Kansas Geological Survey
Open-file Report

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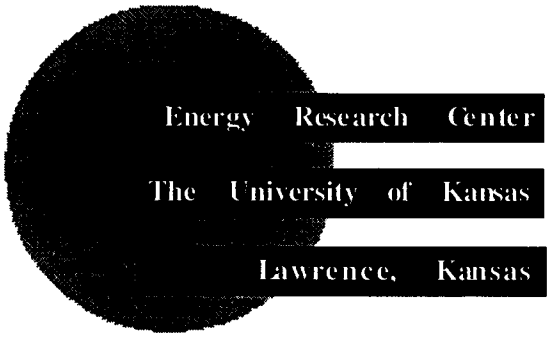
# The Internet Explored for the Petroleum Professional




PTTC

PETROLEUM TECHNOLOGY TRANSFER COUNCIL

December 8, 1995
8:30 AM - 4:30 PM

at the

KU Regents Center
12600 Quivira Road
Overland Park, Kansas

Sponsored by the
KU Energy Research Center
As part of
Petroleum Technology Transfer Council
with funds from the
US Department of Energy

# Internet Explored for the Petroleum Professional
# Course Outline

| | | |
|---|---|---|
| 8:30 - 9:00 | Carr | Introduction |
| 9:00 - 9:30 | Adkins-Heljeson | What is the Net |
| 9:30 - 9:45 | Adkins-Heljeson | Introduction to the Web Browser |
| 9:45 - 10:15 | Staff | Hands-on Use of the Browser |
| 10:15 - 10:45 | Break | |
| 10:45 - 11:15 | Neighbors | Introduction to Remote Access |
| 11:15 - 12:00 | Neighbors | Newsgroups and Bulletin Boards |
| 12:00 - 1:00 | Lunch | |
| 1:00 - 1:45 | Mettille | Demonstration of Data Download |
| 2:00 - 2:15 | Sorensen | Introduction to Internet Library Resources |
| 2:15 - 2:30 | Carr | Introduction to Internet Petroleum Resources |
| 2:30 - 3:00 | Break | |
| 3:00 - 4:30 | Staff | Hands-on Surfin the Petroleum Net |

# Instructors

| | |
|---|---|
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The KU Regents Center has been extremely helpful in support of this workshop.

# Introduction

*"When historians look back at the latter half of the twentieth century it might well be remembered less as the time man walked on the moon, and more as the time we gave birth to the Internet."*

- From the introductory narration for "Understanding the Internet"

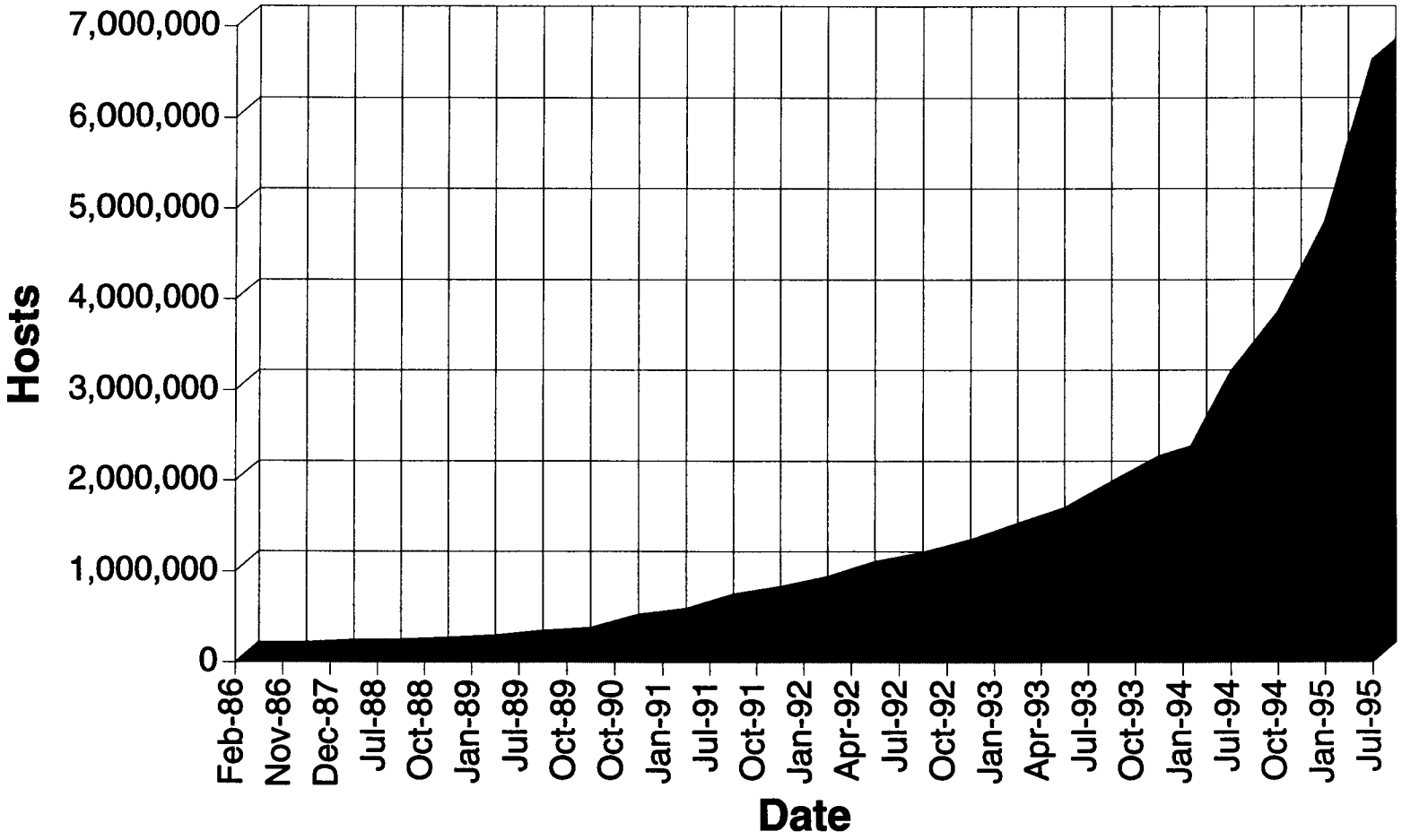
Is Internet over hyped or is it the tool of the future for communication and data access in the petroleum industry? Growth on the net has been explosive. New domain names are requested at a rate of 1.2 per minute, and it has been estimated with tongue-in-cheek that if present growth rates continue the estimated time at which everyone on earth will be on the Internet is 2004 (The Internet Index, Number 9 & 10 by Win Treese; http://www.openmarket.com/diversions/internet-index/). As measured by the number of hosts (servers providing some type of data) the Internet is doubling every 10 months. As of July, 1995 there were over 6.5 million hosts (attached figure).

The Internet is a maze of obscure protocols, servers, browsers, arcane acronyms, and concepts. This course will attempt to provide hands-on exposure to several major aspects of the Internet that link computers across the state, the nation and the world. In addition you will learn to locate and to access existing and future Internet servers that are sources of petroleum information. You will also learn about and access information servers dedicated to Kansas petroleum resources. In addition, we are looking for your ideas as to the future directions for providing petroleum information in Kansas and at the national level.

We hope that at the end of the day you will be comfortable with "surfing" the net and have the basis for evaluating the Internet as a tool for your business.

In addition we should have some fun along the way, and learn such important facts as the number of daily newspapers in Iran with web sites (answer 2 from The Internet Index, Number 11 by Win Treese; http://www.openmarket.com/diversions/internet-index/).

# Internet Host Growth




T. Carr, KGS 11/21/95

Survey data provided by Network Wizards
Data is available at http://www.nw.com

# Introduction to the Internet

## 1.1 Computers and networks

Computer networks started as way to allow remote access to mainframe computing from sites other than at a main computer center. These networks were centered around the mainframes, and allowed simple video terminals and printers to communicate with the larger computer. No computing was done by the terminals, which were designed to work only with a specific mainframe. Examples include access by travel agents of airplane ticketing systems and distributed computing labs on university campuses. Sometimes dedicated wiring was needed, but very slow connections over phone lines were also used because so little information was sent to the text-based terminals and printers.

The advent of micro and personal computers changed all of this. Small networks were designed to allow sharing of printers and backup devices by personal computers. Users at different companies and universities needed to exchange data bases and reports. The remote users had computing power of their own, and much more information than terminal control characters needed to be transmitted. The growth of electronic mail (e-mail) required more network capacity. More importantly, the computer systems thus connected needed to speak a common language not proprietary to any one computer system.

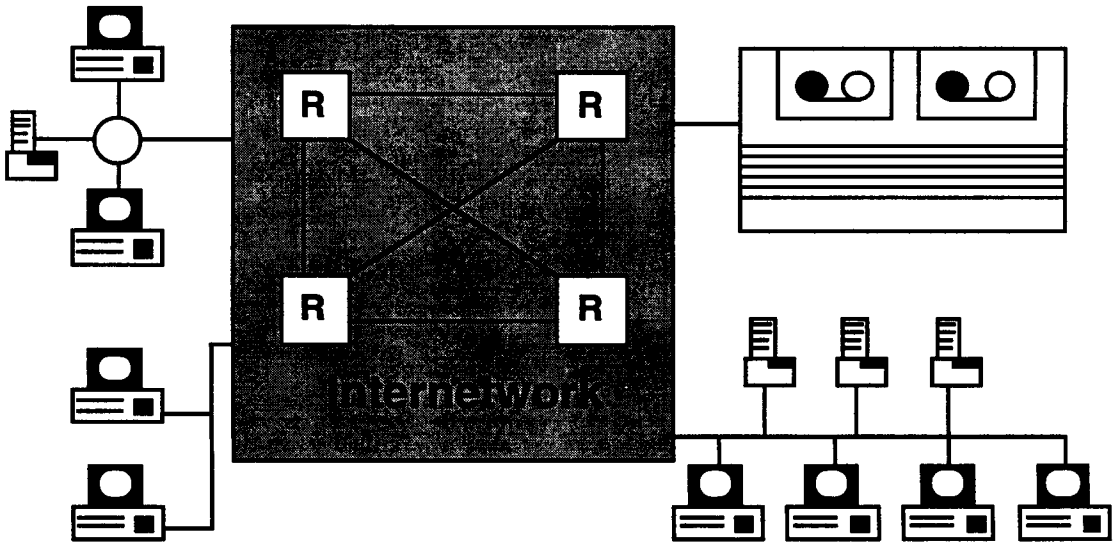



Figure 1-1—An example internet. The system is made of personal computers, printers, routers (R, similar to switches), and a mainframe.

## 1.2 What is the Internet?

To understand what **the** Internet is, it is important to understand that **an** internet in a general sense is any communication system that connects two or more computer networks together. Figure 1-1 shows a small network connecting several small workgroups and a mainframe. The smaller groups are in a sense independent, and can share files with each other locally and print to locally connected printers. However, the addition of the internetwork allows collaboration from state to state or around the world with much the same ease.

Agreed-upon standards dictate what kinds of wire would be used in computer networks, what kinds of characters could be sent across the wires, and how each computer on the network could be addressed uniquely. This allowed computers of all kinds to communicate through file transfers and e-mail. Most local networks will be made of one kind of computer and operating system to enable more sophisticated printing features and file sharing. However, the underlying standards are always present.

If an internet is designed and constructed correctly, the various users who are connected to it will not have to know the details of how information travels from one computer to another. In other words, the internet hides the underlying communications details from the users.

This brings us to the Internet as it exists today. Every computer connected has the ability to talk to every other computer connected in a way that is independent of the kinds of computers involved. Knowing how a particular computer is attached to the network is not necessary. All that is needed is an exchange of passwords.

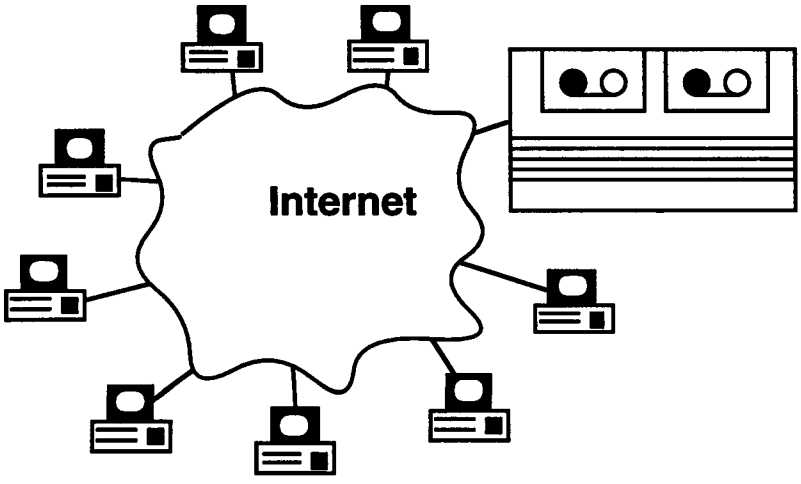



Figure 1-2. Logical view of the Internet.

## 1.3 Internet history

The Internet had its beginnings back in the late 1960's and early 1970's when the U.S. Government began initiating research and development in the area of remote computer communications. During the 1970's, the first internet was connected by the Advanced Research Projects Agency (ARPA) and was called ARPANET. The initial ARPANET connected four supercomputer sites together in California and Utah. The ARPANET expanded rapidly as more and more sites around the U.S. began connecting to these initial sites. As the network grew, the weakness in the initial communications protocol (rules of communications between computers across a network) became more of a bottleneck. A new protocol was needed.

In the late 1970's and early 1980's, a new protocol was developed and implemented on the Internet. This protocol, still used today, is called Transmission Control Protocol/Internet Protocol or TCP/IP. There are two parts to this system, TCP and IP, but the two are generally discussed together. TCP/IP is the method by which one computer can find another computer on the network and how two computers can exchange small packets of information.

Now the Internet is made of many networks, including the National Science Foundation Network (NSFNET), the Australian Academic and Research Network (AARNet), the NASA Science Internet (NSI), the Swiss Academic and Research Network (SWITCH), and about 10,000 other large and small, commercial and research networks.

The Internet is merely the wires and protocols for communication between computers. Several services are run on the Internet, including Archie, Gopher, FTP, and, of course, the World Wide Web. More on these later.

## 1.4 Computer address

The Internet Protocol (IP) system defines how each computer on the Internet must be assigned a unique name. If computer addresses were not unique, then messages meant for one computer could be received by other computers. In addition to being unique, the system must be dynamic. It would be impossible for any one computer, no matter how large, to keep track of the addresses of all other computers on the Internet. Thus all computers

must know how to find another computer on the Internet, even if they've not communicated before.

The IP system involves a four-part number in this format:

$xxx_1.xxx_2.xxx_3.xxx_4$

The dots are part of the address. The numbers (represented by $xxx_n$) can range from 0 to 255. Each group, from left to right, is used to identify a more specific address. Thus there are 256 possible first numbers. These can be considered similar to a country code of a telephone number. They are split between educational, government, military, and foreign use, but you can see that 256 groups is not very many for the world's supply of computers. Some organizations received a single $xxx_1$ for their own use. These are called Class A addresses. Most organizations are Class B, and have received a specific $xxx_1.xxx_2$ from which they can assign numbers. For example, KU has received $129.237.xxx_3.xxx_4$, whereas KSU has 129.130. The organizations can use the third and fourth IP sections to subdivide their network. By the time the complete four-section number is full, a specific computer has been given a specific address, unique in the entire world.

These numbers (an organization's $xxx_1.xxx_2$, not the $xxx_3.xxx_4$ for specific computers) are assigned by national organizations under the direction of an international standards committee. As with much of the Internet, the system grew out of a collaborative process and is often being revised. At the moment, a new version (IPng for "Next Generation") is being finalized because the current system is running out of numbers. Just as the U.S. telephone system had to add area codes with numbers other than 0 and 1 in the second place, the IP system is straining under the growth in the Internet.

### 1.5 Domain Name system (DNS)

Thankfully, human users of computers never have to remember the IP number. A secondary system of Domain Names translates the IP number of a computer into a more easily remembered name. System administrators at computer centers create these names as aliases for the officially sanctioned IP address. Often they will assign more than one name to a specific computer for convenience. Example names would be

ibm.com
nic.ddn.mil
gaea.kgs.ukans.edu

Just as with IP numbers, there are dots separating items of interest. In this case, the items are names and not numbers. On the far right is a word that indicates the general domain of the address. Some are descriptive:

| | |
|---|---|
| .edu for universities | .com for commercial |
| .mil for military | .gov for government |
| .org for organization | |

Some addresses, especially those that are newer, will end in a country designation:

| | |
|---|---|
| .US for United States | .CA for Canada |
| .NZ for New Zealand | .ES for Spain |

and so on. Generally, if you do not see a country code, the country is probably the U.S. A complete address generally has four parts, although it can have more or fewer sections.

| **gaea** | **.kgs** | **.ukans** | **.edu** |
|---|---|---|---|
| specific | sub | main | country |
| machine | organization | organization | or domain |

One point of confusion is that IP addresses are arranged so that the most general part of the address starts at the left (129.239.xxx.yyy), whereas the Domain Name system has the most general part of the address at the right (yyy.xxx.ukans.edu). While you should not need to deal with IP addresses, you will often come across them as you work on the Internet. Sometimes a computer will send you a message using its IP address instead of its name, and sometimes a computer you are communicating with will refer to your computer with an IP address.

Sometimes you will receive messages saying "The Domain Name Service is down" or "Cannot resolve Domain Name." That means another computer you are connecting through cannot figure out what actual computer address is connected to a Domain Name.

Finally, just as with IP addresses, there are national organizations that arbitrate what user owns a particular name. Several forward-thinking individuals reserved names they imagined a large (but Internet-naive) company might want in the future. The individuals hoped that if a certain company later really wanted "mcdonalds.com" they would be willing to pay for it. Few of these plans paid out. Recently several companies "reserved" large numbers of domain names for all of their products (salad dressings, cleaning supplies, and so on). If they ever need to start a World Wide Web site for a particular product, they will already have the name available.

### 1.6 Services over the Internet

From the beginning, e-mail was a primary reason that people worked so hard to create efficient links between computers. Instant communication was possible with e-mail, and information could be sent worldwide without worrying about time zones or border crossings. Systems were created to send the same mail to several people. These Listservers are giant conferences, where all mail to a certain address is distributed to interested parties all around the world. A similar process is the Newsgroup, where dialogs take place between people of similar interests.

While actual real-time communication (audio and video) is possible, most Internet services are of a "store-and-forward" variety. For example, mail sent to Austria from the KGS in Lawrence will first go to KU, then from KU to KSU. Ultimately it will reach one of a few universities that have direct connections to Europe. It is a cooperative process: all members promise to send out mail they receive as quickly as possible, and to store mail if a link is temporarily down. Universities and other organizations store large newsgroup files locally for users to read. Some sites specialize in storing archives of software or newsgroup discussions.

Another major use of the Internet is FTP (File Transfer Protocol). FTP allows a user to log in to a remote computer, move through directories, and retrieve files. (Generally the log on is through Anonymous FTP, and the remote computer restricts the kinds of documents shown.) A service called Archie creates a data base of files found on FTP servers. If the user knows the name of the file desired, Archie can search its data base and show where the file can be found.

As the Internet grew, connection and retrieval clearly were no longer problems, but finding out what was available and where it was located grew to be a huge problem. Gopher, created at the University of Minnesota, is a way of accessing data bases at other sites. The user can access data all over the Internet through a series of menus. Veronica is an extension to Gopher, and a Veronica data base searches all files on all of the world's Gopher servers. In November 1994, over 15 million files were indexed. But the tool that most created explosive interest in the Internet was the World Wide Web (WWW).

## 1.7 World Wide Web

The WWW was created in 1989 at CERN, the European high-energy physics center, by Tim Berners-Lee. The WWW is a product of

1. Web servers that will send information to anonymous users
2. Web documents that contain text, graphics, and links to other Web documents
3. Web browsers that can display the information and understand the hypertext links.

The WWW was created for more efficient distribution of both text and graphical information, a serious need in the high-energy physics community. The pages distributed over the Web are very easy to create (if you don't have a great deal of data to present), and the extremely graphics-heavy format and ease of connection is very user friendly.

Web servers are the software that store information and send it out upon receiving a request from a user. The server software is available for many kinds of computers, but most servers are Unix workstations because of their processing power, strong networking, and multi-user operating system. While the server responds to requests from anonymous users, security is not too much of a problem because Web servers heavily restrict the kinds of information transmitted and close off other parts of a computer system.

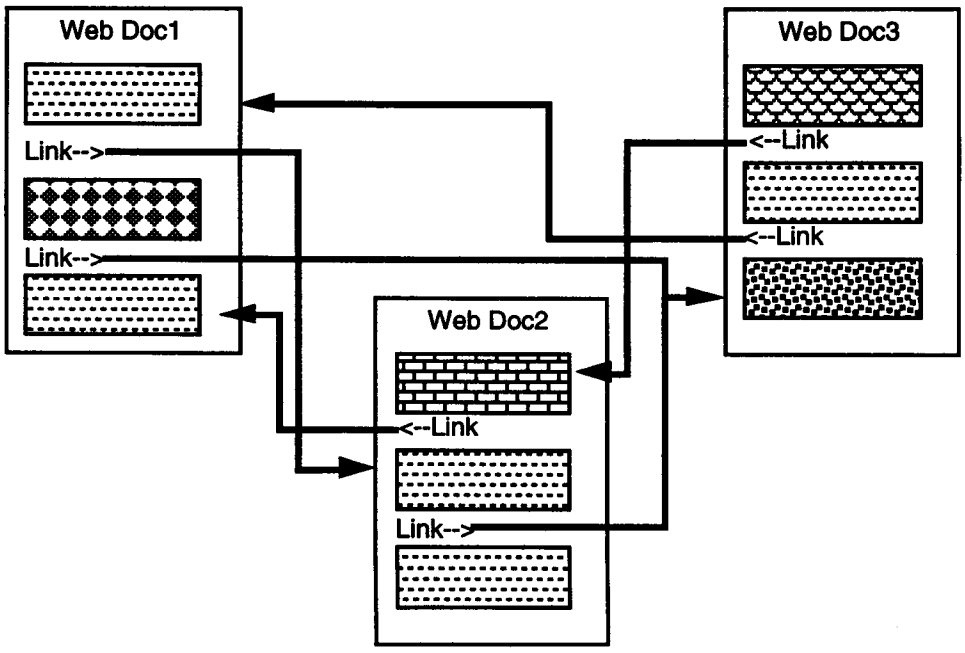



Figure 1-3. Web documents contain text and graphics, and contain links to related information.

Web pages are created in HTML, or Hypertext Markup Language. All text is sent as ASCII, with special codes added (also in ASCII) to help the browser in formatting the document. Graphics are placed directly in the document, and formats are used that are readable by virtually all kinds of computers. In addition to the heavy use of graphics, Web pages succeed because the hypertext links to other pages are easy to create and easy for the user to follow. Just by clicking on a word, the user can go to another page on another computer.

Figure 1.3 shows a sample set of Web pages. Links are added to other pages by the authors themselves, often without the knowledge of the original pages's author. Links create efficient means of transmitting information. At the KGS, for example, we gave up trying to keep track of universities on the Web; we just added a link to a site that specializes in that.

Web browsers bring the servers, documents, and links together in an extremely friendly package. Browsers can display graphics and text, act as an FTP program for downloading files, serve as Newsgroup readers, and can send and read mail. Generally a browser uses other applications on a user's computer to assist in working with files the browser cannot itself read. These helper applications can play movies and sound, un-compress files, even start up spreadsheets, all based on the kind of datafile received by the browser.

The first browser, called Mosiac, was created at the National Center for Supercomputer Applications in Illinois. With its combination of text, graphics, links, and free price, Mosaic was a revolutionary application, and perhaps for the first time showed how the Internet could really be used. Mosiac is still available for all kinds of computers and has spawned several for-profit companies that have created more efficient or more powerful browsers. The most famous of these is Netscape, a company also known for creating servers that were secure enough to allow credit-card transactions over the Web to be carried out.

Text-based browsers (like Lynx) are still available. No graphics are transmitted, but communication is fast and links are followed by typing a number. These are available mostly for mainframe and UNIX computers. Most commercial on-line services (like CompuServe or America Online) have responded to customer requests and have added Web browsers to their standard on-line software. While Web access through the commercial services is sometimes slower than a direct connection, their combination of

private online services, easy-to-use software, and the Web itself is a strong package.

### 1.8 URLs

The Uniform Resource Locator (URL) is the method by which a page is located on the Web. The URL gives the address of a graphic to be displayed, the next page in a series of pages, or the name of a page on another computer that may have other items of interest.

The URL most resembles a Domain Name, with a few additions. Just as with a Domain Name, the URL is mostly alphabetical (not numeric), and it describes the address of a computer in the same way. Here is an example:

http://www.kgs.ukans.edu/ERC/PTTC/data.html

On the left is a string that describes what kind of action is required. HTTP means the document is on a Web server, whereas FTP:// means the file is available for downloading, NEWS:// refers to a newsgroup, and TELNET:// opens a terminal program for talking to a computer in a command-line mode (like DOS has a C:\ prompt).

After the double slashes is what looks to be a Domain Name for a computer, and that pretty much is what it is. Just as with a DNS, the name can be broken into a computer (www), a sub-organization (.kgs), an organization (.ukans) and a domain (.edu). After that comes a series of names and slashes that will give the path of a file. In this case, the file is named data.html and it is located in a directory called PTTC, which is in a directory called PTTC on the WWW machine at the KGS.

Sometimes the address will look like this:

http://uts.cc.utexas.edu:80/~churchh/htmlcheck.html

In this case there is a Port Number (:80) in addition to the computer name. That means they want requests for WWW pages to come into their computer through a certain connection (possibly for security reasons). They may also be running more than one server and allow use only by local computers on one of the servers. After the port number is a ~churchh. The ~ is not a typo, but means to look in a certain user's home directory for the file. Universities will often add the account name to a Web address, as will commercial Internet providers who have many clients.

Sometimes no file name is listed, only a computer name:

http://www.kgs.ukans.edu/

If the server is set up correctly, that address leads to a default welcome page and is perfectly legal.

By the way, you should be somewhat careful of upper and lower case. Usually machine names can be spelled in either upper or lower case and the Domain Name system will figure out what you mean, but the file and directory names should be typed as you find them. If you receive a page saying "Error 404--Page not found," you should check the spelling and letter case of a name. On most servers, the files "PRSHOME.HTML" and "prsHome.html" and PRShome.html" will be seen as different files.

In general, you don't often have to type in an address because you are usually following links by clicking on existing pages. However, if you see an address in a newspaper, magazine, or on television, care taken in typing will usually call up the correct page.

### 1.9 Finding information on the WWW

Just as Archie is used to index FTP sites and Veronica is used to index Gopher servers, the WWW has several tools to assist in finding information. Perhaps the most useful site is Yahoo, or http://www.yahoo.com/ (a version with fewer graphics is at http://www.yahoo.com/text/). Yahoo may return fewer sites than some indexes if you perform a simple search, but it has organized all of its sites in an easy-to-use set of topics. Just a few clicks takes you to a list of sites covering a single topic, and fewer mistaken hits based on a simple keyword search occur.

For depth of coverage, no site can match Lycos (http://www.lycos.com). The searching dialog is easy to use, and it will return sites based on all, any, or just some of the keywords you type in. Similar to Lycos, the Webcrawler site (http://www.webcrawler.com) also covers the Internet with an exhaustive keyword data base. Webcrawler has a ranking system to tell the user how relevant the sites returned are to the searches requested.

Most keyword searches will return several wrong hits for any search. If, for example, you wish to find sites with information on the Civil War photographer Alexander Gardner, you will receive many sites that mention "Alexander Gardner" (some of whom may be the specific person you are interested in). But with Lycos, Webcrawler, and other keyword-based searches, you will also get any site that mentions "Susan Alexander Smith" and "Frank Gardner," for example. Thus you should be as specific as you can on a search and only broaden your search if you are not getting any responses.

### 1.10 The growth of the WWW

The explosive growth of the WWW has taxed heavily the infrastructure of the Internet. Figure 1-4 shows the growth in the number of WWW domains (named WWW sites) created over just the past few years. Figure 1-5 shows the increase in the total number of Internet hosts (specific computers tied to the Internet).

One reason for the growth in the Internet has been the friendly face WWW browsers have put on the search for information. The heavy use of graphics, the addition of movies and sound, and the low price for the software (free for most users) has allowed the WWW to swamp the Internet with people publishing their own works of art, record lists, movie reviews, and other information.

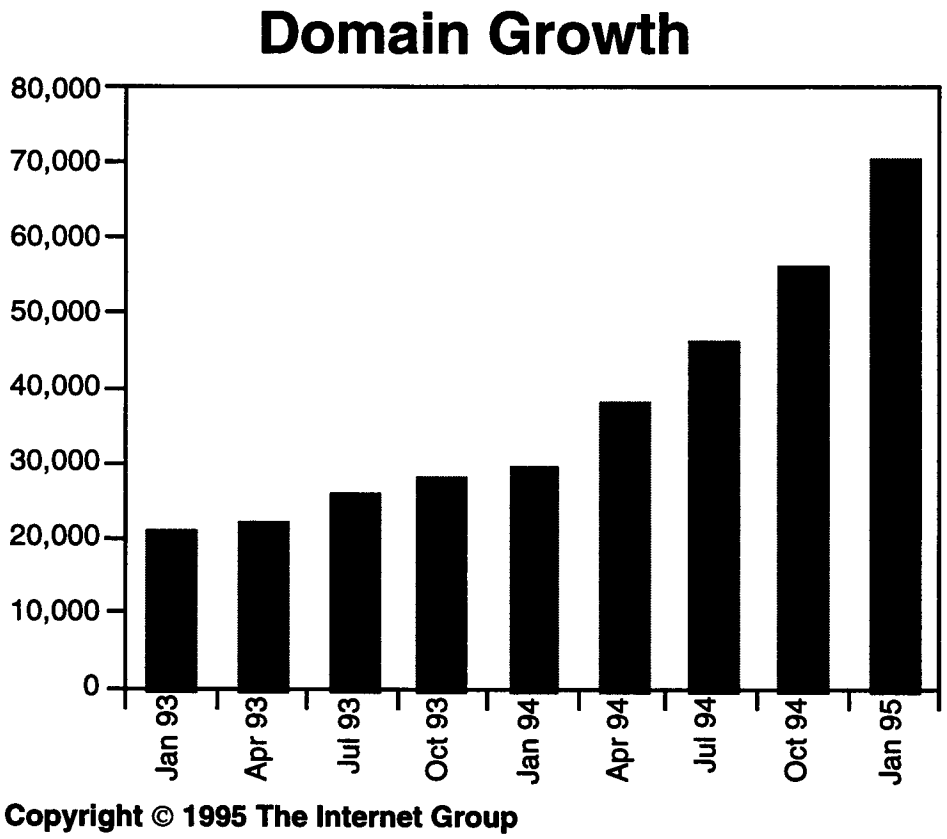



Figure 1.4--Total number of domains as measured by Mark Lotter's Domain Survey (http://www.nw.com).

Having a page on the WWW is like publishing your own magazine. The Internet is a leveling medium, and a small page created by a single person interested in model planes is as easily reached as a large, expensive site designed by Lockeed-Martin or Boeing. Many people have placed whole books online, and often the information in those pages is more useful than any number of books actually published.

Because so many WWW users are students or faculty at universities, their access is free; certainly they have taken advantage of it. Small businesses also have found a place on the Internet. A store can open up online and compete for clients just as a much larger store. However, the growth in online commerce has been slower than many have predicted. Probably worries over security and the generally free-wheeling and academic slant to the WWW has slowed acceptance.

The ease of creating WWW documents has also aided in the growth of the Web. Given an account on a computer hooked to the Internet, a user can

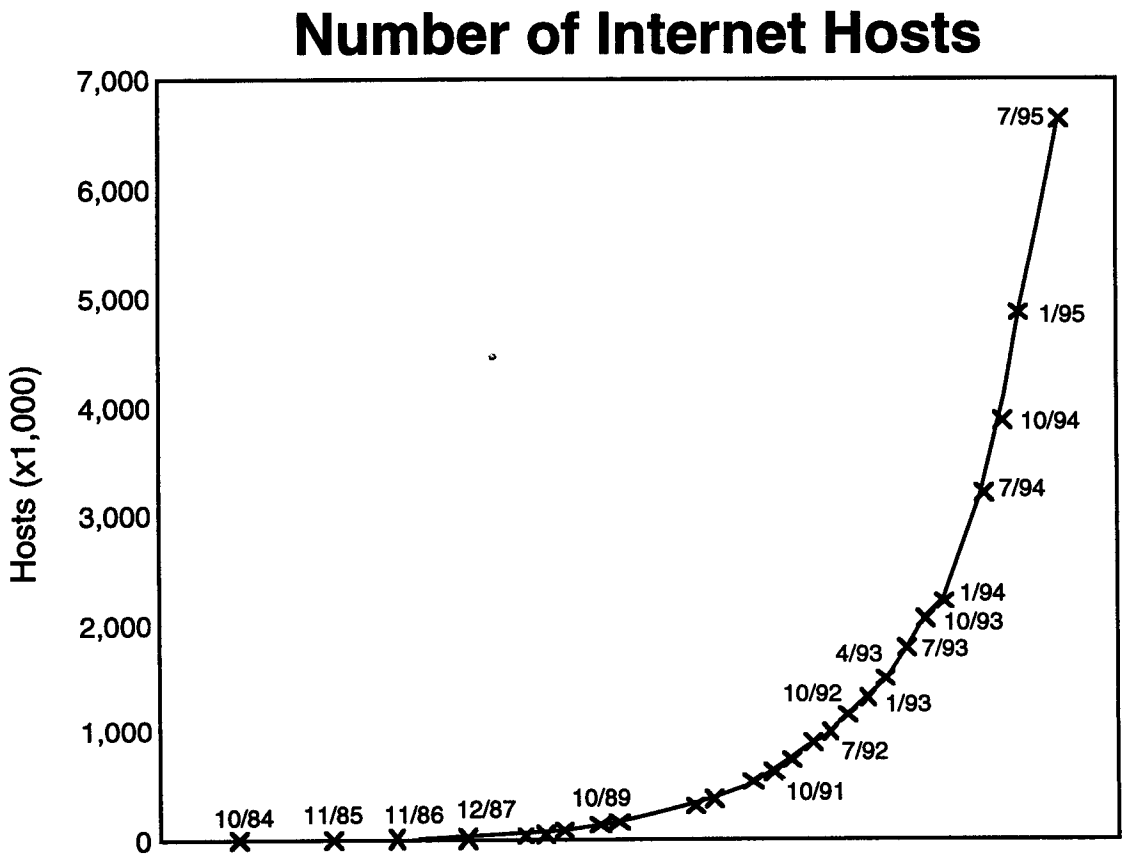



Figure 1.5--Total number of Internet hosts (individual computers) found on the Internet.

look up online guides to making pages, type in the information needed, and add the simple formatting needed in four hours or less. Subsequent pages can be added very quickly, and placing graphics online is very easy for anyone with standard Windows or Macintosh software. A cursory glance at the WWW shows a huge number of people have added their page to the exploding number of sites. Many are just short pages showing their interests, hobbies, and pets. Other are exhaustive (and exhausting) lists of record collections.

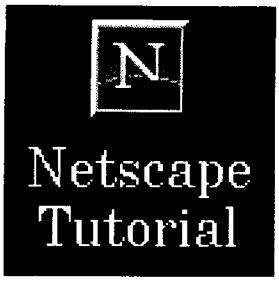
A good place to start learning to make pages is "A Beginner's Guide to HTML" at http://www.ncsa.uiuc.edu/demoweb/html-primer.html. Reading these sites will give you as much a start as any number of books found at the local store. Also, any browser will allow you to save the HTML code for a page you have found (all of it is ASCII text). Find a page on the Web that you like, save the page to your disk (use the "Save as Source" option), and examine the HTML code. Use the "Open local file..." command to see the file you have on your own disk. Change it a little and see what the new version looks like.

One rule to remember is that the creator of a page can only present the information. Different browsers with different users can change the colors you design, change the fonts you select, and hide the graphics you work hard to perfect. Focus on content, not formatting, and your page will be a greater success.

## 1.11 References

Archie—http://www.sura.net/archie/Archie-Usage.html
CompuServe—http://www.compuserve.com:80/homepage.html
Gopher—http://www.eff.org/papers/bdgtti/eegtti.html
Internet growth—http://www.tic.com/mids/growth.html
Internet organization—http://www.isoc.org/
HTML—http://www.ncsa.uiuc.edu/demoweb/html-primer.html
Internet Explorer for Windows 95—
http://www.windows.microsoft.com/windows/ie/ie.htm
Lynx—http://www.cc.ukans.edu/lynx_help/Lynx_users_guide.html
Mosaic for Macintosh—
http://www.ncsa.uiuc.edu/SDG/Software/MacMosaic/

Mosaic for Windows—
http://www.ncsa.uiuc.edu/SDG/Software/WinMosaic/
Mosaic for X Windows—
http://www.ncsa.uiuc.edu/SDG/Software/XMosaic/
Netscape—http://www.netscape.com/
Protocols—http://www.ietf.cnri.reston.va.us/home.html
Spyglass Mosaic—http://www.spyglass.com/three/index.html
Veronica—gopher://gopher.scs.unr.edu/00/veronica/veronica-faq
Yahoo—http://www.yahoo.com
or http://www.yahoo.com/text/




# Netscape Tutorial

A step-by-step tutorial on how to use
one of the finest World Wide Web Browsers available

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The software industry offers a number of World Wide Web browsers. Netscape is one of those World Wide Web browsers. Why does the Networking Module provide such a detailed tutorial on the use of Netscape? Why not choose one of the many other browsers? There are three basic reasons to choose Netscape over other current versions of WWW browsers.

## So why Netscape?

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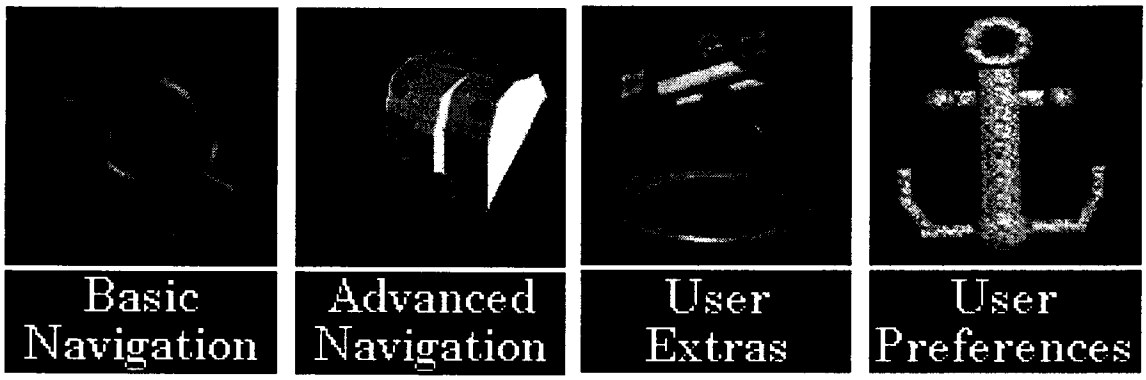


The Links:

- Basic Navigation
- Advanced Navigation
- User Extras
- User Preferences
- Accessing Newsgroups

Return to the Networking Module

---

FEEDBACK
to rswenner@uxa.cso.uiuc.edu

---

Netscape tutorial
The AIM Lab Group
Created by R. Scott Wennerdahl (May 1995)

The Links:

- Read
- Reply
- Post
- Subscribe

RETURN TO THE NETSCAPE TUTORIAL

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FEEDBACK
to rswenner@uxa.cso.uiuc.edu

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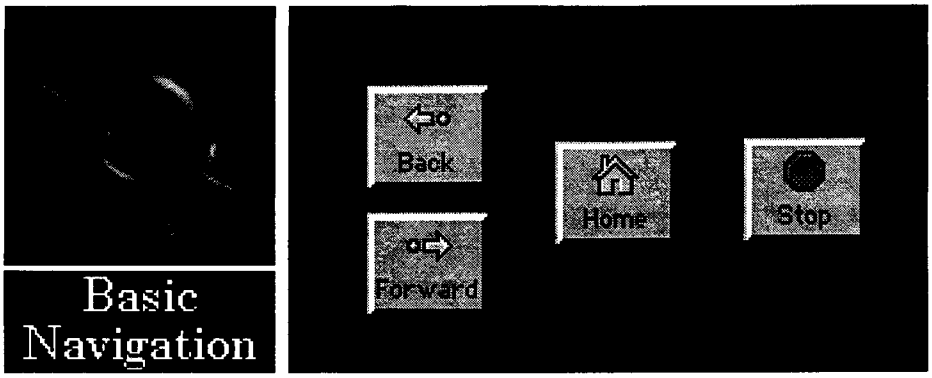
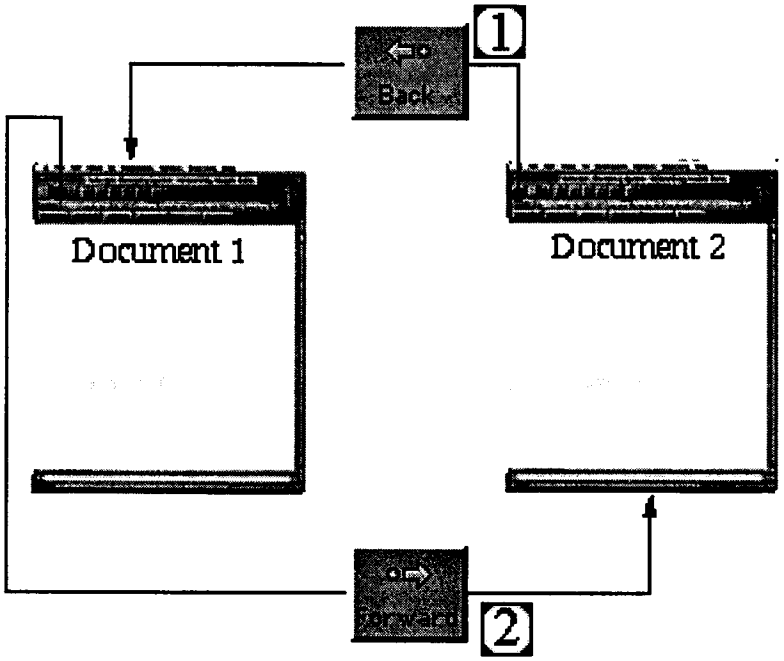
Netscape Newsgroup tutorial
The AIM Lab Group
Created by R. Scott Wennerdahl (July 1995)




## Back and Forward

The Essential Navigation Tools

Back and Forward are the most essential, hence most used, of the Netscape features. Back and Forward are the "page turners" of Netscape. Like your own fingers turning a page in a book, back and forward allow the user to move back and forward through the documents which you have viewed. Below is an example of how Back and Forward are used together.




### How it works...

1

Back is pressed from Document 2 to move back to Document 1.

2

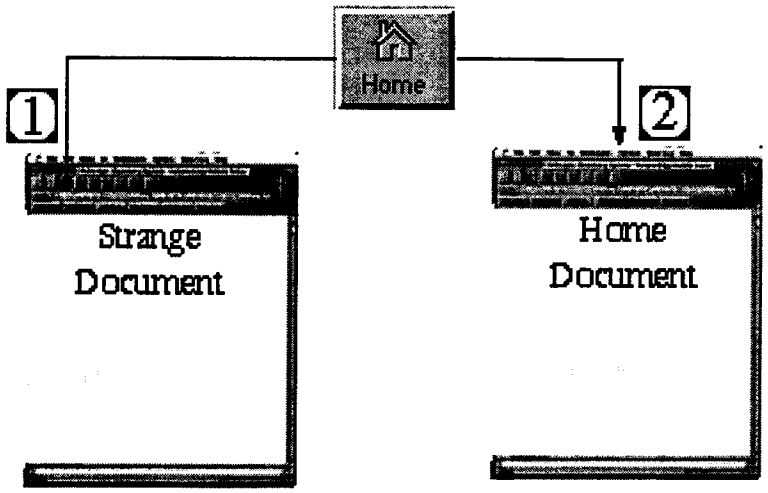
Forward is pressed from Document 1 to move forward to Document 2.

Back and Forward will be inactive when you first begin your session. Once several links have been pressed, back and forward can be pressed repeatedly. For example, pressing Back twice takes you back two documents. Pressing Forward three times takes you forward three documents.

## Home

Lost in Cyberspace? Set a course for Home!

Home takes you to the computer's preset Home Page.




## How it works...

1

After pressing many links, you are lost. Home is pressed.

2

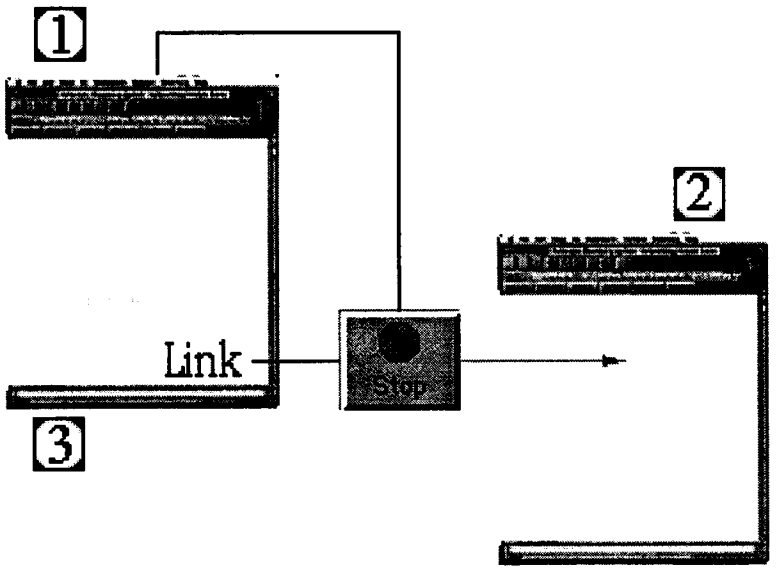
You are taken to the preset Home Page document.

---

## Stop

Link not responding? Download time too long? Press Stop!

"Stop" is perhaps one of the easiest and most useful tool in Netscape. Pressing "Stop" will cease the connection attempt or transfer of information which is currently in process.




## How it works...

1

A link is pressed, then Stop is pressed

2

Download process is stopped.

3

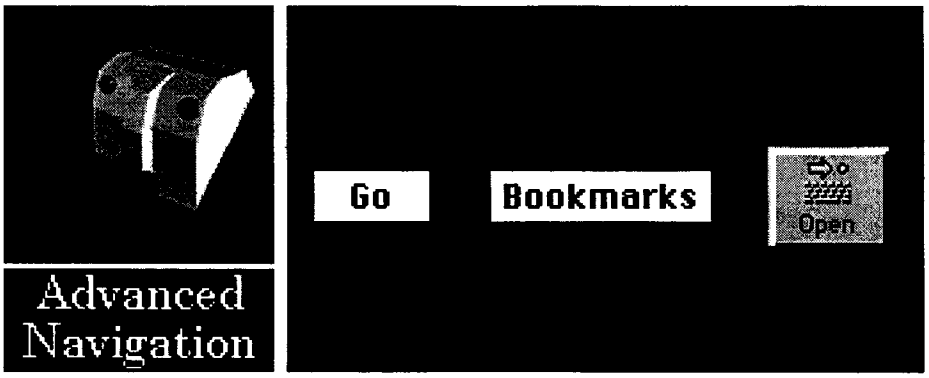
Further user action can now occur.

Use "Stop" when:

1) After pressing a link, a new document or picture does not appear after a long wait. Long waits are often due to increased user traffic. Some documents take longer to access than others.

2) You decide a sound, image or animation file being downloaded is taking too long to download because of its large size. Some sound and animations can be quite large and take time to download.

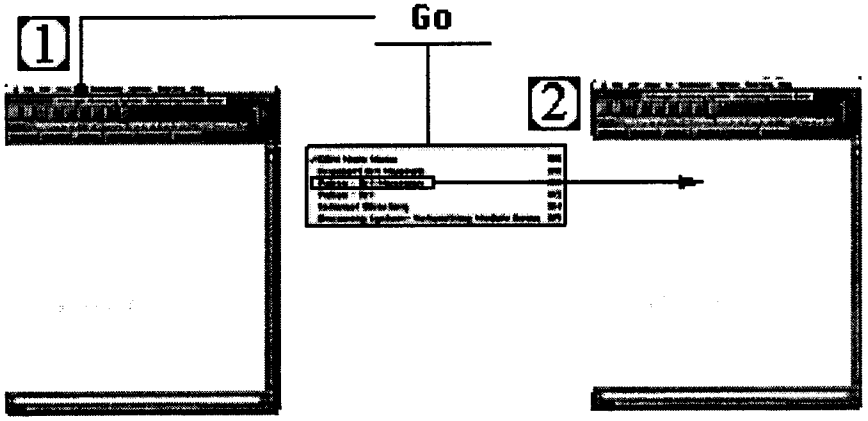
Do not be too hasty to press **Stop**. While animations and sound files can be large and take time to download, the wait is often worth it.




## Go

View a recently accessed documents quickly. Press Go!

Presents the titles of documents viewed during current session which may be selected and viewed again. These document links are NOT preset by Netscape, rather the links presented are based on your Internet exploration path.




### How it works...

1

Select the Go pull-down menu. Choose a recent document.

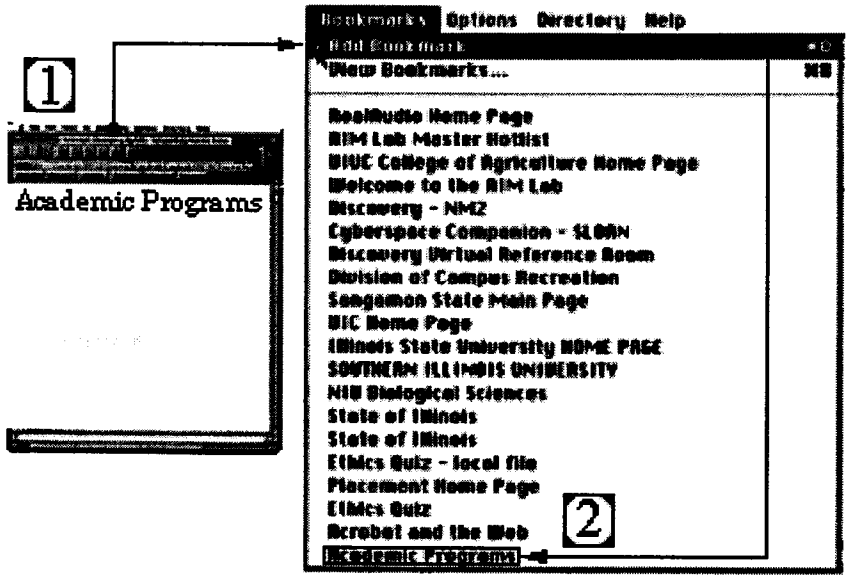
2

The recently viewed document appears in the Netscape window.

If you wish to create a permanent listing of important links use **Bookmarks** (shown below).

## Bookmarks

Record a document for instant access. Put it in the Bookmarks list!




### How it works...

1

An interesting document is discovered. "Add Bookmark" is selected.

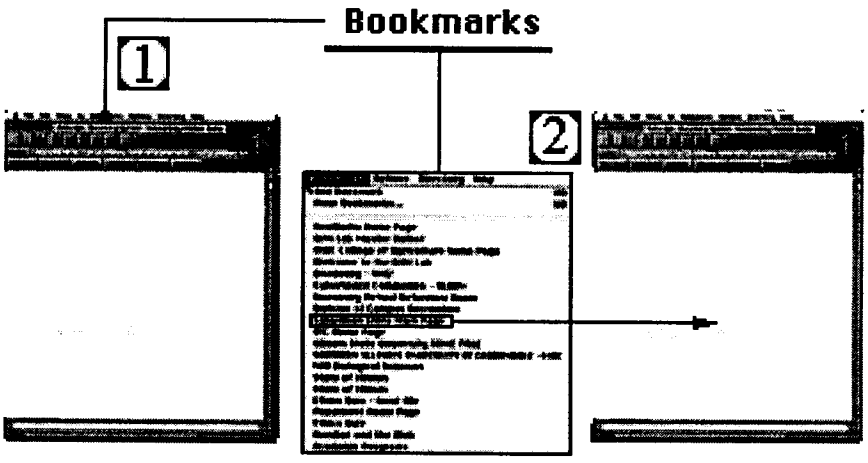
2

Document is stored and may be viewed instantly.

---

## Bookmarks

Recall documents viewed today or even weeks ago. Select a Bookmark!




### How it works...

1

Select the Bookmarks pull-down menu. Select a "marked" document.

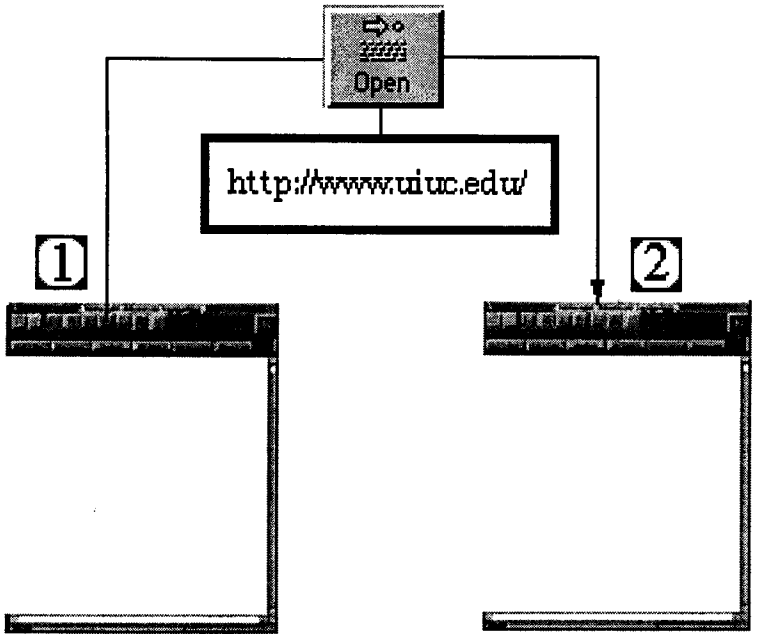
2

The "marked" document appears in the Netscape window.

