might want it. Addressing this "last mile" problem (phone networks are now largely digitized, fiber-optic systems, except for the mile between your home and the nearest switching station) should be a priority.

Computer networks will eventually become ubiquitous around the world. We should therefore be concerned with the impact on society that they have, the opportunities to improve society, and the dangers that they pose. Fundamentally, we are optimists who believe in the potential of networks to enhance democratic values of openness, diversity, and innovation.

Because the medium is so new, it is important now to develop policies at the national and international level that help achieve the potential of computer networks for society as a whole. By the time television was recognized as a vast wasteland it was already too late to change. There is a rare opportunity to develop policies in advance of a technologically and economically mature system which would be hard to change.

"As a net is made up of a series of ties, so everything in this world is connected by a series of ties. If anyone thinks that the mesh of a net is an independent, isolated thing, he is mistaken. It is called a net because it is made up of a series of interconnected meshes, and each mesh has its place and responsibility in relation to other meshes."

– **Buddha**

"Subject: A Superhighway through the Wasteland?"

By *Mitchell Kapor* <mkapor@eff.org> and *Jerry Berman* <jberman@eff.org>[1]
(Reprinted from article posted to **comp.org.eff.talk**; originally published in the New York Times Op-Ed Page, Wednesday, November 24, 1993.)

A Superhighway Through the Wasteland?

Mitchell Kapor is chairman of the Electronic Frontier Foundation, a nonprofit group that promotes civil liberties in digital media. He was a founder of the Lotus Development Corporation, from which he resigned in 1986. Jerry Berman is executive director of the foundation.

(Washington) Telecommunications and cable TV executives, seeking to allay concerns over their proposed megamergers, insist that the coming electronic superhighway will be an educational and informational tool as well as a cornucopia of interactive entertainment. Allow the marriage between entertainment and communications giants, we are told, and they will connect students with learning resources, provide a forum for political discourse, increase economic competitiveness and speed us into the multimedia information age.

Both broadcast and cable TV were introduced with similar fanfare. The results have been disappointing. Because of regulatory failure and the limits of the technology, they failed to be saviors of education or political life. We love the tube but recognize that it is largely a cultural wasteland.

For the Government to break this cycle of promise and disappointment, communications mergers should be approved or barred based on detailed, enforceable commitments that the electronic superhighway will meet public goals. The amount of electronic material the superhighway can carry is dizzying compared to the relatively narrow range of broadcast TV and the limited number of cable channels. Properly constructed and regulated, it could be open to all who wish to speak, publish and communicate.

None of the interactive services will be possible, however, if we have an eight-lane data superhighway rushing into every home and only a narrow footpath coming back out. Instead of settling for a multimedia version of the same entertainment that is increasingly dissatisfying on today's TV, we need a superhighway that encourages the production and distribution of a broader, more diverse range of programming.

The superhighway should be required to provide so-called open platform services. In today's channel-based cable TV system, program producers must negotiate for channel space with cable companies around the country. In an open platform network, we would avoid that bottleneck. Every person would have access to the entire superhighway, so programmers could distribute information directly to consumers.

Consumers would become producers: individuals and small organizations could create and distribute programs to anyone on the highway who wants them. Open platform services will spur diversity in the electronic media, just as low production and distribution costs make possible a wide variety of newspapers and magazines.

To prevent abuses by media giants that because of recent Federal court decisions will control the pipeline into the home and much of the content delivered over it, we need new laws. Like today's phone companies, the companies controlling the superhighway must be required to carry other programmers' content, just as phone companies must provide service to anyone who is willing to pay for it. We must guarantee that anyone who, say, wants to start an alternative news network or a forum for political discussion is given an outlet to do so.

Americans will come to depend on the superhighway even more than they need the telephone. The guarantee of universal telephone service must be expanded to include universal access to the superhighway. Although market forces will help keep the new technology affordable, we need laws to protect consumers when competition fails.

And because several companies will operate the highway, each must be required to interconnect with the others. Likewise, the new computers that will give us access to the superhighway should be built according to commonly accepted standards.

Also, even an open, competitive market will leave out organizations with limited resources such as schools and libraries. To compensate for market oversights, we must insure that money – whether through Federal support or a tax on the companies that will control the superhighway – is made available to these institutions. Finally, people won't use the new technology unless they feel that their privacy is protected. Technical means, such as recently developed encryption techniques, must be made available to all users. And clear legal guidelines for individual control over access to and reuse of personal information must be established. Companies that sell entertainment services will have a record of what their customers' interests are; these records must remain confidential.

Bell Atlantic, T.C.I., Time-Warner, U.S. West and other companies involved in proposed mergers have promised to allow the public full access to the superhighway. But they are asking policy makers to trust that, profits aside, they will use their new positions for the public good.

Rather than opposing mergers or blindly trusting competition to shape the data highways, Congress should make the mergers hinge on detailed commitments to provide affordable services to all Americans. Some legislators, led by Representative Ed Markey, Democrat of Massachusetts, are working to enact similar requirements; these efforts deserve support.

The best approach would be to amend these requirements to the Communications Act of 1934. Still the central law on open access, an updated Communications Act would codify the terms of a new social contract between the the telecommunications industry and the American people.

Preface

By *Adam Gaffin* `<adamg@world.std.com>`
Senior Writer, Network World, Framingham, Mass.

Welcome to the Internet! You're about to start a journey through a unique land without frontiers, a place that is everywhere at once – even though it exists physically only as a series of electrical impulses. You'll be joining a growing community of millions of people around the world who use this global resource on a daily basis.

With this book, you will be able to use the Internet to:

- Stay in touch with friends, relatives and colleagues around the world, at a fraction of the cost of phone calls or even air mail.
- Discuss everything from archaeology to zoology with people in several different languages.
- Tap into thousands of information databases and libraries worldwide.
- Retrieve any of thousands of documents, journals, books and computer programs.
- Stay up to date with wire-service news and sports and with official weather reports.
- Play live, "real time" games with dozens of other people at once.

And you will have become the newest member of this ever growing community. If you stay and contribute, the Net will be richer for it – and so will you.

But it will take a sense of adventure, a willingness to learn and an ability to take a deep breath every once in awhile.

Connecting to "the Net" today, takes something of a sense of adventure, a willingness to learn and an ability to take a deep breath every once in awhile. Visiting the Net today is a lot like journeying to a foreign country. There are so many things to see and do, but everything at first will seem so, well, foreign.

When you first arrive, you won't be able to read the street signs. You'll get lost. If you're unlucky, you may even run into some locals who'd just as soon you went back to where you came from. If this weren't enough, the entire country is constantly under construction; every day, it seems like there's something new for you to figure out.

Fortunately, most of the locals are actually friendly. In fact, the Net actually has a rich tradition of helping out visitors and newcomers. Until very recently, there were few written guides for ordinary people, and the Net grew largely through an "oral" tradition in which the old-timers helped the newcomers.

Here's where you take a deep breath. Fortunately, most of the natives are actually friendly. In fact, the Net actually has a rich tradition of helping out visitors and newcomers. With few written guides for ordinary people, the Net has grown in large part one person at a time – if somebody helps you learn your way around, it's almost expected you'll repay the favor some day by helping somebody else.

So when you connect, don't be afraid to ask for help. You'll be surprised at how many people will lend a hand!

Without such folks, in fact, this guide would not be possible. My thanks to all the people who have written with suggestion, additions and corrections since the Big Dummy's Guide first appeared on the Internet in 1993.

Special thanks go to the following people, who, whether they know it or not, provided particular help – and to my loving wife Nancy:

Rhonda Chapman, Jim Cocks, Tom Czarnik, Christopher Davis, David DeSimone, Jeanne de-Voto, Phil Eschallier, Nico Garcia, Joe Granrose, Joerg Heitkoetter, Joe Ilacqua, Jonathan Kamens, Peter Kaminski, Thomas A. Kreeger, Stanton McCandlish, Leanne Phillips, Nancy Reynolds, Helen Trillian Rose, Barry Shein, Jennifer "Moira" Smith, Gerard van der Leun and Scott Yanoff.

If you have any suggestions or comments on how to make this guide better, I'd love to hear them. You can reach me via e-mail at `<adamg@world.std.com>`.

Boston, Mass., January, 1994.

"Stop the murder!
Support dolphin-free networking."
— **Brendan Kehoe's .signature**

"On the Internet, no one knows you're a dog."
— **Adam's favorite one.**

1 Setting up and Jacking in

1.1 Ready, Set...

The world is just a phone call away. With a computer and modem, you'll be able to connect to the Internet, the world's largest computer network (and if you're lucky, you won't even need the modem; many colleges and companies now give their students or employees direct access to the Internet).

The phone line can be your existing voice line – just remember that if you have any extensions, you (and everybody else in the house or office) won't be able to use them for voice calls while you are connected to the Net.

A modem is a sort of translator between computers and the phone system. It's needed because computers and the phone system process and transmit data, or information, in two different, and incompatible ways. Computers "talk" digitally; that is, they store and process information as a series of discrete numbers. The phone network relies on analog signals, which on an oscilloscope would look like a series of waves. When your computer is ready to transmit data to another computer over a phone line, your modem converts the computer numbers into these waves (which sound like a lot of screeching) – it "modulates" them. In turn, when information waves come into your modem, it converts them into numbers your computer can process, by "demodulating" them.

Increasingly, computers come with modems already installed. If yours didn't, you'll have to decide what speed modem to get. Modem speeds are judged in "bps rate" or bits per second. One bps means the modem can transfer roughly one bit per second; the greater the bps rate, the more quickly a modem can send and receive information. A letter or character is made up of eight bits.

You can now buy a 2400-bps modem for well under $60 – and most now come with the ability to handle fax messages as well. At prices that now start around $150, you can buy a modem that can transfer data at 14,400 bps (and often even faster, using special compression techniques). If you think you might be using the Net to transfer large numbers of files, a faster modem is always worth the price. It will dramatically reduce the amount of time your modem or computer is tied up transferring files and, if you are paying for Net access by the hour, will save you quite a bit in online charges.

Like the computer to which it attaches, a modem is useless without software to tell it how to work. Most modems today come with easy-to-install software. Try the program out. If you find it difficult to use or understand, consider a trip to the local software store to find a better program. You can spend several hundred dollars on a communications program, but unless you have very specialized needs, this will be a waste of money, as there are a host of excellent programs available for around $100 or less. Among the basic features you want to look for are a choice of different "protocols" (more on them in a bit) for transferring files to and from the Net and the ability to write "script" or "command" files that let you automate such steps as logging into a host system.

When you buy a modem and the software, ask the dealer how to install and use them. Try out the software if you can. If the dealer can't help you, find another dealer. You'll not only save yourself a lot of frustration, you'll also have practiced the prime Internet directive: *"Ask. People Know."*

To fully take advantage of the Net, you must spend a few minutes going over the manuals or documentation that comes with your software. There are a few things you should pay special attention to: uploading and downloading; screen capturing (sometimes called "screen dumping"); logging; how to change protocols; and terminal emulation. It is also essential to know how to convert a file created with your word processing program into "ASCII" or "text" format, which will let you share your thoughts with others across the Net.

Uploading is the process of sending a file from your computer to a system on the Net. Downloading is retrieving a file from somewhere on the Net to your computer. In general, things in cyberspace go "up" to the Net and come "down" to you.

Chances are your software will come with a choice of several "protocols" to use for these transfers. These protocols are systems designed to ensure that line noise or static does not cause errors that could ruin whatever information you are trying to transfer. Essentially, when using a protocol, you are transferring a file in a series of pieces. After each piece is sent or received, your computer and the Net system compare it. If the two pieces don't match exactly, they transfer it again, until they agree that the information they both have is identical. If, after several tries, the information just doesn't make it across, you'll either get an error message or your screen will freeze. In that case, try it again. If, after five tries, you are still stymied, something is wrong with a) the file; b) the telephone line; c) the system you're connected to; or d) your own computer.

From time to time, you will likely see messages on the Net that you want to save for later viewing – a recipe, a particularly witty remark, something you want to write your congressman about, whatever. This is where screen capturing and logging come in.

When you tell your communications software to capture a screen, it opens a file in your computer (usually in the same directory or folder used by the software) and "dumps" an image of whatever happens to be on your screen at the time.

Logging works a bit differently. When you issue a logging command, you tell the software to open a file (again, usually in the same directory or folder as used by the software) and then give it a name. Then, until you turn off the logging command, everything that scrolls on your screen is copied into that file, sort of like recording on videotape. This is useful for capturing long documents that scroll for several pages – using screen capture, you would have to repeat the same command for each new screen.

Terminal emulation is a way for your computer to mimic, or emulate, the way other computers put information on the screen and accept commands from a keyboard. In general, most systems on the Net use a system called VT100. Fortunately, almost all communications programs now on the market support this system as well – make sure yours does.

You'll also have to know about protocols. There are several different ways for computers to transmit characters. Fortunately, there are only two protocols that you're likely to run across: 8-1-N (which stands for "8 bits, 1 stop bit, no parity" – yikes!) and 7-1-E (7 bits, 1 stop bit, even parity).

In general, Unix-based systems use 7-1-E, while MS-DOS-based systems use 8-1-N. What if you don't know what kind of system you're connecting to? Try one of the settings. If you get what looks like gobbledygook when you connect, you may need the other setting. If so, you can either change the setting while connected, and then hit enter, or hang up and try again with the other setting. It's also possible your modem and the modem at the other end can't agree on the right bps rate. If changing the protocols doesn't work, try using another bps rate (but no faster than the one listed for your modem). Don't worry, remember, you can't break anything! If something looks wrong, it probably is wrong. Change your settings and try again. Nothing is learned without trial, error and effort. Those are the basics. Now on to the Net!

1.2 Go!

Once, only people who studied or worked at an institution directly tied to the Net could connect to the world. Today, though, an ever-growing number of "public-access" systems provide access for everybody. These systems can now be found in several states, and there are a couple of sites that can provide access across the country.

There are two basic kinds of these host systems. The more common one is known as a UUCP site (UUCP being a common way to transfer information among computers using the Unix operating system) and offers access to international electronic mail and conferences.

However, recent years have seen the growth of more powerful sites that let you tap into the full power of the Net. These Internet sites not only give you access to electronic mail and conferences but to such services as databases, libraries and huge file and program collections around the world. They are also fast – as soon as you finish writing a message, it gets zapped out to its destination.

Some sites are run by for-profit companies; others by non-profit organizations. Some of these public-access, or host, systems, are free of charge. Others charge a monthly or yearly fee for unlimited access. And a few charge by the hour. Systems that charge for access will usually let you sign up online with a credit card. Some also let you set up a billing system.

But cost should be only one consideration in choosing a host system, especially if you live in an area with more than one provider. Most systems let you look around before you sign up. What is the range of each of their services? How easy is each to use? What kind of support or help can you get from the system administrators?

The last two questions are particularly important because many systems provide no user interface at all; when you connect, you are dumped right into the Unix operating system. If you're already familiar with Unix, or you want to learn how to use it, these systems offer phenomenal power – in addition to Net access, most also let you tap into the power of Unix to do everything from compiling your own programs to playing online games.

But if you don't want to have to learn Unix, there are other public-access systems that work through menus (just like the ones in restaurants; you are shown a list of choices and then you make your selection of what you want), or which provide a "user interface" that is easier to figure out than the ever cryptic Unix.

If you don't want or need access to the full range of Internet services, a UUCP site makes good financial sense. They tend to charge less than commercial Internet providers, although their messages may not go out as quickly.

Some systems also have their own unique local services, which can range from extensive conferences to large file libraries.

1.3 Public-Access Internet Providers

When you have your communications program dial one of these host systems, one of two things will happen when you connect. You'll either see a lot of gibberish on your screen, or you'll be asked to log in. If you see gibberish, chances are you have to change your software's parameters (to 7-1-E or 8-1-N as the case may be). Hang up, make the change and then dial in again.

When you've connected, chances are you'll see something like this:

```
Welcome to THE WORLD
Public Access UNIX for the '90s
Login as `new' if you do not have an account

login:
```

That last line is a prompt asking you to do something. Since this is your first call, type

```
new
```

and hit enter. Often, when you're asked to type something by a host system, you'll be told what to type in quotation marks (for example, '`new`' above). Don't include the quotation marks. Repeat: Don't include the quotation marks.

What you see next depends on the system, but will generally consist of information about its costs and services (you might want to turn on your communication software's logging function, to save this information). You'll likely be asked if you want to establish an account now or just look around the system.

You'll also likely be asked for your "user name." This is not your full name, but a one-word name you want to use while online. It can be any combination of letters or numbers, all in lower case. Many people use their first initial and last name (for example, "jdoe"); their first name and the first letter of their last name (for example, "johnd"); or their initials ("jxd"). Others use a nickname. You might want to think about this for a second, because this user name will become part of your electronic-mail address (see Chapter 2 [Electronic Mail], page 37). The one exception is the various Free-Net systems, all of which assign you a user name consisting of an arbitrary sequence of letters and numbers.

You are now on the Net. Look around the system. See if there are any help files for you to read. If it's a menu-based host system, choose different options just to see what happens. Remember: You can't break anything. The more you play, the more comfortable you'll be.

What follows is a list of public-access Internet sites, which are computer systems that offer access to the Net. All offer international e-mail and Usenet (international conferences). In addition, they offer:

FTP
: File-transfer protocol – access to hundreds of file libraries (everything from computer software to historical documents to song lyrics). You'll be able to transfer these files from the Net to your own computer.

Telnet
: Access to databases, computerized library card catalogs, weather reports and other information services, as well as live, online games that let you compete with players from around the world.

Additional services that may be offered include:

WAIS
: Wide-area Information Server; a program that can search dozens of databases in one search.

Gopher
: A program that gives you easy access to dozens of other online databases and services by making selections on a menu. You'll also be able to use these to copy text files and some programs to your mailbox.

IRC
: Internet Relay Chat, a CB simulator that lets you have live keyboard chats with people around the world.

However, even on systems that do not provide these services directly, you will be able to use a number of them through telnet (see Chapter 6 [Telnet], page 79). In the list that follows, systems that let you access services through menus are noted; otherwise assume that when you connect, you'll be dumped right into Unix (a.k.a. MS-DOS with a college degree). Several of these sites are available nationwide through national data networks such as the CompuServe Packet Network and SprintNet.

Please note that all listed charges are subject to change. Many sites require new or prospective users to log on a particular way on their first call; this list provides the name you'll use in such cases.

1.3.1 Alabama

Huntsville. Nuance. Call voice number for modem number. $35 setup; $25 a month. Voice: (205) 533-4296.

1.3.2 Alaska

Anchorage. University of Alaska Southeast, Tundra Services, (907) 789-1314; has local dial-in service in several other cities. $20 a month. Voice: (907) 465-6453.

1.3.3 Alberta

Edmonton. PUCNet Computer Connections, (403) 484-5640. Log on as: guest. $10 setup fee; $25 for 20 hours a month plus $6.25 an hour for access to ftp and telnet. Voice: (403) 448-1901.

1.3.4 Arizona

Tucson. Data Basics, (602) 721-5887. $25 a month or $180 a year. Voice: (602) 721-1988.

Phoenix/Tucson. Internet Direct, (602) 274-9600 (Phoenix); (602) 321-9600 (Tucson). Log on as: guest. $20 a month. Voice: (602) 274-0100 (Phoenix); (602) 324-0100 (Tucson).

1.3.5 British Columbia

Victoria Victoria Free-Net, (604) 595-2300. Menus. Access to all features requires completion of a written form. Users can “link” to other Free-Net systems in Canada and the United States. Free. Log on as: guest. Voice: (604) 389-6026.

1.3.6 California

Berkeley. Holonet. Menus. For free trial, modem number is (510) 704-1058. For information or local numbers, call the voice number. $60 a year for local access, $2 an hour during offpeak hours. Voice: (510) 704-0160.

Cupertino. Portal. Both Unix and menus. (408) 725-0561 (2400 bps); (408) 973-8091 (9600/14,400 bps). $19.95 setup fee, $19.95 a month. Voice: (408) 973-9111.

Encinitas. Cyber Station, (619) 634-1376. Unix. Log on as: guest. Charges: $20 a month for one hour a day; $10 setup fee.

Los Angeles, Oakland, Pasadena and Irvine. For more information, call voice (800) 876-CERF or (619) 534-5087. $50 setup fee; $20 a month plus $5 an hour ($3 on weekends). Voice: (800) 876-2373.

Los Angeles/Orange County. Kaiwan Public Access Internet, (714) 539-5726; (310) 527-7358. $15 signup; $11 a month (credit card). Voice: (714) 638-2139.

Palo Alto. Institute for Global Communications., (415) 322-0284. Unix. Local conferences on environmental/peace issues. Log on as: new. $10 a month and $3 an hour after first hour. Voice: (415) 442-0220.

San Diego. Dial N’ CERF USA, run by the California Education and Research Federation. Provides local dial-up numbers in San Diego, Los Angeles, Oakland, Pasadena and Irvine. For more information, call voice (800) 876-CERF or (619) 534-5087. $50 setup fee; $20 a month plus $5 an hour ($3 on weekends). Voice: (800) 876-2373.

San Diego. CTS Network Services, (619) 637-3660. Log on as: help. $15 set-up fee, monthly fee of $10 to $23 depending on services used. Voice: (619) 637-3637.

San Diego. Cyberspace Station, (619) 634-1376. Unix. Log on as: guest. Charges: $10 sign-up fee; $15 a month or $60 for six months.

San Francisco. Pathways, call voice number for number. Menus. $25 setup fee; $8 a month and $3 an hour. Voice: (415) 346-4188.

San Jose. Netcom, (510) 865-9004 or 426-6610; (408) 241-9760; (415) 424-0131, up to 9600 bps. Unix. Maintains archives of Usenet postings. Log on as: guest. $15 startup fee and then $17.50 a month for unlimited use if you agree to automatic billing of your credit-card account (otherwise $19.50 a month for a monthly invoice). Voice: (408) 554-UNIX.

San Jose. A2i, (408) 293-9010. Log on as: guest. $20 a month; $45 for three months; $72 for six months.

Sausalito. The Whole Earth 'Lectronic Link (WELL), (415) 332-6106. Uses moderately difficult Picospan software, which is sort of a cross between Unix and a menu system. New users get a written manual. More than 200 WELL-only conferences. Log on as: newuser. $15 a month plus $2 an hour. Access through the nationwide CompuServe Packet Network available for another $4.50 an hour. Voice: (415) 332-4335. Recorded message about the system's current status: (800) 326-8354 (continental U.S. only).

1.3.7 Colorado

Colorado Springs/Denver. CNS, (719) 570-1700 (Colorado Springs); (303) 758-2656 (Denver). Local calendar listings and ski and stock reports. Users can choose between menus or Unix. Log on as: new. $35 setup fee; $2.75 an hour (minimum fee of $10 a month). Voice: (719) 592-1240

Colorado Springs. Old Colorado City Communications, (719) 632-4111. Log on as: newuser. $25 a month. Voice: (719) 632-4848.

Denver. Denver Free-Net, (303) 270-4865. Menus. Access to all services requires completion of a written form. Users can "link" to other Free-Net systems across the country. Free. Log on as: guest.

Golden. Colorado SuperNet. E-mail to fax service. Available only to Colorado residents. Local dial-in numbers available in several Colorado cities. For dial-in numbers, call the number below. $3 an hour ($1 an hour between midnight and 6 a.m.); one-time $20 sign-up fee. Voice: (303) 273-3471.

1.3.8 Delaware

Middletown. Systems Solutions, (302) 378-1881. $20 setup fee; $25 a month for full Internet access. Voice: (800) 331-1386

1.3.9 Florida

Talahassee. Talahassee Free-Net, (904) 488-5056. Menus. Full access requires completion of a registration form. Can "link" to other Free-Net systems around the country. Voice: (904) 488-5056.

1.3.10 Illinois

Champaign. Prarienet Free-Net, (217) 255-9000. Menus. Log on as: visitor. Free for Illinois residents; $25 a year for others. Voice: (217) 244-1962.

Chicago. MCSNet, (312) 248-0900. $25/month or $65 for three months of unlimited access; $30 for three months of access at 15 hours a month. Voice: (312) 248-UNIX.

Peoria. Peoria Free-Net, (309) 674-1100. Similar to Cleveland Free-Net (see Ohio, below). Users can "link" to the larger Cleveland system for access to Usenet and other services. There are also Peoria Free-Net public-access terminals in numerous area libraries, other government buildings and senior-citizen centers. Contact the number below for specific locations. Full access (including access to e-mail) requires completion of a written application. Free. Voice: (309) 677-2544.

1.3.11 Maryland

Baltimore. Express Access, (410) 766-1855; (301) 220-0462; (714) 377-9784. Log on as: new. $20 setup fee; $25 a month or $250 a year. Voice: (800 969-9090.

Baltimore. Clarknet, (410) 730-9786; (410) 995-0271; (301) 596- 1626; (301) 854-0446. Log on as: guest. $23 a month, $126 for six months or $228 a year. Voice: (410) 730-9765.

1.3.12 Massachusetts

Bedford. The Internet Access Company, (617) 275-0331. To log on, follow on-line prompts. $20 setup fee; $19.50 a month. Voice: (617) 275-2221.

Brookline. The World, (617) 739-9753. "Online Book Initiative" collection of electronic books, poetry and other text files. Log on as: new. $5 a month plus $2 an hour or $20 for 20 hours a month. Available nationwide through the CompuServe Packet Network for another $5.60 an hour. Voice: (617) 739-0202.

Lynn. North Shore Access, (617) 593-4557. Log on as: new. $10 for 10 hours a month; $1 an hour after that. Voice: (617) 593-3110.

Worcester. NovaLink, (508) 754-4009. Log on as: info. $12.95 sign-up (includes first two hours); $9.95 a month (includes five daytime hours), $1.80 an hour after that. Voice: (800) 274-2814.

1.3.13 Michigan

Ann Arbor. MSEN. Call voice number for dial-in number. Unix. Charges: $20 setup; $20 a month. Voice: (313) 998-4562.

Ann Arbor. Michnet. Has local dial-in numbers in several Michigan numbers. For local numbers, call voice number below. $35 a month plus one-time $40 sign-up fee. Additional network fees for access through non-Michnet numbers. Voice: (313) 764-9430.

1.3.14 New Hampshire

Manchester. MV Communications, Inc. For local dial-up numbers call voice line below. $5 a month mininum plus variable hourly rates depending on services used. Voice: (603) 429-2223.

1.3.15 New Jersey

New Brunswick. Digital Express, (908) 937-9481. Log on as: new. $20 setup fee; $25 a month or $250 a year. Voice: (800) 969-9090.

1.3.16 New York

New York. Panix, (212) 787-3100. Unix or menus. Log on as: newuser. $40 setup fee; $19 a month or $208 a year. Voice: (212) 877-4854.

New York. Echo, (212) 989-8411. Unix, but with local conferencing software. Log on as: newuser. $19.95 ($13.75 students and seniors) a month. Voice: (212) 255-3839.

New York. MindVox, (212) 989-4141. Local conferences. Log on as: guest. $10 setup fee for non-credit-card accounts; $15 a month. Voice: (212) 989-2418.

New York. Pipeline, (212) 267-8606 (9600 bps and higher); (212) 267-7341 (2400 bps). Offers graphical interface for Windows for $90. Log on as: guest. $20 a month and $2 an hour after first 20 hours or $35 a month unlimited hours. Voice: (212) 267-3636.

New York. Maestro, (212) 240-9700. Log on as: newuser. $12 a month or $140 a year. Voice: (212) 240-9600.

1.3.17 North Carolina

Charlotte. Vnet Internet Access, (704) 347-8839; (919) 406-1544. Log on as: new. $25 a month. Voice: (704) 374-0779.

Triangle Research Park. Rock Concert Net. Call number below for local modem numbers in various North Carolina cities. $30 a month; one-time $50 sign-up fee. Voice: (919) 248-1999.

1.3.18 Ohio

Cleveland. Cleveland Free-Net, (216) 368-3888. Ohio and US Supreme Court decisions, historical documents, many local conferences. Full access (including access to e-mail) requires completion of a written application. Free. Voice: (216) 368-8737.

Cincinnati. Tri-State Free-Net, (513) 579-1990. Similar to Cleveland Free-Net. Full access (including access to e-mail) requires completion of a written application. Free.

Cleveland. Wariat, (216) 481-9436. Unix or menus. $20 setup fee; $35 a month. Voice: (216) 481-9428.

Dayton. Freelance Systems Programming, (513) 258-7745. $20 setup fee; $1 an hour. Voice: (513) 254-7246.

Lorain. Lorain County Free-Net, (216) 277-2359 or 366-9753. Similar to Cleveland Free-Net. Users can "link" to the larger Cleveland system for additional services. Full access (including access to e-mail) requires completion of a written application. Free. Voice: (216) 366-4200.

Medina. Medina Free-Net, (216) 723-6732, 225-6732 or 335-6732. Users can "link" to the larger Cleveland Free-Net for additional services. Full access (including access to e-mail) requires completion of a written application. Free.

Youngstown. Youngstown Free-Net, (216) 742-3072. Users can "link" to the Cleveland system for services not found locally. Full access (including access to e-mail) requires completion of a written application. Free.

1.3.19 Ontario

Ottawa. National Capital FreeNet, (613) 780-3733 or (613) 564-3600. Free, but requires completion of a written form for access to all services.

Toronto. UUNorth. Call voice number below for local dial-in numbers. $20 startup fee; $25 for 20 hours a month of offpeak use. Voice: (416) 225-8649.

Toronto. Internex Online, (416) 363-3783. Both Unix and menus. $40 a year for one hour a day. Voice: (416) 363-8676.

1.3.20 Oregon

Portland. Agora, (503) 293-1772 (2400 bps), (503) 293-2059 (9600 bps or higher). Log on as: apply. $6 a month for one hour per day.

Portland. Teleport, (503) 220-0636 (2400 bps); (503) 220-1016 (9600 and higher). Log on as: new. $10 a month for one hour per day. Voice: (503) 223-4245.

1.3.21 Pennsylvania

Pittsburgh. Telerama, (412) 481-5302. $6 for 10 hours a month, 60 cents for each additional hour. Voice: (412) 481-3505.

1.3.22 Quebec

Montreal. Communications Accessibles Montreal, (514) 931-7178 (9600 bps); (514) 931-2333 (2400 bps). $25 a month. Voice: (514) 931-0749.

1.3.23 Rhode Island

East Greenwich. IDS World Network, (401) 884-9002. In addition to Usenet, has conferences from the Fidonet and RIME networks. $10 a month; $50 for six months; $100 for a year.

Providence/Seekonk. Anomaly, (401) 331-3706. $125 for six months or $200 a year. Educational rate of $75 for six months or $125 a year. Voice: (401) 273-4669.

1.3.24 Texas

Austin. RealTime Communications, (512) 459-4391. Log on as: new. $75 a year. Voice: (512) 451-0046.

Dallas. Texas Metronet, (214) 705-2901; (817) 261-1127. Log on as: info or signup. $10 to $35 setup fee, depending on service; $10 to $45 a month, depending on service. Voice: (214) 705-2900 or (817) 543-8756.

Houston. The Black Box, (713) 480-2686. $21.65 a month. Voice: (713) 480-2684.

1.3.25 Virginia

Norfolk/Peninsula. Wyvern Technologies, (804) 627-1828 (Norfolk); (804) 886-0662 (Peninsula). $10 startup fee; $15 a month or $144 a year. Voice: (804) 622-4289.

1.3.26 Washington, DC

The Meta Network. Call voice number below for local dial-in numbers. Caucus conferencing, menus. $15 setup fee; $20 a month. Voice: (703) 243-6622.

CapAccess, (202), 784-1523. Log on as guest with a password of visitor. A Free-Net system (see under Cleveland, Ohio, for information). Free. Voice: (202) 994-4245.

See also: listing under Baltimore, MD for Express Access and Clarknet.

1.3.27 Washington State

Seattle. Eskimo North, (206) 367-3837 (all speeds), (206) 362-6731 (9600/14.4K bps). $10 a month or $96 a year. Voice: (206) 367-7457.

Seattle. Halcyon, (206) 382-6245. Users can choose between menus and Unix. Log on as: new. $10 setup fee; $60 a quarter or $200 a year. Voice: (206) 955-1050.

1.3.28 United Kingdom

London. Demon Internet Systems, 44 (0)81 343 4848. 12.50 setup fee; 10 a month or 132.50 a year. Voice: 44 (0)81 349 0063

1.4 If your Town doesn't have Direct Access

If you don't live in an area with a public-access site, you'll still be able to connect to the Net. Several services offer access through national data networks such as the CompuServe Packet Network and SprintNet, which have dozens, even hundreds of local dial-in numbers across the country. These include Holonet in Berkeley, Calf., Portal in Cupertino, Calf., the WELL in Sausalito, Calf., Dial 'N CERF in San Diego, Calf., the World in Brookline, Mass., and Michnet in Ann Arbor, Mich. Dial 'N CERF offers access through an 800 number. Expect to pay from $2 to $12 an hour to use these networks, above each provider's basic charges. The exact amount depends on the network, time of day and type of modem you use. For more information, contact the above services.

Four other providers deliver Net access to users across the country:

Delphi, based in Cambridge, Mass., is a consumer-oriented network much like CompuServe or America On-Line – only it now offers subscribers access to Internet services.

Charges: $3 a month for Internet access, in addition to standard charges. These are $10 a month for four hours of off-peak (non-working hours) access a month and $4 an hour for eachs additional hour or $20 for 20 hours of access a month and $1.80 an hour for each additional hour. For more information, call (800) 695-4005.

PSI, based in Reston, Va., provides nationwide access to Internet services through scores of local dial-in numbers to owners of IBM and compatible computers. PSILink. which includes access to e-mail, Usenet and ftp, costs $29 a month, plus a one-time $19 registration fee. Special software is required, but is available free from PSI. PSI's Global Dialup Service provides access to telnet for $39 a month plus a one-time $39 set-up fee. For more information, call (800) 82PSI82 or (703) 620-6651.

BIX (the Byte Information Exchange) offers FTP, Telnet and e-mail access to the Internet as part of their basic service. Owned by the same company as Delphi, it also offers 20 hours of access a month for $20. For more information, call (800) 695-4775.

NovX Systems Integration, based in Seattle, Washington, offers full Internet access through an 800 number reachable across the United States. There is a $24.95 setup fee, in addition to a monthly fee of $19.95 and a $10.5 hourly charge. For more information, call (206) 447-0800.

1.5 Net Origins

In the 1960s, researchers began experimenting with linking computers to each other and to people through telephone hook-ups, using funds from the U.S Defense Department's Advanced Research Projects Agency (ARPA).

ARPA wanted to see if computers in different locations could be linked using a new technology known as packet switching, which had the promise of letting several users share just one communications line. Previous computer networking efforts had required a line between each computer on the network, sort of like a train track on which only one train can travel at a time. The packet system allowed for creation of a data highway, in which large numbers of vehicles could essentially share the same lane. Each packet was given the computer equivalent of a map and a time stamp, so that it could be sent to the right destination, where it would then be reassembled into a message the computer or a human could use.

This system allowed computers to share data and the researchers to exchange electronic mail, or e-mail. In itself, e-mail was something of a revolution, offering the ability to send detailed letters at the speed of a phone call.

As this system, known as ARPANet, grew, some enterprising college students (and one in high school) developed a way to use it to conduct online conferences. These started as science-oriented discussions, but they soon branched out into virtually every other field, as people recognized the power of being able to "talk" to hundreds, or even thousands, of people around the country.

In the 1970s, ARPA helped support the development of rules, or protocols, for transferring data between different types of computer networks. These "internet" (from "internetworking") protocols made it possible to develop the worldwide Net we have today that links all sorts of computers across national boundaries. By the close of the 1970s, links developed between ARPANet and counterparts in other countries. The world was now tied together in a computer web.

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In the 1980s, this network of networks, which became known collectively as the Internet, expanded at a phenomenal rate. Hundreds, then thousands, of colleges, research companies and government agencies began to connect their computers to this worldwide Net. Some enterprising hobbyists and companies unwilling to pay the high costs of Internet access (or unable to meet stringent government regulations for access) learned how to link their own systems to the Internet, even if "only" for e-mail and conferences. Some of these systems began offering access to the public. Now anybody with a computer and modem – and persistence – could tap into the world.

In the 1990s, the Net grows at exponential rates. Some estimates are that the volume of messages transferred through the Net grows 20 percent a month. In response, government and other users have tried in recent years to expand the Net itself. Once, the main Net "backbone" in the U.S. moved data at 1.5 million bits per second. That proved too slow for the ever increasing amounts of data being sent over it, and in recent years the maximum speed was increased to 1.5 million and then 45 million bits per second. Even before the Net was able to reach that latter speed, however, Net experts were already figuring out ways to pump data at speeds of up to 2 billion bits per second – fast enough to send the entire Encyclopedia Britannica across the country in just one or two seconds.

Another major change has been the development of commercial services that provide internetworking services at speeds comparable to those of the government system. In fact, by mid-1994, the U.S. government will remove itself from any day-to-day control over the workings of the Net, as regional and national providers continue to expand.

1.6 How it Works

The worldwide Net is actually a complex web of smaller regional networks. To understand it, picture a modern road network of trans-continental superhighways connecting large cities. From these large cities come smaller freeways and parkways to link together small towns, whose residents travel on slower, narrow residential ways.

The Net superhighway is the high-speed Internet. Connected to this are computers that use a particular system of transferring data at high speeds. In the U.S., the major Internet "backbone" theoretically can move data at rates of 45 million bits per second (compare this to the average home modem, which has a top speed of roughly 9,600 to 14,400 bits per second). This internetworking "protocol" lets network users connect to computers around the world.

Connected to the backbone computers are smaller networks serving particular geographic regions, which generally move data at speeds around 1.5 million bits per second.

Feeding off these in turn are even smaller networks or individual computers.

Unlike commercial networks such as CompuServe or Prodigy, the Internet is not run by one central computer or computers. This is both its greatest strength and its greatest weakness. The approach means it is virtually impossible for the entire Net to crash at once – even if one computer shuts down, the rest of the network stays up. The design also reduces the costs for an individual or organization to get onto the network. But thousands of connected computers can also make it difficult to navigate the Net and find what you want – especially as different computers may have different commands for plumbing their resources. It is only recently that Net users have begun to develop the sorts of navigational tools and "maps" that will let neophytes get around without getting lost.

Nobody really knows how many computers and networks actually make up this Net. Some estimates say there are now as many as 5,000 networks connecting nearly 2 million computers and more than 15 million people around the world. Whatever the actual numbers, however, it is clear they are only increasing.

The Net is more than just a technological marvel. It is human communication at its most fundamental level. The pace may be a little quicker when the messages race around the world in a few seconds, but it's not much different from a large and interesting party. You'll see things in cyberspace that will make you laugh; you'll see things that will anger you. You'll read silly little snippets and new ideas that make you think. You'll make new friends and meet people you wish would just go away.

Major network providers continue to work on ways to make it easier for users of one network to communicate with those of another. Work is underway on a system for providing a universal "white pages" in which you could look up somebody's electronic-mail address, for example. This connectivity trend will likely speed up in coming years as users begin to demand seamless network access, much as telephone users can now dial almost anywhere in the world without worrying about how many phone companies actually have to connect their calls.

And today, the links grow ever closer between the Internet and such commercial networks as CompuServe and Prodigy, whose users can now exchange electronic mail with their Internet friends. Some commercial providers, such as Delphi and America Online, are working to bring their subscribers direct access to Internet services.

And as it becomes easier to use, more and more people will join this worldwide community we call the Net.

Being connected to the Net takes more than just reading conferences and logging messages to your computer; it takes asking and answering questions, exchanging opinions – getting involved.

If you choose to go forward, to use and contribute, you will become a "citizen of Cyberspace." If you're reading these words for the first time, this may seem like an amusing but unlikely notion – that one could "inhabit" a place without physical space. But put a mark beside these words. Join the Net and actively participate for a year. Then re-read this passage. It will no longer seem so strange to be a "citizen of Cyberspace." It will seem like the most natural thing in the world.

And that leads to a fundamental thing to remember:

You can't break the Net!

As you travel the Net, your computer may freeze, your screen may erupt into a mass of gibberish. You may think you've just disabled a million-dollar computer somewhere – or even your own personal computer. Sooner or later, this feeling happens to everyone – and likely more than once.

But the Net and your computer are hardier than you think, so relax. You can no more break the Net than you can the phone system. If something goes wrong, try again. If nothing at all happens, you can always disconnect. If worse comes to worse, you can turn off your computer. Then take a deep breath. And dial right back in. Leave a note for the person who runs the computer to which you've connected to ask for advice. Try it again. Persistence pays.

Stay and contribute. The Net will be richer for it – and so will you.

1.7 When things go wrong

- Your computer connects with a public-access site and get gibberish on your screen. If you are using parameters of 8-1-N, try 7-1-e (or vice-versa). If that doesn't work, try another modem speed.
- You have your computer dial a public-access site, but nothing happens. Check the phone number you typed in. If correct, turn on your modem's speaker (on Hayes-compatible modems, you can usually do this by typing ATM1 in your communications software's "terminal mode"). If the phone just rings and rings, the public-access site could be down for maintenance or due to a crash or some other problem. If you get a "connect" message, but nothing else, try hitting enter or escape a couple of times.
- You try to log in, but after you type your password, nothing happens, or you get a "timed out" message followed by a disconnect. Re-dial the number and try it again.
- Always remember, if you have a problem that just doesn't go away, ask! Ask your system administrator, ask a friend, but ask. Somebody will know what to do.

FYI:

The Net grows so fast that even the best guide to its resources would be somewhat outdated the day it was printed. At the end of each chapter, however, you'll find FYI pointers to places on the Net where you can go for more information or to keep updated on new resources and services.

Peter Kaminski maintains a list of systems that provide public access to Internet services. It's availble on the network itself, which obviously does you little good if you currently have no access, but which can prove invaluable should you move or want to find a new system. Look for his "PDIAL" file in the **alt.bbs.lists** or **news.answers** newsgroups in Usenet (for information on accessing Usenet, see Chapter 3 [Global Watering Hole], page 51).

Steven Levy's book, *"Hackers: Heroes of the Computer Revolution"*, (Anchor Press/Doubleday, 1984), describes the early culture and ethos that ultimately resulted in the Internet and Usenet.

John Quarterman, *"The Matrix: Computer Networks and Conferencing Systems Worldwide"* (Digital Press, 1990), is an exhaustive look at computer networks and how they connect with each other. You'll find numerous documents about the Internet, its history and its resources in the '`pub/Net_info`' directory on the Electronic Frontier Foundation's FTP server (see Chapter 7 [FTP], page 99 to decipher this).

"FYI on Where to Start - A Bibliography of Internetworking Information", by **Tracy LaQuey, Joyce K. Reynolds, Karen Roubicek, Mary Stahl** and **Aileen Yuan** (August, 1990), is an excellent list of articles, books, newsletters and other sources of information about the Internet. It's available via ftp from **nic.ddn.mil** in the '`rfc`' directory as '`rfc1175.txt`' (see Chapter 7 [FTP], page 99 for information on getting documents through FTP).

"Ah! Dear Watson, now we enter the mystic room of wizardry, where even the most brilliant of all logic minds might fail."
— **Sir Arthur Conan Doyle**

"Welcome to the Pleasure Dome!"
— **Frankie goes to Hollywood**

2 Electronic Mail

2.1 The Basics

Electronic mail, or e-mail, is your personal connection to the world of the Net.

All of the millions of people around the world who use the Net have their own e-mail addresses. A growing number of "gateways" tie more and more people to the Net every day. When you logged onto the host system you are now using, it automatically generated an address for you, as well.

The basic concepts behind e-mail parallel those of regular mail. You send mail to people at their particular addresses. In turn, they write to you at your e-mail address. You can subscribe to the electronic equivalent of magazines and newspapers. You might even get electronic junk mail.

E-mail has two distinct advantages over regular mail. The most obvious is speed. Instead of several days, your message can reach the other side of the world in hours, minutes or even seconds (depending on where you drop off your mail and the state of the connections between there and your recipient). The other advantage is that once you master the basics, you'll be able to use e-mail to access databases and file libraries. You'll see how to do this later, along with learning how to transfer program and data files through e-mail.

E-mail also has advantages over the telephone. You send your message when it's convenient for you. Your recipients respond at their convenience. No more telephone tag. And while a phone call across the country or around the world can quickly result in huge phone bills, e-mail lets you exchange vast amounts of mail for only a few pennies – even if the other person is in New Zealand.

E-mail is your connection to help – your Net lifeline. The Net can sometimes seem a frustrating place! No matter how hard you try, no matter where you look, you just might not be able to find the answer to whatever is causing you problems. But when you know how to use e-mail, help is often just a few keystrokes away: you can ask your system administrator or a friend for help in an e-mail message.

The quickest way to start learning e-mail is to send yourself a message. Most public-access sites actually have several different types of mail systems, all of which let you both send and receive mail. We'll start with the simplest one, known, appropriately enough, as "mail," and then look at a couple of other interfaces. At your host system's command prompt, type:

```
mail username
```

where username is the name you gave yourself when you first logged on. Hit enter. The computer might respond with

```
Subject:
```

Type

```
test
```

or, actually, anything at all (but you'll have to hit enter before you get to the end of the screen). Hit enter.

The cursor will drop down a line. You can now begin writing the actual message. Type a sentence, again, anything at all. And here's where you hit your first Unix frustration, one that will bug you repeatedly: you have to hit enter before you get to the very end of the line. Just like typewriters, many Unix programs have no word-wrapping.[1]

---

[1] Although using `emacs` you'd simply say '`M-x auto-fill-mode`' to turn on (off) automatic word wrap.

When done with your message, hit return. Now hit control-D (the control and the D keys at the same time). This is a Unix command that tells the computer you're done writing and that it should close your "envelope" and mail it off (you could also hit enter once and then, on a blank line, type a period at the beginning of the line and hit enter again).

You've just sent your first e-mail message. And because you're sending mail to yourself, rather than to someone somewhere else on the Net, your message has already arrived, as we'll see in a moment.

If you had wanted, you could have even written your message on your own computer and then uploaded it into this electronic "envelope." There are a couple of good reasons to do this with long or involved messages. One is that once you hit enter at the end of a line in "mail" you can't readily fix any mistakes on that line (unless you use some special commands to call up a Unix text processor). Also, if you are paying for access by the hour, uploading a prepared message can save you money. Remember to save the document in ASCII or text format. Uploading a document you've created in a word processor that uses special formatting commands (which these days means many programs) will cause strange effects.

When you get that blank line after the subject line, upload the message using the ASCII protocol. Or you can copy and paste the text, if your software allows that. When done, hit control-D as above.

Now you have mail waiting for you. Normally, when you log on, your public-access site will tell you whether you have new mail waiting. To open your mailbox and see your waiting mail, type

```
mail
```

and hit enter.

When the host system sees "mail" without a name after it, it knows you want to look in your mailbox rather than send a message. Your screen, on a plain-vanilla Unix system will display:

```
Mail version SMI 4.0 Mon Apr 24 18:34:15 PDT 1989  Type ? for help.
''/usr/spool/mail/adamg'': 1 message 1 new 1 unread

>N 1 adamg              Sat Jan 15 20:04   12/290   test
```

Ignore the first line; it's just computerese of value only to the people who run your system. You can type a question mark and hit return, but unless you're familiar with Unix, most of what you'll see won't make much sense at this point.

The second line tells you the directory on the host system where your mail messages are put, which again, is not something you'll likely need to know. The second line also tells you how many messages are in your mailbox, how many have come in since the last time you looked and how many messages you haven't read yet.

It's the third line that is of real interest – it tells you who the message is from, when it arrived, how many lines and characters it takes up, and what the subject is. The "N" means it is a new message – it arrived after the last time you looked in your mailbox. Hit enter. And there's your message – only now it's a lot longer than what you wrote!

```
Message 1:
From adamg Jan 15 20:04:55 1994
Received: by eff.org id AA28949
(5.65c/IDA-1.4.4/pen-ident for adamg); Sat, 15 Jan 1994 20:04:55 -0400
(ident-sender: adamg@eff.org)
Date: Sat, 15 Jan 1994 21:34:55 -0400
From: Adam Gaffin <adamg>
Message-Id: <199204270134.AA28949@eff.org>
To: adamg
Subject: test
Status: R

This is only a test!
```

Whoa! What is all that stuff? It's your message with a postmark gone mad. Just as the postal service puts its marks on every piece of mail it handles, so do Net postal systems. Only it's called a "header" instead of a postmark. Each system that handles or routes your mail puts its stamp on it. Since many messages go through a number of systems on their way to you, you will often get messages with headers that seem to go on forever. Among other things, a header will tell you exactly when a message was sent and received (even the difference between your local time and Greenwich Mean Time (GMT) – as at the end of line 4 above).

If this had been a long message, it would just keep scrolling across and down your screen – unless the people who run your public-access site have set it up to pause every 24 lines. One way to deal with a message that doesn't stop is to use your telecommunication software's logging or text-buffer function. Start it before you hit the number of the message you want to see. Your computer will ask you what you want to call the file you're about to create. After you name the file and hit enter, type the number of the message you want to see and hit enter. When the message finishes scrolling, turn off the text-buffer function. The message is now saved in your computer. This way, you can read the message while not connected to the Net (which can save you money if you're paying by the hour) and write a reply offline.

But in the meantime, now what? You can respond to the message, delete it or save it. To respond, type a lowercase "r" and hit enter. You'll get something like this:

```
To: adamg
Subject: Re: test
```

Note that this time, you don't have to enter a user name. The computer takes it from the message you're replying to and automatically addresses your message to its sender. The computer also automatically inserts a subject line, by adding "Re:" to the original subject. From here, it's just like writing a new message. But say you change your mind and decide not to reply after all. How do you get out of the message? Hit control-C once. You'll get this:

```
(Interrupt -- one more to kill letter)
```

If you hit control-C once more, the message will disappear and you'll get back to your mail's command line.

Now, if you type a lowercase "d" and then hit enter, you'll delete the original message. Type a lowercase "q" to exit your mailbox.

If you type a "q" without first hitting "d", your message is transferred to a file called mbox. This file is where all read, but un-deleted messages go. If you want to leave it in your mailbox for now, type a lowercase "x" and hit enter. This gets you out of mail without making any changes.

The mbox file works a lot like your mailbox. To access it, type

```
mail -f mbox
```

at your host system's command line and hit enter.

You'll get a menu identical to the one in your mailbox from which you can read these old messages, delete them or respond to them. It's probably a good idea to clear out your mailbox and mbox file from time to time, if only to keep them uncluttered.

Are there any drawbacks to e-mail? There are a few. One is that people seem more willing to fly off the handle electronically than in person, or over the phone. Maybe it's because it's so easy to hit R and reply to a message without pausing and reflecting a moment. That's why we have smileys (see Section 2.4 [Smileys], page 44)! There's no online equivalent yet of a return receipt: chances are your message got to where it's going, but there's no absolute way for you to know for sure unless you get a reply from the other person.

So now you're ready to send e-mail to other people on the Net. Of course, you need somebody's address to send them mail. How do you get it?

Alas, the simplest answer is not what you'd call the most elegant: you call them up on the phone or write them a letter on paper and ask them. Residents of the electronic frontier are only beginning to develop the equivalent of phone books, and the ones that exist today are far from complete (still, later on, see Chapter 6 [Telnet], page 79, we'll show you how to use some of these directories).

Eventually, you'll start corresponding with people, which means you'll want to know how to address mail to them. It's vital to know how to do this, because the smallest mistake – using a comma when you should have used a period, for instance, can bounce the message back to you, undelivered. In this sense, Net addresses are like phone numbers: one wrong digit and you get the wrong person. Fortunately, most net addresses now adhere to a relatively easy-to-understand system.

Earlier, you sent yourself a mail message using just your user-name. This was sort of like making a local phone call – you didn't have to dial a 1 or an area code. This also works for mail to anybody else who has an account on the same system as you.

Sending mail outside of your system, though, will require the use of the Net equivalent of area codes, called "domains." A basic Net address will look something like this:

```
tomg@world.std.com
```

Tomg is somebody's user ID, and he is at (hence the sign) a site (or in Internetese, a "domain") known as '`std.com`'. Large organizations often have more than one computer linked to the Internet; in this case, the name of the particular machine is world (you will quickly notice that, like boat owners, Internet computer owners always name their machines).

Domains tell you the name of the organization that runs a given e-mail site and what kind of site it is or, if it's not in the U.S., what country it's located in. Large organizations may have more than one computer or gateway tied to the Internet, so you'll often see a two-part domain name; and sometimes even three- or four-part domain names.

In general, American addresses end in an organizational suffix, such as ".edu," which means the site is at a college or university. Other American suffixes include:

`.com` for businesses

`.org` for non-profit organizations

`.gov`

`.mil` for government and military agencies

`.net` for companies or organizations that run large networks.

Sites in the rest of the world tend to use a two-letter code that represents their country. Most make sense, such as '`.ca`' for Canadian sites, but there are a couple of seemingly odd ones, at least if you don't know the ISO 3166 standard international abbreviations. (see Appendix D [Country Codes], page 207 for a list of the rest of the world.) E.g., swiss sites end in '`.ch`' (Confederatio Helvetica), German sites end in '`.de`' (DEutschland), while South African ones end in '`.za`' (from the archaic spelling Zuid Afrika). Some U.S. sites have followed this international convention (such as well.sf.ca.us).