---

## Open

Type in the document's address (URL) and view the document instantly!




## How it works...

1

You are at any document. Press Open and enter the URL of the document you wish to view.

2

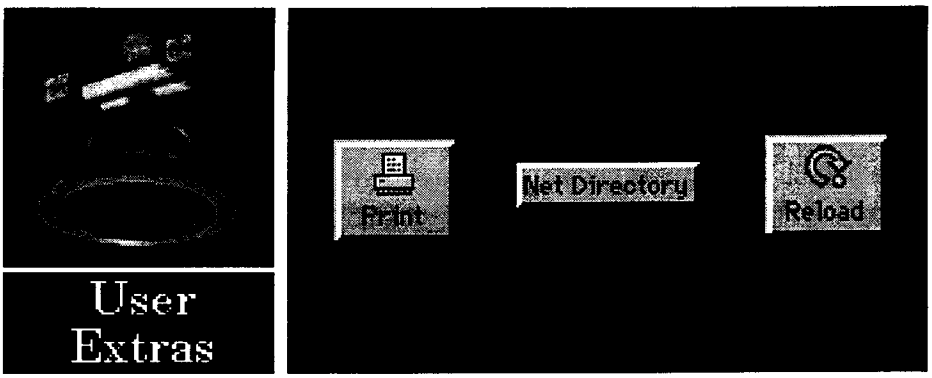
Netscape reads the URL, finds the document and displays it in the window.

A URL (Uniform Resource Locator) is similar to a traditional telephone number. Every document on the WWW has an unique URL address, therefore every document can be viewed instantly if its URL is known. Instead of "1-800-555-1234," the WWW uses addresses like:

http://www.uiuc.edu/
http://w3.ag.uiuc.edu/
http://w3.ag.uiuc.edu/AIM/AIMHome.html
http://w3.ag.uiuc.edu/AIM/Discovery/home.html

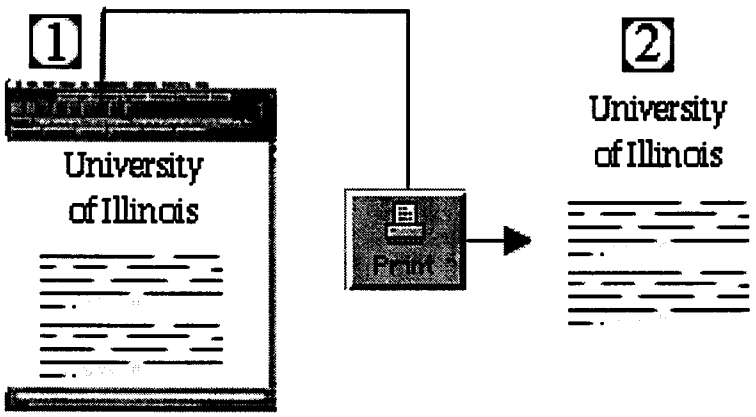
To practice using a URL:

1 Press the "Open" button
2. Type "**http://www.art.uiuc.edu/kam/**" on the long box and press "Open."
3. You should now be at the Krannert Art Museum home page. If not, check spelling and symbols and try again.




## Print

Want to take a copy with you? Press Print!



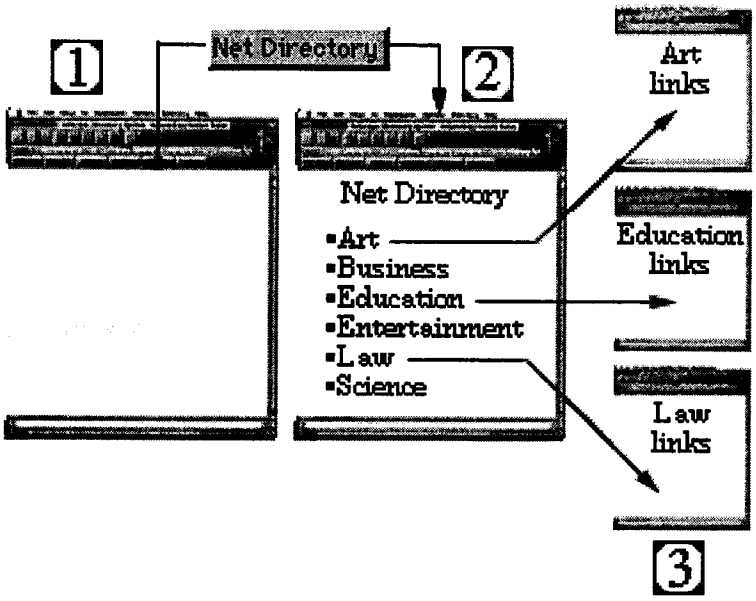

### How it works...

1. The user wishes a print-out of the current document. Print is pressed.
2. The text and images of the document are printed on the selected printer.

Print is a useful feature which allows the user to print text and/or images on a printer. Be careful when using a Laser printer!!! The text will print the same size as it appears on in Netscape window and use lots of paper. Change the font size in the "Fonts and Colors" menu if necessary.

## Net Directory

Looking for Information? Search topics in Net Directory!




## How it works...

1

The user needs specific information. Net Directory is pressed.

2

Net Directory appears in the window.

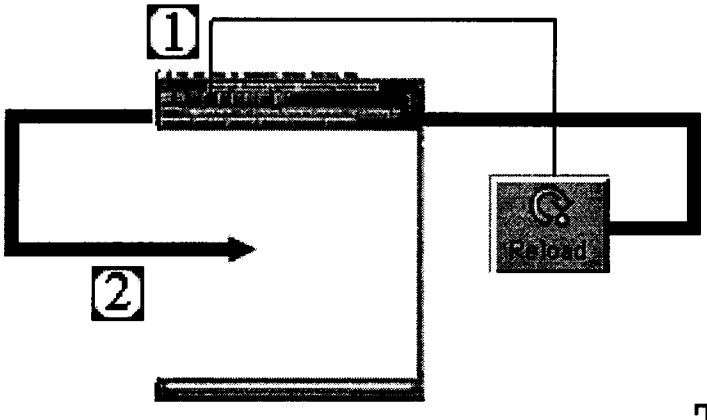
3

Topic links offer links to WWW resources.

---

## Reload

Did a graphic fail to load? Want to see an inline animation again? Press Reload!




## How it works...

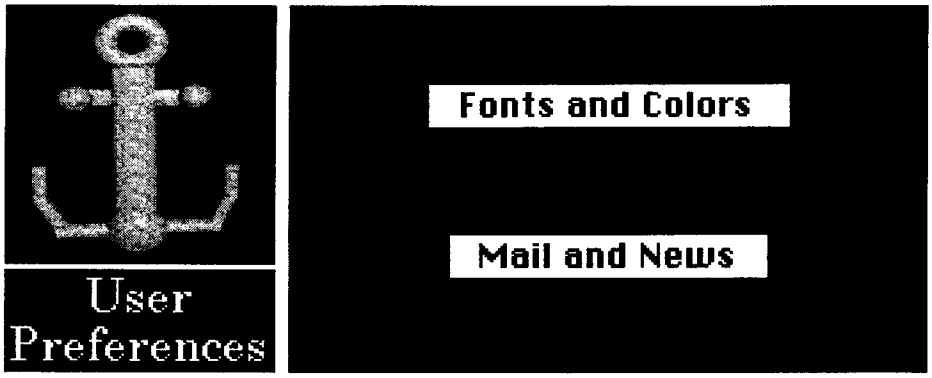
1

The user wishes to download the document again.

2

Reload is pressed. The document downloaded again.

If an image fails to appear in the document, "Reload" can be used to transfer the document information again. This will sometimes bring the image on the screen. If the image does not appear after the second or third reload, the document is designed incorrectly and the image will not appear until the document designer fixes the problem.

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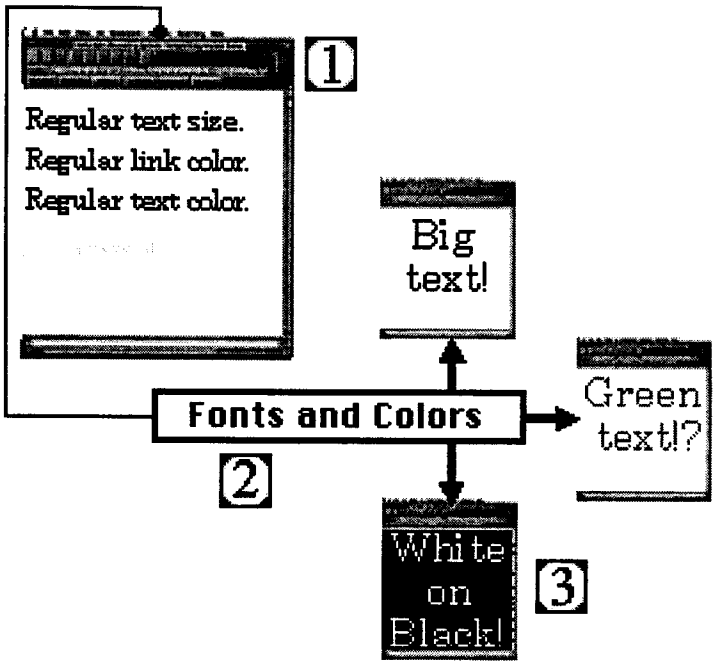
## Fonts and Colors

Text too small? Make them larger! Press Fonts and colors!




### How it works...

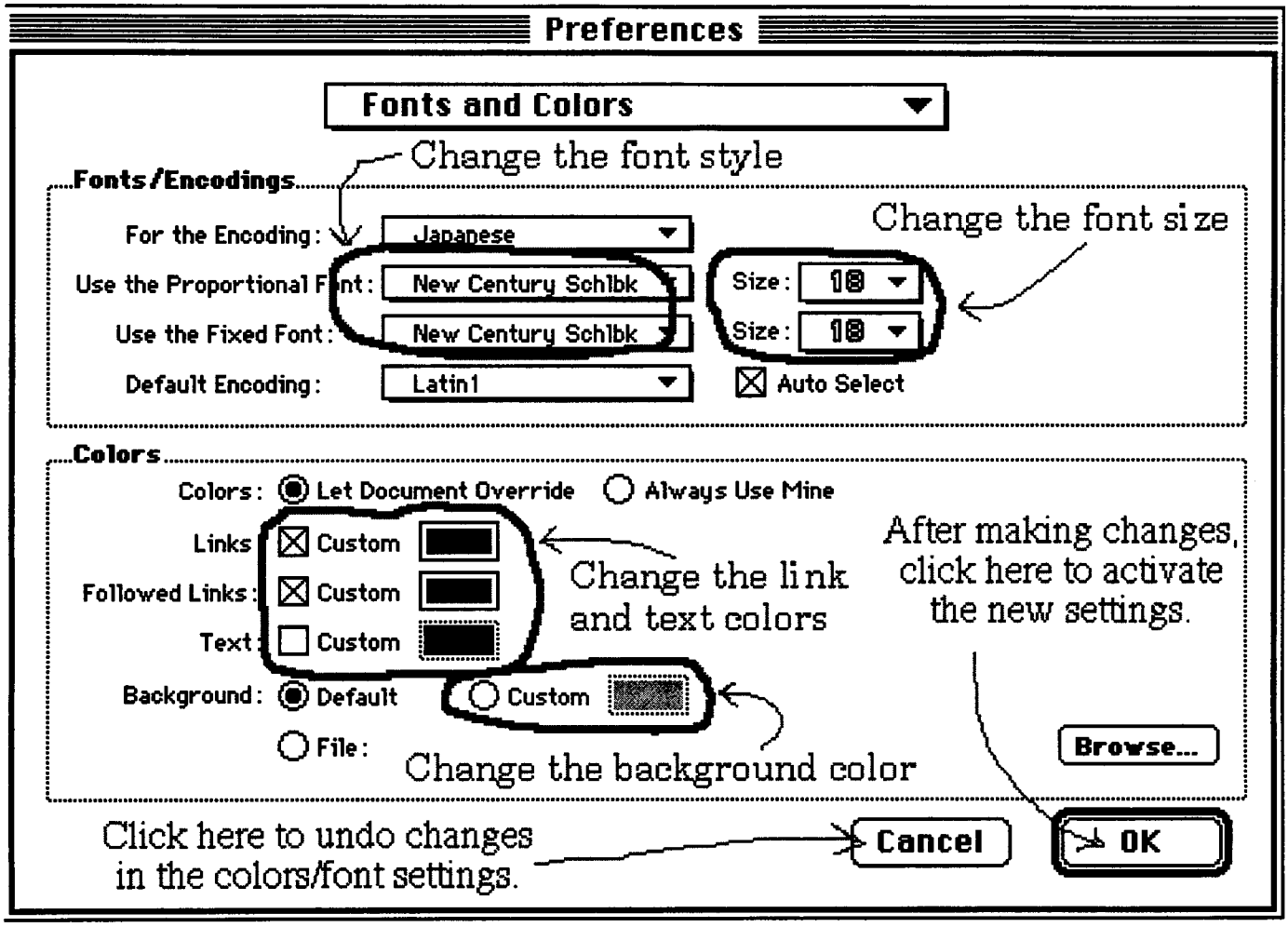
1. The user desires different sizes and colors.
2. Fonts and Colors is selected. Changes are made.
3. New sizes and colors appear in the window.

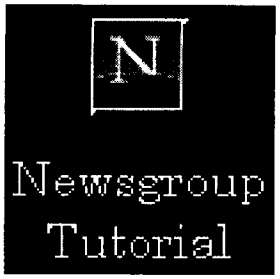

All adjustments in font style, color and size are made using "**Fonts and Colors**". Link and background colors can also be changed. To make these changes select the "**Options**" pull-down menu and choose "**Preferences**".

---

Select "**Fonts and Colors**" to begin making the desired changes.


Window and Link Styles
✓Fonts and Colors
Mail and News
Cache and Network
Images and Security
Applications and Directories
Helper Applications
Proxies

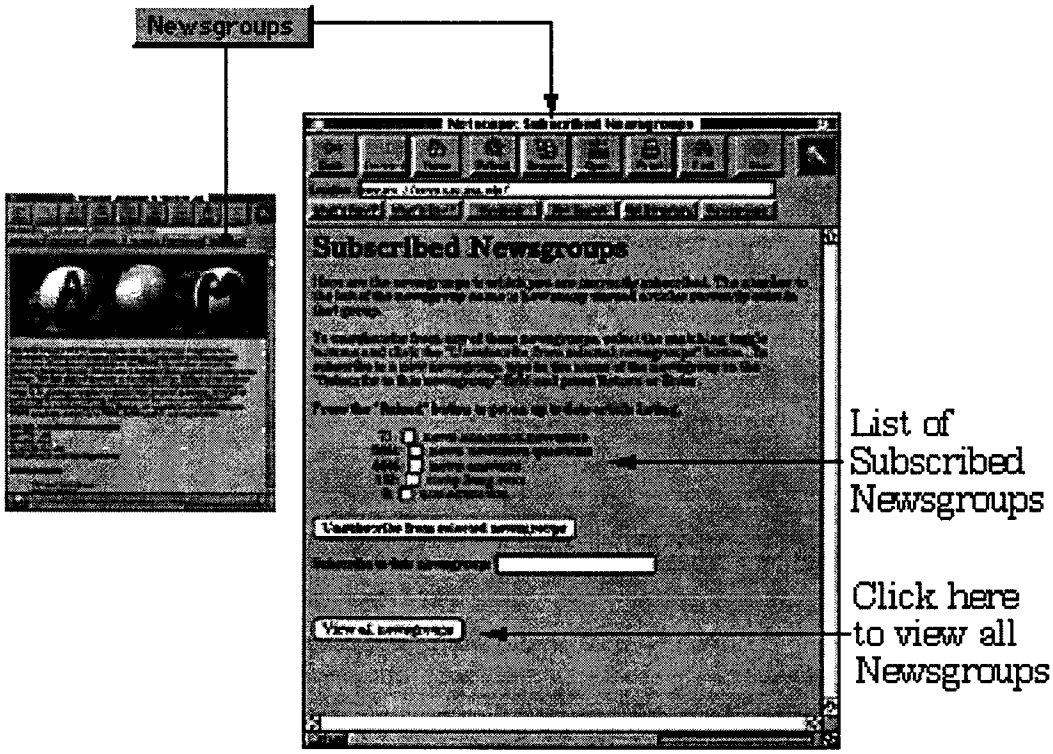

Preferences
Fonts and Colors
Change the font style
Fonts/Encodings
For the Encoding: Japanese
Use the Proportional Font: New Century Schlbk
Use the Fixed Font: New Century Schlbk
Default Encoding: Latin1
Change the font size
Size: 18
Size: 18
Auto Select
Colors
Colors: Let Document Override Always Use Mine
Links Custom
Followed Links: Custom
Text: Custom
Change the link and text colors
After making changes, click here to activate the new settings.
Background: Default Custom
File:
Change the background color
Browse...
Click here to undo changes in the colors/font settings.
Cancel
OK



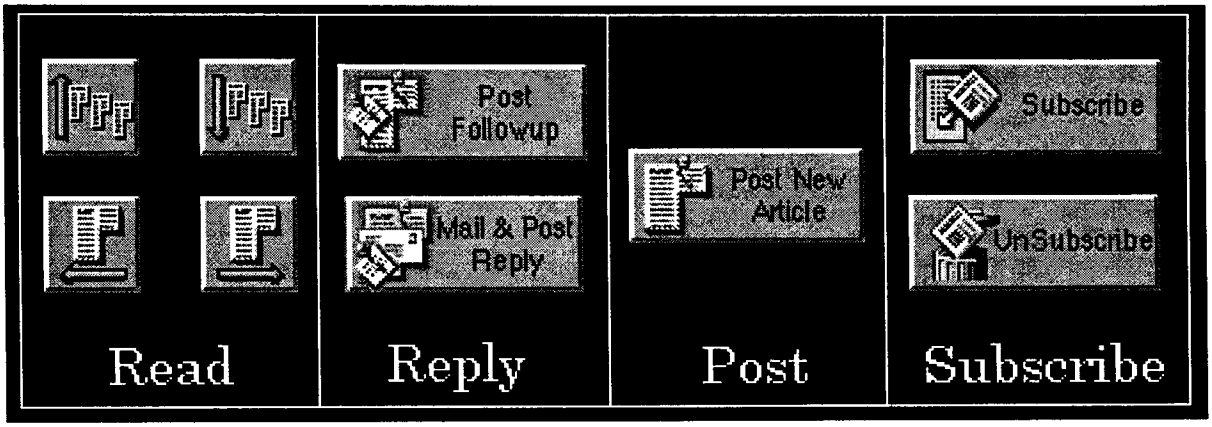

# Netscape Newsgroup Tutorial

A step-by-step tutorial on how to access
Newsgroups with the Netscape Browser

Newsgroups offer discussion on a variety of topics from Astromomy to Computers to University of Illinois classes. Netscape provides an unique and easy-to-use interface for reading, responding, posting to Newsgroup discussions. The diagram below shows what the user sees when the Newsgroup button is first pressed. Newsgroups are entered by pressing the title of a subscribed Newsgroup. Pressing "View all Newsgroups" allows the user to explore a list of basic topics and isolating a specific Newsgroup.




## Newsgroup User Options



# Introduction to Remote Access

What is Remote Access?

What's the difference?

Phone lines vs dedicated lines

Types of dedicated lines and their associated costs

Cost of Remote Access

What are the limitations?

Types of Remote Access connections

Typical Remote Access costs

What about America Online?

Which one is best for me?

What can I do with a Remote Access connection?

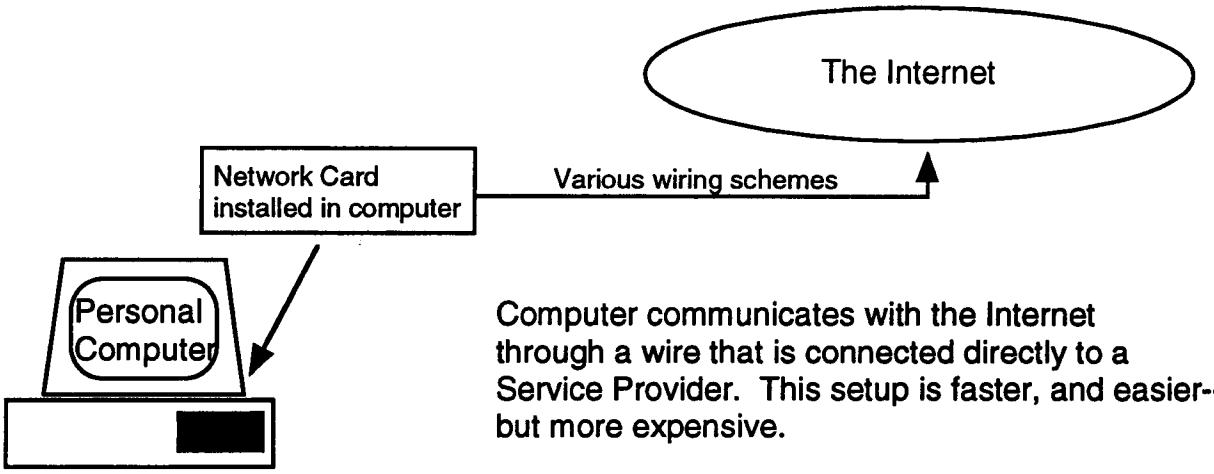
What can't I do?

Potential Remote Access problems

Tying it all together

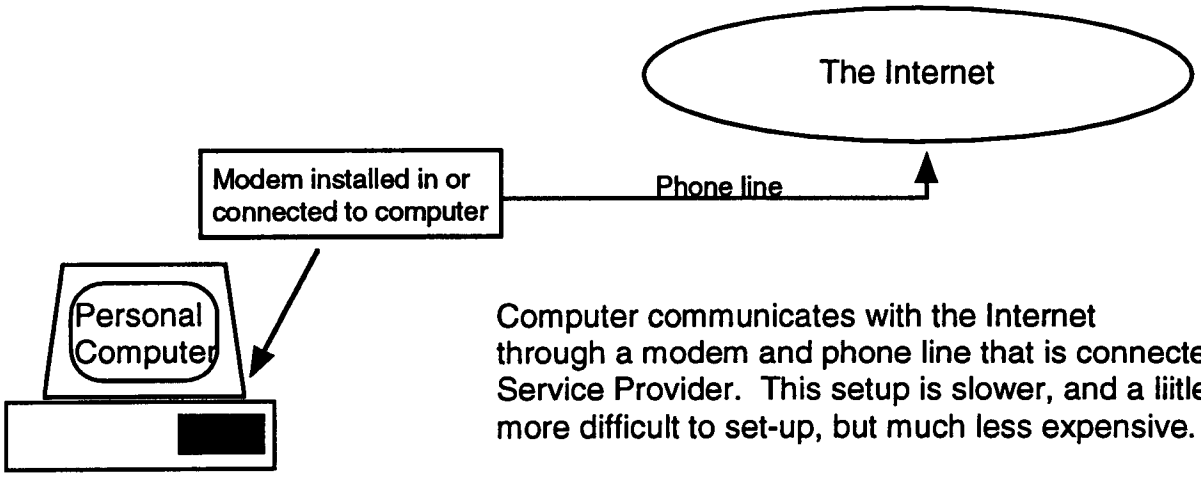
# Hard-wired vs Dial-up: The differences

## Hard-wired connection




Computer communicates with the Internet through a wire that is connected directly to a Service Provider. This setup is faster, and easier--but more expensive.

## Dial-up connection




Computer communicates with the Internet through a modem and phone line that is connected to a Service Provider. This setup is slower, and a liitle more difficult to set-up, but much less expensive.

# Local Service Providers

SouthWind Internet Access, Inc
- Contact: Jeff Stehman
- Phone: (316) 263-7963
- Fax: (316) 267-3943
- Email: staff@southwind.net
- Area codes: 316
- Fees: $22/month, $225/year (flat rate)

Tyrell Corp
- Contact: Kerri McCoy
- Phone: (800) TYRELL-1
- Fax: (816) 741-5315
- Email: support@tyrell.net
- Modem: (816) 454-6788 (login "info")
- Area Codes: 816, 913, 504, 316
- Fees: $10/month, $90/year (30 hrs/month)

SkyNET Corp
- Contact: Mike Johnson
- Phone: (816) 483-0002
- Fax: (816) 483-8852
- Email: info@sky.net
- Area Codes: 816, 913
- Fees: $17.95-$79.95/month

More service provider info can be obtained at:
http://www.primus.com/staff/peggy/provider.html

# Modem Purchase Guidelines

Speed: 28,800 Baud (28.8K BPS)
(Faster is better. 28.8 modems aren't that expensive anymore, and are much more reliable than 14.4 modems)
You get what you pay for--Stick with US Robotics, Hayes, Supra. Don't buy Zoom.
Get internal on PC compatible.
Talk to provider about modem conflicts.
Don't get discouraged! Setting up a modem can be difficult at first, but once it's done, there's not much to it.

# Getting on the Internet

The longest journey begins with a single step. On the Internet, that step is finding a connection. Here's how to go about it.

by Andrew Kantor

---

Possibly the most frequently asked question about the Internet is simply, "How do I get on?" If you have a computer and a modem, it's easy. You start by deciding what you want to do on the Internet. For example, do you want to participate in newsgroups and access data remotely, or simply exchange e-mail messages?

Unless your organization has a direct Internet connection, you'll need a modem. For about $100 you can get a 9600bps or 14400bps unit on sale. Although most modems come bundled with simple communications packages like BitCom or ProComm, an investment in a full-featured program such as ProComm Plus or Crosstalk for Windows is well worth the $60 to $150 you'll spend. Whatever package you buy, make sure it supports VT100 terminal emulation, and ZModem and Kermit file transfers.

Once you have the hardware, you have to decide where you'll connect. By far the most popular use of the Internet is electronic mail (e-mail), and if all you're looking for is an Internet e-mail address, start close by: in the office.

Many corporations are already part of the Internet but choose not to make their connections available to every employee. If you use an internal e-mail system on the job, there's a good chance a connection to the Internet is only a phone call away, especially if your company has divisions or branches in other cities. Speak to your system administrator; the person in charge of keeping your office computers up and running. He or she may be able to set you up with an Internet e-mail address, or even more. If the administrator starts mumbling about "TCP/IP stacks" and "IP addresses," you're on the right track, even if you don't know what those mean.

If you can't connect at work, an electronic mail address is easy to get elsewhere. First, check out a local bulletin-board system (BBS). Run by anyone from professional computer consultants to college students, local BBSs often have e-mail connections to the Internet. Because they're small, accounts can range in price from free to $20 to $30 per month. And because they're local, you never have to worry about toll or long-distance calls.

There are a few ways to find a local BBS in your area. First, ask around; a computer whiz you know can probably point you in the right direction. If

not, pick up an issue of Computer Shopper, which prints a list of local BBSs every month by area code. When you find one near you, dial in with your modem or by voice and ask what kind of Internet access it provides. Also find out whether you can sign on for a few weeks for free to test-drive the service.

An alternative is to sign up for one of the nationwide commercial online services, such as America Online [(800) 827-6364], CompuServe [(800) 848-8199], GEnie [(800) 638-9636], and Prodigy [(800) PRODIGY]. Besides a wealth of discussion areas and file libraries, each of these systems allows you to send and receive mail to and from the Internet. You pay a monthly fee, anywhere from $5 to $10, which includes several hours of online time. After that, you may pay a few dollars per hour for time online.

Be careful, though: Some services charge to send e-mail, some charge you to receive e-mail from the Internet, and some limit the size of the files you can send or receive. Check before you sign up.

Another choice is MCI Mail [(800) 456-MAIL)], a nationwide e-mail-only service that will provide you with an Internet address and an 800-number to dial. There are no hourly charges, but you pay a yearly fee (about $30), plus at least 50¢ per message. There is no charge to receive mail. MCI Mail is a good option if you only need to send occasional messages.

Services with a Smile

But the Internet is more than just e-mail; there are 5,000-plus Usenet newsgroups to follow, Gopher servers to browse through, ftp sites to plunder, and WAIS databases to search. Although you can do some of it with e-mail, it can be a chore (see "E-Mail Tricks," May, Internet World). If you're looking to get more than messaging from the Internet; if you want so-called "full access"; start by looking for a public- access dial-up provider in your area.

There are two easy ways to find a dial-up provider near you. If you know someone with at least e-mail access to the Internet, you can get the PDIAL list, which lists Internet access and service providers by area code. By sending an e-mail message to info-deli-server@netcom.com with the phrase "Send PDIAL" as the subject, you'll receive the latest list. You can also call the Internet Network Information Center (InterNIC) at (800) 444-4345 and work your way through its menus with a touch-tone phone.

Another option is Delphi [(800) 695-4005)], a nationwide Internet provider and online service. It offers full access to Internet tools with a menued interface, and probably has a local phone number you can use for access. (America Online, although more expensive than Delphi, offers access to some

Internet services; see News section.)

Public-access providers vary widely in the services and prices they offer. Following is what you should ask a potential provider:

* Do you provide telnet, ftp, and disk space?

With at least telnet available, you can access all the Internet's other tools: archie, Gopher, IRC (Internet Relay Chat), WAIS, and others. You ll want ftp to download files from remote computers, and you'll need some disk space to store those files before you download them to your PC.

* Do you charge a flat monthly (or quarterly) fee, an hourly rate, or some combination of the two?

Unless you will be using your connection only occasionally, it's best to find a provider that will let you pay a flat monthly rate, but it shouldn't be more than about $20 to $25 for full access. Timed access shouldn't cost more than $3 or $4 per hour. (For comparison, CompuServe, one of the more expensive commercial services, charges $4.80 per hour for high-speed access.)

* What modem speeds do you support?

If it doesn't support at least 9600bps access, look elsewhere. You may only own a 2400bps modem now, but 28800bps is quickly becoming the standard, and high-speed modems are available for less than $100.

* How many modems do you have? How many active users?

If the ratio of users to modems is greater than about ten to one, you may find yourself with a lot of busy signals.

* What kind of interface do you have?

If you aren't comfortable with the Unix dollar-sign prompt, look for a menu interface or even a graphical one.

* What tools do you have available locally?

Sure, you can telnet for just about any tool, but better systems will have archie, Gopher, and WWW clients locally, to save you the trouble.

* What newsgroups do you subscribe to?

There are more than 5,000 Usenet newsgroups, and the system you choose

should get most of them, especially the alt.hierarchy.

* What kind of support can I get?

Better services will have both online and voice support, and some even have a full-time staff to help you with the problems you're bound to encounter.

* After you choose a provider and sign up, what do you get for your money?

With New York's Panix, for instance, you pay a one-time $40 sign-up fee, plus an optional one-time $15 fee for high-speed access. Then there's a $57 charge for three months of full Internet access. Panix; like most dial-up providers; has all the tools you'll want: archie, ftp, Gopher, WWW browsers, plus your choice of several mail programs, at least four Usenet newsreaders, and use of disk space on their Sun SPARCStations. Most other providers offer a similar mix of services and features.

SLIP Sliding Away

Another; and in many ways better; method for connecting to the Internet is by reaching another computer through a SLIP or PPP connection. SLIP (Serial Link Internetworking Protocol) and PPP (Point-to-Point Protocol) are two types of connections that make your computer not just a window to the Internet but a part of it. And they do it over a standard telephone line.

When you have a SLIP or PPP connection, you can't use standard communications software to dial your provider. Rather, you use a version of Internet software; Gopher, WWW, a newsreader, or mail; designed for your home computer. (Mosaic or WinGopher for Windows, and Eudora for the Mac are a few examples.) Your provider (which you find through the PDIAL list or the InterNIC) still does a lot of the dirty work: maintaining a Usenet news server, receiving and passing along your mail, and the like.

What are the advantages and disadvantages of a SLIP or PPP connection? First, you have more control over how you access the Internet. You choose the software, and you can take advantage of your computer's power; the graphical interface, for instance. But you also have to find the software; and pay for it.

A SLIP or PPP connection allows you to do more than one thing at a time in the foreground. In one window on your screen you can be reading mail; in another you can be downloading a file from Sweden. You're only limited by the processing power of your computer.

If you do a lot of file transfers from remote computers via ftp, you save a

step with a SLIP or PPP connection. Instead of transferring a file from, say, Japan to your provider's machine and then downloading it to your PC, you copy it directly to your home computer. (Remember, with SLIP or PPP, your computer is part of the Internet.)

There are some other nifty advantages. By leaving the connection open, and with the right software, you can be your own ftp server. And if your provider is willing, you can even choose your own domain name: steven.com or jennifer.org. But there's a price for all this: Many providers charge anywhere from $30 and up per month to provide a SLIP line. But for heavy-duty users of the net, it's worth the price.

However, before you go running off to acquire a SLIP or PPP connection, be aware that there are additional difficulties. With a dialup connection, you only need to set your modem speed and terminal type. For a SLIP connection, there's a lot more to wrestle with, such as IP addresses, domain servers, postmasters, and what is likely to be a configuration nightmare, even with a half-dozen README files. Be prepared to spend an afternoon setting up a SLIP connection, and several days in asking and getting answers to your questions.

There are, of course, other ways to connect to the Internet. You can get an account at a local college that is part of the net. You may have to take a course or pay a fee, but generally it means full, untimed access . . . at least until the end of the semester. And many colleges also provide dial-in lines for students who commute. If you have the means, you can buy a server, router, and software and lease a high-speed T-1 or T-3 line for a full-speed connection; that's the way many corporations connect.

There are intermediate options as well. Organizations like Performance Systems International (PSI) in Reston, VA [(800) 827-7482] will lease you all or some of the equipment you need, including the hardware and connections, and even maintain it for you.

The beauty of it is that no matter how you connect, you still have access to the same conversations, information, and resources of the worldwide computer network. So get connected, and we'll see you on the Net . . .

# File Transfers

by

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## Abstract

This short paper is written to provide an overview of making file transfers on the Internet. The book "The Whole Internet" by Ed Krol was relied on heavily as well as the expertise of our colleagues to generate these descriptions. Examples were provided with assistance of DASC employees.

The paper presents background to the file transfer protocol (**ftp**) to introduce the reader to the subject. The sections include:

(1) Introduction to file transfer
(2) Listing the file system,
(3) Navigating through the file system,
(4) Transfer modes,
(5) File transfer commands,
(6) File structures and data compression,
(7) Access ftp through an Internet browser,
(8) Examples.

## Introduction to File Transfer

The ftp "File Transfer Protocol" moves files from one computer to another. It does not matter where the computer is located, or how they are connected, or whether or not they use the same operating system. What is needed is that the computers can "talk" the FTP protocol and are connected to the Internet. Basic command structure is the same from machine to machine. It is the common "language" for sharing data. File transfer can be accomplished in three different manners:

(1) *World Wide Web (WWW)* using one of the WWW browsers such as Mosaic or Netscape with graphic user interface (GUI) (least painful)

(2) *Hybrid software* such as Windsock FTP (WSFTP) and WINQVT that provide utilities and help to make FTP easier to use

(3) *Command mode* where file transfer tasks are negotiated at the prompt (most painful).

The internet provider may supply you with file transfer routines or they may not. Netscape and Mosaic have file transfer protocol built-in so the user generally points and clicks the mouse to find, display, and download or send files. These Internet browsers have utilities to make successful downloads of most kinds of information including ASCII text, graphics, and binary files in either compressed or uncompressed format. If the right software is not available, the newer versions of these browsers are smart enough to suggest what you need. In any event, even if you have a browser, we believe that a little background is worth having in order to appreciate what is going on and allow you to better troubleshoot the situation if there are problems. Furthermore, file exchange may occur in different ways among your correspondents. It is good to know what type of files there are and how they are handled in order to solve the problems so that you can go on communicating electronically.

The ftp protocol is a complex program because of the different ways to manipulate files and file structures. Files can also be stored in different ways including ASCII or binary, compressed or uncompressed, to name a few. The use of the GUI on the WWW makes most of these operations transparent to the user.

To get access to files you need an account to be able to log into an ftp daemon (defined as system jobs, such as the ftp protocol, that run in the background all of the time) on a remote "host" machine. An Internet browser can get you there fast. If you need to log in as is common on FTP sites, you will nevertheless need a login name and a password. Another option is anonymous or guest FTP which is a special service that lets you access public databases with a shared public account. Some sites have partial implementation of FTP and these facilities may not be available to you.

## Browsing on the Remote Machine

### Listing a Directory's File Contents

The commands **dir** and **ls** list directory information on the remote computer. The **ls** command gives a simplified listing of file names with no additional information. The **ls** command is also a UNIX command which accepts UNIX switches. To display a more descriptive listing of files, type **ls -l**. The **dir** command also produces a more complete listing, much like the **ls -l** command. Below are some examples of listing files on the remote computer.

```
ftp> ls
200 PORT command successful.
150 Opening ASCII mode data connection for file list.
huc_bnd
rwd
soils
rtk_haz
landcovr
gps
admn_bnd
226 Transfer complete.
55 bytes received in 0.11 seconds (0.50 Kbytes/sec)
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 7
drwxr-xr-x  3 12402   staff       512 Aug 31  1994 admn_bnd
drwxr-xr-x  2 12402   staff       512 Jul 16 21:42 gps
drwxr-xr-x  2 12402   staff       512 Sep  6  1994 huc_bnd
drwxr-xr-x  2 12402   staff       512 Jul 17 15:27 landcovr
drwxr-xr-x  2 12402   staff       512 Sep  6  1994 rtk_haz
drwxr-xr-x  4 12402   staff       512 Sep  2  1994 rwd
drwxr-xr-x  4 12402   staff       512 Sep  2  1994 soils
226 Transfer complete.
442 bytes received in 0.38 seconds (1.16 Kbytes/sec)
ftp> cd gps
250 CWD command successful.
ftp> ls -l
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 15280
-rw-r--r--  1 12402    686364 Jun  5 23:37 r149_153.exe
-rw-r--r--  1 12402    869294 Jun 10 00:50 r156_160.exe
-rw-r--r--  1 12402    883824 Jun 16 23:02 r163_167.exe
-rw-r--r--  1 12402    920273 Jun 23 23:53 r170_174.exe
-rw-r--r--  1 12402    944754 Jul  7 13:08 r177_181.exe
-rw-r--r--  1 12402    772120 Jul 12 02:11 r184_188.exe
-rw-r--r--  1 12402    997745 Jul 16 21:45 r191_195.exe
226 Transfer complete.
898 bytes received in 0.33 seconds (2.72 Kbytes/sec)
ftp>
```

Some ftp utilities will allow you to list files on the local computer. This is done through the **lls** command. This is not available on most typical ftp software. The command usage is identical to the ls command.

## Navigating the File System

The directory structure on the remote computer can be negotiated with the **cd** command. The command's usage is: ftp> **cd** directory_name

When you ftp to a remote computer you are in the same directory as if you had logged into that machine directly. The usage rules are the similar to UNIX and MSDOS change directory command. They include:

1. cd alone prompts the user for a remote directory

2. if directory is .., it moves you up one level from the directory at which you are currently positioned

3. to move through several directories at once type each directory name separated by a forward slash on a UNIX system (/) or a backward slash on a DOS system (\)

4. access is determined by the file and directory access permissions of the log in name

5. most ftp daemons restrict access to one portion of the file system when logged in as anonymous or guest, so you may not be able to move into certain directories

6. when logged in as anonymous, typing **"cd /"** will return you to the default log in directory

7. many ftp servers are case sensitive, so upper and lower case do make a difference

The negotiation of the local directory system is accomplished by the **lcd** command. The specifications of **lcd** are about the same as **cd**. One nice feature of the lcd command is that if you type lcd with no directory name the command will return you to the default working directory on the local computer. To display the current working directory type the print working directory command; **pwd**. Some examples are listed below.

```
ftp> pwd
257 "/" is current directory.
ftp> cd pub
250 CWD command successful.
ftp> ls
200 PORT command successful.
150 Opening ASCII mode data connection for file list.
unix
win
incoming
226 Transfer complete.
21 bytes received in 0.05 seconds (0.42 Kbytes/sec)
ftp> cd unix
250 CWD command successful.
ftp> cd ../..
250 CWD command successful.
ftp> pwd
257 "/" is current directory.
ftp> lcd d:\public
Local directory now D:\PUBLIC
ftp> lcd
Local directory now C:\WINDOWS
ftp>
```

## ASCII and Binary File Transfer Modes

Binary transfers preserve the bit sequence of the file so that the original and the copy are bit-by-bit identical, even if a file containing that bit sequence is meaningless on the destination file.

ASCII is really "text" mode. In ASCII mode transfers are treated as sets of characters; the client and server try to ensure that the characters they transfer have the same meaning on the target computer as they did on the source computer. In other words, the ftp automatically translates the file from one flavor text file, e.g., Mac, to another text file, e.g., IBM VM file. Thus, the file would be readable by both machines.

The mode which files are transferred is determined by two commands **ascii** and **bin**. Simply typing one or the other command toggles the mode which you are transferring. Most ftp software allows the user to select a default mode of transfer. Common file types and modes include:

Table 1. Common File Types and Modes

| FILE | MODE |
|---|---|
| DXF | ASCII, possibly binary |
| text file | ASCII, by definition |
| spreadsheet | probably binary |
| database file | probably binary, possibly ASCII |
| word processor file | probably binary, possibly ASCII |
| program source code | ASCII |
| electronic mail messages | ASCII |
| UNIX "shell archives" | ASCII |
| UNIX "tar file" | binary |
| backup file | binary |
| "compressed file" | binary |
| "uuencoded" file | ASCII |
| executable file | binary |
| "postscript" (laser printer) file | ASCII |
| RTF, "rich text format" | binary |
| Images of picture, TIFF, GIF, BMB | binary |

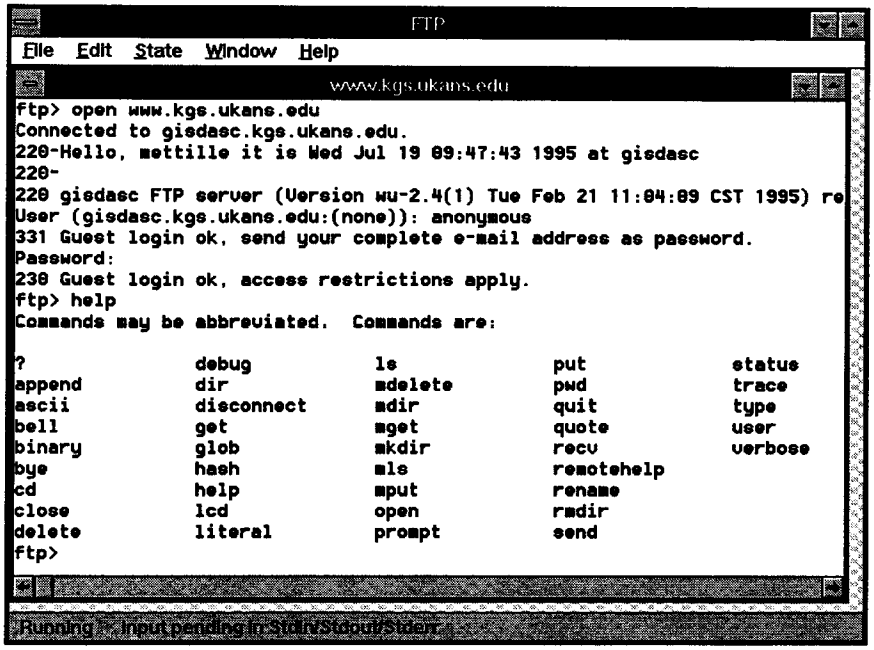
If you are transferring files between identical machines, you still should use the proper mode of transfer, ASCII or binary. FTP does not know the machines are identical. If you attempt to transfer a binary file in ASCII the translation will occur, as ASCII normally does, but this may damage the data making the file unusable. All the bits are important in a binary transfer. This is not the case with ASCII file transfer. Beware.

For those files listed in Table 1 that are probably binary types, try transferring them in binary first and see if they work correctly. Elaborate word processing packages usually create binary output files. Most word processing packages also have an option to store the files as ASCII or text files. If you write an ASCII file, you can transfer it as an ASCII file. However, some of the formatting is usually lost in the text file. Another option in transferring word processing packages is to convert the file to a "rich text format" (RTF). RTF files can be read by most word processing packages and maintain all or most of the formatting. This type of file would transfer in binary mode. Executable files are generally binary files, but with exceptions. Compiled and executed programs are always binary. "Scripts," lists of commands provided to the operating system, are always text files, e.g., autoexec.bat or *.bat files in MS-DOS and scripting languages in UNIX.

## Getting started with FTP

At prompt type ftp and remote machine name:

>ftp gisdasc.kgs.ukans.edu



Microsoft's WFW ftp example

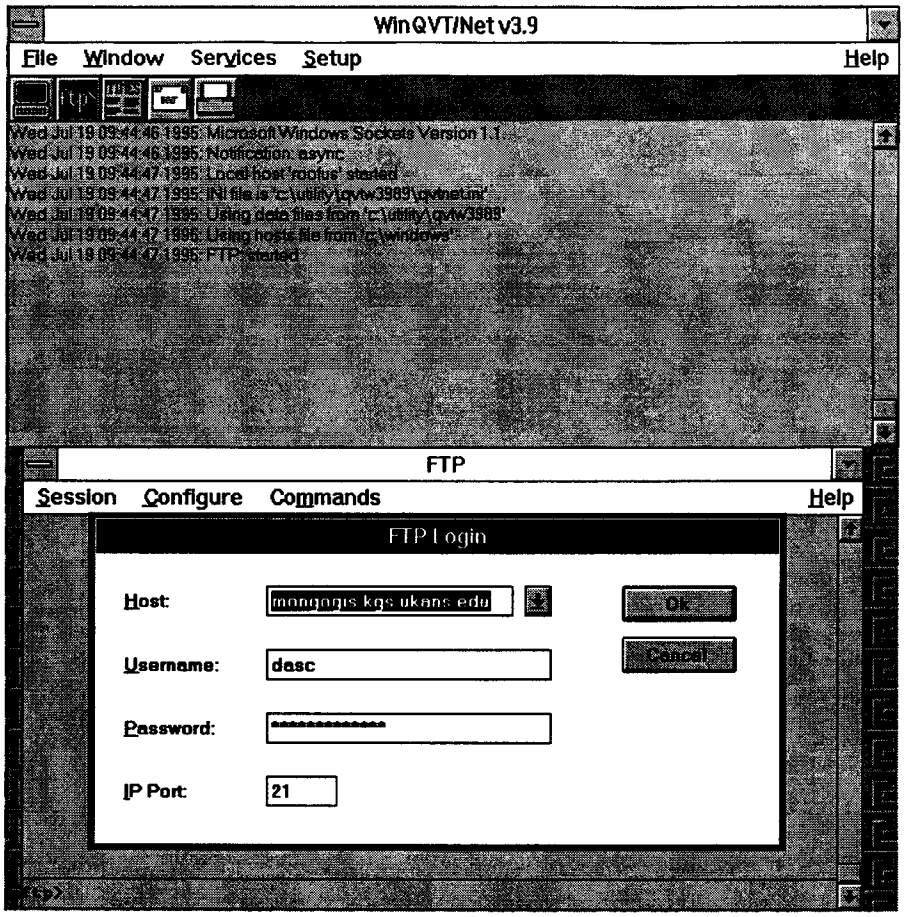
This will make a connection with the remote computer. Then what is called an ftp daemon will prompt you for identification with log in name and password.

Once you are logged in, you are ready to start transferring files. You can retrieve a file from the remote machine using the command **get** and place it on the local machine. You can use the command **put** to take a file from the local machine (the one initiating the transfer) and put it on the remote computer as long as the remote system allows you this level of access. The command structure is:

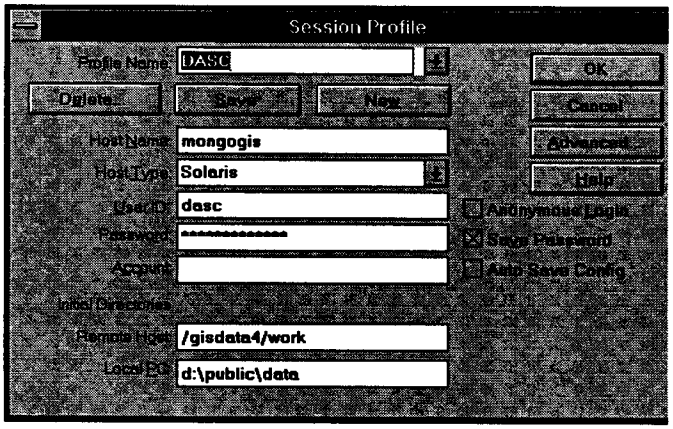
ftp> **get** *source-file destination-file*

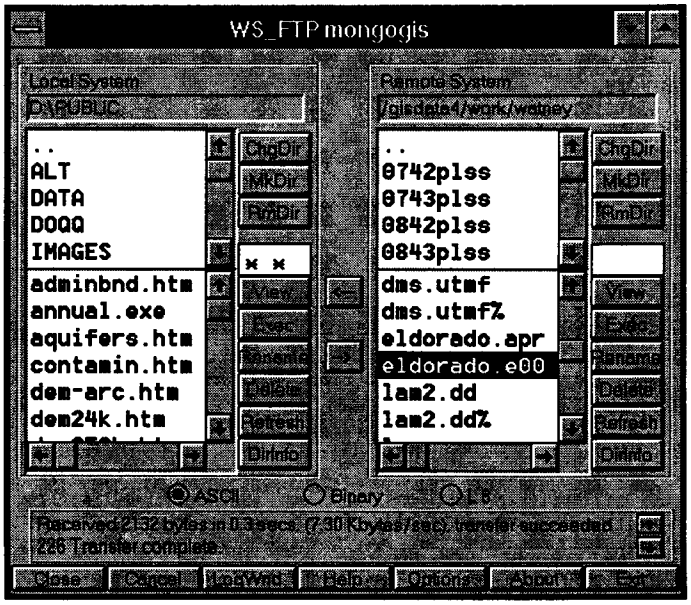
The destination file is the name of the newly created copy and is optional. Remember that most systems are case sensitive, so watch the upper and lower case combinations. If you are transferring from a system which allows long filenames and does not conform to the ISO naming standard of 8.3 you should specify the destination filename, otherwise the ftp software will truncate the filename. This could cause some problems when several files have similar names. The file will be sent to the current directory that you are logged into on either the local or remote computer, depending on the type of file transfer performed (**get** or **put**). Once a command is initiated successfully, this will be acknowledged with a message of this success, type of data, amount of data, and average transfer rate, time taken to transfer the data.

You may have an FTP mouse-based or graphic-user interface (GUI) in which you can select files by clicking on the files with your mouse and download/upload files by pushing a button. Examples of some FTP GUI interfaces are on the following page. These systems help automate much of the process of logging in, navigating through the file system, and listing directory contents.




Example of WinQVTNet interface for ftp and other network utilities




Example of WinSock ftp interface

## Transferring Multiple Files

Multiple files can be transferred in groups at a time using **mput** and **mget**. The **mput** command takes the files following the command and moves them to the remote computer. The **mget** command moves files from the remote to the local computer:

ftp> **mput** *source-file1 source-file2 source-filei...*

Wildcards and partial names can be used for files to be included, e.g., asterisk (*) will match zero or more characters and question mark (?) will match one character.

A simple session might include:

ftp> **cd test** change working directory of the remote machine

ftp> **ls b*** list files in remote directory that begin with the letter "b"

ftp> **mget br*** retrieve all files starting with the letters "br"

You will be prompted if you want to get all of the files that are available. You will answer yes or no after each prompt. If you prefer to transfer all files without the prompt, type **prompt** to turn off the prompt before you get the files. By retyping **prompt** you can toggle the prompting to reactive.

To view the progress of a file being downloaded you can turn a hash display on. Typeing **hash on** causes the ftp system to display a pound (#) character as packets are recieved or sent. This command also toggles on or off when you enter the hash command.

If you desire to change the remote or local directory when making file transfers, use **cd** for changing the remote directory and **lcd** for changing the local directory. Do not attempt to define a new directory to write to in the **mget** or **mput** command line (the directories where you receive or get files from must already exist on the file systems). Also you cannot download a directory using **mget** or **mput**.

Table 2. FTP Command Summary

| | |
|---|---|
| **ascii** | Enters ASCII mode, for transferring text files |
| **binary** | Enters binary mode, for transferring binary files |
| **cd** *remote-directory* | Changes the working directory on the remote machine |
| **close** | Ends **ftp** session to a particular machine, but leaves command line to **open** connection to new system |
| **delete** *filename* | Deletes the named file on the remote system |
| **dir** *file destination* | Give the full directory listing on the remote machine. *File* and *destination* are both optional. *File* can either be a single file or a wildcard construction with asterisk (*) or in UNIX a question mark (?). If file is omitted, the listing will show all the files in the current remote directory. The *destination* is where the output should be put, e.g., file on the local machine. If no file is given listing appears on the terminal. |
| **hash** | Tells **ftp** to print a pound sign (#) every time a block of data is transferred by a **get** or **put** command. |
| **help** *command* | Prints short bit of documentation about command. |
| **lcd** *directory* | Changes the default directory on your local machine to named directory. |
| **ls** *file destination* | Give short directory listing on remote machine. |
| **mget** *file-list* | Gets multiple files from the remote machine. List of files or use of wildcard. |
| **mput** *file-list* | Puts multiple files onto remote machine. |
| **open** *ftp-address* | Connects to the named machine. Need to **close** old connection first. |
| **prompt** | Used with **mget** or **mput** to tell **ftp** to prompt you for confirmation before transferring each file. This is usually the default option. The prompt can prevent overwriting existing files. |
| **pwd** | Prints the name of the current remote directory. |
| **quit** | Closes any connections that are currently open, and exits **ftp**. |
| **user** *user-name* | Send user name to remote machine to log in. If you type name in wrong once, use **user** to retry. |

## Anonymous FTP

*Anonymous FTP* allows users who do not have a log in name or password to access certain files on a computer. There are restrictions in accessing the anonymous directory system of the host computer. For example, anonymous users can normally only **get** files. Unless permission is given, new files cannot be **put** into an anonymous directory nor can files be modified that already exist. Only certain files can be transferred.

Once into **ftp** the log in name, *anonymous*, gains inquirer access to the computer hosting this directory. Any string of characters can serve as the password. It is good form to include your e-mail address as password to help system manager track users and where the data is being distributed. Many systems limit the number of anonymous logins, so if access is denied the sever has probably reached the mixium number of anonymous logins. After signing in as *anonymous* you are allowed to **get** those files which are permitted.

You can move to subdirectories by giving the **cd** command and the name of the subdirectory, or move back to the "parent" by using **cd ..** argument. Typically when you log in anonymously users are allowed access to several directories. Most systems have a **pub** directory where all the public data and programs are located for general distribution. Within that directory there are sub-directories which break the programs into classification types (i.e. different platforms: UNIX DOS, WIN, MAC or types of software: utilities, games, images). Some servers will display available files when you enter a subdirectory or have a README or INDEX file. If you are allowed to write or "put" files as an anonymous user there commonly is a directory called **incoming.** Within this directory all users can transfer (put) files to the server. System administrators monitor this directory on a regular basis and either delete the files or move them to the pub archives. There are large number and many varieties of **anonymous ftp** servers out there to be accessed!

## Handling Large Files and Groups of Files

Large files can take a long time to transfer. This costs time and money. In some situations, large file transfers can also slow down or limit access for others. File compression can be used to reduce a large file and to archive a large number of individual files, large or small. These compressed aggregate files are much cleaner and faster to move across the Internet. Furthermore, most of the **anonymous ftp** servers store files in compressed archives. These files must be "unpacked" once you have transferred them to your system.

Files can usually be compressed from 30% to 80% or more depending on the file type and the compression utilities. Some of the popular utilities include:

Table 3. Compression Utilities

| Compression Program | Decompression Program | File Suffix | Typical Filename |
|---|---|---|---|
| compress | uncompress | .Z | rfc1118.txt.z |
| pack | unpack | .z | textfile.z |
| StuffIt | unsit | Sit | program.sit |
| PackIt | unpit | .pit | report.pit |
| PKZIP | unzip41 | .ZIP | package.ZIP |
| zoo210 | zoo210 | .zoo | picture.zoo |

The file name extensions give a hint as to how a file has been compressed and what utility to use to uncompress the file. UNIX boxes use **compress** and **uncompress** utilities (.Z file extension). MS-DOS boxes often use PKZIP (.zip) and Mac users often use Stuffit (.Sit).

Whole programs with many files can be transferred in over the Internet using a some compression/archival programs. PKZIP and Stuffit allow multiple files to be compressed and then archived into one single file. Other programs compress only one file at a time and do not archive the data in a single file. UNIX programs and data many times are archived using a utility called **tar**. A file.**tar** can be created to contain all data to be distributed. This tar file is then usually compressed with UNIX compress command leaving the file to be retrieved with a ".tar.Z" extension.

## Popular FTP Sites

| Owner | URL | Type of Information Available |
|---|---|---|
| Computer Oriented Geologist Society | ftp://ftp.csn.org/COGS/ | Public domain software |
| USGS/EROS ftp site | ftp://edcftp.cr.usgs.gov/ | Digital map data |
| Kansas Geological Survey | ftp://gisdasc.kgs.ukans.edu/ | GIS databases |
| Xerox Webster Research Center | ftp:.//spectrum.xerox.com/ | GIS databases |
| Indiana University | ftp://winftp.cica.indiana.edu/ | Windows public domain soft. |
| Microsoft | ftp://ftp.microsoft.com/ | Microsoft release updates |
| Digital Corporate Research | ftp://gatekeeper.dec.com/ | Variety of public domain soft. |

## Tricks and Tips

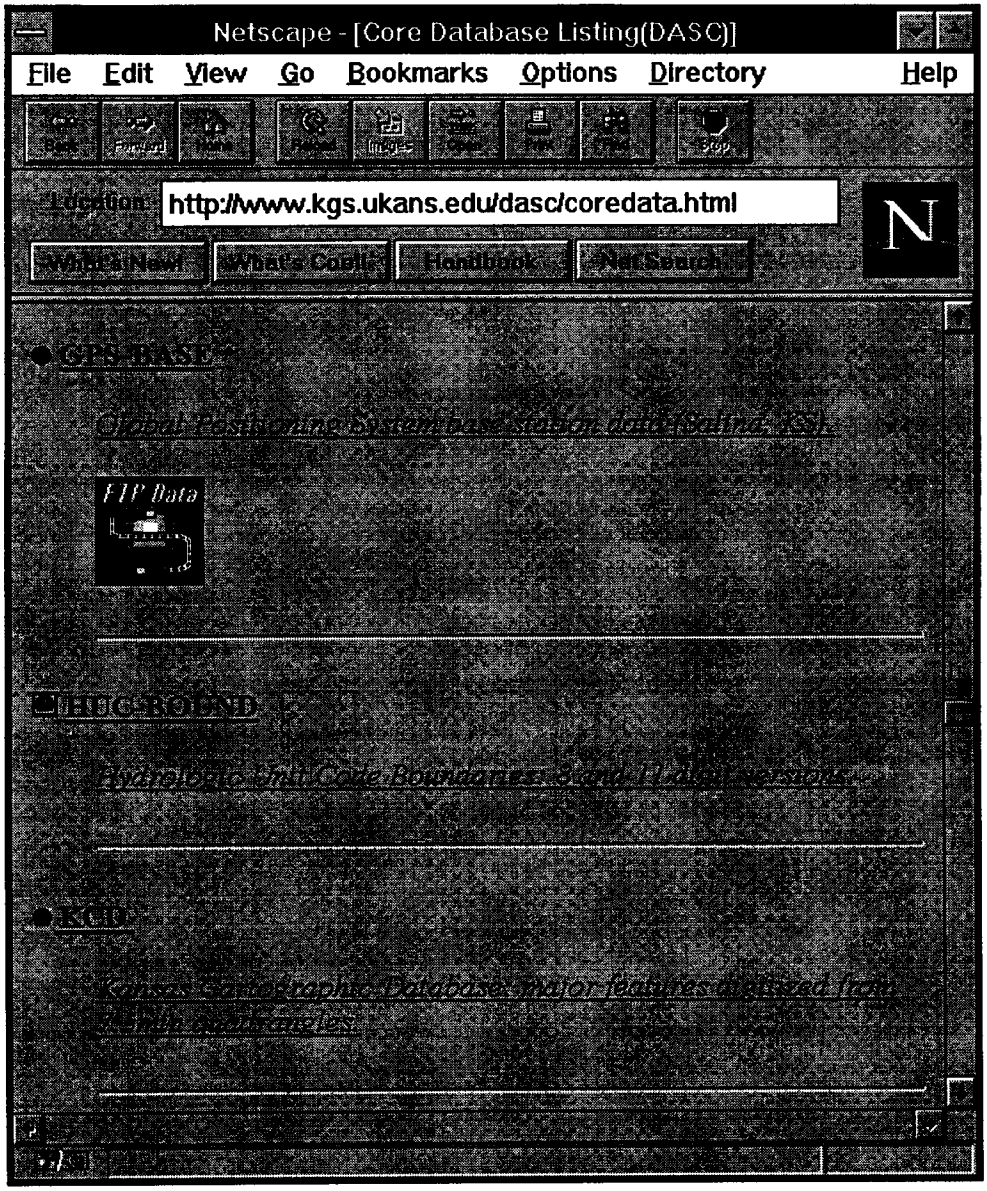
1. You can log in to a remote machine using TELNET and FTP from that machine to a second remote computer in order to pass files between two remote machines.

2. The file command in UNIX at the ftp prompt will return information on the type of file:
   (UNIX ONLY)
   % file *file-name*
   *file-name*: ascii text

3. You can use the get command in UNIX to display an ascii file to your terminal by specifying the output filename as the default terminal.
   (UNIX ONLY)
   ftp>get filename /dev/tty
   This will get the file requested and scroll the output to your command window.

## Accessing FTP site via Internet Browser

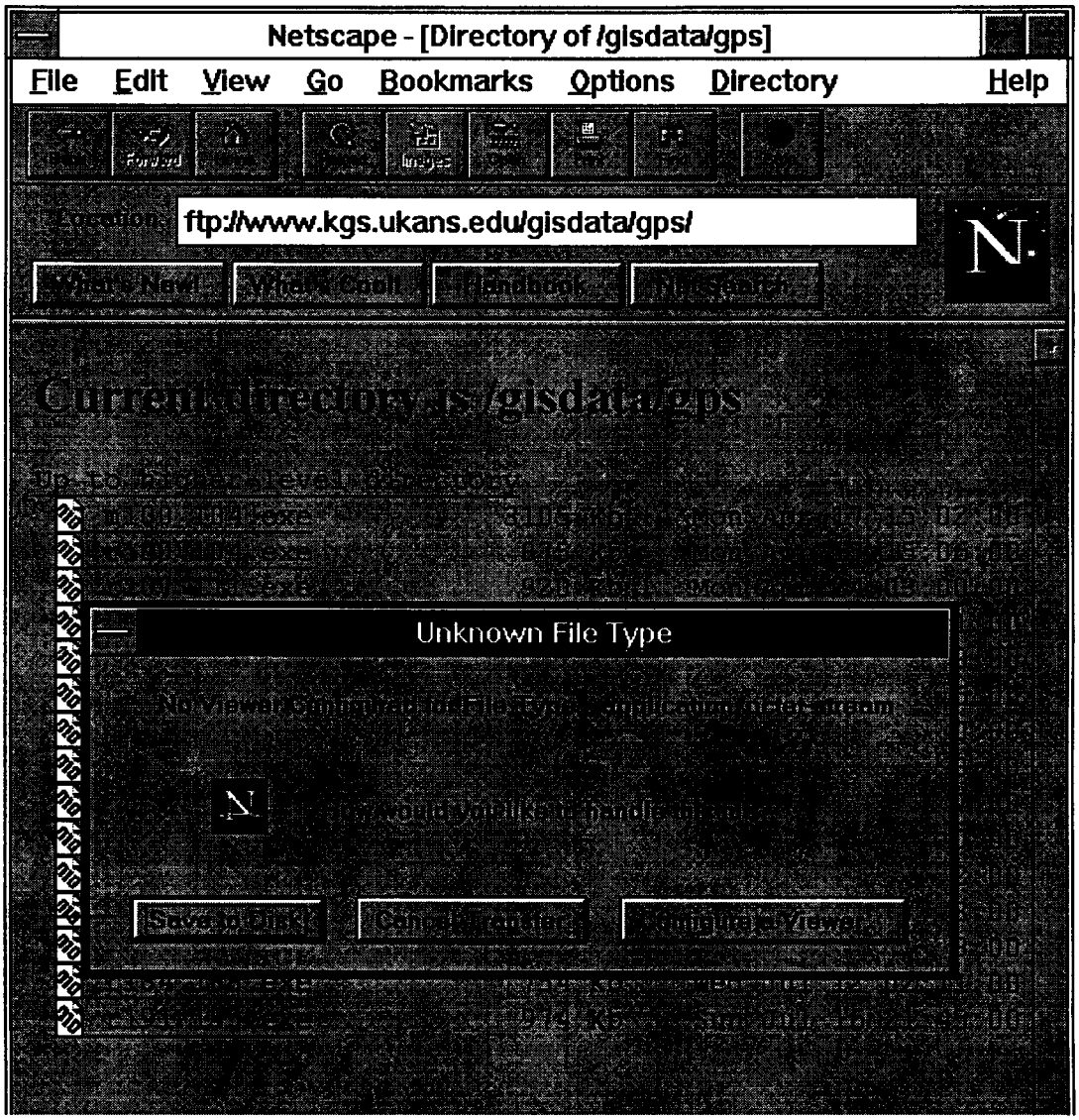
Internet browsers such as Mosaic or Netscape also handle file transfers with anonymous ftp systems. Once a ftp connection has been established, usually handled by a hyper-text link to a ftp server, users can access and download files. In the example below, there is an ftp icon which users click to access the ftp server. The user can also click on the brief descriptions to retrieve more detailed metadata (data about data) information. This example illustrates how on-line catalogs can be developed utilizing the WWW.



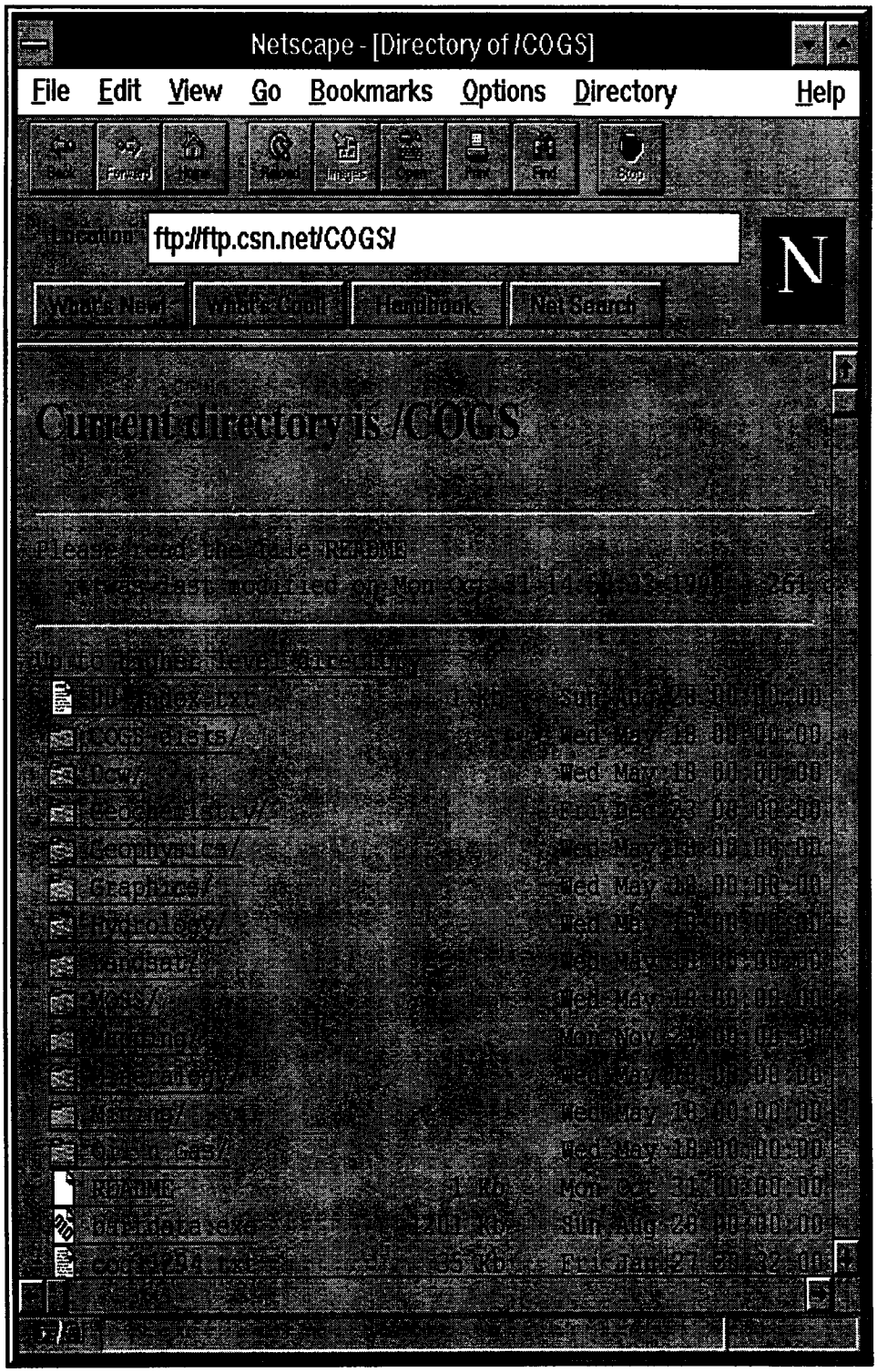

Once you click on the ftp icon or hyper-text link the display will change to something that looks similar to file manager in Windows. At the top of the page your current directory on the ftp server is displayed. Users can retrieve files by clicking on the filenames that are listed. The example on the next page shows what happens when you click on a filename.

Since Netscape is not configured to handle this type of file, the user is prompted to chose an action. Either configure a viewer that will display the results within Netscape, cancel the current operation, or save the file to the local hard disk. If you select save to disk, you will be prompted to select a local drive, directory, and filename to save the file. Once the file have been successfully transferred you will be returned to the file listing display.

To navigate through the file system users simply click on the directory names that are listed. Note: directories and files have differed shaped icons in front of their names. Refer to the



example below on the differences between files and directories. One nice feature is that when you click on an ascii file the contents of the file are displayed in the Netscape view window. In the example below, if you selected the README or 00-index.txt files the text is displayed so you can read about the contents of this directory and decide what files you will download. This feature is not readily available on most command line modes of ftp software.



# Common File Types and Transfer Modes

| File Type | Transfer Mode | Typical File Extension(s) |
|---|---|---|
| Text, ASCII | ASCII | TXT, RTF, READ.ME |
| AutoCAD Exchange File | ASCII, possible BIN | DXF, DXB |
| Database File | BIN, possible ASCII | DBF, DB, MDB |
| Spreadsheets | BIN | XLS, QP1, WK, WQ |
| Source Code | ASCII | F, F77, FOR, C, PAS, CPP, H |
| Compressed Files | BIN | ZIP, GZ, Z, ARC, ZOO, Sit |
| Images and Pictures | BIN | GIF, BMP, TIFF, JPG, RS |
| Postscript | ASCII | PS, ILL |
| Wordprocessor | BIN | DOC, WPD |
| Mail Messages, FAQs | ASCII | TXT |
| Spatial Data | ASCII | DLG, DEM, E00, GEN, LGO |
| Encoded data | ASCII | UUE |
| Tape Archive (TAR) | BIN | TAR |
| Executable | BIN | EXE, COM |

# Downloading Files from An FTP Server Using Netscape

**Retrieving winzip56.exe and decline.zip**
**from the Kansas Geological Survey/DASC WWW site**

1. Navigate to location which contains the FTP files that can be downloaded.

   **URL:ftp://gisdasc.kgs.ukans.edu/pub/win/**

   This file will take you to the FTP server directly.
   The FTP server can be also accessed through the http URL:

   **http://gisdasc.kgs.ukans.edu/**

   Note that you can move <*Up to higher level directory*> by clicking the mouse on this text. It is possible to quickly navigate through the directories.

2. Proceed by clicking on the file that you want to download.

   The file name's extension (i.e., zip, xls, dbf) determines how Netscape will handle the file. If no helper applications are available to read or display the file, you will be prompted as to how to handle the file.

   When Netscape recognizes that a helper application is available it proceeds to run that application. This may be a viewer for a graphic or in the case of compressed files an application program like **WinZip** to view the compressed file archive and to extract the files.

3. Proceed to save the file to disk.

   You will be prompted with standard menu as to where you want to save the file.

   WinZip will show the files in a *.zip file like decline.zip before the files are actually extracted. You can make a decision as to what you want -- extract the information or discard it. Note: The zip file is served as a temporary file on your local disk and after extracting or exiting WinZip, the temporary file is deleted.

or

4. If you are using an application like WinZip, follow the prompts and menus.

# Installation of WinZip, a Windows Client, from a self-extracting compressed file

---

What is WinZip:

*WinZip is a Windows Client that can run alone or under Netscape as a Helper Application. Once installed this software will expedite viewing contents, opening text files of a compressed file before extraction is performed, and directing extracted files to a specific directory.*

---

Installation procedure:

1. Activate the **Program Manager**

2. Select **Run** from the File Menu

3. **Type the full name** of the file including path followed by **\WINZIP56.EXE**. This file should be in its own temporary directory.

4. Press the **Enter Key**. This will extract the files necessary to install WinZip and should execute the setup program. If not, run setup by hand after the files are extracted.

5. **Follow the prompts**

6. When the SETUP program is completed, you can delete the WinZip installation files in your temporary directory.

Note: Utility files of pkzip that are accessed by WinZip need to included in the same directory or identified in the WinZip preferences in order for all of the features of WinZip to work.

WinZip56.exe is available on **ftp://gisdasc.kgs.ukans.edu/pub/win/**

# Setting Preferences for File Retrieval for Netscape

Netscape automatically initiates necessary actions to provide access to contents transmitted in numerous formats including many of those encountered in FTP transfers. On Windows and Macintosh, the mapping of MIME (Multipurpose Internet Mail Extensions) types is handled by the Helper Applications panel. If you have software that will handle these known files they can be identified here as Helper Applications. When a file with the same extension is encountered by Netscape, the appropriate application will be launched.

Modifications might include:

a. Launch an application that examines and directs the disposition of compressed file that is about to be transferred.

b. Run an improved viewing software, e.g., Lview31, or open an imaging software package, e.g., Corel Photo-Paint, when appropriate image files are loaded by Netscape.

An example of a modification might be to change the manner in which *zip compressed files are handled. WinZip is a Window's Client that can list files, view text files, and help direct destination of extracted files before the actual extraction. If the WinZip.exe file (an executable file for this application ) is placed as the launch application file for the *zip files that are loaded, this application will run to assist with the process.

# Making Modifications to Netscape's Helper Applications:

1. Go to **Options** Menu and open **Preferences.**

2. Pull down list of options in **Set Preferences On** box and select **Helper Applications**.

   This menu permits modification of default options of files that are encountered by Netscape. A Type file matches the file format (on the left) with the identifying filename suffix (on the right). The suffixes are usually unique for different file types. You can run through the list and see the different files recognized by Netscape. The button **New Type** can be used to add additional file types.

   An action box at the bottom indicates how Netscape is going to handle the file type (what local application to run). The browser will load and view the text directly. The **Ask User** prompt will appear when files are unknown.

3. Highlight *File Type: Application, subtype: x-zip-compressed, extension: zip*

   This is a type of compressed file commonly found on in many FTP servers.

4. Go the Action Box. Current selection is Unknown: prompt user. If you have WinZip.exe on the computer, use the **Browse** button to find this file and enter it in the text line of the Action Box. The action should now be launch application.

5. Press OK! WinZip will now be launched when a *.zip file is loaded by Netscape.

# Decompressing (Extracting) and Running Decline.exe

**Option 1.**

1. Unzip the compressed file **decline.zip**.

    a. Navigate to the directory containing **decline.zip** using **File Manager**.

        Decline.zip and utility program called **pkunzip.exe** must be in the same directory.

    b. Perform the extraction (decompression) of the archived files from decline.zip

        (1) Go the **File menu**
        (2) Go to **Run** option in file menu
        (3) Type in the run box the full path name including **pkunzip decline**.

            Files will be extracted into same directory.

**Option 2.**

1. Use the Windows Client called **WinZip** to perform the extraction of decline.zip.

    a. Go to **File Manager** and navigate to and highlight **decline.zip** file.

    b. Choose **WinZip** found in menu in File Manger and select **Open Archive** while decline.zip is highlighted.

    c. Follow instructions to extract this file. You can direct the extracted files to any directory.

**Next step, running decline.exe...**

2. Go to **File Manager** and navigate to the **decline.exe** file.

3. **Double click** on decline.exe with the mouse.

    or choose **Run** from the File menu and type in full path and file name decline.exe.

4. The program runs under DOS and the screen will change accordingly. Please follow the menu in order to run the program.

    Hint: Two examples are provided in the program. Use tab key to select different examples or build your own data file.

# Transferring Binary Data via E-mail

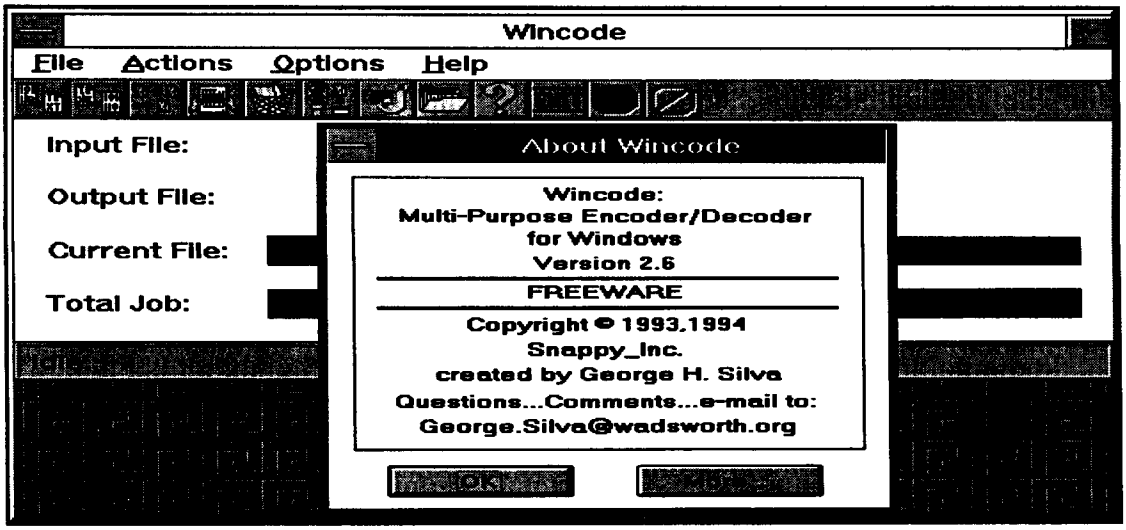
by: Thomas D. Mettille

---

Most electronic mail systems are designed to transfer text mail files to and from network sites. However, these ASCII-based communication systems do not safely send binary files. In order to safely send binary files across the mail network, users must convert 8-bit binary files to 7-bit ASCII-text files. This process is referred to as bit-shifting or encoding. Users on the receiving end decode the text file converting it back to an 8-bit binary file. There are several standards for bit-shifting which utilize slightly different algorhithms. The most common methods are uu/xx and base 64 (MIME - Multipurpose Internet Mail Extensions). These methods allow users to transmit binary files through the E-mail system.

For example, say you have a program or image which you want to share with a colleague. Your colleague does not have ftp software or you do not have an ftp server on which to post the data. You need him/her to review it quickly so you decide to E-mail the file. Typically before binary files are encoded they are compressed to reduce their size. Mail systems have limitations on the size of mail messages that can be sent. A good rule of thumb is to not let your E-mail message exceed 60 Kbytes (984 lines). This limitation may require a binary file to be divided into several parts when encoding. Encoders like Wincode (see below) will divide encoded files into several messages, so they can be mailed out as separate files. After the file is encoded, shifting the 8-bit binary to a 7-bit binary ASCII text, the enclosed file is inserted into the body of the mail file and sent to its destination. On the receiving end the user saves the E-mail message on their local hard drive. Some decoders will require the user to remove extraneous header lines added to the file message by the mail system. More sophisticated decoders like Wincode will ignore these lines and also combine concatenated files. After the user has decoded the file the data can be decompressed then utilized.

This sounds like a complicated process but in reality it is very simple, expecially when using a Windows based encodeer/decoder. This process is commonplace among newsgroup users and the E-mail community. After you have encoded and decoded a few files you will find this to be a fast and economical means to transfer data across the Internet.



# Some Internet Resources for Geology

It's a brave new virtual world out there on the Internet. Curious where to jump off? This a short list of some places to look for geological information. The easiest and most consistent way to access all these places is with a World Wide Web browser, such as *NCSA Mosaic* or *Netscape Navigator*. The sites listed below are a mix of Internet services. If you have a favorite site or service that you would care to share with other people, we would love to include it in future issues See the sidbar, A Short Guide to Common Internet Terms, for definitions for some of the terms in this list.

## World Wide Web and Internet Starting Points

Yahoo - A Guide to WWW ..... http://akebono.stanford.edu/yahoo/
The World-Wide Web Virtual Library: Subject Catalogue ..... http://info.cern.ch./hypertext/DataSources/bySubject/Overview.html
WWW FAQ (Frequently Asked Questions) ..... http://sunsite.unc.edu/boutell/faq/www_faq.html
Starting Point for Internet Exploration ..... http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/StartingPoints/NetworkStartingPoints.html
HTML language primer ..... http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html

## Collections of Internet Resources

ERIN List of Geology Servers ..... http://kaos.erin.gov.au/other_servers/category/Geology.html
Galaxy Petroleum Engineering Page ..... http://galaxy.einet.net/galaxy/Engineering-and-Technology/Civil-and-Construction-Engineering/Petroleum-Engineering.html
Geology Resources ..... gopher://path.net:8001/11/.subject/Geology
Geowissenschaften / Geosciences ..... http://www.potsdam.ifag.de/server/geo.html
GO-TECH Petroleum Industry Electronic Information System http://baervan.nmt.edu
On-line Resources for Earth Scientists ..... http://www.gly.bris.ac.uk/Depts/Geol/gig/ores/ores.html
Rice University's RiceInfo on Geology ..... gopher://riceinfo.rice.edu:70/11/Subject/Geology
Sci.geo.petoleum list of earth science resources ..... http://baervan.nmt.edu/sci.geo.petroleum/home.html
Structural Geology Resources on the Web ..... http://hercules.geology.uiuc.edu/~schimmri/geology/structure.html
UT at Austin Petroleum Engineering ..... http://altona.pe.utexas.edu/petroleum.html
UT at El Paso GeoGopher ..... gopher://dillon.geo.ep.utexas.edu:70/11/EarthScienceRes
WWW Virtual Library: Earth Sciences ..... http://www.geo.ucalgary.ca/VL-EarthSciences.html
WWW Virtual Library: Geophysics ..... http://www-crewes.geo.ucalgary.ca/VL-Geophysics.html
Yahoo Geology and Geophysics Page ..... http://akebono.stanford.edu/yahoo/Science/Geology_and_Geophysics
Zilker Internet Park Geoscience Page ..... http://www.zilker.net/~hal/geoscience

## Professional Societies and Consortia

Active Tectonics ..... http://www.muohio.edu/tectonics/activetectonics.html
American Association of Petroleum Geologists (AAPG) ..... http://www.neosoft.com/aapg
American Geological Institute (AGI) ..... http://agi.umd.edu/agi/agi.html
American Geophysical Union (AGU) ..... http://earth.agu.org/kosmos/homepage.html
American Rock Mechanics Association (ARMA) ..... http://sair019.energylan.sandia.gov:70/0/RockNet/rocknet.html
Association for Women Geoscientists (AWG) ..... gopher://flint.mines.colorado.edu:4501/1
British Geological Survey (BGS) ..... http://192.171.148.40/bgs/w3/wm/home.html
Canadian Society of Petroleum Geologists (CSPG) ..... http://www.cadvision.com/oil/cspg/cspg.html
Computer-Oriented Geological Society (COGS) ..... ftp://ftp.csn.net/COGS/
**Geological Society of America (GSA) ..... http://www.aescon.com/geosociety/index.htm**
Geoscience and Remote Sensing Society (GRSS) ..... http://outside.gsfc.nasa.gov:80/GRSS/
Geoscience Information Group (GIG) ..... http://www.bris.ac.uk/Depts/Geol/gig/gig.html
Global Change (NASA) ..... http://gcmd.gsfc.nasa.gov/
Institute of Geophysics and Planetary Physics (IGPP) ..... http://igpp.ucsd.edu/
International Association of Mathematical Geologists (IAMG) ftp://iamg.org/pub/
International Organization for Standardization (ISO) ..... http://www.iso.ch/welcome.html
International Electrotechnical Commission (IEC) ..... http://www.hike.te.chiba-u.ac.jp/ikeda/IEC/home.html
Jet Propulsion Laboratory (JPL) Home Page ..... http://www.jpl.nasa.gov/
National Petroleum Council (NPC) ..... http://www.npc.org/npc/
National Science Foundation (NSF) Geosciences ..... http://www.nsf.gov/geo/start.htm
National Science Foundation (NSF) NSF Research Awards .... http://www.nsf.gov/nsf/awards.htm
Society for Applied Spectroscopy (SAS) ..... http://esther.la.asu.edu/sas/
Society of Petroleum Engineers (SPE) ..... http://pumpjack.tamu.edu/SPE-JPT.html
U.S. Geological Survey (USGS) Home Page ..... http://info.er.usgs.gov/
U.S. Geological Survey (USGS) Earthquake Information ..... http://info.er.usgs.gov/research/environment/hazards/earthquake/earthquake-education.html

## Data, Images, Maps and Books

Australian Maps ..... http://garnet.bmr.gov.au/map/index.html
Canada Centre for Mapping ..... http://ccm-10.ccm.emr.ca/
DeLorme Maps ..... http://www.delorme.com/
Earth Images Catalog ..... http://galaxy.einet.net/hytelnet/FUL024.html
GEODAS Underway Geophysical Data Management System http://www.ngdc.noaa.gov/mgg/geodas/geodas.html
Geomatics Canada ..... http://www-nais.ccm.emr.ca/wwwnais/wwwnais.html
Mineral Resources Data System (MRDS) ..... http://info.er.usgs.gov/bio/USGS/Geology/OMR/fact-sheets/MRDS_Broch.html
Geology Facts on File ..... gopher://infx.infor.com:4600/11.browse/GEOLOGY
ImageNet ..... http://www.coresw.com/
National Digital Geoscience Data Library ..... gopher://agcgopher.bio.ns.ca

Continued from page 8

Nevada Bureau of Mines and Geology, Digital Cartographic Data Directory gopher://nbmg.unr.edu/
NOAA ..... http://www.noaa.gov/
Ohio State University Center for Mapping ..... http://www.cfm.ohio-state.edu/
Thomas Bros. Maps ..... http://www.thomas.com/
University of Michigan Comprehensive Oil and Gas Information System (COGIS) gopher://una.hh.lib.umich.edu:70/11/ebb/energy/
University of Texas Map Collection ..... http://rowan.lib.utexas.edu/Libs/PCL/Map_collection/Map_collection.html
U.S. Earth Resources Observation Systems ..... http://sun1.cr.usgs.gov/eros-home.html
U.S. Federal Geographic Data Products ..... http://info.er.usgs.gov/fgdc-catalog/table_of_contents.html
U.S. Geological Survey Data Locators ..... http://info.er.usgs.gov/data/locators.html
U.S. Global Land Information System (telnet) ..... telnet://glis.cr.usgs.gov:23/
U.S. Global Land Information System (WWW) ..... http://sun1.cr.usgs.gov/glis/glis.html
U.S. National Trade Data Bank–Outlook for Petroleum and Natural Gas gopher://sunny.stat-usa.gov:70/11/STAT-USA/NTDB/Petrol
U.S. National Trade Data Bank–World Energy Consumption gopher://sunny.stat-usa.gov:70/11/STAT-USA/NTDB/Energy
World of Maps ..... http://www.magi.com/~maps/
World Map ..... http://www.lib.stat.cmu.edu/maps
World Petroleum Engineering Data ..... ftp://r4.pete.lsu.edu/pub/well_data/well.html
Xerox Map Data Archive ..... ftp://spectrum.xerox.com/pub/map/
Xerox Map Viewer ..... http://pubweb.parc.xerox.com/map

## Frequently Asked Question (FAQ) Files

All FAQs ..... http://www.cis.ohio-state.edu:80/hypertext/faq/usenet/
comp.infosystems,gis ..... ftp://rtfm.mit.edu/pub/usenet/comp.infosystems.gis/Geographic_Information_Systems_FAQ
sci.data.formats ..... ftp://rtfm.mit.edu/pub/usenet/sci.data.formats/
sci.geo.geology ..... ftp://rtfm.mit.edu/pub/usenet/sci.geo.geology/
sci.geo.petroleum ..... ftp://rtfm.mit.edu/pub/usenet/sci.geo.petroleum/sci.geo.petroleum_FAQ_-_Internet_Resources
geo-computer-models ..... gopher://nisp.ncl.ac.uk/11/lists/geo-computer-models
geo-gig ..... gopher://nisp.ncl.ac.uk/11/lists/geo-gig
geo-metamorphism ..... gopher://nisp.ncl.ac.uk/11/lists/geo-metamorphism
geo-mineralisation ..... gopher://nisp.ncl.ac.uk/11/lists/geo-mineralisation

## E-Mail Distribution List Information and Archives

All Listserv Lists ..... http://www.lib.ncsu.edu/reference-acadlists.html
All Mailbase Lists ..... gopher://nisp.ncl.ac.uk:70/11/
Search the Listserv Archives ..... gopher://www.lib.ncsu.edu:80/hGET%20/staff/morgan/listwebber.html

## Libraries, Journals, and Book Catalogs

American Geological Institute GeoRef Database CDROM ..... http://www.silverplatter.com/catalog/gref.html
BIBSYS ..... http://www.bibsys.no/search/pube.html
Cambridge Scientific Abstracts ..... http://www.csa.com/
CRC Press ..... http://www.crc.com/
Dictionary of Geophysics ..... http://minerva.ori.u-tokyo.ac.jp/gd
Elsevier–Geophysics Internet Journal and Book Catalogue .... http://www.elsevier.nl/catalogue/ESS/03700/Menu.html
Elsevier–Earth Science Catalogue Gopher ..... gopher://gopher.elsevier.nl/11/catalogue/ESE
Internet Public Library ..... gopher://gopher.nstn.ca/11/Cybrary
Journal of Glacial Geology and Geomorphology ..... http://boris.qub.ac.uk/stephen/Ejournal/ejtitle.html
Journal of Petroleum Technology (JPT) ..... http://petroinfo.tamu.edu/
Library Resources ..... http://www.library.nwu.edu/.nul/libresources.html
Library and Information Science Resources ..... http://www.ub2.lu.se/lisres.html
Macmillan Information SuperLibrary ..... http://www.mcp.com
Public Library Servers ..... http://sjcpl.lib.in.us/homepage/PublicLibraries/PublicLibraryServers.html
Springer–Journals Preview Service ..... http://www.springer.de/
Wiley–International Journal For Numerical Methods In Engineering http://www.ep.cs.nott.ac.uk/wiley/numeng.html
WWW Library Servers ..... http://www.lib.washington.edu/~tdowling/libweb.html

## Miscellany

Archives of Graphics Software and Databases Around the World http://www.gdb.org/Dan/softsearch/graph-links.html
Edwards Aquifer Research and Data Center ..... http://eardc.swt.edu/Edwards-info.html
Dilbert Cartoons ..... http://www.unitedmedia.com/comics/dilbert/
Info-Mine Web ..... http://www.info-mine.com/
International Petroleum Exchange (IPE) ..... http://www.quote.com/info/exchanges/ipe.html
Internet Connectivity by Country ..... gopher://rain.psg.com:70/11/networks/connect/countries
Los Angeles seismicity last 72 hours (map) ..... ftp://garlock.wr.usgs.gov/pub/CURRENT/los_angeles.html
Mining Channel ..... http://www.wimsey.com/Magnet/mc/index.html
Over The Coffee (coffee resources) ..... http://www.infonet.net:80/showcase/coffee/
Scientific Visualization and Graphics ..... http://web.msi.umn.edu/WWW/SciVis/umnscivis.html
Scott King's Earth Science Site of the Week ..... http://agcwww.bio.ns.ca/misc/geores/sotw/sotw.html
Seismic Software ..... ftp://hilbert.mines.colorado.edu/pub/
Software Support Laboratory for Space and Earth Scientists . http://sslab.colorado.edu:2222/ssl_homepage.html
University of California Museum of Paleontology ..... http://ucmp1.berkeley.edu/
U.S. Defense Department Declassified Satellite Photographs http://edcwww.cr.usgs.gov/dclass/dclass.html
U.S.White House ..... http://www.whitehouse.gov/White_House/html/White_House_Home.html

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## 1995 GSA Sedimentary Geology Division field trip (#4): Holocene and Wisconsinan sedimentation, soil formation, and evolution of the Mississippi River floodplain, southern Lower Mississippi Valley.

*Dates:*
Friday, November 3 through Sunday, November 5, 1995.
*Field Trip Leaders:*
**Andres Aslan**, Dept. of Geological Sciences, U. of Colorado, Boulder, CO 80309, (303) 492-6313, aslan@ucsu.colorado.edu
**Whitney J. Autin**, Inst. for Environmental Studies, Lousiana State University, Baton Rouge, LA 70803, (504) 388-3420
**Torbjorn E. Tornqvist**, Dept. of Physical Geography, U. Utrecht, The Netherlands
*Maximum attendees:* 40.
*Cost:*
$190 (0B, 2L, 0D, 2ON, bus).
We will leave New Orleans, LA late Friday afternoon (Nov. 3) and return late Sunday afternoon (Nov. 5).
*Description:*
This trip will examine the sedimentologic and pedologic characteristics of "classic" Mississippi River floodplain depositional environments. Comparisons between Holocene and Wisconsinan Mississippi R. floodplain deposits will also be used to discuss relative sea level and climatic influences on floodplain evolution in the southern Lower Mississippi Valley.

Continued from page 10

### Netnews Groups

#### *Geology groups*

| | |
|---|---|
| sci.geo.eos | |
| sci.geo.fluids | geological fluid dynamics |
| sci.geo.geology | geology |
| sci.geo.hydrology | hydrology |
| sci.geo.meteorology | meterology |
| sci.geo.petroleum | oil and gas industry issues |
| sci.geo.satellite-nav | satellite navigation |

#### *other Netnews groups*

| | |
|---|---|
| comp.graphics.visualization | visualization |
| comp.infosystems.gis | geographic information systems |
| sci.answers | answers to general science questions |
| sci.chem | chemistry |
| sci.data.formats | scientific data formats (e.g., netCDF |
| sci.energy | energy |
| sci.engr.civil | civil engineering |
| sci.engr.mech | mechanical engineering |
| sci.environment | environmental science |
| sci.image.processing | image processing |
| sci.materials | material science |
| sci.math | math |
| sci.math.num-analysis | numerical analysis |
| sci.math.stat | mathematical statistics |
| sci.mech.fluids | fluid mechanics |
| sci.research | scientific research methods |
| soc.history.science | history of science |
| alt.books.technical | technical books information |
| alt.folklore.urban | urban legends |
| alt.food.coffee | discuss all thing caffinated |

## 1996 IGC Travel Grant Program

**30th International Geological Congress, Beijing, China, August 4–14, 1996**

A Travel Grant Program for young (birthdate after August 31, 1956) residents or citizens of the United States, including students, is being administered by the Geological Society of America. Travel grants will consist of economy airfare to China. Applicants must have an abstract included in the program of the 30th IGC. Deadline for applications and letters of support is September 15, 1995. Contact Grants Administrator, GSA, P.O. Box 9140, Boulder, CO 80301, Tel: (303) 447-2020; ext. 137; Fax: 303-447-1133.

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PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

LIBRARY ACCESS VIA INTERNET

UNIVERSITY OF KANSAS
Location: http://falcon.cc.ukans.edu/
Telnet: telnet kuhub.cc.ukans.edu or telnet 129.237.32.1
Access to on-line card catalog (**OCAT**) and **GEOREF** (American Geological Institute's database that includes geology and geophysics); **SCI** - Science Citation Index (Institute for Scientific Information, ISI) and **Dissertation Abstracts** (University Microfilms International, UMI) via a telnet connection. Within KUFACTS under **Reference Shelf** will find gopher listings for libraries world-wide.

# Welcome to the University of Kansas

This server is operated by Academic Computing Services at the University of Kansas, which is the home of

KUfacts, the KU campus wide information system,
KANREN Info, the KANREN information system,
HNSource, the central information server for historians, and

the Lynx and DosLynx World-Wide Web (WWW) browsers. The current version of Lynx is 2.4. If you are running an earlier version PLEASE UPGRADE! Lynx 2.4.2 BETA is available for testing.

## Other University of Kansas Servers

The University of Kansas Medical Center--Pulse
Atmospheric Science
Electrical Engineering and Computer Science
Mathematics
Physics
Printing Services
Research Support and Grants Administration
School of Engineering
Special Education Department
Telecommuncations and Information Sciences Lab
University Affiliated Program for Devleopmental Disabilities

## Information sources about and for WWW

For a description of WWW choose Web Overview
About the WWW Information Sharing project
WWW Information By Subject
WWW Information By Type
Inter-Links, Internet access made easy

**http://falcon.cc.ukans.edu**

University of Kansas

telnet KUHUB.CC.UKANS.EDU or 129.237.32.1

Username: RELAY

If you get trapped hit Control-Y twice to escape

At the SYSTEM? prompt, type OCAT
At the ENTER TERMINAL TYPE prompt, type VT100
On the CICS screen, type OCAT

To exit:

Type LOGOFF
Type Q

CONTACT: John S. Miller SPO5@UKANVM

# Telnet Access to the University of Kansas Libraries' CD-ROM Databases: Macintosh Instructions

## Introduction

This document contains instructions for accessing the University of Kansas Libraries' CD-ROM databases from a Macintosh. The document itself is a freestanding application, requiring no specific wordprocessing program to read and/or print. You may print all chapters or any one chapter of this manual. Go to the **File Menu** when this document is open and select **Print**. Follow the dialog boxes to print all or any one chapter of this manual.

Although you may be anxious to connect to and use the CD-ROM databases, please read ***all*** of this manual before doing so.

This document uses one convention to indicate which keys you should press during your remote session. For example, if you need to press the escape key, this is represented by **<esc>**. If you need to press the **f** key, this is represented by **<f>** and so on.

## Who You Gonna Call?

If you have any questions concerning using your telnet software, contact Consulting of Academic Computing at 864-0410.

If you have questions about using the databases themselves, contact the Watson Library Reference Desk at 864-3347 or the Anschutz Library Reference Desk at 864-4930. The Anschutz Library staff can be of greater assistance with questions related to the Science Databases.

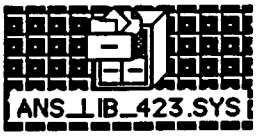
If your telnet software repeatedly says "unable to open connection," contact Chet Durnal at 864-5530 (p.m.).

**Note:** Remote connection has been set to a limit of **4** simultaneous users. You may receive the message "unable to open connection" because of this limit.

## Software Requirements:

First, you must have MacTCP loaded and properly configured for your Macintosh. If you do not have MacTCP, contact Consulting in the Computer Center at 864-0410.

Next, You will need telnet software to connect to the remote computer which manages access to the CD-ROM databases. You may use **NCSA Telnet** or commercial products such as **Versaterm**.

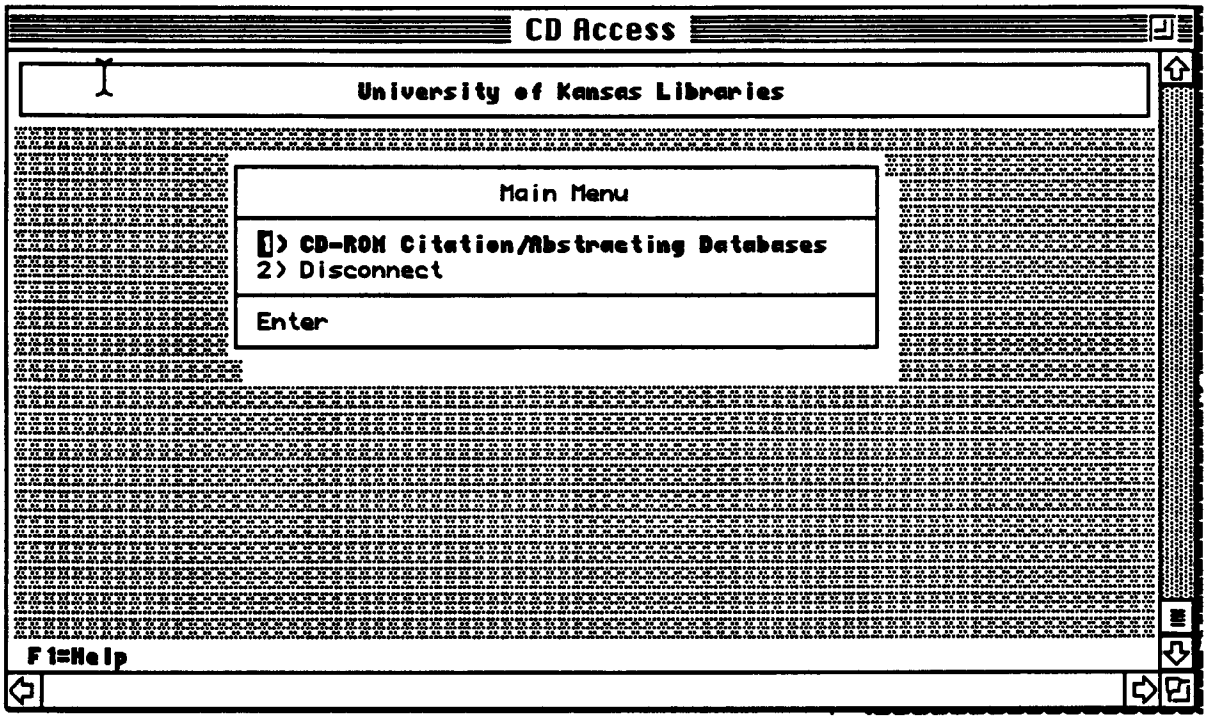



If you do not have telnet software, log in to the KU Library server (**ans_lib_423**) as "guest." To log in to the Library Server first go to the Apple Menu icon. Then select "chooser." Highlight "Appleshare." Select the zone called "Anschutz." When prompted for a password, click on the "guest" button and then click "ok." Open the Public folder. In that folder is a folder called **MAC Applications**. In that folder is a folder called **NCSA Telnet 2.25 and TN3270**. Copy the telnet folder to an appropriate place on your Macintosh. The telnet folder contains an icon labeled **CD Access**. This icon contains NCSA telnet session configurations which have been optimized for Macintosh access to the databases. **NCSA Telnet** can be used at no charge. Log out of ans_lib_423 by dragging the icon to the trash icon.

You may also get the Telnet software by logging in to the Computer Center Lab as guest. The CD access icon is also there. If you cannot get to these resources, use your telnet software and choose **open a connection**. Type **cdrom.lib.ukans.edu** as the connection name.

The NCSA Telnet folder contains complete documentation for using the software. Please become familiar with using your telnet software before connecting to the Libraries' CD-ROM databases.

# Connecting to the Remote PC




## Using NCSA Telnet

If you copied the NCSA Telnet folder from the Anschutz File Server, open that folder. The following icon should be in the folder:

Library CD Access

Double click on that icon. NCSA Telnet will be loaded and attempt to connect to the remote access PC. If the connection is successful, the above Main Menu will display. If the connection is not successful, the limit to the number of simultaneous users has been reached. Wait about 15 minutes and try again.

## Using Other Telnet Software

Most commercial software allows one to open a telnet session by first going to the **File Menu**. At the File Menu choose "open connection." You will be asked to enter the "Host Name" or IP address. Type (without spaces) the following: **cdrom.lib.ukans.edu** Clink on the "ok" button.

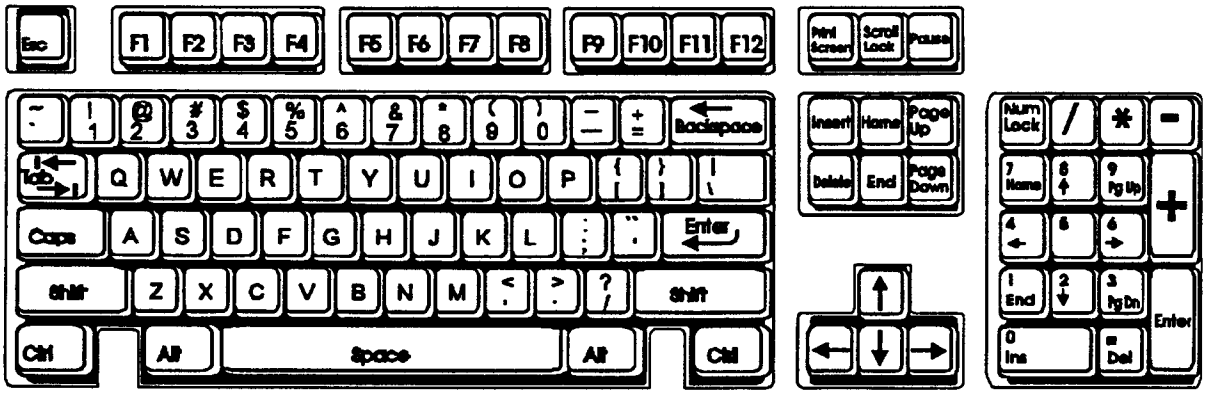
## Disconnecting

Notice item **2** in the above Main Menu. Use this option to disconnect ***gracefully*** from the remote PC. Press **<2>** and your connection will be broken and the remote software will reset itself for another user. You may also press the down arrow key on your Macintosh and then press **<return>** to select option 2. However, once the connection is broken, you will still be running your telnet software. Choose "quit" from the **file** menu of your software to exit.

If the remote software does not respond, you may break the connection by using your telnet software. Go to the file menu and select "close connection."

**Note:** If the remote software does not receive keyboard input from your Macintosh within **10 minutes**, the software will break the connection.

Keep in mind as you read further that you will be connecting to a **DOS** machine which will be running **DOS** software. The implications of this will become clearer as you read further in this manual.