You'll notice that the above addresses are all in lowercase. Unlike almost everything else having anything at all to do with Unix, most Net mailing systems don't care about case, so you generally don't have to worry about capitalizing e-mail addresses. Alas, there are a few exceptions – some public-access sites do allow for capital letters in user names. When in doubt, ask the person you want to write to, or let her send you a message first (recall how a person's e-mail address is usually found on the top of her message). The domain name, the part of the address after the `@` sign, never has to be capitalized.

It's all a fairly simple system that works very well, except, again, it's vital to get the address exactly right – just as you have to dial a phone number exactly right. Send a message to `tomg@unm.edu` (which is the University of New Mexico) when you meant to send it to `tomg@umn.edu` (the University of Minnesota), and your letter will either bounce back to you undelivered, or go to the wrong person.

If your message is bounced back to you as undeliverable, you'll get an ominous looking-message from MAILER-DAEMON (actually a rather benign Unix program that exists to handle mail), with an evil-looking header followed by the text of your message. Sometimes, you can tell what went wrong by looking at the first few lines of the bounced message. Besides an incorrect address, it's possible your host system does not have the other site in the "map" it maintains of other host systems. Or you could be trying to send mail to another network, such as Bitnet or CompuServe, that has special addressing requirements.

Sometimes, figuring all this out can prove highly frustrating. But remember the prime Net commandment: Ask. Send a message to your system administrator. He or she might be able to help decipher the problem.

There is one kind of address that may give your host system particular problems. There are two main ways that Unix systems exchange mail. One is known as UUCP and started out with a different addressing system than the rest of the Net. Most UUCP systems have since switched over to the standard Net addressing system, but a few traditional sites still cling to their original type, which tends to have lots of exclamation points in it, like this:

```
uunet!somesite!othersite!mybuddy
```

The problem for many host sites is that exclamation points (also known as "bangs") now mean something special in the more common systems or "shells" used to operate many Unix computers. This means that addressing mail to such a site (or even responding to a message you received from one) could confuse the poor computer to no end and your message never gets sent out. If that happens, try putting backslashes in front of each exclamation point, so that you get an address that looks like this:

```
uunet\!somesite\!othersite\!mybuddy
```

Note that this means you may not be able to respond to such a message by typing a lowercase '`r`' – you may get an error message and you'll have to create a brand-new message.

If you want to get a taste of what's possible through e-mail, start an e-mail message to

```
almanac@oes.orst.edu
```

Leave the "Subject:" line blank. As a message, write this:

```
send quote
```

Or, if you're feeling a little down, write this instead:

```
send moral-support
```

In either case, you will get back a message within a few seconds to a few hours (depending on the state of your host system's Internet connection). If you simply asked for a quote, you'll get back a fortune-cookie-like saying. If you asked for moral support, you'll also get back a fortune-cookie-like saying, only supposedly more uplifting.

This particular "mail server" is run by Oregon State University. Its main purpose is actually to provide a way to distribute agricultural information via e-mail. If you'd like to find out how to use the server's full range of services, send a message to its address with this line in it:

```
send help
```

You'll quickly get back a lengthy document detailing just what's available and how to get it.

Feeling opinionated? Want to give the President of the United States a piece of your mind? Send a message to <president@whitehouse.gov>. Or if the vice president will do, write <vice-president@whitehouse.gov>.

The "mail" program is actually a very powerful one and a Netwide standard, at least on Unix computers. But it can be hard to figure out – you can type a question mark to get a list of commands, but these may be of limited use unless you're already familiar with Unix. Fortunately, there are a couple of other mail programs that are easier to use.

2.2 ELM – A better way

Elm is a combination mailbox and letter-writing system that uses menus to help you navigate through mail. Most Unix-based host systems now have it online. To use it, type

```
elm
```

and hit enter. You'll get a menu of your waiting mail, along with a list of commands you can execute, that will look something like this:

```
Mailbox is '/usr/spool/mail/adamg' with 38 messages [ELM 2.3 PL11]

1   Sep 1  Christopher Davis  (13)   here's another message.
2   Sep 1  Christopher Davis  (91)   This is a message from Eudora
3   Aug 31 Rita Marie Rouvali (161)  First Internet Hunt !!! (fwd)
4   Aug 31 Peter Scott/Manage (69)   New File <UK077> University of Londo
5   Aug 30 Peter Scott/Manage (64)   New File <DIR020> X.500 service at A
6   Aug 30 Peter Scott/Manage (39)   New File <NET016> DATAPAC Informatio
7   Aug 28 Peter Scott/Manage (67)   Proposed Usenet group for HYTELNET n
8   Aug 28 Peter Scott/Manage (56)   New File <DIR019> JANET Public Acces
9   Aug 26 Helen Trillian Ros (15)   Tuesday
10  Aug 26 Peter Scott/Manage (151)  Update <CWK004> Oxford University OU

You can use any of the following commands by pressing the first character;
d)elete or u)ndelete mail, m)ail a message, r)eply or f)orward mail, q)uit
To read a message, press <return>. j = move down, k = move up, ? = help
```

Each line shows the date you received the message, who sent it, how many lines long the message is, and the message's subject.

If you are using VT100 emulation, you can move up and down the menu with your up and down arrow keys. Otherwise, type the line number of the message you want to read or delete and hit enter.

When you read a message, it pauses every 24 lines, instead of scrolling until it's done. Hit the space bar to read the next page. You can type a lowercase "r" to reply or a lowercase "q" or "i" to get back to the menu (the I stands for "index").

At the main menu, hitting a lowercase "m" followed by enter will let you start a message. To delete a message, type a lowercase "d". You can do this while reading the message. Or, if you are in the menu, move the cursor to the message's line and then hit D.

When you're done with Elm, type a lowercase "q". The program will ask if you really want to delete the messages you marked. Then, it will ask you if you want to move any messages you've read but haven't marked for deletion to a "received" file. For now, hit your "n" key.

Elm has a major disadvantage for the beginner. The default text editor it generally calls up when you hit your "r" or "m" key is often a program called emacs. Unixoids swear by emacs, but everybody else almost always finds it impossible. Unfortunately, you can't always get away from it (or vi, another text editor often found on Unix systems), so later on we'll talk about some basic commands that will keep you from going totally nuts.

If you want to save a message to your own computer, hit "s", either within the message or with your cursor on the message entry in the elm menu. A filename will pop up. If you do not like it, type a new name (you won't have to backspace). Hit enter, and the message will be saved with that file name in your "home directory" on your host system. After you exit elm, you can now download it (ask your system administrator for specifics on how to download – and upload – such files).

2.3 PINE – An even better way

Pine is based on elm but includes a number of improvements that make it an ideal mail system for beginners. Like elm, pine starts you with a menu. It also has an "address book" feature that is handy for people with long or complex e-mail addresses. Hitting A at the main menu puts you in the address book, where you can type in the person's first name (or nickname) followed by her address. Then, when you want to send that person a message, you only have to type in her first name or nickname, and pine automatically inserts her actual address. The address book also lets you set up a mailing list. This feature allows you to send the same message to a number of people at once.

What really sets pine apart is its built-in text editor, which looks and feels a lot more like word-processing programs available for MS-DOS and Macintosh users. Not only does it have word wrap (a revolutionary concept if ever there was one), it also has a rwspell-checker and a search command. Best of all, all of the commands you need are listed in a two-line mini-menu at the bottom of each screen. The commands look like this:

```
^W Where is
```

The little caret is a synonym for the key marked "control" on your keyboard. To find where a particular word is in your document, you'd hit your control key and your W key at the same time, which would bring up a prompt asking you for the word to look for.

Some of pine's commands are a tad peculiar (control-V for "page down" for example), which comes from being based on a variant of emacs (which is utterly peculiar). But again, all of the commands you need are listed on that two-line mini-menu, so it shouldn't take you more than a couple of seconds to find the right one.

To use pine, type

```
pine
```

at the command line and hit enter. It's a relatively new program, so many systems may not yet have it online. But it's so easy to use, you should probably send e-mail to your system administrator urging him to get it!

2.4 Smileys

When you're involved in an online discussion, you can't see the smiles or shrugs that the other person might make in a live conversation to show he's only kidding. But online, there's no body language. So what you might think is funny, somebody else might take as an insult. To try to keep such misunderstandings from erupting into bitter disputes, we have smileys. Tilt your head to the left and look at the following sideways. :-). Or simply :). This is your basic "smiley." Use it to indicate people should not take that comment you just made as seriously as they might otherwise. You make a smiley by typing a colon, a hyphen and a right parenthetical bracket. Some people prefer using the word "grin," usually in this form:

```
<grin>
```

Sometimes, though, you'll see it as *grin* or even just <g> for short. Some other smileys include:

;-)	Wink;
:-(	Frown;
:-O	Surprise;
8-)	Wearing glasses;
=|:-)=	Abe Lincoln.

OK, so maybe the last two are a little bogus :-), but for some really fancy ones, see Appendix E [Smiley Dictionary], page 215.

2.5 E-Mail to other Networks

There are a number of computer networks that are not directly tied to the Net, but to which you can still send e-mail messages. Here's a list of some of the larger networks, how to send mails to them and how their users can send mail to you:

2.5.1 America Online

Remove any spaces from a user's name and append '@aol.com', to get

```
user@aol.com
```

America Online users who want to send mail to you need only put your Net address in the "to:" field before composing a message.

2.5.2 ATTMail

Address your message to <user@attmail.com>. From ATTMail, a user would send mail to you in this form:

```
internet!domain!user
```

So if your address were <nancyr@world.std.com>, your correspondent would send a message to you at

```
internet!world.std.com!nancyr
```

2.5.3 Bitnet

Users of Bitnet (and NetNorth in Canada and EARN in Europe) often have addresses in this form: <IZZY@INDVMS>. If you're lucky, all you'll have to do to mail to that address is add "bitnet" at the end, to get <izzy@indvms.bitnet>. Sometimes, however, mail to such an address will bounce back to you, because Bitnet addresses do not always translate well into an Internet form. If this happens, you can send mail through one of two Internet/Bitnet gateways. First, change the '@' in the address to a '%', so that you get <user%site.bitnet>. Then add either '@vm.marist.edu' or '@cunyvm.cuny.edu', so that, with the above example, you would get <izzy%indyvms.bitnet@vm.marist.edu> or <izzy%indvyvms.bitnet@cunyvm.cuny.edu>

Bitnet users have it a little easier: They can usually send mail directly to your e-mail address without fooling around with it at all. So send them your address and they should be OK.

2.5.4 CompuServe

CompuServe users have numerical addresses in this form: 73727,545. To send mail to a CompuServe user, change the comma to a period and add '@compuserve.com'; for example: <73727.545@compuserve.com>.

Note that some CompuServe users must pay extra to receive mail from the Internet.

If you know CompuServe users who want to send you mail, tell them to GO MAIL and create a mail message. In the address area, instead of typing in a CompuServe number, have them type your address in this form:

```
>INTERNET:YourID@YourAddress.
```

For example, '>INTERNET:adamg@world.std.com'. Note that both the '>' and the ':' are required.

2.5.5 Delphi

To send mail to a Delphi user, the form is <user@delphi.com>.

2.5.6 Fidonet

To send mail to people using a Fidonet BBS, you need the name they use to log onto that system and its "node number." Fidonet node numbers or addresses consist of three numbers, in this form: '1:322/190'. The first number tells which of several broad geographic zones the BBS is in (1 represents the U.S. and Canada, 2 Europe and Israel, 3 Pacific Asia, 4 South America). The second number represents the BBS's network, while the final number is the BBS's "FidoNode" number in that network. If your correspondent only gives you two numbers (for example, '322/190'), it means the system is in zone 1.

Now comes the tricky part. You have to reverse the numbers and add to them the letters 'f', 'n' and 'z' (which stand for "FidoNode," "network," and "zone'). For example, the address above would become

```
f190.n322.
```

Now add '`fidonet.org`' at the end, to get '`f190.n322. z1.fidonet.org`'.[2] Then add '`First Name.LastName@`', to get

`FirstName.LastName@f190.n322.z1.fidonet.org.`

Note the period between the first and last names. Whew!

The reverse process is totally different. First, the person has to have access to his or her BBS's "net mail" area and know the Fidonet address of his or her local Fidonet/UUCP gateway (often their system operator will know it). Your Fidonet correspondent should address a net-mail message to UUCP (not your name) in the "to:" field. In the node-number field, they should type in the node number of the Fidonet/UUCP gateway (if the gateway system is in the same regional network as their system, they need only type the last number, for example, '`390`' instead of '`322/390`'). Then, the first line of the message has to be your Internet address, followed by a blank line. After that, the person can write the message and send it.

Because of the way Fidonet moves mail, it could take a day or two for a message to be delivered in either direction. Also, because many Fidonet systems are run as hobbies, it is considered good form to ask the gateway sysop's permission if you intend to pass large amounts of mail back and forth. Messages of a commercial nature are strictly forbidden (even if it's something the other person asked for). Also, consider it very likely that somebody other than the recipient will read your messages.

2.5.7 GEnie

To send mail to a GEnie user, add '`@genie.com`' to the end of the GEnie user name, for example, `<walt@genie.com>`. Incoming and outbound Internet mail is available to all GEnie users for no extra charge.

If you know GEnie users who want to send mail to you, tell them to go the the mail menu and create a mail message as they normally would. At the '`TO:`' prompt they can enter your address in this form:

`YourID@YourAddress#INET`

For example, '`adamg@world.std.com#INET`'.

2.5.8 MCIMail

To send mail to somebody with an MCIMail account, add '`@mcimail.com`' to the end of their name or numerical address. For example:

`555-1212@mcimail.com`

or

`jsmith@mcimail.com`

Note that if there is more than one MCIMail subscriber with that name, you will get a mail message back from MCI giving you their names and numerical addresses. You'll then have to figure out which one you want and re-send the message.

From MCI, a user would type: *Your Name* '`(EMS)`' at the "To:" prompt. At the EMS prompt, he or she would type '`internet`' followed by your Net address at the "Mbx:" prompt.

[2] Note that some countries have their own national FidoNet backbones, and thus the address part '`fidonet.org`', should better be replaced with the national Internet domain name, to prevent superfluous routing of mail; e.g. in Germany, you might address a Fido node via '`fido.de`', and get '`FirstName.LastName@f190.n322.z2.fido.de`' instead of the example provided above.

2.5.9 Peacenet

To send mail to a Peacenet user, use this form:

```
username@igc.org
```

Peacenet subscribers can use your regular address to send you mail.

2.5.10 Prodigy

`<userID@prodigy.com>`. Note that Prodigy users must pay extra for Internet e-mail.

2.6 Seven UNIX Commands you can't live without:

If you connect to the Net through a Unix system, eventually you'll have to come to terms with Unix. For better or worse, most Unix systems do NOT shield you from their inner workings – if you want to copy a Usenet posting to a file, for example, you'll have to use some Unix commands if you ever want to do anything with that file.

Like MS-DOS, Unix is an operating system - it tells the computer how to do things. Now while Unix may have a reputation as being even more complex than MS-DOS, in most cases, a few basic, and simple, commands should be all you'll ever need.

If your own computer uses MS-DOS or PC-DOS, the basic concepts will seem very familiar – but watch out for the cd command, which works differently enough from the similarly named DOS command that it will drive you crazy. Also, unlike MS-DOS, Unix is case sensitive – if you type commands or directory names in the wrong case, you'll get an error message.

If you're used to working on a Mac, you'll have to remember that Unix stores files in "directories" rather than "folders." Unix directories are organized like branches on a tree. At the bottom is the "root" directory, with sub-directories branching off that (and sub-directories in turn can have sub-directories). The Mac equivalent of a Unix sub-directory is a folder within another folder.

`cat` Equivalent to the MS-DOS "type" command. To pause a file every screen, type '`cat file |more`', better: '`more file`', where "file" is the name of the file you want to see. Hitting control-C will stop the display. You can also use '`cat`' for writing or uploading text files to your name or home directory (similar to the MS-DOS '`copy con:`' command). If you type '`cat >test`' you start a file called "test". You can either write something simple (no editing once you've finished a line and you have to hit return at the end of each line) or upload something into that file using your communications software's ASCII protocol). To close the file, hit control-D.

`cd` The "change directory" command. To change from your present directory to another, type '`cd directory`' and hit enter. Unlike MS-DOS, which uses a \ to denote sub-directories (for example: stuff\text), Unix uses a / (for example: stuff/text). So to change from your present directory to the stuff/text sub-directory, you would type '`cd stuff/text`' and then hit enter. As in MS-DOS, you do not need the first backslash if the subdirectory comes off the directory you're already in. To move back up a directory tree, you would type '`cd ..`' followed by enter. Note the space between the `cd` and the two periods – this is where MS-DOS users will really go nuts.

`cp` Copies a file. The syntax is '`cp file1 file2`' which would copy file1 to file2 (or over-write file2 with file1).

`ls` This command, when followed by enter, tells you what's in the directory, similar to the DOS `dir` command, except in alphabetical order.

`ls |more` will stop the listing every 24 lines – handy if there are a lot of things in the directory. The basic ls command does not list "hidden" files, such as the '`.login`' file that controls how your system interacts with Unix. To see these files, type '`ls -a`' or '`ls -a |more`'

'`ls -l`' will tell you the size of each file in bytes and tell you when each was created or modified.

`mv` Similar to the MS-DOS rename command. In fact, '`mv file1 file2`' will rename file1 as file2, The command can also be used to move files between directories.

'`mv file1 News`' would move file1 to your News directory.

`rm` Deletes a file. Type '`rm filename`' and hit enter (but beware: when you hit enter, it's gone for good).

2.6.1 Wildcards

When searching for, copying or deleting files, you can use "wildcards" if you are not sure of the file's exact name.

```
ls man*
```

would find the following files:

```
manual, manual.txt, man-o-man.
```

Use a question mark when you're sure about all but one or two characters. For example,

```
ls man?
```

would find a file called mane, but not one called manual.

2.7 When things go wrong:

- You send a message but get back an ominous looking message from MAILER-DAEMON containing up to several dozen lines of computerese followed by your message.

  Somewhere in those lines you can often find a clue to what went wrong. You might have made a mistake in spelling the e-mail address. The site to which you're sending mail might have been down for maintenance or a problem. You may have used the wrong "translation" for mail to a non-Internet network.

- You call up your host system's text editor to write a message or reply to one and can't seem to get out.

  If it's emacs, try control-X, control-C (in other words, hit your control key and your X key at the same time, followed by control and C). If worse comes to worse, you can hang up.

- In Elm, you accidentally hit the D key for a message you want to save. Type the number of the message, hit enter and then U, which will "un-delete" the message. This works only before you exit Elm; once you quit, the message is gone.

- You try to upload an ASCII message you've written on your own computer into a message you're preparing in Elm or Pine and you get a lot of left brackets, capital Ms, Ks and Ls and some funny-looking characters.

  Believe it or not, your message will actually wind up looking fine; all that garbage is temporary and reflects the problems some Unix text processors have with ASCII uploads. But it will take much longer for your upload to finish. One way to deal with this is to call up the simple mail program, which will not produce any weird characters when you upload a text file into a message. Another way (which is better if your prepared message is a response to somebody's mail), is to create a text file on your host system with cat, for example,

```
cat >file
```

and then upload your text into that. Then, in Elm or Pine, you can insert the message with a simple command (control-R in Pine, for example); only this time you won't see all that extraneous stuff.

FYI:

Scott Yanoff posts a very long list of existing cross-connections of almost any sub-nets to "newsgroups" (see Chapter 3 [Global Watering Hole], page 51 for an explanation of this term) **comp.mail** , **comp.answers**, and **news.answers**. Just to mention a few: AppleLink, BIX, GreeNet, MausNet, SprintMail, etc. Get your hands on the '`inter-network-guide`', that's kept on **rtfm.mit.edu** in directory '`pub/usenet/comp.mail`'. See Chapter 9 [Advanced E-mail], page 129 or Chapter 7 [FTP], page 99 to find out how to access this Internet treasure chest.

"...and the first lesson learned is:
Never lose the alternative way out of sight."
— **Sir Arthur Conan Doyle**

"If all else fails, read the manual."
— **PC Wizard**

"If all else fails, read the manual page."
— **Unix Wizard**

3 Usenet: the Global Watering Hole

3.1 The Global Watering Hole

Imagine a conversation carried out over a period of hours and days, as if people were leaving messages and responses on a bulletin board. Or imagine the electronic equivalent of a radio talk show where everybody can put their two cents in and no one is ever on hold.

Unlike e-mail, which is usually "one-to-one," Usenet is "many-to-many." Usenet is the international meeting place, where people gather to meet their friends, discuss the day's events, keep up with computer trends or talk about whatever's on their mind. Jumping into a Usenet discussion can be a liberating experience. Nobody knows what you look or sound like, how old you are, what your background is. You're judged solely on your words, your ability to make a point.

To many people, Usenet IS the Net. In fact, it is often confused with Internet. But it is a totally separate system. All Internet sites CAN carry Usenet, but so do many non-Internet sites, from sophisticated Unix machines to old XT clones and Apple IIs.

Technically, Usenet messages are shipped around the world, from host system to host system, using one of several specific Net protocols. Your host system stores all of its Usenet messages in one place, which everybody with an account on the system can access. That way, no matter how many people actually read a given message, each host system has to store only one copy of it. Many host systems "talk" with several others regularly in case one or another of their links goes down for some reason. When two host systems connect, they basically compare notes on which Usenet messages they already have. Any that one is missing the other then transmits, and vice-versa. Because they are computers, they don't mind running through thousands, even millions, of these comparisons every day.

Yes, millions. For Usenet is huge. Every day, Usenet users pump upwards of 40 million characters a day into the system – roughly the equivalent of volumes A-G of the Encyclopedia Britannica. Obviously, nobody could possibly keep up with this immense flow of messages. Let's look at how to find conferences and discussions of interest to you.

The basic building block of Usenet is the newsgroup, which is a collection of messages with a related theme (on other networks, these would be called conferences, forums, boards or special-interest groups). There are now more than 5,000 of these newsgroups, in several diferent languages, covering everything from art to zoology, from science fiction to South Africa.

Some public-access systems, typically the ones that work through menus, try to make it easier by dividing Usenet into several broad categories. Choose one of those and you're given a list of newsgroups in that category. Then select the newsgroup you're interested in and start reading.

Other systems let you compile your own "reading list" so that you only see messages in conferences you want. In both cases, conferences are arranged in a particular hierarchy devised in the early 1980s. Newsgroup names start with one of a series of broad topic names. For example, newsgroups beginning with "comp." are about particular computer-related topics. These broad topics are followed by a series of more focused topics (so that **comp.unix** groups are limited to discussion about Unix). The main hierarchies are:

`bionet`
: Research biology

`bit.listserv`
: Conferences originating as Bitnet mailing lists

`biz`
: Business

`comp`
: Computers and related subjects

`misc`	Discussions that don't fit anywhere else
`news`	News about Usenet itself
`rec`	Hobbies, games and recreation
`sci`	Science other than research biology
`soc`	"Social" groups, often ethnically related
`talk`	Politics and related topics
`alt`	Controversial or unusual topics; not carried by all sites

In addition, many host systems carry newsgroups for a particular city, state or region. For example, **ne.housing** is a newsgroup where New Englanders look for apartments. A growing number also carry K12 newsgroups, which are aimed at elementary and secondary teachers and students. And a number of sites carry clari newsgroups, which is actually a commercial service consisting of wire-service stories and a unique online computer news service (see Chapter 10 [News of the World], page 135).

3.2 Navigating Usenet with nn

How do you dive right in? As mentioned, on some systems, it's all done through menus – you just keep choosing from a list of choices until you get to the newsgroup you want and then hit the "read" command. On Unix systems, however, you will have to use a "newsreader" program. Two of the more common ones are known as rn (for "read news") and nn (for "no news" – because it's supposed to be simpler to use).

For beginners, nn may be the better choice because it works with menus – you get a list of articles in a given newsgroup and then you choose which ones you want to see. To try it out, connect to your host system and, at the command line, type

```
nn news.announce.newusers
```

and hit enter. After a few seconds, you should see something like this:

```
Newsgroup: news.announce.newusers                  Articles: 22 of 22/1 NEW

a Gene Spafford   776  Answers to Frequently Asked Questions
b Gene Spafford   362  A Primer on How to Work With the Usenet Community
c Gene Spafford   387  Emily Postnews Answers Your Questions on Netiquette
d Gene Spafford   101  Hints on writing style for Usenet
e Gene Spafford    74  Introduction to news.announce
f Gene Spafford   367  USENET Software: History and Sources
g Gene Spafford   353  What is Usenet?
h taylor          241  A Guide to Social Newsgroups and Mailing Lists
i Gene Spafford   585  Alternative Newsgroup Hierarchies, Part I
j Gene Spafford   455  Alternative Newsgroup Hierarchies, Part II
k David C Lawrenc 151  How to Create a New Newsgroup
l Gene Spafford   106  How to Get Information about Networks
m Gene Spafford   888  List of Active Newsgroups
n Gene Spafford   504  List of Moderators
o Gene Spafford  1051  Publicly Accessible Mailing Lists, Part I
p Gene Spafford  1123  Publicly Accessible Mailing Lists, Part II
q Gene Spafford  1193  Publicly Accessible Mailing Lists, Part III
r Jonathan Kamens 644  How to become a USENET site
s Jonathan Kamen 1344  List of Periodic Informational Postings, Part I

-- 15:52 -- SELECT -- help:? -----Top 85%-----
Explanatory postings for new users. (Moderated)
```

Obviously, this is a good newsgroup to begin your exploration of Usenet! Here's what all this means: The first letter on each line is the letter you type to read that particular "article" (it makes sense that a "newsgroup" would have "articles"). Next comes the name of the person who wrote that article, followed by its length, in lines, and what the article is about. At the bottom, you see the local time at your access site, what you're doing right now (i.e., SELECTing articles), which key to hit for some help (the ? key) and how many of the articles in the newsgroup you can see on this screen. The "(moderated)" means the newsgroup has a "moderator" who is the only one who can directly post messages to it. This is generally limited to groups such as this, which contain articles of basic information, or for digests, which are basically online magazines (more on them in a bit).

Say you're particularly interested in what "Emily Postnews" (see Appendix B [Dear Emily], page 195) has to say about proper etiquette on Usenet. Hit your c key (lower case!), and the line will light up. If you want to read something else, hit the key that corresponds to it. And if you want to see what's on the next page of articles, hit return or your space bar.

But you're impatient to get going, and you want to read that article now. The command for that in nn is a capital Z. Hit it and you'll see something like this:

```
Gene Spafford: Emily Postnews Answers Your Questions on Netiquette
Original-author: brad@looking.on.ca (Brad Templeton)
Archive-name: emily-postnews/part1
Last-change: 30 Nov 91 by brad@looking.on.ca (Brad Templeton)


**NOTE: this is intended to be satirical.  If you do not recognize
it as such, consult a doctor or professional comedian.  The
recommendations in this article should recognized for what
they are -- admonitions about what NOT to do.


''Dear Emily Postnews''

Emily Postnews, foremost authority on proper net behaviour,
gives her advice on how to act on the net.

=========================================================================

Dear Miss Postnews: How long should my signature be? -- verbose@noisy

A: Dear Verbose: Please try and make your signature as long as you
-- 09:57 --.announce.newusers-- LAST --help:?--Top 4%--
```

The first few lines are the message's header, similar to the header you get in e-mail messages. Then comes the beginning of the message. The last line tells you the time again, the newsgroup name (or part of it, anyway), the position in your message stack that this message occupies, how to get help, and how much of the message is on screen. If you want to keep reading this message, just hit your space bar (not your enter key!) for the next screen and so on until done. When done, you'll be returned to the newsgroup menu. For now hit Q (upper case this time), which quits you out of nn and returns you to your host system's command line.

To get a look at another interesting newsgroup, type

```
nn comp.risks
```

and hit enter. This newsgroup is another moderated group, this time a digest of all the funny and frightening ways computers and the people who run and use them can go wrong. Again, you read articles by selecting their letters. If you're in the middle of an article and decide you want to go onto the next one, hit your n key.

Now it's time to look for some newsgroups that might be of particular interest to you. Unix host systems that have nn use a program called nngrep (ever get the feeling Unix was not entirely written in English?) that lets you scan newsgroups. Exit nn and at your host system's command line, type

```
nngrep word
```

where word is the subject you're interested in. If you use a Macintosh computer, you might try

```
nngrep mac
```

You'll get something that looks like this:

```
alt.music.machines.of.loving.grace
alt.religion.emacs
comp.binaries.mac
comp.emacs
comp.lang.forth.mac
```

```
comp.os.mach
comp.sources.mac
comp.sys.mac.announce
comp.sys.mac.apps
comp.sys.mac.comm
comp.sys.mac.databases
comp.sys.mac.digest
comp.sys.mac.games
comp.sys.mac.hardware
comp.sys.mac.hypercard
comp.sys.mac.misc
comp.sys.mac.programmer
comp.sys.mac.system
comp.sys.mac.wanted
gnu.emacs.announce
gnu.emacs.bug
gnu.emacs.gnews
gnu.emacs.gnus
gnu.emacs.help
gnu.emacs.lisp.manual
gnu.emacs.sources
gnu.emacs.vm.bug
gnu.emacs.vm.info
gnu.emacs.vms
```

Note that some of these obviously have something to do with Macintoshes while some obviously do not; nngrep is not a perfect system. If you want to get a list of ALL the newsgroups available on your host system, type

```
nngrep -a |more
```

or

```
nngrep -a |pg
```

and hit enter (which one to use depends on the Unix used on your host system; if one doesn't do anything, try the other). You don't absolutely need the |more or |pg, but if you don't include it, the list will keep scrolling, rather than pausing every 24 lines. If you are in nn, hitting a capital Y will bring up a similar list.

Typing '`nn newsgroup`' for every newsgroup can get awfully tiring after awhile. When you use nn, your host system looks in a file called '`.newsrc`'. This is basically a list of every newsgroup on the host system along with notations on which groups and articles you have read (all maintained by the computer). You can also use this file to create a "reading list" that brings up each newsgroup to which you want to "subscribe." To try it out, type

```
nn
```

without any newsgroup name, and hit enter.

Unfortunately, you will start out with a '`.newsrc`' file that has you "subscribed" to every single newsgroup on your host system! To delete a newsgroup from your reading list, type a capital U while its menu is on the screen. The computer will ask you if you're sure you want to "unsubscribe." If you then hit a Y, you'll be unsubscribed and put in the next group.

With many host systems carrying thousands of newsgroups, this will take you forever.

Fortunately, there are a couple of easier ways to do this. Both involve calling up your '.newsrc' file in a word or text processor. In a '.newsrc' file, each newsgroup takes up one line, consisting of the group's name, an exclamation point or a colon and a range of numbers.

Newsgroups with a colon are ones to which you are subscribed; those followed by an exclamation point are "un-subscribed." To start with a clean slate, then, you have to change all those colons to exclamation points. If you know some UNIX, it's a one-liner, just type:

```
tr ':' '!' < .newsrc > temprc
```

and you're done. Without the tr command you must use a text editor.

If you know how to use emacs or vi, call up the '.newsrc' file (you might want to make a copy of '.newsrc' first, just in case), and use the search-and-replace function to make the change.

If you're not comfortable with these text processors, you can download the '.newsrc' file, make the changes on your own computer and then upload the revised file. Before you download the file, however, you should do a couple of things. One is to type

```
cp .newsrc temprc
```

and hit enter. You will actually download this temprc file (note the name does not start with a period – some computers, such as those using MS-DOS, do not allow file names starting with periods). After you download the file, open it in your favorite word processor and use its search-and-replace function to change the exclamation points to colons. Be careful not to change anything else! Save the document in ASCII or text format. Dial back into your host system. At the command line, type

```
cp temprc temprc1
```

and hit enter. This new file will serve as your backup '.newsrc' file just in case something goes wrong. Upload the temprc file from your computer. This will overwrite the Unix system's old temprc file. Now type

```
cp temprc .newsrc
```

and hit enter. You now have a clean slate to start creating a reading list.

3.3 nn Commands

To mark a specific article for reading, type the letter next to it (in lower case). To mark a specific article and all of its responses, type the letter and an asterisk, for example:

```
a*
```

To un-select an article, type the letter next to it (again, in lower case).

C
: Cancels an article (around the world) that you wrote. Every article posted on Usenet has a unique ID number. Hitting a capital 'C' sends out a new message that tells host systems that receive it to find earlier message and delete it.

F
: To post a public response, or follow-up. If selected while still on a newsgroup "page", asks you which article to follow up. If selected while in a specific article, will follow up that article. In either case, you'll be asked if you want to include the original article in yours. Caution: puts you in whatever text editor is your default.

N
: Goes to the next subscribed newsgroup with unread articles.

P
: Goes to the previous subscribed newsgroup with unread articles.

G news.group
: Goes to a specific newsgroup. Can be used to subscribe to new newsgroups. Hitting 'G' brings up a sub-menu:

- `u` Goes to the group and shows only un-read articles.
- `a` Goes to the group and shows all articles, even ones you've already read.
- `s` Will show you only articles with a specific subject.
- `n` Will show you only articles from a specific person.

`M` Mails a copy of the current article to somebody. You'll be asked for the recipient's e-mail address and whether you want to add any comments to the article before sending it off. As with '`F`', puts you in the default editor.

`:post` Post an article. You'll be asked for the name of the group.

`Q` Quit, or exit, nn.

`U` Un-subscribe from the current newsgroup.

`R` Responds to an article via e-mail.

`space` Hitting the space bar brings up the next page of articles.

`X` If you have selected articles, this will show them to you and then take you to the next subscribed newsgroup with unread articles. If you don't have any selected articles, it marks all articles as read and takes you to the next unread subscribed newsgroup.

`=word` Finds and marks all articles in the newsgroup with a specific word in the "Subject:" line, for example: '`=modem`'

`Z` Shows you selected articles immediately and then returns you to the current newsgroup.

`?` Brings up a help screen.

`<` Goes to the previous page in the newsgroup.

`>` Goes to the next page in the newsgroup.

`$` Goes to the last page in an article.

`^` Goes to the first page in an article.

3.4 Using rn

Some folks prefer this older newsreader. It's a little easier to do this in rn, so let's try that out, and as long as where there, see how it works.

If you type

```
rn news.announce.newusers
```

at your host system's command line, you'll see something like this:

```
********  21 unread articles in news.announce.newusers--read now? [ynq]
```

If you hit your Y key, the first article will appear on your screen. If you want to see what articles are available first, though, hit your computer's '`=`' key and you'll get something like this:

```
152 Introduction to news.announce
153 A Primer on How to Work With the Usenet Community
154 What is Usenet?
155 Answers to Frequently Asked Questions
156 Hints on writing style for Usenet
158 Alternative Newsgroup Hierarchies, Part I
159 Alternative Newsgroup Hierarchies, Part II
160 Emily Postnews Answers Your Questions on Netiquette
161 USENET Software: History and Sources
162 A Guide to Social Newsgroups and Mailing Lists
163 How to Get Information about Networks
164 How to Create a New Newsgroup
169 List of Active Newsgroups
170 List of Moderators
171 Publicly Accessible Mailing Lists, Part I
172 Publicly Accessible Mailing Lists, Part II
173 Publicly Accessible Mailing Lists, Part III
174 How to become a USENET site
175 List of Periodic Informational Postings, Part I
176 List of Periodic Informational Postings, Part II
177 List of Periodic Informational Postings, Part III
End of article 158 (of 178)--what next? [npq]
```

Notice how the messages are in numerical order this time, and don't tell you who sent them. Article 154 looks interesting. To read it, type in 154 and hit enter. You'll see something like this:

```
Article 154 (20 more) in news.announce.newusers (moderated):
From: spaf@cs.purdue.EDU (Gene Spafford)
Newsgroups: news.announce.newusers,news.admin,news.answers
Subject: What is Usenet?
Date: 20 Sep 92 04:17:26 GMT
Followup-To: news.newusers.questions
Organization: Dept. of Computer Sciences, Purdue Univ.
Lines: 353
Supersedes: <spaf-whatis_715578719@cs.purdue.edu>

Archive-name: what-is-usenet/part1
Original from: chip@tct.com (Chip Salzenberg)
Last-change: 19 July 1992 by spaf@cs.purdue.edu (Gene Spafford)


The first thing to understand about Usenet is that it is widely
misunderstood.  Every day on Usenet, the ``blind men and the elephant''
phenomenon is evident, in spades.  In my opinion, more flame wars
arise because of a lack of understanding of the nature of Usenet than
from any other source.  And consider that such flame wars arise, of
necessity, among people who are on Usenet.  Imagine, then, how poorly
understood Usenet must be by those outside!

--MORE--(7%)
```

This time, the header looks much more like the gobbledygook you get in e-mail messages. To keep reading, hit your space bar. If you hit your n key (lower case), you'll go to the next message in the numerical order.

To escape rn, just keep hitting your q key (in lower case), until you get back to the command line. Now let's set up your reading list. Because rn uses the same '`.newsrc`' file as nn, you can use one of the search-and-replace methods described above. Or you can do this: Type

```
rn
```

and hit enter. When the first newsgroup comes up on your screen, hit your u key (in lower case). Hit it again, and again, and again. Or just keep it pressed down (if your computer starts beeping, let up for a couple of seconds). Eventually, you'll be told you're at the end of the newsgroups, and asked what you want to do next.

Here's where you begin entering newsgroups. Type

```
g newsgroup
```

(for example, '`g comp.sys.mac.announce`') and hit enter. You'll be asked if you want to "subscribe." Hit your y key. Then type

```
g next newsgroup
```

(for example, '`g comp.announce.newusers`') and hit enter. Repeat until done. This process will also set up your reading list for nn, if you prefer that newsreader. But how do you know which newsgroups to subscribe? Typing a lowercase l and then hitting enter will show you a list of all available newsgroups. Again, since there could be more than 2,000 newsgroups on your system, this might not be something you want to do. Fortunately, you can search for groups with particular words in their names, using the l command. Typing

```
l mac
```

followed by enter, will bring up a list of newsgroups with those letters in them (and as in nn, you will also see groups dealing with emacs and the like, in addition to groups related to Macintosh computers).

Because of the vast amount of messages transmitted over Usenet, most systems carry messages for only a few days or weeks. So if there's a message you want to keep, you should either turn on your computer's screen capture or save it to a file which you can later download). To save a message as a file in rn, type

```
s filename
```

where filename is what you want to call the file. Hit enter. You'll be asked if you want to save it in "mailbox format." In most cases, you can answer with an n (which will strip off the header). The message will now be saved to a file in your News directory (which you can access by typing '`cd News`' and then hitting enter).

Also, some newsgroups fill up particularly quickly – go away for a couple of days and you'll come back to find hundreds of articles! One way to deal with that is to mark them as "read" so that they no longer appear on your screen. In nn, hit a capital J; in rn, a small c.

3.5 rn Commands

Different commands are available to you in rn depending on whether you are already in a newsgroup or reading a specific article. At any point, typing a lowercase '`h`' will bring up a list of available commands and some terse instructions for using them. Here are some of them:

After you've just called up rn, or within a newsgroup:

`c` Marks every article in a newsgroup as read (or "caught up") so that you don't have to see them again. The system will ask you if you are sure. Can be done either when asked if you want to read a particular newsgroup or once in the newsgroup.

`g` Goes to a newsgroup, in this form:

`g news.group`
Use this both for going to groups to which you're already subscribed and subscribing to new groups.

`h` Provides a list of available commands with terse instructions.

`l` Gives a list of all available newsgroups.

`p` Goes to the first previous subscribed newsgroup with un-read articles.

`q` Quits, or exits, rn if you have not yet gone into a newsgroup. If you are in a newsgroup, it quits that one and brings you to the next subscribed newsgroup.

Only within a newsgroup:

`=` Gives a list of all available articles in the newsgroup.

`m` Marks a specific article or series of articles as "un-read" again so that you can come back to them later. Typing '`1700m`' and hitting enter would mark just that article as un-read. Typing '`1700-1800m`' and hitting enter would mark all of those articles as un-read.

`s file` Copies the current article to a file in your News directory, where "file" is the name of the file you want to save it to. You'll be asked if you want to use "mailbox" format when saving. If you answer by hitting your '`N`' key, most of the header will not be saved.

`space` Brings up the next page of article listings. If already on the last page, displays the first article in the newsgroup.

`u` Un-subscribe from the newsgroup.

`/text/` Searches through the newsgroup for articles with a specific word or phrase in the "Subject:" line, from the current article to the end of the newsgroup. For example,

`/EFF/` would bring you to the first article with "EFF" in the "Subject:" line.

`?text?` The same as '`/text/`' except it searches in reverse order from the current article.

Only within a specific article:

`C` If you post an article and then decide it was a mistake, call it up on your host system and hit this. The message will soon begin disappearing on systems around the world.

`F` Post a public response in the newsgroup to the current article. Includes a copy of her posting, which you can then edit down using your host system's text editor.

`f` The same as above except it does not include a copy of the original message in yours.

`m` Marks the current article as "un-read" so that you can come back to it later. You do not have to type the article number.

`Control-N`
Brings up the first response to the article. If there is no follow-up article, this returns you to the first unread article in the newsgroup).

`Control-P`
Goes to the message to which the current article is a reply.

`n` Goes to the next unread article in the newsgroup.

`N` Takes you to the next article in the newsgroup even if you've already read it.

`q` Quits, or exits, the current article. Leaves you in the current newsgroup.

`R` Reply, via e-mail only, to the author of the current article. Includes a copy of his message in yours.

`r` The same as above, except it does not include a copy of his article.

`s |mail user`
Mails a copy of the article to somebody. For "user" substitute an e-mail address. Does not let you add comments to the message first, however.

`space` Hitting the space bar shows the next page of the article, or, if at the end, goes to the next un-read article.

3.6 Essential Newsgroups

With so much to choose from, everybody will likely have their own unique Usenet reading list. But there are a few newsgroups that are particularly of interest to newcomers. Among them:

news.announce.newusers This group consists of a series of articles that explain various facets of Usenet.

news.newusers.questions This is where you can ask questions (we'll see how in a bit) about how Usenet works.

news.announce.newsgroups Look here for information about new or proposed newsgroups.

news.answers Contains lists of "Frequently Asked Questions" (FAQs) and their answers from many different newsgroups. Learn how to fight jet lag in the FAQ from **rec.travel.air**; look up answers to common questions about Microsoft Windows in an FAQ from **comp.os.ms-windows**; etc.

alt.internet.services Looking for something in particular on the Internet? Ask here.

alt.infosystems.announce People adding new information services to the Internet will post details here.

3.7 Speaking up

"Threads" are an integral part of Usenet. When somebody posts a message, often somebody else will respond. Soon, a thread of conversation begins. Following these threads is relatively easy. In nn, related messages are grouped together. In rn, when you're done with a message, you can hit control-N to read the next related message, or followup. As you explore Usenet, it's probably a good idea to read discussions for a while before you jump in. This way, you can get a feel for the particular newsgroup – each has its own rhythms.

Eventually, though, you'll want to speak up. There are two main ways to do this. You join an existing conversation, or you can start a whole new thread.

If you want to join a discussion, you have to decide if you want to include portions of the message you are responding to in your message. The reason to do this is so people can see what you're responding to, just in case the original message has disappeared from their system (remember that most Usenet messages have a short life span on the average host system) or they can't find it.

If you're using a Unix host system, joining an existing conversation is similar in both nn and rn: hit your F key when done with a given article in the thread. In rn, type a small f if you don't want to include portions of the message you're responding to; an uppercase F if you do. In nn, type a capital F. You'll then be asked if you want to include portions of the original message.

And here's where you hit another Unix wall. When you hit your F key, your host system calls up its basic Unix text editor. If you're lucky, that'll be Pico, a very easy system. More likely, however, you'll get dumped into emacs (or possibly vi), which you've already met in the chapter on e-mail.

The single most important emacs command is

```
control-x control-c
```

This means, depress your control key and hit x. Then depress the control key and hit c. Memorize this. In fact, it's so important, it bears repeating:

```
control-x control-c
```

These keystrokes are how you get out of emacs. If they work well, you'll be asked if you want to send, edit, abort or list the message you were working on. If they don't work well (say you accidentally hit some other weird key combination that means something special to emacs) and nothing seems to happen, or you just get more weird-looking emacs prompts on the bottom of your screen, try hitting control-g. This should stop whatever emacs was trying to do (you should see the word "quit" on the bottom of your screen), after which you can hit control-x control-c. But if this still doesn't work, remember that you can always disconnect and dial back in!

If you have told your newsreader you do want to include portions of the original message in yours, it will automatically put the entire thing at the top of your message. Use the arrow keys to move down to the lines you want to delete and hit control-K, which will delete one line at a time.

You can then write your message. Remember that you have to hit enter before your cursor gets to the end of the line, because emacs does not have word wrapping.

When done, hit control-X control-C. You'll be asked the question about sending, editing, aborting, etc. Chose one. If you hit Y, your host system will start the process to sending your message across the Net.

The nn and rn programs work differently when it comes to posting entirely new messages. In nn, type

```
:post
```

and hit enter in any newsgroup. You'll be asked which newsgroup to post a message to. Type in its name and hit enter. Then you'll be asked for "keywords." These are words you'd use to attract somebody scanning a newsgroup. Say you're selling your car. You might type the type of car here. Next comes a "summary" line, which is somewhat similar. Finally, you'll be asked for the message's "distribution." This is where you put how widely you want your message disseminated. Think about this one for a second. If you are selling your car, it makes little sense to send a message about it all over the world. But if you want to talk about the environment, it might make a lot of sense. Each host system has its own set of distribution classifications, but there's generally a local one (just for users of that system), one for the city, state or region it's in, another for the country (for example, usa), one for the continent (for Americans and Canadians, na) and finally, one for the entire world (usually: world).

Which one to use? Generally, a couple of seconds' thought will help you decide. If you're selling your car, use your city or regional distribution – people in Australia won't much care and may even get annoyed. If you want to discuss presidential politics, using a USA distribution makes more sense. If you want to talk about events in the Middle East, sending your message to the entire world is perfectly acceptable.

Then you can type your message. If you've composed your message offline (generally a good idea if you and emacs don't get along), you can upload it now. You may see a lot of weird looking characters as it uploads into emacs, but those will disappear when you hit control-X and then control-C. Alternately: "save" the message (for example, by hitting m in rn), log out, compose your message offline, log back on and upload your message into a file on your host system. Then call up Usenet, find the article you "saved." Start a reply, and you'll be asked if you want to include a prepared message. Type in the name of the file you just created and hit enter.

In rn, you have to wait until you get to the end of a newsgroup to hit F, which will bring up a message-composing system. Alternately, at your host system's command line, you can type

```
Pnews
```

and hit enter. You'll be prompted somewhat similarly to the nn system, except that you'll be given a list of possible distributions. If you chose "world," you'll get this message:

This program posts news to thousands of machines throughout the entire civilized world. Your message will cost the net hundreds if not thousands of dollars to send everywhere. Please be sure you know what you are doing.

Are you absolutely sure that you want to do this? [ny]

Don't worry – your message won't really cost the Net untold amounts, although, again, it's a good idea to think for a second whether your message really should go everywhere.

If you want to respond to a given post through e-mail, instead of publicly, hit R in nn or r or R in rn. In rn, as with follow-up articles, the uppercase key includes the original message in yours.

Most newsgroups are unmoderated, which means that every message you post will eventually wind up on every host system within the geographic region you specified that carries that newsgroup.

Some newsgroups, however, are moderated, as you saw earlier with **comp.risks**. In these groups, messages are shipped to a single location where a moderator, acting much like a magazine editor, decides what actually gets posted. In some cases, groups are moderated like scholarly journals. In other cases, it's to try to cut down on the massive number of messages that might otherwise be posted.

You'll notice that many articles in Usenet end with a fancy "signature" that often contains some witty saying, a clever drawing and, almost incidentally, the poster's name and e-mail address. You too can have your own "signature" automatically appended to everything you post. On your own computer, create a signature file. Try to keep it to four lines or less, lest you annoy others on the Net. Then, while connected to your host system, type

```
cat >.signature
```

and hit enter (note the period before the s). Upload your signature file into this using your communications software's ASCII upload protocol. When done, hit control-D, the Unix command for closing a file. Now, every time you post a message, this will be appended to it.

There are a few caveats to posting. Usenet is no different from a Town Meeting or publication: you're not supposed to break the law, whether that's posting copyrighted material or engaging in illegal activities. It is also not a place to try to sell products (except in certain **biz.*** and explicit for-sale newsgroups).

3.8 Cross-posting

Sometimes, you'll have an issue you think should be discussed in more than one newsgroup. Rather than posting individual messages in each group, you can post the same message in several groups at once, through a process known as cross-posting.

Say you want to start a discussion about the political ramifications of importing rare tropical fish from Brazil. People who read **rec.aquaria** might have something to say. So might people who read **alt.politics.animals** and **talk.politics.misc**.

Cross-posting is easy. It also should mean that people on other systems who subscribe to several newsgroups will see your message only once, rather than several times – news-reading software can cancel out the other copies once a person has read the message. When you get ready to post a message (whether through Pnews for rn or the '`:post`' command in nn), you'll be asked in which newsgroups. Type the names of the various groups, separated by a comma, but no space, for example:

```
rec.aquaria,alt.politics.animals,talk.politics.misc
```

and hit enter. After answering the other questions (geographic distribution, etc.), the message will be posted in the various groups (unless one of the groups is moderated, in which case the message goes to the moderator, who decides whether to make it public).

It's considered bad form to post to an excessive number of newsgroups, or inappropriate newsgroups. Probably, you don't really have to post something in 20 different places. And while you may think your particular political issue is vitally important to the fate of the world, chances are the readers of **rec.arts.comics** will not, or at least not important enough to impose on them. You'll get a lot of nasty e-mail messages demanding you restrict your messages to the "appropriate" newsgroups.

```
--
  -------------------  *       _-_
  \==============_=_/ ____.---'---`---.____   *
              \_ \    \----._________.----/
         *      \ \   /  /    `-_-'              *
  *         __,--`.`-'..'-_
           /____          ||            *
                `--.____,-'   ...to boldly go where no man has gone before!
```

```
--
Disclaimer - These opiini^H^H damn! ^H^H ^Q ^[ .... :w  :q  :wq  :wq! ^d  X ^?
exit X Q  ^C ^? :quitbye  CtrlAltDel   ~~q  :~q  logout  save/quit :!QUIT
^[zz ^[ZZZZZZ ^H  man vi ^  ^L  ^[c  ^# ^E ^X ^I ^T ? help  helpquit ^D  ^d
man help ^C ^c help exit ?Quit ?q CtrlShftDel"Hey, what does this button d..."
```

— **.signature(s)**

4 Usenet: from Flame Wars to Killfiles

4.1 Flame, Blather and Spew

Something about online communications seems to make some people particularly irritable. Perhaps it's the immediacy and semi-anonymity of it all. Whatever it is, there are whole classes of people you will soon think seem to exist to make you miserable.

Rather than pausing and reflecting on a message as one might do with a letter received on paper, it's just so easy to hit your R key and tell somebody you don't really know what you really think of them. Even otherwise calm people sometimes find themselves turning into raving lunatics. When this happens, flames erupt.

A flame is a particularly nasty, personal attack on somebody for something he or she has written. Periodically, an exchange of flames erupts into a flame war that begin to take up all the space in a given newsgroup (and sometimes several; flamers like cross-posting to let the world know how they feel). These can go on for weeks (sometimes they go on for years, in which case they become "holy wars," usually on such topics as the relative merits of Macintoshes and IBMs). Often, just when they're dying down, somebody new to the flame war reads all the messages, gets upset and issues an urgent plea that the flame war be taken to e-mail so everybody else can get back to whatever the newsgroup's business is. All this usually does, though, is start a brand new flame war, in which this poor person comes under attack for daring to question the First Amendment, prompting others to jump on the attackers for impugning this poor soul... You get the idea.

Every so often, a discussion gets so out of hand that somebody predicts that either the government will catch on and shut the whole thing down or somebody will sue to close down the network, or maybe even the wrath of God will smote everybody involved. This brings what has become an inevitable rejoinder from others who realize that the network is, in fact, a resilient creature that will not die easily: *"Imminent death of Usenet predicted. Film at 11."*

Flame wars can be tremendously fun to watch at first. They quickly grow boring, though. And wait until the first time you're attacked!

Flamers are not the only **Net.characters** to watch out for.

Spewers assume that whatever they are particularly concerned about either really is of universal interest or should be rammed down the throats of people who don't seem to care – as frequently as possible.

You can usually tell a spewer's work by the number of articles he posts in a day on the same subject and the number of newsgroups to which he then sends these articles – both can reach well into double digits. Often, these messages relate to various ethnic conflicts around the world. Frequently, there is no conceivable connection between the issue at hand and most of the newsgroups to which he posts. No matter. If you try to point this out in a response to one of these messages, you will be inundated with angry messages that either accuse you of being an insensitive racist/American/whatever or ignore your point entirely to bring up several hundred more lines of commentary on the perfidy of whoever it is the spewer thinks is out to destroy his people.