## Sending Keyboard Commands to the Remote PC

Above is a picture of a standard IBM PC keyboard. The DOS software you will be controlling remotely uses **<esc>**, **<F1>** through **<F10>** (function keys) very frequently. However, some of the equivalent keys on your Macintosh will not work with this software. Following is a list of the Macintosh keys which *will* work.

**all alpha/numeric keys** (including shifted keys)
**spacebar**
**delete**
**all arrow keys**
**return**

Since the remaining keys will not work as normal, and the IBM PC has some keys that are not on a Macintosh, there are special keyboard combinations you must use to get the database search software to respond. For example, if you need to press the function key **<F1>**, you must press **<esc> <f> <1>**. You must press these keys in that order. To complicate matters more, if you need to send simply **<esc>**, you must press **<esc> <e>**. The common denominator in these keyboard combinations is the **<esc>** key. All of them require pressing **<esc>** and then one or more additional keys. On the next page is a table listing of all keyboard combinations you can use and how the remote PC translates or responds to each combination.

| Keyboard Combination | Remote Equivalent |
|---|---|
| <esc> <e> | <esc> |
| <esc> <f> <1> | <f1> |
| <esc> <f> <2> | <f2> |
| <esc> <f> <3> | <f3> |
| <esc> <f> <4> | <f4> |
| <esc> <f> <5> | <f5> |
| <esc> <f> <6> | <f6> |
| <esc> <f> <7> | <f7> |
| <esc> <f> <8> | <f8> |
| <esc> <f> <9> | <f9> |
| <esc> <f> <0> | <f10> |
| <esc> <u> | <PgUp> |
| <esc> <d> | <PgDn> |
| <esc> <a> <esc> <f> <1> | <Alt> <f1> |

## Controlling the Screen Appearance

Not all of the databases use the same search software. Each uses different color combinations and graphic lines. Thus, menu items will not clearly display the item currently selected unless you adjust how the image is sent to your MAC. **None** of the colors of the remote software will display through your telnet software. However, chosing one color mode or another from those listed below will improve what is displayed on your Mac.

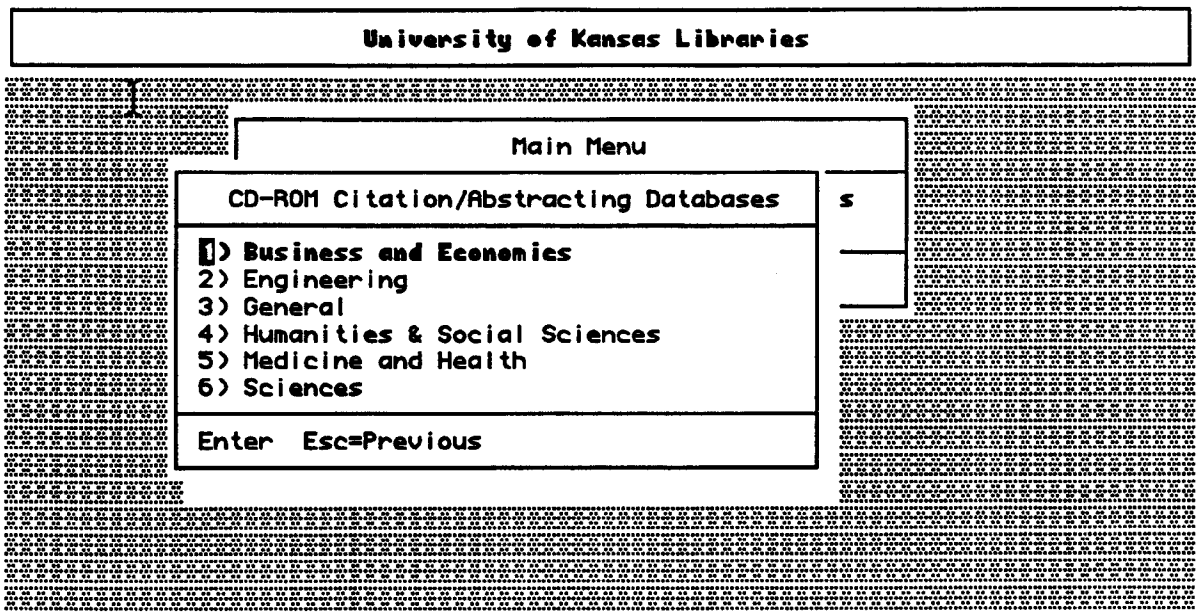
You can adjust the image displayed on your Mac by using keyboard combinations similar to those used in the chart above. Below is a list of the keyboard commands you can send to change the color and/or graphics mode of your remote session.

**<esc> <g>**: provides full graphics display; repeating the key strokes turns this on or off; the default is **on**

**<esc> <0>**: turns off all color support
**<esc> <1>**: monochrome display
**<esc> <2>**: high contrast mode
**<esc> <3>**: full color support

**NOTE:**

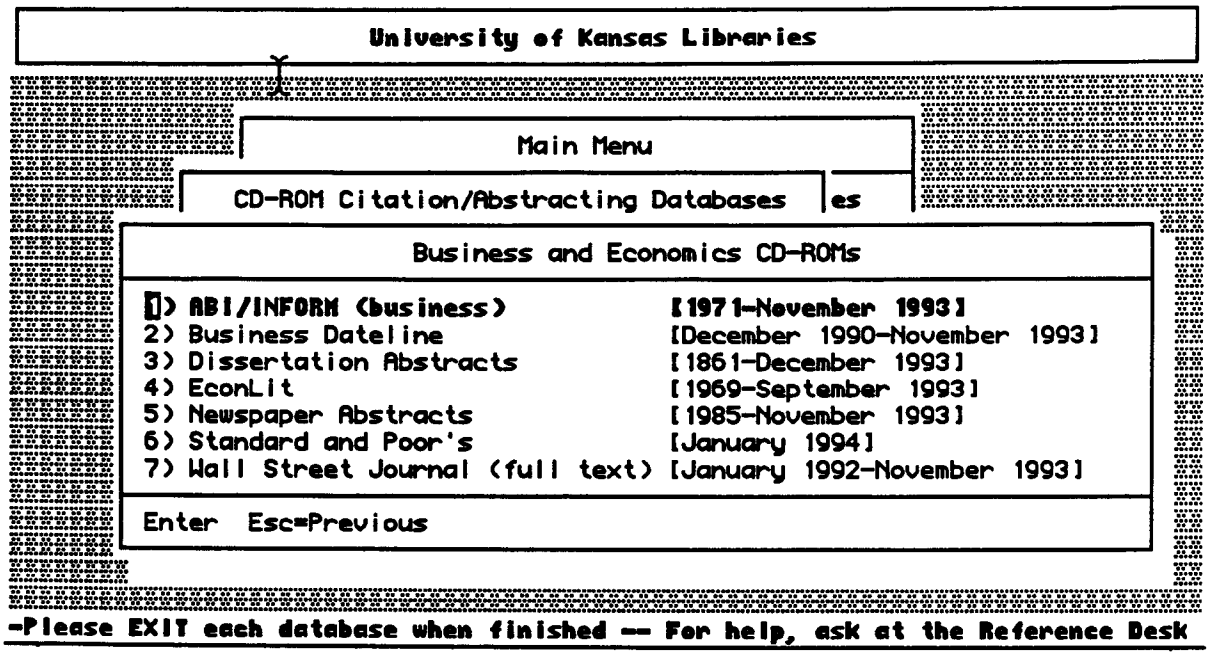
sometimes your telnet software will not keep up with screen changes sent from the remote PC. Thus, "garbage" may appear on your screen. To refresh or redraw the screen, press **<esc> <r>** at any time.




# Using the Databases

When you select option **1** from the Main menu, the above menu displays. This menu shows the database categories available. Notice that the first option, **Business and Economics**, is in bold. This indicates that this is the currently selected option. You may return to the **Main Menu** by pressing **<esc> <e>** or by pressing the **<left arrow>** key.

There are two ways to choose a category. The first is to press the number of the category you wish. For example, if you wish to access the **Engineering** databases, press **2**. Do not press the **<return>** key after pressing a number. The second way to choose a category is to use the **up** and **down** arrow keys on your MAC and then press **<return>**. When you choose a category, a submenu appears. For example, if you choose **Business and Economics**, the menu shown on the next page appears.




Each database category has its own menu, similar to the one above. Notice that **ABI/INFORM (business)** is in bold, indicating it is the currently selected database. The menu also displays the years covered by each database. The years and/or months covered change as the libraries' holdings are updated. Again, if you wish to return to the previous menu, press the **<left arrow>** key or press **<esc> <e>**.

To select the database you want to search, press the corresponding number or use the arrow keys. The search software will begin to load into the memory of the remote PC.

## NOTE:

**Please be patient! As you search the databases, you will not experience the same response speed you are use to with Macintosh applications. When you select a database, it will take from 30 to 45 seconds for the search software to load on the remote PC and transmit that screen to your Macintosh. In addition, when you send <esc> key commands, give the remote system time to respond (sometimes 10 or 15 seconds).**

**Finally, when you exit a database, returning to the CD menu may also take up to 30 seconds.**

# Printing Search Results

Strictly speaking, during a remote session you cannot print search results *directly* to your Macintosh printer. Although you will tell the search software to "print" results, you will actually receive the results as a file called "CD Search Results." The file(s) can then be printed after your remote session is closed. Use **Teachtext** to print the file(s).

Below is a list of the steps to take in saving searches locally. This list is followed by a detailed discussion of each step. I recommend you practice these steps several times.

1. **Turn on Remote Printing: <esc> <p> <3>**
2. **Conduct a search**
3. **Follow all but the *last* search software step to begin remote printing**
4. **Turn on "capture session to file" within your telnet software**
5. **Issue the last search software command to begin "printing"**
6. **Turn off "capture session to file"**
7. **Redraw the screen image: <esc> <r>**
8. **Switch to the finder**
9. **Give the file "CD Search Results" a different name such as "Search 1"**
10. **Switch back to your telnet software**
11. **Repeat steps 2 through 10 for each search you wish to save**

### 1. Turn On Remote Printing:

Press **<esc> <p> <3>** any time *prior* to issuing your *first* print commands to the search software. Once remote printing is turned on, it remains on throughout your remote session and does not effect any other aspects of the session. In fact, you may press **<esc> <p> <3>** when you begin a remote session and before you have selected a database to search and forget about it.

### 2. Conduct a search

A "search" is telling the software to find articles for one set of search criteria. For example, one search could be to find all articles which have the word "wheat" in them. When the results are displayed, you may "mark" selected articles for printing, print just the displayed article, or print all of the articles from the search.

### 3. Follow all but the *last* search software step to begin remote printing

The commands you issue the remote software to reach the print menus vary. Often, the last step is either press **<return>** or press a letter such as **p**. However, do not issue the last step until you have placed your telnet software in its "capture" mode. This is described in the next step.

### 4. Turn On "Capture Session to File" within your telnet software

From the menu bar at the top of the MAC screen, select **session**. Highlight "capture session to file." From this point, *whatever* is displayed on the screen is stored in a file until capture is turned off. Later, when you open the file there will be some "garbage" characters as well as the search results. This garbage can be removed prior to actually printing the results.

### 5. Issue the last search software command to begin "printing"

When you issue the last command or key stroke, the article or articles will scroll across your screen as they are stored on disk. What scrolls across the screen may include some garbage but the file will be fairly "clean." When "printing" is finished, a message such as "output to printer complete" will display. Do not respond to that message until the next step is completed.

### 6. Turn off "capture session to file"

When remote "printing" is completed, a message will display. Return to the **session** option at the top of the MAC screen. Notice that "capture session to file" has a check mark next to it. This indicates that capture is currently on. To turn off "capture session to file," highlight it again.

### 7. Redraw the Screen Image

Once printing is finished, your screen will be cluttered with various characters. Press **<esc> <r>**. This redraws or "refreshes" what is displayed. In fact, this command can be issued at any time if garbage characters appear on you screen.

### 8. Switch to Finder

Switching to finder is only needed if you plan to capture other articles to files. You must switch to finder to rename the capture file. If the capture file is not renamed, the next results captured will ***replace*** the current contents of the file.

**9. Give the file "CD Search Results" a different name such as "Search 1"**

If you are using the "Library CD Access" icon stored on the Anschutz file server, the default name of the capture file is "CD Search Results." You will see that file somewhere in the window of your telnet software. Rename it something descriptive such as "Search 1." This insures that the next article or articles captured will not replace your most recent search.

**10. Switch back to your telnet software**

From the "switcher" icon, hightlight "NCSA Telnet." The screen will redisplay the message that printing is completed. Press **<return>**. The database screen will redisplay. At this point, you may conduct a different search or exit the current database.

If you wish to capture additional search results, you must repeat steps **2** through **10.**

# Terminal Server Access

Terminal server access to the Libraries' cds requires an account on the terminal server. These accounts are only available to faculty, staff, and students. To get an account, go to the Computer Center Customer Service window. You will be required to show a current KU ID. While at the Computer Center, get the write up on Macintosh use of the terminal server.

When you dial into the terminal server, you will be asked to enter the user id and password you established at the Computer Center. Once you logged into the terminal server, the following prompt will display: **KU>**. At the prompt, type **telnet cdrom.lib.ukans.edu**. You can then follow the instructions described in this document for using the databases.

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

LIBRARY ACCESS VIA INTERNET

WICHITA STATE UNIVERSITY
Location: http://twsuvm.uc.twsu.edu/
Telnet: tn3270 tswuvm.uc.twsu.edu
Access to on-line card catalog (**LUIS**). **MDAS** (Multiple Database Access System), due to licensing restrictions, is only available to WSU student's, faculty or staff.

# Welcome to Wichita State University


Centennial Celebration Year

College and Departmental Home Pages

Select Gopher for faculty/staff directories and course offerings.

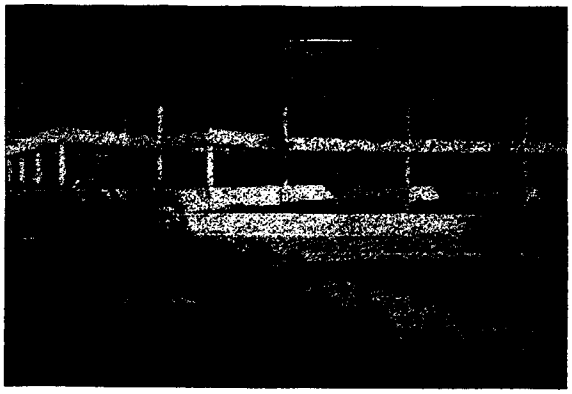
WSU Libraries

Information Sources

Other Universities

Wichita, Kansas Home Page

**http://www.twsu.edu/**



# WICHITA STATE UNIVERSITY LIBRARIES

LUIS Computer Resources

## GENERAL INFORMATION

Hours
Library Directory
Finding Information
Branch Libraries: Chemistry Library and Music Library
Library Departments and Services
Interlibrary Loan

## GENERAL INTERNET RESOURCES

Virtual Reference Desk
Search the Internet
Other WSU Home Pages
Other College and University Resources
Wichita Resources
Kansas Resources

## RESOURCES BY SUBJECT

General Information: Jobs, Schools, Financial Aid
Government Documents
Business
Engineering and Aviation
Fine Arts
Health Sciences
Humanities
Library Science
Sciences
Social Sciences

Wichita State University Home Page

Work in progress

**http://www.twsu.edu/libwww/index.html**

# LUIS/MDAS

LUIS is the library's computer catalog. It lists what books, journals, and government documents the library owns.

MDAS is the library's **M**ultiple **D**atabase **A**ccess **S**ystem. It lets you search for magazine and journal articles in five different databases: Art Index, General Science Index, Humanities Index, Reader's Guide, and Social Science Index.

## Because of licensing restrictions, you must be a currently enrolled student, or faculty or staff at Wichita State to sign onto MDAS.

```
TO SIGN ON TO LUIS/MDAS:

At the WSU logo, press enter to clear the screen
     Type D M (for dial menu) and press enter
     Type L (for library) and press enter
     Type LUIS and press enter

You are now at the LUIS/MDAS selection menus.  Type in the four letter
code of your choice and press enter.  Type HELP and press enter for
online help.

 You may use small or capital letters, the system is case insensitive.

TO EXIT THE SYSTEM, TYPE STOP AND PRESS ENTER.
```

 LUIS/MDAS

 home

Wichita State University

tn3270 TWSUVM.UC.TWSU.EDU
Press Enter or Clear key to begin session
Type dial menu
Type Library
Type LUIS

OPAC = NOTIS <OPO12>

To Exit, type STOP, then QUIT

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

LIBRARY ACCESS VIA INTERNET

KANSAS STATE UNIVERSITY
Location: http://www/lib.ksu.edu/
Telnet: telnet telnet.ksu.edu or 129.130.1.10
Access to on-line card catalog (**LYNX**) and KSU branch libraries.


**Click here to enter LYNX.**

# KSU Libraries

The KSU Libraries are made up of one main library and four branches. Many of these branches have created their own homepages, so you can go directly to the library of your choice.

## Farrell Library

Located next to Willard Hall, the main library contains many departments and units. During construction, some of these departments, such as Archives, Special Collections, and Bibliographic Control, have moved to the Foundation Building on Anderson.

# KSU Branch Libraries

### Chemistry/Biochemistry Library

Located at the north end of Willard Hall in Rooms 101, 102, 122, 123. Contains approximately 17,200 volumes and over 550 serial titles. Services include CAS Online, Current Content SDI, and research level reference assistance.

### Math/Physics Library

Located in Cardwell Hall, room 105. Contains over 23,000 volumes and 300 active serial titles. Speical collections include the departmental copies of master's these and doctoral dissertations.

### Paul Weigel Library of Architecture and Design

Located in room 323 of Seaton Hall. Contains in excess of 36,000 volumes and 200 current magazines. Special collections include newspaper clippings covering the built environment in the Manhattan area and the Sweet's Product File of building trade catalogs.

### Veterinary Medical Library

Located on the top floor of Trotter Hall in the Veterinary Medical Complex. Contains over 36,500 volumes and subscribes to pproximately 850 biomedical serial titles. Special collections include an audiovisual collection, a

veterinary medicine.

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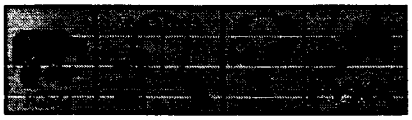
As of June 20, 1995, you are visitor number [redacted] to this page.

---

*Problems, comments, questions to Tim McCune trm@ksu.ksu.edu*



Kansas State University

telnet telnet.KSU.EDU or 129.130.1.10
Select destination as KSUVM
Enter VT100 at terminal type prompt
Type LYNX

or

tn3270 KSUVM.KSU.EDU or 129.130.1.1
Type LYNX

OPAC = NOTIS <OPO12>

To exit, type QUIT

Contact: Dan Scott dscott@ksuvm.ksu.edu

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

# LIBRARY ACCESS VIA INTERNET

## LIBRARY OF CONGRESS

Location: http://www.loc.gov/
Telnet: 140.147.254.3

Access to on-line card catalog and congressional information.


**About the Library and the World Wide Web**

See what's new in July 1995 on this server, access usage statistics, and read about the Library of Congress and the World Wide Web.

**Exhibits and Events**

View major exhibits of the Library of Congress and read about other Library events.

**Services and Publications**

Read about Library services, publications, and conferences.

**Digital Library Collections**

Search and view items from digitized historical collections (American Memory); read about other special Americana collections held by the Library.

**LC Online Systems**

Search LOCIS (Library of Congress Information System) via Telnet or using a new Z39.50 fill-in form, LC MARVEL (the Library's Gopher-based Campus-Wide Information System), the POW/MIA database, and others.

**Congress and Government**

Search congressional information through THOMAS, and access federal and state government information.

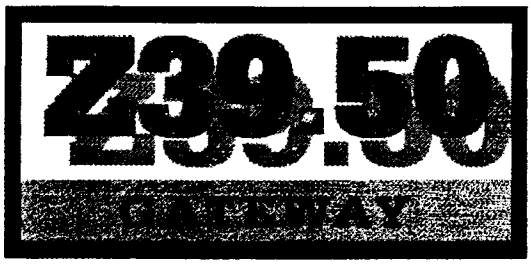
**Indexes to Other World Wide Web Services**

Find selected information on the Internet by subject or genre.

**Library of Congress**

*Comments: lcweb@loc.gov (07/26/95)*

**http:/www.loc.gov/**




*Welcome to the Library of Congress Page for Z39.50. This page contains links to various Z39.50 resources that relate to searching databases that have implemented Z39.50. Access to many Z39.50 servers is provided through LC's WWW/Z39.50 gateway.*

Z39.50 is a national standard defining a protocol for computer-to-computer information retrieval. Z39.50 makes it possible for a user in one system to search and retrieve information from other computer systems (that have also implemented Z39.50) without knowing the search syntax that is used by those other systems. Z39.50 is an American National Standard that was originally approved by the National Information Standards Organization (NISO) in 1988.

A Z39.50 Resource Page, prepared by Robert Waldstein (AT&T), will provide hyperlinks to many Z39.50-related resources.

Using a Z39.50 client, it is currently possible to search the Library of Congress Books File and Name Authority File. Information that will be required to configure your Z39.50 client to search the LC server directly is provided in LC Z39.50 Server Configuration Guidelines. It is also possible to access the LC server by using the appropriate search forms listed below.

# Searching Through LC's WWW/Z39.50 Gateway

Listed below are databases that can be searched using this gateway. The gateway makes use of the ZClient public domain software that is available from CNIDR. It should be noted that many search and retrieval capabilities that are available in the Z39.50 protocol are not implemented in this gateway. The Initialization, Search, and Retrieval facilities have been implemented. However, the TCP/IP connection will close after the search or retrieval response has been received. Follow-on searches or additional record requests are not possible at this time, however, one can direct another search request to the same target making necessary alterations to the search term or to the value of the number of records to be retrieved.

Where applicable, the software vendor for the target Z39.50 implementation is given in parentheses after the name of the institution.

## Library of Congress Server Access

Search Form 1: Title or Personal Name Only

Search Form 2: Supporting More Complex Searches

## Other Z39.50 Servers

Acadia University

AT&T

Butler University (DRA)

Colorado Alliance of Research Libraries (CARL)
- Auraria Higher Education Center
- Colorado School of Mines
- Denver Public Library
- Denver University
- Denver University Law Library
- Regis College
- University of Northern Colorado
- University of Wyoming

Duke University (DRA)

Florida Center for Library Automation
- Florida A&M University
- Florida Atlantic University
- Florida International University
- Florida State University
- University of Central Florida
- University of Florida
- University of North Florida
- University of South Florida
- University of West Florida
- ERIC Database (1967 to date)

Four Colleges Database (INNOPAC)
- Amherst College
- Hampshire College
- Mt. Holyoke College
- Smith College

Government Information Locator Service (GILS) Test Database -- at AT&T

Grambling University (DRA)

Harrington Library Consortium (DRA)

Hong Kong University of Science and Technology (INNOPAC)

Indiana University (NOTIS)

Iowa State University (NOTIS)

Kansas City Public Library (DRA)

Middlebury College (DRA)

Michigan State University (NOTIS)

Mississippi State University (DRA)

North Carolina Central Database (INNOPAC)
- North Carolina Agricultural and Technical State University
- Winston-Salem State University
- North Carolina School of the Arts

North Carolina Coastal Database (INNOPAC)
- Fayetteville State University
- Pembroke State University
- University of North Carolina at Wilmington

North Carolina State University (DRA)

Northwestern University (NOTIS)

OhioLINK Central Catalog (INNOPAC)

Ohio State University (INNOPAC)

Pennsylvania State University

Purdue University (NOTIS)

RLIN -- Research Libraries Information Network Test Server

Sonoma State University (DRA)

Spokane Public Library (DRA)

State Library of Florida (DRA)

University Center at Tulsa (DRA)

University of Alberta (DRA)

University of Arizona (INNOPAC)

University of Arkansas, Little Rock (DRA)

University of California -- MELVYL System

University of Iowa (NOTIS)

University of Illinois, Chicago (NOTIS)

University of Illinois, Urbana (NOTIS)

University of Michigan (NOTIS)

University of Michigan, Flint (NOTIS)

University of Minnesota (NOTIS)

University of North Carolina at Chapel Hill (DRA)

University of North Carolina at Greensboro (DRA)

University of Toronto (DRA)

University of Wisconsin, Madison

*Comments to: lcweb@loc.gov (Last Update 6/16/95)*

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

# LIBRARY ACCESS VIA INTERNET

## MIT (MASSACHUSETTS INSTITUTE OF TECHNOLOGY)

Location: http://web.mit.edu/
Telnet: telnet library.mit.edu

MIT Libraries

Welcome to the MIT Libraries WWW server. This page contains descriptions of our Services, and Libraries, and also provides access to the Libraries' collections of Internet Resources and Online Reference Tools.

# Services

Regular and summer hours; locations and phone numbers of the libraries.
Subjects collected in the MIT Libraries.
Barton is the online catalog of the MIT Libraries.
Document Services offers copies of material in the collections.
Computerized Literature Search Service
Specifications for Thesis Preparation, prepared by the MIT Archives.
Services to Outside Users

# Libraries

Barker Engineering Library
*Branch:* Aeronautics and Astronautics
Dewey Library (Economics, Management & Social Science)
Humanities Library
*Branch:* Music Library
Institute Archives and Special Collections
Rotch Library of Architecture and Planning
*Branch:* Rotch Visual Collections
Science Library
*Branches:*
Lindgren Library (Earth, Atmospheric, and Planetary Sciences)
Schering-Plough Library (Neurosciences and Medicine)

# Internet Resource Collections

MITosis, the Libraries' gopher.
Electronic Journals
Newspapers Online
*Electronic Sources of Internet Information*
- an online bibliography.

# General Reference Tools

Britannica Online
Merriam-Webster Collegiate Dictionary
Oxford English Dictionary (MIT only)

---

Do you have comments regarding this service?
*Last updated: 950413*
MIT Home Page

**http://web.mit.**

MIT
Location: Cambridge, Massachusetts USA
Catalog: GEAC

To access:

1. Type TELNET.LIBRARY.MIT.EDU
2. Press RETURN
3. Enter /V
4. Press RETURN

To exit, hit the TELNET escape key.

Special collections: engineering, aerospace engineering, nuclear engineering
IP address: 18.84.1.12

Notes: this connection is very finicky. It seems mandatory to use a telnet package that can force negotiation of VT100 emulation.

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

Location: http://www.yahoo.com/reference/libraries/

YAHOO searches/LIBRARIES, INSTITUTIONS, ENERGY

Connections to U.S. and international libraries, including Library of Congress, State Libraries, and University Libraries. Homepage information for geoscience institutions, energy information sources (i.e. U.S. Department of Energy).

## Reference:Libraries

AcqWeb - Resources for Acquisitions Librarians
**Australia** *(3)*
Bancarella Libri On-line
Bill's Library - Books, Magazines, Literary Journals, Poetry and Reference Links
**Books@** *(180)* [new]
British Library of Political & Economic Science (BLPES) - library of the London School of Economics
**Canada** *(1)*
**Commercial Library Services@** *(17)*
Committee on East Asian Libraries
**Croatia** *(1)*
GSFC Homer E. Newell Memorial Library
**Information Science** *(42)* [new]
Innovative Internet Applications in Libraries
JANUS Digital Library
Kaapelisolmu - the Knot at the Cable - a pilot project in the field of equal access to electronic information, an electronic publishing house for the non-governmental organisations, cultural movements and individuals
Karen's Kitchen: The Librarians' Menu - Internet Reference Success Stories, links to library-related collections, and an extensive collection of Subject Guides.
**Law Libraries@** *(13)*
**Library of Congress@** *(8)*
Monticello Electronic Library
National Archives and Records Administration - Information System that combines vast collections of information available about the National Archives and Records Administration (NARA) with easy access to diverse electronic resources over the Internet.
**Netherlands** *(1)*
Northwest area libraries - This is a simple list of various library card catalog systems in the Pacific Northwest.
**Norway** *(1)*
**Organizations** *(4)*
**PALS** *(3)*
Portland Area Libraries (PORTALS) - Includes catalogs from the Multnomah County Library and the school libraries of: Clark College Linfield College Oregon Health Sciences University Portland Community College Portland State University Reed College
**Presidential Libraries** *(10)*
**Public Libraries** *(16)* [new]
SALSER - Scottish Academic Libraries Serials
Sarajevo Library project information
SOLINET - Southeastern Library Network
**State Libraries** *(1)*
Subject Guides and Search Engines
The Public-Access Computer Systems Review
**United Kingdom** *(1)*
**University Libraries** *(104)* [new]
**Indices** *(8)*

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*admin@yahoo.com*


**http://www.yahoo.com/reference/libraries/**

## Science:Earth Sciences:Geology and Geophysics:Institutes

American Geological Institute - Home of Geotimes, GeoRef Producers (bibliographic database), and a wealth of geoscience and environmental legislation.
Australian Institute of Geoscientists
Brown University - Geology Department
Caltech Division of Geological and Planetary Sciences
Caltech Experimental Petrology
Colorado School of Mines
Cornell University Geological Science Department
Dalhousie Earth Sciences
Department of Geosciences - San Francisco State U
Dept. of Earth Sciences SUNY Brockport
Dept. of Geology at University of Missouri - Columbia
Duke University - Geology
Earth Sciences and Resources Institute- University of Utah
Edinburgh University
Eearth Resources Lab nCUBE
Finnish Meteorological Institute - Geophysics
Florida State University - Geology
Geodetic Survey of Canada
Geology Department - University of Newcastle, NSW Australia - Information on the department: its staff and graduate students, their research activities. Poster papers on geological topics. Downloadable graphics of minerals.
Geophysical Laboratory - Carnegie Institution of Washington
Geoscience Institute - Mainz University
GIS INSTITUTE UNIV OF IOWA
**Global Change Data Center@** *(2)*
Goettingen - Geochemical Institute
Harvard Earth and Planetary Science
Indiana State University - Geology
Indiana State University - Paleomagnetism - Recent paleomagnetic research at Indiana State University and reprint requests for Joe Meert
Institute of Arctic and Alpine Research (INSTAAR)
Japan National Institute of Polar Research
Kansas Geological Survey
Laboratory of Engineering Geology and Geophysics, Helsinki University of Technology, Finland
Lamont-Doherty Earth Observatory
Lawrence Livermore National Laboratory Earth Sciences Division
Lund University of Technology - Geotechnology
Manchester - Geoscience Research Institute
Margins Initiative
Millersville University Dept. of Earth Sciences
MIT Earth Resources Laboratory - Home Page
MIT Geodesy and Geodynamics Laboratory - conducts research using space geodetic measurements, GPS and VLBI, to study the present state of the earth.
Monash University Earth Science
**National Geophysical Data Center@** *(2)*
Nevada Bureau of Mines and Geology
New Mexico Tech - Geoscience
Northeastern University - Geology

**http://beta.yahoo.com/science/earth_sciences/geology_and_geophysics/institutes**

Oregon State University - Geophysics
Oxford University, Department of Earth Sciences
Paleontological Research Institution
PASSCAL Instrument Center
Penn State - Earth System Science Center
Penn State - Geodynamics
Penn State - Geosciences Computing Laboratory
Potsdam - GeoForschungsZentrum
Princeton Earth Physics Project
Princeton Geological and Geophysical Sciences
Purdue - Geophysics
Queen's University of Belfast - School of Geosciences
Rice University - Department of Geology and Geophysics
Royal Melbourne Institute of Technology - Civil and Geological Engineering
Saint Louis University - Earth and Atmospheric Sciences
San Diego State University - Department of Geological Sciences
San Jose State University - Geology
San Jose State University - Geology Department
Sandia Geochemistry
School of Geography, UNSW
School of Ocean & Earth Science & Technology, University of Hawaii at Manoa
Seismology at Univ Zaragoza
Southern Arizona Seismological Observatory
**Stanford Earth Sciences** *(2)*
Technical University of Clausthal - Geology and Paleontology
TU Delft - Laboratory of Seismics and Acoustics
U. of South Carolina Dept. of Geography
U.S. Bureau Of Mines - The Bureau conducts mining and minerals research. collecting, interpreting, and analyzing info involving mineral reserves. collecting, interpreting, and analyzing info on the production, consumption, and recycling of mineral raw materials.
UBC - Geophysics & Astronomy
Univ Oulu Geophysics Dept.
Universidad de Chile - Departamento de Geofisica
University of Alaska - Geophysical Institute
University of Alaska - Poker Flat Research Range - Space physics and aeronomy research using sounding rockets and ground-based instrumentation.
University of Alaska at Fairbanks - Geological Engineering
University of Arizona Geosciences
University of Bergen - Geophysical Institute
University of Bonn Geodynamik
University of British Columbia
University of Calgary - Geology and Geophysics
University of Canterbury - Department of Geography
University of Chicago - Geophysical Sciences
University of Durham - Department of Geological Sciences
University of Houston - Dept of Geosciences
University of Illinois at Urbana-Champaign - Department of Geology
University of Massachusetts at Amherst - Department of Geosciences
University of Mexico - Geophysics-Seismology - eneral information about the Seismology Department, Geophysics Institute, UNAM
University of Nevada Reno - Seismological Laboratory
University of Oklahoma - College of Geosciences
University of Texas Satellite Geophysics Division
University of Utrecht - Institute of Earth Sciences
University of Washington - Geophysics

University of Waterloo - Earth Observation Laboratory
University of Wisconsin at Madison - Geology and Geophysics
Victoria University of Wellington Research School of Earth Sciences
WHOI Digital Image Analysis Laboratory
World Data Center A for Marine Geology & Geophysics - responsible for all types of data from the seafloor, including both in-situ measurements such as seafloor cores, and remotely sensed data such as marine magnetics, gravity, seismic reflection/refraction, and bathymetry
**Yale University - Department of Geology and Geophysics@** *(1)*
York University Earth and Atmospheric Science

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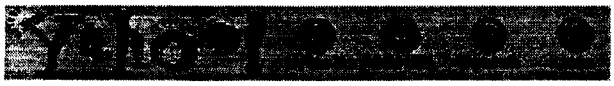
*beta@yahoo.com*



## Science:Energy

Alternative Energy
Alternative Energy Engineering - Making Electricity from Solar, Wind & Water
Biofuels Information Network - BIN provides electronic versions of information created and managed by the Oak Ridge National Laboratory and the National Renewable Energy Laboratory.
BLOCON - Building Physics Computer Programs
CREST's Guide to Alternative Energy
DOE Energy Efficiency & Renewable Energy Network
Energy and the Environment
Energy Efficient Housing in Canada
Ethanol Expo - Come celebrate Illinois' status as the nation's leading producer at the 1994 Illinois state Fair Ethanol Expo. Illinois is also a leader in testing and demonstrating ethanol as an alternative fuel.
**Events** *(1)*
**Fusion@** *(19)*
Geothermal Heat Pump Consortium National Information Resource Center - established to facilitate outreach, communications, technology transfer, networking, and exchange of critical information for geothermal heat pumps (GHPs).
**Institutes** *(12)*
**Journals** *(1)*
Renewable Energy Educational Kiosk
**Solar Energy** *(9)*
THERMIE - European Commission, DG XVII for Energy
Index - Energy - WWW Virtual Library
Index - Energy Yellow Pages - A comprehensive directory of renewable energy companies and organizations.
**Usenet** *(2)*

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*beta@yahoo.com*

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

Location: http://home.mcom.com/internet-white-pages.html/

INTERNET-WHITE PAGES search

Connections to e-mail addresses, Gopher menus and home page directories.

# PEOPLE AND PLACES

Being a member of the Internet community provides access to millions of people from around the globe. But right now, it's still difficult to find that special someone. There are a few tools available to help find an e-mail address, organization name, or domain name. We've listed a few below to help get you started.

We believe that improved tools combined with community participation can improve the ease with which you can contact others and build new associations. We are currently exploring a number of methodologies and technologies in an effort to suggest a better way. If you have an interest or an idea, please drop a line to editor@netscape.com.

**NETFIND**

This provides a simple way to search for someone's email address. If you'd like to read more about Netfind, read the Internet Tools Summary.

**TEXAS TECH**
**NOTRE DAME**
**MIT**

These all have Gopher menus that list many universities, some companies, and other helpful indexes.

**HOME PAGE DIRECTORIES**

This is the page to try if you're looking for someone who has a personal home page available on the world wide Web.

**KNOWBOT INFORMATION SERVICE**

This will enable you to use a command-line to search for a variety of information. You can enter commands like "query clark" to look for someone with that last name. This interface is not for the faint of heart, though.

**FOUR11 DIRECTORY SERVICE**

Here is another very useful White Page site; services include searching, custom listing, group connections, and search agents.

**INTERNET PEOPLE**

If you haven't found the person you are looking for, you might want to also check here. From Yale University, this is a listing of other white pages services.

**http://home.mcom.com/home/internet_white_pages.html/**

PTTC INTERNET WORKSHOP
Wichita State University
August 18, 1995

Location: http://www.penwell.com/

INTERNET SEARCH

Information on PennWell publications, including contents information on current issues of *Oil and Gas Journal*, conferences and exhibitions, PennWell newsletters.


# Communicating Quality Business Information Worldwide Since 1910.

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Welcome to the PennWell Publishing Company World Wide Web server. We are pleased to have you visit and welcome your comments or suggestions.

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**PennWell** employs a variety of media to serve its industries:

**Publications**

PennWell publishes 39 business-to-business trade and technical magazines and newsletters. These publications provide up to the minute industry information to 1.5 million professionals in more than 120 countries.

**Conferences & Exhibitions**

PennWell organizes and sponsors conferences and exhibitions for the industries it serves, staging a dozen major events in the U.S.A., Europe, and Asia.

**Information Products and Services**

PennWell provides a variety of information products and services including books, videos, software and seminars in Petroleum, Dental, Electric Power, and Environmental; Fire Engineering Books and Videos; CSR Market Data Services providing custom market research reports; PennWell Directories providing current industry information and key contacts; PennWell Maps in printed and digital formats; Oil & Gas Journal Energy Database with petroleum and electric power statistics; the International Petroleum Encyclopedia -- the energy industry's most widely-referenced yearbook; on-line information services for the petroleum industry through the JET System.

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## PennWell Magazines

**Petroleum**

Oil & Gas Journal • Offshore • Oil, Gas, & Petroleum Equipment • Russian Oil & Gas Guide

**Electric Power**

Electric Light & Power • Power Engineering • Power Engineering International • Power Delivery Product News

**Healthcare**

Dental Economics • Proofs

**Municipal**

WaterWorld • Fire Engineering

**Microelectronics & Computers**

Computer Design • Military & Aerospace Electronics • Solid State Technology • Microlithography World • Data Storage • CleanRooms

**http://www.penwell.com/**

Lightwave • Cabling Installation & Maintenance • Laser Focus World • Laser Focus World Buyers Guide • Industrial Laser Review • Industrial Laser Review Buyers Guide • Journal of Current Laser Abstracts • Medical Laser Buyers Guide

**Information Technology**

Computer Graphics World • Electronic Publishing • Color Publishing • Computer Artist • BackOffice

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# PennWell Newsletters

**Petroleum Industry Newsletters**

Ocean Oil Weekly Report • The Oilman Weekly Newsletter • Oil & Gas Journal Global Hotline • Asia/Pacific Oil Weekly Report

**Electric Power Industry Newsletter**

DA & DSM Monitor

**Advanced Technology Newsletters**

Laser Report • Wafer News Confidential • Medical Laser Report

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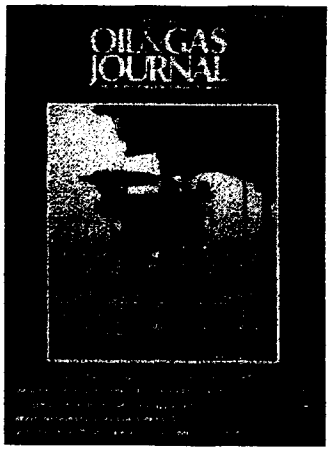
*Please send comments and suggestions to: webmaster@pennwell.com .*



*Multimedia by Digital Frontiers*




# International Petroleum News & Technology

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Welcome to the *Oil & Gas Journal*. If you have questions or comments, please tell our Webmaster.

Please choose one of the following categories for more information.



*OGJ* is published by PennWell Publishing Company .

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## About *Oil & Gas Journal*

*Oil & Gas Journal* is the world's most widely read and respected petroleum industry publication. The *Journal* is unmatched in the depth, breadth, and integrity of its editorial coverage.

Of the 52 issues of *Oil & Gas Journal* in 1995, 36 include a special editorial empahsis on a technology, a region, an industry segment, or an issue of interest to readers around the world.

It's an impressive list. But there is more to *Oil & Gas Journal* than special reports.

Every weekly issue of the *Journal* also delivers the latest international petroleum industry news; practical technology for design, operation, and maintenance; important statistics on international markets and activity; and analysis issues and events.

**http://www/penwell.com/ogj.html**

This powerful package of information comes from the largest, most experienced editorial staff in the petroleum industry.

It is the only package of information designed to meet the needs of engineers, managers, and executives in every industry segment -- exploration, drilling, production, piplining, gas processing, refining, and petrochemical manufacturing.

The *Journal* is the only petroleum industry publication with 100% paid circulation.

Only *Oil & Gas Journal* makes this editorial pledge to its readers:

> **"If you read all 52 issues in the year, you won't miss any news or technical development in the petroleum industry of significance to your job."**

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Houston, TX 77056
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Fax: 713-963-6285
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3050 Post Oak Blvd., Suite 200
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Fax: 713-963-6285
E-mail: JohnK@pennwell.com


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## In This Week's Issue

**July 17, 1995**

**Regular Features**



**The Cover**

Diamond Offshore Drilling Inc.'s Ocean King jack up dwarfs Unocal Corp.'s minimum well structure on Ship Shoal Block 236 in the Gulf of Mexico. *Developing Marginal Offshore Fields*, a special report beginning on p.33, describes the action. Photo courtesy of Unocal and Kent G. Hutslar.

**General Interest**

- Discoveries, production add luster to Offshore Viet Nam's outlook
- Watching Government: Exit Bill White
- Watching the World: Hypercar: A threat to the oil industry?
- Industry Briefs

**Drilling/Production**

- Three Houston contractors sign rig transactions
- Postsanction plan scheduled to boost Iraqi oil production
- CO2 activity picks up in West Texas, New Mexico

**Transportation**

- Oil, gas gathering systems planned in Gulf

**Exploration**

- U.K. awards last of 16th round licenses
- Giant fields of the '80s associated with an 'A' subduction in S. America

**Developing Marginal Offshore Fields**

Experience with minimum offshore structures and the development of an early production system are described in this report.

• Minimum offshore structures cost less, pose higher risk, *by Michael J. K. Craig* • Innovative production system goes in off Ivory Coast, *by Mark Childers and John Barnes*

**Pipeline/Storage**

First year of AGA's weekly storage survey suggests useful patterns, *by Warren R. True*
Analysis after 1 year of weekly U.S. natural-gas storage surveys by AGA suggests yearly patterns for drawdown and working-gas storage levels that are useful in planning for future storage and supply projects.

**Refining**

Internal benchmarking can increase refinery profits, *by Kevin Waguespack*
An expanded production planning process uses LP modeling and performance measurement to help refiners improve profitability without capital investment.

**Drilling**

Pyramid shaker screens help reduce oil mud losses, *by Dietmar Neidhardt*
Corrugated, pyramid shaker screens on a second-stage solids dryer helped recover a large volume of oil-based mud.

**Coming Next Week**

- Advanced controls improve operation of lubes plant dewaxing unit.
- Well Control: Conclusion: Two-phase modeling improves diverter design for shallow gas hazards.
- Equations determine coiled tubing collapse pressure.

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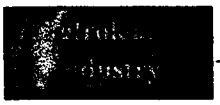
Return to PennWell Home Page


Return to Petroleum Industry Page

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*Please send comments and suggestions to: webmaster@pennwell.com .*

# Collections of Petroleum Related Internet Resources

EARTH/GEOSCIENCE INFORMATION ON THE WWW
http://jacobson.isgs.uiuc.edu/earthsci_links.html
A extensive list that covers a broad range of earth science. Strong on University earth science departments, geologic surveys and links to the earth sciences by subject. Maintained by Russell J. Jacobson <jacobson@geoserv.isgs.uiuc.edu> of the Illinois State Geological Survey.

ERIN List of Geology Servers
http://kaos.erin.gov.au/other_servers/category/Geology.html
Limited listing of earth science Internet Resources. However check out the ERIN homepage. This is the Earth Resources Information Network from the Australian government.

Galaxy Petroleum Engineering Page
http://galaxy.einet.net/galaxy/Engineering-and-Technology/Civil-and-Construction-Engineering/Petroleum-Engineering.html
Limited but nicely constructed listing of petroleum engineering firms and organizations.

GO-TECH Petroleum Industry Electronic Information System
http://baervan.nmt.edu
Joint project of the Petroleum Recovery Research Center, a division of New Mexico Tech, and Los Alamos National Laboratory. Electronic information from diverse organizations of interest to the petroleum community.

Internet Resources for Earth Sciences
gopher://una.hh.lib.umich.edu/00/inetdirsstacks/earthsci%3athoen
Bill Thoen's writeup is a good intorduction to the net for the earth scientist and has an extensive list of anonymous ftp sites with public data, images, and software.

Neopolis Oil Patch
http://www.neosoft.com/neopolis/business/oilpatch/default.html
Listing and links to geophysical resources accessible from the World Wide Web.

Online Resources for Earth Scientists (ORES)
http://www.calweb.com/~tcsmith/ores/geology/index.html
Excellent and extensive listing of Internet resources. Sources are annotated. Check out the online publications. The geology section was compilied by Ted Smith <ted.smith@mtnswest.com>.

Petroleum Business Directory
http://www.ipbd.com/ipbd/
Extensive national and international istings of petroleum related businesses available by location in alphabetical order and business classification. Check out the directory of other web sources.

Petroleum and Geosystems Engineering Sources

http://www.pe.utexas.edu/Dept/Reading/petroleum.html

A listing of diverse sites with concentration on the petroleum industry. Excellent list of foriegn Internet resources. Maintained by Mary Pettengill. <maryp@mail.utexas.edu> for the The University of Texas at Austin Department of Petroleum & Geosystems Engineering.

Rice University's RiceInfo on Geology

gopher://riceinfo.rice.edu:70/11/Subject/Geology

Extensive gopher directory containing links to resources organized by subject
matter. Maintained by Prentiss Riddle <cwis@rice.edu>.

sci.geo.petroleum

http:/www.tpoint.net:80/tipro/spg_htm.html

A listing with links to several hundred Internet resources. Good listing of News Groups, and university earth science departments. Maintained by Scott Guthery <guthery@slb.com>.

The SOFT EARTH: Software and Software Sites

http://wombat.es.mq.edu.au/0c:/s_earth.html/

A resource listing and links for Geoscience software available on the Internet. Maintained by Phillip Ingram <pingram@laurel.ocs.mq.edu.au>.

The Virtual Earth: A Tour of the World Wide Web for Earth Scientists

http://wombat.es.mq.edu.au/0c:/v_earth.html/

The page is a worthwhile introduction to the World Wide Web for Earth Scientists. It is not intended to be a resource listing, but does provide lists and illustrates the potential of the Web as an information retrieval system. Maintained by Phillip Ingram <pingram@laurel.ocs.mq.edu.au>.

UT at El Paso GeoGopher

gopher://dillon.geo.ep.utexas.edu:70/11/EarthScienceRes

A gopher drectory set up to be used as a Subject Catalog of information available on the Internet concerning the earth sciences. Maintained by Don Roberts <roberts@dillon.geo.ep.utexas.edu>. Last recorded update is 1/95.

USGS Earth and Environmental Science

http://internet.er.usgs.gov/network/science/earth/index.html

The U.S. Geological Survey maintains a registry of Earth and Environmental Science Internet resources by subject.

WWW Virtual Library: Earth Sciences

http://www.geo.ucalgary.ca/VL-EarthSciences.html

A large and poorly organized listing of geological organizations and information about software. Maintained by Volunteers at the University of Calgary.

WWW Virtual Library: Geophysics

http://www-crewes.geo.ucalgary.ca/VL-Geophysics.html

Strong listing of geophysical organizations and information about geophysical software. Maintained by Volunteers at the University of Calgary.

Yahoo Geology and Geophysics Page

http://www.yahoo.com/Science/Geology_and_Geophysics

The giant list server in the sky. Searchable and incomprehensible. The place to look for the site by name or subject.

Zilker Internet Park Geoscience Page

http://www.zilker.net/%7Ehal/geoscience/

An Internet provider from Austin, Texas that provides a wide range of services. Zilker maintains an interesting annotated list of geoscience related Internet resources. Excellent source of weather resources. Created and maintained by Hal Mueller <hal@zilker.net>.

# Kansas Related Internet Sources

## Kansas College and University Home Pages

Baker University , Baldwin City
http://www.bakeru.edu/
Bethel College , North Newton
http://www.bethelks.edu/
Emporia State University , Emporia
http://www.emporia.edu/index.html
Fort Hays State University , Hays
http://fhsuvm.fhsu.edu/
Kansas State University , Manhattan
http://www.ksu.edu/
MidAmerica Nazarene College , Olathe
http://www.manc.edu/
Pittsburg State University , Pittsburg
http://www.pittstate.edu/
University of Kansas , Lawrence
http://kuhttp.cc.ukans.edu/
Washburn University , Topeka
http://www.wuacc.edu/
Wichita State University, Wichita
http://www.twsu.edu

## Weather

Kansas
http://www.ksu.edu/unicorn/wtmenu.weather
US and Global Weather Maps, Forecasts and Other Resources
gopher://wx.atmos.uiuc.edu:70/11/
Annotated List of Weather Resources
http://www.zilker.net/%7Ehal/geoscience/weather.html

## Political

### Federal

Congressman Sam Brownback, 2nd District
http://www.house.gov/brownback/welcome.html
Congressman Todd Tiahrt, 4th District
http://www.house.gov/tiahrt/welcome.html
Other Kansas Members of the U.S. House of Representatives
http://www.house.gov/mbr_dir/membr_state_KS.html

State

Governor Bill Graves
http://homepage.databank.com/~governor/

State Representative Robin Jennison (R-117th), Healy
http://www.databank.com/~jennison/
State Representative: Jim Morrison (R-121st), Colby
http://exodus.databank.com/~morrison/mypage.html

### Other

Sights of Kansas
http://falcon.cc.ukans.edu/~nsween/europa.html
List of Kansas Related Pages maintained by the Governors office
http://homepage.databank.com/~governor/ksother.html

## Other Internet Resources of Interest

### Business and News

Daily Oil and Gas Price Reports from Energy Net
http://chiba.netxn.com/~rsasaki/energy.html

Stock Quotes from the Security APL Quote Server
http://www.secapl.com/cgi-bin/qs

Recent stock market information, including previous day's closing prices and one-year graphs of historical prices for approximately 400 major companies from MIT. Also includes mutual funds and other information.
http://www.ai.mit.edu/stocks/

A list of Internet Financial Resources from the University of Texas
http://riskweb.bus.utexas.edu/finweb.htm
Wall Street Journal -- The Money & Investing Update
(Need to be Registered User)
http://update.wsj.com/update/edit/front.html

DowVision - Searchable News from Dow Jones Business Information Services (Need to be Registered User and restricted access)
http://dowvision.wais.net/

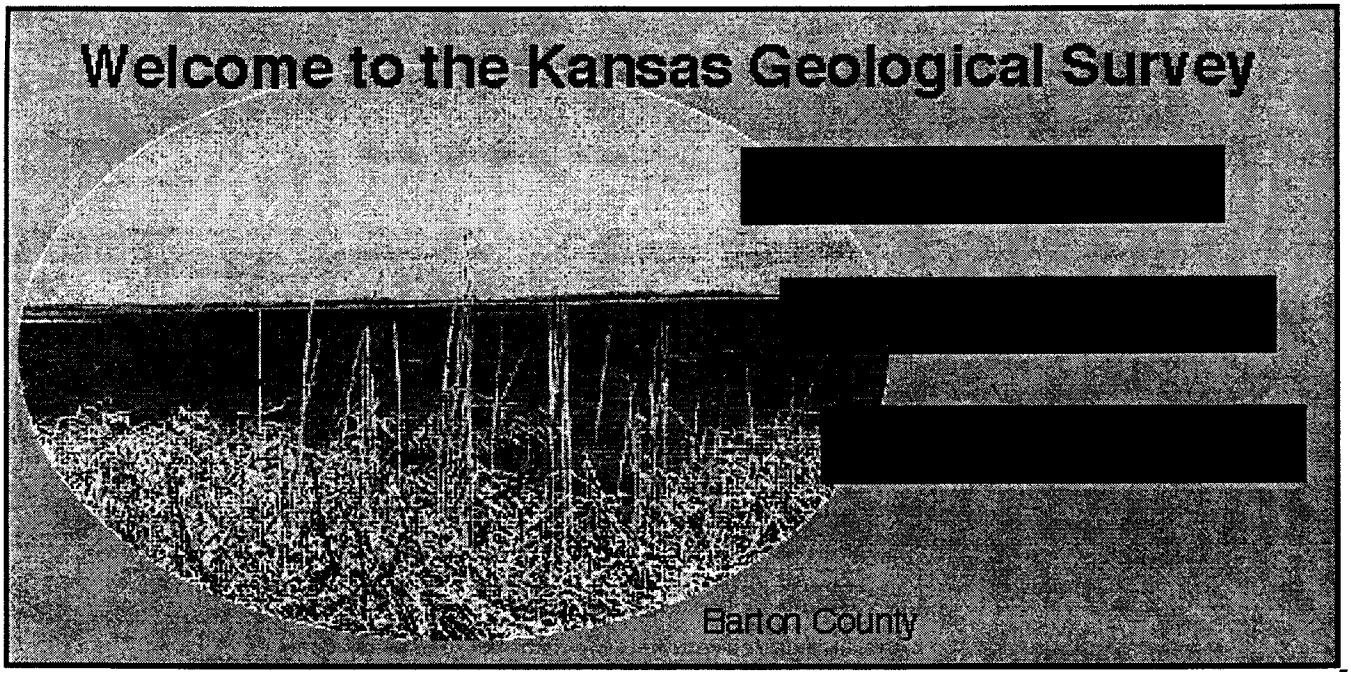
Listing of Internet News Resources from Yahoo
http://www.yahoo.com/News/

## General Political Internet Resources

White House
http://www.whitehouse.gov/
Cabinet Departments
http://www.whitehouse.gov/White_House/Cabinet/html/cabinet_links.html
Independent Federal Agencies and Commissions
http://www.whitehouse.gov/White_House/Independent_Agencies/html/independent_links.html
U.S. House of Representatives - Searchable web site with information on bills, committees and members
http://www.house.gov/
US Senate
http://www.senate.gov
Thomas , The Library of Congress Server - Legislative information available on the web from both houses
http://thomas.loc.gov/
Listing of International, National, Regional & Local Governmental and Government-Related Servers on the Internet
http://www.eff.org:80/govt.html
Listing of US Government Servers
http://www.nttc.edu/gov_res.html

## Petroleum Current Events Etc.

Discovery Place
http://www.worldweb.com:80/DiscoveryPlace/
Concentrates on the oil and gas industry in Alberta. List of companies and consultants, oil or gas properties on the market, surplus eqiupment, employment positions.
Oil Industry News
http://www.newspage.com/NEWSPAGE/cgibin/walk.cgi/NEWSPAGE/info/d13/d2/
(An online source) Stories available mainly from Reuters.
STAT-USA
http://www.stat-usa.gov/
Internet source for business and economic information produced by the Federal Government. STAT-USA gathers the most crucial, timely business and economic information from over 50 Federal agencies and distributes from a central source. Requires subscription.
Newsgroups:
sci.geo.petroleum
news:sci.geo.petroleum
Petroleum Geology Newsgroup that is worth checking out on a weekly or biweekly basis.
Other Newsgroups
sci.geo.geology, sci.geo.hydrology, sci.geo.oceanography




Kansas Geological Survey | DASC (Data Access and Support Center) | North Midcontinent Petroleum Technology Transfer Council

Web server maintained by Kansas Geological Survey. Funds provided by the Petroleum Technology Transfer Council.

Updated Sept. 20, 1995

Send comments and/or suggestions to webadmin@crude2.kgs.ukans.edu

http://www.kgs.ukans.edu/kgs.html

# Kansas Geological Survey

## Kansas Geological Survey

University of Kansas, 1930 Constant Ave., Lawrence, KS 66047-3726
phone 913-864-3965, fax 913-864-5317
Lee Gerhard, Director and State Geologist

### Welcome to the Kansas Geological Survey

- Introduction
- Personnel Listing NEW (Oct. 11)
- 1995-96 Catalog of Publications NEW (Oct. 10)
- Jobs Available
- News Releases

### Home pages of KGS sections

- Data Access and Support Center
- Geohydrology Section
- Mathematical Geology Section
- Petroleum Research Section
- Publications and Sales
- Technical Information Services

### Online data sets and publications

- KGS Bibliography of Geology Online--This online version of the KGS bibliography allows the user to search by author, date, index terms, and several other fields to find the references desired.
- KGS Annual Report 1993.
- Physiographic Map of Kansas.--Learn about the geography of Kansas using this interactive map.
- Kansas Oil and Gas Production Data--An interactive map of Kansas displays 1994 oil and gas production for each county in Kansas.
- Oil fields of Kansas [redacted] (Oct. 9)--Alphabetical listing of oil fields in Kansas showing historical production levels and producing horizons. Not all fields are available online--counties west of a line from Smith to Barber counties are completed, as are several in southern Kansas. Annual oil and gas production reports and cumulative oil-field production histories are also available from the Publication Sales office at the Kansas Geological Survey.

KU Home | Other State Univ. | State of Kansas

You can check our current usage or the usage over the past few months.
Updated Oct. 11, 1995.
Send comments and/or suggestions to webadmin@crude2.kgs.ukans.edu
The URL for this page is HTTP://crude2.kgs.ukans.edu/kgsRev.html


## Petroleum Research Section, Kansas Geological Survey

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## Welcome to our WWW site.

- Introduction
- Personnel
- Calendar of events NEW (Sept. 11)
- What's New! NEW

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## Data and publications available online

- Kansas Oil and Gas Production Data --An interactive map of Kansas displays 1994 oil and gas production for each county in Kansas.
- KGS Bibliography of Geology Online--This online version of the KGS bibliography allows the user to search by author, date, index terms, and several other fields to find the references desired.
- Publications available in an online, WWW-compatible form
- Petroleum Research Section Recent Publications
- **Top Ten Lists** --What county has the leading oil and gas production for 1994? Find out in the Top Ten Oil Production and Top Ten Gas Production pages.
- Oil fields of Kansas [redacted] (Oct. 9) --Alphabetical listing of oil fields in Kansas showing historical production levels and producing horizons. Not all fields are available online--counties west of a line from Smith to Barber counties are completed, as are several in southern Kansas. Annual oil and gas production reports and cumulative oil-field production histories are also available from the Publication Sales office at the Kansas Geological Survey.
- Kansas Corporation Commission oil and gas rules, regulations, and downloadable forms NEW (Nov. 13)

---

## Links to other energy-related organizations

While we will try to keep these lists up to date, you may also want to look at our list of collections. These sites do a good job of keeping track of petroleum information in the Internet.

KU Energy Research Center Home Page
North Midcontinent Petroleum Technology Transfer Council
Kansas Government Departments
National Petroleum Technology Transfer Council
U.S. Federal Government Departments
State Geological Surveys [redacted] (Oct. 27)
Foreign Government Organizations
Universities
Professional Organizations
Industrial Organizations

---

## About this server

This HTTP server is owned by Petroleum Research Section at Kansas Geological Survey. You can check our current usage or the usage over the past few months.

**Send comments and/or suggestions to webadmin@crude2.kgs.ukans.edu**

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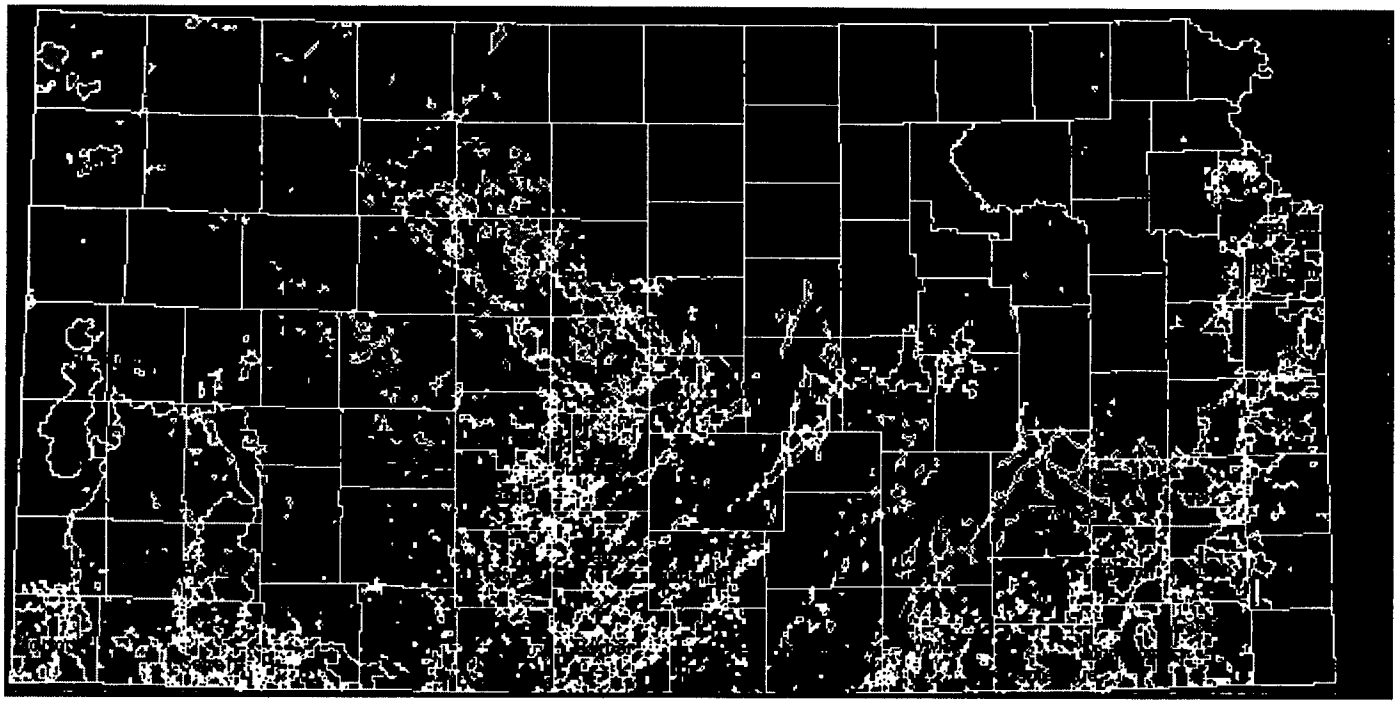
Last Update 8/22/95

---

# 1994 Total Oil and Gas Production in Kansas



## Click on the County You Wish to Examine

### Total Oil Production:

| | | |
|---|---|---|
| Total Producing Area | = | 1,424,970 acres |
| During 1994 | = | 47,332,848 BBL |
| Through 1994 | = | 5,758,578,154 BBL |
| Wells Producing | = | 40,961 |
| Wells Abandoned | = | 1,280 |

### Total Gas Production:

| | | |
|---|---|---|
| Total Producing Area | = | 6,568,360 acres |
| During 1994 | = | 689,029,117 M Cu. Ft. |
| Through 1994 | = | 31,243,655,821 M Cu. Ft. |
| Producing Wells | = | 14,515 |

PRS Home | ERC Home | PTTC Home

*Douglas L. Beene*
Kansas Geological Survey
University of Kansas
Lawrence, KS 66047

# Other Resources

**Petroleum Research Section, Kansas Geological Survey**

---

## Collections of Petroleum Related Internet Resources

Earth/Geoscience Information on the WWW
A extensive list that covers a broad range of earth science. Strong on university earth science departments, geologic surveys and links to the earth sciences by subject. Maintained by Russell J. Jacobson of the Illinois State Geological Survey.

ERIN List of Geology Servers
Limited listing of earth science Internet resources. However, check out the ERIN homepage. This is the Earth Resources Information Network from the Australian government.

Galaxy Petroleum Engineering Page
Limited but nicely constructed listing of petroleum engineering firms and organizations.

GO-TECH Petroleum Industry Electronic Information System
Joint project of the Petroleum Recovery Research Center, a division of New Mexico Tech, and Los Alamos National Laboratory. Electronic information from diverse organizations of interest to the petroleum community.

Internet Resources for Earth Sciences
Bill Thoen's write-up is a good introduction to the net for the earth scientist and has an extensive list of anonymous ftp sites with public data, images, and software.

Neopolis Oil Patch
Listing and links to geophysical resources accessible from the World Wide Web.

Online Resources for Earth Scientists (ORES)
Excellent and extensive listing of Internet resources. Sources are annotated. Check out the online publications. The geology section was compiled by Ted Smith .

Petroleum Business Directory
Extensive national and international listings of petroleum related businesses available by location in alphabetical order and business classification. Check out the directory of other web sources.

Petroleum and Geosystems Engineering Sources
A listing of diverse sites with concentration on the petroleum industry. Excellent list of foreign Internet resources. Maintained by Mary Pettengill. for The University of Texas at Austin, Department of Petroleum & Geosystems Engineering.

Rice University's RiceInfo on Geology
Extensive gopher directory containing links to resources organized by subject matter. Maintained by Prentiss Riddle .

sci.geo.petroleum
A listing with links to several hundred Internet resources. Good listing of News Groups and university earth science departments. Maintained by Scott Guthery .

The SOFT EARTH: Software and Software Sites
A resource listing and links for Geoscience software available on the Internet. Maintained by Phillip Ingram .

The Virtual Earth: A Tour of the World Wide Web for Earth Scientists
The page is a worthwhile introduction to the World Wide Web for Earth Scientists. It is not intended to be a resource listing, but does provide lists and illustrates the potential of the Web as an information retrieval system. Maintained by Phillip Ingram .

UT at El Paso GeoGopher
A gopher directory set up to be used as a Subject Catalog of information available on the Internet concerning the earth sciences. Maintained by Don Roberts . Last recorded update is 1/95.

USGS Earth and Environmental Science
The U.S. Geological Survey maintains a registry of Earth and Environmental Science Internet resources by subject.

WWW Virtual Library: Earth Sciences
A large and poorly organized listing of geological organizations and information about software. Maintained by volunteers at the University of Calgary.

WWW Virtual Library: Geophysics
Strong listing of geophysical organizations and information about geophysical software. Maintained by volunteers at the University of Calgary.

Yahoo Geology and Geophysics Page
The giant list server in the sky. Searchable and incomprehensible. The place to look for the site by name or subject.

Zilker Internet Park Geoscience Page
An Internet provider from Austin, Texas, providing a wide range of services, Zilker maintains an interesting annotated list of geoscience-related Internet resources. Excellent source of weather resources. Created and maintained by Hal Mueller .

---

# Current Events Etc.

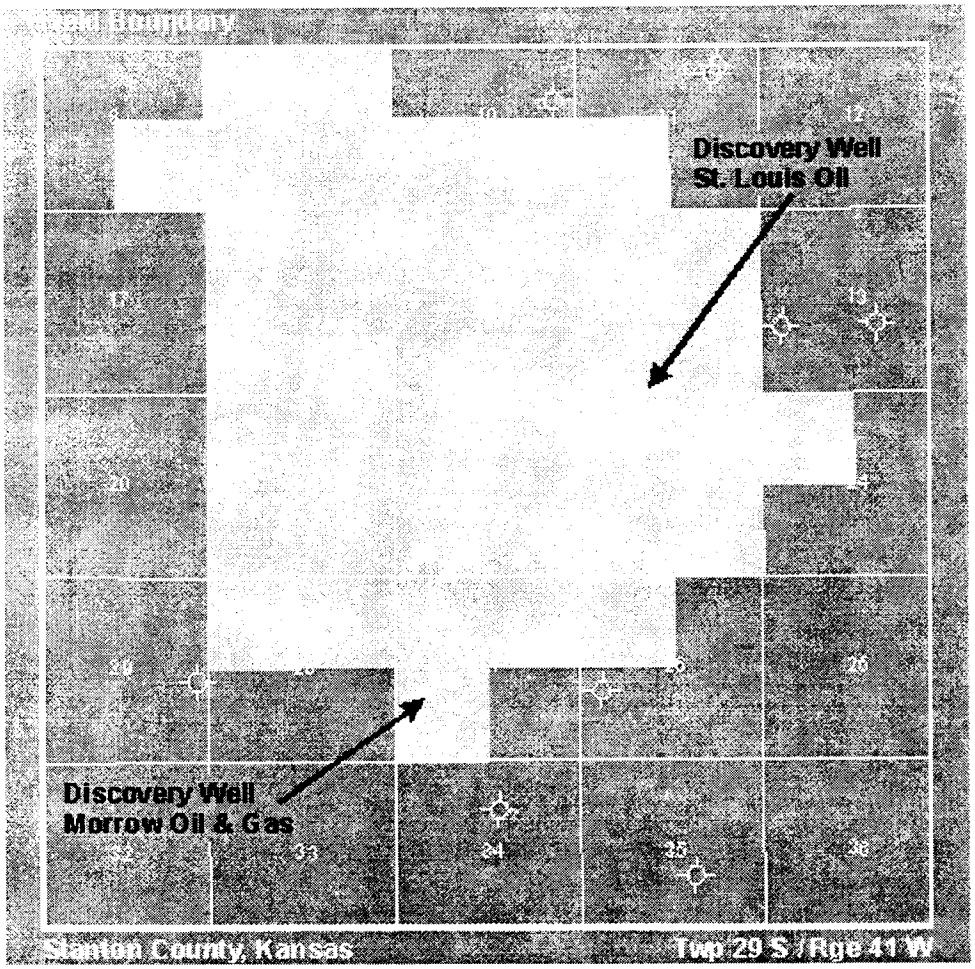
Discovery Place
Concentrates on the oil and gas industry in Alberta. List of companies and consultants, oil or gas properties on the market, surplus equipment, employment positions.

Oil Industry News
(An online source) Stories available mainly from Reuters.

STAT-USA
Internet source for business and economic information produced by the Federal Government. STAT-USA gathers the most crucial, timely business and economic information from over 50 Federal agencies and distributes from a central source. Requires subscription.

# KGS-Digital Petroleum Atlas

**Arroyo Field--Title Page**




**Discovery Well**
J.M. Huber, #27-1 Pro Farms
20'S NW NE SW, 27-T29S-R41W
04/12/90, Morrow Oil & Gas, 5900' RTD

J. M. Huber, #23-1 Kendrich
30'E NW NE NW, 23-T29S-R41W
06/23/92, St. Louis Oil, 5650' RTD

**Field Size:** 6,240 acres
**Productive Wells:** 24
**Abandoned Wells:** None

**Cumulative Oil:** 651,409 bbls as of 7/1/95
**Cumulative Gas:** 21,072,705 mcf as 7/1/95

Annual Field Production Data

Kansas Geological Survey, Digital Petroleum Atlas
Updated Oct. 26, 1995
URL = http://crude2.kgs.ukans.edu/DPA/arroyoMain.html

# Arroyo

**County Location(s): Stanton**
**Field discovery year: 1990**
**Field discovery location: 27 29S 41W**

## Horizons

| Producing Formation | Form Depth | Form Thick | Oil Grav | Prod Type |
|---|---|---|---|---|
| MORROWAN | 0 | | 0 | OG |
| MISSISSIPPIAN | 0 | | 0 | O |

## Oil field information

Stanton County field status: Active
Cumulative production from discovery = 319475

## Gas field information

Stanton County field status: Active
Cumulative production from discovery = 8221789.

## Oil production

### Stanton County

| Year | Oil Production | Prod. Wells | Prod. Acres | Aband Wells |
|---|---|---|---|---|
| 1990 | 0 | 0 | 0 | 0 |
| 1991 | 170 | 1 | 40 | 0 |
| 1992 | 115626 | 9 | 360 | 0 |
| 1993 | 203679 | 10 | 400 | 0 |

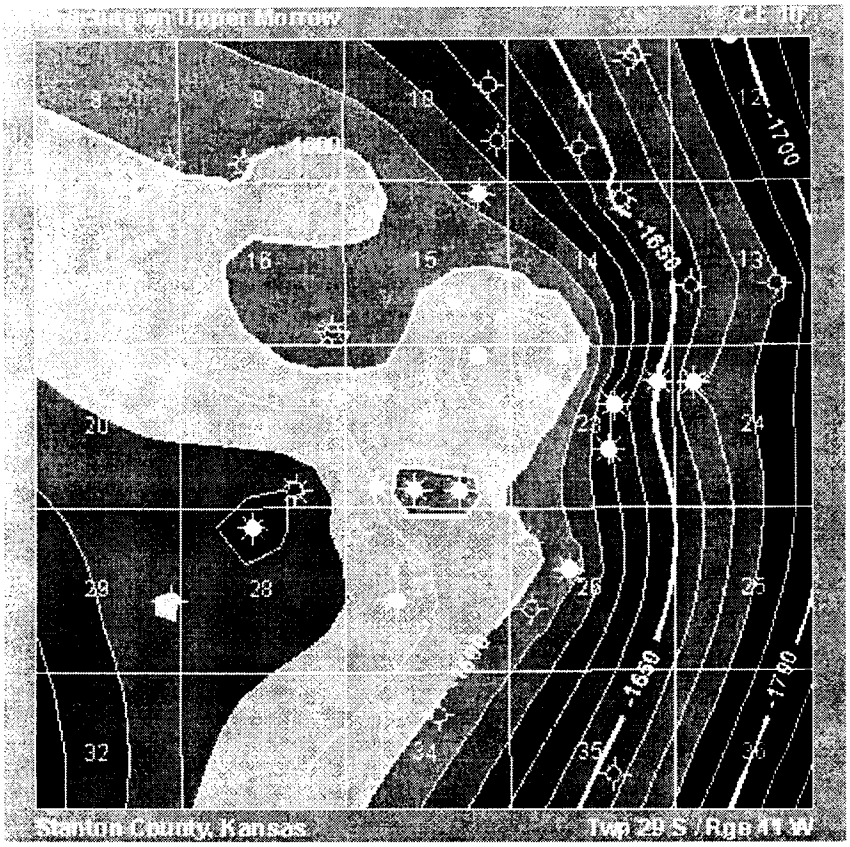
## Cumulative gas production

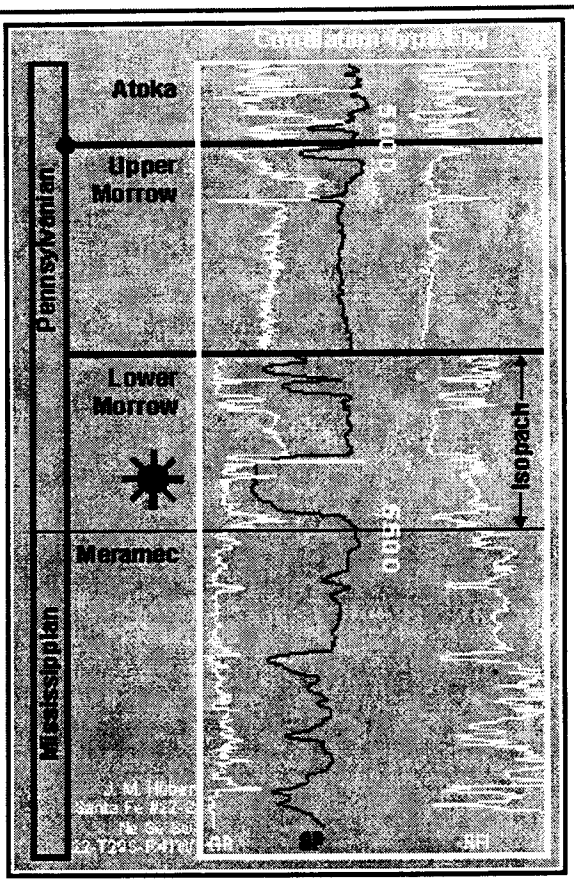
### Stanton County

| Year | Gas Production | Prod. Wells | Prod. Acres |
|---|---|---|---|
| 1990 | 0. | 0 | 0 |
| 1991 | 243149. | 3 | 120 |
| 1992 | 417894. | 2 | 80 |
| 1993 | 8221789. | 16 | 640 |

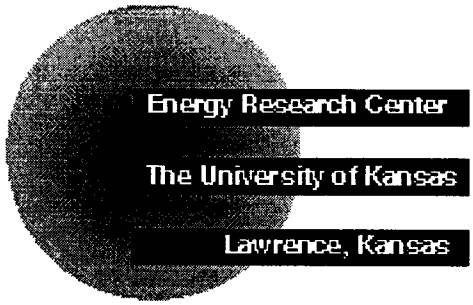
# KGS-Digital Petroleum Atlas

**Arroyo Field--Geological Information**



http://www.kgs.ukans.edu/ERC/ERC.html




# Energy Research Center

The University of Kansas Energy Research Center (ERC) was reorganized in 1991 to serve the University of Kansas by facilitating interdisciplinary energy-related research. The ERC acts as broad umbrella to bring different units together, promote and expand the range of research related to energy, and increase communication among units within the university and between the public sector and the private sector. State funds for the ERC support the Center's 1.5 staff positions and operations. External funding is derived from its own contracts and return of overhead funding from external grants submitted through the ERC support additional activities.

The ERC provides an umbrella for research and technology transfer activities at The University of Kansas. It provides assistance to transfer technology, develop proposal opportunities, and generate interest. The ERC has been particularly active in technology transfer programs to the petroleum industry. Grants submitted through the ERC have totaled $6.4 million in the past three years. The ERC is also a source of seed funds to stimulate promising energy related research programs.



## Links to other energy-related organizations

Kansas Geological Survey Petrolem Research Section
North Midcontinent Petroleum Technology Transfer Council
National Petroleum Technology Transfer Council
Kansas Government Departments
U.S. Federal Government Departments
State Geological Surveys
Foreign Government Organizations
Universities
Professional Organizations
Industrial Organizations

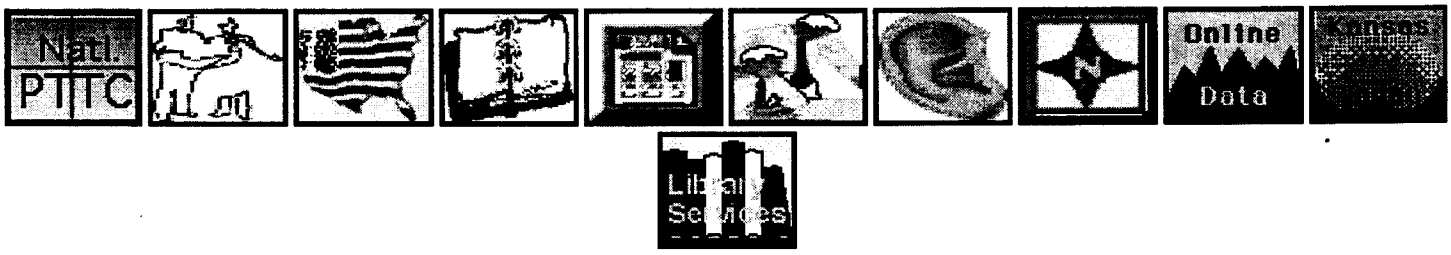
http://www.kgs.ukans.edu/ERC/pttcHome.html

# THE PETROLEUM TECHNOLOGY TRANSFER COUNCIL'S NORTH MIDCONTINENT HOMEPAGE

**Providing technology and information for the oil and gas industry**

Kansas University Energy Research Center, 1930 Constant Ave., Lawrence, KS 66047-3726

Click on the boxes for information




PTTC NATIONAL HOMEPAGE | ORGANIZATION | REGIONS | CALENDAR | NEWS | FORUMS Q&A | FEEDBACK | OTHER INFO | ONLINE DATA | KANSAS TODAY | LIBRARY SERVICES

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These pages are best seen using NETSCAPE 1.1

PTTC

The Petroleum Technology Transfer Council (PTTC) was formed by the U.S. oil and gas exploration and production (E&P) industry to improve technology transfer to producers, primarily independents. Its mission is: (1) to identify priority technical problems of producers and communicate them to the R&D community; and (2) to transfer upstream E&P technologies to help domestic producers reduce costs, improve operating efficiency, increase ultimate recovery, enhance environmental compliance, and add new oil and gas reserves. The PTTC serves as an integrated clearing house for E&P technology information and as a national umbrella organization for technology and R&D providers. It does not perform or fund R&D.

**The Regional Lead Organization is**

Kansas University Energy Research Center
Lanny Schoeling
(913) 8647398
schoeling@kuhub.cc.ukans.edu

**The Producer Advisory Group is led by**

James Devlin
Viking Resources, Inc.
(316) 262-2502 FAX (316) 262-2548

# Library Services

Links to online bibliographic services helpful to the petroleum industry.

## Kansas

KGS Bibliography of Geology Online--This online version of the KGS bibliography allows the user to search by author, date, index terms, and several other fields to find the references desired.

Kansas Geological Survey 1995-96 Catalog of Publications

## National organizations

AAPG Publications
Search AAPG articles published from 1917 through 1994 by title, author, and other keys.

SPE Publications
Search SPE archives of petroleum engineering literature published from 1951 through 1994.

## General online bibliographies

UnCover
An online searchable article delivery service, a table of contents database, and a keyword index to nearly 17,000 periodicals. Includes UnCover Reveal, a current-awareness service that enables the user to receive table-of-contents updates from up to 50 journals and to create and store up to 25 keyword and author searches.

University of Kansas Library Catalog
This online version of the University of Kansas library catalog uses telnet to connect directly to ukanmvsvt. Be sure to take note of the escape characters when reading the directions. May require user registration.

Kansas State University Library Catalog
This online version of the Kansas State University library catalog uses telnet to connect directly to "TELNET TELNET.KSU.EDU". Be sure to take note of the escape characters when reading the directions. May require user registration.

Wichita State University Library Catalog
This online version of the Kansas State University library catalog uses telnet to connect directly to "TELNET TWSUVM.UC.TWSU.EDU". Be sure to take note of the escape characters when reading the directions. May require user registration.

Library of Congress Information System
Also known as LOCIS, this method uses telnet to connect directly to "TELNET LOCIS.LOC.GOV". Be sure to take note of the escape characters when reading the directions.



*webadmin@crude2.kgs.ukans.edu*

Mail*Link SMTP for Tim Carr

**To:**
Tim Carr

**From:**
uncover@csi.carl.org

**Date:**
Sat, Nov 11, 1995 3:16 PM

**Subject:**
UnCover Reveal - World oil.

**RFC Header:**
```
Received: by msmail.kgs.ukans.edu with SMTP;11 Nov 1995 15:12:59 -0600
Received: from csi.carl.org by denver (5.x/SMI-SVR4)
 id AG26734; Sat, 11 Nov 1995 14:12:07 -0700
Date: Sat, 11 Nov 1995 14:12:07 -0700
From: uncover@csi.carl.org
Message-Id: <9511112112.AG26734@denver>
To: tim_carr.moore_hall@msmail.kgs.ukans.edu
Subject:  UnCover Reveal - World oil.
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Article availability and price:
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```
JT World oil.
DA NOV 01 1995 v 216 n 11
PG   35
AU Walker, T.
AU Hopmann, M.
TI Underbalanced completions improve well safety and productivity.
SU New techniques and tools for isolating the payzone continue to prevent
   harmful fluid invasion after drilling with light-weight fluids.
SI 0043-8790(19951101)216:11L.35:UCIW;1-
>>      Profile No.: 9258000        UnCover Article No.:  251,056,245,058

JT World oil.
DA NOV 01 1995 v 216 n 11
PG   43
AU Christian, J.
AU Lea, J.F.
AU Bishop, B.
TI Plunger lift comes of age.
SU Amoco's experience in West Texas shows how selected wells that could not
   economically support beam pumping were converted to plunger lift.
SI 0043-8790(19951101)216:11L.43:PLCA;1-
>>      Profile No.: 9258000        UnCover Article No.:  251,056,245,068

JT World oil.
DA NOV 01 1995 v 216 n 11
PG   49
AU Snyder, R.
TI What's new in production technology.
SI 0043-8790(19951101)216:11L.49:WNPT;1-
>>      Profile No.: 9258000        UnCover Article No.:  251,056,245,071

JT World oil.
DA NOV 01 1995 v 216 n 11
PG   61
AU Verret, A.
```

# Oil and Gas News and Prices

These sites keep current information on oil and gas prices, weather, etc. More Kansas-specific information will be added in the future.

**Data from Energy Net**

- Daily natural gas prices
- Daily crude prices

**Weather**

- National Weather Service (online satellite images and more)
- Kansas Weather Forcasts

**Electric Utility News**

- Electric utility news

**Lasser, Inc., Production Data**

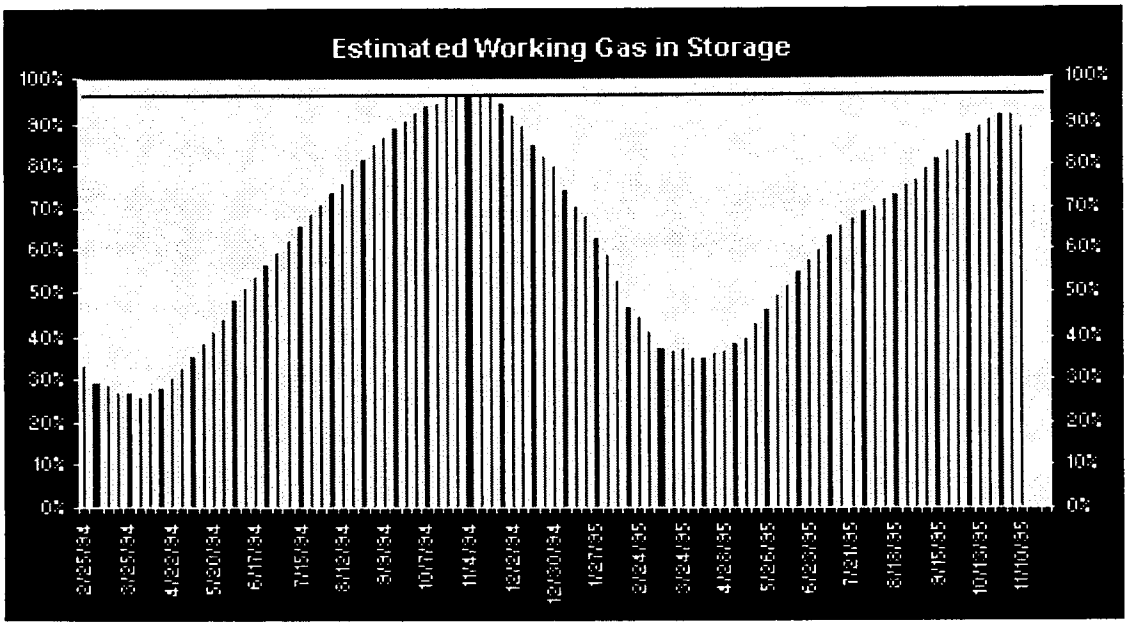
- Data on production from several states, other links of interest



*webadmin@crude2.kgs.ukans.edu*

# AGA Report

**AGA Report for the week ended 11/10/95**




**A Withdrawl of 85 Bcf for the week or 12.1 per day:**. The amount of working gas in storage is 89.4% full vs 96% for the same period last year. The maximum withdrawl was expected to be 38 Bcf for the week, and there were some that thought there would be an injection. **This number is extremely bullish!!!**

| | Week Ended 11/10/95 | Prev. Week | Prev. Year |
|---|---|---|---|
| Producing Region | 794 | 812 | 877 |
| Consuming East | 1669 | 1723 | 1795 |
| Consuming West | 410 | 423 | 427 |
| Total US | 2873 | 2958 | 3099 |

Go Back to Natural Gas Update

http://www.msc.edu:80/pttc/index.html

# WELCOME TO THE PTTC'S NATIONAL HOMEPAGE

**Providing technology and information for the U.S. oil and gas industry**


Headquarters Office
EMAIL: HO@PTTC.org
1101-16th St, NW, Suite 1-C
Washington DC 20036
(202) 785-2225
(202) 785-2240 FAX

Technical Office
jbenton@pttc.org
1801 Broadway, Suite 1120
Denver, CO 80202
(303) 293-9933
(303) 295-0065 FAX


Visit our **New User Page** if you are new to this site or to the Web. Or click on the following boxes for more information:


MISSION | ORGANIZATION | REGIONS | CALENDAR | PUBLICATIONS | FORUMS | NEW | LINKS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These pages are best seen using NETSCAPE 1.1 or later.

What you will find in the PTTC site:



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## Mission

Here is a brief presentation on the organization and functions of the PTTC.

The Petroleum Technology Transfer Council (PTTC) was formed by the U.S. oil and gas exploration and production (E&P) industry to improve technology transfer to producers, primarily independents. Its mission is: (1) to identify priority technical problems of producers and communicate them to the R&D community; and (2) to transfer upstream E&P technologies to help domestic producers reduce costs, improve operating efficiency, increase ultimate recovery, enhance environmental compliance, and add new oil and gas reserves. The PTTC serves as an integrated clearinghouse for E&P technology information and as a national umbrella organization for technology and R&D providers. It does not perform or fund R&D.

The Board of Directors is comprised of producers from ten PTTC regions, with a representative from the Independent Petroleum Association of America, Gas Research Institute, the Interstate Oil and Gas Compact Commission, a major oil producing company, and a major oilfield services company. The Board is supported by a small headquarters staff. In each PTTC region, there is a Producer Advisory Group (PAG) and a Regional Lead Organization (RLO), operating under contract. The initial five year effort is funded partially by DOE's oil and natural gas programs in the DOE Office of Fossil Energy. Additional funds come from Gas Research Institute, several state governments, and cost-share contributions from Regional Lead Organizations, industry, and PTTC regional and national activities.

Building on the new paradigm in technology transfer, the PTTC's approach is customer-driven. Problem Identification Workshops allow producers to identify problems, and set regional technology transfer priorities. Focused Technology Workshops speed information about existing solutions to priority problems to producers and generate feedback to the R&D community where solutions are not available. PTTC Resource Centers in each region provide technical assistance, referrals, and access to data, analytical tools, and technology information. Industry Outreach in the form of Newsletters, information systems, technical forums, on-line surveys, feedback mechanisms, and Regional Support Groups allow producers and other industry participants to communicate with one another, with the PTTC, and with PTTC's industry, DOE, and state sponsors.

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The PTTC is co-funded by the U.S. Department of Energy's oil and natural gas programs, the Gas Research Institute, and industry and university sources.

The PTTC gratefully acknowledges the services of Minnesota Supercomputer Center, Inc. which provides the server and storage for these Web Pages, and the other organizations who have donated resources to the PTTC.



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*We encourage your comments, please send us email at: HQ@PTTC.org*

# PTTC NETWORK NEWS

1st Quarter 1995 ■ Issue #1

PETROLEUM TECHNOLOGY TRANSFER COUNCIL
1101 16TH STREET, N.W., SUITE 1-C, WASHINGTON, DC 20036-4803
(202) 785-2225 FAX (202) 785-2240 EMAIL hq@pttc.org

## CONTENTS



**With this issue, the Petroleum Technology Transfer Council (PTTC) inaugurates its official newsletter to serve the U.S. petroleum exploration and production (E&P) industry.**

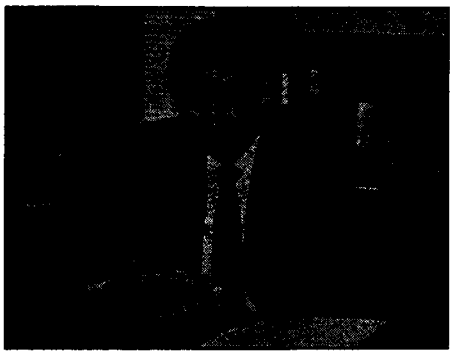
*PTTC Network News* will communicate the activities of the PTTC and its regions to the E&P industry, the R&D community, government, media, and other interested parties. Each issue will include reports from the PTTC regions, features about technology innovations and applications, and news about technology transfer activities and information that are available to America's oil and gas producers.

The *PTTC Network News* will be published quarterly in March, June, September, and December of each year. It will be mailed to all members of the PTTC's Board, Producer Advisory Groups, Regional Lead Organizations, industry associations, interested E&P companies, the PTTC's funding organizations, and other subscribers. Beginning with the next issue, annual subscriptions will be available at a nominal cost that will be determined to cover the costs of administering, preparing, printing, and mailing. *To be added to the PTTC mailing list, or for further information, contact the PTTC at 202-785-2225.*

## BOARD ACTIVITIES

### Russell Steps Down as Founding PTTC Chairman

At the annual Board meeting on February 23, 1995, James E. Russell formally resigned as Chairman of the PTTC. He will forever be known as the organization's Founding Chairman because it was his vision, perseverance, and stature in the industry that led to the formation of the new national association. Russell was the Chairman of the original Improved Oil and Natural Gas Recovery Task Force initiated by the Independent Petroleum Association of America (IPAA) in mid-1991. The IPAA Task Force was the forerunner of the PTTC.



*James E. Russell, former PTTC Chairman*

Russell is a consulting petroleum engineer and operator who owns several companies in Texas and Kansas. He has served in countless leadership positions in the industry, including Chairman of the Texas Independent Producers and Royalty Owners Association (TIPRO), and as the first Chairman of IPAA's Crude Oil Committee. He has been a member of the Board and Executive Committee of the Texas Mid-Continent Oil and Gas Association, and is also on Industry Advisory Boards at the Univ. of Kansas, and the Oil Recovery Partnership of Los Alamos and Sandia national labs.

Russell proved himself to be a pioneer in enhanced oil recovery as early as 1954 when he founded the West Central Texas Waterflood Association. His long and distinguished career has included many awards, including being honored by the Texas House of Representatives for his outstanding achievements in the oil and gas industry. He has testified before Congressional committees on behalf of the industry, and spoken frequently before various groups.

The U.S. petroleum industry owes Russell a debt of gratitude for his tireless efforts in establishing a nationally coordinated program for effectively disseminating technology to producers throughout the country. Russell was succeeded as PTTC chairman by J.C. "Chris" Hall.

http://www.gri.org/

GAS RESEARCH INSTITUTE SEARCH HOME

# TECHNICAL AREAS

EXPLORATION & PRODUCTION

END-USE TECHNOLOGY

BASIC RESEARCH

ENVIRONMENT & SAFETY

TRANSMISSION & DISTRIBUTION

# exploration & production

- PROGRAMS
- PRODUCT CATALOG
- ADDITIONAL RESOURCES

# GRI SEARCH

Use the forms provided below to search through GRI's on-line materials. To search all of GRI's browseable on-line documentation and directories, use form 1: GRI/Net Search. To search through various types of information products available from the GRI Library, use form 2: GRI Library Search.

---

**1: GRI/Net Search**

Enter your query. Click Help for instructions on formulating your query.

Maximum number of items to return: 40

Logging

Search

---

**2: GRI Library Search**

Enter your query. Click Help for instructions on formulating your query.

Maximum number of items to return: 40

Logging

Search

---

# Query Results

Your query was:
**logging**

The selected databases contain the following 40 items relevant to your query.

| | | |
|---|---|---|
| 1990 | | Texaco-GRI Joint Project: Mud Logging Technology. |
| 1988 | Johnson, D | Well Logging for the Nontechnical Person. |
| 1986 | Toksoz, M. | Full Waveform Acoustic Logging Consortium, Annual |
| 1990 | | Quality Control Guidelines for Data Acquisition an |
| 1990 | | Gas Production: New Tool "Sees" Through Steel Cas |
| 1991 | Groten, Ba | Review of Horizontal Drilling, Logging, and Comple |
| 1992 | | Through-Casing Logging: GRI Research Aims to Tap |
| 1983 | Kern, John | Geophysical Techniques for Coalbed Evaluation. |
| 1990 | Luke, Gera | Electrical Properties of Devonian Shale: CSW #1A. |
| 1993 | | Evaluation of Formation Permeability Using Time La |
| 1985 | Davidson, | Seismic Borehole Tomography. |
| 1991 | | New Borehole Tool Provides More Accurate Downhole |
| 1993 | Mahrer, Ke | Microseismic Logging: A New Hydraulic Fracture Di |
| 1980 | Cooke, Cla | Radial Differential Temperature (RDT) Logging - A |
| 1986 | | Devonian Shale Production Profile Analysis Availab |
| 1993 | Holditch, | Evaluation of Mud Filtrate Invasion During Drillin |
| 1989 | Gournay, L | Wellbore Noise Survey for Downhole Logging Tools. |
| 1992 | | ES-Log Interpretation Software (Forward Modeling a |
| 1993 | | Catalog of Exploration & Production Software. |
| 1991 | Whitman, W | Interpretation of E-Logs. |
| 1980 | Goodman, M | Insitu Gas Hydrates: Past Experience and Exploita |
| 1990 | Vail, W. B | Proof of Feasibility of the Through Casing Resisti |
| 1990 | Holditch, | Evaluation of Formation Permeability Using Time La |
| 1991 | | More Accurate Borehole Gravity Tool for Thin Beds. |
| 1980 | Hoffman, E | Update on Natural Gas Hydrates. |
| 1992 | | New Software Available for Locating Bypassed Gas. |
| 1989 | Van der Ha | Borehole Gravimeter Data Acquisition and Technolog |
| 1985 | Holmes, Mi | Log Interpretation for Tight Gas Sands. |
| 1989 | | Summary of Data Acquisition and Field Operations: |
| 1991 | | FORMATION EVALUATION/GRI/EDCON Launch Shuttle to I |
| 1994 | Cicchetti, | GRI, Texaco Mud Logging Technology Available for L |
| 1980 | Dabkowski, | Monitoring Cathodic Protection of Well Casings. |
| 1990 | Lorenzini, | Dynamic Noise Analysis of Gravity Gradiometer. |
| 1981 | Gillies, A | Development of Technology for Coalbed Methane Reco |
| 1992 | DeLaune, P | New Quantitative Technique to Evaluate Gas Shows D |
| 1991 | Van der Ha | Borehole Gravimeter Data Acquisition and Technolog |
| 1991 | | Summary of Open-Hole Data Acquisition and Field Op |
| 1991 | | Summary of Open-Hole Data Acquisition and Field Op |
| 1985 | Curtis, Jo | Devonian Shale Gas Exploration and Production Stud |
| 1992 | | Antrim Shale Workshop, Mt. Pleasant, Michigan, Dec |

# Query Results

RN: GRI-92/0543
TI: Through-Casing Logging: GRI Research Aims to Tap Lowest-Cost Gas Resource.
ST: GRI Technology Focus.
CS: Gas Research Institute, Chicago, IL
DT: Brochure
DA: September 1992
PY: 1992
PG: 5p
AV: GRI
AB: Recent research has uncovered increasing evidence that large amounts of recoverable natural gas were missed by conventional production techniques. Gas Research Institute (GRI) is developing four logging technologies designed specifically to identify gas-bearing reservoirs lying behind well casing in previously drilled and completed wells. These technologies focus on resistivity logging, density logging, and gravity logging. Traditional logging tools are designed for use in open-hole (uncased) wells. The new technologies intend to overcome complications created by the presence of steel casing used to complete the wells. One of the new technologies, the Through-Casing Resistivity Tool, successfully tested to produce measurements through the casing that agree with resistivity recorded previously in the uncased well. The gravity shuttle, a new borehole tool, detects the presence of gas in rock formations more accurately than traditional gravity surveys. GRI plans to develop or enhance sonic, neutron, and pressure-logging technologies specifically designed to work through well casing. It offers the industry powerful formation evaluation technologies to exploit bypassed gas in developed fields.
DE: Gas recovery
DE: Well logging
DE: Electrical logging
DE: Reservoir characteristics
DE: Set through completion
DE: Gas wells
DE: Well completion
DE: Measuring instruments
DE: Physical properties
ID: Through Casing Resistivity Tool(TM)
ID: ParaMagnetic Logging, Inc.
ID: Resistivity logging
ID: Formation evaluation
ID: Through casing logging
CC: NG6
SI: GRI

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---

DEVELOPMENT STATUS:



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1. Full Articles Available:

- Journal of Glacial Geology and Geomorphology (January 1996)
- Journal of Petroleum Technology (February 1995 issue: experimental status)
- Terra Nova (1994-recent)

---

2. With Selected Articles (experimental status):

- Journal of Glacial Geology and Geomorphology (1994)
- Journal of Petroleum Technology (June 1994 issue)
- The Leading Edge (1995)

---

3. With Abstracts:

- Geophysics (current)
- Journal of Geophysical Research (1965-present)
- Journal of Seismic Exploration (1992-1994)

---

4. With Article Titles:

- Annales Geophysicae (1994)
- Applied Spectroscopy Journal (January 1994 - present)
- Bulletin Geodesique (1994)
- Bulletin of Volcanology (1994)
- Geological Society of America Bulletin (current)
- Geology (current)
- Geotimes (current)
- Journal of Metamorphic Geology (current)
- Physics and Chemistry of Minerals (1994 volumes)
- SPE Journals
- Terra Nova (1989-1995)

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5. With Searchable Indices:

- AAPG Bulletins (15,000 listings shortly)
- Annales Geophysicae (1994 article titles)
- Applied Spectroscopy Journal (January 1994 - present)
- Bulletin Geodesique (1994 article titles)
- Bulletin of Volcanology (1994 article titles)
- Journal of Geophysical Research (1965-present)
- Physics and Chemistry of Minerals (1994 article titles)
- Search Cumulative Index of SEG, EAEG, ASEG and CSEG Publications
- Search Journal of Geophysical Research Abstracts

---

6. In The Early Development Stages (the list is very incomplete and has limited information value):

- Ap lied Geochemistry
- Chemical Geology
- Engineering Geology
- Ex loration and Mining Geology
- Fossil Fuel Biomarkers
- Geoexploration
- International Journal of Coal Geology
- Journal of Applied Geophysics
- Journal of Geochemical Exploration
- Journal of Petroleum Science and Engineering
- Marine and Petroleum Geology
- Organic Geochemistry
- Sedimentary Geology

For Further Information About Related Journals Or Books:

- AAPG Bookstore
- AGU Journals
- Cambridge Scientific Abstracts (General)
- Chemical Abstracts Service Online ('STN Database')
- Blackwell Publishers (Geography/Palaeontology)
- Cambridge Scientific Abstracts (Engineering and Computer Sciences)
- Elsevier Scientific Publishers (Earth Sciences)
- Elsevier Scientific Publishers (Engineering/Energy)
- McGraw-Hill Engineering Catalogue
- PennWell Publishers (General)
- Reiters Books (Earth Sciences)
- Reiters Books (Petroleum Engineering)

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7. Journals Monitored By Newsgroups (table of contents):

- Applied Geochemistry (Sci.Geo.Petroleum: selective)
- Chemical Geology (Sci.Geo.Petroleum: selective)
- Drilling & Completion Fluids (Sci.Geo.Petroleum)
- Earth and Planetary Science Letters (Sci.Geo.Petroleum: selective)
- Energy & Fuels (Sci.Geo.Petroleum: selective)
- Geochimica et Cosmochimica Acta (Sci.Geo.Petroleum: selective)
- Journal of the Geological Society (Sci.Geo.Geology)
- Organic Geochemistry (Sci.Geo.Petroleum: selective)
- Peru Oil News (Sci.Geo.Petroleum)
- Petroleum Geoscience (Sci.Geo.Petroleum)
- The Log Analyst (Sci.Geo.Petroleum)

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8. Journals Monitored By Mailing Lists (table of contents):

- Applied Geochemistry (Org-Geochem archive)
- Chemical Geology (Org-Geochem archive)
- Earth and Planetary Science Letters (Org-Geochem archive)
- Geochimica et Cosmochimica Acta (Org-Geochem archive)
- Organic Geochemistry (Org-Geochem archive)

---

9. Newsletters and Scout Reports:

- Australian Petroleum Cooperative Research Centre (APCRC) Update
- Geoscience Information Group (GIG) of the Geological Society (March 1994)
- Hydrological and Hydrogeological Digest (1994-present)
- Peru Oil News (1993-present)
- The Oil Squealer (interactive map, Peruvian Amazon)
- The Outcrop (RMAG Newsletter - sample issue)

---

9. Related Reading:

- Development of a Petroleum Engineering Electronic Journal (Barnett et al., 1994)
- The Electronic Journal of the British Geomorphological Research Group (Whalley, 1994)

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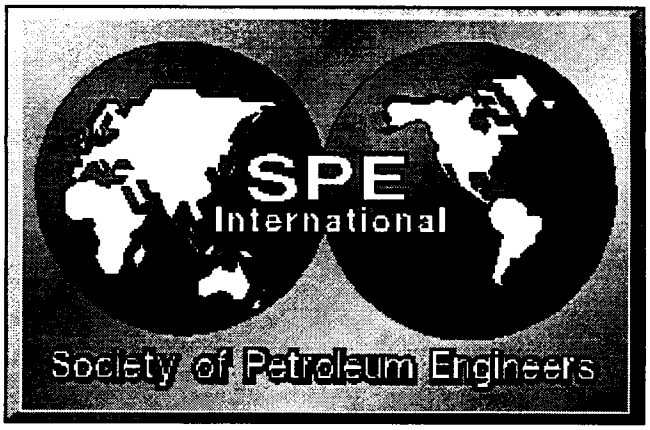
If you have additional information please email: Jorg Schulz-Rojahn (NCPGG), irrespective of publication language.

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Welcome to the **Society of Petroleum Engineers** World Wide Web (WWW) server (SPEWeb). SPEWeb will be adding member information and member services over the coming months, so keep checking to find out what's new.

Each highlighted phrase (in color and/or underlined) is a hyperlink to another document or information resource in SPEWeb or somewhere else on the "information highway." To learn more about the WWW and the Internet, follow this hyperlink. **Click Here**

# 1996 PCC Call for Abstracts

"Software Solutions at Work" is the theme of the 1996 SPE Petroleum Computer Conference to be held June 2-5 in Dallas, Texas, U.S.A. Each year, the conference and exhibition bring petroleum professionals the latest information and technological advances in computing for the oil and gas industry. Now you can submit your abstract electronically for consideration for this premier petroleum industry computer conference.

# Society Information

The primary mission of the Society of Petroleum Engineers is to collect, disseminate, and exchange technical information pertaining to the development of oil and gas resources. Information is provided on the SPE Board of Directors, SPE Foundation, SPE Bylaws, honors and awards, and Committees.

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# Publications

SPE journals, proceedings of SPE-sponsored meetings, individual technical papers, SPE-published books, and books from other publishers are available from the Society.

# Schedule of Events

Conferences, exhibitions, Forums, and short courses are major vehicles used by the Society of Petroleum Engineers to disseminate technical information to the petroleum industry. Wherever petroleum professionals work, they are not far from access to SPE events and the opportunity for interchange of ideas and experiences. The Society adheres to rigid standards to ensure the technical quality of meeting and exhibition programs.

# Sections and Student Chapters

SPE currently has 138 sections in 55 countries and 82 student chapters in 29 countries. Listings of the Sections and Student Chapters are provided.

# Connections

Many societies and groups supply information pertinent to oil and gas exploration and production. Provided are links to societies and sources of additional information.