Closely related to these folks are the Holocaust revisionists, who periodically inundate certain groups (such as **soc.history**) with long rants about how the Holocaust never really happened. Some people attempt to refute these people with facts, but others realize this only encourages them.

Blatherers tend to be more benign. Their problem is that they just can't get to the point – they can wring three or four screenfuls out of a thought that others might sum up in a sentence or two. A related condition is excessive quoting. People afflicted with this will include an entire message in their reply rather than excising the portions not relevant to whatever point they're trying to make. The worst quote a long message and then add a single line:

"I agree!" or some such, often followed by a monster .signature (see Section 4.5 [Big Sig], page 70). There are a number of other Usenet denizens you'll soon come to recognize. Among them:

Net.weenies
: These are the kind of people who enjoy Insulting others, the kind of people who post nasty messages in a sewing newsgroup just for the hell of it.

Net.geeks
: People to whom the Net is Life, who worry about what happens when they graduate and they lose their free, 24-hour access.

Net.gods
: The old-timers; the true titans of the Net and the keepers of its collective history. They were around when the Net consisted of a couple of computers tied together with baling wire.

Lurkers
: Actually, you can't tell these people are there, but they are. They're the folks who read a newsgroup but never post or respond.

Wizards
: People who know a particular Net-related topic inside and out. Unix wizards can perform amazing tricks with that operating system, for example.

Net.saints
: Always willing to help a newcomer, eager to share their knowledge with those not born with an innate ability to navigate the Net, they are not as rare as you might think. Post a question about something and you'll often be surprised how many responses you get.

The last group brings us back to the Net's oral tradition. With few written guides, people have traditionally learned their way around the Net by asking somebody, whether at the terminal next to them or on the Net itself. That tradition continues: if you have a question, ask.

Today, one of the places you can look for help is in the **news.newusers.questions** newsgroup, which, as its name suggests, is a place to learn more about Usenet. But be careful what you post. Some of the Usenet wizards there get cranky sometimes when they have to answer the same question over and over again. Oh, they'll eventually answer your question, but not before they tell you should have asked your host system administrator first or looked at the postings in **news.announce.newusers**.

4.2 Killfiles – The cure for all that ails you

As you keep reading Usenet, you are going to run across things or people that really drive you nuts – or that you just get tired of seeing.

Killfiles are just the thing for you. When you start your newsreader, it checks to see if you have any lists of words, phrases or names you don't want to see. If you do, then it blanks out any messages containing those words.

Such as cascades.

As you saw earlier, when you post a reply to a message and include parts of that message, the original lines show up with a `>` in front of them. Well, what if you reply to a reply? Then you get a `>>` in front of the line. And if you reply to that reply? You get `>>>`. Keep this up, and soon you get a triangle of `>`'s building up in your message.

There are people who like building up these triangles, or cascades. They'll "respond" to your message by deleting everything you've said, leaving only the "In message 123435, you said:" part and the last line of your message, to which they add a nonsensical retort. On and on they go until the triangle has reached the right end of the page. Then they try to expand the triangle by deleting one with each new line. Whoever gets to finish this mega-triangle wins.

There is even a newsgroup just for such folks: alt.cascade. Unfortunately, cascaders would generally rather cascade in other newsgroups. Because it takes a lot of messages to build up a completed cascade, the targeted newsgroup soon fills up with these messages. Of course, if you complain, you'll be bombarded with messages about the First Amendment and artistic expression – or worse, with another cascade. The only thing you can do is ignore them, by setting up a killfile.

There are also certain newsgroups where killfiles will come in handy because of the way the newsgroups are organized. For example, readers of **rec.arts.tv.soaps** always use an acronym in their "Subject:" line for the show they're writing about (AMC, for example, for "All My Children"). This way, people who only want to read about "One Life to Live" can blank out all the messages about "The Young and the Restless" and all the others (to keep people from accidentally screening out messages that might contain the letters "gh" in them, "General Hospital" viewers always use "gh:" in their subject lines).

Both nn and rn let you create killfiles, but in different ways.

To create a killfile in nn, go into the newsgroup with the offending messages and type a capital '`K`'. You'll see this at the bottom of your screen:

```
AUTO (k)ill or (s)elect (CR => Kill subject 30 days)
```

If you hit return, nn will ask you which article's subject you're tired of. Chose one and the article and any follow-ups will disappear, and you won't see them again for 30 days. If you type a lower-case '`k`' instead, you'll get this:

```
AUTO KILL on (s)ubject or (n)ame  (s)
```

If you hit your '`S`' key or just enter, you'll see this:

```
KILL Subject: (=/)
```

Type in the name of the offending word or phrase and hit enter. You'll then be prompted:

```
KILL in (g)roup 'eff.test' or in (a)ll groups  (g)
```

except that the name of the group you see will be the one you're actually in at the moment. Because cascaders and other annoying people often cross-post their messages to a wide range of newsgroups, you might consider hitting '`a`' instead of '`g`'. Next comes:

```
Lifetime of entry in days (p)ermanent  (30)
```

The P key will screen out the offending articles forever, while hitting enter will do it for 30 days. You can also type in a number of days for the blocking.

Creating killfiles in rn works differently – its default killfile generator only works for messages in specific groups, rather than globally for your entire newsgroup list. To create a global killfile, you'll have to write one yourself.

To create a killfile in rn, go into the newsgroup where the offending messages are and type in its number so you get it on your screen. Type a capital '`K`'. From now on, any message with that subject line will disappear before you read the group. You should probably choose a reply, rather than the original message, so that you will get all of the followups (the original message won't have a "Re: " in its subject line). The next time you call up that newsgroup, rn will tell you it's killing messages. When it's done, hit the space bar to go back into reading mode.

To create a "global" kill file that will automatically wipe out articles in all groups you read, start rn and type control-K. This will start your whatever text editor you have as your default on your host system and create a file (called '`KILL`', in your '`News`' subdirectory).

On the first line, you'll type in the word, phrase or name you don't want to see, followed by commands that tell rn whether to search an entire message for the word or name and then what to do when it finds it.

Each line must be in this form

```
/pattern/modifier:j
```

"Pattern" is the word or phrase you want rn to look for. It's case-insensitive: both "test" and "Test" will be knocked out. The modifier tells rn whether to limit its search to message headers (which can be useful when the object is to never see messages from a particular person):

`a:` Looks through an entire message

`h:` Looks just at the header

You can leave out the modifier command, in which case rn will only look at the subject line of messages. The '`j`' at the end tells rn to screen out all articles with the offending word.

So if you never want to see the word "foo" in any header, ever again, type this:

```
/foo/h:j
```

This is particularly useful for getting rid of articles from people who post in more than one newsgroup, such as cascaders, since an article's newsgroup name is always in the header.

If you just want to block messages with a subject line about cascades, you could try:

```
/foo/:j
```

To kill anything that is a followup to any article, use this pattern:

```
/Subject: *Re:/:j
```

When done writing lines for each phrase to screen, exit the text editor as you normally would, and you'll be put back in rn.

One word of caution: go easy on the global killfile. An extensive global killfile, or one that makes frequent use of the '`a:`' modifier can dramatically slow down rn, since the system will now have to look at every single word in every single message in all the newsgroups you want to read.

If there's a particular person whose posts you never want to see again, first find his or address (which will be in the "from:" line of his postings) and then write a line in your killfile like this:

```
/From: *name@address\.all/h:j
```

4.3 Some Usenet hints

Case counts in Unix – most of the time. Many Unix commands, including many of those used for reading Usenet articles, are case sensitive. Hit a '`d`' when you meant a '`D`' and either nothing will happen, or something completely different from what you expected will happen. So watch that case!

In nn, you can get help most of the time by typing a question mark (the exception is when you are writing your own message, because then you are inside the text-processing program). In rn, type a lower-case '`h`' at any prompt to get some online help.

When you're searching for a particular newsgroup, whether through the l command in rn or with nngrep for nn, you sometimes may have to try several keywords. For example, there is a newsgroup dedicated to the *Grateful Dead*, but you'd never find it if you tried, say, '`l grateful dead`', because the name is **rec.music.gdead**. In general, try the smallest possible part of the word or discussion you're looking for, for example, use "trek" to find newsgroups about "Star Trek." If one word doesn't produce anything, try another.

4.4 The Brain-tumor Boy and the Modem Tax an the Chain Letter

Net users sometimes like to think they are smarter or somehow better than everybody else. They're not. If they were, nobody on the Net would ever have heard of Craig Shergold, the Brain-Tumor Boy, or the evil FCC's plan to tax your modem. And you wouldn't keep seeing the same dumb chain letter. Alas, all of these are here to stay. Just when they seem to have died off, somebody posts a message about one or the other, starting a whole new round of flame wars on the subject. For the record, here are the stories then:

4.4.1 Craig Shergold

There once was a seven-year-old boy in England named Craig Shergold who was diagnosed with a seemingly incurable brain tumor. As he lay dying, he wished only to have friends send him postcards. The local newspapers got a hold of the tear-jerking story. Soon, the boy's wish had changed: he now wanted to get into the Guinness Book of World Records for the largest postcard collection. Word spread around the world. People by the millions sent him postcards.

Miraculously, the boy lived. An American billionaire even flew him to the U.S. for surgery to remove what remained of the tumor. And his wish succeeded beyond his wildest dreams – he made the Guinness Book of World Records.

But with Craig now well into his teens, his dream has turned into a nightmare for the post office in the small town outside London where he lives. Like Craig himself, his request for cards just refuses to die, inundating the post office with millions of cards every year. Just when it seems like the flow is slowing, along comes somebody else who starts up a whole new slew of requests for people to send Craig post cards (or greeting cards or business cards – Craig letters have truly taken on a life of their own and begun to mutate). Even Dear Abby has asked people to stop!

What does any of this have to do with the Net? The Craig letter seems to pop up on Usenet as often as it does on cork boards at major corporations. No matter how many times somebody like Gene Spafford posts periodic messages to ignore them or spend your money on something more sensible (a donation to the local Red Cross, say), somebody manages to post a letter asking readers to send cards to poor little Craig.

4.4.2 The Modem Tax

In 1987, the Federal Communications Commission considered removing a tax break it had granted CompuServe and other large commercial computer networks for use of the national phone system. The FCC quickly reconsidered after alarmed users of bulletin-board systems bombarded it with complaints about this "modem tax."

Now, every couple of months, somebody posts an "urgent" message warning Net users that the FCC is about to impose a modem tax. This is NOT true. The way you can tell if you're dealing with the hoax story is simple: it ALWAYS mentions an incident in which a talk-show host on KGO radio in San Francisco becomes outraged on the air when he reads a story about the tax in the New York Times.

Another way to tell it's not true is that it never mentions a specific FCC docket number or closing date for comments. Save that letter to your congressman for something else.

4.4.3 The Chain Letter

Sooner or later, you're going to run into a message titled "Make Money Fast." It's your basic chain letter. The Usenet version is always about some guy named Dave Rhodes who was on the verge of death, or something, when he discovered a perfectly legal way to make tons of money – by posting a chain letter on computer systems around the world. Yeah, right.

4.5 Big Sig

There are .sigs and there are .sigs. Many people put only bare-bones information in their .sig files – their names and e-mail addresses, perhaps their phone numbers. Others add a quotation they think is funny or profound and a disclaimer that their views are not those of their employer. Still others add some ASCII-art graphics. And then there are those who go totally berserk, posting huge creations with multiple quotes, hideous ASCII "barfics" and more e-mail addresses than anybody could humanly need. College freshmen unleashed on the Net seem to excel at these. You can see the best of the worst in the **alt.fan.warlord** newsgroup, which exists solely to critique .sigs that go too far, such as:

```
---------------------------------------------------------------------------
|#########################################################################|
|#|                                                                     |#|
|#|   *****  *    *  *****    *   *  *****  *****  *****                |#|
|#|     *    *    *  *        ** **  *      *      *   *                |#|
|#|     *    ******  ***      * * *  ***    *  **  *****   *****        |#|
|#|     *    *    *  *        *   *  *      *   *  *   *                |#|
|#|     *    *    *  *****    *   *  *****  *****  *   *                |#|
|#|                                                                     |#|
|#|   ****   *****  *****         *****  *****  *****    *****  *****   |#|
|#|   *  **    *    *             *        *    *        *      *   *   |#|
|#|   ****     *    *  **         *****    *    *  **    *      *   *   |#|
|#|   *  **    *    *   *     **      *    *    *   *    *      *   *   |#|
|#|   ****   *****  *****     **  *****  *****  *****    *****  *****   |#|
|#|                                                                     |#|
|#|            T-H-E  M-E-G-A  B-I-G  .S-I-G  C-O-M-P-A-N-Y             |#|
|#|                  ~-----------------------------~                    |#|
|#|  "Annoying people with huge net.signatures for over 20 years..."    |#|
|#|                                                                     |#|
|#|---------------------------------------------------------------------|#|
|#| "The difference between a net.idiot and a bucket of shit is that at |#|
|#|  least a bucket can be emptied.  Let me further illustrate my point |#|
|#|  by comparing these charts here. (pulls out charts)  Here we have a |#|
|#|  user who not only flames people who don't agree with his narrow-   |#|
|#|  minded drivel, but he has this huge signature that takes up many   |#|
|#|  pages with useless quotes.  This also makes reading his frequented |#|
|#|  newsgroups a torture akin to having at 300 baud modem on a VAX. I  |#|
|#|  might also add that his contribution to society rivals only toxic  |#|
|#|  dump sites."                                                       |#|
|#|                     -- Robert A. Dumpstik, Jr                       |#|
|#|                        President of The Mega Big Sig Company        |#|
|#|                        September 13th, 1990 at 4:15pm               |#|
|#|                        During his speech at the "Net.abusers        |#|
|#|                        Society Luncheon" during the                 |#|
|#|                        "1990 Net.idiots Annual Convention"          |#|
|#|_____________________________________________________________________|#|
|#|                                                                     |#|
|#| Thomas Babbit, III: 5th Assistant to the Vice President of Sales    |#|
|#|      --                                                             |#|
|#|  ==========    ______             Digital Widget Manufacturing Co.  |#|
|#|         \\     /                  1147 Complex Incorporated Drive   |#|
|#|        )-=======                  Suite 215                         |#|
|#|                                   Nostromo, VA 22550-1147           |#|
```

```
|#| #NC-17 Enterpoop Ship :)          Phone # 804-844-2525              |#|
|#|    ----------------               Fax # 804-411-1115                |#|
|#| "Shut up, Wesley!"                Online Service # 804-411-1100     |#|
|#|                 -- Me             at 300-2400, and now 9600 baud!   |#|
|#|                                   PUNet: tbabb!digwig!nostromo      |#|
|#| Home address:                     InterNet: dvader@imperial.emp.com |#|
|#| Thomas Babbit, III                Prodigy: Still awaiting author-   |#|
|#| 104 Luzyer Way                            ization                   |#|
|#| Sulaco, VA 22545                  "Manufacturing educational widget |#|
|#| Phone # 804-555-1524               design for over 3 years..."      |#|
|#|=====================================================================|#|
|#|                                                                     |#|
|#|  Introducing:                                                       |#|
|#|                                ------                               |#|
|#|  The  |\  /|                        /                               |#|
|#|       | \/ |                       /                                |#|
|#|       |    |                      /                                 |#|
|#|       |    |                     /                                  |#|
|#|       |    | ETELHED            /_____ ONE                          |#|
|#|’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’‘’|#|
|#| 50Megs Online!  The k00l BBS for rad teens!  Lots of games and many |#|
|#| bases for kul topix!  Call now and be validated to the Metelhed Zone|#|
|#|                     -- 804-555-8500 --                              |#|
|#|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\V/////////////////////////////////////|#|
|#| "This is the end, my friend..."      -- The Doors                   |#|
|#########################################################################|
---------------------------------------------------------------------------
Hit ‘‘b’’ to continue

Hahahha... fooled u!
```

4.6 The First Amendment as Local Ordinance

Usenet's international reach raises interesting legal questions that have yet to be fully resolved. Can a discussion or posting that is legal in one country be transmitted to a country where it is against the law? Does the posting even become illegal when it reaches the border? And what if that country is the only path to a third country where the message is legal as well? Several foreign colleges and other institutions have cut off feeds of certain newsgroups where Americans post what is, in the U.S., perfectly legal discussions of drugs or alternative sexual practices. Even in the U.S., some universities have discontinued certain newsgroups their administrators find offensive, again, usually in the **alt.*** hierarchy.

4.7 Usenet History

In the late 1970s, Unix developers came up with a new feature: a system to allow Unix computers to exchange data over phone lines.

In 1979, two graduate students at Duke University in North Carolina, *Tom Truscott* and *Jim Ellis*, came up with the idea of using this system, known as UUCP (for Unix-to-Unix CoPy), to distribute information of interest to people in the Unix community. Along with *Steve Bellovin*, a graduate student at the University of North Carolina and *Steve Daniel*, they wrote conferencing software and linked together computers at Duke and UNC.

Word quickly spread and by 1981, a graduate student at Berkeley, *Mark Horton* and a nearby high school student, *Matt Glickman*, had released a new version that added more features and was able to handle larger volumes of postings – the original North Carolina program was meant for only a few articles in a newsgroup each day.

Today, Usenet connects tens of thousands of sites around the world, from mainframes to Amigas. With more than 3,000 newsgroups and untold thousands of readers, it is perhaps the world's largest computer network.

4.8 When things go wrong:

- When you start up rn, you get a "warning" that "bogus newsgroups" are present.

  Within a couple of minutes, you'll be asked whether to keep these or delete them. Delete them. Bogus newsgroups are newsgroups that your system administrator or somebody else has determined are no longer needed.
- While in a newsgroup in rn, you get a message: "skipping unavailable article." This is usually an article that somebody posted and then decided to cancel.
- You upload a text file to your Unix host system for use in a Usenet message or e-mail, and when you or your recipient reads the file, every line ends with a '`^M`'.

  This happens because Unix handles line endings differently than MS- DOS or Macintosh computers. Most Unix systems have programs to convert incoming files from other computers. To use it, upload your file and then, at your command line, type

  ```
  dos2unix filename filename
  ```

  or

  ```
  mac2unix filename filename
  ```

  depending on which kind of computer you are using and where filename is the name of the file you've just uploaded. A similar program can prepare text files for downloading to your computer, for example:

  ```
  unix2dos filename filename
  ```

  or

  ```
  unix2mac filename filename
  ```

  will ensure that a text file you are about to get will not come out looking odd on your computer.

FYI:

Leanne Phillips periodically posts a list of frequently asked questions (and answers) about use of the rn killfile function in the **news.newusers.questions** and **news.answers** newsgroups on Usenet. **Bill Wohler** posts a guide to using the nn newsreader in the **news.answers** and **news.software** newsgroups. Look in the **news.announce.newusers** and **news.groups** newsgroups on Usenet for *"A Guide to Social Newsgroups and Mailing Lists"*, which gives brief summaries of the various **soc.*** newsgroups.

"Managing UUCP and Usenet" by **Tim O'Reilly** and **Grace Todino** (O'Reilly & Associates, 1992) is a good guide for setting up your own Usenet system.

"Somehow, that News fails to disquiet me."
— **Cyrano de Bergerac**

"Welcome, to the watering hole, to the death of objectivity, and the killing fields of the wide boys, where are we now..."
— **Marillion**, *"The Thieving Magpie (La Gazza Ladra)"*
Used in concerts as spoken intro by **Fish**
to the 2nd part of *"Misplaced Childhood"*

5 Mailing Lists and Bitnet

5.1 Internet Mailing Lists

Usenet is not the only forum on the Net. Scores of “mailing lists” represent another way to interact with other Net users. Unlike Usenet messages, which are stored in one central location on your host system’s computer, mailing-list messages are delivered right to your e-mail box, unlike Usenet messages.

You have to ask for permission to join a mailing list. Unlike Usenet, where your message is distributed to the world, on a mailing list, you send your messages to a central moderator, who either re-mails it to the other people on the list or uses it to compile a periodic “digest” mailed to subscribers.

Given the number of newsgroups, why would anybody bother with a mailing list?

Even on Usenet, there are some topics that just might not generate enough interest for a newsgroup; for example, the *Queen* list, which is all about the late *Freddie Mercury*’s band; or the *Marillion & Fish* list called “Freaks.”

And because a moderator decides who can participate, a mailing list can offer a degree of freedom to speak one’s mind (or not worry about **net.weenies**) that is not necessarily possible on Usenet. Several groups offer anonymous postings – only the moderator knows the real names of people who contribute. Examples include 12Step, where people enrolled in such programs as Alcoholics Anonymous can discuss their experiences, and sappho, a list limited to gay and bisexual women.

You can find mailing addresses and descriptions of these lists in the **news.announce.newusers** newsgroup with the subject of “Publicly Accessible Mailing Lists.” Mailing lists now number in the hundreds, so this posting is divided into three parts.

If you find a list to which you want to subscribe, send an e-mail message to

```
list-request@address
```

where “list” is the name of the mailing list and “address” is the moderator’s e-mail address, asking to be added to the list. Include your full e-mail address just in case something happens to your message’s header along the way, and ask, if you’re accepted, for the address to mail messages to the list.

5.2 Bitnet Lists

As if Usenet and mailing lists were not enough, there are Bitnet “discussion groups” or “lists.”

Bitnet is an international network linking colleges and universities, but it uses a different set of technical protocols for distributing information than the Internet or Usenet. It offers hundreds of discussion groups, comparable in scope to Usenet newsgroups.

One of the major differences is the way messages are distributed. Bitnet messages are sent to your mailbox, just as with a mailing list. However, where mailing lists are often maintained by a person, all Bitnet discussion groups are automated – you subscribe to them through messages to a “listserver” computer. This is a kind of robot moderator that controls distribution of messages on the list. In many cases, it also maintains indexes and archives of past postings in a given discussion group, which can be handy if you want to get up to speed with a discussion or just search for some information related to it.

Many Bitnet discussion groups are now “translated” into Usenet form and carried through Usenet in the **bit.listserv.*** hierarchy. In general, it’s probably better to read messages through Usenet if you can. It saves some storage space on your host system’s hard drives.

If 50 people subscribe to the same Bitnet list, that means 50 copies of each message get stored on the system; whereas if 50 people read a Usenet message, that's still only one message that needs storage on the system. It can also save your sanity if the discussion group generates large numbers of messages. Think of opening your e-mailbox one day to find 200 messages in it – 199 of them from a discussion group and one of them a "real" e-mail message that's important to you.

Subscribing and canceling subscriptions is done through an e-mail message to the listserver computer. For addressing, all listservers are known as "listserv" (yep) at some Bitnet address. This means you will have to add '`.bitnet`' to the end of the address, if it's in a form like this: '`listserv@miamiu`'. For example, if you have an interest in environmental issues, you might want to subscribe to the Econet discussion group. To subscribe, send an e-mail message to

```
listserv@miamiu.bitnet
```

Some Bitnet listservers are also connected to the Internet, so if you see a listserver address ending in '`.edu`', you can e-mail the listserver without adding '`.bitnet`' to the end.

Always leave the "Subject:" line blank in a message to a listserver. Inside the message, you tell the listserver what you want, with a series of simple commands:

`subscribe group` *Your Name*
: To subscribe to a list, where **group** is the list name and *Your Name* is your full name, for example: '`subscribe econet Henry Fielding`'

`unsubscribe group` *Your Name*
: To discontinue a group, for example: '`unsubscribe econet Henry Fielding`'

`list global`
: This sends you a list of all available Bitnet discussion groups. But be careful – the list is VERY long!

`get refcard`
: Sends you a list of other commands you can use with a listserver, such as commands for retrieving past postings from a discussion group.

Each of these commands goes on a separate line in your message (and you can use one or all of them). If you want to get a list of all Bitnet discussion groups, send e-mail to

```
listserv@bitnic.educom.edu
```

Leave the "Subject:" line blank and use the list global command.

When you subscribe to a Bitnet group, there are two important differences from Usenet.

First, when you want to post a message for others to read in the discussion group, you send a message to the group name at its Bitnet address. Using Econet as an example, you would mail the message to:

```
econet@miamiu.bitnet
```

Note that this is different from the listserv address you used to subscribe to the group to begin with. Use the listserv address ONLY to subscribe to or unsubscribe from a discussion group. If you use the discussion-group address to try to subscribe or unsubscribe, your message will go out to every other subscriber, many of whom will think unkind thoughts, which they may share with you in an e-mail message).

The second difference relates to sending an e-mail message to the author of a particular posting. Usenet newsreaders such as rn and nn let you do this with one key. But if you hit your '`R`' key to respond to a discussion-group message, your message will go to the listserver, and from there to everybody else on the list! This can prove embarrassing to you and annoying to others. To make sure your message goes just to the person who wrote the posting, take down his e-mail address from the posting and then compose a brand-new message. Remember, also, that if you see an e-mail address like `<IZZY@INDYVMS>`, it's a Bitnet address.

Two Bitnet lists will prove helpful for delving further into the network. NEW-LIST tells you the names of new discussion groups. To subscribe, send a message to `<listserv@ndsuvm1.bitnet>`:

```
sub NEW-LIST Your Name
```

INFONETS is the place to go when you have questions about Bitnet. It is also first rate for help on questions about all major computer networks and how to reach them. To subscribe, send e-mail to `<info-nets-request@think.com>`:

```
sub INFONETS Your Name
```

Both of these lists are also available on Usenet, the former as **bit.listserv.new-list**; the latter as **bit.listserv.infonets** (sometimes **bit.listserv.info-nets**).

"It wasn't long before the invention of the mailing-list, an ARPANET broadcasting technique in which an identical message could be sent automatically to large number of network subscribers. Interestingly, one of the first really big mailing-list was "SF-LOVERS", for Science Fiction fans. Disscussing science fiction on the network was not work-related and was frowned upon by many ARPANET computer administrators, but this didn't stop it from happening."
— **Bruce Sterling**, F&SF Science Column #5 *"Internet"*

6 Telnet (Mining the Net, part I)

6.1 Mining the Net

Like any large community, cyberspace has its libraries, places you can go to look up information or take out a good book. Telnet is one of your keys to these libraries.

Telnet is a program that lets you use the power of the Internet to connect you to databases, library catalogs, and other information resources around the world. Want to see what the weather's like in Vermont? Check on crop conditions in Azerbaijan? Get more information about somebody whose name you've seen online? Telnet lets you do this, and more.

Alas, there's a big "but!" Unlike the phone system, Internet is not yet universal; not everybody can use all of its services. Almost all colleges and universities on the Internet provide telnet access. So do all of the for-fee public-access systems listed in Section 1.1 [Ready - Set], page 23. But the Free-Net systems do not give you access to every telnet system. And if you are using a public-access UUCP or Usenet site, you will not have access to telnet. The main reason for this is cost. Connecting to the Internet can easily cost $1,000 or more for a leased, high-speed phone line. Some databases and file libraries can be queried by e-mail, however; we'll show you how to do that later on. In the meantime, the rest of this chapter assumes you are connected to a site with at least partial Internet access.

Most telnet sites are fairly easy to use and have online help systems. Most also work best (and in some cases, only) with VT100 emulation. Let's dive right in and try one.

At your host system's command line, type

```
telnet access.usask.ca
```

and hit enter. That's all you have to do to connect to a telnet site! In this case, you'll be connecting to a service known as Hytelnet, which is a database of computerized library catalogs and other databases available through telnet. You should see something like this:

```
Trying 128.233.3.1 ...
Connected to access.usask.ca.
Escape character is '^]'.


Ultrix UNIX (access.usask.ca)

login:
```

Every telnet site has two addresses – one composed of words that are easier for people to remember; the other a numerical address better suited for computers. The "escape character" is good to remember. When all else fails, hitting your control key and the '`]`' key at the same time will disconnect you and return you to your host system. At the login prompt, type

```
hytelnet
```

and hit enter. You'll see something like this:

```
Welcome to HYTELNET
version 6.2
...................

What is HYTELNET?         <WHATIS>     .     Up/Down arrows MOVE
Library catalogs          <SITES1>     .     Left/Right arrows SELECT
Other resources           <SITES2>     .     ? for HELP anytime
Help files for catalogs   <OP000>      .
Catalog interfaces        <SYS000>     .     m returns here
Internet Glossary         <GLOSSARY>   .     q quits
Telnet tips               <TELNET>     .
Telnet/TN3270 escape keys <ESCAPE.KEY> .
Key-stroke commands       <HELP.TXT>   .


........................
HYTELNET 6.2 was written by Peter Scott,
U of Saskatchewan Libraries, Saskatoon, Sask, Canada.  1992
Unix and VMS software by Earl Fogel, Computing Services, U of S 1992
```

The first choice, "<WHATIS>" will be highlighted. Use your down and up arrows to move the cursor among the choices. Hit enter when you decide on one. You'll get another menu, which in turn will bring up text files telling you how to connect to sites and giving any special commands or instructions you might need. Hytelnet does have one quirk. To move back to where you started (for example, from a sub-menu to a main menu), hit the left-arrow key on your computer.

Play with the system. You might want to turn on your computer's screen-capture, or at the very least, get out a pen and paper. You're bound to run across some interesting telnet services that you'll want to try – and you'll need their telnet "addresses."

As you move around Hytelnet, it may seem as if you haven't left your host system – telnet can work that quickly. Occasionally, when network loads are heavy, however, you will notice a delay between the time you type a command or enter a request and the time the remote service responds.

To disconnect from Hytelnet and return to your system, hit your q key and enter.

Some telnet computers are set up so that you can only access them through a specific "port." In those cases, you'll always see a number after their name, for example: **india.colorado.edu 13**. It's important to include that number, because otherwise, you may not get in.

In fact, try the above address. Type

```
telnet india.colorado.edu 13
```

and hit enter. You should see something like this:

```
Trying 128.138.140.44 ...
```

Followed very quickly by this:

```
telnet india.colorado.edu 13

Escape character is '^]'.
Sun Jan 17 14:11:41 1994
Connection closed by foreign host.
```

What we want is the middle line, which tells you the exact Mountain Standard Time, as determined by a government-run atomic clock in Boulder, Colo.

6.2 Library Catalogs

Several hundred libraries around the world, from the Snohomish Public Library in Washington State to the Library of Congress are now available to you through telnet. You can use Hytelnet to find their names, telnet addresses and use instructions.

Why would you want to browse a library you can't physically get to? Many libraries share books, so if yours doesn't have what you're looking for, you can tell the librarian where he or she can get it. Or if you live in an area where the libraries are not yet online, you can use telnet to do some basic bibliographic research before you head down to the local branch.

There are several different database programs in use by online libraries. Harvard's is one of the easier ones to use, so let's try it.

Telnet to **hollis.harvard.edu**. When you connect, you'll see:

```
*****************        H A R V A R D   U N I V E R S I T Y
*****************         OFFICE FOR INFORMATION TECHNOLOGY
***    ***    ***
*** VE *** RI ***
***    ***    ***         HOLLIS    (Harvard OnLine LIbrary System)
 *****    *****
  **** TAS ****           HUBS      (Harvard University Basic Services)
    ***   ***
      *****               IU        (Information Utility)
       ***
                          CMS       (VM/CMS Timesharing Service)


** HOLLIS IS AVAILABLE WITHOUT ACCESS RESTRICTIONS **
Access to other applications is limited to individuals who have been
granted specific permission by an authorized person.

To select one of the applications above, type its name on the command
line followed by your user ID, and press RETURN.
** HOLLIS DOES NOT REQUIRE A USERID **

EXAMPLES:   HOLLIS (press RETURN)  or  HUBS userid (press RETURN)
===>
```

Type

```
hollis
```

and hit enter. You'll see several screens flash by quickly until finally the system stops and you'll get this:

```
WELCOME TO HOLLIS
(Harvard OnLine Library Information System)

To begin, type one of the 2-character database codes listed below:

HU      Union Catalog of the Harvard libraries
OW      Catalog of Older Widener materials
LG      Guide to Harvard Libraries and Computing Resources

AI      Expanded Academic Index (selective 1987-1988, full 1989-  )
LR      Legal Resource Index (1980-  )
PA      PAIS International (1985-  )

To change databases from any place in HOLLIS, type CHOOSE followed by a
2-character database code, as in:    CHOOSE HU

For general help in using HOLLIS, type HELP.   For HOLLIS news, type
HELP NEWS.   For HOLLIS hours of operation, type HELP HOURS.

ALWAYS PRESS THE ENTER OR RETURN KEY AFTER TYPING YOUR COMMAND
```

The first thing to notice is the name of the system: Hollis. Librarians around the world seem to be inordinately found of cutesy, anthropomorphized acronyms for their machines (not far from Harvard, the librarians at Brandeis University came up with Library On-Line User Information Service, or Louis; MIT has Barton).

If you want to do some general browsing, probably the best bet on the Harvard system is to choose HU, which gets you access to their main holdings, including those of its medical libraries. Chose that, and you'll see this:

```
THE HARVARD UNIVERSITY LIBRARY UNION CATALOG

To begin a search, select a search option from the list below and type its
code on the command line.  Use either upper or lower case.

AU           Author search
TI           Title search
SU           Subject search
ME           Medical subject search
KEYWORD      Keyword search options
CALL         Call number search options
OTHER        Other search options

For information on the contents of the Union Catalog, type HELP.
To exit the Union Catalog, type QUIT.

A search can be entered on the COMMAND line of any screen.

ALWAYS PRESS THE ENTER OR RETURN KEY AFTER TYPING YOUR COMMAND.
```

Say you want to see if Harvard has shed the starchy legacy of the Puritans, who founded the school. Why not see if they have "The Joy of Sex" somewhere in their stacks? Type

```
TI Joy of Sex
```

and hit enter. This comes up:

```
HU: YOUR SEARCH RETRIEVED NO ITEMS.  Enter new command or HELP.  You typed:
TI JOY OF SEX
***************************************************************************









ALWAYS PRESS THE ENTER OR RETURN KEY AFTER TYPING YOUR COMMAND.
---------------------------------------------------------------------------
OPTIONS: FIND                       START - search options          HELP
QUIT - exit database
COMMAND?
```

Oh, well! Do they have anything that mentions "sex" in the title? Try another TI search, but this time just: 'TI sex'. You get:

```
HU GUIDE: SUMMARY OF SEARCH RESULTS    2086 items retrieved by your search:
FIND TI SEX
---------------------------------------------------------------------------
   1    SEX
   2    SEX A
 823    SEXA
 827    SEXBO
 831    SEXCE
 833    SEXDR
 834    SEXE
 879    SEXIE
 928    SEXJA
 929    SEXLE
 930    SEXO
 965    SEXPI
 968    SEXT
1280    SEXUA
2084    SEXWA
2085    SEXY
---------------------------------------------------------------------------
OPTIONS: INDEX (or I 5 etc) to see list of items         HELP
START - search options
REDO - edit search                            QUIT - exit database
COMMAND?
```

If you want to get more information on the first line, type 1 and hit enter:

```
HU INDEX: LIST OF ITEMS RETRIEVED      2086 items retrieved by your search:
FIND TI SEX
----------------------------------------------------------------------------
SEX
1 geddes patrick sir 1854 1932/ 1914  bks

SEX A Z
2 goldenson robert m/ 1987  bks

SEX ABUSE HYSTERIA SALEM WITCH TRIALS REVISITED
3 gardner richard a/ 1991  bks

SEX AETATES MUNDI ENGLISH AND IRISH
4 irish sex aetates mundi/ 1983  bks

SEX AFTER SIXTY A GUIDE FOR MEN AND WOMEN FOR THEIR LATER YEARS
5 butler robert n 1927/ 1976  bks


----------------------------------------------------- (CONTINUES) --------
OPTIONS: DISPLAY 1 (or D 5 etc) to see a record          HELP
GUIDE                  MORE - next page       START - search options
REDO - edit search                            QUIT - exit database
COMMAND?
```

Most library systems give you a way to log off and return to your host system. On Hollis, hit escape followed by

`xx`

One particularly interesting system is the one run by the Colorado Alliance of Research Libraries, which maintains databases for libraries throughout Colorado, the West and even in Boston.

Telnet **pac.carl.org**

Follow the simple log-in instructions. When you get a menu, type '72' (even though that is not listed), which takes you to the Pikes Peak Library District, which serves the city of Colorado Springs.

Several years ago, its librarians realized they could use their database program not just for books but for cataloging city records and community information, as well. Today, if you want to look up municipal ordinances or city records, you only have to type in the word you're looking for and you'll get back cites of the relevant laws or decisions.

Carl will also connect you to the University of Hawaii library, which, like the one in Colorado Springs, has more than just bibliographic material online. One of its features is an online Hawaiian almanac that can tell you everything you ever wanted to know about Hawaiians, including the number injured in boogie-board accidents each year (seven).

6.3 Some Interesting Telnet Sites

6.3.1 Agriculture

PENPages, run by Pennsylvania State University's College of Agricultural Sciences, provides weekly world weather and crop reports from the U.S. Department of Agriculture. These reports detail everything from the effect of the weather on palm trees in Malaysia to the state of the Ukrainian wheat crop. Reports from Pennsylvania country extension officers offer tips for improving farm life. One database lists Pennsylvania hay distributors by county – and rates the quality of their hay!

The service lets you search for information two different ways. A menu system gives you quick access to reports that change frequently, such as the weekly crop/weather reports. An index system lets you search through several thousand online documents by keyword. At the main menu, you can either browse through an online manual or choose "PENPages," which puts you into the agriculture system.

Telnet: **psupen.psu.edu**
User name: Your 2-letter state code or WORLD

California State University's Advanced Technology Information Network provides similar information as PENPages, only focusing on California crops. It also maintains lists of upcoming California trade shows and carries updates on biotechnology.

Telnet: **caticsuf.cati.csufresno.edu**
Log in: public

You will then be asked to register and will be given a user name and password. Hit '`a`' at the main menu for agricultural information. Hit '`d`' to call up a menu that includes a biweekly biotechnology report.

6.3.2 AIDS

The University of Miami maintains a database of AIDS health providers in southern Florida.

Telnet: **callcat.med.miami.edu**
Log in: library

At the main menu, select '`P`' (for "AIDS providers") and you'll be able to search for doctors, hospitals and other providers that care for patients with AIDS. You can also search by speciality.

See also under Conversation Section 6.3.8 [Conversation], page 87 and Health Section 6.3.15 [Health], page 90.

6.3.3 Amateur Radio

The National Ham Radio Call-Sign Callbook lets you search for American amateur operators by callsign, city, last name or Zip code. A successful search will give you the ham's name, address, callsign, age, type of license and when he or she got it. Telnet: **callsign.cs.buffalo.edu 2000** or **ham.njit.edu 2000**. When you connect, you tell the system how you want to search and what you're looking for. For example, if you want to search for hams by city, you would type

```
city city-name
```

and hit enter (for example: '`city Kankakee`').

Other search choices are "call" (after which you would type a ham's call sign), "name," and "zip" (which you would follow with a Zip code). Be careful when searching for hams in a large city; there doesn't seem to be anyway to shut off the list once it starts except by using control-]. Otherwise, when done, type

```
quit
```

and hit enter to disconnect.

6.3.4 Animals

See under Health Section 6.3.15 [Health], page 90.

6.3.5 Calculators

Hewlett-Packard maintains a free service on which you can seek advice about their line of calculators.

Telnet: **hpcvbbs.cv.hp.com**

No log-in is needed.

6.3.6 Chemistry

The Electronic Periodic Table of the Elements draws the table on your screen and then lets you look up various properties of individual elements.

Telnet: **camms2.caos.kun.nl**
No password needed.

6.3.7 Congress

The Library of Congress Information Service lets you search current and past legislation (dating to 1982).

Telnet: **locis.loc.gov**
Password: none needed.

When you connect, you'll get a main menu that lets you select from several databases, including the Library of Congress card catalog (with book entries dating to 1978) and a database of information on copyright laws.

For the congressional database, select the number next to its entry and hit enter. You'll then be asked to choose which legislative year to search. After that, a menu similar to this will come up:

```
***C103- THE LEGISLATIVE INFORMATION FILE FOR THE 103RD CONGRESS,
which was updated on 05/10/93 and contains 4,044 records,
is now available for your search.

CURRENCY: All information is NOT current through the above date, which is
machine generated when ANY information is added to the file.
Bill numbers, official titles, sponsors, and status (STEP) added
within 48 hours.  Indexing terms and digests added later, in
some cases several weeks after the bill is added to the file.

TO START   RETRIEVE to find:              EXAMPLES:
SEARCH:    member name  -------------->   retrieve rep gingrich
                                          retrieve sen kennedy
           bill number  -------------->   retrieve h.r. 1
           subject keywords  --------->   retrieve day care

FOR HELP:  Type the word HELP and press the ENTER key.

READY FOR NEW COMMAND:
```

6.3.8 Conversation

Communications Canada, a Canadian government agency is developing Conversational Hypertext Access Technology (CHAT), a system to provide easy database access to people with little or no computer experience, using what are known as hypertext links. Instead of cryptic computer commands, users type questions in English.

Telnet: **debra.doc.ca**
Log in: chat

You choose one of the three databases now online, one on AIDS, and then ask questions in English.

Ask the AIDS database, "When was AIDS first discovered?" and it answers:

"The first case of AIDS in North America was diagnosed in 1979. Before that, it existed in Africa, probably beginning in the 1950's. AIDS was discovered in North America when a number of young men with a history of homosexuality developed a rare type of cancer called Kaposi's sarcoma."

Sometimes, you do have to rephrase your question. For example, when asked "What is the link between AIDS and drug use?" the computer responds:

"I know two things about drugs: the drugs that are used to treat people with AIDS, and the risks that drug users have in getting AIDS. Please ask about treatments or drug users."

6.3.9 Copyright Law

See under Congress Section 6.3.7 [Congress], page 86.

6.3.10 Current Events

Every year, the CIA publishes a Fact Book that is essentially an almanac of all the world's countries and international organizations, including such information as major products, type of government and names of its leaders. It's available for searching through the University of Maryland Info Database.

Telnet: **info.umd.edu**

Chose a terminal type and hit enter (or just hit enter if you are using VT100). At the Gopher menu, choose the number next to "Educational Resources" and hit enter. Then do the same in the next menu for "International". One of your options will then be for "Factbook." Chose that one, and you can then search by country or agency. This site also maintains copies of the U.S. budget, documents related to the North American Free Trade Agreement and other government initiatives. At the "Educational Resources" menu, select the number next to "United States" and then the one next to "Government."

The Access Legislative Information Service lets you browse through and look up bills before the Hawaiian legislature. Telnet: **access.uhcc.hawaii.edu**

6.3.11 Dictionary

Rutgers University's Campus-Wide Information Service has an online dictionary, thesaurus and database of familiar quotations, as well as online copies of the Bible, the Koran and the Book of Mormon and the U.S. Constitution.

Telnet: **info.rutgers.edu**
No log-in name is needed.

At the main menu, type

```
reference
```

and hit enter. You'll see a menu like this:

```
Online reference material
Menu Commands...

Command         Purpose
-------         -------
Dictionary      Concise Oxford Dictionary, 8th Ed.
Thesaurus       Oxford Thesaurus
Familiar        Oxford Dictionary of Familiar Quotations (and Modern Q.)
World           CIA World Factbook
US              US government: Constitution, etc.
Religion        Bible, Book of Mormon, Koran

For more information you may look under Libraries in the main menu

Previous        Return to previous menu
Find            Search for information
Source          Age and provider of information.  Where to go for more.
Quit            Go back to main menu

Online reference material
Menu>
```

To access any of them, type its name (dictionary, for example) and hit enter. You'll then be asked for the word to look for. If, instead, you type

```
religion
```

and hit enter, you'll be able to search for a word or passage from the Bible, the Koran or the Book of Mormon.

6.3.12 Environment

The U.S. Environmental Protection Agency maintains online databases of materials related to hazardous waste, the Clean Lakes program and cleanup efforts in New England. The agency plans to eventually include cleanup work in other regions, as well. The database is actually a computerized card catalog of EPA documents – you can look the documents up, but you'll still have to visit your regional EPA office to see them.

Telnet: **epaibm.rtpnc.epa.gov**
No password or user name is needed.

At the main menu, type

```
public
```

and hit enter (there are other listed choices, but they are only for use by EPA employees). You'll then see a one-line menu. Type

```
ols
```

and hit enter, and you'll see something like this:

```
NET-106 Logon to TS004    in progress.

DATABASES:
N     NATIONAL CATALOG         CH    CHEMICAL COLL. SYSTEM
H     HAZARDOUS WASTE          1     REGION I
L     CLEAN LAKES

OTHER OPTIONS:
?     HELP
Q     QUIT

ENTER SELECTION -->
```

Choose one and you'll get a menu that lets you search by document title, keyword, year of publication or corporation. After you enter the search word and hit enter, you'll be told how many matches were found. Hit 1 and then enter to see a list of the entries. To view the bibliographic record for a specific entry, hit V and enter and then type the number of the record.

The University of Michigan maintains a database of newspaper and magazine articles related to the environment, with the emphasis on Michigan, dating back to 1980.

Telnet: **hermes.merit.edu**
Host: mirlyn
Log in: meem

Envirolink is a large database and conference system about the environment, based in Pittsburgh.

Telnet: **envirolink.org**
Log on: gopher

See under Current Events Section 6.3.10 [Current Events], page 87 and Congress Section 6.3.7 [Congress], page 86.

6.3.13 Geography

The University of Michigan Geographic Name Server can provide basic information, such as population, latitude and longitude of U.S. cities and many mountains, rivers and other geographic features. Telnet: **martini.eecs.umich.edu 3000**

No password or user name is needed. Type in the name of a city, a Zip code or a geographic feature and hit enter. The system doesn't like names with abbreviations in them (for example, Mt. McKinley), so spell them out (for example, Mount McKinley).

By typing in a town's name or zip code, you can find out a community's county, Zip code and longitude and latitude. Not all geographic features are yet included in the database.

6.3.14 Government

The National Technical Information Service runs a system that not only provides huge numbers of federal documents of all sorts – from environmental factsheets to patent abstract – but serves as a gateway to dozens of other federal information systems.

Telnet: **fedworld.gov**
Log on as: new

See also under Congress Section 6.3.7 [Congress], page 86 and Current Events Section 6.3.10 [Current Events], page 87.

6.3.15 Health

The U.S. Food and Drug Administration runs a database of health-information.

Telnet: **fdabbs.fda.gov**
Log in: bbs

You'll then be asked for your name and a password you want to use in the future. After that, type

```
topics
```

and hit enter. You'll see this:

```
   TOPICS       DESCRIPTION

*  NEWS         News releases
*  ENFORCE      Enforcement Report
*  APPROVALS    Drug and Device Product Approvals list
*  CDRH         Centers for Devices and Radiological Health Bulletins
*  BULLETIN     Text from Drug Bulletin
*  AIDS         Current Information on AIDS
*  CONSUMER     FDA Consumer magazine index and selected articles
*  SUBJ-REG     FDA Federal Register Summaries by Subject
*  ANSWERS      Summaries of FDA information
*  INDEX        Index of News Releases and Answers
*  DATE-REG     FDA Federal Register Summaries by Publication Date
*  CONGRESS     Text of Testimony at FDA Congressional Hearings
*  SPEECH       Speeches Given by FDA Commissioner and Deputy
*  VETNEWS      Veterinary Medicine News
*  MEETINGS     Upcoming FDA Meetings
*  IMPORT       Import Alerts
*  MANUAL       On-Line User's Manual
```

You'll be able to search these topics by key word or chronologically. It's probably a good idea, however, to capture a copy of the manual, first, because the way searching works on the system is a little odd. To capture a copy, type

```
manual
```

and hit enter. Then type

```
scan
```

and hit enter. You'll see this:

```
FOR LIST OF AVAILABLE TOPICS TYPE TOPICS
OR ENTER THE TOPIC YOU DESIRE ==>

   MANUAL
   BBSUSER
   08-OCT-91
1  BBS User Manual
```

At this point, turn on your own computer's screen-capture or logging function and hit your 1 key and then enter. The manual will begin to scroll on your screen, pausing every 24 lines.

6.3.16 Hiring and College Program Information

The Federal Information Exchange in Gaithersburg, MD, runs two systems at the same address: FEDIX and MOLIS. FEDIX offers research, scholarship and service information for several federal agencies, including NASA, the Department of Energy and the Federal Aviation Administration. Several more federal agencies provide minority hiring and scholarship information. MOLIS provides information about minority colleges, their programs and professors.

Telnet: **fedix.fie.com**
User name: fedix

(for the federal hiring database) or "molis" (for the minority-college system). Both use easy menus to get you to information.

6.3.17 History

Stanford University maintains a database of documents related to Martin Luthor King.

Telnet: **forsythetn.stanford.edu**
Account: socrates

At the main menu, type '`select mlk`' and hit enter.

6.3.18 Quotations

See under Dictionary Section 6.3.11 [Dictionary], page 87.

6.3.19 Religion

See under Dictionary Section 6.3.11 [Dictionary], page 87.

6.3.20 Ski Reports

See under Weather Section 6.3.27 [Weather], page 93.

6.3.21 Space

NASA Spacelink in Huntsville, Ala., provides all sorts of reports and data about NASA, its history and its various missions, past and present. You'll find detailed reports on every single probe, satellite and mission NASA has ever launched along with daily updates and lesson plans for teachers.

The system maintains a large file library of GIF-format space graphics, but you can't download these through telnet. If you want them, you have to dial the system directly, at (205) 895-0028.

Telnet: **spacelink.msfc.nasa.gov**

When you connect, you'll be given an overview of the system and asked to register and choose a password.

The NED-NASA/IPAC Extragalactic Database lists data on more than 100,000 galaxies, quasars and other objects outside the Milky Way.

Telnet: **ipac.caltech.edu**
Log in: ned

You can learn more than you ever wanted to about quasars, novae and related objects on a system run by the Smithsonian Astrophysical Observatory in Cambridge, Mass.

Telnet: **cfa204.harvard.edu**
Log in: einline

The physics department at the University of Massachusetts at Amherst runs a bulletin-board system that provides extensive conferences and document libraries related to space.

Telnet: **spacemet.phast.umass.edu**
Log on with your name and a password.

6.3.22 Supreme Court Decisions

The University of Maryland Info Database maintains U.S. Supreme Court decisions from 1991 on.

Telnet: **info.umd.edu**
User name: info

Chose a terminal type and hit enter (or just hit enter if you are using VT100). At the main menu, choose the number next to "Educational Resources" and hit enter. One of your options will then be for "United States." Select that number and then, at the next menu, choose the one next to "Supreme Court."

6.3.23 Telnet Addresses

Hytelnet, at the University of Saskatchewan, is an online guide to hundreds of telnet sites around the world.

Telnet: **access.usask.ca**
Log in: hytelnet

6.3.24 Thesaurus

See under Dictionary Section 6.3.11 [Dictionary], page 87.

6.3.25 Time

To find out the exact time:

Telnet: **india.colorado.edu 13**

You'll see something like this:

```
Escape character is '^]'.
Sun Apr  5 14:11:41 1992
Connection closed by foreign host.
```

The middle line tells you the date and exact Mountain Standard Time, as determined by a federal atomic clock.

If you want a more philosophical approach to your time, the U.S. Naval Observatory's Automated Data Service has copies of detailed papers on such things as "the nature of time." It also carries information on how to buy a clock, along with arcana on such things as "leap seconds."

Unfortunately the unrestricted telnet "ads" account that has been introduced at this place in previous release of this guide has been restricted for priviledged users. But an alternative way has also been set up.

Now, one has to use an e-mail query to get the information, so the following info would have better gone into another (see Chapter 9 [Advanced E-mail], page 129) section, but for the "sake of history..."

There is a new experimental mail server called "adsmail" on tycho. It will send by return mail any of the ADS data files. You can obtain a list of available files by sending e-mail to `<adsmail@tycho>` with subject: '`anything`'. For example:

```
mail -s anything adsmail@tycho.usno.navy.mil
```

To obtain any pariticular ADS file, just send e-mail with the name of the command associated withe the file:

```
mail -s gpssy adsmail@tycho.usno.navy.mil
```

and in 10 minutes or less you will receive the requested file. This service extends ADS access to people who normally cannot telnet to tycho. Note that no password is required for e-mail service.

6.3.26 Transportation

The Subway Navigator in Paris can help you learn how long it will take to get from point A to point B on subway systems around the world.

Telnet: **metro.jussieu.fr 10000**

No log-in is needed. When you connect, you'll be asked to choose a language in which to search (you can choose English or French) and then a city to search. You'll be asked for the station you plan to leave from and the station you want to get to.

6.3.27 Weather

The University of Michigan's Department of Atmospheric, Oceanographic and Space Sciences supplies weather forecasts for U.S. and foreign cities, along with skiing and hurricane reports.

Telnet: **madlab.sprl.umich.edu 3000** (note the 3000)
No log-in name is needed.

See Section 7.6.36 [Weather (FTP)], page 111 in the FTP list for information on downloading satellite and radar weather images.

6.4 Telnet Bulletin-Board Systems

You might think that Usenet, with its hundreds of newsgroups, would be enough to satisfy the most dedicated of online communicators.