# SPE 28249

# New PC Based Software for Multiphase Flow Calculations

Khalid Aziz and Nicholas Petalas



## ABSTRACT

A new multiphase flow analysis and design system for DOS-based personal computers is described. Examples are also presented and analyzed using different multiphase flow techniques. These techniques are investigated using flow map and three-dimensional pressure surface comparisons and a new mechanistic model is discussed which attempts to overcome many of the problems associated with existing multiphase flow analysis methods.

## INTRODUCTION

The simultaneous flow of oil, gas and water in pipes is a common problem for the oil and gas industry. Multiphase flow often exists in wells and gathering systems for both on-shore and off-shore reservoirs producing oil, gas or condensates.

Complexity of the production system, changing oil and gas properties with pressure and temperature, and availability of a multitude of correlations for fluid properties and pressure drop calculations, all combine to make the design of multiphase systems a difficult problem for the production engineer.

Since the early seventies, computer programs have been commercially available for performing fluid property, well, and pipeline calculations involving both single phase and multiphase flow. With the arrival of personal computers (PCs) in the early eighties, many of these programs have been ported over to this platform without extensive reprogramming to take advantage of the special features of the PC. Now, a new generation of design and analysis programs is appearing that eases the design task by making the process interactive through the use of on-line multilevel help and graphics. One such suite of programs which has recently been introduced is the multiphase flow analysis system by ASA Systems[1]. All of the results presented here are generated with this suite of programs.

## PROGRAM DESCRIPTION

The complete software package includes a program for analyzing flow in pipes (*ASAPIPE*), another for wells (*ASAWELL*) and a program for calculating fluid properties (*ASAPROP*). A recent addition to these is the program, *ASAMAP*, which is extremely helpful in providing an understanding of how the various correlations for predicting flow patterns, pressure drop and holdup differ from each other. Flow pattern maps can be generated that show the flow pattern transitions using a common set of coordinates so that direct comparisons between methods are easily made. Furthermore, all significant quantities (frictional, hydrostatic, and total pressure drop, liquid holdup, liquid height for stratified flow, film thickness for annular flow, etc.) can be plotted in a variety of formats. One of the most useful formats involves a three-dimensional plot where the quantity being investigated is

References and illustrations at end of paper

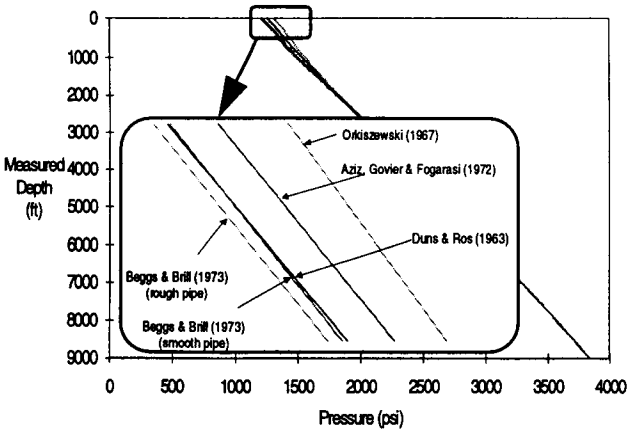



**Figure 2 - Pressure Profile for GOR=750 scf/STB**

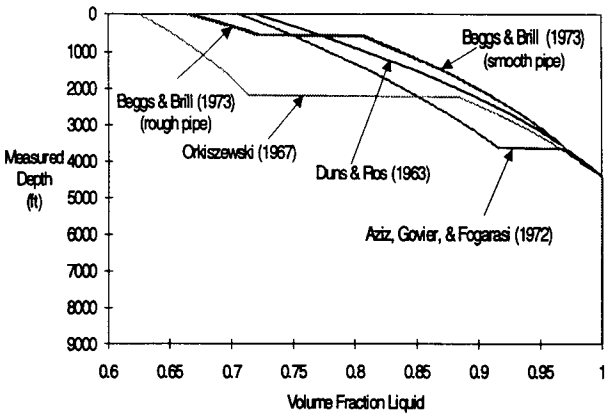



**Figure 5 - Volume Fraction Liquid Profile for GOR=750 scf/STB**

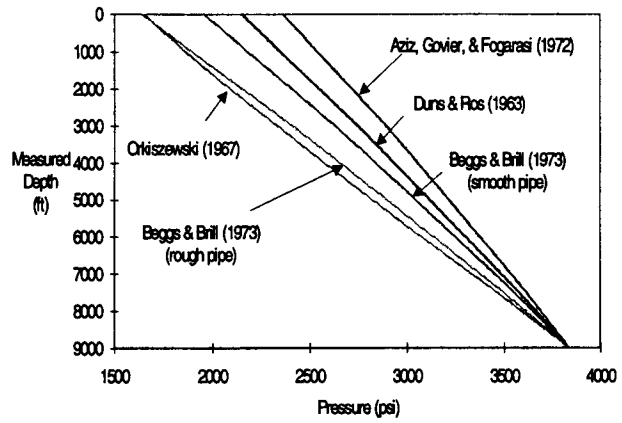



**Figure 3 - Pressure Profile for GOR=5,000 scf/STB**

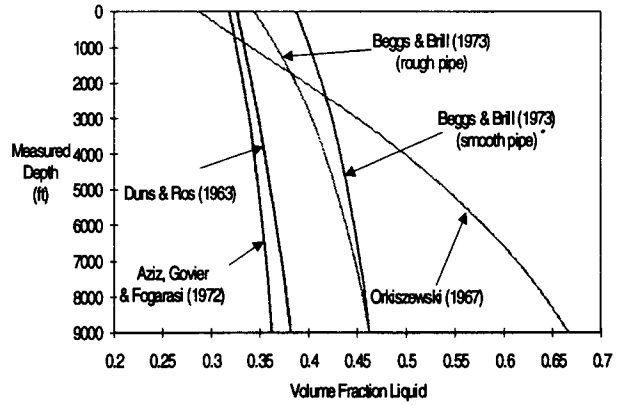



**Figure 6 - Volume Fraction Liquid Profile for GOR=5,000 scf/STB**

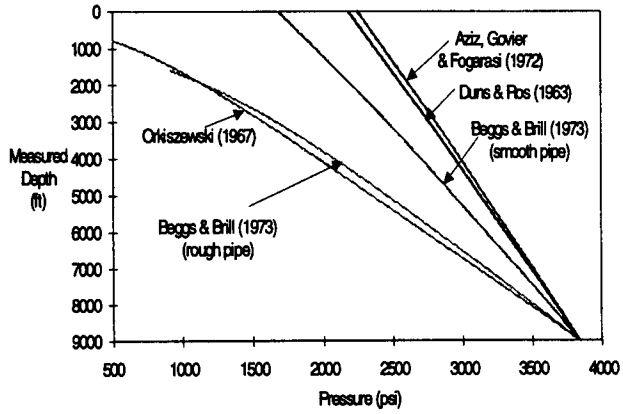



**Figure 4 - Pressure Profile for GOR=10,000 scf/STB**

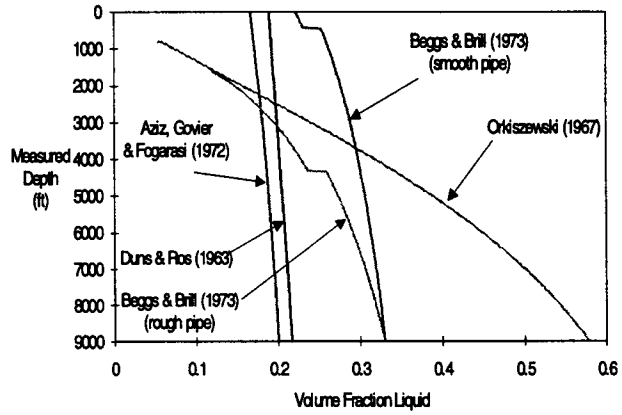
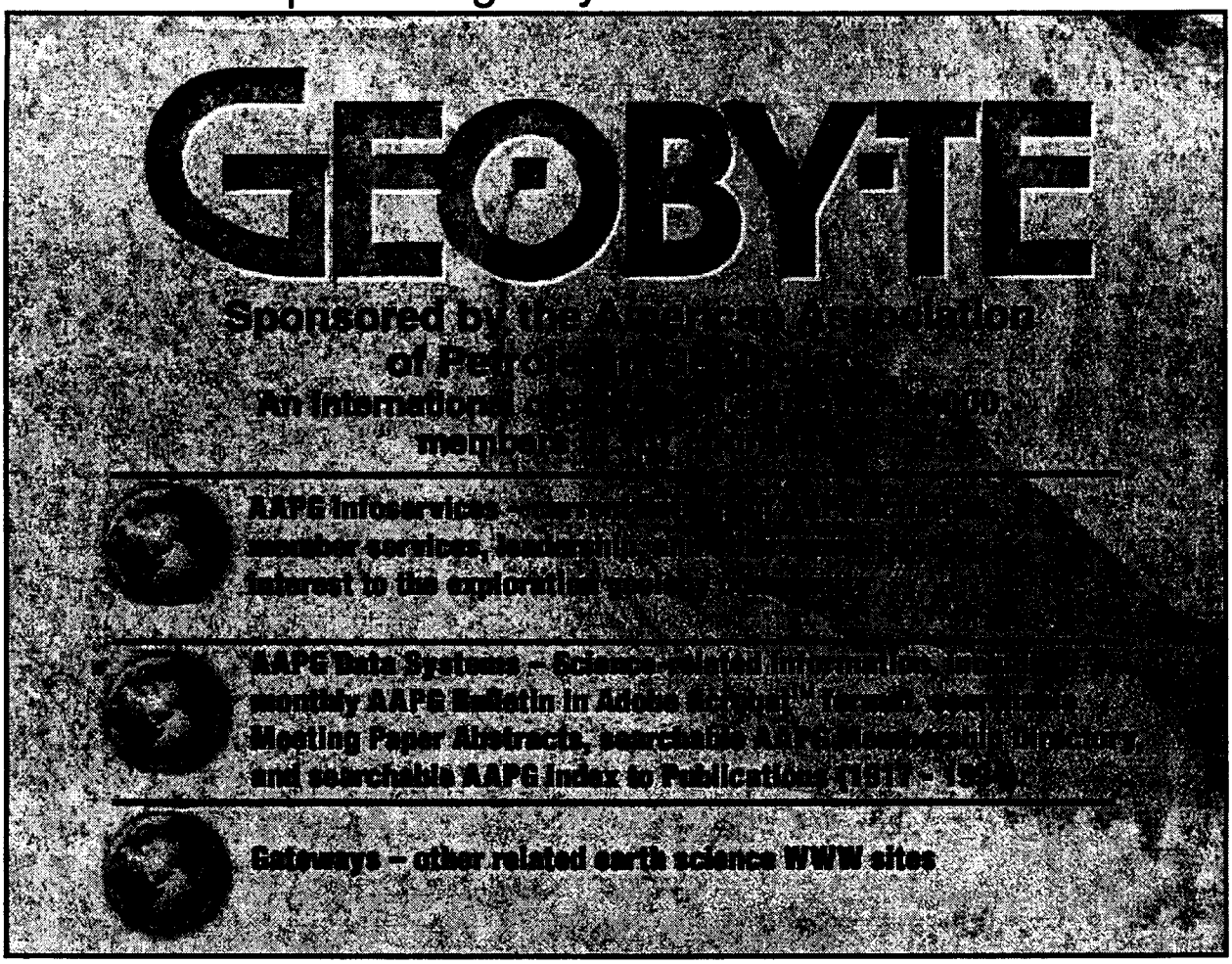



**Figure 7 - Volume Fraction Liquid Profile for GOR=10,000 scf/STB**

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| calc.bas | 6 Kb | Tue Jan 1 00:00:00 1980 | |
| chance.bas | 8 Kb | Tue Jan 1 00:00:00 1980 | |
| declcurv.sit | 53 Kb | Mon Feb 24 00:00:00 1992 | macintosh archive |
| decline.zip | 70 Kb | Mon Mar 2 00:00:00 1992 | |
| drawdown.bas | 7 Kb | Tue Jan 1 00:00:00 1980 | |
| energy.doc | 5 Kb | Thu Jun 21 00:00:00 1990 | |
| h2osatsp.zip | 763 bytes | Mon Mar 2 00:00:00 1992 | |
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| log.zip | 67 Kb | Mon Mar 2 00:00:00 1992 | |
| logger.wk1 | 11 Kb | Thu Jun 21 00:00:00 1990 | |
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| logref.zip | 204 Kb | Mon Mar 2 00:00:00 1992 | |
| monocalc.bas | 7 Kb | Tue Jan 1 00:00:00 1980 | |
| nswe.bas | 9 Kb | Thu Sep 13 00:00:00 1990 | |
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| oil-econ.zip | 15 Kb | Mon Mar 2 00:00:00 1992 | |
| oil123.zip | 6 Kb | Mon Mar 2 00:00:00 1992 | |
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| zfactor.zip | 16 Kb | Mon Mar 2 00:00:00 1992 | |

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|---|---|---|
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| us-coord.zip | 34 Kb | Mon Aug 31 00:00:00 1992 |

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| Dcw/ | | Wed May 18 00:00:00 1994 | Directory |
| Geochemistry/ | | Fri Dec 23 00:00:00 1994 | Directory |
| Geophysics/ | | Wed May 18 00:00:00 1994 | Directory |
| Graphics/ | | Wed May 18 00:00:00 1994 | Directory |
| Hydrology/ | | Wed May 18 00:00:00 1994 | Directory |
| Landsat/ | | Wed May 18 00:00:00 1994 | Directory |
| MOSS/ | | Wed May 18 00:00:00 1994 | Directory |
| Mapping/ | | Mon Nov 21 00:00:00 1994 | Directory |
| Mineralogy/ | | Wed May 18 00:00:00 1994 | Directory |
| Mining/ | | Wed May 18 00:00:00 1994 | Directory |
| Oil n Gas/ | | Wed May 18 00:00:00 1994 | Directory |
| README | 1 Kb | Mon Oct 31 00:00:00 1994 | |
| bartdata.exe | 1201 Kb | Sun Aug 28 00:00:00 1994 | Binary executable |
| cogl1294.txt | 35 Kb | Fri Jan 27 00:00:00 1995 | Plain text |
| cogsappl.txt | 3 Kb | Sat Feb 12 00:00:00 1994 | Plain text |
| cogsdsks.txt | 13 Kb | Sat Feb 12 00:00:00 1994 | Plain text |
| cogsinfo.txt | 16 Kb | Sat Feb 12 00:00:00 1994 | Plain text |
| cogslist.txt | 13 Kb | Wed Apr 20 00:00:00 1988 | Plain text |
| cogsnet.files | 99 Kb | Sat Feb 12 00:00:00 1994 | |
| cogspub.txt | 6 Kb | Wed Apr 20 00:00:00 1988 | Plain text |
| fabric30.exe | 112 Kb | Mon Jun 20 00:00:00 1994 | Binary executable |
| fabric30.txt | 839 bytes | Mon Jun 20 00:00:00 1994 | Plain text |
| in.coming/ | | Sun Jul 16 23:45:00 1995 | Directory |
| internet.resources... | 169 bytes | Sat Jun 11 00:00:00 1994 | |
| news1294.txt | 35 Kb | Sun Feb 19 20:24:00 1995 | Plain text |
| ores.txt | 108 Kb | Wed Jun 15 00:00:00 1994 | Plain text |
| ps2txt.zip | 8 Kb | Wed Jun 16 00:00:00 1993 | |

# Newsgroup: sci.geo.petroleum

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# Gas & Oil Technology Exchange and Communication Highway of New Mexico

Welcome to the Gas & Oil Technology Exchange and Communication Highway (GO-TECH). GO-TECH is a joint project of the Petroleum Recovery Research Center, a division of New Mexico Tech, and Los Alamos National Laboratory. Development of this electronic information system is sponsored by the State of New Mexico and the U.S. Department of Energy. With the support of the Gas and Oil National Information Infrastructure (GO-NII), the goal of this system is to make the high-speed electronic information highways readily accessible to the petroleum community for rapidly exchanging ideas, data, and technology.

The GO-TECH system served as a prototype for the Petroleum Technology Transfer Council (PTTC), a national umbrella organization providing technology and information to the U.S. oil and gas industry.

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## Inside Cover

- What's new at GO-TECH Updated 11/01/95
- November's Cover Illustration (59800 bytes)

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- Current Petroleum Prices
- Results of Latest NM State Oil and Gas Lease Sale
- New Mexico Directory
- Calendar of events
- Programs, Resources, & Organizations
- PRRC Research Projects & Field Studies
- Computer programs
- Data and databases
- Publications, reports, etc
- Regulations, rules

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This effort is being assisted by the USGS Volunteer for Science Program.

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*Contact: webmaster@internet.er.usgs.gov*
*Last modification: 7-19-95@5:45pm (MP)*

# Biblography of Well-Log Applications Cumulative Edition: to September 30, 1994

**by Sephen E. Prensky**
**U. S. Department of the Interior**
**U. S. Geological Survey**

What is it?
How do I get it?
Who do I contact if I have a question?
Can I see the USGS home page?

 [options]

---

The new cumulative edition of my "Bibliography of Well-Log Applications", U.S. Geological Survey Open-File Report 95-0064 is now available and can be obtained via anonymous FTP from the USGS server. This is part of an effort to make USGS publications available over the Internet.

Comments are welcome!!

The document, together with README files, is available as self-extracting archives in both DOS (WordPerfect) and Macintosh (MS Word) formats. The compressed files are between 1.2 and 1.5 Mb and the expanded files are 3.5 to 4.0 Mb in size. The bibliography, which contains over 5,600 individual citation, is divided into three parts, two subject listings and a first-author listing. The print version is 800 pages in length.

ftp://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-95-0064/

Macintosh files (binhexed)
/README.MAC
/ofr95-0064.sea.hqx

DOS/Windows (binary)
/readme.dos
/of9564.exe

Some Macintosh users have reported a glitch in the binhex format. Here's a workaround that will still get the intact .sea file.

If you use Fetch 2.1.1 (perhaps other versions as well) and possibliy other FTP programs, just before the file is completely downloaded (it can be as brief as 10-15 sec over ethernet or as long as 40 minutes via a 14.4 modem, I know, I've tried both). The user gets a message that the file isn't properly formatted in Binhex 4.0. It then asks whether you want the file downloaded without decoding.

You should answer yes at that point. Once you have the binhex coded file, use a separate utility to decode it, e.g. Stuffit Expander, and the .sea file will be preserved OK.

The original .sea and .hqx files were created in DropStuffit. Perhaps there's some incompatibility with the Binhex 4.0 format. If anyone can provide information as to how to correct this glitch, I'd appreciate it.

---

Steve Prensky
U.S. Geological Survey
Denver, CO
(303) 236-5772 (voice)
prensky@bpgsvr.cr.usgs.gov

---

For those unfamiliar with this bibliography (updates published annually in the SPWLA technical journal The Log Analyst) an excerpt from the introduction as well as the contents page follow.

The purpose of this bibliography is to emphasize the application and various uses of well-log data. The topical organization is loosely based on research interests within the U.S.Geological Survey (USGS). The following general criteria are applied to papers to determine whether they will be included: 1) the paper must be written in English, 2) it must be obtainable by a research library, and 3) most of the paper should discuss a particular application of well-log data or have immediate impact on the use of such data. For lack of space, abstracts are excluded (except for extended abstracts) and cross-indexing has been kept to a minimum. This cumulative edition has over 5,600 individual references. The starting point for this bibliography is 1975 although key papers published prior to that year are included.

## CONTENTS

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- Biographical Information for First Lady Linda Graves
- Image of Governor Graves
- Image of the Governor and First Lady

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Page Created: March, 1995

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| $ Change | : 0.1250 | % Change | : 0.56 |
| Volume | : 1586700 | # of Trades | : 142 |
| Day Low | : 22.5000 | Day High | : 22.6250 |
| 52 Week Low | : 18.0000 | 52 Week High: | 24.3750 |

WWW hyperlinks for the symbol OXY are available including those from the EDGAR Dissemination Project.

For a more detailed look at market activity see our Market Watch page.

**The Podium**

● An electronic forum made available to Investment Advisors by Security APL

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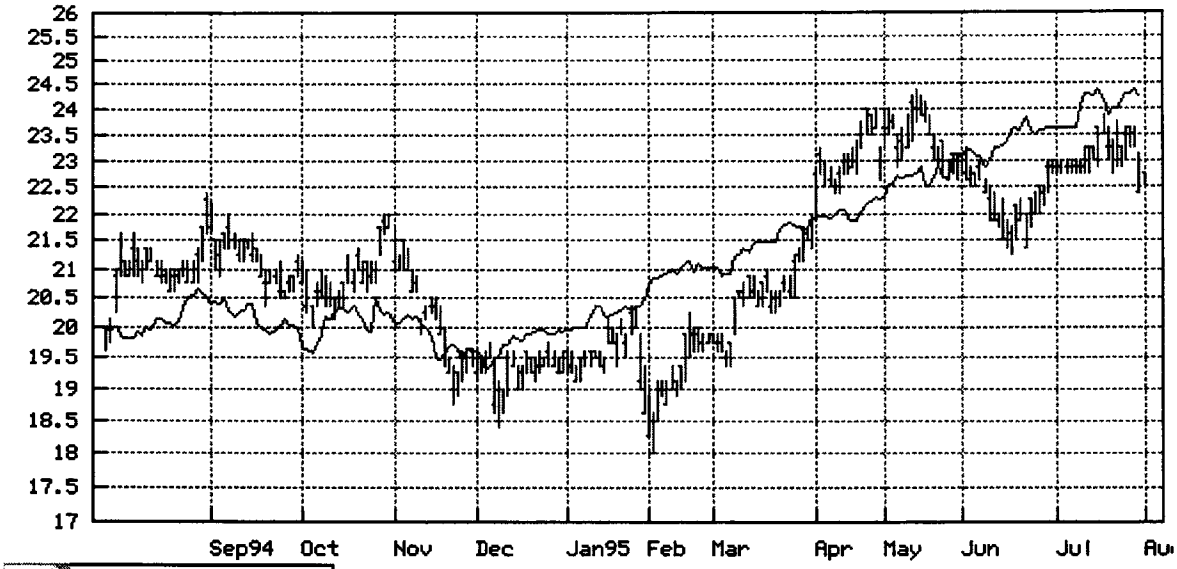
# Occidental Petroleum Corp (OXY)

**as of 95-08-01, close 22.750, up 0.375, or 1.68%**

The Experimental Stock Market Data Server is a service of the M.I.T. Artificial Intelligence Laboratory.





[volume graph of OXY]

Volume chart shows daily price * volume, in millions of dollars.
Solid violet line shows relative performance of S&P 500.
Click here to download the same Price or Volume graphs

| Date | High | Low | Close | Vol | Price*Volume |
|---|---|---|---|---|---|
| 950724 | 23.625 | 23.000 | 23.500 | 1220.6 | 28.6841 |
| 950725 | 23.625 | 23.250 | 23.625 | 1158.3 | 27.3648 |
| 950726 | 23.625 | 23.250 | 23.500 | 1174.9 | 27.6102 |
| 950728 | 23.125 | 22.375 | 22.375 | 1058.1 | 23.6750 |
| 950801 | 22.750 | 22.500 | 22.750 | 1695.2 | 38.5658 |

For the complete data file, ftp://ftp.ai.mit.edu/pub/stocks/results/OXY

*Brought to you since 1993 by The Stockmaster, Mark C. Torrance*
*Please send email only to stockmaster@ai.mit.edu*

# On-line Resources for Earth Scientists (ORES)

By Bill Thoen
June 15, 1994

This is a list of on-line resources available through the Internet and other networks that may be useful to those who have an interest in the earth sciences. These resources consist of digital documents, news sources, software, data sets and other on-line services that are available to the public.

Changes (since the June 2, 1994 release)

* Section 2.6.4 Changed domain name for CLIMLIST
* Section 2.6.27 Added Quaternay FTP site
* Section 3.11.34 Deleted (file has been removed)
* Section 3.15.5 Combined with 3.15.6, and section 3.15.6 was consolidated.
* Renumbered Topics 3.11 and 3.15

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## 1.1. Copyright Notice

The information in this article is provided as-is, with no warranties or assurances as to its accuracy or suitability. If you find errors or omissions, please send a message to Bill Thoen at bthoen@gisnet.com.

## 1.2. Introduction

The rapid growth and expansion of the on-line web of information is really challenging our best efforts to manage it. Various new software tools have appeared such as World Wide Web's Mosaic and Lynx browsers, Gopher, and WAIS, in addition to e-mail and FTP and telnet. There are new services appearing that serve mainly as gateways to other resources, and explosion of FAQ (Frequently Asked Questions) documents, resource documents (like this one) and books on navigating the Internet. Efforts like the Interpedia project are attempting to index the entire matrix, and diversions like the monthly Internet Hunt explore the ways people can find obscure information from the matrix, and to test its limits. New experiments in developing network "scavengers" such as automatic news filters and "knowbots" are becoming more common.

This is a guide for earth scientists who would like to get to know this cyberspace world better. The first section covers methods and resources that you can use to explore on your own, and the last part is a fairly exhaustive list of known resources that are related to the earth sciences.

There are many different services that can be used to retrieve electronic documents from the Internet. Each service is designed to serve different needs and is usually accessed through different software or methods. The resources section of this article is organized by subject, and so you will often see several methods listed that can be used to access resources on a subject. In this article we use the proposed Universal Resource Locator (URL) convention so that each resource can be presented in a standard way.

For more information about the URL, see Tim Brenner-Lee's article, "Uniform Resource Locators" at:

URL: http://info.cern.ch/hypertext/WWW/Addressing/URL/Overview.html

If you don't have a clue what this address means, you can find references to this document by using gopher, and searching for "Brenner-Lee".

## 1.3. URL Examples

So that you aren't left totally in the dark, the following is a simplified explanation of how to interpret URLs.

### 1.3.1. FTP

ftp://ftp.uu.net/usenet/news.answers/ftp-list/ftp.Z

This is a URL for an FTP resource. To get this using FTP, enter the following:

ftp ftp.uu.net

When you connect to this site, you will be asked to enter a username; enter 'anonymous' (without the quotes, of course). Next you will be asked for a password. Enter your e-mail address and press the Enter or Return key. After you are logged in, and you see the ftp prompt, change to the desired directory. In this case, you enter:

cd usenet/news.answers/ftp-list

Since the file we want here is in UNIX compressed format, it is a binary file (as opposed to plain text, or ASCII). To successfully transfer binary files,

you must set the transfer mode to binary. To do this, enter:

binary

To actually transfer the file to your system, enter the get command, like so:

get ftp.Z

The file will now start downloading to your system. When it's finished, and you are done transferring files, enter the 'bye' command to leave FTP. Now that you have this file, run 'uncompress' on it, and read it for more of the fine details on how to use FTP and Archie.

### 1.3.2. Telnet

telnet://strongmo:nceer@duke.ldgo.columbia.edu:23/8

The above example is a fairly complete URL for a the telnet site to access the NCEER service that reports strong seismic activity. The host name is 'duke.ldgo.columbia.edu', the port is 23; the type is 8; the username is 'strongmo'; and the password is 'nceer'. Some telnet URL's may omit everything except the host name, which means there is no special port or login procedure.

To access a telnet site (using the above as an example) enter

telnet duke.ldgo.columbia.edu 23

At the username prompt, enter 'strongmo' (without the quotes), and when asked for a password, enter 'nceer'. then simply follow the menus from there on.

### 1.3.3. Gopher

gopher://una.hh.lib.umich.edu:70/11/inetdirs

This is a typical gopher URL. To access this site, you must have a gopher client set up on your system or be able to connect to one. In this case the host name is 'una.hh.lib.umich.edu', the port is 70, the type is 1, and the selector path is 1/inetdirs. If you use gopher interactively, all you'll need to worry about is the host name and port (if it is present). Note that if there is a port specified, you may not get access if you don't include it after the host name.

In this case, enter the command:

gopher una.hh.lib.umich.edu 70

To access the gopher menu for the "Clearinghouse for Subject-Oriented Internet Resource Guides"

### 1.3.4. World Wide Web

http://info.er.usgs.gov/fgdc-catalog/title.html

The http stands for "hypertext transfer protocol", and this indicates that you need to use a World Wide Web (WWW) client to access this site or, in this case, the main USGS hypertext "home page". See the WWW FAQ file or the documentation for your WWW client software (e.g. Mosaic, Cello or Lynx, etc.) for more information on how to set up these resources.

### 1.3.5. E-Mail

mailto:geoinfo@geovax.edinburgh.ac.uk

Some resources require that you send an e-mail message and simply ask for them. In the above example, send and e-mail message to geoinfo@geovax.edinburgh.ac.uk and ask for (in this case) information on the "Catalogue of Digital Elevation Data".

## 1.4. Information on Internet Services

It is beyond the scope of this document to teach you how to use all the Internet services, but there are several very good books out on the market right now, so check your local bookstore. A good one (but rapidly getting out of date) is Ed Krol's "the Whole Internet". The ISBN number is 1-56592-025-2. Everything you need can also be found on-line (but you have to learn to dig around). The following section contains pointers to these files.

### 1.4.1. File Transfer Protocol (FTP)

URL: ftp://ftp.uu.net/usenet/news.answers/ftp-list/ftp.Z

### 1.4.2. Gopher

URL: ftp://rtfm.mit.edu/pub/usenet/news.answers/gopher-faq

### 1.4.3. Wide Area Information Servers (WAIS)

URL: ftp://rtfm.mit.edu/pub/usenet-by-group/news.answers/wais-faq/getting-started

### 1.4.4. World Wide Web (WWW)

URL: ftp://rtfm.mit.edu/pub/usenet/news.answers/www/faq

# 2. Resource References, Indexes and Pointers

As the volume of online information increases, it becomes more and more difficult to locate exactly what you want. To solve this problem, new tools are appearing to make it easier for both the beginner and the experienced internaut to navigate the vast web of knowledge known as the Internet.

Information organization and retrieval in a dynamic and decentralized environment like the Internet is proving to be a formidable challenge even for those who have studied the problem for years. Still, the difficulty of cataloging information hasn't stopped people from making the attempt. Services such as Gopher and World Wide Web (WWW) are becoming very popular as organizing tools. Resource catalogs (like this one) and Frequently Asked Questions (FAQ) files are also common.

However, a "list of resources" is out of date almost as soon as it is published or distributed. It would be incomplete if it did not also provide the reader with methods for extending his or her knowledge as the Matrix evolves. The following section provides a list of resources that are themselves continually updated pointers to resources.

## 2.1. Online Documents

These are files that are relatively static. They are updated occasionally, but generally they are designed to be a summary of the current state of things in the are they attempt to cover.

### 2.1.1. Online Resources for Earth Scientists (ORES)

This is what you are reading now. It is updated only as I get time (about every two years it seems). An appropriate reference would be:

Thoen, Bill (1994), "Online Resources for Earth Scientists", digital text file, June 1994 version. Available via ftp from ftp.csn.org in the COGS directory, 114K

URL: ftp://ftp.csn.org/COGS/ores.txt
Contact: bthoen@gisnet.com (Bill Thoen)

### 2.1.2. List of Mailing Lists

This list describes many mailing lists; not just those related to earth sciences.

URL: ftp://rtfm.mit.edu/pub/usenet/news.answers/mail/mailing-lists

2.1.3. The Clearinghouse for Subject-Oriented Internet Resource Guides (UMich)

The Clearinghouse for Subject-Oriented Internet Resource Guides is a joint effort of the University of Michigan's University Library and the School of Information and Library Studies (SILS). Its goal is to collect and make widely available guides to Internet resources which are subject-oriented. These guides are produced by members of the Internet community, and by SILS students who participate in the Internet Resource Discovery project..

URL: ftp://una.hh.lib.umich.edu/inetdirs
URL: gopher://una.hh.lib.umich.edu:70/11/inetdirs
Contact: Lou Rosenfeld (lou@umich.edu)

2.1.4. Manual of Federal Geographic Data Products

The Federal Geographic Data Committee (FGDC) has compiled the Manual of Federal Geographic Data Products to promote the coordinated development, use, sharing, and dissemination of surveying, mapping, and related spatial data. The manual describes Federal geographic data products that are national in scope and commonly distributed to the public. Geographic data products include maps, digital data, aerial photography and multispectral imagery, earth science, and other geographically-referenced data sets. Federal agencies were encouraged to list only those geographic data products that are supported by an office to which the public could make inquiries and place orders. Data products are described in a standard format and grouped by producing agency. A cross-reference matrix is provided to help readers find products by data type.

Federal Geographic Data Committee Secretariat
U.S. Geological Survey
590 National Center
Reston, VA 22092
Tel 703-648-4533
Fax 703-648-5755

However, the supply of printed copies of the "Manual of Federal Geographic Data Products" has been exhausted. The following options are available to obtain the information from the manual:

(1) black-and-white reproductions of the manual are being sold by the NTIS. Paper copies are sold for $44.50; microfiche for $17.50. In addition, there is a $3 fee for handling (US/Canada/Mexico). Telephone orders can be paid for by VISA, MasterCard, American Express, or NTIS Deposit Account. Be sure to mention stock number PB 93236503 in correspondence with NTIS.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
Attention: Order Desk
Tel 703-487-4650

The FGDC manual is also available via the World Wide Web Service on the Internet. The text of the manual, and some of the illustrations, are available from:

URL: http://info.er.usgs.gov/fgdc-catalog/title.html

2.1.5. GPS Information Sources

Langley, Richard B., 1994, "GPS Information Sources", digital text file, updated periodically, Apr 1994 version, 20747 bytes

URL: ftp://unbmvs1.csd.unb.ca/PUB.CANSPACE.GPS.INFO.SOURCES

2.1.6. World Wide Elevation Data Sources
Gittings, Bruce (1994) "Catalogue of Digital Elevation Data", Usenet comp.infosystems.gis; periodic posting

URL: mailto:geoinfo@geovax.edinburgh.ac.uk
Contact: bruce@geovax.ed.ac.uk (Bruce Gittings)

## 2.2. Frequently Asked Questions (FAQ) Files

These are files that are created to provide answers to the most often asked questions in their particular area of interest. If you have any questions about a particular subject, you should first see if there is a "FAQ" on it, and read it first if there is.

2.2.1. Data Standards
Lutz, Dale (1994), "SAIF Frequently Asked Questions", Usenet comp.infosystems.gis, digital text file.

Contact: infosafe@safe.com (Dale Lutz)

2.2.2. GIS
Nyman, Lisa and Virgil Sealy, (1994) "Frequently Asked Questions with Answers about Geographic Information Systems", Usenet comp.infosystems.gis, updated monthly, 117K.

URL: ftp://abraxas.adelphi.edu/pub/gis/FAQ
URL: ftp://ftp.census.gov/pub/geo/gis-faq.txt
Contact: panda@syrinx.umd.edu (Lisa Nyman)

2.2.2.1. IDRISI
Morgan, Jay, 1994, "IDRISI-L Frequently Asked Questions (FAQ) List (Version 1.3)", digital text file, 27K.

URL: ftp://midget.towson.edu/
Contact: E7G4MOR@TOE.TOWSON.EDU (Jay Morgan)

2.2.2.2. MapInfo
McCombs, John (1994), "MapInfo Frequently Asked Questions", Windows Help file, updated monthly, 139K.

URL: ftp://ftp.csn.org/mapinfo/mi_faq.zip
Contact: john@inmap.co.nz (John McCombs)

2.2.3. Geology
Ramshaw, R. Spencer (1994) "FAQ sci.geo.geology", Usenet sci.geo.geology, digital text file. updated monthly

Contact: rsr@amthyst.dweomer.org (R. Spencer Ramshaw)

2.2.4. Biology
Smith, Una R. (1993), "A Biologist's Guide to Internet Resources", Usenet sci.answers. Available via gopher, anonymous FTP and e-mail from various archives. For a free copy via e-mail, send the text "send pub/usenet/sci.answers/biology/guide/*" to the e-mail address mail-server@rtfm.mit.edu. ~45 pages.

Contact: smith-una@yale.edu (Una Smith)

2.2.5. Meteorology
Stern, Illana (1994), "Sources of Meteorological Data Frequently Asked Questions (FAQ)". Usenet news.answers (bi-monthly). digital text file, 68K

To recieve this document via e-mail, send a message to mail-server@rtfm.mit.edu with the line:

send /pub/usenet/news.answers/weather/data/part1

in the body. Other sources are listed below.

URL: ftp://rtfm.mit.edu/pub/usenet/news/answers/weather/data/part1
URL: ftp://vmd.cso.uiuc.edu/wx/sources.doc
URL: http://www.cis.ohio-state.edu/hypertext/faq/usenet/weather/top.html
Contact: ilana@ncar.ucar.edu (Ilana Stern)

## 2.3. Online Catalogs and Resource Pointers

As the Internet grows we are beginning to see an explosion of growth in "pointer to resources" like WWW pages and gopher sites. These are great to find out the latest resources, but they tend to be overly-redundant, and some are not organized as long lists of pointers without much help on where to find anything specific.

### 2.3.1. Information Sources: the Internet and Computer-Mediated Communication

URL: file://ftp.rpi.edu/pub/communications/internet-cmc.html
This points to just about every Internet reference guide around!

### 2.3.2. Michael McDermott's GIS Resources Pointers

URL: ftp://gis.queensu.ca/pub/gis/docs/gissites.txt
URL: ftp://gis.queensu.ca/pub/gis/docs/gissites.html
IP: 130.15.94.1
Contact: mcdermom@gisdog.gis.queensu.ca (Michael J. McDermott)

### 2.3.3. Roland Stahl's GIS Resource Pointers

URL: http://www.laum.uni-hannover.de/gis/gisnet/gisnet.html

### 2.3.4. A GIS User Guide to Tools

Murnion, Shane and George Munroe (1994?) "A GIS User Guide to Tools", Html text file.

This guide provides a good overview of some of the software tools that can be used to find GIS information on the Internet.

URL: file://jupiter.qub.ac.uk/pub/GIS/GIS.html

### 2.3.5. United States Geological Survey Home Page

This is the main starting point for on-line information about the USGS, its programs and missions. It also contains an extensive list of other pointers to Earth Science and GIS resources not specifically managed by the USGS.

URL: http://info.er.usgs.gov/

### 2.3.6. CERN - WWW Virtual Library on the subject of Geography

URL:
http://info.cern.ch/hypertext/DataSources/bySubject/Geography/Overview.html

### 2.3.7. Annotated Scientific Visualization URL Bibliography

This is a collection of pointers to weblets on the subject of scientific visualisaztion. It looks well-maintained.

URL: http://www.nas.nasa.gov/RNR/Visualization/annotatedURLs.html

### 2.3.8. EINet Galaxy's Pointers to Geosciences Resources

Large list of pointers to earth science resources.

URL: http://galaxy.einet.net/galaxy/Science/Geosciences.html

2.3.9. Software Support Laboratory for Space and Earth Scientists
Software tools for Space and Earth Scientists

URL: http://sslab.colorado.edu:2222/ssl_homepage.html

2.3.10. National Geophysical Data Center
This is the main starting point for information on NGDC programs and activities.

URL: gopher://gopher.ngdc.noaa.gov
URL: http://www.ngdc.noaa.gov/ngdc.html

2.3.11. MIT Earth Resources Laboratory - Home Page
URL: http://www-erl.mit.edu/

2.3.12. CIESIN - Information Gateway
The Consortium for International Earth Science Information Network(CIESIN) is cataloging metadata on the human dimensions of global environmental change, also in the Directory Interchange Format(DIF).

URL: telnet://gopher@gopher.ciesin.org
Contact: MDUSO@NSSDCA.GSFC.NASA.GOV

2.3.13. ERIN - Environment Environmental Resources Information Network
Environmental Resources Information Network (ERIN) has been established in Australia to draw together and distribute any information on the environment.

URL: http://kaos.erin.gov.au:80/erin.html
URL: gopher://kaos.erin.gov.au

2.3.14. GCMD - The Global Change Master Directory
The Global Change Master Directory (GCMD) is a multidisciplinary on-line information system containing descriptions of Earth and space science data holdings available to the science community. These include data from NASA, NOAA, NCAR, USGS, DOE (CDIAC), EPA, NSF and other U.S. agencies, universities, research centers as well as international agencies.

URL: telnet://NSSDC@128.183.36.23: (U.S.A.)
URL: telnet://GCNET@132.156.47.218 : (Canada)
URL: telnet://ESAPID@192.106.252.160: (Europe)
URL: telnet://NASDADIR@133.56.72.1 : (Japan)
Contact: mduso@nssdca.gsfc.nasa.gov

2.3.15. GLIS - Global Land Information System
This is a Telnet hypertext system about land information databases. You can order data through here as well as download some of it directly to your PC. Most of the data sets available through government agencies are referenced here.

URL: telnet//glis.cr.usgs.gov
IP: 152.62.192.54 (unofficial)

2.3.16. NASA Information by Subject
URL: http://hypatia.gsfc.nasa.gov/nasa_subjects/nasa_subjectpage.html

2.3.17. NASA Master Directory of Earth Science Data Sets
To find high-level information about any science data from earth satellites or planetary missions, including land observations, ocean data, meteorology, astronomy, earth/sun science, etc., use the NASA Master Directory. Also available are data/observations made from earth or of earth. Navigate the menus and you'll find out where to get the information you want on any satellite or instrument on a satellite.

Once you locate interesting data sets through the MD, it's often possible to link to the specific system that holds the data and order it online. From

NSI/DECNet, SET HOST NSSDCA.

URL: ftp://nssdca.gsfc.nasa.gov
Contact: mduso@nssdca.gsfc.nasa.gov

2.3.18. NSSDC- National Space Science Data Center On-Line Data
The National Space Science Data Center (NSSDC) On-Line Data and Information Service (NODIS) is a menu-driven interactive system which provides information on services and data supported by NSSDC. Includes *NASA Master Directory* -- an online search system providing brief overview information about NASA and many important non-NASA space and earth science data, and data information systems. In some cases, the directory offers automatic network connections to catalogs or other systems. Some topics: Nimbus-7 GRID TOMS Data, Geophysical Models, Standards and Technology Information System.

URL: telnet://NSSDC@nssdca.gsfc.nasa.gov
IP: 128.183.36.23

2.3.19. Naval Observatory Automated Data Service
URL: telnet://ads@tycho.usno.navy.mil
IP: 192.5.41.239

2.3.20. NCAR - National Center for Atmospheric Research data support archive
URL: ftp://ncardata.ucar.edu
IP: 128.117.8.111

2.3.21. STIS - Science & Technology Information Service
Science & technology Information Service STIS is maintained by the National Science Foundation.

URL: telnet://public@stis.nsf.gov
IP: 128.150.195.40

2.3.22. NCSU Library - Earth and Geography gophers
URL: gopher://dewey.lib.ncsu.edu:70/11/library/disciplines/earth
URL: gopher://dewey.lib.ncsu.edu:70/11/library/disciplines/geography/gis

2.3.23. UCSC- University of California - Santa Cruz Earth and Marine Science Gopher
URL: gopher://scilibx.ucsc.edu:70/11/The Researcher/Science and Engineering/Earth and Marine Sciences

2.3.24. Rice University
URL: gopher://chico.rice.edu:70/11/Subject/Geology

2.3.25. UTEP - University of Texas at El Paso GeoGopher
This is one of the better subject-oriented lists of resource pointers for Geology interests.

URL: gopher://dillon.geo.ep.utexas.edu:70/11/EarthScienceRes

2.3.26. Oklahoma Geological Survey gopher
URL: gopher://wealaka.okgeosurvey1.gov

2.3.27. UCSB - University of California - Santa Barbara Geological Sciences Gopher
URL: gopher://gopher.geol.ucsb.edu

2.3.28. Northwestern University, Dept. of Geological Sciences gopher
URL: gopher://gopher.earth.nwu.edu

## 2.4. Newsletters

### 2.4.1. Electronic Atlas Newsletter

This is a hard copy newsletter "dedicated to information about 'real-life' and professional applications of Geographic Information Systems (GIS)". To receive a free sample copy of the newsletter contact:

Brian J. Matuschak
c/o Electronic Atlas Newsletter
1414 N Northgate #101
Seattle, WA 98133
Tel: 206-525-7155
Contact: bjm@hebron.connected.com (Brian Matuschak)

### 2.4.2. HOTLINE Climate Change Newsletter

HOTLINE is an occasional newsletter from the US Climate Action Network dedicated to updates and information on climate change science and policy. HOTLINE will include information on climate change science, as well as updates on current events: from local initiatives in the United States, to international treaty negotiations. HOTLINE is intended to inform scientists, local activists and organizations about the science surrounding the potential threat of climate change, and current policy efforts to avoid this threat.

URL: ftp://igc.apc.org/pub/ECIX/hotlineMMYY (MMYY = month/year, e.g. 0194=Jan 94)
IP: 192.82.108.1
Contact: uscan@igc.org
US Climate Action Network
1350 New York Ave.
NW Suite 300
Washington, D.C. 20005

### 2.4.3. GPS Digest

The GPS Digest is a forum for the discussion of topics related to the USAF Global Positioning System (GPS) and other satellite navigation positioning systems. The GPS Digest is moderated and is not presently available via USENET newsgroup. Submissions should be made to gps@tws4.si.com. Administrative requests should be made to gps-request@tws4.si.com.

Past issues of the GPS Digest can be found in the file archives of the Canadian Space Geodesy Forum are at:

URL: ftp://unbmvs1.csd.unb.ca/PUB.CANSPACE.GPS.DIGEST.V1
URL: ftp://unbmvs1.csd.unb.ca/PUB.CANSPACE.GPS.DIGEST.V2
IP: 131.202.1.2
Contact: lang@unb.ca (Richard Langley)

## 2.5. Usenet Newsgroups

Usenet newsgroups are one of the biggest firehoses you can drink from on the Internet. These are public mailing lists where people from all over the world post their comments, opinions, wisdom, flames, and insanities. It can often be a challenge to separate the signal from the noise in these channels, but most of this document originally developed from message on these lists.

There are thousands of these topically oriented lists ranging from hard science to sexual fantasy interests, to gaming, to lawn care, to you-name-it-it's here.

Unfortunately, these are not available to everybody. Ask you system administrator if you have access to Usenet. If you don't have access, ask why not. you are missing a big part of the experience.

### 2.5.1. comp.infosystems.gis

Discussion of Geographic Information Systems (GIS) topics. This is the main GIS newsgroup.

### 2.5.2. sci.geo.fluids

Discussion of geophysical fluid dynamics.

2.5.3. sci.geo.geology
Discussion of general interest geological topics. This is the main newsgroup for geology.

2.5.4. sci.geo.meteorology
Discussion of general interest meteorological topics. This is the main newsgroup for meteorology.

2.5.5. sci.techniques.spectroscopy
The main aim of sci.techniques.spectroscopy is to provide an open forum for the discussion of spectroscopy and related fields on the Internet and to provide a catalyst for improved dissemination of information between those working with spectroscopy.

2.5.6. sci.geo.hydrology
The objective of this newsgroup is to provide a forum for discussion on issues pertaining to surface and groundwater hydrology, their relation to climate, water quality issues and water resource management and policy issues.

## 2.6. Mailing Lists

Mailing lists, or mailing reflectors, are e-mail services set up to send messages to a group of subscribers automatically. Once you subscribe, you receive a copy of every e-mail message sent to the list. There are two addresses associated with every list, and it is important to understand how each address differs. First, there is the server address. This is the address you send requests to in order to subscribe or unsubscribe, receive files, get help, etc. Second, there is the list address itself, which is the address you send public messages related to the list's topic. Never, EVER send a subscribe or unsubscribe command to the list--these messages must only go to the server! You'll only look stupid and annoy everybody else if you send "subscribe" messages to the list.

There are several types of list server software, but most common is the 'listserv' software. To subscribe to any of the following lists send a messages to the SERVER address that contains the line:

subscribe list-name FirstName LastName

Replace 'list-name' with the actual list name, and 'FirstName LastName' with your name, or the name you want to be known as on this list. For example, if your name is 'Gerhardus Mercator' and you wished to subscribe to GIS-L, the Geographic Information Systems mailing list, you would send a message to listserv@ubvm.cc.buffalo.edu, and put on the first line:

subscribe GIS-L Gerhardus Mercator

Then, within a day or so, you will receive an e-mail message from the server confirming your subscription, and providing you with additional information and instructions about using the GIS-L list. Save this 'welcome' message! It contains important information that you will want to have later.

Messages posted to the list would start to appear automatically in your mailbox. You can get quite a lot of mail this way (GIS-L generates over 50 messages a day), so be prepared to clean out your mailbox regularly.

Note that not all mailing lists use the listserv software. In the following descriptions, exceptions to the listserv convention are mentioned if they apply. If subscription information is not specifically described, then you can assume that the listserv example mentioned above is what you use.

2.6.1. ACDGIS-L GIS Discussions for German-speaking Countries
Topics include GIS, Cartography, Remote Sensing and Image Processing as related to GIS, Geo-Statistics. This list aims at improving local/regional communication and is viewed as complementary to GIS-L.

Server: listserv@awiimc12.bitnet
List: ACDGIS-L@awiimc12.bitnet
Contact: wigeoarn@awiwuw11.bitnet (Zoltan Daroczy)

2.6.2. AQUIFER Pollution and Groundwater Recharge
Server: listserv@ibacsata.bitnet
List: AQUIFER@ibacsata.bitnet

2.6.3. CANSPACE Canadian Space Geodesy Forum
Any topic related to the space geodetic techniques of GPS, Transit, VLBI, SLR, satellite altimetry, etc., may be discussed. Information concerning satellite launches and orbital elements may be posted. Questions are particularly encouraged. GPS Constellation daily status reports and ionospheric disturbance warnings are posted.

Server: listserv@unbvm1.bitnet
List: CANSPACE@unbvm1.bitnet
Contact: lang@unb.ca (Richard B. Langley)

2.6.4. CLIMLIST Climatology Information and News
Server: listserv@psuvm.psu.edu
List: CLIMLIST@psuvm.psu.edu

2.6.5. COASTGIS Coastal GIS Mailing List
This is set up to discuss issues relating to Coastal Applications of GIS.

Server: listserv@irlearn.ucd.ie
List: COASTGIS@irlearn.bitnet
Contact: STGG8004@iruccvax.ucc.ie (Darius Bartlett)

2.6.6. COASTNET Coastal Management and Resources
This discussion list covers topics related to Coastal Management and Resources.

Server: Listserv@uriacc.uri.edu or listserv@uriacc.bitnet
List: COASTNET@uriacc.uri.edu or COASTNET@uriacc.bitnet
Contact: rpuf4584@uriacc.uri.edu or puf4584@uriacc.bitnet (Robert H. Puffer)

2.6.7. CONSGIS Conservation Biology And GIS
Server: listserv@uriacc.bitnet
List: CONSGIS@uriacc.bitnet

2.6.8. ENERGY-L Energy Discussion List
Server: listserv@taunivm.bitnet
List: ENERGY-L@taunivm.bitnet

2.6.9. ESRI-L Arc/Info Support List
The purpose of this list is to provide users of ESRI software with a forum to ask questions of each other and exchange technical information and expertise. It is not seen as a competitor to our CompuServe forum which serves a different clientele and is primarily to support ESRI's PC based products.

Server: listserv@esri.com
List: ESRI-L@esri.com
Contact: esri-l-human@esri.com

2.6.10. GEOCAL Geography, Geology, Town and Regional Planning, Meteorology
The CTI Centre for Geography has established a discussion list on Computer Assisted Learning at the University of Leicester. This moderated list will discuss all aspects of CAL/CBT/CAI/CML within the Centre's 'community' of

Geography, Geology, Town and Regional Planning and Meteorology.

To subscribe, send e-mail to the list server, and put

JOIN GEOCAL FirstName LastName

as the first line of the message. An example would be:

join geocal Chris Columbus

from outside UK:

Server: mailbase@mailbase.ac.uk
List: GEOCAL@mailbase.ac.uk

Within UK:

Server: mailbase@uk.ac.mailbase
List: GEOCAL@uk.ac.mailbase
Contact: cti@uk.ac.leicester (John Castleford)

2.6.11. GEOGRAPH Geography discussion list
GEOGRAPHy is an experimental BULLETIN BOARD and DISCUSSION FORUM for academic geography - faculty, students and other persons having interests in the field of modern geographic research.

Server: listserv@searn.sunset.se
List: GEOGRAPH@searn.sunset.se

2.6.12. GEOLOGY Geology discussion list
Discussion of Geology topics

Server: listserv@ptearn.bitnet
List: GEOLOGY@ptearn.bitnet
Contact: AMORIM@PTEARN.bitnet (Pedro Amorim)

2.6.13. GEONET-L Geoscience Librarians & Information Specialists
Server: listserv@iubvm.bitnet
List: GEONET-L@iubvm.bitnet

2.6.14. GIS-L Geographic Information Systems Topics
This discussion group focuses on all aspects of GIS and digital cartography and analysis. This is generally considered to be the main list for GIS. It is also available as a Usenet newsgroup as comp.infosystems.gis.

Server: listserv@ubvm.cc.buffalo.edu or listserv@ubvm.bitnet
List: GIS-L@ubvm.cc.buffalo.edu or GIS-L@ubvm.bitnet
Contact: GIS-L-Request@ubvm.cc.buffalo.edu

2.6.15. GIST-L GIS Transport Discussion Group
Server: listserv@ukacrl.bitnet
List: GIST-L@ukacrl.bitnet

2.6.16. GPS-L Globally Positioned Satellite Topics
Server: gps-request@tws4.si.com
List: GPS-L@tws4.si.com

2.6.17. GRASS lists
Sending mail to either server address with "SUB Your Name" in the subject line or in the text (left-justified, no quotes) will sign you up for the list and you will begin receiving mail from others. To quit, just replace SUB above with UNSUB.