But there are a number of "bulletin-board" and other systems that provide even more conferences or other services, many not found directly on the Net. Some are free; others charge for access. They include:

6.4.1 Cimarron

Run by the Instituto Technical in Monterey, Mexico, this system has Spanish conferences, but English commands, as you can see from this menu of available conferences:

```
List of Boards
Name                Title
General             Board general
Dudas               Dudas de Cimarron
Comentarios         Comentarios al SYSOP
Musica              Para los afinados........
Libros              El sano arte de leer.....
Sistemas            Sistemas Operativos en General.
Virus               Su peor enemigo......
Cultural            Espacio Cultural de Cimarron
NeXT                El Mundo de NeXT
Ciencias            Solo apto para Nerds.
Inspiracion         Para los Romanticos e Inspirados.
Deportes            Discusiones Deportivas
```

To be able to write messages and gain access to files, you have to leave a note to SYSOP with your name, address, occupation and phone number. To do this, at any prompt, hit your M key and then enter, which will bring up the mail system. Hitting H brings up a list of commands and how to use them.

Telnet: **bugs.mty.itesm.mx** (8 p.m. to 10 a.m., Eastern time, only).

At the "login:" prompt, type 'bbs' and hit enter.

6.4.2 Cleveland Free-Net

The first of a series of Free-nets, this represents an ambitious attempt to bring the Net to the public. Originally an in-hospital help network, it is now sponsored by Case Western Reserve University, the city of Cleveland, the state of Ohio and IBM. It uses simple menus, similar to those found on CompuServe, but organized like a city:

```
<<< CLEVELAND FREE-NET DIRECTORY >>>

 1 The Administration Building
 2 The Post Office
 3 Public Square
 4 The Courthouse & Government Center
 5 The Arts Building
 6 Science and Technology Center
 7 The Medical Arts Building
 8 The Schoolhouse (Academy One)
 9 The Community Center & Recreation Area
10 The Business and Industrial Park
11 The Library
12 University Circle
13 The Teleport
14 The Communications Center
15 NPTN/USA TODAY HEADLINE NEWS
------------------------------------------------
h=Help, x=Exit Free-Net, "go help"=extended help

Your Choice ==>
```

The system has a vast and growing collection of public documents, from copies of U.S. and Ohio Supreme Court decisions to the Magna Carta and the U.S. Constitution. It links residents to various government agencies and has daily stories from USA Today. Beyond Usenet (found in the Teleport area), it has a large collection of local conferences on everything from pets to politics. And yes, it's free!

Telnet: **freenet-in-a.cwru.edu**, **freenet-in-b.cwru.edu**
or **freenet-in-c.cwru.edu**

When you connect to Free-Net, you can look around the system. However, if you want to be able to post messages in its conferences or use e-mail, you will have to apply in writing for an account. Information on this is available when you connect.

6.4.3 Dialog

This commercial service offers access to a large variety of databases – for a fairly sizable fee. You need a Dialog account to use the system through the Net.

Telnet: **dialog.com**

6.4.4 DUBBS

This is a bulletin-board system in Delft in the Netherlands. The conferences and files are mostly in Dutch, but the help files and the system commands themselves are in English.

Telnet: **tudrwa.tudelft.nl**

6.4.5 ISCA BBS

Run by the Iowa Student Computer Association, it has more than 100 conferences, including several in foreign languages. After you register, hit '`K`' for a list of available conferences and then '`J`' to join a particular conference (you have to type in the name of the conference, not the number next to it). Hitting H brings up information about commands.

Telnet **bbs.isca.uiowa.edu**

At the "login:" prompt, type '`bbs`' and hit enter.

6.4.6 Whole Earth 'Lectronic Link (WELL)

Itself a major Net access point in the San Francisco area, the WELL is also a unique online community that maintains dozens of conferences on every imaginable topic (seven devoted just to the Grateful Dead). WELL users are intelligent and opinionated; discussions are often fast and furious. The Electronic Frontier Foundation was basically started in a series of online conversations on the WELL. Although it has a serious San Francisco flavor, it has users from across the country (enough to support both East Coast and Midwest conferences).

For its conferences, the WELL uses PicoSpan software, which presents messages differently than rn or nn. When you enter a conference, you can call up a list of "topics." Enter a topic number, and all of the messages start scrolling down the screen, sort of like the music on an old-fashioned player-piano. There is some online help, but new users are sent a written manual. See Chapter 2 [Electronic Mail], page 37 for information on access charges (one advantage to connecting to the WELL through telnet is that unless you live in the Bay Area, it is likely to be much cheaper than other access methods).

Telnet: **well.sf.ca.us**

See [The Well], page 161 if you're interested in an intimate look on The WELL.

6.4.7 Youngstown Free-Net

The people who created Cleveland Free-Net sell their software for $1 to anybody willing to set up a similar system. A number of cities now have their own Free-Nets, including Youngstown, Ohio.

Telnet: **yfn.ysu.edu**

At the "login:" prompt, type '`visitor`' and hit enter.

6.5 Putting the Finger on Someone

Finger is a handy little program which lets you find out more about people on the Net – and lets you tell others on the Net more about yourself.

Finger uses the same concept as telnet or ftp. But it works with only one file, called .plan (yes, with a period in front). This is a text file an Internet user creates with a text editor in his home directory. You can put your phone number in there, tell a little bit about yourself, or write almost anything at all.

To finger somebody else's '`.plan`' file, type this at the command line:

```
finger email-address
```

where email-address is the person's e-mail address. You'll get back a display that shows the last time the person was online, whether they've gotten any new mail since that time and what, if anything, is in their '`.plan`' file. Some people and institutions have come up with creative uses for these '`.plan`' files, letting you do everything from checking the weather in Massachusetts to getting the latest baseball standings. Try fingering these e-mail addresses:

`<coke@cs.cmu.edu>`
: See how many cans of each type of soda are left in a particular soda machine in the computer-science department of Carnegie-Mellon University.

`<weather@cirrus.mit.edu>`
: Latest National Weather Service weather forecasts for regions in Massachusetts.

`<quake@geophys.washington.edu>`
: Locations and magnitudes of recent earthquakes around the world.

`<jtchern@ocf.berkeley.edu>`
: Current major-league baseball standings and results of the previous day's games.

`<nasanews@space.mit.edu>`
: The day's events at NASA.

6.6 Finding Someone on the Net

So you have a friend and you want to find out if he has an Internet account to which you can write? The quickest way may be to just pick up the phone, call him and ask him. Although there are a variety of "white pages" services available on the Internet, they are far from complete – college students, users of commercial services such as CompuServe and many Internet public-access sites, and many others simply won't be listed. Major e-mail providers are working on a universal directory system, but that could be some time away.

In the meantime, a couple of "white pages" services might give you some leads, or even just entertain you as you look up famous people or long-lost acquaintances.

The whois directory provides names, e-mail and postal mail address and often phone numbers for people listed in it. To use it, telnet to **internic.net**. No log-on is needed. The quickest way to use it is to type

```
whois name
```

at the prompt, where "name" is the last name or organization name you're looking for.

Another service worth trying, especially since it seems to give beginners fewer problems, is the Knowbot Information Service reachable by telnet at **info.cnri.reston.va. us 185**. Again, no log-on is needed. This service actually searches through a variety of other "white pages" systems, including the user directory for MCIMail. To look for somebody, type

```
query name
```

'`name`' is the last name of the person you're looking for. You can get details of other commands by hitting a question mark at the prompt.

You can also use the knowbot system by e-mail. Start a message to `<netaddress@info.cnri.reston.va.us>` Leave the "subject:" line blank. As your message, write '`query name`' for the simplest type of search. If you want details on more complex searches, add another line: '`man`'

Apart from the previously mentioned methods, there exists a periodical posting on Usenet entitled *"How to find people's E-mail addresses"* that is edited and maintained by *Jonathan I. Kamens*. It lists several alternatives in order of success probability, to enable everybody to find everyone.

Just get '`/pub/usenet/news.answers/finding-addresses`' from **rtfm.mit.edu**. See Chapter 7 [FTP], page 99 to find out how to access this server. It's cross-posted each month to **comp.mail.misc** , **soc.net-people**, **news.newusers.questions**, and the respective ***.answers** newsgroups.

The most interesting way described therein is a way to search via the Usenet name server. This is a system at MIT that keeps track of the e-mail addresses of everybody who posts a Usenet message that appears at MIT. It works by e-mail. Send a message to `<mail-server@rtfm.mit.edu>`. You can leave the '`Subject:`' line blank. As your message, write '`send usenet-addresses/lastname`' where "lastname" is the last name of the person you're looking for.

6.7 When things go wrong:

- Nothing happens when you try to connect to a telnet site. The site could be down for maintenance or problems.
- You get a "host unavailable" message. The telnet site is down for some reason.

  Try again later.
- You get a "host unknown" message.

  Check your spelling of the site name.
- You type in a password on a telnet site that requires one, and you get a "login incorrect" message.

  Try logging in again. If you get the message again, hit your control and '`]`' keys at the same time to disengage and return to your host system.
- You can't seem to disconnect from a telnet site.

  Use control-] to disengage and return to your host system.

FYI:

The Usenet newsgroups **alt.internet.services** and **alt.bbs.internet** can provide pointers to new telnet systems. **Scott Yanoff** periodically posts his *"Updated Internet Services List"* in the former;

The **alt.bbs.internet** newsgroup is also where you'll find **Aydin Edguer**'s compendium of FAQs related to Internet bulletin-board systems. **Peter Scott**, who maintains the Hytelnet database, runs a mailing list about new telnet services and changes in existing ones. To get on the list, send him a note at <scott@sklib.usask.ca>. **Gleason Sackman** is a veteran **net.surfer** who maintains another mailing list dedicated to new Internet services and news about the new uses to which the Net is being put. To subscribe, send a message to <listserv@internic.net>. Leave the "Subject:" line blank, and as your message, write: 'Sub net-happenings Your Name'.

"Good literature is about Love and War.
Trash fiction is about Sex and Violence."
— **Author Unknown**

"The world's as ugly as sin, and almost as delightful."
— **Frederick Locker-Lampson**

7 FTP (Mining the Net, part II)

7.1 Tons of Files

Hundreds of systems connected to Internet have file libraries, or archives, accessible to the public. Much of this consists of free or low- cost shareware programs for virtually every make of computer. If you want a different communications program for your IBM, or feel like playing a new game on your Amiga, you'll be able to get it from the Net.

But there are also libraries of documents as well. If you want a copy of a recent U.S. Supreme Court decision, you can find it on the Net. Copies of historical documents, from the Magna Carta to the Declaration of Independence are also yours for the asking, along with a translation of a telegram from Lenin ordering the execution of rebellious peasants. You can also find song lyrics, poems, even summaries of every "Lost in Space" episode ever made. You can also find extensive files detailing everything you could ever possibly want to know about the Net itself. First you'll see how to get these files; then we'll show you where they're kept.

The commonest way to get these files is through the file transfer protocol, or ftp. As with telnet, not all systems that connect to the Net have access to ftp. However, if your system is one of these, you'll be able to get many of these files through e-mail (see Chapter 9 [Advanced E-mail], page 129).

Starting ftp is as easy as using telnet. At your host system's command line, type

```
ftp site.name
```

and hit enter, where "site.name" is the address of the ftp site you want to reach. One major difference between telnet and ftp is that it is considered bad form to connect to most ftp sites during their business hours (generally 6 a.m. to 6 p.m. local time). This is because transferring files across the network takes up considerable computing power, which during the day is likely to be needed for whatever the computer's main function is. There are some ftp sites that are accessible to the public 24 hours a day, though. You'll find these noted in the list of ftp sites (see Section 7.6 [Some Interesting FTP Sites], page 105).

How do you find a file you want, though?

7.2 Your Friend Archie

Until a few years ago, this could be quite the pain – there was no master directory to tell you where a given file might be stored on the Net. Who'd want to slog through hundreds of file libraries looking for something?

Alan Emtage, *Bill Heelan* and *Peter Deutsch*, students at McGill University in Montreal, asked the same question. Unlike the weather, though, they did something about it.

They created a database system, called archie, that would periodically call up file libraries and basically find out what they had available. In turn, anybody could dial into archie, type in a file name, and see where on the Net it was available. Archie currently catalogs close to 1,000 file libraries around the world.

Today, there are three ways to ask archie to find a file for you: through telnet, a "client" Archie program on your own host system or e-mail. All three methods let you type in a full or partial file name and will tell you where on the Net it's stored. If you have access to telnet, you can telnet to one of the following addresses: **archie.mcgill.ca**; **archie.sura.net**; **archie.unl.edu**; **archie.ans.net**; or **archie.rutgers.edu**. If asked for a log-in name, type

```
archie
```

and hit enter.

When you connect, the key command is prog, which you use in this form:

```
prog filename
```

followed by enter, where "filename" is the program or file you're looking for. If you're unsure of a file's complete name, try typing in part of the name. For example, 'PKZIP' will work as well as 'PKZIP204.EXE'. The system does not support DOS or Unix wildcards. If you ask archie to look for 'PKZIP*', it will tell you it couldn't find anything by that name. One thing to keep in mind is that a file is not necessarily the same as a program – it could also be a document. This means you can use archie to search for, say, everything online related to the Beatles, as well as computer programs and graphics files.

A number of Net sites now have their own archie programs that take your request for information and pass it onto the nearest archie database – ask your system administrator if s/he has it online. These "client" programs seem to provide information a lot more quickly than the actual archie itself! If it is available, at your host system's command line, type

```
archie -s filename
```

where filename is the program or document you're looking for, and hit enter. The '-s' tells the program to ignore case in a file name and lets you search for partial matches. You might actually want to type it this way:

```
archie -s filename |more
```

which will stop the output every screen (handy if there are many sites that carry the file you want). Or you could open a file on your computer with your text-logging function.

The third way, for people without access to either of the above, is e-mail.

Send a message to <archie@quiche.cs.mcgill.ca>. You can leave the subject line blank. Inside the message, type

```
prog filename
```

where filename is the file you're looking for. You can ask archie to look up several programs by putting their names on the same "prog" line, like this:

```
prog file1 file2 file3
```

Within a few hours, archie will write back with a list of the appropriate sites.

In all three cases, if there is a system that has your file, you'll get a response that looks something like this:

```
Host sumex-aim.stanford.edu

Location: /info-mac/comm
FILE -rw-r--r--     258256  Feb 15 17:07  zterm-09.hqx
Location: /info-mac/misc
FILE -rw-r--r--       7490  Sep 12 1991   zterm-sys7-color-icons.hqx
```

Chances are, you will get a number of similar looking responses for each program. The "Host" is the system that has the file. The "Location" tells you which directory to look in when you connect to that system. Ignore the funny-looking collections of r's and hyphens for now. After them come the size of the file or directory listing in bytes, the date it was uploaded, and the name of the file.

Now you want to get that file.

7.3 Getting the Files

Assuming your host site does have ftp, you connect in a similar fashion to telnet, by typing:

```
ftp sumex-aim.stanford.edu
```

(or the name of whichever site you want to reach). Hit enter. If the connection works, you'll see this:

```
Connected to sumex-aim.stanford.edu.
220 SUMEX-AIM FTP server (Version 4.196 Mon Jan 13 13:52:23 PST 1992) ready.
Name (sumex-aim.stanford.edu:adamg):
```

If nothing happens after a minute or so, hit control-C to return to your host system's command line. But if it has worked, type

```
anonymous
```

and hit enter. You'll see a lot of references on the Net to "anonymous ftp." This is how it gets its name – you don't really have to tell the library site what your name is. The reason is that these sites are set up so that anybody can gain access to certain public files, while letting people with accounts on the sites to log on and access their own personal files. Next, you'll be asked for your password. As a password, use your e-mail address. This will then come up:

```
230 Guest connection accepted. Restrictions apply.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>
```

Now type

```
ls -l
```

and hit enter. You'll see something awful like this:

```
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 2636
-rw-rw-r--  1 0        31           4444 Mar  3 11:34 README.POSTING
dr-xr-xr-x  2 0        1             512 Nov  8 11:06 bin
-rw-r--r--  1 0        0        11030960 Apr  2 14:06 core
dr--r--r--  2 0        1             512 Nov  8 11:06 etc
drwxrwsr-x  5 13       22            512 Mar 19 12:27 imap
drwxr-xr-x 25 1016     31            512 Apr  4 02:15 info-mac
drwxr-x---  2 0        31           1024 Apr  5 15:38 pid
drwxrwsr-x 13 0        20           1024 Mar 27 14:03 pub
drwxr-xr-x  2 1077     20            512 Feb  6  1989 tmycin
226 Transfer complete.
ftp>
```

Ack! Let's decipher this Rosetta Stone.

First, ls is the ftp command for displaying a directory (you can actually use dir as well, but if you're used to MS-DOS, this could lead to confusion when you try to use dir on your host system, where it won't work, so it's probably better to just remember to always use ls for a directory while online).

The very first letter on each line tells you whether the listing is for a directory or a file. If the first letter is a '`d`', or an '`l`', it's a directory. Otherwise, it's a file.

The rest of that weird set of letters and dashes consist of "flags" that tell the ftp site who can look at, change or delete the file. You can safely ignore it. You can also ignore the rest of the line until you get to the second number, the one just before the date. This tells you how large the file is, in bytes. If the line is for a directory, the number gives you a rough indication of how many items are in that directory – a directory listing of 512 bytes is relatively small. Next comes the date the file or directory was uploaded, followed (finally!) by its name.

Notice the '`README.POSTING`' file up at the top of the directory. Most archive sites have a "read me" document, which usually contains some basic information about the site, its resources and how to use them. Let's get this file, both for the information in it and to see how to transfer files from there to here. At the '`ftp>`' prompt, type

```
get README.POSTING
```

and hit enter. Note that ftp sites are no different from Unix sites in general: they are case-sensitive. You'll see something like this:

```
200 PORT command successful.
150 Opening BINARY mode data connection for README.POSTING (4444 bytes).
226 Transfer complete. 4444 bytes received in 1.177 seconds (3.8 Kbytes/s)
```

And that's it! The file is now located in your home directory on your host system, from which you can now download it to your own computer. The simple '`get`' command is the key to transferring a file from an archive site to your host system.

If you want to download more than one file at a time (say a series of documents), use '`mget`' instead of '`get`'; for example:

```
mget *.txt
```

This will transfer copies of every file ending with '`.txt`' in the given directory. Before each file is copied, you'll be asked if you're sure you want it. Despite this, mget could still save you considerable time – you won't have to type in every single file name. If you want to save even more time, and are sure you really want *all* of the given files, type '`prompt`' before you do the mget command. This will turn off the prompt, and all the files will be zapped right into your home directory.

There is one other command to keep in mind. If you want to get a copy of a computer program, type

```
bin
```

and hit enter. This tells the ftp site and your host site that you are sending a binary file, i.e., a program. Most ftp sites now use binary format as a default, but it's a good idea to do this in case you've connected to one of the few that doesn't.

To switch to a directory, type

```
cd directory-name
```

(substituting the name of the directory you want to access) and hit enter. Type

```
ls
```

and hit enter to get the file listing for that particular directory. To move back up the directory tree, type

```
cd ..
```

(note the space between the d and the first period) and hit enter. Or you could type

```
cdup
```

and hit enter. Keep doing this until you get to the directory of interest. Alternately, if you already know the directory path of the file you want (from our friend archie), after you connect, you could simply type

```
get directory/subdirectory/filename
```

On many sites, files meant for public consumption are in the pub or public directory; sometimes you'll see an info directory.

Almost every site has a bin directory, which at first glance sounds like a bin in which interesting stuff might be dumped. But it actually stands for "binary" and is simply a place for the system administrator to store the programs that run the ftp system. Lost+found is another directory that looks interesting but actually never has anything of public interest in them.

Before, you saw how to use archie. From our example, you can see that some system administrators go a little berserk when naming files. Fortunately, there's a way for you to rename the file as it's being transferred. Using our archie example, you'd type

```
get zterm-sys7-color-icons.hqx zterm.hqx
```

and hit enter. Instead of having to deal constantly with a file called '`zterm-sys7-color-icons.hqx`', you'll now have one called, simply, '`zterm.hqx`'.

Those last three letters bring up something else: Many program files are compressed to save on space and transmission time. In order to actually use them, you'll have to use an un-compress program on them first.

7.4 Odd Letters – Decoding File Endings

There are a wide variety of compression methods in use. You can tell which method was used by the last one to three letters at the end of a file. Here are some of the more common ones and what you'll need to un- compress the files they create (most of these decompression programs can all be located through archie).

`.txt`
`.TXT` By itself, this means the file is a document, rather than a program.

`.ps`
`.PS` A PostScript document (in Adobe's page description language). You can print this file on any PostScript capable printer, or use a previewer, like GNU project's GhostScript.

`.doc`
`.DOC` Is another common suffix for documents. No de-compression is needed, unless it is followed by

`.z` A file compressed by the Unix `pack` utility. It uses Huffman coding (which minimizes redundancy) on each byte. Type '`unpack filename.z`' or '`gunzip filename.z`' to decompress it. This suffix was also briefly used to indicate gzip'ed files before '.gz' was adopted. However, some sites *still* use this suffix for gzip'ed files, e.g. the EFF's FTP-server, due to local set-ups.

.Z
: This is a Unix compression method. To uncompress the file, type 'uncompress filename.Z' or 'gunzip filename.Z' and hit enter at your host system's command prompt. If it's a text file, you can read it online by typing 'zcat file.txt.Z |more' at your host system's command line. There is a Macintosh 'u16.zip' is an MS-DOS program that will let you download such a file and uncompress it on your own computer. The Macintosh equivalent program is called MacCompress (use archie to find these).

.zip
.ZIP
: These indicate the file has been compressed with a common MS-DOS compression program, known as PKZIP (use archie to find 'PKZIP204.EXE'). Many Unix systems will let you un-ZIP a file with a program called, well, unzip.

.gz
: The GNU project's compression format. A variant of the PKZIP format. Use 'gunzip filename.gz' to uncompress.

.zoo
.ZOO
: A Unix, VAX and MS-DOS format. Requires the use of a program called zoo to uncompress.

.Hqx
.hqx
: A Macintosh format that needs BinHex for de-coding.

.shar
.Shar
: A Unix format. Use unshar.

.tar
: Another Unix format, often used to glue several related files and/or complete directory trees into one big file. Use the 'tar' command. Often, a "tarred" file will also be compressed with the '.Z'/'.gz' method, so you first have to use 'uncompress'/'gunzip' and then 'tar'.

.TAZ
.TGZ
: Sometimes used for compressed tar archives '.tar.Z', that are stored on "3 letter suffix only systems" (aka MS-DOS).

.sit
.Sit
: A Macintosh format, requires StuffIt.

.ARC
: A DOS format that requires the use of ARC or ARCE.

.LZH
: Another DOS compression format; requires the use of LHARC.

.lz
.lha
: The Amiga variant of LHARC. It's the most common Amiga archiving method, and made with the program lha or lz.

A few last words of caution: Check the size of a file before you get it. The Net moves data at phenomenal rates of speed. But that 500,000-byte file that gets transferred to your host system in a few seconds could take more than an hour or two to download to your computer if you're using a 2400-baud modem. Your host system may also have limits on the amount of bytes you can store online at any one time. Also, although it is really extremely unlikely you will ever get a file infected with a virus, if you plan to do much downloading over the Net, you'd be wise to invest in a good anti-viral program, just in case.

7.5 The Keyboard Cabal

System administrators are like everybody else – they try to make things easier for themselves. And when you sit in front of a keyboard all day, that can mean trying everything possible to reduce the number of keys you actually have to hit each day.

Unfortunately, that can make it difficult for the rest of us.

You've already read about '`bin`' and '`lost+found`' directories, '`etc`' is another seemingly interesting directory that turns out to be another place to store files used by the ftp site itself. Again, nothing of any real interest.

Then, once you get into the actual file libraries, you'll find that in many cases, files will have such non-descriptive names as '`V1.1-AK.TXT`'. The best known example is probably a set of several hundred files known as RFCs, which provide the basic technical and organizational information on which much of the Internet is built. These files can be found on many ftp sites, but always in a form such as '`RFC101.TXT`', '`RFC102.TXT`' and so on, with no clue whatsoever as to what information they contain.

Fortunately, almost all ftp sites have a "Rosetta Stone" to help you decipher these names. Most will have a file named '`README`' (or some variant) that gives basic information about the system. Then, most directories will either have a similar '`README`' file or will have an index that does give brief descriptions of each file. These are usually the first file in a directory and often are in the form '`00INDEX.TXT`'. Use the ftp command to get this file. You can then scan it online or download it to see which files you might be interested in.

Another file you will frequently see is called '`ls-lgR.Z`'. This contains a listing of every file on the system, but without any descriptions (the name comes from the Unix command '`ls -lgR`', which gives you a listing of all the files in all your directories). The '`.Z`' at the end means the file has been compressed, which means you will have to use a Unix un-compress command before you can read the file.

And finally, we have those system administrators who almost seem to delight in making things difficult – the ones who take full advantage of Unix's ability to create absurdly long file names. On some FTP sites, you will see file names as long as 80 characters or so, full of capital letters, underscores and every other orthographic device that will make it almost impossible for you to type the file name correctly when you try to get it. Your secret weapon here is the mget command. Just type mget, a space, and the first five or six letters of the file name, followed by an asterisk, for example:

```
mget This_F*
```

The FTP site will ask you if you want to get the file that begins with that name. If there are several files that start that way, you might have to answer '`n`' a few times, but it's still easier than trying to recreate a ludicrously long file name.

7.6 Some Interesting FTP Sites

What follows is a list of some interesting ftp sites, arranged by category. With hundreds of ftp sites now on the Net, however, this list barely scratches the surface of what is available. Liberal use of archie will help you find specific files.

The times listed for each site are in Eastern time and represent the periods during which it is considered acceptable to connect.

7.6.1 Amiga

ftp.uu.net Has Amiga programs in the '`systems/amiga`' directory. Available 24 hours.

wuarchive.wustl.edu Look in the 'pub/aminet' directory. Available 24 hours.

7.6.2 Atari

atari.archive.umich.edu Find almost all the Atari files you'll ever need, in the 'atari' directory. 7 p.m. - 7 a.m.

7.6.3 Books

rtfm.mit.edu The 'pub/usenet/rec.arts.books' directory has reading lists for various authors as well as lists of recommended bookstores in different cities. Unfortunately, this site uses incredibly long file names – so long they may scroll off the end of your screen if you are using an MS-DOS or certain other computers. Even if you want just one of the files, it probably makes more sense to use mget than get. This way, you will be asked on each file whether you want to get it; otherwise you may wind up frustrated because the system will keep telling you the file you want doesn't exist (since you may miss the end of its name due to the scrolling problem). 6 p.m. - 6 a.m.

7.6.4 Computer Ethics

ftp.eff.org The home of the Electronic Frontier Foundation. Use cd to get to the pub directory and then look in the EFF, SJG and CPSR directories for documents on the EFF itself and various issues related to the Net, ethics and the law. Available 24 hours.

7.6.5 Consumer

rtfm.mit.edu The 'pub/usenet/misc.consumers' directory has documents related to credit. The 'pub/usenet/rec.travel.air' directory will tell you how to deal with airline reservation clerks, find the best prices on seats, etc. See under Books for a caveat in using this ftp site. 6 p.m. - 6 a.m.

7.6.6 Cooking

wuarchive.wustl.edu Look for recipes and recipe directories in the 'usenet/rec.food.cooking/recipes' directory.

gatekeeper.dec.com Recipes are in the 'pub/recipes' directory.

7.6.7 Economics

neeedc.umesbs.maine.edu The Federal Reserve Bank of Boston uses this site (yes, there are three 'e's in "neeedc") to house all sorts of data on the New England economy. Many files contain 20 years or more of information, usually in forms that are easily adaptable to spreadsheet or database files. Look in the 'frbb' directory.

town.hall.org Look in the edgar directory for the beginnings of a system to distribute annual reports and other data publicly held companies are required to file with the Securities and Exchange Commission. The 'other/fed' directory holds various statistical files from the Federal Reserve Board.

7.6.8 Esperanto

ftp.stack.urc.tue.nl You'll find text files about the Esperanto artificial language in the 'pub/esperanto' directory. 6 p.m. - 6 a.m.

7.6.9 Evolutionary Computation

lumpi.informatik.uni-dortmund.de If you're interested in one possible future of computation, and also are interested in global optimization problems, evolutionary biology and genetics, you might want to take a look at this server. For an overview on the field, you should get the file '`pub/EA/docs/hhgtec-*.ps.gz`', aka *"The Hitch-Hiker's Guide to Evolutionary Computation"*. Available 24 hours.

ftp.santafe.edu Look at SAFIER, the SANta Fe Institute's Evolutionary computation Repository. It's the most comprehensive collection of the field, and has more online than you ever wanted to know on EC. Get '`/pub/EC/CONTENTS`' for the complete contents of this location. *"The Hitch-Hiker's Guide to Evolutionary Computation"* is available as '`pub/EC/FAQ/hhgtec-*.ps.gz`'. An introduction to SAFIER entitled *"The Navigator's Guide to SAFIER"* is available for A4 and US letter size paper as '`pub/EC/handbook/safier.ps.gz`' and '`pub/EC/handbook/safier-US.ps.gz`', respectively. Available 24 hours.

7.6.10 FTP Addresses

iraun1.ira.uka.de Run by the computer-science department of the University of Karlsruhe in Germany, this site offers lists of anonymous-FTP sites both internationally (in the '`anon.ftp.sites`' directory) and in Germany (in '`anon.ftp.sites.de`'). 12 p.m. to 2 a.m.

ftp.netcom.com The '`pub/profiles`' directory has lists of ftp sites.

7.6.11 Government

ncsuvm.cc.ncsu.edu The '`SENATE`' directory contains bibliographic records of U.S. Senate hearings and documents for the past several Congresses. Get the file '`README.DOS9111`', which will explain the cryptic file names. 6 p.m. - 6 a.m.

info.umd.edu The '`info/Government/US/Whitehouse`' directory has copies of press releases and other documents from the Clinton administration. 6 p.m. - 6 a.m.

(see Section 7.6.15 [Law], page 108)

nptn.org The General Accounting Office (GAO) is the investigative wing of Congress. The '`pub/e.texts/gao.reports`' directory represents an experiment by the agency to use ftp to distribute its reports. Available 24 hours.

7.6.12 History

nptn.org This site has a large, growing collecting of text files. In the '`pub/e.texts/freedom.shrine`' directory, you'll find copies of important historical documents, from the Magna Carta to the Declaration of Independence and the Emancipation Proclamation. Available 24 hours.

leginfo.public.ca.gov This is a repository of legislative calendars, bills and other information related to state government in California. Available 24 hours.

whitehouse.gov Look for copies of presidential position papers, transcripts of press conferences and related information here. Available 24 hours.

ra.msstate.edu Mississippi State maintains an eclectic database of historical documents, detailing everything from Attila's battle strategy to songs of soldiers in Vietnam, in the '`docs/history`' directory. 6 p.m. - 6 a.m.

seq1.loc.gov The Library of Congress has acquired numerous documents from the former Soviet government and has translated many of them into English. In the '`pub/soviet.archive/text.english`' directory, you'll find everything from telegrams from Lenin ordering the death of peasants to Khrushchev's response to Kennedy during the Cuban missile crisis. The 'README' file in the 'pub/soviet.archive' directory provides an index to the documents. 6 p.m. - 6 a.m.

7.6.13 Hong Kong

nok.lcs.mit.edu GIF pictures of Hong Kong pop stars, buildings and vistas are available in the 'pub/hongkong/HKPA' directory. 6 p.m. - 6 a.m.

7.6.14 Internet

ftp.eff.org The 'pub/Net_info' directory has a number of sub-directories containing various Internet resources guides and information files, including the latest online version of the *"Big Dummy's Guide"*. Available 24 hours.

nic.ddn.mil The 'internet-drafts' directory contains information about the Internet, while the 'scc' directory holds network security bulletins. 6 p.m. - 6 a.m.

7.6.15 Law

info.umd.edu U.S. Supreme Court decisions from 1989 to the present are stored in the 'info/Government/US/SupremeCt' directory. Each term has a separate directory (for example, 'term1992'). Get the 'README' and 'Index' files to help decipher the case numbers. 6 p.m. - 6 a.m.

ftp.uu.net Supreme Court decisions are in the court-opinions directory. You'll want to get the index file, which tells you which file numbers go with which file names. The decisions come in Word Perfect and Atex format only. Available 24 hours a day.

7.6.16 Libraries

ftp.unt.edu The library directory contains numerous lists of libraries with computerized card catalogs accessible through the Net.

7.6.17 Literature

mrcnext.cso.uiuc.edu Project Gutenberg is an effort to translate paper texts into electronic form. Already available are more than 100 titles, from works by Lewis Carroll to Mark Twain; from *"A Tale of Two Cities"* to *"Son of Tarzan"*. Look in the '/etext/etext92' and '/etext/etext93' directories. 6 p.m. - 9 a.m.

nptn.org In the 'pub/e.texts/gutenberg/etext91' and 'etext92' directories, you can get copies of Aesop's Fables, works by Lewis Carroll and other works of literature, as well as the Book of Mormon. Available 24 hours.

world.std.com The 'obi' directory has everything from online fables to accounts of Hiroshima survivors. 6 p.m. - 6 a.m.

7.6.18 Macintosh

sumex-aim.stanford.edu This is the premier site for Macintosh software. After you log in, switch to the info-mac directory, which will bring up a long series of sub-directories of virtually every free and shareware Mac program you could ever want. 9 p.m. - 9 a.m.

ftp.uu.net You'll find lots of Macintosh programs in the 'systems/mac/simtel20' directory. Available 24 hours a day.

7.6.19 Movie Reviews

lcs.mit.edu Look in the '`movie-reviews`' directory. 6 p.m. - 6 a.m.

7.6.20 MS-DOS

wuarchive.wustl.edu This carries one of the world's largest collections of MS-DOS software. The files are actually copied, or "mirrored" from a computer at the U.S. Army's White Sands Missile Range (which uses ftp software that is totally incomprehensible). It also carries large collections of Macintosh, Windows, Atari, Amiga, Unix, OS9, CP/M and Apple II software. Look in the mirrors and systems directories. The '`gif`' directory contains a large number of GIF graphics images. Accessible 24 hours.

ftp.uu.net Look for MS-DOS programs and files in the '`systems/msdos/simtel20`' directory. Available 24 hours a day.

7.6.21 Music

cs.uwp.edu The '`pub/music`' directory has everything from lyrics of contemporary songs to recommended CDs of baroque music. It's a little different - and easier to navigate - than other ftp sites. File and directory names are on the left, while on the right, you'll find a brief description of the file or directory, like this:

```
SITES        1528  Other music-related FTP archive sites
classical/      -  (dir) Classical Buying Guide
database/       -  (dir) Music Database program
discog/         =  (dir) Discographies
faqs/           =  (dir) Music Frequently Asked questions files
folk/           -  (dir) Folk Music Files and pointers
guitar/         =  (dir) Guitar TAB files from ftp.nevada.edu
info/           =  (dir) rec.music.info archives
interviews/     -  (dir) Interviews with musicians/groups
lists/          =  (dir) Mailing lists archives
lyrics/         =  (dir) Lyrics Archives
misc/           -  (dir) Misc files that don't fit anywhere else
pictures/       =  (dir) GIFS, JPEGs, PBMs and more.
press/          -  (dir) Press Releases and misc articles
programs/       -  (dir) Misc music-related programs for various machines
releases/       =  (dir) Upcoming USA release listings
sounds/         =  (dir) Short sound samples
226 Transfer complete.
ftp>
```

When you switch to a directory, don't include the '`/`'. 7 p.m. - 7 a.m.

potemkin.cs.pdx.edu The Bob Dylan archive. Interviews, notes, year-by-year accounts of his life and more, in the '`pub/dylan`' directory. 9 p.m. - 9 a.m.

ftp.nevada.edu Guitar chords for contemporary songs are in the '`pub/guitar`' directory, in subdirectories organized by group or artist.

7.6.22 Native Americans

pines.hsu.edu Home of IndianNet, this site contains a variety of directories and files related to Indians and Eskimos, including federal census data, research reports and a tribal profiles database. Look in the pub and indian directories.

7.6.23 Pets

rtfm.mit.edu The '`pub/usenet/rec.pets.dogs`' and '`pub/usenet.rec.pets.cats`' directories have documents on the respective animals. See under Books Section 7.6.3 [Books], page 106 for a caveat in using this ftp site. 6 p.m. - 6 a.m.

7.6.24 Pictures

wuarchiv.wustl.edu The '`graphics/gif`' directory contains hundreds of GIF photographic and drawing images, from cartoons to cars, space images to pop stars. These are arranged in a long series of subdirectories.

7.6.25 Photography

ftp.nevada.edu Photolog is an online digest of photography news, in the '`pub/photo`' directory.

7.6.26 Religion

nptn.org In the '`pub/e.texts/religion`' directory, you'll find subdirectories for chapters and books of both the Bible and the Koran. Available 24 hours.

7.6.27 Science Fiction

elbereth.rutgers.edu In the pub/sfl directory, you'll find plot summaries for various science-fiction TV shows, including Star Trek (not only the original and Next Generation shows, but the cartoon version as well), Lost in Space, Battlestar Galactica, the Twilight Zone, the Prisoner and Doctor Who. There are also lists of various things related to science fiction and an online science-fiction fanzine. 6 p.m. - 6 a.m.

7.6.28 Sex

rtfm.mit.edu Look in the '`pub/usenet/alt.sex`' and '`pub/usenet/alt.sex.wizards`' directories for documents related to all facets of sex. See under Books Section 7.6.3 [Books], page 106 for a caveat in using this ftp site. 6 p.m. - 6 a.m.

7.6.29 Shakespeare

atari.archive.umich.edu The shakespeare directory contains most of the Bard's works. A number of other sites have his works as well, but generally as one huge mega-file. This site breaks them down into various categories (comedies, poetry, histories, etc.) so that you can download individual plays or sonnets.

7.6.30 Space

ames.arc.nasa.gov Stores text files about space and the history of the NASA space program in the '`pub/SPACE`' subdirectory. In the '`pub/GIF`' and '`pub/SPACE/GIF`' directories, you'll find astronomy- and NASA-related GIF files, including pictures of planets, satellites and other celestial objects. 9 p.m. - 9 a.m.

7.6.31 TEX

ftp.dante.de, **ftp.SHSU.edu**, or **ftp.tex.ac.uk** in '`/tex-archive/`' or '`/pub/tex/`' form the CTAN (comprehensive TeX archive network), that always has the latest TEX version (and everything that comes with it) available.

7.6.32 TV

coe.montana.edu The '`pub/TV/Guides`' directory has histories and other information about dozens of TV shows. Only two anonymous-ftp log-ins are allowed at a time, so you might have to try more than once to get in. 8 p.m. - 8 a.m.

ftp.cs.widener.edu The '`pub/simpsons`' directory has more files than anybody could possibly need about Bart and family. The '`pub/strek`' directory has files about the original and Next Generation shows as well as the movies. See also under Science Fiction Section 7.6.27 [Science Fiction], page 110.

7.6.33 Travel

nic.stolaf.edu Before you take that next overseas trip, you might want to see whether the State Department has issued any kind of advisory for the countries on your itinerary. The advisories, which cover everything from hurricane damage to civil war, are in the '`pub/travel-advisories/advisories`' directory, arranged by country. 7 p.m. - 7 a.m.

7.6.34 Usenet

ftp.uu.net In the usenet directory, you'll find "frequently asked questions" files, copied from **rtfm.mit.edu**. The communications directory holds programs that let MS-DOS users connect directly with UUCP sites. In the info directory, you'll find information about ftp and ftp sites. The inet directory contains information about Internet. Available 24 hours.

rtfm.mit.edu This site contains all available FAQs "frequently asked questions" files for Usenet newsgroups in the '`pub/usenet`' directory. For easy access, get the '`index`' file. See under Books Section 7.6.3 [Books], page 106 for a caveat in using this ftp site. 6 p.m. - 6 a.m.

ftp.uni-stuttgart.de In directory '`/pub/doc/faq`' resides a mirror of **rtfm.mit.edu**. Available 24 hours.

7.6.35 Viruses

ftp.unt.edu The antivirus directory has anti-virus programs for MS-DOS and Macintosh computers. 7 p.m. - 7 a.m.

7.6.36 Weather

wuarchive.wustl.edu The '`/multimedia/images/wx`' directory contains GIF weather images of North America. Files are updated hourly and take this general form: '`CV100222`'. The first two letters tell the type of file: CV means it is a visible-light photo taken by a weather satellite. CI images are similar, but use infrared light. Both these are in black and white. Files that begin with SA are color radar maps of the U.S. that show severe weather patterns but also fronts and temperatures in major cities. The numbers indicate the date and time (in GMT - five hours ahead of EST) of the image: the first two numbers represent the month, the next two the date, the last two the hour. The file '`WXKEY.GIF`' explains the various symbols in SA files.

7.6.37 X Windows

ftp.x.org The default server for MIT's X Window System. See under '/pub'.

ftp.germany.eu.net Germany's backbone site located at the University of Dortmund, in the European part of the Internet; the so-called EUnet. It's also Germany's default server for X window system releases, and also "mirrors" several important sites; e.g. in 'pub/packages/gnu' the GNU project's default server. Furthermore you'll find "mirrors" of '386BSD', 'NetBSD', and 'Linux'. Available 24 hours.

7.7 ncftp – Now You Tell Me!

If you're lucky, the people who run your host system or public- access site have installed a program called ncftp, which takes some of the edges off the ftp process.

For starters, when you use ncftp instead of plain old ftp, you no longer have to worry about misspelling "anonymous" when you connect. The program does it for you. And once you're in, instead of getting line after line filled with dashes, x's, r's and d's, you only get listings of the files or directories themselves (if you're used to MS-DOS, the display you get will be very similar to that produced by the 'dir/w' command). The program even creates a list of the ftp sites you've used most recently, so you can pick from that list, instead of trying to remember some incredibly complex ftp site name.

Launching the program, assuming your site has it, is easy. At the command prompt, type

```
ncftp sitename
```

where "sitename" is the site you want to reach (alternately, you could type just ncftp and then use its open command). Once connected, you can use the same ftp commands you've become used to, such as ls, get and mget. Entries that end in a '/' are directories to which you can switch with 'cd'; others are files you can get. A couple of useful ncftp commands include type, which lets you change the type of file transfer (from ASCII to binary for example) and size, which lets you see how large a file is before you get it, for example

```
size declaration.txt
```

would tell you how large the declaration.txt file is before you get it. When you say 'bye' to disconnect from a site, ncftp remembers the last directory you were in, so that the next time you connect to the site, you are put back into that directory automatically. If you type 'help' you'll get a list of files you can read to extend the power of the program even further.

7.8 Project Gutenberg – Electronic Books

Project Gutenberg, coordinated by Michael Hart, has a fairly ambitious goal: to make more than 10,000 books and other documents available electronically by the year 2001. In 1993, the project uploaded an average of four books a month to its ftp sites; in 1994, they hope to double the pace.

Begun in 1991, the project already maintains a "library" of hundreds of books and stories, from Aesop's Fables to "Through the Looking Glass" available for the taking. It also has a growing number of current-affairs documents, such as the CIA's annual "World Factbook" almanac.

Besides **nptn.org**, Project Gutenberg texts can be retrieved from **mrcnext.cso.uiuc.edu** in the etext directory.

7.9 When things go wrong:

- You get a “host unavailable” message.

  The ftp site is down for some reason. Try again later.
- You get a “host unknown” message.

  Check your spelling of the site name.
- You misspell “anonymous” when logging in and get a message telling you a password is required for whatever you typed in.

  Type something in, hit enter, type ‘`bye`’, hit enter, and try again. Alternately, try typing ‘`ftp`’ instead of ‘`anonymous`’. It will work on a surprising number of sites. Or just use ncftp, if your site has it, and never worry about this again.

FYI:

Liberal use of archie will help you find specific files or documents. For information on new or interesting ftp sites, try the **comp.archives** newsgroup on Usenet. You can also look in the **comp.misc**, **comp.sources.wanted** or **news.answers** newsgroups on Usenet for lists of ftp sites posted every month by *Tom Czarnik* and *Jon Granrose*.

The **comp.archives** newsgroup carries news of new ftp sites and interesting new files on existing sites.

In the **comp.virus** newsgroup on Usenet, look for postings that list ftp sites carrying anti-viral software for Amiga, MS-DOS, Macintosh, Atari and other computers.

The **comp.sys.ibm.pc.digest** and **comp.sys.mac.digest** newsgroups provide information about new MS-DOS and Macintosh programs as well as answers to questions from users of those computers.

“Welch ein Ort zum Plündern!”
(What a place to plunder!)
— **General Gebhard Leberecht von Blücher**

8 Gophers, WAISs and the World-Wide Web

8.1 Gophers

Even with tools like Hytelnet and archie, telnet and ftp can still be frustrating. There are all those telnet and ftp addresses to remember. Telnet services often have their own unique commands. And, oh, those weird directory and file names!

But now that the Net has become a rich repository of information, people are developing ways to make it far easier to find and retrieve information and files. Gophers and Wide-Area Information Servers (WAISs) are two services that could ultimately make the Internet as easy to navigate as commercial networks such as CompuServe or Prodigy.

Both gophers and WAISs essentially take a request for information and then scan the Net for it, so you don't have to. Both also work through menus – instead of typing in some long sequence of characters, you just move a cursor to your choice and hit enter. Gophers even let you select files and programs from ftp sites this way.

Let's first look at gophers (named for the official mascot of the University of Minnesota, where the system was developed).

Many public-access sites now have gophers online. To use one, type

```
gopher
```

at the command prompt and hit enter. If you know your site does not have a gopher, or if nothing happens when you type that, telnet to

```
consultant.micro.umn.edu
```

At the log-in prompt, type

```
gopher
```

and hit enter. You'll be asked what type of terminal emulation you're using, after which you'll see something like this:

```
Internet Gopher Information Client v1.03

Root gopher server: gopher.micro.umn.edu

-->  1.  Information About Gopher/
     2.  Computer Information/
     3.  Discussion Groups/
     4.  Fun & Games/
     5.  Internet file server (ftp) sites/
     6.  Libraries/
     7.  News/
     8.  Other Gopher and Information Servers/
     9.  Phone Books/
     10. Search lots of places at the U of M  <?>
     11. University of Minnesota Campus Information/

Press ? for Help, q to Quit, u to go up a menu      Page: 1/1
```

Assuming you're using VT100 or some other VT emulation, you'll be able to move among the choices with your up and down arrow keys. When you have your cursor on an entry that looks interesting, just hit enter, and you'll either get a new menu of choices, a database entry form, or a text file, depending on what the menu entry is linked to (more on how to tell which you'll get in a moment).

Gophers are great for exploring the resources of the Net. Just keep making choices to see what pops up. Play with it; see where it takes you. Some choices will be documents. When you read one of these and either come to the end or hit a lower-case '`q`' to quit reading it, you'll be given the choice of saving a copy to your home directory or e-mailing it to yourself. Other choices are simple databases that let you enter a word to look for in a particular database. To get back to where you started on a gopher, hit your '`u`' key at a menu prompt, which will move you back "up" through the gopher menu structure (much like "cd .." in ftp).

Notice that one of your choices above is "Internet file server (ftp) sites." Choose this, and you'll be connected to a modified archie program – an archie with a difference. When you search for a file through a gopher archie, you'll get a menu of sites that have the file you're looking for, just as with the old archie. Only now, instead of having to write down or remember an ftp address and directory, all you have to do is position the cursor next to one of the numbers in the menu and hit enter. You'll be connected to the ftp site, from which you can then choose the file you want. This time, move the cursor to the file you want and hit a lower-case '`s`'. You'll be asked for a name in your home directory to use for the file, after which the file will be copied to your home system. Unfortunately, this file-transfer process does not yet work with all public-access sites for computer programs and compressed files. If it doesn't work with yours, you'll have to get the file the old-fashioned way, via anonymous ftp.

In addition to ftp sites, there are hundreds of databases and libraries around the world accessible through gophers. There is not yet a common gopher interface for library catalogs, so be prepared to follow the online directions more closely when you use gopher to connect to one.

Gopher menu entries that end in a '`/`' are gateways to another menu of options. Entries that end in a period are text, graphics or program files, which you can retrieve to your home directory (or e-mail to yourself or to somebody else). A line that ends in '`<?>`' or '`<CSO>`' represents a request you can make to a database for information. The difference is that '`<?>`' entries call up one-line interfaces in which you can search for a keyword or words, while '`<CSO>`' brings up an electronic form with several fields for you to fill out (you might see this in online "White Pages" directories at colleges).

Gophers actually let you perform some relatively sophisticated Boolean searches. For example, if you want to search only for files that contain the words "MS-DOS" and "Macintosh," you'd type

```
ms-dos and macintosh
```

(gophers are not case-sensitive) in the keyword field. Alternately, if you want to get a list of files that mention either "MS-DOS" or "Macintosh," you'd type

```
ms-dos or macintosh
```

8.2 Burrowing Deeper

As fascinating as it can be to explore "gopherspace," you might one day want to quickly retrieve some information or a file. Or you might grow tired of calling up endless menus to get to the one you want. Fortunately, there are ways to make even gophers easier to use.

One is with archie's friend, veronica (it allegedly is an acronym, but don't believe that for a second), who does for gopherspace what archie does for ftp sites.

In most gophers, you'll find veronica by selecting "Other gopher and information services" at the main menu and then "Searching through gopherspace using veronica." Select this and you'll get something like this:

```
              Internet Gopher Information Client v1.1

-->  1.  Search titles in Gopherspace using veronica.
     2.  FAQ:  Frequently-Asked Questions about veronica  (1993/08/23).
     3.  How to compose  veronica queries (NEW June 24) READ ME!!.
     4.  Search Gopher Directory Titles at PSINet <?>
     5.  Search Gopher Directory Titles at SUNET <?>
     6.  Search Gopher Directory Titles at U. of Manitoba <?>
     7.  Search Gopher Directory Titles at University of Cologne <?>
     8.  Search gopherspace at PSINet <?>
     9.  Search gopherspace at SUNET <?>
     10. Search gopherspace at U. of Manitoba <?>
     11. Search gopherspace at University of Cologne <?>

Press ? for Help, q to Quit, u to go up a menu                Page: 1/1
```

A few choices there! First, the difference between searching directory titles and just plain ol' gopherspace. If you already know the sort of directory you're looking for (say a directory containing MS-DOS programs), do a directory-title search. But if you're not sure what kind of directory your information might be in, then do a general gopherspace search. In general, it doesn't matter which of the particular veronicas you use – they should all be able to produce the same results. The reason there is more than one is because the Internet has become so popular that only one veronica (or one gopher or one of almost anything) would quickly be overwhelmed by all the information requests from around the world.

You can use veronica to search for almost anything. Want to find museums that might have online displays from their exhibits? Try searching for "museum." Looking for a copy of the Declaration of Independence? Try "declaration."

In many cases, your search will bring up a new gopher menu of choices to try.

Say you want to impress those guests coming over for dinner on Friday by cooking cherries flambe. If you were to call up veronica and type in "flambe" after calling up veronica, you would soon get a menu listing several flambe recipes, including one called "dessert flambe." Put your cursor on that line of the menu and hit enter, and you'll find it's a menu for cherries flambe. Then hit your '`q`' key to quit, and gopher will ask you if you want to save the file in your home directory on your public-access site or whether you want to e-mail it somewhere.

As you can see, you can use veronica as an alternative to archie, which, because of the Internet's growing popularity, seems to take longer and longer to work.

In addition to archie and veronica, we now also have jugheads (no bettys yet, though). These work the same as veronicas, but their searches are limited to the specific gopher systems on which they reside.

If there are particular gopher resources you use frequently, there are a couple of ways to get to them even more directly.

One is to use gopher in a manner similar to the way you can use telnet. If you know a particular gopher's Internet address (often the same as its telnet or ftp address), you can connect to it directly, rather than going through menus. For example, say you want to use the gopher at **info.umd.edu**. If your public-access site has a gopher system installed, type this

```
gopher info.umd.edu
```

and you'll be connected.

But even that can get tedious if there are several gophers you use frequently. That's where bookmarks come in. Gophers let you create a list of your favorite gopher sites and even database queries. Then, instead of digging ever deeper into the gopher directory structure, you just call up your bookmark list and select the service you want.

To create a bookmark for a particular gopher site, first call up gopher. Then go through all the gopher menus until you get to the menu you want. Type a capital 'A'. You'll be given a suggested name for the bookmark enty, which you can change if you want by backspacing over the suggestion and typing in your own. When done, hit enter. Now, whenever you're in gopherspace and want to zip back to that particular gopher service, just hit your 'V' key (upper- or lower-case; in this instance, gopher doesn't care) anywhere within gopher. This will bring up a list of your bookmarks. Move to the one you want and hit enter, and you'll be connected.

Using a capital 'A' is also good for saving particular database or veronica queries that you use frequently (for example, searching for news stories on a particular topic if your public-access site maintains an indexed archive of wire-service news).

Instead of a capital 'A', you can also hit a lower-case 'a'. This will bring you to the particular line within a menu, rather than show you the entire menu.

If you ever want to delete a bookmark, hit 'V' within gopher, select the item you want to get rid of, and then hit your 'D' key. One more hint: If you want to find the address of a particular gopher service, hit your '=' key after you've highlighted its entry in a gopher menu. You'll get back a couple of lines, most of which will be technicalese of no immediate value to most folks, but some of which will consist of the site's address.

8.3 Gopher Commands

`a`	Add a line in a gopher menu to your bookmark list.
`A`	Add an entire gopher menu or a database query to your bookmark list.
`d`	Delete an entry from your bookmark list (you have to hit 'v' first).
`q`	Quit, or exit, a gopher. You'll be asked if you really want to.
`Q`	Quit, or exit, a gopher without being asked if you're sure.
`s`	Save a highlighted file to your home directory.
`u`	Move back up a gopher menu structure
`v`	View your bookmark list.
`=`	Get information on the originating site of a gopher entry.
`>`	Move ahead one screen in a gopher menu.
`<`	Move back one screen in a gopher menu.

8.4 Some Interesting Gophers

There are now hundreds of gopher sites around the world. What follows is a list of some of them. Assuming your site has a gopher "client" installed, you can reach them by typing

```
gopher sitename
```

at your command line. Can't find what you're looking for? Remember to use veronica to look up categories and topics!

8.4.1 Agriculture

cyfer.esusda.gov More agricultural statistics and regulations than most people will ever need.

usda.mannlib.cornell.edu More than 140 different types of agricultural data, most in Lotus 1-2-3 spreadsheet format.

8.4.2 Amimals

saimiri.primate.wisc.edu Information on primates and animal-welfare laws.

8.4.3 Architecture

libra.arch.umich.edu Maintains online exhibits of a variety of architectural images.

8.4.4 Art

marvel.loc.gov The Library of Congress maintains several online "galleries" of exhibits on display at the Library itself. These pictures, in GIF or JPEG image format, can be "delivered" to your home directory, from which you can download. Some pictures are *HUGE*, so be careful what you get first. Exhibits include works of art from the Vatican, copies of once secret Soviet government documents and pictures of artifacts related to Columbus's 1492 voyage. At the main menu, select 2 and then "Exhibits."

galaxy.ucr.edu The California Musuem of Art maintains its own online gallery here. At the main menu, select "Campus Events," then "California Museum of Photography," then "Network Exhibitions."

8.4.5 Astronomy

cast0.ast.cam.ac.uk A gopher devoted to astronomy, run by the Institute of Astronomy and the Royal Greenwich Observatory, Cambridge, England.

8.4.6 Census

bigcat.missouri.edu You'll find detailed federal census data for communities of more than 10,000 people, as well as for states and counties here. At the main menu, select "Reference and Information Center," then "United States and Missouri Census Information" and "United States Census."

8.4.7 Computers

wuarchive.wustl.edu Dozens of directories with software for all sorts of computers. Most programs have to be "un-compressed" before you can use them.

sumex-aim.stanford.edu A similar type of system, with the emphasis on Macintosh programs and files.

8.4.8 Disability

val-dor.cc.buffalo.edu The Cornucopia of Disability Information carries numerous information resources on disability issues and links to other disability-related services.

8.4.9 Environment

ecosys.drdr.virginia.edu Copies of Environmental Protection Agency factsheets on hundreds of chemicals; searchable by keyword. Select "Education" and then "Environmental fact sheets."

envirolink.org Dozens of documents and files related to environmental activism around the world.

8.4.10 Entomology

spider.ento.csiro.au All about creepy-crawly things, both the good and the bad ones.

8.4.11 Geology

gopher.stolaf.edu Select "Internet resources" and then "Weather and geography" for information on recent earthquakes.

8.4.12 Government

mavel.loc.gov Run by the Library of Congress, this site provides numerous informational resources, including access to the Library's voluminous card catalog and all manner of data about the U.S. Congress.

gopher.lib.umich.edu Another source for a wide variety of government information, from Congressional committee assignments to information on NAFTA to economic statistics.

ecix.doc.gov Information on conversion of military installations to private uses, run by the Department of Commerce.

sunsite.unc.edu Copies of the 1993 and 1994 U.S. federal budgets can be found by going into "Sunsite archives," then "Politics," then "Sunsite political science archives."

wiretap.spies.com Various documents related to the government and constitution of Canada can be found in the "Government docs" area.

darcms1.dartmouth.edu Look for government jobs in the "Jobs" menu.

stis.nih.gov Go into the "Other U.S. government gopher servers" area for access to numerous other government gophers.

8.4.13 Health

odie.niaid.nih.gov National Institutes of Health database on AIDS. Includes information on the disease, treatments, summaries of related stories in daily newspapers. Look under "AIDS related information."

helix.nih.gov The National Cancer Institute provides detailed factsheets on different cancers. Select "Health and clinical information" and then "Cancernet information."

nysernet.org Look for information on breast cancer in the "Special Collections: Breast Cancer" menu.

welchlink.welch.jhu.edu This is Johns Hopkins University's medical gopher.

8.4.14 History

See under Art (see Section 8.4.4 [Gopher Art], page 119).

8.4.15 Internet

gopher.lib.umich.edu Home to several guides to Internet resources in specific fields, for example, social sciences. Select “What’s New & Featured Resources” and then “Clearinghouse.”

8.4.16 Israel

jerusalem1.datasrv.co.il This Israeli system offers numerous documents on Israel and Jewish life.

8.4.17 Japan

gopher.ncc.go.jp Look in the “Japan information” menu for documents related to Japanese life and culture.

8.4.18 Music

mtv.com Run by MTV VJ Adam Curry, this site not only has music news but Curry’s daily Cybersleaze celebrity report.

8.4.19 Nature

ucmp1.berkeley.edu The University of California at Berkeley’s Museum of Palentology runs several online exhibits. You can obtain GIF images of a variety of different plants and birds and other animals in the “Remote Nature” area. An “Origin of the Species” menu lets you read Darwin’s work or search it by key word.

8.4.20 Sports

culine.colorado.edu Look up schedules for teams in various professional sports leagues here, under “Professional Sports Schedules.”

8.4.21 Weather

ashpool.micro.umn.edu Look up weather forecasts for major American and Canadian cities in the “Weather” area.

wx.atmos.uiuc.edu Look up weather forecasts for North America or bone up on your weather facts.

8.4.22 More Gophers

Blake Gumprecht maintains a list of gopher and telnet sites related to, or run by, the government. He posts it every three weeks to the **news.answers** and **soc.answers** newsgroups on Usenet. It can also be obtained via anonymous ftp from **rtfm.mit.edu**, as ‘`/pub/usenet/news.answers/us-govt-net-pointers`’.

Students at the University of Michigan’s School of Information and Library Studies, recently compiled separate lists of Internet resources in 11 specific areas, from aeronautics to theater. They can be obtained via gopher at **gopher.lib.umich.edu**, in the “What’s New and Featured Resources” menu.

8.5 Wide-Area Information Servers

Now you know there are hundreds of databases and library catalogs you can search through. But as you look, you begin to realize that each seems to have its own unique method for searching. If you connect to several, this can become a pain. Gophers reduce this problem somewhat.

Wide-area information servers promise another way to zero in on information hidden on the Net. In a WAIS, the user sees only one interface – the program worries about how to access information on dozens, even hundreds, of different databases. You give a WAIS a word and it scours the net looking for places where it's mentioned. You get a menu of documents, each ranked according to how relevant to your search the WAIS thinks it is.

Like gophers, WAIS "client" programs can already be found on many public-access Internet sites. If your system has a WAIS client, type

```
swais
```

at the command prompt and hit enter (the "s" stands for "simple"). If it doesn't, telnet to bbs.oit.unc.edu, which is run by the University of North Carolina At the "login:" prompt, type

```
bbs
```

and hit enter. You'll be asked to register and will then get a list of "bulletins," which are various files explaining how the system works. When done with those, hit your Q key and you'll get another menu. Hit 4 for the "simple WAIS client," and you'll see something like this:

```
SWAIS                           Source Selection          Sources: 23#
Server                          Source                             Cost
001:   [            archie.au]  aarnet-resource-guide              Free
002:   [     archive.orst.edu]  aeronautics                        Free
003:   [nostromo.oes.orst.ed]  agricultural-market-news           Free
004:   [sun-wais.oit.unc.edu]  alt-sys-sun                        Free
005:   [     archive.orst.edu]  alt.drugs                          Free
006:   [     wais.oit.unc.edu]  alt.gopher                         Free
007:   [sun-wais.oit.unc.edu]  alt.sys.sun                        Free
008:   [     wais.oit.unc.edu]  alt.wais                           Free
009:   [     archive.orst.edu]  archie-orst.edu                    Free
010:   [            archie.au]  archie.au-amiga-readmes            Free
011:   [            archie.au]  archie.au-ls-lRt                   Free
012:   [            archie.au]  archie.au-mac-readmes              Free
013:   [            archie.au]  archie.au-pc-readmes               Free
014:   [ pc2.pc.maricopa.edu]  ascd-education                     Free
015:   [            archie.au]  au-directory-of-servers            Free
016:   [    cirm2.univ-mrs.fr]  bib-cirm                           Free
017:   [  cmns-sun.think.com]  bible                              Free
018:   [       zenon.inria.fr]  bibs-zenon-inria-fr                Free

Keywords:

<space> selects, w for keywords, arrows move, <return> searches, q quits, ?
```

Each line represents a different database (the .au at the end of some of them means they are in Australia; the .fr on the last line represents a database in France). And this is just the first page! If you type a capital K, you'll go to the next page (there are several pages). Hitting a capital J will move you back a page.

The first thing you want to do is tell the WAIS program which databases you want searched. To select a database, move the cursor bar over the line you want (using your down and up arrow keys) and hit your space bar. An asterisk will appear next to the line number. Repeat this until you've selected all of the databases you want searched. Then hit your W key, after which you'll be prompted for the key words you're looking for. You can type in an entire line of these words – separate each with a space, not a comma.

Hit return, and the search begins.

Let's say you're utterly fascinated with wheat. So you might select agricultural-market-news to find its current world price. But you also want to see if it has any religious implications, so you choose the Bible and the Book of Mormon. What do you do with the stuff? Select recipes and usenet-cookbook. Are there any recent Supreme Court decisions involving the plant? Chose supreme-court. How about synonyms? Try roget-thesaurus and just plain thesaurus.

Now hit w and type in wheat. Hit enter, and the WAIS program begins its search. As it looks, it tells you whether any of the databases are offline, and if so, when they might be ready for a search. In about a minute, the program tells you how many hits it's found. Then you get a new menu, that looks something like this:

```
Keywords:

#    Score  SourceTitleLines
001: [1000] (roget-thesaurus) #465. [results of comparison. 1] Di 19
002: [1000] (roget-thesaurus) #609. Choice. -- N. choice, option; 36
003: [1000] (roget-thesaurus) #465. [results of comparison. 1] Di 19
004: [1000] (roget-thesaurus) #609. Choice. -- N. choice, option; 36
005: [1000] (recipes)  aem@mthvax Re: MONTHLY: Rec.Food.Recipes 425
006: [1000] ( Book_of_Mormon) Mosiah 9:96
007: [1000] ( Book_of_Mormon) 3 Nephi 18:185
008: [1000] (agricultural-ma) Re: JO GR115, WEEKLY GRAIN82
009: [ 822] (agricultural-ma) Re: WA CB351 PROSPECTIVE PLANTINGS 552
010: [ 800] (        recipes) kms@apss.a Re: REQUEST: Wheat-free, Suga 35
011: [ 750] (agricultural-ma) Re: WA CB101 CROP PRODUCTION258
012: [ 643] (agricultural-ma) Re: SJ GR850 DAILY NAT GRN SUM72
013: [ 400] (        recipes) pat@jaamer Re: VEGAN: Honey Granola63
014: [ 400] (        recipes) jrtrint@pa Re: OVO-LACTO: Sourdough/Trit 142
```

Each of these represents an article or citing that contains the word wheat, or some related word. Move the cursor bar (with the down and up arrow keys) to the one you want to see, hit enter, and it will begin to appear on your screen. The "score" is a WAIS attempt to gauge how closely the citing matches your request. Doesn't look like the Supreme Court has had anything to say about the plant of late!

Now think of how much time you would have spent logging onto various databases just to find these relatively trivial examples.

8.6 World-Wide Web

Developed by researchers at CERN, the European Particle Physics Laboratory in Geneva, the World-Wide Web is somewhat similar to a WAIS. But it's designed on a system known as hypertext. Words in one document are "linked" to other documents. It's sort of like sitting with an encyclopedia – you're reading an article, see a reference that intrigues you and so flip the pages to look up that reference.

To take a walk on The Web try the WWW's (or W3 in the project's own jargon), default telnet site:

```
info.cern.ch
```

No log in is needed. When you connect, you'll see something like:

```
                                                  Overview of the Web
                       GENERAL OVERVIEW

There is no "top" to the World-Wide Web. You can look at it from many points
of view. If you have no other bias, here are some places to start:

by Subject[1]          A classification by subject of interest. Incomplete
                       but easiest to use.

by Type[2]             Looking by type of service (access protocol, etc) may
                       allow to find things if you know what you are looking
                       for.

About WWW[3]           About the World-Wide Web global information sharing
                       project

Starting somewhere else

To use a different default page, perhaps one representing your field of
interest, see  "customizing your home page"[4].

What happened to CERN?

1-6, Up, <RETURN> for more, Quit, or Help:
```

Ok. Now type '3', and get the following screen:

```
                                                     The World Wide Web project
                       WORLD WIDE WEB

The WorldWideWeb (W3) is a wide-area hypermedia[1] information retrieval
initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this
document, including an executive summary[2] of the project, an illustrated
talk[3] , Mailing lists[4] , Policy[5] and Conditions[6] , May's W3 news[7]
, Frequently Asked Questions[8] .

What's out there?[9]   Pointers to the world's online information,
                       subjects[10] , W3 servers[11] , etc.

WWW Software Products[12]
                       What there is and how to get it: clients, servers and
                       tools.

Technical[13]          Details of protocols, formats, program internals etc

Bibliography[14]       Paper documentation on W3 and references. Also:
                       manuals[15] .

1-20, Back, Up, <RETURN> for more, Quit, or Help:
```

You navigate the web by typing the number next to a given reference. So if you want to know more about the web, hit 2. This is another system that bears playing with.

8.7 Clients, or how to snare more on the Web

If you are used to plain-vanilla Unix or MS-DOS, then the way these gophers and WAISs work seems quite straightforward. But if you're used to a computer with a graphical interface, such as a Macintosh, an IBM compatible with Windows or a Next, you'll probably regard their interfaces as somewhat primitive. And even to a veteran MS-DOS user, the World-Wide Web interface is rather clunky (and some of the documents and files on the Web now use special formatting that would confuse your poor computer).

There are, however, ways to integrate these services into your graphical user interface. In fact, there are now ways to tie into the Internet directly, rather than relying on whatever interface your public-access system uses, through what are known as "client" programs. These programs provide graphical interfaces for everything from ftp to the World-Wide Web.

There is now a growing number of these "client" programs for everything from ftp to gopher. PSI of Reston, Va., which offers nationwide Internet access, in fact, requires its customers to use these programs. Using protocols known as SLIP and PPP, these programs communicate with the Net using the same basic data packets as much larger computers online.

Beyond integration with your own computer's "desktop," client programs let you do more than one thing at once on the net – while you're downloading a large file in one window, you can be chatting with a friend through an Internet chat program in another.

Unfortunately, using a client program can cost a lot of money. Some require you to be connected directly to the Internet through an Ethernet network for example. Others work through modem protocols, such as SLIP, but public-access sites that allow such access may charge anywhere from $25 to $200 a month extra for the service.

Your system administrator can give you more information on setting up one of these connections.

8.8 When Things Go Wrong

As the Internet grows ever more popular, its resources come under more of a strain. If you try to use gopher in the middle of the day, at least on the East Coast of the U.S., you'll sometimes notice that it takes a very long time for particular menus or database searches to come up. Sometimes, you'll even get a message that there are too many people connected to whichever service you're trying to use and so you can't get in. The only alternative is to either try again in 20 minutes or so, or wait until later in the day, when the load might be lower. When this happens in veronica, try one of the other veronica entries.

When you retrieve a file through gopher, you'll sometimes be asked if you want to store it under some ludicrously long name (there go our friends the system administrators again, using 128 characters just because Unix lets them). With certain MS-DOS communications programs, if that name is longer than one line, you won't be able to backspace all the way back to the first line if you want to give it a simpler name. Backspace as far as you can. Then, when you get ready to download it to your home computer, remember that the file name will be truncated on your end, because of MS-DOS's file-naming limitations. Worse, your computer might even reject the whole thing. What to do? Instead of saving it to your home directory, mail it to yourself. It should show up in your mail by the time you exit gopher. Then, use your mail command for saving it to your home directory – at which point you can name it anything you want. Now you can download it.

FYI:

David Riggins maintains a list of gophers by type and category. You can find the most recent one at the ftp site **ftp.einet.net**, in the pub directory. Look for a file with a name like '`gopher-jewels.txt`'. Alternately, you can get on a mailing list to get the latest version sent to your e-mailbox automatically. Send a mail message to `<gopherjewelslist-request@tpis.cactus .org>` (yep, that first part is all one word). Leave the "subject:" line blank, and as a message, write SUBSCRIBE.

The Interpedia project is an attempt to take gopher one step further, by creating an online repository of all of the interesting and useful information availble on the Net and from its users. To get on the mailing list for the project, send an e-mail message, with a "subject:" of "subscribe" to `<interpedia-request@telerama.lm.com>`. You can get supporting documentation for the project via anonymous ftp at **ftp.lm.com** in the '`pub/interpedia`' directory.

See also the Usenet newsgroups **comp.infosystems.***:

comp.infosystems.gopher, **comp.infosystems.wais**, and **comp.infosystems.www** are places to go for technical discussions about Gopher, WAISs, and the World-Wide Web project respectively. Moreover there are **comp.infosystems** for more general discussion of related issues. The group **comp.infosystems.gis** relates to Geographic Information Systems, and thus is more specialized on this subject.

At present, there are no veronica clients; veronica is a gopher tool. An informal veronica FAQ is posted regularly in **comp.infosystems.gopher** and archived on **veronica.scs.unr.edu** as '`veronica/veronica-faq`'.

There even exists a Gopher service to read Usenet news: '`gopher gopher.msu.edu 4320`'. But, the lines behind this service are few, and thus it's likely that you get the following message, when trying to enter:

```
We are sorry, but our Usenet News gateway limits the number of
simultaneous connections.  If you were attempting to read news and were
instead directed to this file, all of those connections are in use.  We
offer this gateway as a "last resort" for people who have no other
access for reading Usenet.  We do not have the capacity to serve as the
Usenet gateway for large numbers of users around the Internet.
Individuals who like this style of access should ask their Internet
service providers to offer the same sort of gateway on their local
Gopher server.  Individuals and campuses should consider installing
local news feeds and local news readers (such as RN, NN, TIN, or
Trumpet) so that users can read and post to Usenet newsgroups
conveniently.

For system administrators: the software we use to implement this gateway
is the go4gw Gopher gateway software from Roland Schemers of Stanford
University.  This software should be available by anonymous ftp from
boombox.micro.umn.edu, somewhere under /pub/gopher.

-- The Michigan State University Gopher Team
```

"Reliable information is the basis of successful planning."
— **Christoph Columbus**

9 Advanced E-mail

9.1 The File's in the Mail

E-mail by itself is a powerful tool, and by now you may be sending e-mail messages all over the place. You might even be on a mailing list or two. But there is a lot more to e-mail than just sending messages. If your host system does not have access to ftp, or it doesn't have access to every ftp site on the Net, you can have programs and files sent right to your mailbox. And using some simple techniques, you can use e-mail to send data files such as spreadsheets, or even whole programs, to friends and colleagues around the world.

A key to both is a set of programs known as encoders and decoders. For all its basic power, Net e-mail has a big problem: it can't handle graphics characters or the control codes found in even the simplest of computer programs. Encoders however, can translate these into forms usable in e-mail, while decoders turn them back into a form that you can actually use. If you are using a Unix-based host system, chances are it already has an encoder and decoder online that you can use. These programs will also let you use programs posted in several Usenet newsgroups, such as **comp.binaries.ibm.pc**.

If both you and your intended recipient communicate via Unix-based host systems, then it's pretty easy, because almost all Unix host systems will have encoder/decoder programs online.

First, upload the file you want to send to your friend to your host site. Ask your system administrator how to upload a file to your name or "home" directory. Then type

```
uuencode file file >file.uu
```

and hit enter. "File" is the name of the file you want to prepare for mailing, and yes, you have to type the name twice! The > is a Unix command that tells the system to call the "encoded" file "file.uu" (you could actually call it anything you want).

Now to get it into a mail message. The quick and dirty way is to type

```
mail friend
```

where "friend" is your friend's address. At the subject line, tell her the name of the enclosed file. When you get the blank line, type

```
~r file.uu
```

or whatever you called the file, and hit enter. (on some systems, the '~' may not work; if so, ask your system administrator what to use). This inserts the file into your mail message. Hit control-D, and your file is on its way!

On the other end, when your friend goes into his mailbox, she should transfer it to her home directory. Then your friend should type

```
uudecode file.name
```

and hit enter. This creates a new file in her name directory with whatever name you originally gave it. She can then download it to her own computer. Before she can actually use it, though, she'll have to open it up with a text processor and delete the mail header that has been "stamped" on it. If you use a mailer program that automatically appends a "signature," tell her about that so she can delete that as well.

9.2 Receiving Files

If somebody sends you a file through the mail, you'll have to go through a couple of steps to get it into a form you can actually use. If you are using the simple mail program, go into mail and type

```
w # file.name
```

where '#' is the number of the message you want to transfer and 'file.name' is what you want to call the resulting file. In pine, call up the message and hit your O key and then E. You'll then be asked for a file name. In elm, call up the message and hit your S key. You'll get something that looks like this:

```
=file.request
```

Type a new file name and hit enter (if you hit enter without typing a file name, the message will be saved to another mail folder, not your home directory).

In all three cases, exit the mail program to return to your host system's command line. Because the file has been encoded for mail delivery, you now have to run a decoder. At the command line, type

```
uudecode file.name
```

where 'file.name' is the file you created while in mail. Uudecode will create a new, uncompressed binary file. In some cases, you may have to run it through some other programs (for example, if it is in "tar" form), but generally it should now be ready for you to download to your own computer (on which you might then have to run a de-compressor program such as PKXZIP).

9.3 Sending Files to Non-Internet Sites

What if your friend only connects with a non-Unix system, such as CompuServe or MCIMail? There are programs available for MS-DOS, Apple and Amiga computers that will encode and decode files. Of course, since you can't send one of these programs to your friend via e-mail (how would she un-encode it?), you'll have to mail (the old-fashioned way) or give her a diskette with the program on it first. Then, she can get the file by e-mail and go through the above process (only on her own computer) to get a usable file. Remember to give her an encoder program as well, if she wants to send you files in return.

For MS-DOS machines, you'll want to get uunecode.com and uudecode.com. Both can be found through anonymous ftp at **wuarchive.wustl.edu** in the '/mirrors/msdos/starter' directory. The MS-DOS version is as easy to use as the Unix one: Just type

```
uudecode filename.ext
```

and hit enter.

Mac users should get a program called uutool, which can be found in the 'info-mac/util' directory on **sumex-aim.stanford.edu**.

Think twice before sending somebody a giant file. Although large sites connected directly to the Internet can probably handle mega-files, many smaller systems cannot. Some commercial systems, such as CompuServe and MCIMail, limit the size of mail messages their users can receive. Fidonet doesn't even allow encoded messages. In general, a file size of 30,000 or so bytes is a safe upper limit for non-Internet systems.

9.4 Getting FTP Files via E-Mail

To help people without ftp access, a number of ftp sites have set up mail servers (also known as archive servers) that allow you to get files via e-mail. You send a request to one of these machines and they send back the file you want. As with ftp, you'll be able to find everything from historical documents to software (but please note that if you do have access to ftp, that method is always quicker and ties up fewer resources than using e-mail).

Some interesting or useful mail servers include:

`<mail-server@rtfm.mit.edu>`
: Files of "frequently asked questions" related to Usenet; state-by-state lists of U.S. representatives and Senators and their addresses and office phone numbers.

`<archive-server@eff.org>`
: Information about the Electronic Frontier Foundation; documents about legal issues on the Net.

`<archive-server@cs.widener.edu>`
: Back copies of the Computer Underground Digest and every possible fact you could want to know about "The Simpsons."

`<netlib@uunet.uu.net>`
: Programs for many types of personal computers; archives of past postings from many Usenet newsgroups.

`<archive-server@ames.arc.nasa.gov>`
: Space-related text and graphics (GIF-format) files.

`<service@nic.ddn.mil>`
: Detailed information about Internet.

Most mail servers work pretty much the same – you send an e-mail message that tells them what file you want and how you want it sent to you. The most important command is "send," which tells the computer you want it to send you a particular file.

First, though, you'll need to know where the mail server stores that file, because you have to tell it which directory or sub-directory it's in. There are a couple of ways to do this. You can send an e-mail message to the archive-server that consists of one line:

```
index
```

The server will then send you a directory listing of its main, or root directory. You'll then have to send a second message to the archive server with one line:

```
index directory/subdirectory
```

where that is the directory or directory path for which you want a listing. An alternative is to send an e-mail message to our old friend archie, which should send you back the file's exact location on the archive-server (along with similar listings for all the other sites that may have the file, however)

Once you have the file name and its directory path, compose a message to the archive server like this:

```
send directory/subdirectory/file
```

Send off the message and, anywhere from a few minutes to a couple of days later, you'll find a new message in your mailbox: a copy of the file you requested. The exact time it will take a file to get to you depends on a variety of factors, including how many requests are in line before yours (mail servers can only process so many requests at a time) and the state of the connections between the server and you.

Seems simple enough. It gets a little more complicated when you request a program rather than a document. Programs or other files that contain unusual characters or lines longer than 130 characters (graphics files, for example) require special processing by both the mail server to ensure they are transmitted via e-mail. Then you'll have to run them through at least one converter program to put them in a form you can actually use. To ensure that a program or other "non-mailable" file actually gets to you, include another line in your e-mail message to the server:

```
encoder
```

This converts the file into an encoded form. To decode it, you'll first have to transfer the file message into a file in your home directory.

One further complication comes when you request a particularly long file. Many Net sites can only handle so much mail at a time. To make sure you get the entire file, tell the mail server to break it up into smaller pieces, with another line in your e-mail request like this:

```
size 100000
```

This gives the mail server the maximum size, in bytes, of each file segment. This particular size is good for UUCP sites. Internet and Bitnet sites can generally go up to 300,000. When you get all of these files in mail, transfer them to your home directory. Exit mail and call up each file in your host system's text processor and delete each one's entire header and footer (or "signature" at the end). When done with this, at your host system's command line, type

```
cat file1 file2 > bigfile
```

where file1 is the first file, file2 the second file, and so on. The '>' tells your host system to combine them into a new megafile called bigfile (or whatever you want to call it). After you save the file to your home directory (see Section 9.2 [Receiving Files], page 130 above), you can then run uudecode, tar, etc. One word of caution, though: if the file you want is long enough that it has to be broken into pieces, think of how much time it's going to take you to download the whole thing – especially if you're using a 2400-baud modem!

There are a number of other mail servers. To get a list, send an e-mail message to:

```
<mail-server@rtfm.mit.edu>
```

```
send usenet/comp.sources.wanted/How_to_find_sources_(READ_THIS_BEFORE_POSTING)
```

You'll have to spell it exactly as listed above. Some mail servers use different software, which will require slightly different commands than the ones listed here. In general, if you send a message to a mail server that says only

```
help
```

you should get back a file detailing all of its commands.

But what if the file you want is not on one of these mail servers? That's where ftpmail comes in. Run by Digital Equipment Corp. in California, this service can connect to almost any ftp site in the world, get the file you want and then mail it to you. Using it is fairly simple – you send an e-mail message to ftpmail that includes a series of commands telling the system where to find the file you want and how to format it to mail to you.

Compose an e-mail message to

```
ftpmail@decwrl.dec.com
```

Leave the "subject:" line blank. Inside the message, there are several commands you can give. The first line should be

```
reply address
```

where "address" is your e-mail address. The next line should be

```
connect host
```

where “host” is the system that has the file you want (for example: **wuarchive.wustl.edu**). Other commands you should consider using are “binary” (required for program files); “compress” (reduces the file size for quicker transmission) and “uuencode” (which encodes the file so you can do something with it when it arrives). The last line of your message should be the word “quit”.

Let’s say you want a copy of the U.S. constitution. Using archie, you’ve found a file called, surprise, constitution, at the ftp site **archive.cis.ohio-state.edu**, in the ‘`/pub/firearms/politics/rkba`’ directory. You’d send a message to `<ftpmail@decwrl.dec.com>` that looks like this:

```
reply adamg@world.std.com
connect archive.cis.ohio-state.edu
binary
compress
uuencode
get pub/firearms/politics/rkba/constitution
quit
```

When you get the file in your mailbox, use the above procedure for copying it to a file. Run it through uudecode. Then type

```
uncompress file.name
```

to make it usable.

Since this was a text file, you could have changed the “binary” to “ascii” and then eliminated the “uuencode” file. For programs, though, you’ll want to keep these lines. One caveat with ftpmail: it has become such a popular service that it could take a week or more for your requested files to arrive.

We therefore strongly encourage you to “distribute” your requests over the currently known “ftpmail” sites:

USA: `<ftpmail@decwrl.dec.com>`

`<ftpmail@sunsite.unc.edu>`

`<bitftp@pucc.princeton.edu>`

Germany: `<bitftp@dearn>` or `<bitftp@vm.gmd.de>` (Europe only)

`<ftpmail@ftp.uni-stuttgart.de>`

`<ftpmail@ftp.inf.tu-dresden.de>`

France: `<ftpmail@grasp.insa-lyon.fr>`

Poland: `<bitftp@plearn.edu.pl>` or `<bitftp@plearn>` (Europe)

United Kingdom:
`<ftpmail@doc.ic.ak.uk>`

9.5 The all knowing Oracle

One other thing you can do through e-mail is consult with the Usenet Oracle. You can ask the Oracle anything at all and get back an answer (whether you like the answer is another question).

First, you’ll want to get instructions on how to address the Oracle (he, or she, or it, is very particular about such things and likes being addressed in august, solemn and particularly sycophantic tones). Start an e-mail message to

```
oracle@iuvax.cs.indiana.edu
```

In the "Subject:" line, type

```
help
```

and hit enter. You don't actually have to say anything in the message itself – at least not yet. Hit control-D to send off your request for help. Within a few hours, the Oracle will mail you back detailed instructions. It's a fairly long file, so before you start reading it, turn on your communications software's logging function, to save it to your computer (or save the message to a file on your host system's home directory and then download the file). After you've digested it, you can compose your question to the Oracle. Mail it to the above address, only this time with a subject line that describes your question. Expect an answer within a couple of days. And don't be surprised if you also find a question in your mailbox – the Oracle extracts payment by making seekers of knowledge answer questions as well!

*"If just one piece of mail gets lost, well, they'll just think they forgot to send it. But if *two* pieces of mail get lost, hell, they'll just think the other guy hasn't gotten around to answering his mail. And if *fifty* pieces of mail get lost, can you imagine it, if *fifty* pieces of mail get lost, why they'll think someone *else* is broken! And if 1GB of mail gets lost, they'll just *know* that Arpa is down and think it's a conspiracy to keep them from their God given right to receive Net Mail ..."*
— **Leith 'Casey' Leedom**

10 News of the World

10.1 Clarinet: UPI, Dave Barry and Dilbert

Usenet "newsgroups" can be something of a misnomer. They may be interesting, informative and educational, but they are often not news, at least, not the way most people would think of them. But there are several sources of news and sports on the Net.

One of the largest is Clarinet, a company in Cupertino, Calf., that distributes wire-service news and columns, along with a news service devoted to computers and even the Dilbert comic strip, in Usenet form.

Distributed in Usenet form, Clarinet stories and columns are organized into more than 100 newsgroups (in this case, a truly appropriate name), some of them with an extremely narrow focus, for example, **clari.news.gov.taxes**. The general news and sports come from United Press International; the computer news from the NewsBytes service; the features from several syndicates.

Because Clarinet charges for its service, not all host systems carry its articles. Those that do carry them as Usenet groups starting with **clari.***. As with other Usenet hierarchies, these are named starting with broad area and ending with more specific categories. Some of these include business news (**clari.biz**); general national and foreign news, politics and the like (**clari.news**), sports (**clari.sports**); columns by *Mike Royko*, *Miss Manners*, *Dave Barry* and others (**clari.feature**); and NewsBytes computer and telecommunications reports (**clari.nb**). Because Clarinet started in Canada, there is a separate set of **clari.canada** newsgroups. The **clari.nb** newsgroups are divided into specific computer types (**clari.nb.apple**, for example).

Clari news groups feature stories updated around the clock. There are even a couple of "bulletin" newsgroups for breaking stories: **clari.news.bulletin** and **clari.news.urgent**. Clarinet also sets up new newsgroups for breaking stories that become ongoing ones (such as major natural disasters, coups in large countries and the like).

Occasionally, you will see stories in clari newsgroups that just don't seem to belong there. Stories about former Washington, D.C. mayor *Marion Barry*, for example, often wind interspersed among columns by *Dave Barry*.

This happens because of the way wire services work. UPI uses three-letter codes to route its stories to the newspapers and radio stations that make up most of its clientele, and harried editors on deadline sometimes punch in the wrong code.

10.2 Reuters

This is roughly the British equivalent of UPI or Associated Press. Msen, a public-access site in Michigan, currently feeds Reuters dispatches into a series of Usenet-style conferences. If your site subscribes to this service, look for newsgroups with names that begin in **msen.reuters**.

10.3 USA Today

If your host system doesn't carry the clari or **msen.reuters** newsgroups, you might be able to keep up with the news a different way over the Net. USA Today has been something of an online newspaper pioneer, selling its stories to bulletin-board and online systems across the country for several years. Cleveland Free-Net provides the online version of USA Today (along with all its other services) for free. Currently, the paper only publishes five days a week, so you'll have to get your weekend news fix elsewhere.

Telnet: **freenet-in-a.cwru.edu** or **freenet-in-b.cwru.edu**

After you connect and log in, look for this menu entry: NPTN/USA TODAY HEADLINE NEWS. Type the number next to it and hit enter. You'll then get a menu listing a series of broad categories, such as sports and telecommunications. Choose one, and you'll get a yet another menu, listing the ten most recent dates of publication. Each of these contains one-paragraph summaries of the day's news in that particular subject.

10.4 The World Today, from Belarus to Brazil

Radio Free Europe and Radio Liberty are American radio stations that broadcast to the former Communist countries of eastern Europe. Every day, their news departments prepare a summary of news in those countries, which is then disseminated via the Net, through a Bitnet mailing list and a Usenet newsgroup.

To have the daily digests sent directly to your e-mailbox, send a message to

```
listserv@ubvm.cc.buffalo.edu
```

Leave the subject line blank, and as a message, write:

```
subscribe rferl-l Your Name
```

Alternately, look for the bulletins in the Usenet newsgroup **misc.news-east-europe.rferl**.

Daily Brazilian news updates are available (in Portuguese) from the University of Sao Paulo. Use anonymous ftp to connect to

```
uspif.if.usp.br
```

Use 'cd' to switch to the whois directory. The news summaries are stored in files with this form: 'NEWS.23OCT92;1'. But to get them, leave off the semicolon and the 1, and don't capitalize anything, for example:

```
get news.23oct92
```

Daily summaries of news reports from France (in French) are availble on the National Capital FreeNet in Ottawa, Ont. Telnet to **freenet.carleton.ca** and log on as: 'guest'. At the main menu, select the number for "The Newsstand" and then "La presse de France."

10.5 E-Mailing News Organizations

A number of newspapers, television stations and networks and other news organizations now encourage readers and viewers to communicate with them electronically, via Internet e-mail addresses. They include:

The Middlesex News, Framingham, Mass.
`<sysop@news.ci.net>`

The Boston Globe
`<voxbox@globe.com>`

WCVB-TV, Boston, Mass.
`<wcvb@aol.com>`

NBC News, New York, N.Y.
`<nightly@nbc.com>`

The Ottawa Citizen, Ottawa, Ont.
`<ottawa-citizen@freenet.carleton.ca>`

CJOH-TV, Ottawa, Ont.
`<ab363@freenet.carleton.ca>`

St. Petersburg (Fla.) Times
`<73174.3344@compuserve.com>`

Illinois Issues, Springfield, Ill.
`<gherardi@sangamon.edu>`

WTVF-TV, Nashville, Tenn.
`<craig.ownsby@nashville.com>`

FYI:

The **clari.net.newusers** newsgroup on Usenet provides a number of articles about Clarinet and ways of finding news stories of interest to you.

To discuss the future of newspapers and newsrooms in the new electronic medium, subscribe to the Computer Assisted Reporting and Research mailing list on Bitnet. Send a mail message of

```
Subscribe carr-l Your Name
```

to `<listserv@ulkyvm.bitnet>`.

"Be it true or false, so it be news."
— **Ben Johnson**, *"News from the World"*

"In a medium in which a News piece takes a minute
and an 'In-Depth' piece takes two minutes,
the Simple will drive out the Complex."
— **Frank Mankiewicz**

11 IRC, MUDs and other things that are more fun than they sound

Many Net systems provide access to a series of interactive services that let you hold live "chats" or play online games with people around the world. To find out if your host system offers these, you can ask your system administrator or just try them – if nothing happens, then your system does not provide them. In general, if you can use telnet and ftp, chances are good you can use these services as well.

11.1 Talk

This is the Net equivalent of a telephone conversation and requires that both you and the person you want to talk to have access to this function and are online at the same time. To use it, type

```
talk user@site.name
```

where '`user@site.name`' is the e-mail address of the other person. She will see something like this on her screen:

```
talk: connection requested by yourname@site.name
talk: respond with:  talk yourname@site.name
```

To start the conversation, she should then type (at her host system's command line):

```
talk yourname@site.name
```

where that is your e-mail address. Both of you will then get a top and bottom window on your screen. She will see everything you type in one window; you'll see everything she types in the other. To disconnect, hit control-C.

One note: Public-access sites that use Sun computers sometimes have trouble with the talk program. If talk does not work, try typing '`otalk`' or '`ntalk`' instead. However, the party at the other end will have to have the same program online for the connection to work.

11.2 Internet Relay Chat

IRC is a program that lets you hold live keyboard conversations with people around the world. It's a lot like an international CB radio - it even uses "channels." Type something on your computer and it's instantly echoed around the world to whoever happens to be on the same channel with you. You can join in existing public group chats or set up your own. You can even create a private channel for yourself and as few as one or two other people. And just like on a CB radio, you can give yourself a unique "handle" or nickname.

IRC currently links host systems in 20 different countries, from Australia to Hong Kong to Israel. Unfortunately, it's like telnet – either your site has it or it doesn't. If your host system does have it, Just type

```
irc
```

and hit enter. You'll get something like this:

```
*** Connecting to port 6667 of server world.std.com
*** Welcome to the Internet Relay Network, adamg
*** Your host is world.std.com, running version 2.7.1e+4
*** You have new mail.
*** If you have not already done so, please read the new user
information with +/HELP NEWUSER
*** This server was created Sat Apr 18 1992 at 16:27:02 EDT
*** There are 364 users on 140 servers
*** 45 users have connection to the twilight zone
*** There are 124 channels.
*** I have 1 clients and 3 servers
MOTD - world.std.com Message of the Day -
MOTD - Be careful out there...
MOTD -
MOTD - ->Spike
* End of /MOTD command.

23:13 [1] adamg [Mail: 32] * type /help for help
```

You are now in channel 0, the "null" channel, in which you can look up various help files, but not much else. As you can see, IRC takes over your entire screen. The top of the screen is where messages will appear. The last line is where you type IRC commands and messages. All IRC commands begin with a '/'. The slash tells the computer you are about to enter a command, rather than a message. To see what channels are available, type

```
/list
```

and hit enter. You'll get something like this:

```
*** Channel    Users  Topic
*** #Money     1      School CA$H (/msg SOS_AID help)
*** #Gone      1      ----->> Gone with the wind!!!  ------>>>>>
*** #mee       1
*** #eclipse   1
*** #hiya      2
*** #saigon    4
*** #screwed   3
*** #z         2
*** #comix     1      LET'S TALK 'BOUT COMIX!!!!!
*** #Drama     1
*** #RayTrace  1      Rendering to Reality and Back
*** #NeXT      1
*** #wicca     4      Mr. Potato Head, R. I. P.
*** #dde^mhe`  1      no'ng chay? mo*? ...ba` con o*iiii
*** #jgm       1
*** #ucd       1
*** #Maine     2
*** #Snuffland 1
*** #p/g!      4
*** #DragonSrv 1
```

Because IRC allows for a large number of channels, the list might scroll off your screen, so you might want to turn on your computer's screen capture to capture the entire list. Note that the channels always have names, instead of numbers. Each line in the listing tells you the channel name, the number of people currently in it, and whether there's a specific topic for it. To switch to a particular channel, type

```
/join #channel
```

where '#channel' is the channel name and hit enter. Some "public" channels actually require an invitation from somebody already on it. To request an invitation, type

```
/who #channel-name
```

where 'channel-name' is the name of the channel, and hit enter. Then ask someone with an @ next to their name if you can join in. Note that whenever you enter a channel, you have to include the '#'. Choose one with a number of users, so you can see IRC in action.

If it's a busy channel, as soon as you join it, the top of your screen will quickly be filled with messages. Each will start with a person's IRC nickname, followed by his message.

It may seem awfully confusing at first. There could be two or three conversations going on at the same time and sometimes the messages will come in so fast you'll wonder how you can read them all.

Eventually, though, you'll get into the rhythm of the channel and things will begin to make more sense. You might even want to add your two cents (in fact, don't be surprised if a message to you shows up on your screen right away; on some channels, newcomers are welcomed immediately). To enter a public message, simply type it on that bottom line (the computer knows it's a message because you haven't started the line with a slash) and hit enter.

Public messages have a user's nickname in brackets, like this:

```
<tomg>
```

If you receive a private message from somebody, his name will be between asterisks, like this:

```
*tomg*
```

For more information on using IRC, see the IRC command box. You can find discussions about IRC in the **alt.irc** newsgroup.

11.3 IRC Commands

Note: Hit enter after each command.

`/away`
: When you're called away to put out a grease fire in the kitchen, issue this command to let others know you're still connected but just away from your terminal or computer for awhile.

`/help`
: Brings up a list of commands for which there is a help file. You will get a "topic:" prompt. Type in the subject for which you want information and hit enter. Hit enter by itself to exit help.

`/invite`
: Asks another IRC to join you in a conversation.

`/invite fleepo #hottub`
: would send a message to fleepo asking him to join you on the #hottub channel. The channel name is optional.

`/join`
: Use this to switch to or create a particular channel, like this: '/join #hottub'

  If one of these channels exists and is not a private one, you will enter it. Otherwise, you have just created it. Note you have to use a '#' as the first character.

`/list`
: This will give you a list of all available public channels, their topics (if any) and the number of users currently on them. Hidden and private channels are not shown.

`/m name` Send a private message to that user.

`/mode` This lets you determine who can join a channel you've created.

`/mode #channel +s`
creates a secret channel.

`/mode #channel +p`
makes the channel private

`/nick` This lets you change the name by which others see you.

'`/nick fleepo`' would change your name for the present session to fleepo. People can still use /whois to find your e-mail address. If you try to enter a channel where somebody else is already using that nickname, IRC will ask you to select another name.

`/query` This sets up a private conversation between you and another IRC user. To do this, type '`/query nickname`'

Every message you type after that will go only to that person. If she then types '`/query nickname`' where nickname is yours, then you have established a private conversation. To exit this mode, type '`/query`' by itself. While in query mode, you and the other person can continue to "listen" to the discussion on whatever public channels you were on, although neither of you will be able to respond to any of the messages there.

`/quit` Exit IRC.

`/signoff` Exit IRC.

`/summon` Asks somebody connected to a host system with IRC to join you on IRC. You must use the person's entire e-mail address.

'`/summon fleepo@foo.bar.com`' would send a message to fleepo asking him to start IRC. Usually not a good idea to just summon people unless you know they're already amenable to the idea; otherwise you may wind up annoying them no end. This command does not work on all sites.

`/topic` When you've started a new channel, use this command to let others know what it's about.

'`/topic #Amiga`' would tell people who use /list that your channel is meant for discussing Amiga computers.

`/who <chan>`
Shows you the e-mail address of people on a particular channel.

'`/who #foo`' would show you the addresses of everybody on channel foo.

'`/who`' by itself shows you every e-mail address for every person on IRC at the time, although be careful: on a busy night you might get a list of 500 names!

`/whois` Use this to get some information about a specific IRC user or to see who is online.

'`/whois nickname`' will give you the e-mail address for the person using that nickname.

'`/whois *`' will list everybody on every channel.

`/whowas` Similar to '`/whois`'; gives information for people who recently signed off IRC.

11.4 IRC in Times of Crisis

IRC has become a new medium for staying on top of really big breaking news. In 1993, when Russian lawmakers barricaded themselves inside the parliament building, some enterprising Muscovites and a couple of Americans set up a "news channel" on IRC to relay first-person accounts direct from Moscow. The channel was set up to provide a continuous loop of information, much like all-news radio stations that cycle through the day's news every 20 minutes. In 1994, Los Angeles residents set up a similar channel to relay information related to the Northridge earthquake. In both cases, logs of the channels were archived somewhere on the Net, for those unable to "tune in" live.

How would you find such channels in the future? Use the '`/list`' command to scroll through the available channels. If one has been set up to discuss a particular breaking event, chances are you'll see a brief description next to the channel name that will tell you that's the place to tune.

11.5 MUDs

Multiple-User Dimensions or Dungeons (MUDs) take IRC into the DUM realm of fantasy. MUDs are live, role-playing games in which you enter assume a new identity and enter an alternate reality through your keyboard. As you explore this other world, through a series of simple commands (such as "look," "go" and "take"), you'll run across other users, who may engage you in a friendly discussion, enlist your aid in some quest or try to kill you for no apparent reason.

Each MUD has its own personality and creator (or God) who was willing to put in the long hours required to establish the particular MUD's rules, laws of nature and information databases. Some MUDs stress the social aspects of online communications – users frequently gather online to chat and join together to build new structures or even entire realms. Others are closer to "Dungeons and Dragons" and are filled with sorcerers, dragons and evil people out to keep you from completing your quest – through murder if necessary.

Many MUDs (there are also related games known as MUCKs and MUSEs) require you to apply in advance, through e-mail, for a character name and password. One that lets you look around first, though, is HoloMuck at McGill University in Montreal. The premise of this game is that you arrive in the middle of Tanstaafl, a city on the planet Holo. You have to find a place to live (else you get thrown into the homeless shelter) and then you can begin exploring. Magic is allowed on this world, but only outside the city limits. Get bored with the city and you can roam the rest of the world or even take a trip into orbit (of course, all this takes money; you can either wait for your weekly salary or take a trip to the city casino). Once you become familiar with the city and get your own character, you can even begin erecting your own building (or subway line, or almost anything else).

To connect, telnet to **hobbes.cs.mcgill.ca 5757**

When you connect, type

```
connect guest guest
```

and hit enter. This connects you to the "guest" account, which has a password of "guest." You'll see this:

```
The Homeless Shelter(#22Rna)
You wake up in the town's Homeless Shelter, where vagrants are put for
protective holding.
Please don't sleep in public places-- there are plenty of
open apartments available.  Type 'apartments' to see how to get to an
apartment building with open vacancies.
There is a small sign on the wall here, with helpful information.
Type 'look sign' to read it.
The door is standing open for your return to respectable society.
Simply walk 'out' to the center.
```

Of course, you want to join respectable society, but first you want to see what that sign says. So you type

```
look sign
```

and hit enter, which brings up a list of some basic commands. Then you type

```
out
```

followed by enter, which brings up this:

```
You slip out the door, and head southeast...
Tanstaafl Center
This is the center of the beautiful town of Tanstaafl.
High Street runs north and south into residential areas, while
Main Street runs east and west into business districts.
SW: is Tanstaafl Towers.
Please claim an apartment... no sleeping in public!
SE: the Public Library offers both information and entertainment.
NW: is the Homeless Shelter, formerly the Town Jail.
NE: is Town Hall, site of several important services, including: Public
Message Board, Bureau of Land Management (with maps and regulations), and
other governmental/ bureaucratic help.
Down: Below a sign marked with both red and blue large letter 'U's, a
staircase leads into an underground subway passage.
(Feel free to 'look' in any direction for more information.)
[Obvious exits: launch, d, nw, se, w, e, n, s, ne, sw]
Contents:
Instructions for newcomers
Directional signpost
Founders' statue
```

To see "Instructions for newcomers", type

```
look Instructions for newcomers
```

and hit enter. You could do the same for "Directional signpost" and "Founders' statue." Then type

```
SW
```

and enter to get to Tanstaafl Towers, the city housing complex, where you have to claim an apartment (you may have to look around; many will already be occupied). And now it's off to explore Holo! One command you'll want to keep in mind is "take." Periodically, you'll come across items that, when you take them will confer certain abilities or powers on you. If you type

```
help
```

and enter, you'll get a list of files you can read to learn more about the MUD's commands.

The "say" command lets you talk to other players publicly. For example,

```
say Hey, I'm here!
```

would be broadcast to everybody else in the room with you. If you want to talk to just one particular person, use "whisper" instead of "say."

```
whisper agora=Hey, I'm here!
```

would be heard only by agora. Another way to communicate with somebody regardless of where on the world they are is through your pager. If you suddenly see yours go off while visiting, chances are it's a wizard checking to see if you need any help. To read his message, type

```
page
```

To send him a message, type

```
page name=message
```

where name is the wizard's name (it'll be in the original message).

Other MUDs and MUCKs may have different commands, but generally use the same basic idea of letting you navigate through relatively simple English commands.

When you connect to a MUD, choose your password as carefully as you would one for your host system; alas, there are MUD crackers who enjoy trying to break into other people's MUD accounts. And never, never use the same password as the one you use on your host system!

MUDs can prove highly addicting. "The jury is still out on whether MUDding is 'just a game' or 'an extension of real life with gamelike qualities'," says *Jennifer Smith*, an active MUD player who wrote an FAQ on the subject.

She adds one caution: "You shouldn't do anything that you wouldn't do in real life, even if the world is a fantasy world. The important thing to remember is that it's the fantasy world of possibly hundreds of people, and not just yours in particular. There's a human being on the other side of each and every wire! Always remember that you may meet these other people some day, and they may break your nose. People who treat others badly gradually build up bad reputations and eventually receive the NO FUN Stamp of Disapproval."

11.6 Go, Go, Go (and Chess, too)!

Fancy a good game of go or chess? You no longer have to head for the nearest park with a board in hand. The Internet has a couple of machines that let you engage people from around the world in your favorite board games. Or, if you prefer, you can watch matches in progress.

To play go,

```
telnet hellspark.wharton.upenn.edu 6969
```

log on as: '`guest`'

You'll find prompts to various online help files to get you started. For a chess match,

```
telnet news.panix.com 5000
```

log on as: '`guest`'

You'll find prompts for online help files on the system, which lets you choose your skill level.

11.7 The other Side of the Coin

All is not fun and games on the Net. Like any community, the Net has its share of obnoxious characters who seem to exist only to make your life miserable (you've already met some of them in Chapter 3 [Global Watering Hole], page 51). There are people who seem to spend a bit more time on the Net than many would find healthy. It also has its criminals. *Clifford Stoll* writes in *"The Cuckoo's Egg"* how he tracked a team of German hackers who were breaking into U.S. computers and selling the information they found to the Soviets. *Robert Morris*, a Cornell University student, was convicted of unleashing a "worm" program that effectively disabled several thousand computers connected to the Internet.

Of more immediate concern to the average Net user are crackers who seek to find other's passwords to break into Net systems and people who infect programs on ftp sites with viruses.

There is a widely available program known as "Crack" that can decipher user passwords composed of words that might be found in a dictionary (this is why you shouldn't use such passwords). Short of that, there are the annoying types who take a special thrill in trying to make you miserable. The best advice in dealing with them is to count to 10 and then ignore them – like juveniles everywhere, most of their fun comes in seeing how upset you can get.

Meanwhile, two Cornell University students pleaded guilty in 1992 to uploading virus-infected Macintosh programs to ftp sites. If you plan to try out large amounts of software from ftp sites, it might be wise to download or buy a good anti-viral program.

But can law enforcement go too far in seeking out the criminals? The Electronic Frontier Foundation was founded in large part in response to a series of government raids against an alleged gang of hackers. The raids resulted in the near bankruptcy of one game company never alleged to have had anything to do with the hackers, when the government seized its computers and refused to give them back. The case against another alleged participant collapsed in court when his attorney showed the "proprietary" and supposedly hacked information he printed in an electronic newsletter was actually available via an 800 number for about $13 – from the phone company from which that data was taken.

FYI:

You can find discussions about IRC in the **alt.irc** newsgroup. *"A Discussion on Computer Network Conferencing"*, by **Darren Reed** (May, 1992), provides a theoretical background on why conferencing systems such as IRC are a Good Thing. It's available through ftp at **nic.ddn.mil** as file '`rfc/rfc1324.txt`'.