GRASS Users' list

Server: grassu-request@moon.cecer.army.mil
List: grassu-list@moon.cecer.army.mil

GRASS Programmers List

Server: grassp-request@moon.cecer.army.mil
List: grassp-list@moon.cecer.army.mil
Contact: grass-lists-owner@moon.cecer.army.mil

2.6.18. HYDROLOGY Hydrology Topics
Monash University in Australia has a Hydrology Mailing List set up for general open discussion on all matters concerning hydrology.

Server: listserv@eng.monash.edu.au
List: HYDROLOGY@eng.monash.edu.au

2.6.19. IDRISI-L Idrisi Support List
IDRISI-L is an Internet and Bitnet discussion group for users of the IDRISI software package developed by the Graduate School of Geography at Clark University. The purposes of IDRISI-L are: 1) to foster communication among the community of IDRISI users; 2) to encourage the application of IDRISI to real world problems; and 3) to provide user feedback regarding IDRISI to the Graduate School of Geography at Clark University. IDRISI-L is supported by the Department of Geography and Environmental Planning at Towson State University.

Server: mailserv@towsonvx.bitnet or mailserv@toe.towson.edu
List: IDRISI-L@towsonvx.bitnet or IDRISI-L@toe.towson.edu
Contact: e7g4mor@toe.towson.edu (Dr. John M. Morgan, III).

2.6.20. IMGRS-L Digital Image Processing of Remotely Sensed Data
Server: listserv@csearn.bitnet
List: IMAGRS-L@csearn.bitnet or IMAGRS-L@csearn.earn

2.6.21. MAPHIST Historical Maps Topics
MAPHIST-L is a discussion group whose primary focus is historical maps, atlases, globes and other cartographic formats. This listserv is open to all persons interested in the history of cartography and discussion is encouraged on all aspects of this broad subject.

The primary purpose of MAPHIST-L is to encourage individuals to communicate current research; evaluate methods and tools of analysis; announce important acquisitions and news; announce position vacancies; announce new publications (direct advertising, however, is discouraged); investigate library holdings; and to share information between conferences and the appearance of relevant journals.

Server: listserv@harvarda.harvard.edu
List: MAPHIST@harvarda.harvard.edu
Contact: cobb@widener1.mhs.harvard.edu (David Cobb)

2.6.22. MAPINFO-L MapInfo Discussion Group
The purpose of the MAPINFO-L mailing list is to provide a world-wide E-mail forum for discussing issues of interest to users, dealers, and developers of MapInfo software, applications and data sets. Topics can range from narrow technical details of using MapInfo to broad issues about GIS and Mapping.

To join, send e-mail to the server, and put

SUBSCRIBE MAPINFO-L

On the first line of the message. You will receive a confirmation message with additional information once you are successfully signed up. Note that this list does not use 'listserv' software, so do not put your name on the subscribe line!. Also the word 'subscribe' must be spelled out completely,

but it can be in either upper or lower case text.

Server: majordomo@csn.org
List: MAPINFO-L@csn.org
Contact: MAPINFO-L-Owner@gisnet.com (Bill Thoen)

2.6.23. MAPS-L Maps and Air Photos Systems Forum
This list is strongly oriented towards issues involved in map librarianship; such as storing, cataloging, preserving, classification, etc. of maps and air photos. Also good source for information on ancient sites and maps, and hard-to-answer geography questions.

Server: listserv@uga.bitnet
List: MAPS-L@uga.bitnet or MAPS-L@uga.cc.uga.edu
Contact: jsutherl@uga.cc.uga.edu (Johnnie D. Sutherland)

2.6.24. MDGIS-L Discussion list for Maryland GIS users
Server: mailserv@towsonvx.bitnet or mailserv@toe.towson.edu
List: MDGIS-L@towsonvx.bitnet or MDGIS-L@toe.towson.edu

2.6.25. NSDI-L US National Spatial Data Infrastructure
The purpose of this list is to discuss issues in the US National Spatial Data Infrastructure (NSDI). The National Research Council definition of NSDI is given as: The National Spatial Data Infrastructure is the means to assemble geographic information that describes the arrangement and attributes of features and phenomena on the Earth. The infrastructure includes the materials, technology, and people necessary to acquire, process, store, and distribute such information to meet a wide variety of needs.

Server: listproc@grouse.umesve.maine.edu
List: NSDI-L@grouse.umesve.maine.edu
Contact: stevef@grouse.umesve.maine.edu (Steven Frank)

2.6.26. QUAKE-L General Earthquake Discussion
The focus of this mailing list is on the ways various national and international computer networks can help in the event of an earthquake. One of the basic problems discussed might be network reconfigurations which would be temporarily required; others might be in actually putting various groups in electronic contact with each other.

Public notebooks for the list will be available from the server (send the command "information database" to the server for details), and are available via anonymous FTP.

URL: ftp://vm1.nodak.edu/LISTARCH/QUAKE-L.*
IP: 134.129.111.1
Server: listserv@vm1.nodak.edu or listserv@ndsuvm1.bitnet
List: QUAKE-L@vm1.nodak.edu or QUAKE-L@ndsuvm1.bitnet
Contact: nu021172@vm1.nodak.edu
Contact: nu021172@ndsuvm1.bitnet (Marty Hoag)

2.6.27. QUATERNARY List
This mailing list is for all interested in research in the Quaternary geological period, including geologists, geomorphologists, soil scientists, palaeoenvironmentalists, archaeologists, palaeontologists, geochronologists, palynologists, and others. An FTP site is also available.

Server: listserv@morgan.ucs.mun.ca
List: QUATERNARY@morgan.ucs.mun.ca
URL: ftp://zeppo.geosurv.gov.nf.ca
Contact: dgl@zeppo.geosurv.gov.nf.ca (Dave Liverman)

2.6.28. RAILROAD List
To subscribe to the railroad list, send a message to listserv@cunyvm.cuny.edu with the line "subscribe railroad" in the body.

2.6.29. SEISM-L Seismological Data Distribution
Seismological data for general distribution

Server: listserv@bingvmb or listserv@bingvmb.cc.binghamton.edu
List: SEISM-L@bingvmb or SEISM-L@bingvmb.cc.binghamton.edu
Contact: fwu@bingvmb.bitnet (Francis Wu)

2.6.30. SEISMD-L Seismological Discussion
Seismological topics of general interest

Server: listserv@bingvmb or listserv@bingvmb.cc.binghamton.edu
List: SEISMD-L@bingvmb.bitnet or SEISMD-L@bingvmb.cc.binghamton.edu
Contact: fwu@bingvmb.bitnet (Francis Wu)

2.6.31. SOILS-L Soil Science
A forum for the discussion of all subjects dealing with soil science. Soil physics, chemistry, genesis, classification, mineralogy, fertility, conservation, etc. may be discussed within this unmoderated group. The formation of this group has been sanctioned by The American Society of Agronomy and the Soil Science Society of America.

Server: listserv@unl.edu
List: SOILS-L@unl.edu
Contact: jp@unl.edu (Jerome Pier)

2.6.32. STAT-GEO Quantitative Methods In Geosciences
Forum of quantitative methods in geosciences.

Server: listserv@ufrj.bitnet or listserv%ufrj.bitnet@vtbit.cc.vt.edu
List: STAT-GEO@ufrj.bitnet or STAT-GEO@%ufrj.bitnet@cunyvm.cuny.edu
Contact: igg02001@ufrj.bitnet (Hugo Richard)

2.6.33. TGIS-L Temporal Topics in GIS Mailing List
TGIS-L is a listserver set up to facilitate discussion of all issues regarding temporal topics in GIS (Geographic Information Systems). TGIS-L has been established by joint effort of the ICA Interest Group on Temporal Topics in GIS and the US National Center for Geographic Information and Analysis. The ICA Interest group is chaired by Gail Langran (langran@u.washington.edu). The NCGIA's research initiative #10, on "Spatio-Temporal Reasoning and GIS", is co-led by Max Egenhofer (max@mecan1.maine.edu) and Reg Golledge (golledge@ncgia.ucsb.edu).

Postings to this list should focus on research, commentary, and business concerning spatiotemporal subjects. These include, but are not limited to: time in GIS; spatio-temporal reasoning; representing time on maps; dynamic cartography; temporal aspects of spatial cognition.

Server: listserv@ubvm.cc.buffalo.edu or listserv@ubvm.bitnet
List: TGIS-L@ubvm.cc.buffalo.edu or TGIS-L@ubvm.bitnet
Contact: geodmm@ubvms.cc.buffalo.edu (David Mark)

2.6.34. TRANSIT List
Send a message to listserv@gitvm1.bitnet with the message "subscribe transit" in the body, to subscribe to the transit list.

2.6.35. TRANSP-L Transportation Planning
Send a message to listproc@gmu.edu with the message "subscribe transp-l" in the body, to subscribe to the transportation planning list.

2.6.36. UIGIS-L GIS User Interface issues
The central theme of this discussion group is the issues about the user interface for GIS software.

Server: listserv@ubvm.bitnet

List: UIGIS-L@ubvm.bitnet

2.6.37. URBAN-L Urban Planning
Send a message to listserv@trearn.bitnet with the message "subscribe urban-1" in the body, to subscribe to the urban planning list.

Server: listserv@trearn.bitnet
List: URBAN-L@trearn.bitnet

2.6.38. VIGIS-L Virtual World Interfaces for GIS
VIGIS-L is a mailing list for those specifically interested in Virtual World Interfaces and their application to Geographic Information Systems.

Its purpose is to provide a forum for issues specifically surrounding the use of Virtual Worlds (Virtual Reality) Interfaces for Geographic Information Systems as well as any and all spatial information/decision support systems. The broad goal is to generate constructive discussions about how Virtual Worlds will be used in GIS, as well as approach the fundamental issue of why implement VR at all.

Server: listserv@uwavm.bitnet
List: VIGIS-L@uwavm.bitnet

2.6.39. VOLCANO Volcano Discussion list
It carries some discussions about volcano-related issues, as well as the monthly Global Volcanism Network reports. The latter are published by a group of geologists at the Smithsonian; we receive the reports a few weeks before they come out in print. I also maintain a list of volcanologists called VLIST FILE. VLIST contains names, e-mail addresses, research interests, job titles, and fax numbers for a hundred or so volcanologists and assorted fans.

If you would like to join volcano listserv, send a brief note to Jon Fink at AIJHF@ASUACAD.BITNET.

List: VOLCANO@asuacad.bitnet
Contact: aijhf@asuacad.bitnet (Jon Fink)

## 2.7. Bibliographies

### 2.7.1. NCGIA Publications
NCGIA publications, Initiatives, annual reports, and tech reports.

URL: ftp://ncgia.ucsb.edu/pub/biblio
IP: 128.111.254.105
Contact: postmaster@ncgia.ucsb.edu or raj@ncgia.ucsb.edu (Richard A. Johnson)

The NCGIA Bibliographies can also be found at U Maine.

URL: ftp://grouse.umesve.maine.edu/pub/NCGIA/Biblio
Contact: stevef@grouse.umesve.maine.edu

### 2.7.2. Bibliography from the Tectonics and Topography Conference
This directory includes the bibliography from the Tectonics and Topography conference held on Aug 31 to Sept 4, 1992. The bibliography is in several formats: text, text for procite import, and macintosh endnote. The macintosh version is compressed, and binhexed.

URL: ftp://magic.ucsb.edu/pub/chapman
Contact: dwv@magic.ucsb.edu (David Valentine)

### 2.7.3. EPA National Library
EPA National Library on-line database can be accessed for bibliographic searches.

URL: telnet://epaibm.rtpnc.epa.gov

IP: 134.67.180.1

2.7.4. Multidisipline Bibliographic Database
This contains a lot in geology but is not near as good as commercial databases like GeoRef.

URL: telnet://database.carl.org

## 3. Resources by Subject

### 3.1. Bulletin Board Systems (BBS)

BBS systems are often the best sources of good up-to-date and organized information. Because they are run by individuals who try to reach an audience every day with news and fresh perspectives, you get the benefit of an active site of information. Ask a question of the Sysop (the system operator of the BBS), and you'll get an answer within a day at least. They also tend to specialize in a particular field, so if you want to know something about that field, chances are the BBS is the place to check first, even before you go searching the Internet. Most BBS operators are often well aware of what's out there on the net already.

For example, GISnet BBS specializes in GIS resources, and even though it is not as big as the whole Internet, if you log in there you can usually find just the pointer you need to the multi-megabyte database you've been looking for. Even things that don't get saved on the Internet (like interesting message threads) are often archived here.

To reach BBSes, you need to use a modem and dial out over regular telephone lines.

3.1.1. The GeoInfo Network
GeoInfo Network is an association of BBS systems throughout North America that specialize in earth science or GIS interests.

| | | |
|---|---|---|
| CDMG Online | 916-327-1208 | Sacramento, CA |
| COGSnet | 303-526-1617 | Golden, CO |
| Computer Plumber | 319-337-6723 | Iowa City, IA |
| Computer Solutions | 504-542-9600 | Hammond, LA |
| Dark Matter | 604-534-7667 | Langley, BC |
| GeoFuel | 416-829-0858 | Oakville, ONT |
| GeoNet | 316-265-6457 | Witchita, KS |
| Geotechnica | 303-933-0712 | Littleton, CO |
| GISnet | 303-447-0927 | Boulder, CO |
| NASA MLP | 206-871-3965 | Port Orchard, WA |
| PSN (Memphis) | 901-360-0302 | Memphis, TN |
| PSN (Pasadena) | 818-797-0536 | Pasadena, CA |
| PSN (San Jose) | 408-226-0675 | San Jose, CA |
| RMAG BBS | 303-473-0048 | Boulder, CO |
| SurveyNet | 207-549-3213 | Whitefield, ME |

### 3.2. Jobs in Earth Sciences

3.2.1. GIS Jobs Clearinghouse
Intended to be a simple listing of jobs related to GIS and other similar fields (image processing, GPS etc...). The archive will be accessible via gopher and WWW. This is NOT a new mailing list, rather an archive of submissions from those advertising positions. Please, only send announcements if you're the originator of the announcement. To post a send mail to: jobs@torpedo.forestry.umn.edu and please include the following on the subject line: job title, location (state, country, zip code) and a closing date.

Look under "Remote Sensing and GIS Information" on either server.

URL: gopher://walleye.forestry.umn.edu:70/11/gopher
URL: http://walleye.forestry.umn.edu/0/www/main.html
Contact: sdlime@soils.umn.edu (Steve Lime)

3.2.2. Federal Government Jobs
This site has a sub section of jobs listed by the Federal government. This includes many different offers, not just those related to earth sciences.

URL: telnet://fedworld.gov

3.2.3. The GeoInfo Network BBSes -- Job conferences
The GeoInfo BBS network maintains a conference of jobs available in the earth sciences. Most of these are originally advertised over the Internet, but if you aren't following all the relevant Internet conferences, you can catch up here. See the listing of BBSes above to find the one nearest to you.

3.2.4. Jobs listed by keyword/geographic search
Current job announcements in many, many fields. The gopher index is searchable by geographic area, keyword (like gis), etc.

URL: gopher://nero.aa.msen.com

## 3.3. Programming - Algorithms Source Code and Data Formats

3.3.1. Computers & Geoscience Source Code
The IAMG will establish an ftp site effective June 1st, 1994. This service will provide Internet users access to programs and test data that have been published in the journals, Computers and Geosciences and Mathematical Geology. The service is intended to assist members in obtaining programs/data which have been previously difficult or time consuming to obtain.

Programs will be stored in both tar (UNIX) and zip (PKZIP-DOS) forms. Code access will be by Journal, Volume and Number. Thus, for Computers & Geosciences, the file v20-5-10.zip will contain programs published in Volume 20, Number 5, Paper/Note #10. The files are in the directory: /pub/CG.

For the Journal Mathematical Geology, program code from Volume 25, No. 5, Paper/Article #1 will be in file v25-5-1 in directory /pub/MG.

URL: ftp://imag.org
Contact: rsr@amthyst.dweomer.org (Spencer Ramshaw)

3.3.2. Point In Polygon
Fastest Point in Polygon Test, Eric Haines, in Ray Tracing News, vol. 5, no. 3, September, 1992; ftp://princeton.edu/pub/Graphics/RTNews/RTNv5n3.Z

3.3.3. Voronoi Tessellation source code
Source code from the article Spatial Data And The Voronoi Tessellation, Dr. Dobbs Journal, Dec 1992

URL: ftp://ftp.mv.com/pub/ddj/dec94

3.3.4. Viewshed Algorithms
skatz@DSC.BLM.GOV (Sol Katz 303-236-0101) writes:

"Look at yalemap (original and 2 prettified versions). It has a viewshed program written in f77. You can see how it works using cogsmap or skmap in the same directory. (skmap has better graphics)."

URL: ftp://dsc.blm.gov/pub/gis/yalemap.zip
Contact: skatz@DSC.BLM.GOV (Sol Katz 303-236-0101)

3.3.5. TIN "Linear Time Algorithm" Software
An article is published in IJGIS, 1993, Vol. 7, No. 6, pp. 501-524 describes a "linear-time algorithm". The associated DOS-executable program developed

by the author is available.

URL: ftp://shelf.ersc.wisc.edu/pub/CHIDTVD.ZIP

3.3.6. Thiessen / Voronoi Polygons & Delauney Triangle Algorithms
C source code for calculating vectors for Thiessen Polygons:

URL: ftp://netlib.att.com:netlib/voronoil/sweep2.Z

The GRASS module, s.voroni.

URL: ftp://pasture.ecn.purdue.edu/pub/mccauley/grass/s.voroni

The NCSA 'MinMaxer' is a triangulation system that does, amongst others, Delaunay triangulation, which is the dual to Voronoi or Thiessen polygons.

URL: ftp://ftp.ncsa.uiuc.edu/SGI/MinMaxer

3.3.7. AML code for ARC/INFO 5.0, 6.11
URL: ftp://dis2qvarsa.er.usgs.gov/amls

3.3.8. AML code for GIRAS data
URL: ftp://dis2qvarsa.er.usgs.gov/data/giras

3.3.9. AML ftp site
There is a very small ftp site of AMLs at:

URL: ftp://wigeo.wu-wien.ac.at/pub/acdgis-l/aml
URL: ftp://wigeo.wu-wien.ac.at/pub/acdgis-l/sml: PC Arc/Information

3.3.10. Coordinate Conversion Software
USGS General Cartographic Transformation package converted to C

URL: edcftp.cr.usgs.gov/software/gctpc

3.3.11. Topographic Analysis source code (FORTRAN)
URL: ftp://edcftp.cr.usgs.gov/software/topo

3.3.12. DCW to DXF conversion:
URL: ftp://dsc.blm.gov/pub/gis/dcw2dxf.zip

3.3.13. UNIX version of VPFView 1.1 (to view DCW data) is available from:
URL: ftp://jupiter.drev.dnd.ca
URL: ftp://cc.drev.dnd.ca
IP: 131.132.32.2
Contact: parento@cc.drev.dnd.ca (Marc Parenteau)

3.3.14. LAS (Land Analysis System) Documentation
URL: ftp://edcftp.cr.usgs.gov/software/las/doc

## 3.4. Digital Data

3.4.1. ARC/INFO Coverages
380 ARC/INFO coverages online

URL: ftp://gsb.igsb.uiowa.edu
Contact: jgiglierano@gsbth-po.igsb.uiowa.edu (Jim Giglierano)

3.4.2. Counties

3.4.2.1. ARC/INFO Export Coverage of selected U.S. States
URL: ftp://csdokokl.cr.usgs.gov/pub/gis_data
IP: 136.177.176.4
Contact: ahrea@csdokokl.cr.usgs.gov (Alan Rea, Hydrologist, USGS)

3.4.2.2. ARC/INFO export files of US statewide county coverages
The maps were derived from the Census TIGER files. As such, the data in metro areas may be the old, crude DIME data, but the rest of the boundaries are derived from USGS 1:100K DLGs.

URL: ftp://dis2qvarsa.er.usgs.gov/state100

3.4.2.3. County outlines as Versatec plot file
URL: ftp://ftp.uu.net/graphics/maps/USmap.Z
IP: 192.48.96.9

3.4.3. Micro World Databank II
URL: ftp://ftp.uu.net/graphics/maps/wdb-ii.Z
IP: 192.48.96.9

3.4.4. Census County Boundaries
URL: Part 1 of the 1980 Census boundaries
URL: ftp://ftp.uu.net/graphics/maps/Census.Part1.Z
IP: 192.48.96.9

3.4.5. US Census Bureau Data
This is the main Bureau of the Census FTP site, and looks like it will be a rich source of population, business, health and other demographic data.

URL: ftp://ftp.census.gov

3.4.6. US Hydrologic Units Data
This directory contains all the 1:100,000-scale and 1:250,000-scale data files of Hydrologic Units for the United States.

URL: ftp://dis2qvarsa.er.usgs.gov/data/giras/hu

3.4.7. GIRAS Land Use Data
This directory contains all the 1:100,000-scale and 1:250,000-scale data files of land use and land cover maps for the United States. These files were obtained from the National Mapping Division in GIRAS format and were compressed using the UNIX compress command.

URL: ftp://dis2qvarsa.er.usgs.gov/data/giras/lu

3.4.8. Digital Data on India
Digital data for India includes nationwide district-level data from the 1961, 1971, and 1981 censuses and from annual agricultural production statistics.

URL: ftp://cwmills.umd.edu/pub/india

3.4.9. Timezone Boundary Data
Arthur David Olson has created a public domain time zone database, but it does not include latitude/longitude boundaries.

URL: ftp://elsie.nci.nih.gov/pub/tzcode94d.tar.gz: code
URL: ftp://elsie.nci.nih.gov/pub/tzdata94d.tar.gz: data

3.4.10. EROS Data Center
The EROS site contains all the 1:100,000 and 1:2,000,000 scale Digital Line Graph (DLG), Land Use/Land Cover and 1:250,000 scale Digital Elevation Model (DEM) data for the United States. This site also contains numerous Arc/Info coverages and AMLs. Source code for manipulating these data can also be found here.

URL: edcftp.cr.usgs.gov

3.4.13. Digital Elevation Models (DEMs)

3.4.13.1. Software

3.4.13.1.1. MicroDEM - DEM Software
Microdem is a set of pascal programs with source code which do all kinds of things with DEM data, and includes one data set. The program is shareware and available from the author:

Dr. Peter Guth
PETMAR TRILOBITE BREEDING RANCH
252 Lower Magothy Beach Road
Severna Park, MD 21146

URL: ftp://ftp.blm.gov/gis/microdem.zip

3.4.13.1.2. GRIDPAK - 3D Gridding Software
URL: ftp://ahab.rutgers.edu/pub/gridpak

3.4.13.1.3. SPLAT - Contouring Software
SPLAT is a contouring package.

The file to download is called SPLATSFX.EXE which is a self extracting (PK) archive of the program SPLAT.EXE and a short manual in windows write format.

URL: ftp://ftp.cica.indiana.edu /pub/pc/win3
URL: ftp://nic.funet.fi/pub/msdos

3.4.13.2. Data

3.4.13.2.1. Mars DEMs
Mars DEM data (Valles Marineris region) sampled at a variety of spatial resolutions.

URL: ftp://stardent.arc.nasa.gov/pub/
IP: 128.102.21.44

3.4.13.2.2. US 3-Arc-second DEMs
3 arc-second DEM data in 1 degree square segments for most of the U.S.

URL: ftp://resdgs1.er.usgs.gov/dems
IP: 130.11.52.55

3.4.13.2.3. DEMs of USA 1:250,000 scale
URL: edcftp.cr.usgs.gov/data/DEM/250/

3.4.13.2.4. ETOPO5 World Topographic Dataset
These files contain worldwide bathymetric and elevation data in meters with a 5 minute by 5 minute latitude/longitude data density.

URL: ftp://walrus.wr.usgs.gov/pub/data/etopo5.northern.bat.Z (8.3 Mb)
URL: ftp://walrus.wr.usgs.gov/pub/data/etopo5.southern.bat.Z (7.9 Mb)
IP: 130.118.7.254
Contact: norman@OCTOPUS.WR.USGS.GOV (Norman Maher)

URL: ftp://ahab.rutgers.edu/pub/gridpak/etopo5

3.4.13.2.5. Map Datasets -- DLG, DEM, TIGER USGS DLG
This is a gold mine of a site for mapping data. It is a DEM, DTM, TIGER Data exchange site for all kinds of public domain map data.

URL: ftp://spectrum.xerox.com/pub/map/
IP: 192.70.225.78
Contact: Moore.Wbst128@Xerox.Com (Lee Moore)

3.4.13.2.6. DEMs of the San Francisco Area
The data have a horizontal resolution of 3.0 X 3.0 seconds of lat/long degrees and have a vertical resolution of 1.0 meters.

```
sf24.dem  38.0  37.0 -123.0 -122.0 SAN FRANCISCO, CA
sj13.dem  38.0  37.0 -122.0 -121.0 SAN JOSE, CA
sx24.dem  37.0  36.0 -123.0 -122.0 SANTA CRUZ, CA
zp13.dem  37.0  36.0 -122.0 -121.0 MONTEREY, CA
```

URL: ftp://walrus.wr.usgs.gov/pub/data/dem/
IP: 130.118.7.254
Contact: norman@OCTOPUS.WR.USGS.GOV (Norman Maher)

3.4.13.2.7. DEMs of Haiti and Madagascar
These are 30 arc-second DEMs created by EROS from the elevation contours from the Digital Chart of the World CD-ROM dataset.

URL: ftp://edcftp.cr.usgs.gov/data/30ASDCWDEM/

3.4.14. CIA World Map database
The CIA World map database is a set of coastlines, rivers, political boundaries developed by the CIA years ago, and released via the Freedom of Information Act. The data was captured at a scale of 1:5,000,000 I believe. It's got a few errors as some counties have changed boundaries since its release, but it's not bad for world maps. The data are not topologically structured, so all you can get is lines, no polygons. Pity, that. This is all over the place too. A few sites that have it now are:

URL: ftp://gis.queensu.ca/pub/gis/cia/
URL: ftp://ftp.cs.toronto.edu/doc/geography/
URL: ftp://ftp.uu.net/graphics/maps/WorldMap.tar.Z-split

3.4.15. City Locations

3.4.15.1. World Cities
Coarse lat/long file for cities around the world.

URL: ftp://gis.queensu.ca/pub/gis/city/

3.4.15.2. World & US Cities
URL: ftp://ftp.cs.toronto.edu/doc/geography/

## 3.5. Environmental

3.5.1. GERMINAL project (GIS for Environmental Management and Planning)
Document follows developments on the GERMINAL project (GIS for Environmental Management and Planning). Subject headings are "Geographic Information Systems" and "Environment".

URL: http://dgrwww.epfl.ch/GERMINAL/Germinal.html

3.5.2. ANU - Australian National University - Bioinformatics
URL: http://life.anu.edu.au:80/

3.5.3. ANU - Landscape Ecology Services
URL: http://life.anu.edu.au/landscape_ecology/landscape.html

3.5.4. ERIN - Australian Environmental Resources Information Network
ERIN is experimenting with providing metadata through database queries, automatic generation of species distribution maps, biological modelling, many and varied documents, and actual geographic information bits and bytes. They also have links to all sorts of other interesting environmental and GIS servers and resources.

ERIN's purpose is to make environmental information available to the Commonwealth of Australia Department of Environment and associated agencies.

URL: http://kaos.erin.gov.au/erin.html

Contact: davidc@ERIN.GOV.AU (David Crossley)

3.5.5. HOLIT - Israel Ecological & Environmental Information System
URL: http://vms.huji.ac.il/www_teva/db000.html

3.5.6. Environmental Science Gopher at UC Santa Cruz
URL: gopher://scilibx.ucsc.edu:70/11/The Researcher/Science and Engineering/Environmental Science

3.5.7. EnviroGopher at Carnegie Mellon University
URL: gopher://envirolink.hss.cmu.edu:70/1

## 3.6. Forestry

3.6.1. Forest Management DSS software
HSG (Harvest Schedule Generator) is a spatially referenced forest inventory projection tool developed by Tom Moore and Cary Lockwood of the Petawawa National Forestry Institute. This tool is designed to assist forest managers and others in the design and evaluation of forest management strategies.

URL: ftp://pi19.pnfi.forestry.ca/pub/hsglite

3.6.2. Oregon State Univ, Forestry Sciences Laboratory
This gopher is maintained by the Forest Science Laboratory of Oregon State University, Corvallis, Oregon. The primary purpose is to allow users to find GIS (Geographic Information System) files among our rather extensive collection of geographic data.

The gopher operates solely as an index. This means that you will not be able to retrieve GIS files directly through the gopher system.

If you are interested in obtaining GIS data, we recommend that you first use the gopher to identify the particular files that you want. Once you have identified the files, please fill out the request form (if you do not have accounts on fsl machines) and email it to:

GIS-request@fsl.orst.edu

When the available data are ready for transfer, you will receive a confirmation of the name of your file and the date it can be accessed in an anonymous ftp area for downloading. Data is made available within 1 - 2 working days of your request, although priority may be given to financial benefactors.

URL: gopher://gopher.fsl.orst.edu:70/1

## 3.7. Geography

3.7.1. Geographic Name Server
Zipcode, population, lat/long other stats from 1980 census for US cities. Enter name of city at the (non-existent) prompt and press Enter. Include state (as in Ipswich, MA) or you'll get that city's information in every state it is found. Type 'quit' to exit.

Tom Liebert (author of the GNS) reports: GNS covers only USA now, but I just received global city data from CIA RWDB2. I'll incorporate that fairly soon.

URL: telnet://martini.eecs.umich.edu:3000
IP: 141.212.99.9, 141.212.100.9
Contact: libert@eecs.umich.edu (Tom Libert, GNS author)

3.7.2. Japan Geography
URL: http://www.ntt.jp/japan/index.html

3.7.3. Project GeoSim - Geography education software

URL: http://geosim.cs.vt.edu/index.html

3.7.4. Gazetter for the U.S.
URL: http://wings.buffalo.edu/geogw

3.7.5. Geography Datasets -- US Census Data
The file Census.part1.Z contains part 1 of the 1980 US Census county boundaries. The other parts do not seem to be available. This site also contains a copy of the CIA World Databank II and a shell archive file to

create two C programs to compress and/or map the WDB data (wdb-ii.Z) Note: This site is extremely fussy about the password you use. You must use your actual, full email address, or you won't be granted access.

URL: ftp://ftp.uu.net/pub/Census
IP: 192.48.96.9

3.7.6. CIA World Fact Book
The CIA World Factbook contains summary information about the countries of the world including size and population,, commercial, military, and political data.

There are many places where this data set can be found on the Internet. The best way to find the latest versions is to use Veronica and search for "world factbook". Also note that this is updated each year.

URL: ftp://ftp.cs.toronto.edu/doc/geography

## 3.8. Geology & Geophysics

### 3.8.1. Mineralogy

#### 3.8.1.1. Minerals Database
This is a database containing the names and chemical formulas of all currently accepted mineral species, 3507 or so of them. It is now available in a plain ASCII version which is easily importable in your favorite database program, and in a Microsoft RTF format.

URL: ftp://c.scs.uiuc.edu
Contact: mcdonald@aries.scs.uiuc.edu (Doug McDonald)

#### 3.8.1.2. Mineral ID database
Mineral ID for the Macintosh computer is an interactive database of minerals, crystallographic systems, and mineralogy terms for both educational and reference purposes. For more information, e-mail me, and I will send you a full information sheet.

Contact: liquori@lamar.ColoState.EDU (Michael Liquori)

#### 3.8.1.3. Rock forming mineral compositional database; PROBE software
URL: ftp://perry.berkeley.edu/outgoing/donovan/

#### 3.8.1.4. Crystallography for the Macintosh
URL: ftp://mac.archive.umich.edu/Crystal
URL: ftp://mac.archive.umich.edu/CrystalView
Contact: thomas.h.kosel.1@nd.edu (Tom Kosel)

### 3.8.2. Earthquakes

#### 3.8.2.1. NCEER Strong Motion Data Facility
URL: telnet://strongmo:nceer@duke.ldgo.columbia.edu:23/8

#### 3.8.2.2. Center for Earthquake Research and Information (CERI Memphis St U)

URL: gopher://141.225.56.24:70/1
URL: gopher://41.225.56.24:70

3.8.2.3. USGS Branch of Global Seismology and Geomagnetism
URL: telnet://QED@neis.cr.usgs.gov

3.8.2.4. Oklahoma Earthquake Catalog
URL: gopher://wealaka.okgeosurvey1.gov:70/11/okeqcat

3.8.2.5. Earthquake Information
The Usenet newsgroup ca.earthquakes is a good source of earthquake information and news.

Northern California

URL: finger:quake@andreas.wr.usgs.gov
Other sources

URL: finger:quake@eqinfo.seis.utah.edu
URL: finger:quake@geophys.washington.edu
Official office of emergency services bulletin site

URL: telnet://oes1.oes.ca.gov:5501

3.8.2.6. Geologic Faults Map Data
Digitized database of geologic faults (primarily for different parts of the U.S.) and California earthquake locations.

URL: ftp://alum.wr.usgs.gov/pub/map: Faults data
URL: ftp://alum.wr.usgs.gov/pub/summary: Earthquake locations
Contact: oppen@alum.wr.usgs.gov (David Oppenheimer)

3.8.2.7. Earthquake Maps & Charts of the Northridge earthquake
This site contains data, graphs, and maps relating to the Northridge Quake. They have been collected from sci.geo.geology and ca.earthquakes, and ftped from caltech. There are postscript (ps), GIF (gif), and text (txt) files.

URL: ftp://laplace.stat.ucla.edu/pub/data/various/quake/

3.8.2.8. World Earthquake Data via "Finger"
URL: finger://quake@geophys.washington.edu

3.8.3. USGS Digital Map Open-File Reports
The Geologic Division of the USGS (Central Region) has a server that functions as a repository for on-line publications. You can find the following digital map Open-file Reports:

ofr-92-0328: The digital geologic map of the Roswell Resource Area, New Mexico, in ARC/INFO export format.

ofr-92-0507: The digital geologic map of Colorado in ARC/INFO export format.

ofr-90-0676: Interactive Macintosh display of petroleum exploration through time across the continental United States.

URL: ftp://greenwood.cr.usgs.gov/pub/open-file-reports/
IP: 136.177.48.5
Contact: gellis@ctr-dms1.cr.usgs.gov (Eugene Ellis)

3.8.4. Geologic finite-element software
Three finite-element programs for modeling plate deformation are now available by anonymous FTP. They can be used to model deformation of the lithosphere, formulate tectonic hypotheses, fit geodetic data, estimate long-term seismic hazard, study the rheology of the plates, or teach students.

Each program is accompanied by explanatory text files, sample input and output files, and accessory programs for help in preparing the input and plotting graphics from the output.

Source code (FORTRAN77) is available.

URL: ftp://pong.igpp.ucla.edu/pub/pbird/read_me
Contact: Peter Bird <pbird@ess.ucla.edu>

3.8.5. StereoNet for Windows

StereoNet for Windows is a program for plotting on stereonets and performing 3D analysis and recalculations. If you are working on any of the above named subjects a lot of time can be saved by letting your PC do this work. The plots are ready for publication when they come out of your printer.

Some features:

- Schmidt or Wulff nets.
- Plotting planar data, as great circles.
- Plotting points, with a number of different symbols
- Plotting density contours.
- Plotting rose diagrams.
- Plotting statistics (mean, girdle, pole to girdle)
- Plotting slip linear plots
- Color support, the user can define any color.

URL: ftp://torsken.nfh.uit.no/STEREO/
IP: 129.242.211.254
Contact: perivar@ibg.uit.no (Per Ivar Steinsund)

3.8.6. USGS - United States Geological Survey
URL: http://sun1.cr.usgs.gov

3.8.7. Arizona Geologic Survey (AzGS)
URL:
gopher://dillon.geo.ep.utexas.edu:70/11/EarthScienceRes/Publications/AZ.GeolSurv

3.8.8. El Paso Geological Society Publication list
URL:
gopher://dillon.geo.ep.utexas.edu:70/00/EarthScienceRes/Publications/ElPasoGS

3.8.9. Computer Oriented Geological Society (COGS)

Archives Contains COGS diskettes and other software collected from COGSnet BBS including geologic, GIS, mapping, earth science software for the PC and Macintosh. Includes several mapping data sets of use to all, or pointers to where they can be found. GSMAP and MOSS can be found here.

URL: ftp://ftp.csn.org/COGS/
IP: 128.138.213.21
Contact: bthoen@gisnet.com (Bill Thoen)

3.8.10. Geological Symbol Font

Font in Adobe Type 1 and True Type formats (both for the PC) contains geological symbols. It has also been converted to a CorelDRAW "wfn" file so it may be installed as a symbol for FCorelDRAW 3.x and 4.x.

Also CorelDRAW "pat" files containing geological patterns.

URL: ftp://opal.geology.utoronto.ca/pub/geology/corel/symbols/: Fonts
URL: ftp://opal.geology.utoronto.ca/pub/geology/corel/patterns/:
Patterns
Contact: charters@madhaus.uucp (Jim Charters)

3.8.11. CIA World Databank-II Map Data

This is a data file of coastlines, countries, rivers, islands and lakes of the world compiled by the CIA and now de-classified into the public domain. It's a large database; over 12 megabytes, compressed! This file is broken up into 5 pieces, so you have to get them all separately and 'cat' them together. The file is tightly packed in a binary format, and to read it you will need to use the C program contained in the archive, 'domap.c'. The national boundary data is out-of-date as there have been many changes in the world since the late 80's. However it seems to be the best source for free world map data.

URL: ftp://sepftp.stanford.edu/

3.8.12. Sunrise/sunset Calculations
Calculate sunrise and sunset for anyplace not 'close' to the poles. The source includes both 'print to screen' and 'print to printer' versions. Executable versions are here too.

URL: ftp://ftpnssl.nssl.uoknor.edu/pub/skaggs/sunrise.bas
IP: 129.15.66.34

3.8.13. World Paleomagnetic Database
Databases, programs and information related to paleomagnetism.

URL: ftp://earth.eps.pitt.edu/pub
IP: 130.49.3.1

3.8.14. Magnetic Field Computing programs
URL: ftp://ftp.ngdc.noaa.gov
Contact: npeddie@isdres.er.usgs.edu

3.8.15. Geochemistry -- NewPet Software
This is an ftp site for NewPet, a geochem/igneous petrology data handling program. Includes ternary plots. MS-DOS compatible shareware ($25 voluntary).

URL: ftp://sparky2.esd.mun.ca
IP: 134.153.11.101

3.8.16. Geological Hypercard Stacks
Macintosh Hypercard stacks pertaining to geology: bedforms An application for geometric simulation of sedimentary structures produced by migrating bedforms over time. Companion to the book "Bedforms, Cross-Bedding, and Sedimentary Structures" by David M. Rubin, published by SEPM. QuickTime animations of selected figures from the book. Best viewed on a screen 640x480 pixels or larger, set to 256 *grays* (not colors). Each of these files is a HyperCard stack with instructions and a pattern for making a three-dimensional model of one or more interesting landforms:

earthquake_effects
effects_of_ice
island_coral_reefs
loma_prieta
seven_faults
volcano map projections:

Hypertext files on USGS map projections usa-exploration:

USA Exploration -- USGS OFR 90-676. This application illustrates the history of oil and gas exploration in the United States from 1900 to 1986.

URL: ftp://ftp.walrus.wr.usgs.gov/pub/mac
IP: 130.118.7.254
Contact: dr@octopus.wr.usgs.gov

3.8.17. University of Minnesota Soil Science Gopher
URL: gopher://gopher.soils.umn.edu:70/11

3.8.18. Time Dependent Topography Through the Glacial Cycle
This site contains data sets of topography and ice coverage during the last glacial maximum. The topography data set contains elevation at 1 Kyr intervals, with elevations in meters. The second data set contains ice-cover data at 1 Kyr intervals. Area of coverage is the entire globe in a 1 x 1 degree grid, with a temporal range of 21KBP to the present.

URL: ftp://rainbow.physics.utoronto.ca/pub/iceA/README
IP: 128.100.75.19 (unofficial)

3.8.19. Water Quality Data Directory
URL: gopher://scilibx.ucsc.edu:70/7/waissrc:/.WAIS/water-quality.src

3.8.20. IGWR - Institute for Ground Water Research
URL: gopher://igwmc.mines.colorado.edu/3851/1

## 3.9. Geographic Information Systems (GIS)

3.9.1. Tallahassee Freenet (Internet GIS BBS)
Select SCIENCE AND TECHNOLOGY CENTRE from their main menu.

URL: telnet://freenet.fsu.edu

3.9.2. USGS beginners tutorial on GIS
URL: http://waisqvarsa.er.usgs.gov/wais/home.html

3.9.3. GeoSim module (MigModel)
Project GeoSim is a multidisciplinary effort by members of Virginia Tech's Departments of Geography and Computer Science, and College of Education, to develop computer-aided education software for introductory geography at the college and high school levels. Supported by NSF and FIPSE (US Dept. of Education), GeoSim's goal is to produce major changes in undergraduate geography education by applying the immense capabilities of Geographic Information Systems (GIS) and simulation.

Project GeoSim's primary activity is the creation of a series of computerized laboratory modules applicable to virtually all introductory geography courses. The first module, Intlpop/Humpop is meant to teach the basics of demographics and population modeling.

Intlpop is an interactive simulation and Humpop is a multimedia tutorial on population issues. The version presently available runs under MS-DOS (Intlpop alone) or MS Windows (both Humpop and Intlpop together). Versions running under the X Window System and the Macintosh operating system should be available sometime during Spring 1994.

MigModel, a program for studying modeling of migration patterns between counties of the US, is now available in preliminary form. This program allows students to select several variables from a larger list that the student hypothesizes affect migration patterns. The patterns that would result if the hypothesis were true are compared against the actual migration patterns to determine the level of correlation.

URL: http://geosim.cs.vt.edu/index.html
URL: ftp://geosim.cs.vt.edu
IP: 128.173.40.85
URL: gopher://geosim.cs.vt.edu
IP: 128.173.40.85
Contact: shaffer@vtopus.cs.vt.edu (Cliff Shaffer)
Contact: carstens@vtvm1.cc.vt.edu (Bill Carstensen)

3.9.4. CERL/GRASS welcome file
URL: http://baldrick.cecer.army.mil:80/welcome.html

### 3.9.5. OzGIS Mapping System

OzGIS is a software system for displaying geographically referenced data, such as Census data or environment data, as maps and diagrams on screens, printers and plotters on an IBM PC compatible. The system can be used to analyze socio-economic data produced by censuses and surveys and to support management decisions associated with for example Government planning, marketing, sales, site and personnel location, advertising. Digitized map data (e.g.Census boundaries, GIS) and attribute data (e.g. sales, environmental) are accepted as Ascii files and preprocessed (e.g. amalgamation, line thinning, polygon construction, subsetting) before display. Maps of polygons, lines and points can be displayed according to one or two attributes along with various overlays. About 130 menus provide extensive options for interactively designing the layout and appearance of the map, and for attribute handling, classification, interrogation and saving maps. Maps can be output on plotters, printers and various file types. Applications such as territory definition and retail site catchment analysis are supported.

URL: ftp://oak.oakland.edu
IP: 141.210.10.117
URL: ftp://wuarchive.wustl.edu
IP: 128.252.135.4
URL: ftp://archive.orst.edu
IP: 128.193.2.13
URL: ftp://ftp.uu.net
IP: 137.39.1.9
URL: ftp://nic.funet.fi
IP: 128.214.6.100
URL: ftp://src.doc.ic.ac.uk
IP: 146.169.3.7
URL: ftp://nic.switch.ch
IP: 130.59.1.40
URL: ftp://archie.au
IP: 139.130.4.6
URL: ftp://nctuccca.edu.tw
IP: 140.111.3.21
Contact: lws@ITD0.DSTO.GOV.AU (Lloyd Simons)

### 3.9.6. GRASS/Linux Support Group

The old address (st00@siuemus) is no longer valid. For information or technical support on GRASS/Linux, please send a message to the following new address.

Contact: CCAO@SIUEMUS.BITNET
Contact: ahrensl@daisy.siue.edu
XIS Solutions
Box 1459, SIUE
Edwardsville, IL 62026
Tel: 618-692-2090

### 3.9.7. GRASS GIS Source Code

In addition to the GRASS GIS source code, there is an extensive database for the Spearfish (South Dakota) area to be used with GRASS. Although intended for GRASS, some of the data could easily be used for other purposes. For example, Arc/Information can display GRASS raster data. The README in /grass says that it is open 24 hours a day, 7 days a week.)

URL: ftp://moon.cecer.army.mil/grass
IP: 129.229.1.16

### 3.9.8. Idrisi Files FTP site

This is the ftp site for Idrisi support files.

URL: ftp://midget.towson.edu/pub/gis
The Idrisi FAQ file:

URL: ftp://midget.towson.edu/IDRISI/OTHER

3.9.9. Miscellaneous GIS source code
This site has been known to briefly contain some interesting-looking files on the subjects of GIS, MOSS, mapping and other code fragments and subroutines along the same lines.

URL: ftp://ftp.blm.gov/pub/gis/
IP: 158.68.32.62
Contact: skatz@dsc.blm.gov

3.9.10. Hydrology
USGS Streamflow Data sets 1874-1988 This site contains data on USGS streamflow statistics from 1874 to 1988 (that's no typo... it's 1874).

The USGS Open-File Report 92-129, "Hydro-Climatic Data Network (HCDN): A U.S. Geological Survey streamflow data set for the United States for the study of climate variations, 1874-1988", by J.R. Slack and Jurate Maciunas Landwehr is available here also, and serves as documentation for the data set. See the 1ST_READ.ME file for details.

URL: ftp://srv1rvares.er.usgs.gov/hcdn92
IP: 130.11.51.209

## 3.10. GPS & Geodesy

GPS satellite current constellation status.

URL: finger:gps@geomac.se.unb.ca

3.10.1. GPS & Loran Information Center, U.S. Coast Guard
This service is actually a Bulletin Board System (BBS) linked up to the Internet. From this site you can reach many other government sites and resources.

URL: telnet://fedworld.gov

3.10.2. GPStech Mailing List
Mailing list for the discussion of GPS technical issues. The intended audience is earth scientists and geodesists interested in high-precision GPS geodesy.

The mailing list is accessible by sending a message to the server

Server: gpstech-request@cotopaxi.stanford.edu
Contact: Jeff Freymueller at Stanford

3.10.3. CANSPACE - Canadian Space Geodesy Forum
This site is one of the best for GPS and Geodesy information

URL: gopher://unbmvs1.csd.unb.ca:1570/1EXEC%3aCANSPACE

3.10.4. Earth Disc image
This is a 2500x2499 pixel full-disc 11.5um (infrared) image of the earth taken by the METEOSAT 4 satellite on 16 September 1993.

Rick Kohrs (rickk@ssec.wisc.edu) colored the image as follows. He used a threshold temperature to determine which pixels in the image corresponded to clouds. He then removed the cloud pixels from consideration. Since the temperatures over land and sea overlap, he used a base map to separate the remaining pixels into sea and land groups. At this point he had three partial images: (a) clouds, (b) unclouded sea, and (c) unclouded land. Based on temperatures he colored each of these separately using an appropriate

fraction of the total number of cells available in an 8-bit color map. The combined image you see here uses the whole set of 256 colors.

URL: ftp://ssec.wisc.edu/pub/dws/em930916.jpg: JPEG version
URL: ftp://ssec.wisc.edu/pub/dws/em930916.gif: GIF version
IP: 144.92.108.61

## 3.11. Mapping

### 3.11.1. GeoVu - Windows Mapping software

URL: ftp://ftp.ngdc.noaa.gov/Acess_Tools
Contact: amh@ngdc.noaa.gov (Allen Hittelman)

### 3.11.2. JHU/APL Digital relief maps of U.S.

URL: http://ageninfo.tamu.edu/apl-us/

### 3.11.3. WWW map for Japan

URL: http://www.ntt.jp/japan/map

### 3.11.4. VPFVIEW (DCW) program for UNIX (Sun workstations)

Program for UNIX systems to view maps from the DMA's Digital Chart of the World CD-ROM data set.

URL: ftp://jupiter.drev.dnd.ca/pub/gis/vpfview
IP: 131.132.32.2

### 3.11.5. EPI-MAP GIS source and data

Thematic mapping system developed by the Center for Disease Control and Prevention in Atlanta, GA. (USA). Includes many data sets of various country political boundaries down to the state/province (2nd order) level. US counties are also included.

URL: ftp://oak.oakland.edu/pub/msdos/mapping/epi-map*
IP: 141.210.10.117

### 3.11.6. GMT - Generic Mapping Tools software source

URL: ftp://kiawe.soest.hawaii.edu/pub/gmt
IP: 128.171.151.16

### 3.11.7. GRASS GIS source for LINUX

URL: ftp://topquark.cecer.army.mil/pub/grass
IP: 129.229.32.13

### 3.11.8. KHOROS - Scientific Visualizaion Software

URL: pprg.eece.unm.edu/pub/khoros/release
IP: 129.24.24.10

### 3.11.9. MapInfo & MapBasic Files

MapBaisc applications, many with source code, data sets for MapInfo, and information files of tips and tricks for working with MapInfo. See also MAPINFO-L , the MapInfo mailing list.

URL: ftp://ftp.csn.org/pub/mapinfo/
IP: 128.138.213.21
Contact: bthoen@gisnet.com (Bill Thoen)

### 3.11.10. MOSS - PC GIS

PC MOSS executables and data.

URL: ftp://ftp.csn.org/COGS/MOSS/
IP: 128.138.213.21
Contact: skatz@dsc.blm.gov (Sol Katz)

3.11.11. Sample ETOPO5 data set relief images
Texas A&M University

URL: ftp://ageninfo.tamu.edu/11/apl-us
IP: 128.194.173.6

3.11.12. LINUX - UNIX on DOS platform
URL: ftp://sc.tamu.edu
IP: 128.194.167.3

3.11.13. MAPGEN/PLOTGEN Mapping Software
This is the primary source of the MAPGEN/PLOTGEN public-domain software. Other source code of general interest, including the USGS General Cartographic Transformation Package (GCTP-II), is also available here. A newer projection package, proj4.2 is available here.

URL: ftp://charon.er.usgs.gov/pub/
IP: 128.128.40.24
Contact: gie@charon.er.usgs.gov (G.I. Evenden)

3.11.14. USGS General Cartographic Transformation Package
Source code for the USGS General Cartographic Transformation Package (GCTP-II). This software can be used to calculate lat/long conversions between various projections used on USGS maps.

URL: ftp://isdres.er.usgs.gov/usgs/gctp/
IP: 130.11.48.2

3.11.15. Generic Mapping Tools (GMT) Software
Contains the Generic Mapping Tools (gmt) software by Paul Wessel for map projections, spatial interpolation, contouring, 3D perspective, raster processing (postscript). This is C code designed for UNIX workstations (Sun, DEC, SGI, and NeXT).

URL: http://www.soest.hawaii.edu/soest/about.ftp.html
URL: ftp://kiawe.soest.hawaii.edu/pub/gmt/
IP: 128.171.151.16
Contact: wessel@soest.hawaii.edu (Paul Wessel)

3.11.16. USGS Cartographic Software and Data Documentation
The National Mapping Division of the U. S. Geological Survey (NMD) provides a national series of base cartographic data. Computer software supporting these data is primarily in the FORTRAN language. The software programs are supported on a variety of mainframe, minicomputer, and workstation hardware platforms. This software was previously available to the general public only on 9-track magnetic tape or diskette through the Earth Sciences Information Center (ESIC) for a nominal reproduction and handling fee. Fifteen FORTRAN programs, sample data and job control language are now available on Internet using file transfer protocol (FTP). A limited amount of soft-copy computer program documentation is also available in both Word Perfect and ASCII.

URL: ftp://nmdpow9.er.usgs.gov/
IP: 130.11.52.92
Contact: mlinck@usgs.gov (Michael K. Linck, Jr.)

3.11.17. Oceanography Physical oceanography data
URL: ftp://shrimp.jpl.nasa.gov

3.11.18. Ocean Network Information Center
OCEANIC database -- data about ocean currents for climatic change, subduction zones and deep sea dumping, among other things. A list of information and oceanographers involved in the WOCE project is also available. Also contains descriptions of the following data sets:

NODC data sets

NCAR data sets
Hawaii Sea Level Center data sets
JPL DAAC (formerly NODS)
ECMWF data sets
NSIDC data sets
University of Miami data sets
University of Rhode Island data sets
CDIAC data sets

URL: telnet://oceanic@delocn.udel.edu
URL: gopher://diu.cms.udel.edu/
URL: http://diu.cms.udel.edu/
IP: 128.175.24.1

3.11.19. Marine and Aquatic Sciences Libraries (UC Santa Cruz)
URL: gopher://gopher.ucsc.edu:70/11/The Library/Other Libraries/Marine and Aquatic Sciences Serials Lists

3.11.20. National Oceanographic Data Center (NODC, NOAA)
URL: gopher://gopher.nodc.noaa.gov:70/11/

3.11.21. Virginia Coast Reserve Information System (VCRIS)
URL: gopher://atlantic.evsc.virginia.edu:70/1

3.11.22. Geological Survey Atlantic Marine Geology
This is a good gateway to other resources, Marine geology, Bathymetry, Great Lakes and more.

URL: gopher://bramble.er.usgs.gov:70/1

3.11.23. Bedford Institute of Oceanography (Canada) Gopher System
URL: gopher://biome.bio.dfo.ca:70/1

3.11.24. Ocean Network Information Center Software
Home of the World Ocean Circulation Experiment (WOCE) Data Information Unit (DIU). Files include programs to do various oceanographic computations.