Every Friday, **Scott Goehring** posts a new list of MUDs and related games and their telnet addresses in the newsgroup **rec.games.mud.announce**. There are several other mud newsgroups related to specific types of MUDs, including **rec.games.mud.social**, **rec.games.mud.adventure** , **rec.games.mud.tiny**, **rec.games.mud.diku** and **rec.games.mud.lp**.

For a good overview of the impact on the Internet of the Morris Worm, read *"Virus Highlights Need for Improved Internet Management"*, by **the U.S. General Accounting Office** (June, 1989). You can get a copy via ftp from **cert.sei.cmu.edu** in the '`pub/virus-l/docs`' directory. It's listed as '`gao_rpt`'.

Clifford Stoll describes how the Internet works and how he tracked a group of KGB-paid German hackers through it, in *"The Cuckoo's Egg: Tracking a Spy through the Maze of Computer Espionage"*, Doubleday (1989).

See also **Bruce Sterling**'s essay ([Statement of Principle], page 175).

"**F**: *When into a room I plunge, I*
Sometimes find some VIOLET FUNGI.
Then I linger, darkly brooding
On the poison they're exuding.

H: *If a 'GOBLIN (HOB) waylays you,*
Slice him up before he slays you.
Nothing makes you look a slob
Like running from a HOB'LIN (GOB).

K: *Cobalt's metal, hard and shining;*
Cobol's wordy and confining;
KOBOLDS topple when you strike them;
Don't feel bad, it's hard to like them.

T: *One big monster, he called TROLL.*
He don't rock, and he don't roll;
Drink no wine, and smoke no stogies.
He just Love To Eat Them Roguies.

U: *There's a U – a Unicorn!*
Run right up and rub its horn.
Look at all those points you're losing!
UMBER HULKS are so confusing."
— **The Roguelet's ABC**

12 Education and the Net

12.1 The Net in the Classroom

If you're a teacher, you've probably already begun to see the potential the Net has for use in the class. Usenet, ftp and telnet have tremendous educational potential, from keeping up with world events to arranging international science experiments.

Because the Net now reaches so many countries and often stays online even when the phones go down, you and your students can "tune in" to first-hand accounts during international conflicts. Look at your system's list of Usenet **soc.culture.*** groups to see if there is one about the country or region you're interested in. Even in peacetime, these newsgroups can be great places to find people from countries you might be studying.

The biggest problem may be getting accounts for your students, if you're not lucky enough to live within the local calling area of a Free-Net system. Many colleges and universities, however, are willing to discuss providing accounts for secondary students at little or no cost. Several states, including California and Texas, have Internet-linked networks for teachers and students.

In addition, there are a number of resources on the Internet aimed specifically at elementary and secondary students and teachers. You can use these to set up science experiments with classes in another country, learn how to use computers in the classroom or keep up with the latest advances in teaching everything from physics to physical education.

Some of these resources are listed in the follwoing.

12.2 Some Specific Resources for Students and Teachers

12.2.1 K12Net

Begun on the Fidonet hobbyist network, K12Net is now also carried on many Usenet systems and provides a host of interesting and valuable services. These include international chat for students, foreign-language discussions (for example, there are French and German-only conference where American students can practice those languages with students from Quebec and German). There are also conferences aimed at teachers of specific subjects, from physical education to physics. The K12 network still has limited distribution, so ask your system administrator if your system carries it.

12.2.2 AskERIC

Run by the Educational Resource and Information Center, AskERIC provides a way for educators, librarians and others interested in K-12 education to get more information about virtually everything. The center maintains an e-mail address (`<askeric@ericir.syr.edu>`) for questions and promises answers within 48 hours. It also maintains a gopher site that contains digests of questions and answers, lesson plans in a variety of fields and other educationally related information. The gopher address is **ericir.syr.edu**.

12.2.3 SpaceMet

If your system doesn't carry K12, but has access to telnet, you can reach it through SpaceMet Forum, a bulletin-board system aimed at teachers and students that is run by the physics and astronomy department at the University of Massachusetts at Amherst. The address is **spacemet.phast.umass.edu**. When you connect, hit escape once. Like K12, SpaceMet Forum began as a Fidonet system, but has since grown much larger. Mort and Helen Sternheim, professors at the university, started SpaceMet as a one-line bulletin-board system several years ago to help bolster middle-school science education in nearby towns.

Today, there is a whole series of satellite SpaceMet BBSs in western Massachusetts and SpaceMet itself is now linked to Fidonet and Internet.

In addition to the K12 conferences, SpaceMet carries numerous educationally oriented conferences. It also has a large file library of interest to educators and students, but be aware that getting files to your site could be difficult and maybe even impossible. Unlike most other Internet sites, Spacemet does not use an ftp interface. The Sternheims say ZMODEM sometimes works over the network, but don't count on it.

12.2.4 Kidsphere

Kidsphere is a mailing list for elementary and secondary teachers, who use it to arrange joint projects and discuss educational telecommunications. You will find news of new software, lists of sites from which you can get computer-graphics pictures from various NASA satellites and probes and other news of interest to modem-using teachers.

To subscribe, send a request by e-mail to `<kidsphere-request@vms.cis.pitt.edu>` or try `<joinkids@vms.cis.pitt.edu>` and you will start receiving messages within a couple of days. To contribute to the discussion, send messages to `<kidsphere@vms.cis.pitt.edu>`.

KIDS is a spin-off of KIDSPHERE just for students who want to contact students. To subscribe, send a request to `<joinkids@vms.cis.pitt.edu>`, as above. To contribute, send messages to `<kids@vms.cist.pitt.edu>`.

12.2.5 Health-Ed:

A mailing list for health educators. Send a request to `<health-ed-request@stjhmc.fidonet.org>`.

12.2.6 Knoxville News-Sentinel Online

Using the newspaper in the electronic classroom. This gopher site lets students and teachers connect to the newspaper, and provides resources for them derived from the newsroom. Use gopher to connect to **gopher.opup.org**.

12.2.7 Hemingway

PAPA is a mailing list about Hemingway and his work. To get on the list, send a request to `<dgross@polyslo.calpoly.edu>`.

12.2.8 MicroMUSE

This is an online, futuristic city, built entirely by participants (see chapter 11 for information on MUSEs and MUDs in general). Hundreds of students from all over have participated in this educational exercise, coordinated by MIT. Telnet to **michael.ai.mit.edu**. Log on as '`guest`' and then follow the prompts for more information.

12.2.9 NASA Spacelink

This system, run by NASA in Huntsville, Ala., provides all sorts of reports and data about NASA, its history and its various missions, past and present. Telnet **spacelink.msfc.nasa.gov** or 128.158.13.250.

When you connect, you'll be given an overview of the system and asked to register. The system maintains a large file library of GIF-format space graphics, but note that you can't download these through telnet. If you want to, you have to dial the system directly, at (205) 895-0028. Many can be obtained through ftp from **ames.arc.nasa.gov**, however.

12.2.10 Newton

Run by the Argonne National Laboratory. It offers conferences for teachers and students, including one called "Ask a Scientist." Telnet: **newton.dep.anl.gov**. Log in as: cocotext

You'll be asked to provide your name and address. When you get the main menu, hit '`4`' for the various conferences. The "Ask a Scientist" category lets you ask questions of scientists in fields from biology to earth science. Other categories let you discuss teaching, sports and computer networks.

12.2.11 OERI

The U.S. Department of Education's Office of Educational Resources and Improvement runs a gopher system that provides numerous educational resources, information and statistics for teachers. Use gopher to connect to **gopher.ed.gov**.

12.2.12 More Educational Resources

To get a list of ftp sites that carry astronomical images in the GIF graphics format, use ftp to connect to **nic.funet.fi**. Switch to the '`/pub/astro/general`' directory and get the file '`astroftp.txt`'. Among the sites listed is **ames.arc.nasa.gov**, which carries images taken by the Voyager and Galileo probes, among other pictures.

12.3 Usenet and Bitnet in the Classroom

There are numerous Usenet newsgroups of potential interest to teachers and students (see Chapter 3 [Global Watering Hole], page 51).

As you might expect, many are of a scientific bent. You can find these by typing '`l sci.`' in rn or using '`nngrep sci.`' for nn. There are now close to 40, with subjects ranging from archaeology to economics (the "dismal science," remember?) to astronomy to nanotechnology (the construction of microscopically small machines).

One thing students will quickly learn from many of these groups: science is not just dull, boring facts. Science is argument and standing your ground and making your case. The Usenet **sci.*** groups encourage critical thinking.

Beyond science, social-studies and history classes can keep busy learning about other countries, through the **soc.culture.*** newsgroups.

Most of these newsgroups originated as ways for expatriates of a given country to keep in touch with their homeland and its culture. In times of crisis, however, these groups often become places to disseminate information from or into the country and to discuss what is happening. From Afghanistan to Yugoslavia, close to 50 countries are now represented on Usenet. To see which groups are available, use '`l soc.culture.`' in rn or '`nngrep soc.culture.`' for nn.

One caveat: Teachers might want to peruse particular newsgroups before setting their students loose in them. Some have higher levels of flaming and blather than others.

Several "talk" newsgroups provide additional topical discussions, but teachers should screen them first before recommending them to students. They range from **talk.abortion**, via **talk.politics.guns** to **talk.politics.space**, and **talk.environment**.

There are also a number of Bitnet discussion groups of potential interest to students and teachers. See Chapter 5 [Mailing Lists], page 75 for information on finding and subscribing to Bitnet discussion groups. Some with an educational orientation include:

```
biopi-l    ksuvm.bitnet        Secondary biology education
chemed-l   uwf.bitnet          Chemistry education
dts-l      iubvm.bitnet        The Dead Teacher's Society list
phys-l     uwf.bitnet          Discussions for physics teachers
physhare   psuvm.bitnet        Where physics teachers share resources
scimath-l  psuvm.bitnet        Science and math education
```

FYI:

Carl Erickson <erickson@oak.mcs.gvsu.edu> has written an interesting paper, entitled *"USENET as a Teaching Tool"*, published in the Proceedings of 24th, ACM Conference on Science and Education (CSE-2/93-IN).

The August '93 issue of *"Communications of the ACM"* was wholly devoted to the Internet and featured several interesting articles on the topics discussed in the previous chapter (see [Paperware], page 221 for a list of all articles in the "Journal Articles & Papers" section).

"A fool's brain digests philosophy into folly, science into superstition, and art into pedantry. Hence University education."
— **George Bernhard Shaw**

"Education is the process of casting false pearls before real swine."
— **Irsin Edman**

"It is against the grain of modern education to teach children to program. What fun is there in making plans, acquiring discipline in organizing thoughts, devoting attention to detail, and learning to be self-critical?"
— **Alan Perlis**

13 Business on the Net

13.1 Setting Up Shop

Back in olden days, oh, before 1990 or so, there were no markets in the virtual community – if you wanted to buy a book, you still had to jump in your car and drive to the nearest bookstore.

This was because in those days, the Net consisted mainly of a series of government-funded networks on which explicit commercial activity was forbidden. Today, much of the Net is run by private companies, which generally have no such restrictions, and a number of companies have begun experimenting with online "shops" or other services. Many of these shops are run by booksellers, while the services range from delivery of indexed copies of federal documents to an online newsstand that hopes to entice you to subscribe to any of several publications (of the printed on paper variety). A number of companies also use Usenet newsgroups (in the biz hierarchy) to distribute press releases and product information.

Still, commercial activity on the remains far below that found on other networks, such as CompuServe, with its Electronic Mall, or Prodigy, with its advertisements on almost every screen. In part that's because of the newness and complexity of the Internet as a commercial medium. In part, however, that is because of security concerns. Companies worry about such issues as crackers getting into their system over the network, and many people do not like the idea of sending a credit-card number via the Internet (an e-mail message could be routed through several sites to get to its destination). These concerns could disappear as Net users turn to such means as message encryption and "digital signatures." In the meantime, however, businesses on the Net can still consider themselves something of Internet pioneers.

A couple of public-access sites and a regional network have set up "marketplaces" for online businesses.

The World in Brookline, Mass., currently rents "space" to several bookstores and computer-programming firms, as well as an "adult toy shop." To browse their offerings, use gopher to connect to

```
world.std.com
```

At the main menu, select "Shops on the World."

Msen in Ann Arbor provides its "Msen Marketplace," where you'll find a travel agency and an "Online Career Center" offering help-wanted ads from across the country. Msen also provides an "Internet Business Pages," an online directory of companies seeking to reach the Internet community. You can reach Msen through gopher at

```
gopher.msen.com
```

At the main menu, select "Msen Marketplace."

The Nova Scotia Technology Network runs a "Cybermarket" on its gopher service at

```
nstn.ns.ca
```

There, you'll find an online bookstore that lets you order books through e-mail (to which you'll have to trust your credit-card number) and a similar "virtual record store." Both let you search their wares by keyword or by browsing through catalogs.

Other online businesses include:

AnyWare Associates
: This Boston company runs an Internet-to-fax gateway that lets you send fax message anywhere in the world via the Internet (for a fee, of course). For more information, write `<sales@awa.com>`

Bookstacks Unlimited
: This Cleveland bookstore offers a keyword-searchable database of thousands of books for sale. Telnet: **books.com**

Counterpoint Publishing
: Based in Cambridge, Mass., this company's main Internet product is indexed versions of federal journals, including the Federal Register (a daily compendium of government contracts, proposed regulations and the like). Internet users can browse through recent copies, but complete access will run several thousand dollars a year. Use gopher to connect to **enews.com** and select "Counterpoint Publishing"

Dialog
: The national database company can be reached through telnet at **dialog.com**. To log on, however, you will have first had to set up a Dialog account.

Dow Jones News Retrieval
: A wire service run by the information company that owns the Wall Street Journal. Available via telnet at **djnr.dowjones.com**. As with Dialog, you need an account to log on.

Infinity Link
: Browse book, music, software, video-cassette and laser-disk catalogs through this system based in Malvern, Penn. Use gopher to connect to **columbia.ilc.com**. Log on as: '`cas`'

The Internet Company
: Sort of a service bureau, this company, based in Cambridge, Mass., is working with several publishers on Internet-related products. Its Electronic Newsstand offers snippets and special subscription rates to a number of national magazines, from the New Republic to the New Yorker. Use gopher to connect to **enews.com**

MarketBase
: You can try the classified-ads system developed by this company in Santa Barbara, Calif., by gopher to connect to **mb.com**.

O'Reilly and Associates
: Best known for its "Nutshell" books on Unix, O'Reilly runs three Internet services. The gopher server, at **ora.com** provides information about the company and its books. It posts similar information in the **biz.oreilly.announce** Usenet newsgroup. Its Global Network Navigator, accessible through the World-Wide Web, is a sort of online magazine that lets users browse through interesting services and catalogs.

13.2 FYI

The com-priv mailing list is the place to discuss issues surrounding the commercialization and the privatization of the Internet. To subscribe (or un-subscribe), send an e-mail request to `<com-priv-request@psi.com>`.

Mary Cronin's book, *"Doing Business on the Internet"* (1994, Van Nostrand Reinhold), takes a more in-depth look at the subject.

Kent State University in Ohio maintains a repository of *"Business Sources on the Net"*. Use gopher to connect to **refmac.kent.edu**.

"Conclusion: the End?" by Adam Gaffin

The revolution is just beginning.

New communications systems and digital technologies have already meant dramatic changes in the way we live. Think of what is already routine that would have been considered impossible just ten years ago. You can browse through the holdings of your local library – or of libraries halfway around the world – do your banking and see if your neighbor has gone bankrupt, all through a computer and modem.

Imploding costs coupled with exploding power are bringing ever more powerful computer and digital systems to ever growing numbers of people. The Net, with its rapidly expanding collection of databases and other information sources, is no longer limited to the industrialized nations of the West; today the web extends into once remote areas from Siberia to Zimbabwe. The cost of computers and modems used to plug into the Net, meanwhile, continue to plummet, making them ever more affordable.

Cyberspace has become a vital part of millions of people's daily lives. People form relationships online, they fall in love, they get married, all because of initial contacts in cyberspace, that ephemeral "place" that transcends national and state boundaries. Business deals are transacted entirely in ASCII. Political and social movements begin online, coordinated by people who could be thousands of miles apart.

Yet this is only the beginning.

We live in an age of communication, yet, the various media we use to talk to one another remain largely separate systems. One day, however, your telephone, TV, fax machine and personal computer will be replaced by a single "information processor" linked to the worldwide Net by strands of optical fiber.

Beyond databases and file libraries, power will be at your fingertips. Linked to thousands, even millions of like-minded people, you'll be able to participate in social and political movements across the country and around the world.

How does this happen? In part, it will come about through new technologies. High-definition television will require the development of inexpensive computers that can process as much information as today's workstations. Telephone and cable companies will compete to see who can bring those fiber-optic cables into your home first. High-speed data networks, such as the Internet, will be replaced by even more powerful systems.

The Clinton administration, arguably the first led by people who know how to use not only computer networks but computers, is pushing for creation of a series of "information superhighways" comparable in scope to the Interstate highway system of the 1950s (one of whose champions in the Senate has a son elected vice president in 1992).

Right now, we are in the network equivalent of the early 1950s, just before the creation of that massive highway network. Sure, there are plenty of interesting things out there, but you have to meander along two-lane roads, and have a good map, to get to them.

Creation of this new Net will also require a new communications paradigm: the Net as information utility. The Net remains a somewhat complicated and mysterious place. To get something out of the Net today, you have to spend a fair amount of time with a Net veteran or a manual like this. You have to learn such arcana as the vagaries of the Unix cd command.

Contrast this with the telephone, which now also provides access to large amounts of information through push buttons, or a computer network such as Prodigy, which one navigates through simple commands and mouse clicks.

Internet system administrators have begun to realize that not all people want to learn the intricacies of Unix, and that that fact does not make them bad people. We are already seeing the development of simple interfaces that will put the Net's power to use by millions of people. You can already see their influence in the menus of gophers and the World-Wide Web, which require no complex computing skills but which open the gates to thousands of information resources. Mail programs and text editors such as Pico and Pine promise much of the power of older programs such as emacs at a fraction of the complexity.

Some software engineers are looking at taking this even further, by creating graphical interfaces that will let somebody navigate the Internet just by clicking on the screen with a mouse or by calling up an easy text editor, sort of the way one can now navigate a Macintosh computer – or a commercial online service such as Prodigy.

Then there are the Internet services themselves.

For every database now available through the Internet, there are probably three or four that are not. Government agencies are only slowly beginning to connect their storehouses of information to the Net. Several commercial vendors, from database services to booksellers, have made their services available through the Net.

Few people now use one of the Net's more interesting applications. A standard known as MIME lets one send audio and graphics files in a message. Imagine opening your e-mail one day to hear your granddaughter's first words, or a "photo" of your friend's new house. Eventually, this standard could allow for distribution of even small video displays over the Net.

All of this will require vast new amounts of Net power, to handle both the millions of new people who will jump onto the Net and the new applications they want. Replicating a moving image on a computer screen alone takes a phenomenal amount of computer bits, and computing power to arrange them.

All of this combines into a National Information Infrastructure able to move billions of bits of information in one second – the kind of power needed to hook information "hoses" into every business and house.

As these "superhighways" grow, so will the "on ramps," for a high-speed road does you little good if you can't get to it. The costs of modems seem to fall as fast as those of computers. High-speed modems (9600 baud and up) are becoming increasingly affordable. At 9600 baud, you can download a satellite weather image of North America in less than two minutes, a file that, with a slower modem could take up to 20 minutes to download. Eventually, homes could be connected directly to a national digital network. Most long-distance phone traffic is already carried in digital form, through high-volume optical fibers. Phone companies are ever so slowly working to extend these fibers the "final mile" to the home. The Electronic Frontier Foundation is working to ensure these links are affordable.

Beyond the technical questions are increasingly thorny social, political and economic issues. Who is to have access to these services, and at what cost? If we live in an information age, are we laying the seeds for a new information under class, unable to compete with those fortunate enough to have the money and skills needed to manipulate new communications channels? Who, in fact, decides who has access to what? As more companies realize the potential profits to be made in the new information infrastructure, what happens to such systems as Usenet, possibly the world's first successful anarchistic system, where everybody can say whatever they want?

What are the laws of the electronic frontier? When national and state boundaries lose their meaning in cyberspace, the question might even be: WHO is the law? What if a practice that is legal in one country is "committed" in another country where it is illegal, over a computer network that crosses through a third country? Who goes after computer crackers?

What role will you play in the revolution?

"The first duty of a revolutionary is to get away with it."
— **Abbie Hoffman**

"The only act of revolution left
in a collective world, is thinking for yourself."
— **Bob Geldof**, *"Is that it?"*

HAMLET: *"O, I die, Horatio;*
The potent poison quite o'er-crows my spirit:
I cannot live to hear the news from England;
But I do prophesy the election lights
On Fortinbras: he has my dying voice;
So tell him, with the occurrents, more and less,
Which have solicited. The rest is silence."
— **Shakespeare**, *"Hamlet, Act V, Scene II"*
(text ftp'd from **terminator.rs.itd.umich.edu**)

"A Slice of Life in my Virtual Community" by Howard Rheingold

By *Howard Rheingold*[1] <hlr@well.sf.ca.us>
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> **NOTE:** In 1988, *"Whole Earth Review"* published my article, "Virtual Communities." Four years later, I reread it and realized that I had learned a few things, and that the world I was observing had changed. So I rewrote it. The original version is available on the WELL as '/uh/72/hlr/virtual_communities88'.
>
> Portions of this will appear in *"Globalizing Networks: Computers and International Communication"*, edited by *Linda Harasim* and *Jan Walls* for MIT press. Portions of this will appear in "Virtual Communities," by Howard Rheingold, Addison-Wesley. Portions of this may find their way into Whole Earth Review.
>
> This is a world-readable file, and I think these are important issues; encourage distribution, but I do ask for fair use: Don't remove my name from my words when you quote or reproduce them, don't change them, and don't impair my ability to make a living with them.

I'm a writer, so I spend a lot of time alone in a room with my words and my thoughts. On occasion, I venture outside to interview people or to find information. After work, I reenter the human community, via my family, my neighborhood, my circle of acquaintances. But that regime left me feeling isolated and lonely during the working day, with few opportunities to expand my circle of friends. For the past seven years, however, I have participated in a wide-ranging, intellectually stimulating, professionally rewarding, sometimes painful, and often intensely emotional ongoing interchange with dozens of new friends, hundreds of colleagues, thousands of acquaintances. And I still spend many of my days in a room, physically isolated. My mind, however, is linked with a worldwide collection of like-minded (and not so like-minded) souls: My virtual community.

Virtual communities emerged from a surprising intersection of humanity and technology. When the ubiquity of the world telecommunications network is combined with the information-structuring and storing capabilities of computers, a new communication medium becomes possible. As we've learned from the history of the telephone, radio, television, people can adopt new communication media and redesign their way of life with surprising rapidity. Computers, modems, and communication networks furnish the technological infrastructure of computer-mediated communication (CMC); cyberspace is the conceptual space where words and human relationships, data and wealth and power are manifested by people using CMC technology; virtual communities are cultural aggregations that emerge when enough people bump into each other often enough in cyberspace.

A virtual community as they exist today is a group of people who may or may not meet one another face to face, and who exchange words and ideas through the mediation of computer bulletin boards and networks. In cyberspace, we chat and argue, engage in intellectual intercourse, perform acts of commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games and metagames, flirt, create a little high art and a lot of idle talk. We do everything people do when people get together, but we do it with words on computer screens, leaving our bodies behind. Millions of us have already built communities where our identities commingle and interact electronically, independent of local time or location. The way a few of us live now might be the way a larger population will live, decades hence.

The pioneers are still out there exploring the frontier, the borders of the domain have yet to be determined, or even the shape of it, or the best way to find one's way in it. But people are using the technology of computer-mediated communications CMC technology to do things with each other that weren't possible before. Human behavior in cyberspace, as we can observe it and participate in it today, is going to be a crucially important factor. The ways in which people use CMC always will be rooted in human needs, not hardware or software.

If the use of virtual communities turns out to answer a deep and compelling need in people, and not just snag onto a human foible like pinball or pac-man, today's small online enclaves may grow into much larger networks over the next twenty years. The potential for social change is a side-effect of the trajectory of telecommunications and computer industries, as it can be forecast for the next ten years. This odd social revolution – communities of people who may never or rarely meet face to face – might piggyback on the technologies that the biggest telecommunication companies already are planning to install over the next ten years.

It is possible that the hardware and software of a new global telecommunications infrastructure, orders of magnitude more powerful than today's state of the art, now moving from the laboratories to the market, will expand the reach of this spaceless place throughout the 1990s to a much wider population than today's hackers, technologists, scholars, students, and enthusiasts. The age of the online pioneers will end soon, and the cyberspace settlers will come en-masse. Telecommuters who might have thought they were just working from home and avoiding one day of gridlock on the freeway will find themselves drawn into a whole new society. Students and scientists are already there, artists have made significant inroads, librarians and educators have their own pioneers as well, and political activists of all stripes have just begun to discover the power of plugging a computer into a telephone. When today's millions become tens and hundreds of millions, perhaps billions, what kind of place, and what kind of model for human behavior will they find?

Today's bedroom electronic bulletin boards, regional computer conferencing systems, global computer networks offer clues to what might happen when more powerful enabling technology comes along. The hardware for amplifying the computing and communication capacity of every home on the world-grid is in the pipeline, although the ultimate applications are not yet clear. We'll be able to transfer the Library of Congress from any point on the globe to any another point in seconds, upload and download full-motion digital video at will. But is that really what people are likely to do with all that bandwidth and computing power? Some of the answers have to come from the behavioral rather than the technological part of the system. How will people actually use the desktop supercomputers and multimedia telephones that the engineers tell us we'll have in the near future.

One possibility is that people are going to do what people always do with a new communication technology: use it in ways never intended or foreseen by its inventors, to turn old social codes inside out and make new kinds of communities possible. CMC will change us, and change our culture, the way telephones and televisions and cheap video cameras changed us – by altering the way we perceive and communicate. Virtual communities transformed my life profoundly, years ago, and continue to do so.

A Cybernaut's Eye View

The most important clues to the shape of the future at this point might not be found in looking more closely at the properties of silicon, but in paying attention to the ways people need to, fail to, and try to communicate with one another. Right now, some people are convinced that spending hours a day in front of a screen, typing on a keyboard, fulfills in some way our need for a community of peers. Whether we have discovered something wonderful or stumbled into something insidiously unwonderful, or both, the fact that people want to use CMC to meet other people and experiment with identity are valuable signposts to possible futures. Human behavior in cyberspace, as we can observe it today on the nets and in the BBSs, gives rise to important questions about the effects of communication technology on human values. What kinds of humans are we becoming in an increasingly computer-mediated world, and do we have any control over that transformation?

How have our definitions of "human" and "community" been under pressure to change to fit the specifications of a technology-guided civilization?

Fortunately, questions about the nature of virtual communities are not purely theoretical, for there is a readily accessible example of the phenomenon at hand to study. Millions of people now inhabit the social spaces that have grown up on the world's computer networks, and this previously invisible global subculture has been growing at a monstrous rate recently (e.g., the Internet growing by 25% per month).

I've lived here myself for seven years; the WELL and the net have been a regular part of my routine, like gardening on Sunday, for one sixth of my life thus far. My wife and daughter long ago grew accustomed to the fact that I sit in front of my computer early in the morning and late at night, chuckling and cursing, sometimes crying, about something I am reading on the computer screen. The questions I raise here are not those of a scientist, or of a polemicist who has found an answer to something, but as a user – a nearly obsessive user – of CMC and a deep mucker-about in virtual communities. What kind of people are my friends and I becoming? What does that portend for others?

If CMC has a potential, it is in the way people in so many parts of the net fiercely defend the use of the term "community" to describe the relationships we have built online. But fierceness of belief is not sufficient evidence that the belief is sound. Is the aura of community an illusion? The question has not been answered, and is worth asking. I've seen people hurt by interactions in virtual communities. Is telecommunication culture capable of becoming something more than what Scott Peck calls a "pseudo-community," where people lack the genuine personal commitments to one another that form the bedrock of genuine community? Or is our notion of "genuine" changing in an age where more people every day live their lives in increasingly artificial environments? New technologies tend to change old ways of doing things. Is the human need for community going to be the next technology commodity?

I can attest that I and thousands of other cybernauts know that what we are looking for, and finding in some surprising ways, is not just information, but instant access to ongoing relationships with a large number of other people. Individuals find friends and groups find shared identities on-line, through the aggregated networks of relationships and commitments that make any community possible. But are relationships and commitments as we know them even possible in a place where identities are fluid? The physical world, known variously as "IRL" ("In Real Life"), or "offline," is a place where the identity and position of the people you communicate with are well known, fixed, and highly visual. In cyberspace, everybody is in the dark. We can only exchange words with each other – no glances or shrugs or ironic smiles. Even the nuances of voice and intonation are stripped away. On top of the technology-imposed constraints, we who populate cyberspace deliberately experiment with fracturing traditional notions of identity by living as multiple simultaneous personae in different virtual neighborhoods.

We reduce and encode our identities as words on a screen, decode and unpack the identities of others. The way we use these words, the stories (true and false) we tell about ourselves (or about the identity we want people to believe us to be) is what determines our identities in cyberspace. The aggregation of personae, interacting with each other, determines the nature of the collective culture. Our personae, constructed from our stories of who we are, use the overt topics of discussion in a BBS or network for a more fundamental purpose, as means of interacting with each other. And all this takes place on both public and private levels, in many-to-many open discussions and one-to-one private electronic mail, front stage role-playing and backstage behavior.

When I'm online, I cruise through my conferences, reading and replying in topics that I've been following, starting my own topics when the inspiration or need strikes me. Every few minutes, I get a notice on my screen that I have incoming mail. I might decide to wait to read the mail until I'm finished doing something else, or drop from the conference into the mailer, to see who it is from. At the same time that I am participating in open discussion in conferences and private discourse in electronic mail, people I know well use "sends" – a means of sending one or two quick sentences to my screen without the intervention of an electronic mail message. This can be irritating before you get used to it, since you are either reading or writing something else when it happens, but eventually it becomes a kind of rhythm: different degrees of thoughtfulness and formality happen simultaneously, along with the simultaneous multiple personae. Then there are public and private conferences that have partially overlapping memberships. CMC offers tools for facilitating all the various ways people have discovered to divide and communicate, group and subgroup and regroup, include and exclude, select and elect.

When a group of people remain in communication with one another for extended periods of time, the question of whether it is a community arises. Virtual communities might be real communities, they might be pseudocommunities, or they might be something entirely new in the realm of social contracts, but I believe they are in part a response to the hunger for community that has followed the disintegration of traditional communities around the world.

Social norms and shared mental models have not emerged yet, so everyone's sense of what kind of place cyberspace is can vary widely, which makes it hard to tell whether the person you are communicating with shares the same model of the system within which you are communicating. Indeed, the online acronym YMMV ("Your Mileage May Vary") has become shorthand for this kind of indeterminacy of shared context. For example, I know people who use vicious online verbal combat as a way of blowing off steam from the pressures of their real life – "sport hassling" – and others who use it voyeuristically, as a text-based form of real-life soap-opera. To some people, it's a game. And I know people who feel as passionately committed to our virtual community and the people in it (or at least some of the people in it) as our nation, occupation, or neighborhood. Whether we like it or not, the communitarians and the venters, the builders and the vandals, the egalitarians and the passive-aggressives, are all in this place together. The diversity of the communicating population is one of the defining characteristics of the new medium, one of its chief attractions, the source of many of its most vexing problems.

Is the prospect of moving en-masse into cyberspace in the near future, when the world's communication network undergoes explosive expansion of bandwidth, a beneficial thing for entire populations to do? In which ways might the growth of virtual communities promote alienation? How might virtual communities facilitate conviviality? Which social structures will dissolve, which political forces will arise, and which will lose power? These are questions worth asking now, while there is still time to shape the future of the medium. In the sense that we are traveling blind into a technology-shaped future that might be very different from today's culture, direct reports from life in different corners of the world's online cultures today might furnish valuable signposts to the territory ahead.

Since the summer of 1985, I've spent an average of two hours a day, seven days a week, often when I travel, plugged into the WELL (Whole Earth 'Lectronic Link) via a computer and a telephone line, exchanging information and playing with attention, becoming entangled In Real Life, with a growing network of similarly wired-in strangers I met in cyberspace. I remember the first time I walked into a room full of people (IRL) whose faces were completely unknown to me, but who knew many intimate details of my history, and whose own stories I knew very well. I had contended with these people, shot the breeze around the electronic water cooler, shared alliances and formed bonds, fallen off my chair laughing with them, become livid with anger at these people, but I had not before seen their faces.

I found this digital watering hole for information-age hunters and gatherers the same way most people find such places – I was lonely, hungry for intellectual and emotional companionship, although I didn't know it. While many commuters dream of working at home, telecommuting, I happen to know what it's like to work that way. I never could stand to commute or even get out of my pajamas if I didn't want to, so I've always worked at home. It has its advantages and its disadvantages. Others like myself also have been drawn into the online world because they shared with me the occupational hazard of the self-employed, home-based symbolic analyst of the 1990s – isolation. The kind of people that Robert Reich calls "symbolic analysts" are natural matches for online communities: programmers, writers, freelance artists and designers, independent radio and television producers, editors, researchers, librarians. People who know what to do with symbols, abstractions, and representations, but who sometimes find themselves spending more time with keyboards and screens than human companions.

I've learned that virtual communities are very much like other communities in some ways, deceptively so to those who assume that people who communicate via words on a screen are in some way aberrant in their communication skills and human needs. And I've learned that virtual communities are very much not like communities in some other ways, deceptively so to those who assume that people who communicate via words on a screen necessarily share the same level of commitment to each other in real life as more traditional communities. Communities can emerge from and exist within computer-linked groups, but that technical linkage of electronic personae is not sufficient to create a community.

Social Contracts, Reciprocity, and Gift Economies in Cyberspace

The network of communications that constitutes a virtual community can include the exchange of information as a kind of commodity, and the economic implications of this phenomenon are significant; the ultimate social potential of the network, however, lies not solely in its utility as an information market, but in the individual and group relationships that can happen over time. When such a group accumulates a sufficient number of friendships and rivalries, and witnesses the births, marriages, and deaths that bond any other kind of community, it takes on a definite and profound sense of place in people's minds. Virtual communities usually have a geographically local focus, and often have a connection to a much wider domain. The local focus of my virtual community, the WELL, is the San Francisco Bay Area; the wider locus consists of hundreds of thousands of other sites around the world, and millions of other communitarians, linked via exchanges of messages into a meta-community known as "the net."

The existence of computer-linked communities was predicted twenty years ago by *J.C.R. Licklider* and *Robert Taylor*, who as research directors for the Department of Defense, set in motion the research that resulted in the creation of the first such community, the ARPAnet: "What will on-line interactive communities be like?" Licklider and Taylor wrote, in 1968: "In most fields they will consist of geographically separated members, sometimes grouped in small clusters and sometimes working individually. They will be communities not of common location, but of common interest..."

My friends and I sometimes believe we are part of the future that Licklider dreamed about, and we often can attest to the truth of his prediction that "life will be happier for the on-line individual because the people with whom one interacts most strongly will be selected more by commonality of interests and goals than by accidents of proximity." I still believe that, but I also know that life also has turned out to be unhappy at times, intensely so in some circumstances, because of words on a screen. Events in cyberspace can have concrete effects in real life, of both the pleasant and less pleasant varieties. Participating in a virtual community has not solved all of life's problems for me, but it has served as an aid, a comfort and an inspiration at times; at other times, it has been like an endless, ugly, long-simmering family brawl.

I've changed my mind about a lot of aspects of the WELL over the years, but the "sense of place" is still as strong as ever. As Ray Oldenburg revealed in "The Great Good Place," there are three essential places in every person's life: the place they live, the place they work, and the place they gather for conviviality. Although the casual conversation that takes place in cafes, beauty shops, pubs, town squares is universally considered to be trivial, "idle talk," Oldenburg makes the case that such places are where communities can arise and hold together. When the automobile-centric, suburban, high-rise, fast food, shopping mall way of life eliminated many of these "third places," the social fabric of existing communities shredded. It might not be the same kind of place that Oldenburg had in mind, but so many of his descriptions of "third places" could also describe the WELL.

The feeling of logging into the WELL for just a minute or two, dozens of times a day is very similar to the feeling of peeking into the cafe, the pub, the common room, to see who's there, and whether you want to stay around for a chat. Indeed, in all the hundreds of thousands of computer systems around the world that use the UNIX operating system, as does the WELL, the most widely used command is the one that shows you who is online. Another widely used command is the one that shows you a particular user's biography.

I visit the WELL both for the sheer pleasure of communicating with my newfound friends, and for its value as a practical instrument for gathering information on subjects that are of momentary or enduring importance, from child care to neuroscience, technical questions on telecommunications to arguments on philosophical, political, or spiritual subjects. It's a bit like a neighborhood pub or coffee shop. It's a little like a salon, where I can participate in a hundred ongoing conversations with people who don't care what I look like or sound like, but who do care how I think and communicate. There are seminars and word fights in different corners. And it's all a little like a groupmind, where questions are answered, support is given, inspiration is provided, by people I may have never heard from before, and whom I may never meet face to face.

Because we cannot see one another, we are unable to form prejudices about others before we read what they have to say: Race, gender, age, national origin and physical appearance are not apparent unless a person wants to make such characteristics public. People who are thoughtful but who are not quick to formulate a reply often do better in CMC than face to face or over the telephone. People whose physical handicaps make it difficult to form new friendships find that virtual communities treat them as they always wanted to be treated – as thinkers and transmitters of ideas and feeling beings, not carnal vessels with a certain appearance and way of walking and talking (or not walking and not talking). Don't mistake this filtration of appearances for dehumanization: Words on a screen are quite capable of moving one to laughter or tears, of evoking anger or compassion, of creating a community from a collection of strangers.

From my informal research into virtual communities around the world, I have found that enthusiastic members of virtual communities in Japan, England, and the US agree that "increasing the diversity of their circle of friends" was one of the most important advantages of computer conferencing. CMC is a way to meet people, whether or not you feel the need to affiliate with them on a community level, but the way you meet them has an interesting twist: In traditional kinds of communities, we are accustomed to meeting people, then getting to know them; in virtual communities, you can get to know people and then choose to meet them. In some cases, you can get to know people who you might never meet on the physical plane.

How does anybody find friends? In the traditional community, we search through our pool of neighbors and professional colleagues, of acquaintances and acquaintances of acquaintances, in order to find people who share our values and interests. We then exchange information about one another, disclose and discuss our mutual interests, and sometimes we become friends. In a virtual community we can go directly to the place where our favorite subjects are being discussed, then get acquainted with those who share our passions, or who use words in a way we find attractive. In this sense, the topic is the address: You can't simply pick up a phone and ask to be connected with someone who wants to talk about Islamic art or California wine, or someone with a three year old daughter or a 30 year old Hudson; you can, however, join a computer conference on any of those topics, then open a public or private correspondence with the previously-unknown people you find in that conference. You will find that your chances of making friends are magnified by orders of magnitude over the old methods of finding a peer group.

You can be fooled about people in cyberspace, behind the cloak of words. But that can be said about telephones or face to face communications, as well; computer-mediated communications provide new ways to fool people, and the most obvious identity-swindles will die out only when enough people learn to use the medium critically. Sara Kiesler noted that the word "phony" is an artifact of the early years of the telephone, when media-naive people were conned by slick talkers in ways that wouldn't deceive an eight-year old with a cellular phone today.

There is both an intellectual and an emotional component to CMC. Since so many members of virtual communities are the kind of knowledge-based professionals whose professional standing can be enhanced by what they know, virtual communities can be practical, cold-blooded instruments. Virtual communities can help their members cope with information overload. The problem with the information age, especially for students and knowledge workers who spend their time immersed in the info-flow, is that there is too much information available and no effective filters for sifting the key data that are useful and interesting to us as individuals. Programmers are trying to design better and better "software agents" that can seek and sift, filter and find, and save us from the awful feeling one gets when it turns out that the specific knowledge one needs is buried in 15,000 pages of related information.

The first software agents are now becoming available (e.g., WAIS, Rosebud), but we already have far more sophisticated, if informal, social contracts among groups of people that allow us to act as software agents for one another. If, in my wanderings through information space, I come across items that don't interest me but which I know one of my worldwide loose-knit affinity group of online friends would appreciate, I send the appropriate friend a pointer, or simply forward the entire text (one of the new powers of CMC is the ability to publish and converse with the same medium). In some cases, I can put the information in exactly the right place for 10,000 people I don't know, but who are intensely interested in that specific topic, to find it when they need it. And sometimes, 10,000 people I don't know do the same thing for me.

This unwritten, unspoken social contract, a blend of strong-tie and weak-tie relationships among people who have a mixture of motives, requires one to give something, and enables one to receive something. I have to keep my friends in mind and send them pointers instead of throwing my informational discards into the virtual scrap-heap. It doesn't take a great deal of energy to do that, since I have to sift that information anyway in order to find the knowledge I seek for my own purposes; it takes two keystrokes to delete the information, three keystrokes to forward it to someone else. And with scores of other people who have an eye out for my interests while they explore sectors of the information space that I normally wouldn't frequent, I find that the help I receive far outweighs the energy I expend helping others: A marriage of altruism and self-interest.

The first time I learned about that particular cyberspace power was early in the history of the WELL, when I was invited to join a panel of experts who advise the U.S. Congress Office of Technology Assessment (OTA). The subject of the assessment was "Communication Systems for an Information Age." I'm not an expert in telecommunication technology or policy, but I do know where to find a group of such experts, and how to get them to tell me what they know. Before I went to Washington for my first panel meeting, I opened a conference in the WELL and invited assorted information-freaks, technophiles, and communication experts to help me come up with something to say. An amazing collection of minds flocked to that topic, and some of them created whole new communities when they collided.

By the time I sat down with the captains of industry, government advisers, and academic experts at the panel table, I had over 200 pages of expert advice from my own panel. I wouldn't have been able to integrate that much knowledge of my subject in an entire academic or industrial career, and it only took me (and my virtual community) a few minutes a day for six weeks. I have found the WELL to be an outright magical resource, professionally. An editor or producer or client can call and ask me if I know much about the Constitution, or fiber optics, or intellectual property. "Let me get back to you in twenty minutes," I say, reaching for the modem. In terms of the way I learned to use the WELL to get the right piece of information at the right time, I'd say that the hours I've spent putting information into the WELL turned out to be the most lucrative professional investments I've ever made.

The same strategy of nurturing and making use of loose information-sharing affiliations across the net can be applied to an infinite domain of problem areas, from literary criticism to software evaluation. It's a neat way for a sufficiently large, sufficiently diverse group of people to multiply their individual degree of expertise, and I think it could be done even if the people aren't involved in a community other than their company or their research specialty. I think it works better when the community's conceptual model of itself is more like barn-raising than horse-trading, though. Reciprocity is a key element of any market-based culture, but the arrangement I'm describing feels to me more like a kind of gift economy where people do things for one another out of a spirit of building something between them, rather than a spreadsheet-calculated quid pro quo. When that spirit exists, everybody gets a little extra something, a little sparkle, from their more practical transactions; different kinds of things become possible when this mindset pervades. Conversely, people who have valuable things to add to the mix tend to keep their heads down and their ideas to themselves when a mercenary or hostile zeitgeist dominates an online community.

I think one key difference between straightforward workaday reciprocity is that in the virtual community I know best, one valuable currency is knowledge, elegantly presented. Wit and use of language are rewarded in this medium, which is biased toward those who learn how to manipulate attention and emotion with the written word. Sometimes, you give one person more information than you would give another person in response to the same query, simply because you recognize one of them to be more generous or funny or to-the-point or agreeable to your political convictions than the other one.

If you give useful information freely, without demanding tightly-coupled reciprocity, your requests for information are met more swiftly, in greater detail, than they would have been otherwise. The person you help might never be in a position to help you, but someone else might be. That's why it is hard to distinguish idle talk from serious context-setting. In a virtual community, idle talk is context-setting. Idle talk is where people learn what kind of person you are, why you should be trusted or mistrusted, what interests you. An agora is more than the site of transactions; it is also a place where people meet and size up one another.

A market depends on the quality of knowledge held by the participants, the buyers and sellers, about price and availability and a thousand other things that influence business; a market that has a forum for informal and back-channel communications is a better-informed market. The London Stock Exchange grew out of the informal transactions in a coffee-house; when it became the London International Stock Exchange a few years ago, and abolished the trading-room floor, the enterprise lost something vital in the transition from an old room where all the old boys met and cut their deals to the screens of thousands of workstations scattered around the world.

The context of the informal community of knowledge sharers grew to include years of both professional and personal relationships. It is not news that the right network of people can serve as an inquiry research system: You throw out the question, and somebody on the net knows the answer. You can make a game out of it, where you gain symbolic prestige among your virtual peers by knowing the answer. And you can make a game out of it among a group of people who have dropped out of their orthodox professional lives, where some of them sell these information services for exorbitant rates, in order to participate voluntarily in the virtual community game.

When the WELL was young and growing more slowly than it is now, such knowledge-potlatching had a kind of naively enthusiastic energy. When you extend the conversation – several dozen different characters, well-known to one another from four or five years of virtual hanging-out, several hours a day – it gets richer, but not necessarily "happier."

Virtual communities have several drawbacks in comparison to face-to-face communication, disadvantages that must be kept in mind if you are to make use of the power of these computer-mediated discussion groups. The filtration factor that prevents one from knowing the race or age of another participant also prevents people from communicating the facial expressions, body language, and tone of voice that constitute the inaudible but vital component of most face to face communications. Irony, sarcasm, compassion, and other subtle but all-important nuances that aren't conveyed in words alone are lost when all you can see of a person are words on a screen.

It's amazing how the ambiguity of words in the absence of body language inevitably leads to online misunderstandings. And since the physical absence of other people also seems to loosen some of the social bonds that prevent people from insulting one another in person, misunderstandings can grow into truly nasty stuff before anybody has a chance to untangle the original miscommunication. Heated diatribes and interpersonal incivility that wouldn't crop up often in face to face or even telephone discourse seem to appear with relative frequency in computer conferences. The only presently available antidote to this flaw of CMC as a human communication medium is widespread knowledge of this flaw – aka "netiquette."

Online civility and how to deal with breaches of it is a topic unto itself, and has been much-argued on the WELL. Degrees of outright incivility constitute entire universes such as alt.flame, the Usenet newsgroup where people go specifically to spend their days hurling vile imprecations at one another. I am beginning to suspect that the most powerful and effective defense an online community has in the face of those who are bent on disruption might be norms and agreements about withdrawing attention from those who can't abide by even loose rules of verbal behavior. "If you continue doing that," I remember someone saying to a particularly persistent would-be disrupter, "we will stop paying attention to you." This is technically easy to do on Usenet, where putting the name of a person or topic header in a "kill file" (aka "bozo filter") means you will never see future contributions from that person or about that topic. You can simply choose to not see any postings from Rich Rosen, or that feature the word "abortion" in the title. A society in which people can remove one another, or even entire topics of discussion, from visibility. The WELL does not have a bozo filter, although the need for one is a topic of frequent discussion.

Who Is The WELL?

One way to know what the WELL is like is to know something about the kind of people who use it. It has roots in the San Francisco Bay Area, and in two separate cultural revolutions that took place there in past decades. The Whole Earth Catalog originally emerged from the counterculture as Stewart Brand's way of providing access to tools and ideas to all the communes who were exploring alternate ways of life in the forests of Mendocino or the high deserts outside Santa Fe. The Whole Earth Catalogs and the magazines they spawned, Co-Evolution Quarterly and Whole Earth Review, have outlived the counterculture itself, since they are still alive and raising hell after nearly 25 years. For many years, the people who have been exploring alternatives and are open to ideas that you don't find in the mass media have found themselves in cities instead of rural communes, where their need for new tools and ideas didn't go away.

The Whole Earth Catalog crew received a large advance in the mid-1980s to produce an updated version, a project involving many geographically-separated authors and editors, many of whom were using computers. They bought a minicomputer and the license to Picospan, a computer conferencing program, leased an office next to the magazine's office, leased incoming telephone lines, set up modems, and the WELL was born in 1985. The idea from the beginning was that the founders weren't sure what the WELL would become, but they would provide tools for people to build it into something useful. It was consciously a cultural experiment, and the business was designed to succeed or fail on the basis of the results of the experiment. The person Stewart Brand chose to be the WELL's first director – technician, manager, innkeeper, and bouncer – was Matthew McClure, not-coincidentally a computer-savvy veteran of The Farm, one of the most successful of the communes that started in the sixties. Brand and McClure started a low-rules, high-tone discussion, where savvy networkers, futurists, misfits who had learned how to make our outsiderness work for us, could take the technology of CMC to its cultural limits.

The Whole Earth network – the granola-eating utopians, the solar-power enthusiasts, serious ecologists and the space-station crowd, immortalists, Biospherians, environmentalists, social activists – was part of the core population from the beginning. But there were a couple of other key elements. One was the subculture that happened ten years after the counterculture era – the personal computer revolution. Personal computers and the PC industry were created by young iconoclasts who wanted to have whizzy tools and change the world. Whole Earth had honored them, including the outlaws among them, with the early Hacker's Conferences. The young computer wizards, and the grizzled old hands who were still messing with mainframes, showed up early at the WELL because the guts of the system itself – the UNIX operating system and "C" language programming code – were available for tinkering by responsible craftsmen.

A third cultural element that made up the initial mix of the WELL, which has drifted from its counterculture origins in many ways, were the deadheads. Books and theses have been written about the subculture that have grown up around the band, the Grateful Dead. The deadheads have a strong feeling of community, but they can only manifest it en masse when the band has concerts. They were a community looking for a place to happen when several technology-savvy deadheads started a "Grateful Dead Conference" on the WELL. GD was so phenomenally successful that for the first several years, deadheads were by far the single largest source of income for the enterprise.

Along with the other elements came the first marathon swimmers in the new currents of the information streams, the futurists and writers and journalists. The New York Times, Business Week, the San Francisco Chronicle, Time, Rolling Stone, Byte, the Wall Street Journal all have journalists that I know personally who drop into the WELL as a listening post. People in Silicon Valley lurk to hear loose talk among the pros. Journalists tend to attract other journalists, and the purpose of journalists is to attract everybody else: most people have to use an old medium to hear news about the arrival of a new medium.

Things changed, both rapidly and slowly, in the WELL. There were about 600 members of the WELL when I joined, in the summer of 1985. It seemed that then, as now, the usual ten percent of the members did 80% of the talking. Now there are about 6000 people, with a net gain of about a hundred a month. There do seem to be more women than other parts of cyberspace. Most of the people I meet seem to be white or Asian; African-Americans aren't missing, but they aren't conspicuous or even visible. If you can fake it, gender and age are invisible, too. I'd guess the WELL consists of about 80% men, 20% women. I don't know whether formal demographics would be the kind of thing that most WELL users would want to contribute to. It's certainly something we'd discuss, argue, debate, joke about.

One important social rule was built into Picospan, the software that the WELL lives inside: Nobody is anonymous. Everybody is required to attach their real "userid" to their postings. It is possible to use pseudonyms to create alternate identities, or to carry metamessages, but the pseudonyms are always linked in every posting to the real userid. So individual personae – whether or not they correspond closely to the real person who owns the account – are responsible for the words they post. In fact, the first several years, the screen that you saw when you reached the WELL said "You own your own words." Stewart Brand, the WELL's co-founder likes epigrams: "Whole Earth," "Information wants to be free." "You own your own words." Like the best epigrams, "You own your own words" is open to multiple interpretations. The matter of responsibility and ownership of words is one of the topics WELLbeings argue about endlessly, so much that the phrase has been abbreviated to "YOYOW," As in, "Oh no, another YOYOW debate."

Who are the WELL members, and what do they talk about? I can tell you about the individuals I have come to know over six years, but the WELL has long since been something larger than the sum of everybody's friends. The characteristics of the pool of people who tune into this electronic listening post, whether or not they every post a word in public, is a strong determinant of the flavor of the "place." There's a cross-sectional feeling of "who are we?" that transcends the intersecting and non-intersecting rings of friends and acquaintances each individual develops.

My Neighborhood On The WELL

Every CMC system gives users tools for creating their own sense of place, by customizing the way they navigate through the database of conferences, topics, and responses. A conference or newsgroup is like a place you go. If you go to several different places in a fixed order, it seems to reinforce the feeling of place by creating a customized neighborhood that is also shared by others. You see some of the same users in different parts of the same neighborhood. Some faces, you see only in one context – the parents conference, the Grateful Dead tours conference, the politics or sex conference.

My home neighborhood on the WELL is reflected in my ".cflist," the file that records my preferences about the order of conferences I visit. It is always possible to go to any conference with a command, but with a '`.cflist`' you structure your online time by going from conference to specified conference at regular intervals, reading and perhaps responding in several ongoing threads in several different places. That's the part of the art of discourse where I have found that the computer adds value to the intellectual activity of discussing formally distinct subjects asynchronously, from different parts of the world, over extending periods, by enabling groups to structure conversations by topic, over time.

My '`.cflist`' starts, for sentimental reasons, with the Mind conference, the first one I hosted on the WELL, since 1985. I've changed my '`.cflist`' hundreds of times over the years, to add or delete conferences from my regular neighborhood, but I've always kept Mind in the lead. The entry banner screen for the Mind conference used to display to each user the exact phase of the moon in numbers and ASCII graphics every time they logged in to the conference. But the volunteer programmer who had created the "phoon" program had decided to withdraw it, years later, in a dispute with WELL management. There is often a technological fix to a social problem within this particular universe. Because the WELL seems to be an intersection of many different cultures, there have been many experiments with software tools to ameliorate problems that seemed to crop up between people, whether because of the nature of the medium or the nature of the people. A frighteningly expensive pool of talent was donated by volunteer programmers to create tools and even weapons for WELL users to deal with each other. People keep giving things to the WELL, and taking them away. Offline readers and online tools by volunteer programmers gave others increased power to communicate.

The News conference is what's next. This is the commons, the place where the most people visit the most often, where the most outrageous off-topic proliferation is least pernicious, where the important announcements about the system or social events or major disputes or new conferences are announced. When an earthquake or fire happens, News is where you want to go. Immediately after the 1989 earthquake and during the Oakland fire of 1991, the WELL was a place to check the damage to the local geographic community, lend help to those who need it, and get first-hand reports. During Tienamen square, the Gulf War, the Soviet Coup, the WELL was a media-funnel, with snippets of email from Tel-Aviv and entire newsgroups fed by fax machines in China, erupting in News conference topics that grew into fast-moving conferences of their own. During any major crisis in the real world, the routine at our house is to turn on CNN and log into the WELL.

After News is Hosts, where the hottest stuff usually happens. The hosts community is a story in itself. The success of the WELL in its first five years, all would agree, rested heavily on the efforts of the conference hosts – online characters who had created the character of the first neighborhoods and kept the juice flowing between one another all over the WELL, but most pointedly in the Hosts conference. Some spicy reading in the Archives conference originated from old hosts' disputes - and substantial arguments about the implications of CMC for civil rights, intellectual property, censorship, by a lot of people who know what they are talking about, mixed liberally with a lot of other people who don't know what they are talking about, but love to talk anyway, via keyboard and screen, for years on end.

In this virtual place, the pillars of the community and the worst offenders of public sensibilities are in the same group – the hosts. At their best and their worst, this ten percent of the online population put out the words that the other ninety percent keep paying to read. Like good hosts at any social gathering, they make newcomers welcome, keep the conversation flowing, mediate disputes, clean up messes, and throw out miscreants, if need be. A WELL host is part salon keeper, part saloon keeper, part talk-show host, part publisher. The only power to censor or to ban a user is the hosts' power. Policy varies from host to host, and that's the only policy. The only justice for those who misuse that power is the forced participation in weeks of debilitating and vituperative post-mortem.

The hosts community is part long-running soap opera, part town meeting, bar-room brawl, anarchic debating society, creative groupmind, bloody arena, union hall, playpen, encounter group. The Hosts conference is extremely general, from technical questions to personal attacks. The Policy conference is supposed to be restricted to matters of what WELL policy is, or ought to be. The part-delusion, part-accurate perception that the hosts and other users have strong influence over WELL policy is part of what feeds debate here, and a strong element in the libertarian reputation of the stereotypical WELLite. After fighting my way through a day's or hour's worth of the Hot New Dispute in News, Hosts, and Policy, I check on the conferences I host – Info, Virtual Communities, Virtual Reality. After that my '`.cflist`' directs me, at the press of the return key, to the first new topic or response in the Parenting, Writers', Grateful Dead tours, Telecommunication, Macintosh, Weird, Electronic Frontier Foundation, Whole Earth, Books, Media, Men on the WELL, Miscellaneous, and Unclear conferences.

The social dynamics of the WELL spawn new conferences in response to different kinds of pressures. Whenever a hot interpersonal or doctrinal issue breaks out, for example, people want to stage the brawl or make a dramatic farewell speech or shocking disclosure or serious accusation in the most heavily-visited area of the WELL, which is usually the place that others want to be a Commons – a place where people from different sub-communities can come to find out what is going on around the WELL, outside the WELL, where they can pose questions to the committee of the whole. When too many discussions of what the WELL's official policy ought to be, about censorship or intellectual property or the way people treat each other, break out, they tended to clutter the place people went to get a quick sense of what is happening outside their neighborhoods. So the Policy conference was born.

But then the WELL grew larger and it wasn't just policy but governance and social issues like political correctness or the right of users to determine the social rules of the system. Several years and six thousand more users after the fission of the News and Policy conferences, another conference split off News – "MetaWELL," a conference was created strictly to discussions about the WELL itself, its nature, its situation (often dire), its future.

Grabbing attention in the Commons is a powerful act. Some people seem drawn to performing there; others burst out there in acts of desperation, after one history of frustration or another. Dealing with people who are so consistently off-topic or apparently deeply grooved into incoherence, long-windedness, scatology, is one of the events that challenges a community to decide what its values really are, or ought to be.

Something is happening here. I'm not sure anybody understands it yet. I know that the WELL and the net is an important part of my life and I have to decide for myself whether this is a new way to make genuine commitments to other human beings, or a silicon-induced illusion of community. I urge others to help pursue that question in a variety of ways, while we have the time. The political dimensions of CMC might lead to situations that would pre-empt questions of other social effects; responses to the need for understanding the power-relationships inherent in CMC are well represented by the Electronic Frontier Foundation and others. We need to learn a lot more, very quickly, about what kind of place our minds are homesteading.

The future of virtual communities is connected to the future of everything else, starting with the most precious thing people have to gain or lose – political freedom. The part played by communication technologies in the disintegration of communism, the way broadcast television pre-empted the American electoral process, the power of fax and CMC networks during times of political repression like Tienamen Square and the Soviet Coup attempt, the power of citizen electronic journalism, the power-maneuvering of law enforcement and intelligence agencies to restrict rights of citizen access and expression in cyberspace, all point to the future of CMC as a close correlate of future political scenarios. More important than civilizing cyberspace is ensuring its freedom as a citizen-to-citizen communication and publication medium; laws that infringe equity of access to and freedom of expression in cyberspace could transform today’s populist empowerment into yet another instrument of manipulation. Will “electronic democracy” be an accurate description of political empowerment that grows out of the screen of a computer? Or will it become a brilliant piece of disinfotainment, another means of manipulating emotions and manufacturing public opinion in the service of power.

Who controls what kinds of information is communicated in the international networks where virtual communities live? Who censors, and what is censored? Who safeguards the privacy of individuals in the face of technologies that make it possible to amass and retrieve detailed personal information about every member of a large population? The answers to these political questions might make moot any more abstract questions about cultures in cyberspace. Democracy itself depends on the relatively free flow of communications. The following words by James Madison are carved in marble at the United States Library of Congress: “A popular government without popular information, or the means of acquiring it, is but a prologue to a farce or a tragedy, or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own governors must arm themselves with the power which knowledge gives.” It is time for people to arm themselves with power about the future of CMC technology.

Who controls the market for relationships? Will the world’s increasingly interlinked, increasingly powerful, decreasingly costly communications infrastructure be controlled by a small number of very large companies? Will cyberspace be privatized and parceled out to those who can afford to buy into the auction? If political forces do not seize the high ground and end today’s freewheeling exchange of ideas, it is still possible for a more benevolent form of economic control to stunt the evolution of virtual communities, if a small number of companies gain the power to put up toll-roads in the information networks, and smaller companies are not able to compete with them.

Or will there be an open market, in which newcomers like Apple or Microsoft can become industry leaders? The playing field in the global telecommunications industry will never be level, but the degree of individual freedom available through telecommunication technologies in the future may depend upon whether the market for goods and services in cyberspace remains open for new companies to create new uses for CMC.

I present these observations as a set of questions, not as answers. I believe that we need to try to understand the nature of CMC, cyberspace, and virtual communities in every important context – politically, economically, socially, culturally, cognitively. Each different perspective reveals something that the other perspectives do not reveal. Each different discipline fails to see something that another discipline sees very well. We need to think as teams here, across boundaries of academic discipline, industrial affiliation, nation, to understand, and thus perhaps regain control of, the way human communities are being transformed by communication technologies. We can’t do this solely as dispassionate observers, although there is certainly a huge need for the detached assessment of social science. But community is a matter of the heart and the gut as well as the head. Some of the most important learning will always have to be done by jumping into one corner or another of cyberspace, living there, and getting up to your elbows in the problems that virtual communities face.

FYI:

Howard Rheingold (1985) *“Tools for Thought”* New York, NY.

Howard Reingold (1991) *“Virtual Reality”* New York, NY: Simon & Schuster.

Howard Rheingold (1993) *“The Virtual Community: Homesteading On The Electronic Frontier”* Addison–Wesley, Reading, MA.

"Everybody's got somewhere they call home."
— **Roger Waters**

"All's WELL that ends WELL."
— **Shakespeare**

"A Statement of Principle" by Bruce Sterling

By *Bruce Sterling*[1] `<bruces@well.sf.ca.us>`
(Reprinted from SCIENCE FICTION EYE #10 with permission of the author.)

I just wrote my first nonfiction book. It's called THE HACKER CRACKDOWN: LAW AND DISORDER ON THE ELECTRONIC FRONTIER. Writing this book has required me to spend much of the past year and a half in the company of hackers, cops, and civil libertarians.

I've spent much time listening to arguments over what's legal, what's illegal, what's right and wrong, what's decent and what's despicable, what's moral and immoral, in the world of computers and civil liberties. My various informants were knowledgeable people who cared passionately about these issues, and most of them seemed well-intentioned. Considered as a whole, however, their opinions were a baffling mess of contradictions.

When I started this project, my ignorance of the issues involved was genuine and profound. I'd never knowingly met anyone from the computer underground. I'd never logged-on to an underground bulletin-board or read a semi-legal hacker magazine. Although I did care a great deal about the issue of freedom of expression, I knew sadly little about the history of civil rights in America or the legal doctrines that surround freedom of the press, freedom of speech, and freedom of association. My relations with the police were firmly based on the stratagem of avoiding personal contact with police to the greatest extent possible.

I didn't go looking for this project. This project came looking for me. I became inextricably involved when agents of the United States Secret Service, acting under the guidance of federal attorneys from Chicago, came to my home town of Austin on March 1, 1990, and confiscated the computers of a local science fiction gaming publisher. *Steve Jackson* Games, Inc., of Austin, was about to publish a gaming-book called GURPS Cyberpunk.

When the federal law-enforcement agents discovered the electronic manuscript of CYBERPUNK on the computers they had seized from Mr. Jackson's offices, they expressed grave shock and alarm. They declared that CYBERPUNK was "a manual for computer crime."

It's not my intention to reprise the story of the Jackson case in this column. I've done that to the best of my ability in THE HACKER CRACKDOWN; and in any case the ramifications of March 1 are far from over. Mr. Jackson was never charged with any crime. His civil suit against the raiders is still in federal court as I write this.

I don't want to repeat here what some cops believe, what some hackers believe, or what some civil libertarians believe. Instead, I want to discuss my own moral beliefs as a science fiction writer – such as they are. As an SF writer, I want to attempt a personal statement of principle.

It has not escaped my attention that there are many people who believe that anyone called a "cyberpunk" must be, almost by definition, entirely devoid of principle. I offer as evidence an excerpt from *Buck BloomBecker*'s 1990 book, SPECTACULAR COMPUTER CRIMES. On page 53, in a chapter titled "Who Are The Computer Criminals?", Mr. BloomBecker introduces the formal classification of "cyberpunk" criminality.

"In the last few years, a new genre of science fiction has arisen under the evocative name of 'cyberpunk.' Introduced in the work of *William Gibson*, particularly in his prize-winning novel NEUROMANCER, cyberpunk takes an apocalyptic view of the technological future. In NEUROMANCER, the protagonist is a futuristic hacker who must use the most sophisticated computer strategies to commit crimes for people who offer him enough money to buy the biological creations he needs to survive. His life is one of cynical despair, fueled by the desire to avoid death. Though none of the virus cases actually seen so far have been so devastating, this book certainly represents an attitude that should be watched for when we find new cases of computer virus and try to understand the motivations behind them."

"The New York Times's *John Markoff*, one of the more perceptive and accomplished writers in the field, has written that a number of computer criminals demonstrate new levels of meanness. He characterizes them, as do I, as cyberpunks."

Those of us who have read Gibson's NEUROMANCER closely will be aware of certain factual inaccuracies in Mr. BloomBecker's brief review. NEUROMANCER is not "apocalyptic." The chief conspirator in NEUROMANCER forces Case's loyalty, not by buying his services, but by planting poison-sacs in his brain. Case is "fueled" not by his greed for money or "biological creations," or even by the cynical "desire to avoid death," but rather by his burning desire to hack cyberspace. And so forth.

However, I don't think this misreading of NEUROMANCER is based on carelessness or malice. The rest of Mr. BloomBecker's book generally is informative, well-organized, and thoughtful. Instead, I feel that Mr. BloomBecker manfully absorbed as much of NEUROMANCER as he could without suffering a mental toxic reaction. This report of his is what he actually *saw* when reading the novel.

NEUROMANCER has won quite a following in the world of computer crime investigation. A prominent law enforcement official once told me that police unfailingly conclude the worst when they find a teenager with a computer and a copy of NEUROMANCER. When I declared that I too was a "cyberpunk" writer, she asked me if I would print the recipe for a pipe-bomb in my works. I was astonished by this question, which struck me as bizarre rhetorical excess at the time. That was before I had actually examined bulletin-boards in the computer underground, which I found to be chock-a-block with recipes for pipe-bombs, and worse. (I didn't have the heart to tell her that my friend and colleague *Walter Jon Williams* had once written and published an SF story closely describing explosives derived from simple household chemicals.)

Cyberpunk SF (along with SF in general) has, in fact, permeated the computer underground. I have met young underground hackers who use the aliases "Neuromancer," "Wintermute" and "Count Zero." The Legion of Doom, the absolute bete noire of computer law-enforcement, used to congregate on a bulletin-board called "Black Ice."

In the past, I didn't know much about anyone in the underground, but they certainly knew about me. Since that time, I've had people express sincere admiration for my novels, and then, in almost the same breath, brag to me about breaking into hospital computers to chortle over confidential medical reports about herpes victims.

The single most stinging example of this syndrome is "*Pengo*," a member of the German hacker-group that broke into Internet computers while in the pay of the KGB. He told German police, and the judge at the trial of his co-conspirators, that he was inspired by NEUROMANCER and *John Brunner*'s SHOCKWAVE RIDER.

I didn't write NEUROMANCER. I did, however, read it in manuscript and offered many purportedly helpful comments. I praised the book publicly and repeatedly and at length. I've done everything I can to get people to read this book.

I don't recall cautioning Gibson that his novel might lead to anarchist hackers selling their expertise to the ferocious and repulsive apparat that gave the world the Lubyanka and the Gulag Archipelago. I don't think I could have issued any such caution, even if I'd felt the danger of such a possibility, which I didn't. I still don't know in what fashion Gibson might have changed his book to avoid inciting evildoers, while still retaining the integrity of his vision – the very quality about the book that makes it compelling and worthwhile.

This leads me to my first statements of moral principle.

As a "cyberpunk" SF writer, I am not responsible for every act committed by a Bohemian with a computer. I don't own the word "cyberpunk" and cannot help where it is bestowed, or who uses it, or to what ends.

As a science fiction writer, it is not my business to make people behave. It is my business to make people imagine. I cannot control other people's imaginations – any more than I would allow them to control mine.

I am, however, morally obliged to speak out when acts of evil are committed that use my ideas or my rhetoric, however distantly, as a justification.

Pengo and his friends committed a grave crime that was worthy of condemnation and punishment. They were clever, but treacherously clever. They were imaginative, but it was imagination in a bad cause. They were technically accomplished, but they abused their expertise for illicit profit and to feed their egos. They may be "cyberpunks" – according to many, they may deserve that title far more than I do – but they're no friends of mine.

What is "crime"? What is a moral offense? What actions are evil and dishonorable? I find these extraordinarily difficult questions. I have no special status that should allow me to speak with authority on such subjects. Quite the contrary. As a writer in a scorned popular literature and a self-professed eccentric Bohemian, I have next to no authority of any kind. I'm not a moralist, philosopher, or prophet. I've always considered my "moral role," such as it is, to be that of a court jester – a person sometimes allowed to speak the unspeakable, to explore ideas and issues in a format where they can be treated as games, thought-experiments, or metaphors, not as prescriptions, laws, or sermons.

I have no religion, no sacred scripture to guide my actions and provide an infallible moral bedrock. I'm not seeking political responsibilities or the power of public office. I habitually question any pronouncement of authority, and entertain the liveliest skepticism about the processes of law and justice. I feel no urge to conform to the behavior of the majority of my fellow citizens. I'm a pain in the neck.

My behavior is far from flawless. I lived and thrived in Austin, Texas in the 1970s and 1980s, in a festering milieu of arty crypto-intellectual hippies. I've committed countless "crimes," like millions of other people in my generation. These crimes were of the glamorous "victimless" variety, but they would surely have served to put me in prison had I done them, say, in front of the State Legislature.

Had I lived a hundred years ago as I live today, I would probably have been lynched by outraged fellow Texans as a moral abomination. If I lived in Iran today and wrote and thought as I do, I would probably be tried and executed.

As far as I can tell, moral relativism is a fact of life. I think it might be possible to outwardly conform to every jot and tittle of the taboos of one's society, while feeling no emotional or intellectual commitment to them. I understand that certain philosophers have argued that this is morally proper behavior for a good citizen. But I can't live that life. I feel, sincerely, that my society is engaged in many actions which are foolish and shortsighted and likely to lead to our destruction. I feel that our society must change, and change radically, in a process that will cause great damage to our present system of values. This doesn't excuse my own failings, which I regret, but it does explain, I hope, why my lifestyle and my actions are not likely to make authority feel entirely comfortable.

Knowledge is power. The rise of computer networking, of the Information Society, is doing strange and disruptive things to the processes by which power and knowledge are currently distributed. Knowledge and information, supplied through these new conduits, are highly corrosive to the status quo. People living in the midst of technological revolution are living outside the law: not necessarily because they mean to break laws, but because the laws are vague, obsolete, overbroad, draconian, or unenforceable. Hackers break laws as a matter of course, and some have been punished unduly for relatively minor infractions not motivated by malice. Even computer police, seeking earnestly to apprehend and punish wrongdoers, have been accused of abuse of their offices, and of violation of the Constitution and the civil statutes. These police may indeed have committed these "crimes." Some officials have already suffered grave damage to their reputations and careers – all the time convinced that they were morally in the right; and, like the hackers they pursued, never feeling any genuine sense of shame, remorse, or guilt.

I have lived, and still live, in a counterculture, with its own system of values. Counterculture – Bohemia – is never far from criminality. "To live outside the law you must be honest" was Bob Dylan's classic hippie motto. A Bohemian finds romance in the notion that "his clothes are dirty but his hands are clean." But there's danger in setting aside the strictures of the law to linchpin one's honor on one's personal integrity. If you throw away the rulebook to rely on your individual conscience you will be put in the way of temptation.

And temptation is a burden. It hurts. It is grotesquely easy to justify, to rationalize, an action of which one should properly be ashamed. In investigating the milieu of computer-crime I have come into contact with a world of temptation formerly closed to me. Nowadays, it would take no great effort on my part to break into computers, to steal long-distance telephone service, to ingratiate myself with people who would merrily supply me with huge amounts of illicitly copied software. I could even build pipe-bombs. I haven't done these things, and disapprove of them; in fact, having come to know these practices better than I cared to, I feel sincere revulsion for them now. But this knowledge is a kind of power, and power is tempting. Journalistic objectivity, or the urge to play with ideas, cannot entirely protect you. Temptation clings to the mind like a series of small but nagging weights. Carrying these weights may make you stronger. Or they may drag you down.

"His clothes are dirty but his hands are clean." It's a fine ideal, when you can live up to it. Like a lot of Bohemians, I've gazed with a fine disdain on certain people in power whose clothes were clean but their hands conspicuously dirty. But I've also met a few people eager to pat me on the back, whose clothes were dirty and their hands as well. They're not pleasant company.

Somehow one must draw a line. I'm not very good at drawing lines. When other people have drawn me a line, I've generally been quite anxious to have a good long contemplative look at the other side. I don't feel much confidence in my ability to draw these lines. But I feel that I should. The world won't wait. It only took a few guys with pool cues and switchblades to turn Woodstock Nation into Altamont. Haight-Ashbury was once full of people who could trust anyone they'd smoked grass with and love anyone they'd dropped acid with – for about six months. Soon the place was aswarm with speed-freaks and junkies, and heaven help us if they didn't look just like the love-bead dudes from the League of Spiritual Discovery. Corruption exists, temptation exists. Some people fall. And the temptation is there for all of us, all the time.

I've come to draw a line at money. It's not a good line, but it's something. There are certain activities that are unorthodox, dubious, illegal or quasi-legal, but they might perhaps be justified by an honest person with unconventional standards. But in my opinion, when you're making a commercial living from breaking the law, you're beyond the pale. I find it hard to accept your countercultural sincerity when you're grinning and pocketing the cash, compadre.

I can understand a kid swiping phone service when he's broke, powerless, and dying to explore the new world of the networks. I don't approve of this, but I can understand it. I scorn to do this myself, and I never have; but I don't find it so heinous that it deserves pitiless repression. But if you're stealing phone service and selling it – if you've made yourself a miniature phone company and you're pimping off the energy of others just to line your own pockets – you're a thief. When the heat comes to put you away, don't come crying "brother" to me.

If you're creating software and giving it away, you're a fine human being. If you're writing software and letting other people copy it and try it out as shareware, I appreciate your sense of trust, and if I like your work, I'll pay you. If you're copying other people's software and giving it away, you're damaging other people's interests, and should be ashamed, even if you're posing as a glamorous info-liberating subversive. But if you're copying other people's software and selling it, you're a crook and I despise you.

Writing and spreading viruses is a vile, hurtful, and shameful activity that I unreservedly condemn.

There's something wrong with the Information Society. There's something wrong with the idea that "information" is a commodity like a desk or a chair. There's something wrong with patenting software algorithms. There's something direly mean spirited and ungenerous about inventing a language and then renting it out to other people to speak. There's something unprecedented and sinister in this process of creeping commodification of data and knowledge. A computer is something too close to the human brain for me to rest entirely content with someone patenting or copyrighting the process of its thought. There's something sick and unworkable about an economic system which has already spewed forth such a vast black market. I don't think democracy will thrive in a milieu where vast empires of data are encrypted, restricted, proprietary, confidential, top secret, and sensitive. I fear for the stability of a society that builds sand castles out of databits and tries to stop a real-world tide with royal commands.

Whole societies can fall. In Eastern Europe we have seen whole nations collapse in a slough of corruption. In pursuit of their unworkable economic doctrine, the Marxists doubled and redoubled their efforts at social control, while losing all sight of the values that make life worth living. At last the entire power structure was so discredited that the last remaining shred of moral integrity could only be found in Bohemia: in dissidents and dramatists and their illegal samizdat underground fanzines. Their clothes were dirty but their hands were clean. The only agitprop poster Vaclav Havel needed was a sign saying *Vaclav Havel Guarantees Free Elections*. He'd never held power, but people believed him, and they believed his Velvet Revolution friends.

I wish there were people in the Computer Revolution who could inspire, and deserved to inspire, that level of trust. I wish there were people in the Electronic Frontier whose moral integrity unquestionably matched the unleashed power of those digital machines. A society is in dire straits when it puts its Bohemia in power. I tremble for my country when I contemplate this prospect. And yet it's possible. If dire straits come, it can even be the last best hope.

The issues that enmeshed me in 1990 are not going to go away. I became involved as a writer and journalist, because I felt it was right. Having made that decision, I intend to stand by my commitment. I expect to stay involved in these issues, in this debate, for the rest of my life. These are timeless issues: civil rights, knowledge, power, freedom and privacy, the necessary steps that a civilized society must take to protect itself from criminals. There is no finality in politics; it creates itself anew, it must be dealt with every day.

The future is a dark road and our speed is headlong. I didn't ask for power or responsibility. I'm a science fiction writer, I only wanted to play with Big Ideas in my cheerfully lunatic sandbox. What little benefit I myself can contribute to society would likely be best employed in writing better SF novels. I intend to write those better novels, if I can. But in the meantime I seem to have accumulated a few odd shreds of influence. It's a very minor kind of power, and doubtless more than I deserve; but power without responsibility is a monstrous thing.

In writing HACKER CRACKDOWN, I tried to describe the truth as other people saw it. I see it too, with my own eyes, but I can't yet pretend to understand what I'm seeing. The best I can do, it seems to me, is to try to approach the situation as an open-minded person of goodwill. I therefore offer the following final set of principles, which I hope will guide me in the days to come.

- I'll listen to anybody, and I'll try to imagine myself in their situation.
- I'll assume goodwill on the part of others until they fully earn my distrust.
- I won't cherish grudges. I'll forgive those who change their minds and actions, just as I reserve the right to change my own mind and actions.

- I'll look hard for the disadvantages to others, in the things that give me advantage. I won't assume that the way I live today is the natural order of the universe, just because I happen to be benefiting from it at the moment.

And while I don't plan to give up making money from my ethically dubious cyberpunk activities, I hope to temper my impropriety by giving more work away for no money at all.

FYI:

Bruce Sterling (1992) *"Free as Air, Free as Water, Free as Knowledge"* Speech to the Library Information Technology Association, June 1992. San Francisco, CA.

Bruce Sterling (1992) *"The Hacker Crackdown: Law and Disorder at the Electronic Frontier"*, Bantam Books, NY: New York.

Bruce Sterling & William Gibson (1993) *"Literary Freeware – Not for Commercial Use"* Speeches to National Academy of Sciences Convocation on Technology and Education, May 10, 1993, Washington, D.C.: Computer Underground Digest #5.54.

Bruce Sterling (1992–1993) *"Agitprop disk: Literary Freeware – Not for Commercial Use"* Contains various SF magazine columns, texts of speeches, etc. Available via anonymous FTP from **ftp.eff.org** in directory '`/pub/agitprop`'. Or use Gopher at **gopher.well.sf.ca.us** (alternatively **tic.com**) and see under '`Bruce Sterling/`'.

Bruce Sterling (1994) *"The Hacker Crackdown: Law and Disorder at the Electronic Frontier (electronical issue)"* New on the "Agitprop" disk, and all archives it is available from (cf above).

"...and the silicon chip inside her head,
has turned to overload."
— **Bob Geldof**, *"I don't like Mondays"*

"Subject: TIME article on Internet" by Philip Elmer-Dewitt

By *Philip Elmer-Dewitt*[1]
(Reprinted from article posted to `<interesting-people@eff.org>`, and originally in TIME magazine)

TECHNOLOGY
FIRST NATION IN CYBERSPACE

Twenty million strong and adding a million new users a month, the Internet is suddenly the place to be.

Back in the mid-1960s, at the height of the cold war, the Department of Defense faced a tough question: How could orders be issued to the armed forces if the U.S. were ravaged by a nuclear assault? The communication hubs in place at the time – the telephone switching offices and the radio and TV broadcast stations – were not only vulnerable to attack, they would also probably be the first to go. The Pentagon needed a military command-and-control system that would continue to operate even if most of the phone lines were in tatters and the switches had melted down.

In 1964 a researcher at the Rand Corp. named Paul Baran came up with a bizarre solution to this Strangelovian puzzle. He designed a computer-communications network that had no hub, no central switching station, no governing authority, and that assumed that the links connecting any city to any other were totally unreliable. Baran's system was the antithesis of the orderly, efficient phone network; it was more like an electronic post office designed by a madman. In Baran's scheme, each message was cut into tiny strips and stuffed into electronic envelopes, called packets, each marked with the address of the sender and the intended receiver. The packets were then released like so much confetti into the web of interconnected computers, where they were tossed back and forth over high-speed wires in the general direction of their destination and reassembled when they finally got there. If any packets were missing or mangled (and it was assumed that some would be), it was no big deal; they were simply re-sent.

Baran's packet-switching network, as it came to be called, might have been a minor footnote in cold war history were it not for one contingency: it took root in the computers that began showing up in universities and government research laboratories in the late 1960s and early 1970s and became, by a path as circuitous as one taken by those wayward packets, the technological underpinning of the Internet.

The Internet, for those who haven't been hanging out in cyberspace, reading the business pages or following Doonesbury, is the mother of all computer networks – an anarchistic electronic freeway that has spread uncontrollably and now circles the globe. It is at once the shining archetype and the nightmare vision of the information highway that the Clinton Administration has been touting and that the telephone and cable-TV companies are racing to build. Much of what Bell Atlantic and Time Warner are planning to sell – interactivity, two-way communications, multimedia info on demand – the Internet already provides for free. And because of its cold war roots, the Internet has one quality that makes it a formidable competitor: you couldn't destroy it if you tried.

Nobody owns the Internet, and no single organization controls its use. In the mid-1980s the National Science Foundation built the high-speed, long-distance data lines that form Internet's U.S. backbone. But the major costs of running the network are shared in a cooperative arrangement by its primary users: universities, national labs, high-tech corporations and foreign governments. Two years ago, the NSF lifted restrictions against commercial use of the Internet, and in September the White House announced a plan to make it the starting point for an even grander concept called the National Information Infrastructure.

Suddenly the Internet is the place to be. College students are queuing up outside computing centers to get online. Executives are ordering new business cards that show off their Internet addresses. Millions of people around the world are logging on to tap into libraries, call up satellite weather photos, download free computer programs and participate in discussion groups with everyone from lawyers to physicists to sadomasochists. Even the President and Vice President have their own Internet accounts (although they aren't very good at answering their mail). "It's the Internet boom," says network activist Mitch Kapor, who thinks the true sign that popular interest has reached critical mass came this summer when the New Yorker printed a cartoon showing two computer-savvy canines with the caption, "On the Internet, nobody knows you're a dog."

But the Internet is not ready for prime time. There are no TV Guides to sort through the 5,000 discussion groups or the 2,500 electronic newsletters or the tens of thousands of computers with files to share. Instead of feeling surrounded by information, first-timers ("newbies" in the jargon of the Net) are likely to find themselves adrift in a borderless sea. Old-timers say the first wave of dizziness doesn't last long. "It's like driving a car with a clutch," says Thomas Lunzer, a network designer at SRI International, a California consulting firm. "Once you figure it out, you can drive all over the place."

But you must learn new languages (like UNIX), new forms of address (like `<president@whitehouse.gov>`) and new ways of expressing feeling (like those ubiquitous sideways smiley faces), and you must master a whole set of rules for how to behave, called netiquette. Rule No. 1: Don't ask dumb questions. In fact, don't ask any questions at all before you've read the FAQ (frequently asked questions) files. Otherwise you risk annoying a few hundred thousand people who may either yell at you (IN ALL CAPS!) or, worse still, ignore you.

All that is starting to change, however, as successive waves of netters demand, and eventually get, more user-friendly tools for navigating the Internet. In fact, anyone with a desktop computer and a modem connecting it to a phone line can now find ways into and around the network. "The Internet isn't just computer scientists talking to one another anymore," says Glee Willis, the engineering librarian at the University of Nevada at Reno and one of nearly 20,000 (mostly female) academic librarians who have joined the Internet in the past five years. "It's a family place. It's a place for perverts. It's everything rolled into one."

As traffic swells, the Internet is beginning to suffer the problems of any heavily traveled highway, including vandalism, break-ins and traffic jams. "It's like an amusement park that's so successful that there are long waits for the most popular rides," says David Farber, a professor of information science at the University of Pennsylvania and one of the network's original architects. And while most users wait patiently for the access and information they need, rogue hackers use stolen passwords to roam the network, exploring forbidden computers and reading other people's mail.

How big is the Internet? Part of its mystique is that nobody knows for sure. The only fact that can be measured precisely is the number of computers directly connected to it by high-speed links – a figure that is updated periodically by sending a computer program crawling around like a Roto-Rooter, tallying the number of connections (last count: roughly 2 million). But that figure does not include military computers that for security reasons are invisible to other users, or the hundreds of people who may share a single Internet host. Nor does it include millions more who dial into the Internet through the growing number of commercial gateways, such as Panix and Netcom, which offer indirect telephone access for $10 to $20 a month. When all these users are taken into account, the total number of people around the world who can get into the Internet one way or another may be 20 million. "It's a large country," says Farber of the Internet population. "We ought to apply to the U.N. as the first nation in cyberspace."

That nation is about to get even bigger as the major commercial computer networks – Prodigy, CompuServe, America Online, GEnie and Delphi Internet Service – begin to dismantle the walls that have separated their private operations from the public Internet. The success of the Internet is a matter of frustration to the owners of the commercial networks, who have tried all sorts of marketing tricks and still count fewer than 5 million subscribers among them. Most commercial networks now allow electronic mail to pass between their services and the Internet. Delphi, which was purchased by Rupert Murdoch's News Corp. in September, began providing its customers full Internet access last summer. America Online (which publishes an electronic version of Time) is scheduled to begin offering limited Internet services later this month.

People who use these new entry points into the Net may be in for a shock. Unlike the family-oriented commercial services, which censor messages they find offensive, the Internet imposes no restrictions. Anybody can start a discussion on any topic and say anything. There have been sporadic attempts by local network managers to crack down on the raunchier discussion groups, but as Internet pioneer *John Gilmore* puts it, "The Net interprets censorship as damage and routes around it."

The casual visitor to the newsgroups on the Usenet (a bulletin-board system that began as a competitor to the Internet but has been largely subsumed by it) will discover discussion groups labeled, according to the Net's idiosyncratic cataloging system, alt.sex.masturbation, alt.sex.bondage and alt.sex.fetish.feet. On Internet Relay Chat, a global 24-hour-a-day message board, one can stumble upon imaginary orgies played out with one-line typed commands ("Now I'm taking off your shirt..."). In **alt.binaries.pictures.erotica**, a user can peek at snapshots that would make a sailor blush.

But those who focus on the Internet's sexual content risk missing the point. For every sexually oriented discussion group there are hundreds on tamer and often more substantial topics ranging from bungee jumping to particle physics. Last week Virginia college student *Chris Glover* responded to a distressed message from a suicidal undergraduate in Denver. After two hours of messages back and forth, Glover was able to pinpoint the woman's location and call for help.

With all this variety, Internet users are unimpressed by television's promise of a 500-channel future. The Internet already delivers 10,000 channels, and the only obstacle that prevents it from carrying live TV pictures is the bandwidth (or carrying capacity) of the data lines. Some video clips – and at least one full-length video movie – are already available on the network. And last spring, writer Carl Malamud began using the Internet to distribute a weekly "radio" interview show called Geek of the Week. Malamud is undeterred by the fact that it takes a computer about an hour over a high-speed modem to capture the 30 minutes of sound that a \$10 radio can pick up instantly for free. But bandwidth capacity has nowhere to go but up, says Malamud, and its cost will only go down.

The Internet, however, will have to go through some radical changes before it can join the world of commerce. Subsidized for so long by the Federal Government, its culture is not geared to normal business activities. It does not take kindly to unsolicited advertisements; use electronic mail to promote your product and you are likely to be inundated with hate mail directed not only at you personally but also at your supervisor, your suppliers and your customers as well. "It's a perfect Marxist state, where almost nobody does any business," says Farber. "But at some point that will have to change."

The change has already begun. NSF's contribution now represents about 10% of the total cost of the network, and the agency is scheduled to start phasing out its support next April, removing at the same time what few restrictions still remain against commercial activity. According to Tim O'Reilly, president of O'Reilly & Associates, a publisher experimenting with advertiser-supported Internet magazines, the system could evolve in one of two ways: either entrepreneurs will manage to set up shop on a free-market version of the Internet, or some consortium will take the whole thing over and turn it into a giant CompuServe. "That's an outcome," O'Reilly says, "that would effectively destroy the Internet as we know it."

As the traffic builds and the billboards go up, some Internet veterans are mourning the old electronic freeway. "I feel kind of sad about it," says Denise Caruso, editorial director of Friday Holdings, a publisher specializing in new media. "It was such a dynamic, pulsing thing. I wonder whether we shouldn't have left it alone." Others see the period of uncertainty ahead as a rare opportunity for citizens to shape their own technological destiny. "We need... a firm idea of the kind of media environment we would like to see in the future," warns Howard Rheingold in his new book, The Virtual Community. While it may be difficult for communities as diverse as those on the Internet to set their own agenda, it seems increasingly likely that if they don't, someone else will do it for them.

With reporting by *David S. Jackson*/San Francisco and *Wendy King*/Washington.

"Subject: A Perspective on NREN" by Greg Chartrand

By *Greg Chartrand*[1] <Greg_Chartrand@qmail.ssc.gov>

National Science Foundation Develops a National Super Highway
Greg Chartrand
3/11/93

> "I just returned from a network meeting in San Diego today and thought you would be interested in my interpretation of what NSF proposes for the National Education and Research Network (NREN). Rather than comment specifically, I decided it would be interesting to write a *parody* which relates the NREN to the construction of a national super highway. Doing so removes the highly technical aspects of the overall planned functions the NREN. Please excuse this style, but I think its the only way to explain my understanding of their plan in a way that does not immediately get very technical. It may be flawed, but the information is based upon Hans-Werner Braun's presentation.... as I understood it."

The National Science Foundation is in the process of developing plans to build a national super highway that will advance transportation technology in our country. The super highway proposed will replace the existing interstate highway system and allow speeds of at least 240 MPH. the following interview with NSF developers explores their current plans.

*

ME: I understand you are building a new Super national highway[2] to serve the purposes of advancing ground transportation throughout our county.

NSF: Yes we are, as a part of an earlier initiative sponsored by the then Senator Gore. We are very excited about the technology that will allow transportation speeds of 240 MPH[3] across the country.

ME: That sounds exciting, how will it be built?

NSF: Well, we will have this super highway designed to allow the high speed travel[4] and it will have six entrance/exit ramps.[5]

ME: Ahh.... that doesn't sound like very many ramps, where will they be located?

NSF: Well, several years ago we funded the establishment of six gourmet restaurants[6] scattered across the country, we are going to fund the building of the super highway and access ramps at the restaurant locations. We are however allowing the ramp contractor[7] to build as many ramps as he wishes, at his own expense.

ME: I assume then the contractor for the highway[8] builds ramps where ever it makes sense to optimize access.

NSF: Well, not exactly. We are separating the contracts for the ramps and the highway so the bidders can be very competitive.

---

2 NSFnet backbone project
3 155 megabit/s
4 high speed data transfer
5 Network Access Points (NAP's)
6 NSF sponsored super computer centers
7 The contractor providing the NAP's.
8 The contractor to provide the backbone telecommunications services

ME: I see. How to you plan to connect the rest of the interstate highway system[9] to your super national highway?

NSF: Well actually, its not part of our plan. We are having the highway and access ramps built for us, its up to the states or other government agencies to provide the highways to the access ramps. We will however fund a few temporary roads[10] to connect parts of the existing interstate highway system, but don't intend to make them permanent. Did I forget to mention that we will be shutting down the existing interstate highway system?[11]

ME: You mean I will no longer be able to drive across the existing interstate highway system?

NSF: Yes, it will be destroyed.

ME: OK, lets see If I understand. I have a state highway system for example, and I put in a connecting highway to your super highway, and I can now travel on it, right?

NSF: Well, no you can't. The super highway will only be used for vehicles that can run 240 MPH[12] and we must approve every vehicle, destination, and trip the vehicle takes.[13] We don't want our super highway clogged with vehicles which can only travel 70 MPH![14]

ME: I'm confused. You mean you want my state for example, to build an access road to a super highway it can't generally use?

NSF: Well, yes and no. You see we also want to encourage development of toll roads in our country.[15] Our six high speed access ramps are wide enough to allow parallel toll roads to be accessed as well as our super highway. Private road builders will be able to put in toll roads between our access ramps, for a fee.

ME: So there will no longer be a "free" interstate highway system?

NSF: Right!

ME: Lets see if I got this straight. You build a national super highway that has six access ramps located where you once established gourmet restaurants and you destroy the interstate highway system. There are no plans to replicate the functionality of the interstate highway systems, but you will allow private toll road builders to use your wide access ramps and develop parallel toll roads to your super highway. My state or the government has to build the roads that lead to the super highway, but once there, cannot travel on it unless the specific vehicle can run at 240 MPH and has specific permission from you to travel on it.

NSF: You've got it!

ME: Well then you must have a very interesting reason to put this highway and the access ramps at these restaurant locations.

---

[9] The Existing internet, regional, state, and other networks

[10] NSF plans to provide interim funding for NSF regionals to connect to the NAP's. State networks and other government agencies are on their own.

[11] The existing NSFnet will be turned off at some point after the new "arrangement" is in place.

[12] The Very High Speed Backbone Service (VBNS) is reserved for applications and purposes where a demonstrated need for high speed/capacity transmission is needed.

[13] NSF will require approval.

[14] NSF does not wish to clog the VBNS with low speed aggregate traffic unless additions are made to the network. 70 MPH = 45 MBS.

[15] The NSF expects commercial providers like AT&T, MCI to put networking between NAP's. Most of the existing NSFnet traffic would go over these commercial networks which would have to be paid for by the users.

NSF: Well, you see, the gourmet food business isn't what it used to be. Fast food has really taken over in our country, we really need to preserve the gourmet food business.[16] High quality restaurants should be located right off of classy high speed highways. We really would like to encourage restaurant patrons to use the super highway so they can have breakfast in San Diego and dinner in Champaign Illinois. We will be looking for patrons who can afford to eat at multiple restaurants and we will let them ride the highway for free! Of course they must have a vehicle that can go 240 MPH.[17]

ME: I'm even more confused. How will I get across the country?

NSF: Well, if your state puts in an access road to one of our access ramps you take it, and then exit-off on to one of the toll roads that will be built parallel to our super highway.

ME: How fast will I be able to go?[18]

NSF: What ever the speed limit is on the toll road.

ME: What will it cost me to ride on it?

NSF: What ever the toll is. You see, we expect that several toll roads will be developed. Competition! It should keep the price down.

ME: When the super highway is empty, how will it be used?

NSF: Well, we are telling the gourmet restaurants that they should work together even though they will be competing with each other for customers.[19] You know, they could develop plans to send trash to each other so they can demonstrate how fast the transportation is on the super highway, it would be in their best interest.[20]

ME: Aren't there plans for development of high speed toll roads already in progress by several toll road builders? What makes you think they will put their roads in-between your access ramps?[21]

NSF: F.O.D.

ME: What?

NSF: Field Of Dreams. If we build it they will come.

ME: So again, tell me who pays for what?

NSF: The government funds the super highway and six access ramps. The toll road providers build their own roads and pays an access fee for the ramps. The states and other government agencies pay for any roads necessary to get to the access ramps. When you get on a toll road and pay what ever the price is.

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[16] The usefulness of super computer systems has been grossly reduced by the technological advances associated with very powerful Unix work stations. Super computers fill a diminishing niche in science and industry.

[17] NSF is looking for potential users that can use more than one super computer center and use the VBNS to make the application work. Applications of this nature are a bit obscure.

[18] There are no specifications for commercial providers.

[19] NSF super computer centers are no longer funded by NSF so they compete for commercial and non-commercial business.

[20] NSF is asking the NSF super computer centers to develop demonstration applications which show how the network might be used. These applications would demonstrate, and not necessarly do anything useful.

[21] The major telecommunications suppliers will be selling similar services this year without the complications of the NAP's. The NAP's primary function would allow communications between commercial vendors which would be very useful, but it is unclear if the telecommunications suppliers will "buy" into this concept.

ME: And the only one's allowed to ride on the super highway are those persons who have special vehicles that can go 240 MPH with your specific permission, or those who can afford to frequent the gourmet restaurants and travel at 240 MPH. Everyone else takes the toll roads.

NSF: Right, but don't forget the trash runs between restaurants!

ME: Oh, how silly of me! Hmmmm. I wonder if this is really what Senator Gore had in mind?

"If we do not succeed, then we face the risk of failure."
— **Vice President Dan Quayle**

"What a terrible thing to have lost one's mind.
Or not to have a mind at all. How true that is."
— **Vice President Dan Quayle**
(winning friends while speaking to the United Negro College Fund)

Appendix A The Lingo

This glossary is only a tiny subset of net.speak, all the various terms and phrases that people regularly use on Internet. For a more complete (and more entertaining) reference, get a copy of *"The New Hacker's Dictionary"*, which is based on a VERY large text file called the Jargon File, edited by Eric Raymond `<eric@snark.thyrsus.com>`.

The 2nd edition just came out in December 1993, and is available from the MIT Press, Cambridge, Massachusetts, 02142. The up-to-date version of the Jargon File *"The on-line hacker Jargon File, version 3.0, 29 July 1993"*, is kept on various FTP servers (e.g. from **ftp.gnu.ai.mit.edu** as file '`/pub/gnu/jarg300.txt.gz`').

`:-)` This odd symbol is one of the ways a person can portray "mood" in the very flat medium of computers—by using "smilies." This is "metacommunication," and there are literally hundreds of them, from the obvious to the obscure (see Appendix E [Smiley Dictionary], page 215). This particular example expresses "happiness." Don't see it? Tilt your head to the left 90 degrees. Smilies, or smileys are also used to denote sarcasm.

ASCII Has two meanings. ASCII is a universal computer code for English letters and characters. Computers store all information as binary numbers. In ASCII, the letter "A" is stored as 01000001, whether the computer is made by IBM, Apple or Commodore. ASCII also refers to a method, or protocol, for copying files from one computer to another over a network, in which neither computer checks for any errors that might have been caused by static or other problems.

ANSI Computers use several different methods for deciding how to put information on your screen and how your keyboard interacts with the screen. ANSI is one of these "terminal emulation" methods. Although most popular on PC-based bulletin-board systems, it can also be found on some Net sites. To use it properly, you will first have to turn it on, or enable it, in your communications software.

ARPANet A predecessor of the Internet. Started in 1969 with funds from the Defense Department's Advanced Projects Research Agency.

Backbone A high-speed network that connects several powerful computers. In the U.S., the backbone of the Internet is often considered the NSFNet, a government funded link between a handful of supercomputer sites across the country.

Baud The speed at which modems transfer data. One baud is roughly equal to one bit per second. It takes eight bits to make up one letter or character. Modems rarely transfer data at exactly the same speed as their listed baud rate because of static or computer problems. More expensive modems use systems, such as Microcom Network Protocol (MNP), which can correct for these errors or which "compress" data to speed up transmission.

BITNet Another, academically oriented, international computer network, which uses a different set of computer instructions to move data. It is easily accessible to Internet users through e-mail, and provides a large number of conferences and databases. Its name comes from "Because It's Time."

Bounce What your e-mail does when it cannot get to its recipient – it bounces back to you – unless it goes off into the ether, never to be found again.

Command line On Unix host systems, this is where you tell the machine what you want it to do, by entering commands.

Communications software A program that tells a modem how to work.

Daemon An otherwise harmless Unix program that normally works out of sight of the user. On the Internet, you'll most likely encounter it only when your e-mail is not delivered to your recipient – you'll get back your original message plus an ugly message from a "mailer daemon."

Distribution A way to limit where your Usenet postings go. Handy for such things as "for sale" messages or discussions of regional politics.

Domain The last part of an Internet address, such as "news.com."

Dot When you want to impress the net veterans you meet at parties, say "dot" instead of "period," for example: "My address is john at site dot domain dot com."

Dot file A file on a Unix public-access system that alters the way you or your messages interact with that system. For example, your .login file contains various parameters for such things as the text editor you get when you send a message. When you do an ls command, these files do not appear in the directory listing; do '`ls -a`' to list them.

Down When a public-access site runs into technical trouble, and you can no longer gain access to it, it's down.

Download Copy a file from a host system to your computer. There are several different methods, or protocols, for downloading files, most of which periodically check the file as it is being copied to ensure no information is inadvertently destroyed or damaged during the process. Some, such as XMODEM, only let you download one file at a time. Others, such as batch-YMODEM and ZMODEM, let you type in the names of several files at once, which are then automatically downloaded.

EMACS From Editing MACroS. A standard Unix text editor preferred by Unix types that beginners tend to hate.

E-mail Electronic mail – a way to send a private message to somebody else on the Net. Used as both noun and verb.

Emoticon A smiley. See `:-)`.

F2F Face to Face. When you actually meet those people you been corresponding with/flaming.

FAQ Frequently Asked Questions. A compilation of answers to these. Many Usenet newsgroups have these files, which are posted once a month or so for beginners.

FYI For Your Interest.

Film at 11 One reaction to an overwrought argument: "Imminent death of the Net predicted. Film at 11."

Finger An Internet program that lets you get some bit of information about another user, provided they have first created a '`.plan`' file.

Flame Online yelling and/or ranting directed at somebody else. Often results in flame wars, which occasionally turn into holy wars (See Chapter 4 [Flame Wars to Killfiles], page 65).

Followup A Usenet posting that is a response to an earlier message.

Foo/foobar A sort of online algebraic place holder, for example: "If you want to know when another site is run by a for-profit company, look for an address in the form of `<foo@foobar.com>`."

Fortune cookie An inane/witty/profund comment that can be found around the net.

Freeware Software that doesn't cost anything.

FTP File-transfer Protocol. A system for transferring files across the Net.

Get a life What to say to somebody who has, perhaps, been spending a wee bit too much time in front of a computer.

GIF Graphics Interchange Format. A format developed in the mid-1980s by CompuServe for use in photo-quality graphics images. Now commonly used everywhere online.

GNU Gnu's Not Unix. A project of the Free Software Foundation to write a free version of the Unix operating system.

Hacker On the Net, unlike among the general public, this is not a bad person; it is simply somebody who enjoys stretching hardware and software to their limits, seeing just what they can get their computers to do. What many people call hackers, net.denizens refer to as crackers.

Handshake Two modems trying to connect first do this to agree on how to transfer data.

Hang When a modem fails to hang up.

Holy war Arguments that involve certain basic tenets of faith, about which one cannot disagree without setting one of these off. For example: IBM PCs are inherently superior to Macintoshes.

Host system A public-access site; provides Net access to people outside the research and government community.

IMHO In My Humble Opinion.

Internet A worldwide system for linking smaller computer networks together. Networks connected through the Internet use a particular set of communications standards to communicate, known as TCP/IP.

Killfile A file that lets you filter Usenet postings to some extent, by excluding messages on certain topics or from certain people.

Log on/log in Connect to a host system or public-access site.

Log off Disconnect from a host system.

Lurk Read messages in a Usenet newsgroup without ever saying anything.

Mailing list Essentially a conference in which messages are delivered right to your mailbox, instead of to a Usenet newsgroup. You get on these by sending a message to a specific e-mail address, which is often that of a computer that automates the process.

MIME Multi-purpose Internet Mail Extensions. A currently (1993) heavily developing extension of the Internet mail protocol, that enables sending of 8 bit e-mail messages, e.g. to support extended character sets, voice mail, FAX images, etc. Read **comp.mail.mime** if you want to keep up with new developments.

MOTSS Members of the Same Sex. Gays and Lesbians online. Originally an acronym used in the 1980 federal census.

Net.god One who has been online since the beginning, who knows all and who has done it all.

Net.personality Somebody sufficiently opinionated/flaky/with plenty of time on his hands to regularly post in dozens of different Usenet newsgroups, whose presence is known to thousands of people.

Net.police Derogatory term for those who would impose their standards on other users of the Net. Often used in vigorous flame wars (in which it occasionally mutates to **Net.nazis**).

Netiquette A set of common-sense guidelines for not annoying others.

Network A communications system that links two or more computers. It can be as simple as a cable strung between two computers a few feet apart or as complex as hundreds of thousands of computers around the world linked through fiber optic cables, phone lines and satellites.

Newbie Somebody new to the Net. Sometimes used derogatorily by **net.veterans** who have forgotten that they, too, were once newbies who did not innately know the answer to everything. "Clueless newbie" is always derogatory.

Newsgroup A Usenet conference.

NIC Network Information Center. As close as an Internet- style network gets to a hub; it's usually where you'll find information about that particular network.

NREN National Research and Education Network. The future of the U.S. part of the Internet. Said to be 50 times faster than currently (1993).

NSA line eater The more aware/paranoid Net users believe that the National Security Agency has a super-powerful computer assigned to reading everything posted on the Net. They will jokingly (?) refer to this line eater in their postings. Goes back to the early days of the Net when the bottom lines of messages would sometimes disappear for no apparent reason.

NSF National Science Foundation. Funds the NSFNet, a high-speed network that once formed the backbone of the Internet in the U.S.

Offline When your computer is not connected to a host system or the Net, you are offline.

Online When your computer is connected to an online service, bulletin-board system or public-access site.

Ping A program that can trace the route a message takes from your site to another site.

.plan file A file that lists anything you want others on the Net to know about you. You place it in your home directory on your public-access site. Then, anybody who fingers (See Chapter 6 [Telnet], page 79,) you, will get to see this file.

Post To compose a message for a Usenet newsgroup and then send it out for others to see.

Postmaster The person to contact at a particular site to ask for information about the site or complain about one of his/her user's behavior.

Protocol The method used to transfer a file between a host system and your computer. There are several types, such as Kermit, YMODEM and ZMODEM.

Prompt When the host system asks you to do something and waits for you to respond. For example, if you see "login:" it means type your user name.

README Files found on FTP sites that explain what is in a given FTP directory or which provide other useful information (such as how to use FTP).

Real Soon Now A vague term used to describe when something will actually happen.

RFC Request for Comments. A series of documents that describe various technical aspects of the Internet.

ROTFL Rolling on the Floor Laughing. How to respond to a particularly funny comment.

ROT13 A simple way to encode bad jokes, movie reviews that give away the ending, pornography, etc. Essentially, each letter in a message is replace by the letter 13 spaces away from it in the alphabet. There are online decoders to read these; nn and rn have them built in.

RTFM Read the, uh, you know, Manual. Often used in flames against people who ask computer-related questions that could be easily answered with a few minutes with a manual. More politely: RTM.

Screen capture A part of your communications software that opens a file on your computer and saves to it whatever scrolls past on the screen while connected to a host system.

Server A computer that can distribute information or files automatically in response to specifically worded e-mail requests.

Shareware Software that is freely available on the Net. If you like and use the software, you should send in the fee requested by the author, whose name and address will be found in a file distributed with the software.

.sig file Sometimes, '`.signature`' file. A file that, when placed in your home directory on your public-access site, will automatically be appended to every Usenet posting you write.

.sig quote A profound/witty/quizzical/whatever quote that you include in your '`.sig`' file.

Signal-to-noise ratio The amount of useful information to be found in a given Usenet newsgroup. Often used derogatorily, for example: "the signal-to-noise ratio in this newsgroup is pretty low."

SIMTEL20 The White Sands Missile Range used to maintain a giant collection of free and low-cost software of all kinds, which was "mirrored" to numerous other ftp sites on the Net. In the fall of 1993, the Air Force decided it had better things to do than maintain a free software library and shut it down. But you'll still see references to the collection, known as SIMTEL20, around the Net.

Smiley A way to describe emotion online. Look at this with your head tilted to the left `:-)`. There are scores of these smileys, from grumpy to quizzical.

Snail mail Mail that comes through a slot in your front door or a box mounted outside your house.

Sysadmin The system administrator; the person who runs a host system or public-access site.

Sysop A system operator. Somebody who runs a bulletin-board system.

TANSTAAFL There Ain't No Such Thing as a Free Lunch.

TLA Three Letter Acronym, such as IBM, DEC, etc.

TCP/IP Transmission Control Protocol/Internet Protocol. The particular system for transferring information over a computer network that is at the heart of the Internet.

Telnet A program that lets you connect to other computers on the Internet.

Terminal emulation There are several methods for determining how your keystrokes and screen interact with a public-access site's operating system. Most communications programs offer a choice of "emulations" that let you mimic the keyboard that would normally be attached directly to the host-system computer.

UUCP Unix-to-Unix CoPy. A method for transferring Usenet postings and e-mail that requires far fewer net resources than TCP/IP, but which can result in considerably slower transfer times.

Upload Copy a file from your computer to a host system.

User name On most host systems, the first time you connect you are asked to supply a one-word user name. This can be any combination of letters and numbers.

VT100 Another terminal-emulation system. Supported by many communications program, it is the most common one in use on the Net. VT102 is a newer version.

"It's is not, it isn't ain't, and it's it's, not its, if you mean it is.
If you don't, it's its. Then too, it's hers. It isn't her's.
It isn't our's either. It's ours, and likewise yours and theirs."
— **Oxford University Press**, *"Edpress News"*

Appendix B Dear Emily Postnews

By *Brad Templeton*[1] `<brad@clarinet.com>`

The following is available as file '/pub/usenet/news.answers/emily-postnews/part1' on **rtfm.mit.edu**. The last changes were made on 30 Nov 91 by Brad Templeton.

NOTE: this is intended to be satirical. If you do not recognize it as such, consult a doctor or professional comedian. The recommendations in this article should recognized for what they are – admonitions about what NOT to do.

"Dear Emily Postnews"

Ms Emily Postnews, foremost authority on proper net behaviour, gives her advice on how to act on the net.

*

Dear Miss Postnews: How long should my signature be? – <verbose@noisy>

A: Dear Verbose: Please try and make your signature as long as you can. It's much more important than your article, of course, so try to have more lines of signature than actual text.

Try to include a large graphic made of ASCII characters, plus lots of cute quotes and slogans. People will never tire of reading these pearls of wisdom again and again, and you will soon become personally associated with the joy each reader feels at seeing yet another delightful repeat of your signature.

Be sure as well to include a complete map of USENET with each signature, to show how anybody can get mail to you from any site in the world. Be sure to include Internet gateways as well. Also tell people on your own site how to mail to you. Give independent addresses for Internet, UUCP, and BITNET, even if they're all the same.

Aside from your reply address, include your full name, company and organization. It's just common courtesy – after all, in some newsreaders people have to type an *entire* keystroke to go back to the top of your article to see this information in the header.

By all means include your phone number and street address in every single article. People are always responding to usenet articles with phone calls and letters. It would be silly to go to the extra trouble of including this information only in articles that need a response by conventional channels!

*

Dear Emily: Today I posted an article and forgot to include my signature. What should I do? – <forgetful@myvax>

A: Dear Forgetful: Rush to your terminal right away and post an article that says, "Oops, I forgot to post my signature with that last article. Here it is."

Since most people will have forgotten your earlier article, (particularly since it dared to be so boring as to not have a nice, juicy signature) this will remind them of it. Besides, people care much more about the signature anyway. See the previous letter for more important details.

Also, be sure to include your signature TWICE in each article. That way you're sure people will read it.

*

Dear Ms. Postnews: I couldn't get mail through to somebody on another site. What should I do? – <eager@beaver.dam>

[1] *Copyright © 1991 by Brad Templeton. All rights reserved.*

A: Dear Eager: No problem, just post your message to a group that a lot of people read. Say, "This is for John Smith. I couldn't get mail through so I'm posting it. All others please ignore."

This way tens of thousands of people will spend a few seconds scanning over and ignoring your article, using up over 16 man-hours their collective time, but you will be saved the terrible trouble of checking through Usenet maps or looking for alternate routes. Just think, if you couldn't distribute your message to 30,000 other computers, you might actually have to (gasp) call directory assistance for 60 cents, or even phone the person. This can cost as much as a few DOLLARS (!) for a 5 minute call!

And certainly it's better to spend 10 to 20 dollars of other people's money distributing the message then for you to have to waste $9 on an overnight letter, or even 29 cents on a stamp!

Don't forget. The world will end if your message doesn't get through, so post it as many places as you can.

*

Q: What about a test message?

A: It is important, when testing, to test the entire net. Never test merely a subnet distribution when the whole net can be done. Also put "please ignore" on your test messages, since we all know that everybody always skips a message with a line like that. Don't use a subject like "My sex is female but I demand to be addressed as male." because such articles are read in depth by all USEnauts.

*

Q: Somebody just posted that Roman Polanski directed Star Wars. What should I do?

A: Post the correct answer at once! We can't have people go on believing that! Very good of you to spot this. You'll probably be the only one to make the correction, so post as soon as you can. No time to lose, so certainly don't wait a day, or check to see if somebody else has made the correction.

And it's not good enough to send the message by mail. Since you're the only one who really knows that it was Francis Coppola, you have to inform the whole net right away!

*

Q: I read an article that said, "reply by mail, I'll summarize." What should I do?

A: Post your response to the whole net. That request applies only to dumb people who don't have something interesting to say. Your postings are much more worthwhile than other people's, so it would be a waste to reply by mail.

*

Q: I collected replies to an article I wrote, and now it's time to summarize. What should I do?

A: Simply concatenate all the articles together into a big file and post that. On USENET, this is known as a summary. It lets people read all the replies without annoying newsreaders getting in the way. Do the same when summarizing a vote.

*

Q: I saw a long article that I wish to rebut carefully, what should I do?

A: Include the entire text with your article, particularly the signature, and include your comments closely packed between the lines. Be sure to post, and not mail, even though your article looks like a reply to the original. Everybody *loves* to read those long point-by-point debates, especially when they evolve into name-calling and lots of "Is too!" – "Is not!" – "Is too, twizot!" exchanges.

Be sure to follow-up everything, and never let another person get in the last word on a net debate. Why, if people let other people have the last word, then discussions would actually stop!

Remember, other net readers aren't nearly as clever as you, and if somebody posts something wrong, the readers can't possibly realize that on their own without your elucidations. If somebody gets insulting in their net postings, the best response is to get right down to their level and fire a return salvo. When I read one net person make an insulting attack on another, I always immediately take it as gospel unless a rebuttal is posted. It never makes me think less of the insulter, so it's your duty to respond.

*

Q: How can I choose what groups to post in?

A: Pick as many as you can, so that you get the widest audience. After all, the net exists to give you an audience. Ignore those who suggest you should only use groups where you think the article is highly appropriate. Pick all groups where anybody might even be slightly interested.

Always make sure followups go to all the groups. In the rare event that you post a followup which contains something original, make sure you expand the list of groups. Never include a "Followup-to:" line in the header, since some people might miss part of the valuable discussion in the fringe groups.

*

Q: How about an example?

A: Ok. Let's say you want to report that Gretzky has been traded from the Oilers to the Kings. Now right away you might think **rec.sport.hockey** would be enough. WRONG. Many more people might be interested. This is a big trade! Since it's a NEWS article, it belongs in the **news.*** hierarchy as well. If you are a news admin, or there is one on your machine, try **news.admin**. If not, use **news.misc**.

The Oilers are probably interested in geology, so try **sci.geo.fluids**. He is a big star, so post to **sci.astro**, and **sci.space** because they are also interested in stars. And of course **comp.dcom.telecom** because he was born in the birthplace of the telephone. And because he's Canadian, post to **soc.culture.Ontario.southwestern**. But that group doesn't exist, so cross-post to **news.groups** suggesting it should be created. With this many groups of interest, your article will be quite bizarre, so post to **talk.bizarre** as well. (And post to **comp.std.mumps**, since they hardly get any articles there, and a "comp" group will propagate your article further.)

You may also find it is more fun to post the article once in each group. If you list all the newsgroups in the same article, some newsreaders will only show the the article to the reader once! Don't tolerate this.

*

Q: How do I create a newsgroup?

A: The easiest way goes something like '`inews -C newgroup ...`', and while that will stir up lots of conversation about your new newsgroup, it might not be enough.

First post a message in news.groups describing the group. This is a "call for discussion." (If you see a call for discussion, immediately post a one line message saying that you like or dislike the group.) When proposing the group, pick a name with a TLA (three-letter acronym) that will be understood only by "in" readers of the group.

After the call for discussion, post the call for flames, followed by a call for arguments about the name and a call for run-on puns. Eventually make a call for "votes." USENET is a democracy, so voters can now all post their votes to ensure they get to all 30,000 machines instead of just the person counting. Every few days post a long summary of all the votes so that people can complain about bad mailers and double votes. It means you'll be more popular and get lots of mail. At the end of 21 days you can post the vote results so that people can argue about all the technical violations of the guidelines you made. Blame them on the moderator-of-the-week for news.announce.newgroups. Then your group might be created.

To liven up discussion, choose a good cross-match for your hierarchy and group. For example, comp.race.formula1 or soc.vlsi.design would be good group names. If you want your group created quickly, include an interesting word like "sex" or "activism." To avoid limiting discussion, make the name as broad as possible, and don't forget that TLA.

If possible, count votes from a leaf site with a once-a-week polled connection to botswanavax. Schedule the vote during your relay site's head crash if possible.

Under no circumstances use the trial group method, because it eliminates the discussion, flame, pun, voting and guideline-violation accusation phases, thus taking all the fun out of it. To create an ALT group, simply issue the creation command. Then issue an rmgroup and some more newgroup messages to save other netters the trouble of doing that part.

*

Q: I cant spell worth a dam. I hope your going too tell me what to do?

A: Don't worry about how your articles look. Remember it's the message that counts, not the way it's presented. Ignore the fact that sloppy spelling in a purely written forum sends out the same silent messages that soiled clothing would when addressing an audience.

Q: How should I pick a subject for my articles?

A: Keep it short and meaningless. That way people will be forced to actually read your article to find out what's in it. This means a bigger audience for you, and we all know that's what the net is for. If you do a followup, be sure and keep the same subject, even if it's totally meaningless and not part of the same discussion. If you don't, you won't catch all the people who are looking for stuff on the original topic, and that means less audience for you.

*

Q: What sort of tone should I take in my article?

A: Be as outrageous as possible. If you don't say outlandish things, and fill your article with libelous insults of net people, you may not stick out enough in the flood of articles to get a response. The more insane your posting looks, the more likely it is that you'll get lots of followups. The net is here, after all, so that you can get lots of attention.

If your article is polite, reasoned and to the point, you may only get mailed replies. Yuck!

*

Q: The posting software suggested I had too long a signature and too many lines of included text in my article. What's the best course?

A: Such restrictions were put in the software for no reason at all, so don't even try to figure out why they might apply to your article. Turns out most people search the net to find nice articles that consist of the complete text of an earlier article plus a few lines.

In order to help these people, fill your article with dummy original lines to get past the restrictions. Everybody will thank you for it.

For your signature, I know it's tough, but you will have to read it in with the editor. Do this twice to make sure it's firmly in there. By the way, to show your support for the free distribution of information, be sure to include a copyright message forbidding transmission of your article to sites whose USENET politics you don't like.

Also, if you do have a lot of free time and want to trim down the text in your article, be sure to delete some of the attribution lines so that it looks like the original author of – say – a plea for world peace actually wrote the followup calling for the nuking of Bermuda.

*

Q: They just announced on the radio that the United States has invaded Iraq. Should I post?

A: Of course. The net can reach people in as few as 3 to 5 days. It's the perfect way to inform people about such news events long after the broadcast networks have covered them. As you are probably the only person to have heard the news on the radio, be sure to post as soon as you can.

*

Q: I have this great joke. You see, these three strings walk into a bar...

A: Oh dear. Don't spoil it for me. Submit it to rec.humor, and post it to the moderator of **rec.humor.funny** at the same time. I'm sure he's never seen that joke.

*

Q: What computer should I buy? An Atari ST or an Amiga?

A: Cross post that question to the Atari and Amiga groups. It's an interesting and novel question that I am sure they would love to investigate in those groups. There is no need to read the groups in advance or examine the "frequently asked question" lists to see if the topic has already been dealt with. In fact, you don't need to read the group at all, and you can tell people that in your query.

*

Q: What about other important questions? How should I know when to post?

A: Always post them. It would be a big waste of your time to find a knowledgeable user in one of the groups and ask through private mail if the topic has already come up. Much easier to bother thousands of people with the same question.

*

Q: Somebody just posted a query to the net, and I want to get the answer too. What should I do?

A: Immediately post a following, including the complete text of the query. At the bottom add, "Me too!" If somebody else has done this, follow up their article and add "Me three," or whatever number is appropriate. Don't forget your full signature. After all, if you just mail the original poster and ask for a copy of the answers, you will simply clutter the poster's mailbox, and save people who do answer the question the joyful duty of noting all the "me (n)s" and sending off all the multiple copies.

*

Q: What is the measure of a worthwhile group?

A: Why, it's Volume, Volume, Volume. Any group that has lots of noise in it must be good. Remember, the higher the volume of material in a group, the higher percentage of useful, factual and insightful articles you will find. In fact, if a group can't demonstrate a high enough volume, it should be deleted from the net.

*

Q: Emily, I'm having a serious disagreement with somebody on the net. I tried complaints to his sysadmin, organizing mail campaigns, called for his removal from the net and phoning his employer to get him fired. Everybody laughed at me. What can I do?

A: Go to the daily papers. Most modern reporters are top-notch computer experts who will understand the net, and your problems, perfectly. They will print careful, reasoned stories without any errors at all, and surely represent the situation properly to the public. The public will also all act wisely, as they are also fully cognizant of the subtle nature of net society.

Papers never sensationalize or distort, so be sure to point out things like racism and sexism wherever they might exist. Be sure as well that they understand that all things on the net, particularly insults, are meant literally. Link what transpires on the net to the causes of the Holocaust, if possible. If regular papers won't take the story, go to a tabloid paper – they are always interested in good stories.

By arranging all this free publicity for the net, you'll become very well known. People on the net will wait in eager anticipation for your every posting, and refer to you constantly. You'll get more mail than you ever dreamed possible – the ultimate in net success.

*

Q: What does foobar stand for?

A: It stands for you, dear.

"News articles are separated into divisions called newsgroups. Each division is supposed to limit itself to a single topic, and the name of the group is supposed to give you some idea as to the content of the group. These groups are then organized into hierarchies of related topics. Usenet Network News started out with just two hierarchies, mod and net. The mod hierarchy had those groups that had a person as the moderator to edit and control the information. The net hierarchy handled all other groups. With the release of B News and its ability to have any single group be moderated or open, the great renaming was undertaken." — **Weinstein** (1992)

Appendix C EFF Information

C.1 General Information About the EFF

The Electronic Frontier Foundation (EFF) was founded in July of 1990 to ensure that the principles embodied in the Constitution and the Bill of Rights are protected as new communications technologies emerge.

From the beginning, EFF has worked to shape our nation's communications infrastructure and the policies that govern it in order to maintain and enhance First Amendment, privacy and other democratic values. We believe that our overriding public goal must be the creation of Electronic Democracy, so our work focuses on the establishment of:

- new laws that protect citizens' basic Constitutional rights as they use new communications technologies,
- a policy of common carriage requirements for all network providers so that all speech, no matter how controversial, will be carried without discrimination,
- a National Public Network where voice, data and video services are accessible to all citizens on an equitable and affordable basis, and
- a diversity of communities that enable all citizens to have a voice in the information age.

C.1.1 Information Infrastructure

EFF's Open Platform Proposal advocates that the nation's telecommunications infrastructure providers offer affordable, widely available transmission of voice, data and video information. The telecommunications infrastructure must promote broad access and enable citizens to receive and publish a diversity of information. In addition, a competitive environment must be ensured to preserve the core principles of common carriage, universal service and open standards.

In the near term, EFF supports the implementation of services such as ISDN and ADSL, currently available digital technologies, for sending voice, data and video at reasonable cost to consumers.

EFF supports federal funding to promote the development of network tools and applications that will make the Internet and the NREN easier to use. Although the NREN will be made up of services from commercial providers, government also has a vital role to play in making grants to institutions that cannot afford to pay for Internet connectivity.

C.1.2 Civil Liberties

EFF has been working to ensure that common carrier principles are upheld in the information age. Common carrier principles require that network providers carry all speech, regardless of its controversial content. Common carriers must also provide all speakers and information providers with equal, nondiscriminatory access to the network.

EFF chairs the Digital Security and Privacy Working Group, a coalition of over 50 organizations–from computer software and hardware firms, telecommunications and energy companies to civil liberties advocates–that work on sound privacy policies in telecommunications. For example, the group has worked to oppose the FBI's Digital Telephony proposal and government-mandated encryption policies.

EFF is working to convince Congress that all measures supporting broader public access to information should be enacted into law. EFF supports an Electronic Freedom of Information Act and other legislation to make information more accessible to citizens in electronic formats.

EFF supports both legal and technical means to enhance privacy in communications. We, therefore, advocate all measures that ensure the public's right to use the most effective encryption technologies available.

C.1.3 Legal Services

EFF sponsors legal cases where users' online civil liberties have been violated. The Steve Jackson Games case, decided in March of 1993, established privacy protections for electronic publishers and users of electronic mail. We continue to monitor the online community for legal actions that merit EFF support.

EFF provides a free telephone hotline for members of the online community who have questions regarding their legal rights.

Members of EFF's staff and board speak to law enforcement organizations, state attorney bar associations and university classes on the work that we do and how these groups can get involved.

C.1.4 Community Building

EFF, in conjunction with the Consumer Federation of America and the American Civil Liberties Union, coordinates and sponsors the Communications Policy Forum (CPF). CPF enables nonprofit organizations, computer and communications firms, and government policymakers to come together in a nonpartisan setting to discuss communications policy goals and strategies.

EFF works with local organizations that support online communications issues. In September of 1993, EFF will cosponsor a cryptography conference with a group in Austin, Texas. Earlier this year, EFF sponsored a summit of groups from around the country to discuss common goals. We also participate in an online mailing list for organizations that share our interests.

EFF is a funder and organizer of the annual Computers, Freedom and Privacy conference, where academics, civil libertarians, law enforcement officials and computer users all meet to discuss the privacy implications of communicating online. Each year at the conference, EFF presents its Pioneer awards to individuals who have made significant contributions to computer communications.

EFF maintains several communications forums online. We have our own Internet node, eff.org, which houses our FTP and Gopher sites and our discussion areas, **comp.org.eff.talk** and **comp.org.eff.news**. EFF also maintains conferences on the *Whole Earth 'Lectronic Link (WELL)*, *CompuServe* and *America Online*.

C.2 How to connect to EFF?

C.2.1 Internet and USENET

General information requests, including requests to be added to the EFFector Online mailing list, can be sent to `<eff@eff.org>`. Other Internet contact addresses are as follows:

`<membership@eff.org>`
: Membership & donations.

`<ssteele@eff.org>`
: Legal services.

`<pubs@eff.org>`
: Hardcopy publications.

`<mech@eff.org>`
: Online publications, conferences, & other resources.

`<ask@eff.org>`
General EFF, legal, or policy questions.

If you receive any USENET newsgroups, your site may carry the newsgroups **comp.org.eff.news** and **comp.org.eff.talk**. The former is a moderated newsgroup for announcements, newsletters, and other information; the latter is an unmoderated discussion group for discussing EFF and issues relating to the electronic frontier.

For those unable to read the newsgroups, there are redistributions via electronic mail. Send requests to be added to or dropped from the **comp.org.eff.news** mailing list to `<eff-request@eff.org>`. For the **comp.org.eff.talk** mailing list, send a note to `<eff-talk-request@eff.org>`. Please note that eff-talk can be extremely high-volume at times.

A document library containing all EFF news releases and other publications of interest, including John Perry Barlow's history of EFF, *"Crime and Puzzlement"*, is available via anonymous FTP from **ftp.eff.org**. Send a note to `<ftphelp@eff.org>` if you have questions or are unable to use FTP. This archive is also accessible via Gopher. Try '`gopher gopher.eff.org`'.

C.2.2 The WELL

The WELL is host to an active EFF conference, as well as many other related conferences of interest to EFF supporters. Access to the WELL is $15/month plus $2/hour. Telecom access is available through the CompuServe Packet Network for an additional $4.50/hour. If you have an Internet connection, you can reach the WELL via telnet at **well.sf.ca.us**; otherwise, dial `+1 415 332 6106` (data). The WELL's voice number is `+1 415 332 4335`.

C.2.3 CompuServe

Our forum on CompuServe is also open. '`GO EFFSIG`' to join. Many of the files on **ftp.eff.org**, as well as other items of interest, are mirrored in the EFFSIG Libraries.

C.2.4 America Online

EFF hosts a Special Interest Group on America Online as part of the *Macintosh Communications Forum (MCM)*. '`GOTO Keyword EFF`' to join. Many of the files on **ftp.eff.org**, as well as other items of interest, are mirrored in this forum. In addition, EFF sponsors an interactive discussion on this forum the second Saturday night of each month at 9:00 p.m. ET.

C.3 Membership in the Electronic Frontier Foundation

I wish to become a member of the Electronic Frontier Foundation. I enclose:

$________ Regular membership – $40
$________ Student membership – $20

Special Contribution

I wish to make a tax-deductible donation in the amount of $________ to further support the activities of EFF and to broaden participation in the organization.

Documents Available in Hard Copy Form

The following documents are available free of charge from the Electronic Frontier Foundation. Please indicate any of the documents you wish to receive.

__ Open Platform Proposal - EFF's proposal for a national telecommunications infrastructure. 12 pages. July, 1992

__ An Analysis of the FBI Digital Telephony Proposal - Response of EFF-organized coalition to the FBI's digital telephony proposal of Fall, 1992. 8 pages. September, 1992.

__ Building the Open Road: The NREN and the National Public Network - A discussion of the National Research and Education Network as a prototype for a National Public Network. 20 pages. May, 1992.

__ Innovative Services Delivered Now: ISDN Applications at Home, School, the Workplace and Beyond - A compilation of ISDN applications currently in use. 29 pages. January, 1993.

__ Decrypting the Puzzle Palace - John Perry Barlow's argument for strong encryption and the need for an end to U.S. policies preventing its development and use. 13 pages. May, 1992.

__ Crime and Puzzlement - John Perry Barlow's piece on the founding of the Electronic Frontier Foundation and the world of hackers, crackers and those accused of computer crimes. 24 pages. June, 1990.

__ Networks & Policy - A quarterly newsletter detailing EFF's activities and achievements.

Your Contact Information:

Name: ____

Organization: ____

Address: ____

____

Phone: (___) _____________ FAX: (___) _____________ (optional)

E-mail address: ____

Payment Method

__ Enclosed is a check payable to the Electronic Frontier Foundation.

__ Please charge my:
__ MasterCard __ Visa __ American Express

Card Number: ______________________________________

Expiration Date: ___________________________________

Signature: ____

Privacy Policy

EFF occasionally shares our mailing list with other organizations promoting similar goals. However, we respect an individual's right to privacy and will not distribute your name without explicit permission.

__ I grant permission for the EFF to distribute my name and contact information to organizations sharing similar goals.

Print out and mail to:

Membership Coordinator
Electronic Frontier Foundation
1001 G Street, N.W.
Suite 950 East
Washington, DC 20001
(202) 347-5400 voice
(202) 393-5509 fax

The Electronic Frontier Foundation is a nonprofit, 501(c)(3) organization supported by contributions from individual members, corporations and private foundations. Donations are tax-deductible.

Get GUMMed

"The Gurus of Unix Meeting of Minds (GUMM) takes place Wednesday, April 1, 2076 (check THAT in your perpetual calendar program), 14 feet above the ground directly in front of the Milpitas Gumps. Members will grep each other by the hand (after intro), yacc a lot, smoke filtered chroots in pipes, chown with forks, use the wc (unless uuclean), fseek nice zombie processes, strip, and sleep, but not, we hope, od. Three days will be devoted to discussion of the ramifications of whodo. Two seconds have been allotted for a complete rundown of all the user- friendly features of Unix. Seminars include "Everything You Know is Wrong," led by Tom Kempson, "Batman or Cat:man?" led by Richie Dennis "cc C? Si! Si!" led by Kerwin Bernighan, and "Document Unix, Are You Kidding?" led by Jan Yeats. No Reader Service No. is necessary because all GUGUs (Gurus of Unix Group of Users) already know everything we could tell them."

— Dr. Dobb's Journal, June '84

Appendix D Internet Country Codes

This appendix gives a list of country codes with e-mail accessibility. It is helpful in finding-out if a country has easy access to e-mail and Internet facilities and is aimed at general e-mail and Internet users. This file is continuously updated and available by FTP from **rtfm.mit.edu** as '`pub/usenet/news.answers/mail/country-codes`'. See Section D.8 [Archiving], page 208 below.

This document is based on *International Standard ISO 3166 Names*.
Compiled by *Olivier M.J. Crepin-Leblond*[1] `<ocl@ic.ac.uk>` Release: 93.8.1

D.1 Description of codes

FI
: stands for FULL INTERNET access. This includes 'telnet', 'ftp', and internet e-mail.

B
: stands for BITNET access although the address may be in internet DNS (Domain Name System) format.

* (Asterisk)
: means that the country is reachable by e-mail. If this is not preceded by FI or B, it means that the connection may be a UUCP connection. An asterisk is included after FI or B for consistency.

PFI
: stands for a provisional full internet connection.(+)

P
: stands for provisional connection.
This is used when one or more of the following is true:
  - address not verified or lack of address
  - UUCP dialup not active
  - net connection possible but not officially announced
  - premature official announcement of connection

D.2 Networks which are not included

Networks such as MILNET (U.S. Army) have computers all around the world. It is generally possible to assume that wherever there is a U.S. military base, there will be a node reachable through gateways.

Private company networks such as for DEC (Digital Equipment Corp.), or Sun Microsystems, for example, have nodes in many exotic locations. However the connection may take place via UUCP and cost a lot of money. Those networks have therefore not been included. In addition, those are PRIVATE networks.

Many companies (like U.S. Sprint, for example) offer commercial services to many countries which are not readily available on the Internet. The service is VERY COSTLY, usually takes place via UUCP or X.400 connections. X.400 e-mail is usually charged to someone and if the telecommunication carrier cannot find someone to pay for the message transfer, it will reject it. As a result, those types of network have not been included in the list. Although a user may RECEIVE e-mail from a user on those networks, one may not be able to reply to it.

FIDONET nodes are NOT included. While all nodes agree to forward e-mail as a condition to be included in the tables, the high cost of phone calls in more exotic locations prompts some sysadmins not to want their site publicised. Many FIDO nodes exist throughout the Middle-East and Africa.

D.3 Updates

The situation changes from day to day. The growth in international networking is such that the information contained in this document may be out of date by the time it reaches you. If you have any update (i.e. knowledge that a new country is connected), please send a message to `<country-codes@ic.ac.uk>`, including an example address from the country reached so that it can be verified.

D.4 .us sites

While there are several hundreds of BITNET nodes in USA, none have a name in the format '`.us`'. That's why the '`.us`' domain is only '`FI`' and '`*`'.

D.5 .edu, .com, etc.

The domains in this section are special in that some of them are used in more than one country. The domains which have full internet access are marked accordingly. However, this doesn't mean that *all* of those domains have full internet access. For example, only a small proportion of .mil sites have full internet access. The same is true for .com sites, for example.

D.6 UK and GB domains

There are two codes for United Kingdom, namely UK and GB. While UK is used for addressing of most domains in DNS format, the field GB is used mainly in the X.400 addressing of United Kingdom sites. However, there is an increasing trend in some United Kingdom sites being directly connected to Internet under the GB domain. The GB domain is hence a perfectly suitable Internet top level domain.

D.7 Main nameservers

This is the main nameserver as listed in the **rs.internic.net** database. Those often change as the network grows, and it is hard to keep track of all nameservers, but they should usually work. Nameservers can be queried by users using '`nslookup`'.

D.8 Archiving

Once released, this document is archived in a number of archive sites around the world. Amongst them:

rtfm.mit.edu (18.70.0.224)
directory: '`/pub/usenet/news.answers/mail`'

lth.se (130.235.20.3)
directory: '`/pub/archive2/netnews/news.answers/mail`'

ftp.uu.net (192.48.96.9)
directory: '`/usenet/news.answers/mail`'

unix.hensa.ac.uk (129.12.21.7)
directory: '`/pub/uunet/usenet/news.answers/mail`'

grasp1.univ-lyon1.fr (134.214.100.25)
directory: '`/pub/faq/mail`'

The tagged hosts (#) may not be accessible via Bear access or direct PC access in some cases.

Via listserver request: `<listserver@grasp1.univ-lyon1.fr>` with the command: '`get faq mail/country-codes`'.

All FAQs are also available via `<listserv@cc1.kuleuven.ac.be>` or `<listserv@blekul11.bitnet>`. For an index of all FAQs available, put the command '`GET NETFAQS FILELIST`' in the body of your message.

The document is also retrievable by sending e-mail to `<mail-server@rtfm.mit.edu>`, blank subject line and the command: '`send usenet/news. answers/mail/country-codes`'

The up-to-date, pre-release document is also available using an experimental simple mail-server that I have setup from my account. Send e-mail to: `<ocl@ic.ac.uk>` with a subject: '`archive-server-request`' and the command: '`get mail/country-codes`' in the body of your message.

D.9 ISO 3166 Codes & Top level domains

Code	Country	Conn	Notes	main nameserver
AD	Andorra			
AE	United Arab Emirates	*		ns.uu.net
AF	Afghanistan			
AG	Antigua and Barbuda	*		upr1.upr.clu.edu
AI	Anguilla			
AL	Albania	P		gwd2i.cnuce.cnr.it
AM	Armenia		Ex-USSR	
AN	Netherland Antilles			
AO	Angola			
AQ	Antarctica	FI *		luxor.cc.waikato.ac.nz
AR	Argentina	FI B *		ns.uu.net
AS	American Samoa			
AT	Austria	FI B *		pythia.edvz.univie.ac.at
AU	Australia	FI *		munnari.oz.au
AW	Aruba			
AZ	Azerbaidjan		Ex-USSR	
BA	Bosnia-Herzegovina		Ex-Yugoslavia	
BB	Barbados	*		upr1.upr.clu.edu
BD	Bangladesh			
BE	Belgium	FI B *		ub4b.buug.be
BF	Burkina Faso	*		orstom.orstom.fr
BG	Bulgaria	FI B *		pythia.ics.forth.gr
BH	Bahrain	B *	Gulfnet	
BI	Burundi			
BJ	Benin			
BM	Bermuda	*		ns.uu.net
BN	Brunei Darussalam			
BO	Bolivia	*		ns.uu.net
BR	Brazil	FI B *		fpsp.fapesp.br
BS	Bahamas	*		upr1.upr.clu.edu
BT	Buthan			
BV	Bouvet Island			
BW	Botswana	*		hippo.ru.ac.za
BY	Belarus	*	Ex-USSR	

BZ	Belize			P		upr1.upr.clu.edu
CA	Canada	FI	B	*		relay.cdnnet.ca
CC	Cocos (Keeling) Isl.					
CF	Central African Rep.					
CG	Congo					
CH	Switzerland	FI	B	*		scsnms.switch.ch
CI	Ivory Coast					
CK	Cook Islands					
CL	Chile	FI	B	*		dcc.uchile.cl
CM	Cameroon	FI		*	in .fr domain	inria.inria.fr
CN	China	PFI		*		iraun1.ira.uka.de
CO	Colombia		B	*		cunixd.cc.columbia.edu
CR	Costa Rica	FI	B	*		ns.cr
CS	Czechoslovakia	FI	B	*	still works...	ns.cesnet.cz
CU	Cuba			*		igc.org
CV	Cape Verde					
CX	Christmas Island					
CY	Cyprus		B	*		pythia.ics.forth.gr
CZ	Czech Republic	FI		*		ns.cesnet.cz
DE	Germany	FI	B	*		deins.informatik.uni-dortmund.de
DJ	Djibouti					
DK	Denmark	FI	B	*		ns.dknet.dk
DM	Dominica			P		upr1.upr.clu.edu
DO	Dominican Republic			P		upr1.upr.clu.edu
DZ	Algeria			*		
EC	Ecuador	FI	B	*		ecua.net.ec
EE	Estonia	FI		*	Ex-USSR	uvax2.kbfi.ee
EG	Egypt	PFI	B	*		frcu.eun.eg
EH	Western Sahara					
ES	Spain	FI	B	*		sun.rediris.es
ET	Ethiopia					
FI	Finland	FI	B	*		funet.fi
FJ	Fiji			*		truth.waikato.ac.nz
FK	Falkland Isl.(Malvinas)					
FM	Micronesia					
FO	Faroe Islands			P		danpost.uni-c.dk
FR	France	FI	B	*		inria.inria.fr
FX	France (European Ter.)				???	
GA	Gabon					
GB	Great Britain (UK)	FI		*	X.400 & IP	ns1.cs.ucl.ac.uk
GD	Grenada			P		upr1.upr.clu.edu
GE	Georgia			*	Ex-USSR	ns.eu.net
GH	Ghana					
GI	Gibraltar					
GL	Greenland					
GP	Guadeloupe (Fr.)					
GQ	Equatorial Guinea					
GF	Guyana (Fr.)					
GM	Gambia					
GN	Guinea					
GR	Greece	FI	B	*		pythia.ics.forth.gr
GT	Guatemala			*		ns.uu.net
GU	Guam (US)					
GW	Guinea Bissau					

GY	Guyana					
HK	Hong Kong	FI	B	*		hp9000.csc.cuhk.hk
HM	Heard & McDonald Isl.					
HN	Honduras			*		ns.uu.net
HR	Croatia	FI		*	Ex-Yugo	dns.srce.hr
HT	Haiti					
HU	Hungary	FI	B	*		sztaki.hu
ID	Indonesia			*		ns.uu.net
IE	Ireland	FI	B	*		nova.ucd.ie
IL	Israel	FI	B	*		relay.huji.ac.il
IN	India	FI	B	*		sangam.ncst.ernet.in
IO	British Indian O. Terr.					
IQ	Iraq					
IR	Iran		B	*		
IS	Iceland	FI	B	*		isgate.is
IT	Italy	FI	B	*		dns.nis.garr.it
JM	Jamaica			*		upr1.upr.clu.edu
JO	Jordan					
JP	Japan	FI	B	*		jp-gate.wide.ad.jp
KE	Kenya			*		rain.psg.com
KG	Kirgistan				Ex-USSR	
KH	Cambodia					
KI	Kiribati					
KM	Comoros					
KN	St.Kitts Nevis Anguilla			P		upr1.upr.clu.edu
KP	Korea (North)			P		
KR	Korea (South)	FI	B	*		ns.kaist.ac.kr
KW	Kuwait	FI		*	No BITNET	dns.kuniv.edu.kw
KY	Cayman Islands					
KZ	Kazachstan			*	Ex-USSR in .su domain	
LA	Laos					
LB	Lebanon			P		
LC	Saint Lucia			P		upr1.upr.clu.edu
LI	Liechtenstein	PFI		*		scsnms.switch.ch
LK	Sri Lanka			*		ns.eu.net
LR	Liberia					
LS	Lesotho			*		hippo.ru.ac.za
LT	Lithuania	PFI		*	Ex-USSR	aun.uninett.no
LU	Luxembourg	FI	B	*		menvax.restena.lu
LV	Latvia	FI		*	Ex-USSR	lapsene.mii.lu.lv
LY	Libya					
MA	Morocco			P		
MC	Monaco					
MD	Moldavia				Ex-USSR	
MG	Madagascar					
MH	Marshall Islands					
ML	Mali					
MM	Myanmar					
MN	Mongolia					
MO	Macau			*		hkuxb.hku.hk
MP	Northern Mariana Isl.					
MQ	Martinique (Fr.)					
MR	Mauritania					
MS	Montserrat					

MT	Malta			P		ns.iunet.it
MU	Mauritius					
MV	Maldives					
MW	Malawi					
MX	Mexico	FI	B	*		mtecv1.mty.itesm.mx
MY	Malaysia	FI	B	*		mimos.my
MZ	Mozambique			*		hippo.ru.ac.za
NA	Namibia			*		rain.psg.com
NC	New Caledonia (Fr.)					
NE	Niger			*	in .fr domain	inria.inria.fr
NF	Norfolk Island					
NG	Nigeria					
NI	Nicaragua			*		ns.uu.net
NL	Netherlands	FI	B	*		sering.cwi.nl
NO	Norway	FI	B	*		nac.no
NP	Nepal					
NR	Nauru					
NT	Neutral Zone					
NU	Niue					
NZ	New Zealand	FI		*		truth.waikato.ac.nz
OM	Oman					
PA	Panama		B	*		
PE	Peru		B	*		rain.psg.com
PF	Polynesia (Fr.)					
PG	Papua New Guinea			*		munnari.oz.au
PH	Philippines			*		ns.uu.net
PK	Pakistan			*		ns.uu.net
PL	Poland	FI	B	*		danpost.uni-c.dk
PM	St. Pierre & Miquelon					
PN	Pitcairn					
PT	Portugal	FI	B	*		ns.dns.pt
PR	Puerto Rico (US)	FI	B	*		sun386-gauss.pr
PW	Palau					
PY	Paraguay			*		ns.uu.net
QA	Qatar					
RE	Reunion (Fr.)	FI		*	In .fr domain	inria.inria.fr
RO	Romania	FI	B	*		roearn.ici.ac.ro
RU	Russian Federation			P	Ex-USSR	
RW	Rwanda					
SA	Saudi Arabia		B	*	GulfNet	
SB	Solomon Islands					
SC	Seychelles					
SD	Sudan					
SE	Sweden	FI	B	*		sunic.sunet.se
SG	Singapore	FI	B	*		solomon.technet.sg
SH	St. Helena					
SI	Slovenia	FI		*	Ex-Yugos via .yu	klepec.yunac.yu
SJ	Svalbard & Jan Mayen Is					
SK	Slovak Republic	FI		*		ns.eunet.sk
SL	Sierra Leone					
SM	San Marino					
SN	Senegal			*		rain.psg.com
SO	Somalia					
SR	Suriname			P		upr1.upr.clu.edu

ST	St. Tome and Principe					
SU	Soviet Union	FI	B	*	Still used.	ns.eu.net
SV	El Salvador					
SY	Syria					
SZ	Swaziland					
TC	Turks & Caicos Islands					
TD	Chad					
TF	French Southern Terr.					
TG	Togo					
TH	Thailand	FI		*		chulkn.chula.ac.th
TJ	Tadjikistan				Ex-USSR	
TK	Tokelau					
TM	Turkmenistan			*	Ex-USSR in .su domain	
TN	Tunisia	FI	B	*		alyssa.rsinet.tn
TO	Tonga					
TP	East Timor					
TR	Turkey	FI	B	*		knidos.cc.metu.edu.tr
TT	Trinidad & Tobago			P		upr1.upr.clu.edu
TV	Tuvalu					
TW	Taiwan	FI	B	*		moevax.edu.tw
TZ	Tanzania					
UA	Ukraine	FI		*	Ex-USSR via .su	ns.eu.net
UG	Uganda					
UK	United Kingdom	FI	B	*	ISO 3166 is GB	ns1.cs.ucl.ac.uk
UM	US Minor outlying Isl.					
US	United States	FI		*	see note (4)	venera.isi.edu
UY	Uruguay		B	*		ns.uu.net
UZ	Uzbekistan				Ex-USSR	
VA	Vatican City State					
VC	St.Vincent & Grenadines			P		upr1.upr.clu.edu
VE	Venezuela	FI		*		nisc.jvnc.net
VG	Virgin Islands (British)					
VI	Virgin Islands (US)			*		
VN	Vietnam			*		
VU	Vanuatu					
WF	Wallis & Futuna Islands					
WS	Samoa					
YE	Yemen					
YU	Yugoslavia	FI	B	*	Bitnet is cut	klepec.yunac.yu
ZA	South Africa	FI		*		rain.psg.com
ZM	Zambia					
ZR	Zaire					
ZW	Zimbabwe			*		rain.psg.com

See Section D.7 [Main nameservers], page 208 for the next top level domains (**rs.internic.net**):

ARPA	Old style Arpanet			*	alias still works	ns.nic.ddn.mil
COM	Commercial	FI		*		ns.internic.net
EDU	Educational	FI	B	*		ns.internic.net
GOV	Government	FI		*		ns.internic.net
INT	International field	FI		*	used by Nato	ns1.cs.ucl.ac.uk
MIL	US Military	FI		*		ns.nic.ddn.mil
NATO	Nato field			*	soon to be deleted	
NET	Network	FI		*		ns.internic.net
ORG	Non-Profit Organization	FI		*		ns.internic.net

D.10 Disclaimer

While every effort is made to provide accurate information, this list is not guaranteed to be accurate. This document is in NO WAY an official document. The information given should not be used as a basis for routing tables but only as general end-user information. This is a voluntary effort. I would appreciate greatly if errors/omissions could be pointed out to me and they would be corrected in the next release. The information included in this document implies no view whatsoever regarding questions of sovereignty or the status of any place listed. Affiliation to Imperial College is given for identification purposes only.

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"I hate definitions."
—**Benjamin Disraeli**, *"Vivian Grey"* Bk I, Chap II

Appendix E The Unofficial Smiley Dictionary

This *"Unofficial Smiley Dictionary"* is only one of many different collections by various "editors" you'll come across at many places on the Net, e.g. you can get "The-Smiley-File" from **gopher.world.std.com**; and even a complete booklet has been written on smileys and is available as:

> **David W. Sanderson** (ed.), *"Smileys"*, O'Reilly & Associates, Sebastopol, CA. 93 pages. ISBN 1-56592-041-4. Price $5.95 (US).

E.1 Basic Smileys

`:-)` Your basic smiley. This smiley is used to inflect a sarcastic or joking statement since we can't hear voice inflection over e-mail.

`;-)` Winky smiley. User just made a flirtatious and/or sarcastic remark. More of a "don't hit me for what I just said" smiley.

`:-(` Frowning smiley. User did not like that last statement or is upset or depressed about something.

`:-I` Indifferent smiley. Better than a `:-(` but not quite as good as a `:-)`.

`:->` User just made a really biting sarcastic remark. Worse than a `;-)`.

`>:->` User just made a really devilish remark.

`>;->` Winky and devil combined. A very lewd remark was just made.

E.2 Widely used Smileys

`(-:` User is left handed.

`%-)` User has been staring at a green screen for 15 hours straight.

`:*)` User is drunk.

`[:]` User is a robot.

`8-)` User is wearing sunglasses.

`B:-)` Sunglasses on head.

`::-)` User wears normal glasses.

`B-)` User wears horn-rimmed glasses.

`8:-)` User is a little girl.

`:-)-8` User is a Big girl.

`:-{)` User has a mustache.

`:-{}` User wears lipstick.

`{:-)` User wears a toupee.

`}:-(` Toupee in an updraft.

`:-[` User is a vampire.

`:-E` Bucktoothed vampire.

`:-F` Bucktoothed vampire with one tooth missing.

:-7 User juust made a wry statement.

:-* User just ate something sour.

:-)~ User drools.

:-~) User has a cold.

:'-(User is crying.

:'-) User is so happy, s/he is crying.

:-@ User is screaming.

:-# User wears braces.

:^) User has a broken nose.

:v) User has a broken nose, but it's the other way.

:_) User's nose is sliding off of his face.

:<) User is from an Ivy League School.

:-& User is tongue tied.

=:-) User is a hosehead.

-:-) User is a punk rocker.

-:-(Real punk rockers don't smile.

:=) User has two noses.

+-:-) User is the Pope or holds some other religious office.

`:-) User shaved one of his eyebrows off this morning.

,:-) Same thing...other side.

|-I User is asleep.

|-O User is yawning/snoring.

:-Q User is a smoker.

:-? User smokes a pipe.

O-) Megaton Man On Patrol! (or else, user is a scuba diver)

O :-) User is an angel (at heart, at least).

:-` User spitting out its chewing tobacco.

:-S User just made an incoherent statement.

:-D User is laughing (at you!)

:-X User's lips are sealed.

:-C User is really bummed.

<|-) User is Chinese.

<|-(User is Chinese and doesn't like these kind of jokes.

:-/ User is skeptical.

C=:-) User is a chef.

@= User is pro-nuclear war.

`*<:-)` User is wearing a Santa Claus Hat.

`:-o` Uh oh!

`(8-o` It's Mr. Bill!

`*:o)` And Bozo the Clown!

`3:]` Pet smiley.

`3:[` Mean Pet smiley.

`d8=` Your pet beaver is wearing goggles and a hard hat.

`E-:-)` User is a Ham radio operator.

`:-9` User is licking his/her lips.

`%-6` User is braindead.

`[:-)` User is wearing a walkman.

`(:I` User is an egghead.

`<:-I` User is a dunce.

`K:P` User is a little kid with a propeller beenie.

`@:-)` User is wearing a turban.

`:-O` No Yelling! (Quiet Lab)

`:-:` Mutant smiley; the invisible smiley.

`.-)` User only has one eye.

`,-)` Ditto...but he's winking.

`X-(` User just died.

`8 :-)` User is a wizard.

`-=* :-)` User is a TeX wizard.

E.3 Midget Smileys

A lot of these can be typed without noses to make midget smileys.

`:)` Midget smiley.

`:]` Gleep...a friendly midget smiley who will gladly be your friend.

`=)` Variation on a theme...

`:}` What should we call these? (what?)

`:)` Happy.

`:>` What?

`:@` What?

`:D` Laughter.

`:I` Hmmm...

`:(` Sad.

`:[` Real Downer.

`:<` What?

`:{` What?

`:O` Yelling.

`:C` What?

`:Q` What?

`:,(` Crying.

`[]` Hugs and ...

`:*` Kisses.

`|I` Asleep.

`^o` Snoring.

E.4 Mega Smileys

`C=}>;*{())` A drunk, devilish chef with a toupee in an updraft, a mustache, and a double chin.

`}:^#})` Updrafted bushy-mustached pointy nosed smiley with a double-chin.

E.5 Usenet Smileys

In some Usenet articles you might also find these smileys which form a certain "dialect" developed and used in this most creative environment.

`~~:-(` Net.flame

`O |-)` Net.religion

`8 :-I` Net.unix-wizards

`X-(` Net.suicide

`E-:-I` Net.ham-radio

E.6 Emotional Smileys

`:-)` ha ha

`|-)` hee hee

`|-D` ho ho

`:->` hey hey

`:-(` boo hoo

`:-I` hmmm

`:-O` oops

`:-P` nyahhhh!

"The man who smiles when things go wrong has thought of someone to blame it on."
— **Jone's Law**

"Standing on head makes smile of frown, but rest of face also upside down."
— **Fortune cookie**

Paperware on the Net

The following is a compendium of sources that have information that will be of use to anyone reading this guide. Some of them were used in the writing of this guide, while others are simply noted because they are a must for any good **net.citizen**'s bookshelf.

It might also be useful for those, who are interested in the history of the Internet. Thanks for the better part of this compilation to *Henry Edward Hardy*. It has been stripped from his Master's Thesis *"The History of the Net"* at the School of Communications, Grand Valley State University, Allendale, MI 49401. Version 7.2 was posted to **comp.org.eff.talk** on August 28, 1993.

> Version 8.5 of *"The History of the Net"* is now available. This is exactly the same as the final, archival copy submitted to the Grand Valley State University Library. Work will continue to produce an article, and perhaps also a book, from this material. I invite continued responses, particularly with reference to the history of non-American networks. Corrections or general discussion are also welcome.
>
> Please note that this is a draft of an unpublished work, here presented for purposes of peer review and comment. Please email comments, questions and errata to `<seraphim@umcc.umich.edu>`.
>
> Current copies of this work are be available via '`gopher umcc.umich.edu 1.14.3`' and by anon ftp from **umcc.umich.edu** '`/pub/seraphim/doc/nethist8.txt`'.
>
> I put a Mac Word and a postscript version of the text in the anon FTP directory if you would like a pretty version. A printed and bound (in one of those $3 hard 2-hole report binders) edition, numbered and signed by the author, is also available for $. Email me for details.
>
> Thanks, –HH `<seraphim@umcc.umich.edu>`

Note that some publishers might also be contacted by e-mail, e.g. O'Reilly & Associates at `<nuts@ora.com>`.

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FYI:

The following lists a selection of addresses you might find helpful, when you want to hook into cyberspace.

Snail Mail Addresses

Whole Earth 'Lectronic Link (WELL), 27 Gate Five Rd, Sausalito CA 94966, $15/mo; $2/hr, (415) 332-4335.

WHOLE EARTH REVIEW, P.O. Box 38, Sausalito, CA 94966-9932, $20/yr; four issues.

MONDO 2000 (Cyberpunk Magazine), P.O. Box 10171, Berkeley, CA 94709-5171, $24 five issues more or less quarterly.

bOING bOING (World's Greatest Neurozine), 11288 Ventura Blvd #818, Studio City CA 91604, $14/ 4 issues kind of quarterly.

SCIENCE FICTION EYE, P.O. Box 18539, Asheville, NC 28814, $10 three issues; two a year, more or less.

THE MAGAZINE OF FANTASY AND SCIENCE FICTION, P.O. Box 56, Cornwall, CT 06753, $26 twelve issues a year.

E-Mail and List server Addresses

Computers and Academic Freedom: To subscribe send 'add comp-academic-freedom-news' to <listserv@eff.org>.

Computer Underground Digest: <tk0jut2@niu.bitnet>

Phrack: <phracksub@stormking.com>

RISKS Digest: <risks-request@csl.sri.com>

FTP'able & Gopher'able Addresses

ftp.eff.org In directory '/pub/agitprop' you'll find the contents of a disk containing "Literacy Freeware" by Bruce Sterling.

In directory '/pub/cud' you'll find the "Computer underground Digest" archives.

gopher.well.sf.ca.us Gopher this site and browse through the index. It's full of e-text publications.

tic.com In directory '`Bruce Sterling's agitprop/`' you'll find the contents of the "Literacy Freeware" disk by Bruce Sterling.

"And all else is literature."
— **Paul Verlaine**, The Sun, New York
While he was city editor in 1873–1890.

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ftphelp@eff.org 203
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ftpmail@doc.ic.ak.uk 133
ftpmail@ftp.inf.tu-dresden.de 133
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listserv@ndsuvm1.bitnet 77
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president@white house.gov 182
president@whitehouse.gov 42
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"In short, **N** *is Richardian if, and only if,*
N *is not Richardian."*
— **Anonymous**

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"I have made this letter longer than usual because
I lack the time to make it shorter."
— **Blaise Pascal**, *"Provincial Letters XVI"*

"The world is coming to an end.
Please log off."
— **Anonymous**

" 'It's dark,' he said.
'Yes,' said Ford Prefect, 'it's dark.' "
— **Douglas Adams**, *"The Hitch Hiker's Guide to the Galaxy"*