URL: ftp://delocn.udel.edu/FORTRAN
IP: 128.175.24.1
Contact: walt@delocn.udel.edu

3.11.25. East Coast Tidal Heights & Winds Database
From the file "README" at this site: "This account is intended to provide an easily accessible data base of tidal heights and winds along the U.S. east coast. This project of the FSU Sea Level Center is funded by C&GC, NOAA. The data set is at present still being accumulated: In the directory 'pub/Tidedata' files labeled .hrly. are hourly data from standard NOAA tidal stations; monthly data are labeled .mon. etc Thus, "fernand.mon.9791" is monthly data, Fernandina, Fla, 1897-1991; the data are in standard NOAA format: tides in hundredths of ** FEET** relative to the mean for 1960-1978 National Tidal Datum epoch. (missing data are 9999's) In the directory pub/Opcplot is a set of files from Dr Murray Brown; a flexible set of routines for plotting ocean data; see readme file. In the directory pub/Tides: a Shareware program "Tides" computes tidal heights and currents; in QuickBasic,for IBM PC-comps; In the directory pub/LiveAtlas is a set of files of the oceanographic atlas of Luyten & Stommel. Please see the readme

file. In the directory 'pub' the single file "tsftdem.ftp" is a set of files which constitute the "terribly slow Fourier transform" that recovers the low-frequency spectrum of a gappy data set (under Matlab)"

URL: ftp://atlantic.ocean.fsu.edu/pub/Tidedata
IP: 128.186.3.39
Contact: sturges@atlantic.ocean.fsu.edu

3.11.26. Sea-surface temperature data (near real-time)
The data are AVHRR images within the radius of reception of the university's HRPT station, approximately 5S to 45N and 125W to 165E. Other tiles (windows) are available over California, Gulf of Mexico and West Atlantic as well.

URL: ftp://satftp.soest.hawaii.edu/pub/avhrr/images
IP: 128.171.154.29
Contact: sat_lab@soest.hawaii.edu

3.11.27. Digital relief images of USA
Topographic relief images created from the ETOPO5 data set by Ray Sterner.

URL: http://ageninfo.tamu.edu/apl-us/
URL: gopher://ageninfo.tamu.edu/11/apl-us.
Contact: hmueller@amethyst.tamu.edu (Hal Mueller)

3.11.28. Color Shaded Relief Map of the U.S.
A color shaded relief map of the US is available as 60 GIF images.

Individual GIF images cover a 5 deg by 5 deg area. These images are being made available on a trial basis on our ftp site. Please do not copy more than 1 or 2 images during working hours (8:30 to 7:00 pm Eastern Standard Time) or they may have to be removed.

The elevation data is from ETOPO5 which has a horizontal resolution of 1/2 arc minute for both East/West and North/South, and a vertical resolution of 20 feet. The vector data (coastlines, rivers, boundaries) are from the world vector data base. There are some areas where the two data bases have minor differences in positioning, most noticeable for some rivers. The errors are not constant over the map and no attempt has been made to correct for them in this version of the map.

URL: ftp://fermi.jhuapl.edu/pub/gifmap
IP: 128.244.147.18
Contact: sterner@tesla.jhuapl.edu (Ray Sterner)

3.11.29. Diamondhead Oahu 3D GIF Image
Images of a honolulu dem file converted to several .gif files.

URL: ftp://ftp.cerf.net/pub/inbound/KV_TMP

3.11.30. 3D DEM images of San Francisco
Images of USGS San Francisco topography created with VisionForm's Vdm; JPEG compressed.

URL: ftp://ftp.cerf.net/pub/inbound/KV_TMP/README_SANF
Contact: jsquires@nic.cerf.net (James A. Squires)

3.11.31. Digital relief maps of U.S.
Created from the ETOPO5 data set (5 arc-minute resolution)

URL: http://www.doc.ic.ac.uk/public/geology/maps/gifmaps/
URL: ftp://src.doc.ic.ac.uk/geology/maps/gifmaps
IP: 146.169.2.10

3.11.32. Mid-East Maps from 1000 BCE to Gulf War
This service is primarily dedicated to information about Israel politics, and other government information, but the "graphics" option contains GIF maps of Israel and the nearby Arab states. Maps depict the limits of the Kingdom of David and Solomon of 1000 BCE to missile strikes during the Gulf War.

URL: gopher://israel-info.gov.il

3.11.33. US GeoData indexes
These indexes are the same as the graphic indexes showing the availability of

the DEM 7.5' and 15' Units, DEM 1-Degree Units, DLG 7.5' and 15' Units, DLG 30' Units, LULC 30' Units, LULC 1-Degree Units, CD ROM Data, and also about 400 DOQ listings.

URL: ftp://greenwood.cr.usgs.gov/pub/open-file-reports/
IP: 136.177.48.5
Contact: gellis@ctr-dms1.cr.usgs.gov (Eugene Ellis)

3.11.35. Color Shaded Relief Map Images
GIF images are made with ER Mapper.

URL: ftp://earth.eps.pitt.edu/pub/ermapper/
IP: 130.49.3.1

## 3.12. Paleontology

3.12.1. University of California - Berkeley, Museum of Paleontology
URL: gopher://ucmp1.berkeley.edu:70/1

## 3.13. Remote Sensing

3.13.1. AVHRR Images - Western US
AVHRR (Advanced Very High Resolution Radiometer) images from 1989 through 7 Jan 1992 cover CO, WY, KS, NE, and NM, as well as parts of AZ, UT, OK, and TX. Since 7 Jan 1992, coverage includes these plus CA, OR, NV, WA, and MT, to 1000 km off Pacific coast. Total coverage of US for 1989-present will be available soon. West coast data from 1980-1985 will be available some time this year.

Images are 1024 lines x 1024 elements before 7 Jan 1992, 2560 lines x 1024 elements after. Images are 1 km resolution and 8-bit format.

Contact Tim Kelley by e-mail kelley@sanddunes.scd.ucar.edu or telephone 303/497-1221 for login, password, and manual. Service is free to Internet users and is funded by NASA.

URL: telnet://sanddunes.scd.ucar.edu (for login password, contact Tim Kelly)
Contact: kelley@sanddunes.scd.ucar.edu (Tim Kelly)

3.13.2. Satellite Images
URL: http://web.nexor.co.uk/places/satellite.html

3.13.3. SRSC - Space Remote Sensing Center satellite flood images (U.S./Europe)
URL: http://ma.itd.com:8000/flood.html

3.13.4. EROS Data Center, the USGS repository for Remote Sensing data
URL: http://sun1.cr.usgs.gov/eros-home.html

3.13.5. Institute for Photogrammetry - University of Stuttgart
URL: http://hpux.bauingenieure.uni-stuttgart.de

3.13.6. NASA - Images from the Voyager and Magellan missions
URL: ftp://explorer.arc.nasa.gov/pub/SPACE/
IP: 128.102.32.18

3.13.7. Images of Planets
Planetary images from Magellean and Viking missions. News about other NASA missions.

URL: ftp://ames.arc.nasa.gov/pub/SPACE/CDROM/
URL: ftp://ames.arc.nasa.gov/pub/SPACE/GIF/

Famous image of Earth taken by one of the Apollo missions to the moon:

URL: ftp://ames.arc.nasa.gov/pub/SPACE/GIF/earth.gif
IP: 128.102.18.3

3.13.8. Snow Cover Satellite Images
US Map of snow cover for the US, derived from 12km reduction of GOES data. Also 1km resolution snow cover maps of California and Nevada, Snow Water Equivalent and other images The National Operational Hydrologic Remote Sensing Center is now distributing satellite snow data derived from AVHRR and GOES for major portions of the U.S., southern Canada and Alaska. North America is split into 26 windows, each approx 1000x1000 pixels, at a resolution of 1.1 km/pixel. There are a number of types of GIF images in this directory: the Satellite Snow Cover Maps, weekly national and regional summaries and a special blow-up of the Upper Colorado basin.

URL: ftp://snow.nohrsc.nws.gov/pub/snow
IP: 192.46.108.1
Contact: tim@snow.nohrsc.nws.gov (Tim Szeliga)

3.13.9. Space Shuttle Earth Observation Project Photography Database
Space Shuttle Earth Observation Project photography database of the Flight Science Support Office (FSSO). Contains references to over 120,000 photographs of Earth from space during the last 3 decades. Also some digitized images. These are in band- sequential format with a 512-byte header, and 512 x 512 bytes of red, green, and blue data layers. The images are stored in .DAT files and are binary. There are two types of photos available: 1024 x 1024 and 512 x 512. Some are 3 channel, Some are 1 channel. Note: Get the file 'pho.list' to see descriptions of selected images, and which are color and which are grey-scale. The 1024x1024 are 1 channel and the 512x512 are 3 channel. Adobe Photoshop (Macintosh) reads these just fine.

URL: ftp://sseop.jsc.nasa.gov
IP: 146.154.11.34
Contact: pitts@sn.jsc.nasa.gov (Dr. David E. Pitts, Manager)

3.13.10. NOAA-11/12 Mosaic Images of North America
NOAA-11/12 mosaic GIF images of North America derived from HRPT (High Resolution Picture Transmission) data stream

URL: ftp://rainbow.physics.utoronto.ca/pub/sat_images
IP: 128.100.75.19 (unofficial)
Contact: moore@rainbow.physics.utoronto.ca (Professor G.W.K. Moore)

3.13.11. AVHRR sample images and viewers - U.S. Weather Service Hydrologic RS Center
URL: ftp://snow.nohrsc.nws.gov/AVHRR_sample
IP: 192.46.108.1

3.13.12. Satellite images
URL: http://web.nexor.co.uk/places/satellite.html

## 3.14. Space & Planetary Science

3.14.1. CASS - Center for Advanced Space Studies
The Center for Advanced Space Studies (previously Lunar/Planetary Institute, or LPI) provides resources on geology, geophysics, astronomy and astrophysics. Support services are provided for other departments, such as publications, and computer. Materials on these topics are available. Menu driven -- use VT100 emulation or equivalent.

URL: telnet://cass:online@cass.jsc.nasa.gov
URL: http://cass.jsc.nasa.gov/CASS_home.html

Contact: bigwood@cass.jsc.nasa.gov (David Bigwood)

3.14.2. SPAN - Space Physics Analysis Network
Space Physics Analysis Network (SPAN) Network Information Center (NIC), managed by the National Space Science Data Center (NSSDC), an online facility to provide a central source for information.

URL: telnet://span_nic@nssdca.gsfc.nasa.gov

3.14.3. NED - NASA/IPAC Extragalactic Database
NASA/IPAC Extragalactic Database

URL: telnet://ned@ipac.caltech.edu
IP: 131.215.139.35

3.14.4. Earth, space science data
URL: ftp://huntress.jpl.nasa.gov

3.14.5. JPL public information
URL: ftp://pubinfo.jpl.nasa.gov/

3.14.6. The NASA Home Page
URL: http://hypatia.gsfc.nasa.gov/NASA_homepage.html

## 3.15. Standards

3.15.1. Spatial Data Standards documents
Documentation on the Distributed Spatial Data Library (DSDL), 1992 ASTM Spatial Data Standard, and policy statements.

URL: ftp://dis2qvarsa.er.usgs.gov/docs
(Mar 1993) Metadata Standard documents, FGDC definitions, minutes of ASTM, GIS/LIS and URISA meetings

URL: ftp://dis2qvarsa.er.usgs.gov/metadata

3.15.2. European Mapping Standards & Reference systems
MEGRIN (Multipurpose European Ground-Related Information Network) is an initiative of the Comité Européen des Responsables de la Cartographie Officielle - C.E.R.C.O.

The concept of MEGRIN is to be a service open to all of those who want to use in their own systems digital spatial data which are produced and administrated in other systems. There you can find information about national spatial information systems in Europe and the European Transfer Format (ETF)

(Note: this site may be closed after June 1, 1994)

URL: telnet://megrin:megrin@v2.ifag.de
IP: 141.74.240.1

3.15.3. Nova Scotia Land Information Standards Initiative
The Province of Nova Scotia, under the direction of the Department of Municipal Affairs, has formed the Nova Scotia Land Information Standards Committee. This committee has been established to address the issues surrounding the development of land-related information standards within Nova Scotia. The initiative is an open, consensus building one which has representation from a variety of organization including: federal, provincial, municipal and private sector. Efforts are now underway to develop a communication strategy to disseminate information regarding the activities of the committee and its associated task groups. If you or your organization are interested in the Nova Scotia standards initiative and would like additional information either on the process or how you might become involved, please contact Ed Light, Land Information Analyst, Department of

Municipal Affairs, Land Information Management Services Division [phone] (902) 424-3761; [fax] (902) 424-5872; or [e-mail] poirier@fox.nstn.ns.ca

Contact: poirier@FOX.NSTN.NS.CA (Mark Poirier)

3.15.4. FGDC metadata standard
The latest documents on the (US) Federal Geographic Data Committee's (FGDC) draft of the spatial metadata standard is available in WordPerfect (ver. 5.1), and postscript formats.

URL: ftp://isdres.er.usgs.gov/GDC/
IP: 130.11.48.2
URL: ftp://waisqvarsa.er.usgs.gov/wais/docs/
IP: 130.11.51.187
Contact: GDC@USGS.GOV
Contact: MDOMARAT@USGS.GOV (Michael A. Domaratz)

3.15.5. Spatial Data Transfer Standard
This seems to be the official site for informaiton and source code in support of the SDTS standard. This site contains files of all the text to the latest release of the Spatial Data Transfer Standard (SDTS). The standard is quite extensive and covers every type of spatial data that you are ever likely to encounter. A must-read for GIS data developers! You can also find sample SDTS data sets including DLG-3, TIGER, and digital orthophoto quarterquadrangle. A large collection of SDTS source code is available here too.

URL: ftp://sdts.er.usgs.gov/pub/sdts
IP: 130.11.52.170
Contact: sdts@usgs.gov

3.15.6. NMD Map Standards Documents (DLG, DOQ)
The National Mapping Division of the U.S. Geological Survey now offers certain of its computer software programs and associated documentation on Internet. The NMD provides a national series of base cartographic data. Computer software supporting these data is primarily in the FORTRAN language. The software programs are supported on a variety of mainframe, minicomputer, and workstation hardware platforms. This software was previously available to the general public only on 9-track magnetic tape or diskette through the Earth Sciences Information Center (ESIC) for a nominal reproduction and handling fee. Fifteen FORTRAN programs, sample data and job control language are now available on Internet using file transfer protocol (FTP). A limited amount of soft-copy computer program documentation is also available in both Word Perfect and ASCII. Additional documentation will be added. Any documentation not available via FTP can be obtained in hard copy from USGS's Earth Sciences Information Center for a nominal charge. Ordering information and price quotes may be obtained by calling 1-800-USA-MAPS.

URL: ftp://nmdpow9.er.usgs.gov/public
IP: 130.11.52.92
Contact: mlinck@usgs.gov (Michael K. Linck, Jr.)

3.15.7. Open Geodata Interoperability Specification (OGIS)
Draft specs (OGIS is sponsored by the Open GIS Foundation)

URL: ftp://moon.cecer.army.mil/ogis/spec

3.15.8. Metadata standards and minutes of GISLIS, ASTM, URISA meetings
URL: ftp://dis2qvarsa.er.usgs.gov/metadata

## 3.16. Transportation

3.16.1. Institute for Transportation Research and Education at the U. of North Carolina
URL: http://itre.uncecs.edu

## 3.17. Meteorology

Stern, Illana (1994), "Sources of Meteorological Data Frequently Asked Questions (FAQ)". Usenet news.answers (bi-monthly). digital text file, 68K

This is the best source for online meteorological resources. It is well-maintained, accurate, and pretty much the authoritative reference on the subject.

This document contains a good introduction to Internet use and resources, and specifically covers information on the following topics:

1) Current weather (satellite images)
   a) North America
   b) Europe
   c) Pacific
   d) Other
2) Current weather and forecasts (maps, radar, soundings)
3) Current weather and forecasts (text)
4) Special event information (may be transient)
5) Other images
6) Map data
7) Research data and metadata
8) Software
9) Pointers to other resources

To receive this document via e-mail, send a message to mail-server@rtfm.mit.edu with the line:

send /pub/usenet/news.answers/weather/data/part1

in the body. Other sources are listed below.

URL: ftp://rtfm.mit.edu/pub/usenet/news/answers/weather/data/part1
URL: ftp://vmd.cso.uiuc.edu/wx/sources.doc
URL: http://www.cis.ohio-state.edu/hypertext/faq/usenet/weather/top.html
Contact: ilana@ncar.ucar.edu (Ilana Stern)

### 3.17.1. CDIAC - Climatic Data Sets Carbon Dioxide Information Analysis Center

Contains data sets of world-wide climatic data including Atmospheric CO2 content, tree-core/precip. correllations, historical air temp., pressure, precip. (some going back to the 1600's!) for world, global paleoclimate to 6000 B.P., historical weather station data back to 1800's, and more.

URL: ftp://cdiac.esd.ornl.gov/pub
URL: ftp://suns01.esd.ornl.gov/pub
IP: 128.219.24.36
Contact: OMNET: CDIAC
Contact: INTERNET: CDP@STC10.CTD.ORNL.GOV
Contact: BITNET: CDP@ORNLSTC

## 3.18. Wildlife

### 3.18.1. Fish and Wildlife Service (USFWS) WAIS Server

The following items can be found here:

1. A Catalog of Automated Information Systems (CAIS) of the FWS. This catalog of metadata (descriptive information) lists both active and proposed information systems. Contact points are included for each system.

2. The CAIS currently describes 87 information systems. A new version of

the CAIS will be available by the end of June. This version will serve updated metadata on 120 systems.

3. A description of the various servers (WAIS, World Wide Web, Gopher, File Transfer Protocol, etc.) maintained by the FWS.

4. State codes, County codes, and USGS Hydrologic Units, as defined in FIPS publications 5-2, 6-4 and 103.

5. The latest copy of the "Content Standards for Digital Spatial Metadata" produced by the Federal Geographic Data Committee.

6. The President's Executive Order implementing the National Spatial Data Infrastructure.

7. A list of State fish and wildlife agency contacts for fish and wildlife information systems produced by the Fish and Wildlife Information Exchange.

8. The WinWAIS client software produced by the U.S. Geological Survey for accessing WAIS servers.

9. The MOSAIC client software for accessing World Wide Web servers.

The easiest way to establish communications with this WAIS server is to access the Directory of Servers, search for "wildlife" (without the quotes), and download the address information.
URL: wais://
USFWS_Region_9_Info_Res_Mgt_Data_Admin:1028//data/wais/spxwais/irmindex/irmserv
IP: 164.159.126.3
Contact: fishera@mail.fws.gov (Dr. Alan R. Fisher)

3.18.2. USFWS Forensics Laboratory
URL: ftp://ash.lab.r1.fws.gov/
URL: http://ash.lab.r1.fws.gov/
Contact: mitchellStu@mail.fws.gov

3.18.3. USFWS National Wetlands Inventory
URL: ftp://192.189.43.33
Contact: herman@enterprise.nwi.fws.gov

3.18.4. USFWS Division of Information Resources Management Library Server
The library server is an automated mechanism for distributing information via Internet mail. The library server responds to requests for specific files. For more information, send an e-mail message to r9irmlib@mail.fws.gov with "send help" (without the quotes) as the subject.

URL: mailto:r9irmlib@mail.fws.gov
Contact: fishera@mail.fws.gov

3.18.5. USFWS Division of Refuges WWW Server
URL: http://bluegoose.arw.r9.fws.gov/
Contact: furnisss@mail.fws.gov

- eof -

# Overview of the Internet and Glossary

Attached is a glossary from the Network Working Group. Additional information about the Internet can be found in several books and on-line. Check out "Understanding the Internet (http://www.screen.com/understand/startingout.html)" from COCHRAN INTERACTIVE INCORPORATED for a good selection of links that provide an survey of the Internet.

# Internet Users' Glossary

Network Working Group
Request for Comments: 1392
FYI: 18

G. Malkin
Xylogics, Inc.
T. LaQuey Parker
UTexas
Editors
January 1993

## Status of this Memo

This memo provides information for the Internet community. It does not specify an Internet standard. Distribution of this memo is unlimited.

## Abstract

There are many networking glossaries in existence. This glossary concentrates on terms which are specific to the Internet. Naturally, there are entries for some basic terms and acronyms because other entries refer to them.

## Acknowledgements

This document is the work of the User Glossary Working Group of the User Services Area of the Internet Engineering Task Force (IETF).Special thanks go to Jon Postel for his definitive definition of "datagram".

# Glossary

10BaseT
A variant of Ethernet which allows stations to be attached via twisted pair cable. See also: Ethernet, twisted pair.

802.x
The set of IEEE standards for the definition of LAN protocols. See also: IEEE.

822
See: RFC 822

:-)
This odd symbol is one of the ways a person can portray "mood" in the very flat medium of computers--by using "smiley faces". This is "metacommunication", and there are literally hundreds of such symbols, from the obvious to the obscure. This particular example expresses "happiness". Don't see it? Tilt your head to the left 90 degrees. Smiles are also used to denote sarcasm. [Source: ZEN]

abstract syntax
A description of a data structure that is independent of machine-oriented structures and encodings. [Source: RFC1208]

Abstract Syntax Notation One (ASN.1)
The language used by the OSI protocols for describing abstract syntax. This language is also used to encode SNMP packets. ASN.1 is defined in ISO documents 8824.2 and 8825.2. See also: Basic Encoding Rules.

Acceptable Use Policy (AUP)
Many transit networks have policies which restrict the use to which the network may be put. A well known example is NSFNET's AUP which does not allow commercial use. Enforcement of AUPs varies with the network. See also: National Science Foundation.

Access Control List (ACL)
Most network security systems operate by allowing selective use of services. An Access Control List is the usual means by which access to, and denial of, services is controlled. It is simply a list of the services available, each with a list of the hostspermitted to use the service.

ACK
See: Acknowledgment

acknowledgment (ACK)
A type of message sent to indicate that a block of data arrived at its destination without error. See also: Negative Acknowledgement. [Source: NNSC]

ACL
See: Access Control List

AD
See: Administrative Domain

address
There are three types of addresses in common use within the Internet. They are email address; IP, internet or Internet address; and hardware or MAC address. See also: email address, IP address, internet address, MAC address.

address mask
A bit mask used to identify which bits in an IP address correspond to the network and subnet portions of the address. This mask is often referred to as the subnet mask because the network portion of the address can be determined by the encoding inherent in an IP address.

address resolution
Conversion of an internet address into the corresponding physical address.

Address Resolution Protocol (ARP)
Used to dynamically discover the low level physical network hardware address that corresponds to the high level IP address for a given host. ARP is limited to physical network systems that support broadcast packets that can be heard by all hosts on the network. It is defined in RFC 826. See also: proxy ARP.

Administrative Domain (AD)
A collection of hosts and routers, and the interconnecting network(s), managed by a single administrative authority.

Advanced Research Projects Agency Network (ARPANET)
A pioneering longhaul network funded by ARPA (now DARPA). It served as the basis for early networking research, as well as a central backbone during the development of the Internet. TheARPANET consisted of individual packet switching computers interconnected by leased lines. See also: Defense Advanced Research Projects Agency. [Source: FYI4]

agent
In the client-server model, the part of the system that performs information preparation and exchange on behalf of a client or server application. [Source: RFC1208]

alias
A name, usually short and easy to remember, that is translated into another name, usually long and difficult to remember.

American National Standards Institute (ANSI)
This organization is responsible for approving U.S. standards in many areas, including computers and communications. Standards approved by this organization are often called ANSI standards (e.g., ANSI C is the version of the C language approved by ANSI). ANSI is a member of ISO. See also: International Organization for Standardization. [Source: NNSC]

American Standard Code for Information Interchange (ASCII)
A standard character-to-number encoding widely used in the computer industry. See also: EBCDIC.

anonymous FTP
Anonymous FTP allows a user to retrieve documents, files, programs, and other archived data from anywhere in the Internet without having to establish a userid and password. By using the special userid of "anonymous" the network user will bypass local security checks and will have access to publicly accessible files on the remote system. See also: archive site, File Transfer Protocol.

ANSI
See: American National Standards Institute

API
See: Application Program Interface

Appletalk
A networking protocol developed by Apple Computer forcommunication between Apple Computer products and other computers.This protocol is independent of the network layer on which it is run. Current implementations exist for Localtalk, a 235Kb/s localarea network; and Ethertalk, a 10Mb/s local area network.[Source: NNSC]

application
A program that performs a function directly for a user. FTP, mail and Telnet clients are examples of network applications.

application layer
The top layer of the network protocol stack. The application layer is concerned with the semantics of work (e.g., formatting electronic mail messages). How to represent that data and how to reach the foreign node are issues for lower layers of the network. [Source: MALAMUD]

Application Program Interface (API)
A set of calling conventions which define how a service is invoked through a software package. [Source: RFC1208]

archie
A system to automatically gather, index and serve information on the Internet. The initial implementation of archie provided an indexed directory of filenames from all anonymous FTP archives on the Internet. Later versions provide other collections of information. See also: archive site, Gopher, Prospero, Wide Area Information Servers.

archive site
A machine that provides access to a collection of files across the Internet. An "anonymous FTP archive site", for example, provides access to this material via the FTP protocol. See also: anonymous FTP, archie, Gopher, Prospero, Wide Area Information Servers.

ARP
See: Address Resolution Protocol

ARPA
See: Defense Advanced Research Projects Agency

ARPANET
See: Advanced Research Projects Agency Network

AS
See: Autonomous System

ASCII
See: American Standard Code for Information Interchange

ASN.1
See: Abstract Syntax Notation One

assigned numbers
The RFC [STD2] which documents the currently assigned values from several series of numbers used in network protocol implementations. This RFC is updated periodically and, in any case, current information can be obtained from the Internet Assigned Numbers Authority (IANA). If you are developing a protocol or application that will require the use of a link, socket, port, protocol, etc., please contact the IANA to receive a number assignment. See also: Internet Assigned Numbers Authority, STD. [Source: STD2]

Asynchronous Transfer Mode (ATM)
A method for the dynamic allocation of bandwidth using a fixed- size packet (called a cell). ATM is also known as "fast packet".

ATM
See: Asynchronous Transfer Mode

AUP
See: Acceptable Use Policy

authentication
The verification of the identity of a person or process. [Source: MALAMUD]

Autonomous System (AS)
A collection of routers under a single administrative authority using a common Interior Gateway Protocol for routing packets.

backbone
The top level in a hierarchical network. Stub and transit networks which connect to the same backbone are guaranteed to be interconnected. See also: stub network, transit network.

bandwidth
Technically, the difference, in Hertz (Hz), between the highest and lowest frequencies of a transmission channel. However, as typically used, the amount of data that can be sent through a given communications circuit.

bang path
A series of machine names used to direct electronic mail from one user to another, typically by specifying an explicit UUCP path through which the mail is to be routed. See also: email address, mail path, UNIX-to-UNIX CoPy.

baseband
A transmission medium through which digital signals are sent without complicated frequency shifting. In general, only one communication channel is available at any given time. Ethernet is an example of a baseband network. See also: broadband, Ethernet. [Source: NNSC]

Basic Encoding Rules (BER)
Standard rules for encoding data units described in ASN.1. Sometimes incorrectly lumped under the term ASN.1, which properly refers only to the abstract syntax description language, not theencoding technique. See also: Abstract Syntax Notation One. [Source: NNSC]

BBS
See: Bulletin Board System

BCNU
Be Seein' You

BER
See: Basic Encoding Rules

Berkeley Internet Name Domain (BIND)
Implementation of a DNS server developed and distributed by the University of California at Berkeley. Many Internet hosts run BIND, and it is the ancestor of many commercial BIND implementations.

Berkeley Software Distribution (BSD)
Implementation of the UNIX operating system and its utilities developed and distributed by the University of California at Berkeley. "BSD" is usually preceded by the version number of the distribution, e.g., "4.3 BSD" is version 4.3 of the Berkeley UNIX distribution. Many Internet hosts run BSD software, and it is the ancestor of many commercial UNIX implementations. [Source: NNSC]

BGP
See: Border Gateway Protocol

big-endian
A format for storage or transmission of binary data in which the most significant bit (or byte) comes first. The term comes from "Gulliver's Travels" by Jonathan Swift. The Lilliputians, being very small, had correspondingly small political problems. The Big-Endian and Little-Endian parties debated over whether soft-boiled eggs should be opened at the big end or the little end. See also: little-endian. [Source: RFC1208]

binary
11001001

BIND
See: Berkeley Internet Name Domain

Birds Of a Feather (BOF)
A Birds Of a Feather (flocking together) is an informal discussion group. It is formed, often ad hoc, to consider a specific issue and, therefore, has a narrow focus.

Bitnet
An academic computer network that provides interactive electronic mail and file transfer services, using a store-and-forward protocol, based on IBM Network Job Entry protocols. Bitnet-II encapsulates the Bitnet protocol within IP packets and depends on the Internet to route them.

BOF
See: Birds Of a Feather

BOOTP
The Bootstrap Protocol, described in RFCs 951 and 1084, is used for booting diskless nodes. See also: Reverse Address Resolution Protocol.

Border Gateway Protocol (BGP)
The Border Gateway Protocol is an exterior gateway protocol defined in RFCs 1267 and 1268. It's design is based on experience gained with EGP, as defined in STD 18, RFC 904, and EGP usage in the NSFNET Backbone, as described in RFCs 1092 and 1093. See also: Exterior Gateway Protocol.

bounce
The return of a piece of mail because of an error in its delivery. [Source: ZEN]

bridge
A device which forwards traffic between network segments based on datalink layer information. These segments would have a common network layer address. See also: gateway, router.

broadband
A transmission medium capable of supporting a wide range of frequencies. It can carry multiple signals by dividing the totalcapacity of the medium into multiple, independent bandwidthchannels, where each channel operates only on a specific range offrequencies. See also: baseband.

broadcast
A special type of multicast packet which all nodes on the network are always willing to receive. See also: multicast.

broadcast storm
An incorrect packet broadcast onto a network that causes multiple hosts to respond all at once, typically with equally incorrect packets which causes the storm to grow exponentially in severity.

brouter
A device which bridges some packets (i.e., forwards based on datalink layer information) and routes other packets (i.e., forwards based on network layer information). The bridge/route decision is based on configuration information. See also: bridge, router.

BSD
See: Berkeley Software Distribution

BTW
By The Way

Bulletin Board System (BBS)
A computer, and associated software, which typically provides electronic messaging services, archives of files, and any other services or activities of interest to the bulletin board system's operator. Although BBS's have traditionally been the domain of hobbyists, an increasing number of BBS's are connected directly to the Internet, and many BBS's are currently operated by government, educational, and research institutions. See also: Electronic Mail, Internet, Usenet. [Source: NWNET]

Campus Wide Information System (CWIS)
interactive computing available via kiosks,interactive computing systems and campus networks. SA CWIS makes information and services publicly available on campusvia kiosks, and makes ervicesroutinely include directory information, calendars, bulletinboards, databases.

CCIRN
See: Coordinating Committee for Intercontinental Research Networks

CCITT
See: Comite Consultatif International de Telegraphique et Telephonique

CERT
See: Computer Emergency Response Team

checksum
A computed value which is dependent upon the contents of a packet. This value is sent along with the packet when it is transmitted. The receiving system computes a new checksum based upon the received data and compares this value with the one sent with the packet. If the two values are the same, the receiver has a high degree of confidence that the data was received correctly. [Source: NNSC]

circuit switching
A communications paradigm in which a dedicated communication path is established between two hosts, and on which all packets travel.The telephone system is an example of a circuit switched network. See also: connection-oriented, connectionless, packet switching.

client
A computer system or process that requests a service of another computer system or process. A workstation requesting the contents of a file from a file server is a client of the file server. See also: client-server model, server. [Source: NNSC]

client-server model
A common way to describe the paradigm of many network protocols. Examples include the name-server/name-resolver relationship in DNS and the file-server/file-client relationship in NFS. See also: client, server, Domain Name System, Network File System.

CNI
See: Coalition for Networked Information

Coalition for Networked Information (CNI)
A consortium formed by American Research Libraries, CAUSE, and EDUCOM to promote the creation of, and access to, information resources in networked environments in order to enrich scholarship and enhance intellectual productivity.

Comite Consultatif International de Telegraphique et Telephonique (CCITT)
This organization is part of the United National International Telecommunications Union (ITU) and is responsible for making technical recommendations about telephone and data communications systems. Every four years CCITT holds plenary sessions where they adopt new standards; the most recent was in 1992. [Source: NNSC]

Computer Emergency Response Team (CERT)
The CERT was formed by DARPA in November 1988 in response to the needs exhibited during the Internet worm incident. The CERT charter is to work with the Internet community to facilitate its response to computer security events involving Internet hosts, to take proactive steps to raise the community's awareness of computer security issues, and to conduct research targeted at improving the security of existing systems. CERT products and services include 24-hour technical assistance for responding to computer security incidents, product vulnerability assistance, technical documents, and tutorials. In addition, the team maintains a number of mailing lists (including one for CERT Advisories), and provides an anonymous FTP server, at "cert.org", where security-related documents and tools are archived. The CERT may be reached by email at "cert@cert.org" and by telephone at +1-412-268-7090 (24-hour hotline). See also: Defense Advanced Research Projects Agency, worm.

congestion
Congestion occurs when the offered load exceeds the capacity of a data communication path.

connection-oriented
The data communication method in which communication proceeds through three well-defined phases: connection establishment, data transfer, connection release. TCP is a connection-oriented protocol. See also: circuit switching, connectionless, packet switching, Transmission Control Protocol.

connectionless
The data communication method in which communication occurs between hosts with no previous setup. Packets between two hosts may take different routes, as each is independent of the other. UDP is a connectionless protocol. See also: circuit switching, connection-oriented, packet switching, User Datagram Protocol.

Coordinating Committee for Intercontinental Research Networks (CCIRN)

A committee that includes the United States FNC and its counterparts in North America and Europe. Co-chaired by the executive directors of the FNC and the European Association of Research Networks (RARE), the CCIRN provides a forum for cooperative planning among the principal North American and European research networking bodies. See also: Federal Networking Council, RARE. [Source: MALAMUD]

core gateway
Historically, one of a set of gateways (routers) operated by the Internet Network Operations Center at Bolt, Beranek and Newman (BBN). The core gateway system formed a central part of Internet routing in that all groups must advertise paths to their networks from a core gateway. [Source: MALAMUD]

Corporation for Research and Educational Networking (CREN)
This organization was formed in October 1989, when Bitnet and CSNET (Computer + Science NETwork) were combined under one administrative authority. CSNET is no longer operational, but CREN still runs Bitnet. See also: Bitnet. [Source: NNSC]

cracker
A cracker is an individual who attempts to access computer systems without authorization. These individuals are often malicious, as opposed to hackers, and have many means at their disposal for breaking into a system. See also: hacker, Computer Emergency Response Team, Trojan Horse, virus, worm.

CRC
See: cyclic redundancy check

CREN
See: Corporation for Research and Educational Networking

CWIS
See: Campus Wide Information system

Cyberspace
A term coined by William Gibson in his fantasy novel Neuromancer to describe the "world" of computers, and the society that gathers around them. [Source: ZEN]

Cyclic Redundancy Check (CRC)
A number derived from a set of data that will be transmitted. By recalculating the CRC at the remote end and comparing it to the value originally transmitted, the receiving node can detect some types of transmission errors. [Source: MALAMUD]

DARPA
See: Defense Advanced Research Projects Agency

Data Encryption Key (DEK)
Used for the encryption of message text and for the computation of message integrity checks (signatures). See also: encryption.

Data Encryption Standard (DES)
A popular, standard encryption scheme. See also: encryption.

datagram
A self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network. See also: frame, packet. [Source: J. Postel]

DCA
See: Defense Information Systems Agency

DCE
Data Circuit-terminating Equipment

DCE
See: Distributed Computing Environment

DDN
See: Defense Data Network

DDN NIC
See: Defense Data Network Network Information Center

DECnet
A proprietary network protocol designed by Digital Equipment Corporation. The functionality of each Phase of the implementation, such as Phase IV and Phase V, is different.

default route
A routing table entry which is used to direct packets addressed to networks not explicitly listed in the routing table. [Source: MALAMUD]

Defense Advanced Research Projects Agency (DARPA)
An agency of the U.S. Department of Defense responsible for the development of new technology for use by the military. DARPA (formerly known as ARPA) was responsible for funding much of the development of the Internet we know today, including the Berkeley version of Unix and TCP/IP. [Source: NNSC]

Defense Data Network (DDN)
A global communications network serving the US Department of Defense composed of MILNET, other portions of the Internet, and classified networks which are not part of the Internet. The DDN is used to connect military installations and is managed by the Defense Information Systems Agency. See also: Defense Information Systems Agency.

Defense Data Network Network Information Center (DDN NIC)
Often called "The NIC", the DDN NIC's primary responsibility is the assignment of Internet network addresses and Autonomous System numbers, the administration of the root domain, and providing information and support services to the DDN. It is also a primary repository for RFCs. See also: Autonomous System, network address, Internet Registry, Network Information Center, Request For Comments.

Defense Information Systems Agency (DISA)
Formerly called the Defense Communications Agency (DCA), this is the government agency responsible for managing the DDN portion of the Internet, including the MILNET. Currently, DISA administers the DDN, and supports the user assistance services of the DDN NIC. See also: Defense Data Network.

DEK
See: Data Encryption Key

DES
See: Data Encryption Standard

dialup
A temporary, as opposed to dedicated, connection between machines established over a standard phone line.

Directory Access Protocol
X.500 protocol used for communication between a Directory User Agent and a Directory System Agent. [Source: MALAMUD]

Directory System Agent (DSA)
The software that provides the X.500 Directory Service for a portion of the directory information base. Generally, each DSA is responsible for the directory information for a single organization or organizational unit. [Source: RFC1208]

Directory User Agent (DUA)
The software that accesses the X.500 Directory Service on behalf of the directory user. The directory user may be a person or another software element. [Source: RFC1208]

DISA
See: Defense Information Systems Agency

Distributed Computing Environment (DCE)
An architecture of standard programming interfaces, conventions, and server functionalities (e.g., naming, distributed file system, remote procedure call) for distributing applications transparently across networks of heterogeneous computers. Promoted and controlled by the Open Software Foundation (OSF), a consortium led by Digital, IBM and Hewlett Packard. [Source: RFC1208]

distributed database
A collection of several different data repositories that looks like a single database to the user. A prime example in the Internet is the Domain Name System.

DIX Ethernet
See: Ethernet

DNS
See: Domain Name System

domain
"Domain" is a heavily overused term in the Internet. It can be used in the Administrative Domain context, or the Domain Name context. See also: Administrative Domain, Domain Name System.

Domain Name System (DNS)
The DNS is a general purpose distributed, replicated, data query service. The principal use is the lookup of host IP addresses based on host names. The style of host names now used in the Internet is called "domain name", because they are the style of names used to look up anything in the DNS. Some important domains are: .COM (commercial), .EDU (educational), .NET (network operations), .GOV (U.S. government), and .MIL (U.S. military). Most countries also have a domain. For example, .US (United States), .UK (United Kingdom), .AU (Australia). It is defined in STD 13, RFCs 1034 and 1035. See also: Fully Qualified Domain Name.

dot address (dotted decimal notation)
Dot address refers to the common notation for IP addresses of the form A.B.C.D; where each letter represents, in decimal, one byte of a four byte IP address. See also: IP address. [Source: FYI4]

DS1
A framing specification for T-1 synchronous lines. See also: T1

DS3
A framing specification for T-3 synchronous lines. See also: T3

DSA
See: Directory System Agent

DTE
Data Terminal Equipment

DUA
See: Directory User Agent

dynamic adaptive routing
Automatic rerouting of traffic based on a sensing and analysis of current actual network conditions. NOTE: this does not include cases of routing decisions taken on predefined information. [Source: J. Postel]

EARN
See: European Academic and Research Network

EBCDIC
See: Extended Binary Coded Decimal Interchange Code

Ebone
A pan-European backbone service.

EFF
See: Electronic Frontier Foundation

EFLA
See: Extended Four Letter Acronym

EGP
See: Exterior Gateway Protocol

Electronic Frontier Foundation (EFF)
A foundation established to address social and legal issues arising from the impact on society of the increasingly pervasive use of computers as a means of communication and information distribution.

Electronic Mail (email)
A system whereby a computer user can exchange messages with other computer users (or groups of users) via a communications network. Electronic mail is one of the most popular uses of the Internet. [Source: NNSC]

email
See: Electronic mail

email address
The domain-based or UUCP address that is used to send electronic mail to a specified destination. For example an editor's address is "gmalkin@xylogics.com". See also: bang path, mail path, UNIX- to-UNIX CoPy. [Source: ZEN]

encapsulation
The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data. [Source: RFC1208]

encryption
Encryption is the manipulation of a packet's data in order to prevent any but the intended recipient from reading that data. There are many types of data encryption, and they are the basis of network security. See also: Data Encryption Standard.

Ethernet
A 10-Mb/s standard for LANs, initially developed by Xerox, and later refined by Digital, Intel and Xerox (DIX). All hosts are connected to a coaxial cable where they contend for network access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) paradigm. See also: 802.x, Local Area Network, token ring.

Ethernet meltdown
An event that causes saturation, or near saturation, on an Ethernet. It usually results from illegal or misrouted packets and typically lasts only a short time. [Source: COMER]

European Academic and Research Network (EARN)
A network connecting European academic and research institutions with electronic mail and file transfer services using the Bitnet protocol. See also: Bitnet

Extended Binary Coded Decimal Interchange Code (EBCDIC)
A standard character-to-number encoding used primarily by IBM computer systems. See also: ASCII.

Extended Four Letter Acronym (EFLA)
A recognition of the fact that there are far too many TLAs. See also: Three Letter Acronym. [Source: K. Morgan]

Exterior Gateway Protocol (EGP)
A protocol which distributes routing information to the routers which connect autonomous systems. The term "gateway" is historical, as "router" is currently the preferred term. There is also a routing protocol called EGP defined in STD 18, RFC 904. See also: Autonomous System, Border Gateway Protocol, Interior Gateway Protocol.

eXternal Data Representation (XDR)
A standard for machine independent data structures developed by Sun Microsystems and defined in RFC 1014. It is similar to ASN.1. See also: Abstract Syntax Notation One. [Source: RFC1208]

FARNET
A non-profit corporation, established in 1987, whose mission is to advance the use of computer networks to improve research and education.

FAQ
Frequently Asked Question

FDDI
See: Fiber Distributed Data Interface

Federal Information Exchange (FIX)
One of the connection points between the American governmental internets and the Internet. [Source: SURA]

Federal Networking Council (FNC)
The coordinating group of representatives from those federal agencies involved in the development and use of federal networking, especially those networks using TCP/IP and the Internet. Current members include representatives from DOD, DOE, DARPA, NSF, NASA, and HHS. See also: Defense Advanced Research Projects Agency, National Science Foundation.

Fiber Distributed Data Interface (FDDI)
A high-speed (100Mb/s) LAN standard. The underlying medium is fiber optics, and the topology is a dual-attached, counter- rotating token ring. See also: Local Area Network, token ring. [Source: RFC1208]

file transfer
The copying of a file from one computer to another over a computer network. See also: File Transfer Protocol, Kermit.

File Transfer Protocol (FTP)
A protocol which allows a user on one host to access, and transfer files to and from, another host over a network. Also, FTP is usually the name of the program the user invokes to execute the protocol. It is defined in STD 9, RFC 959. See also: anonymous FTP.

finger
A program that displays information about a particular user, or all users, logged on the local system or on a remote system. It typically shows full name, last login time, idle time, terminal line, and terminal location (where applicable). It may also display plan and project files left by the user.

FIX
See: Federal Information Exchange

flame
A strong opinion and/or criticism of something, usually as a frank inflammatory statement, in an electronic mail message. It is common to precede a flame with an indication of pending fire (i.e., FLAME ON!). Flame Wars occur when people start flaming other people for flaming when they shouldn't have. See also: Electronic Mail

FNC
See: Federal Networking Council

For Your Information (FYI)
A subseries of RFCs that are not technical standards or descriptions of protocols. FYIs convey general information about topics related to TCP/IP or the Internet. See also: Request For Comments, STD.

FQDN
See: Fully Qualified Domain Name

fragment
A piece of a packet. When a router is forwarding an IP packet to a network that has a maximum packet size smaller than the packet size, it is forced to break up that packet into multiple fragments. These fragments will be reassembled by the IP layer at the destination host.

fragmentation
The IP process in which a packet is broken into smaller pieces to fit the requirements of a physical network over which the packet must pass. See also: reassembly.

frame
A frame is a datalink layer "packet" which contains the header and trailer information required by the physical medium. That is, network layer packets are encapsulated to become frames. See also: datagram, encapsulation, packet.

freenet
Community-based bulletin board system with email, information services, interactive communications, and conferencing. Freenets are funded and operated by individuals and volunteers -- in one sense, like public television. They are part of the National Public Telecomputing Network (NPTN), an organization based in Cleveland, Ohio, devoted to making computer telecommunication and networking services as freely available as public libraries. [Source: LAQUEY]

FTP
See: File Transfer Protocol

Fully Qualified Domain Name (FQDN)
The FQDN is the full name of a system, rather than just its hostname. For example, "venera" is a hostname and "venera.isi.edu" is an FQDN. See also: hostname, Domain Name System.

FYI
See: For Your Information

gross
A dozen dozen (144).

gated
Gatedaemon. A program which supports multiple routing protocols and protocol families. It may be used for routing, and makes an effective platform for routing protocol research. The software is freely available by anonymous FTP from "gated.cornell.edu". Pronounced "gate-dee". See also: Exterior Gateway Protocol, Open Shortest Path First..., Routing Information Protocol, routed.

gateway
The term "router" is now used in place of the original definition of "gateway". Currently, a gateway is a communications device/program which passes data between networks having similar functions but dissimilar implementations. This should not be confused with a protocol converter. By this definition, a router is a layer 3 (network layer) gateway, and a mail gateway is a layer 7 (application layer) gateway. See also: mail gateway, router, protocol converter.

Gopher
A distributed information service that makes available hierarchical collections of information across the Internet. Gopher uses a simple protocol that allows a single Gopher client to access information from any accessible Gopher server, providing the user with a single "Gopher space" of information. Public domain versions of the client and server are available. See also: archie, archive site, Prospero, Wide Area Information Servers.

GOSIP
See: Government OSI Profile

Government OSI Profile
A subset of OSI standards specific to U.S. Government procurements, designed to maximize interoperability in areas where plain OSI standards are ambiguous or allow excessive options. [Source: BIG-LAN]

hacker
A person who delights in having an intimate understanding of the internal workings of a system, computers and computer networks in particular. The term is often misused in a pejorative context, where "cracker" would be the correct term. See also: cracker.

header
The portion of a packet, preceding the actual data, containing source and destination addresses, and error checking and other fields. A header is also the part of an electronic mail message that precedes the body of a message and contains, among other things, the message originator, date and time. See also: Electronic Mail, packet.

heterogeneous network
A network running multiple network layer protocols. See also: DECnet, IP, IPX, XNS.

hierarchical routing
The complex problem of routing on large networks can be simplified by reducing the size of the networks. This is accomplished by breaking a network into a hierarchy of networks, where each level is responsible for its own routing. The Internet has, basically, three levels: the backbones, the mid-levels, and the stub networks. The backbones know how to route between the mid-levels, the mid-levels know how to route between the sites, and each site (being an autonomous system) knows how to route internally. See also: Autonomous System, Exterior Gateway Protocol, Interior Gateway Protocol, stub network, transit network.

High Performance Computing and Communications (HPCC)
High performance computing encompasses advanced computing, communications, and information technologies, including scientific workstations, supercomputer systems, high speed networks, special purpose and experimental systems, the new generation of large scale parallel systems, and application and systems software with all components well integrated and linked over a high speed network. [Source: HPCC]

High Performance Parallel Interface (HIPPI)
An emerging ANSI standard which extends the computer bus over fairly short distances at speeds of 800 and 1600 Mb/s. HIPPI is often used in a computer room to connect a supercomputer to routers, frame buffers, mass-storage peripherals, and other computers. See also: American National Standards Institute [Source: MALAMUD]

HIPPI
See: High Performance Parallel Interface

hop
A term used in routing. A path to a destination on a network is a series of hops, through routers, away from the origin.

host
A computer that allows users to communicate with other host computers on a network. Individual users communicate by using application programs, such as electronic mail, Telnet and FTP. [Source: NNSC]

host address
See: internet address

hostname
The name given to a machine. See also: Fully Qualified Domain Name. [Source: ZEN]

host number
See: host address

HPCC
See: High Performance Computing and Communications

hub
A device connected to several other devices. In ARCnet, a hub is used to connect several computers together. In a message handling service, a hub is used for the transfer of messages across the network. [Source: MALAMUD]

I-D
See: Internet-Draft

IAB
See: Internet Architecture Board

IANA
See: Internet Assigned Numbers Authority

ICMP
See: Internet Control Message Protocol

IEEE
Institute of Electrical and Electronics Engineers

IEEE 802
See: 802.x

IEN
See: Internet Experiment Note

IESG
See: Internet Engineering Steering Group

IETF
See: Internet Engineering Task Force

IINREN
See: Interagency Interim National Research and Education Network

IGP
See: Interior Gateway Protocol

IMHO
In My Humble Opinion

IMR
See: Internet Monthly Report

Integrated Services Digital Network (ISDN)
An emerging technology which is beginning to be offered by the telephone carriers of the world. ISDN combines voice and digital network services in a single medium, making it possible to offer customers digital data services as well as voice connections through a single "wire". The standards that define ISDN are specified by CCITT. See also: CCITT. [Source: RFC1208]

Interagency Interim National Research and Education Network (IINREN)
An evolving operating network system. Near term (1992-1996) research and development activities will provide for the smooth evolution of this networking infrastructure into the future gigabit NREN. [Source: HPCC]

Interior Gateway Protocol (IGP)
A protocol which distributes routing information to the routers within an autonomous system. The term "gateway" is historical, as "router" is currently the preferred term. See also: Autonomous System, Exterior Gateway Protocol, Open Shortest Path First..., Routing Information Protocol.

Intermediate System (IS)
An OSI system which performs network layer forwarding. It is analogous to an IP router. See also: Open Systems Interconnection, router.

Intermediate System-Intermediate System (IS-IS)
The OSI IGP. See also: Open Systems Interconnection, Interior Gateway Protocol.

International Organization for Standardization (ISO)
A voluntary, nontreaty organization founded in 1946 which is responsible for creating international standards in many areas, including computers and communications. Its members are the national standards organizations of the 89 member countries, including ANSI for the U.S. See also: American National Standards Institute, Open Systems Interconnection. [Source: TAN]

internet
While an internet is a network, the term "internet" is usually used to refer to a collection of networks interconnected with routers. See also: network.

Internet
(note the capital "I") The Internet is the largest internet in the world. Is a three level hierarchy composed of backbone networks (e.g., NSFNET, MILNET), mid-level networks, and stub networks. The Internet is a multiprotocol internet. See also: backbone, mid-level network, stub network, transit network, Internet Protocol, Corporation for Research and Educational Networks, National Science Foundation.

internet address
A IP address that uniquely identifies a node on an internet. An Internet address (capital "I"), uniquely identifies a node on the Internet. See also: internet, Internet, IP address.

Internet Architecture Board (IAB)
The technical body that oversees the development of the Internet suite of protocols. It has two task forces: the IETF and the IRTF. "IAB" previously stood for Internet Activities Board. See also: Internet Engineering Task Force, Internet Research Task Force.

Internet Assigned Numbers Authority (IANA) The central registry for various Internet protocol parameters, such as port, protocol and enterprise numbers, and options, codes and types. The currently assigned values are listed in the "Assigned Numbers" document [STD2]. To request a number assignment, contact the IANA at "iana@isi.edu". See also: assigned numbers, STD.

Internet Control Message Protocol (ICMP)
ICMP is an extension to the Internet Protocol. It allows for the generation of error messages, test packets and informational messages related to IP. It is defined in STD 5, RFC 792. [Source: FYI4]

Internet-Draft (I-D)
Internet-Drafts are working documents of the IETF, its Areas, and its Working Groups.As the name implies, Internet-Drafts are draft documents. They are valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. Very often, I-Ds are precursors to RFCs. See also: Internet Engineering Task Force, Request For Comments.

Internet Engineering Steering Group (IESG)
The IESG is composed of the IETF Area Directors and the IETF Chair. It provides the first technical review of Internet standards and is responsible for day-to-day "management" of the IETF. See also: Internet Engineering Task Force.

Internet Engineering Task Force (IETF)
The IETF is a large, open community of network designers, operators, vendors, and researchers whose purpose is to coordinate the operation, management and evolution of the Internet, and to resolve short-range and mid-range protocol and architectural issues. It is a major source of proposals for protocol standards which are submitted to the IAB for final approval. The IETF meets three times a year and extensive minutes are included in the IETF Proceedings. See also: Internet, Internet Architecture Board. [Source: FYI4]

Internet Experiment Note (IEN)
A series of reports pertinent to the Internet. IENs were published in parallel to RFCs and are no longer active. See also: Internet-Draft, Request For Comments.

Internet Monthly Report (IMR)
Published monthly, the purpose of the Internet Monthly Reports is to communicate to the Internet Research Group the accomplishments, milestones reached, or problems discovered by the participating organizations.

internet number
See: internet address

Internet Protocol (IP)
The Internet Protocol, defined in STD 5, RFC 791, is the network layer for the TCP/IP Protocol Suite. It is a connectionless, best-effort packet switching protocol. See also: packet switching, Request For Comments, TCP/IP Protocol Suite.

Internet Registry (IR)
The IANA has the discretionary authority to delegate portions of its responsibility and, with respect to network address and Autonomous System identifiers, has lodged this responsibility with an IR. The IR function is performed by the DDN NIC. See also: Autonomous System, network address, Defense Data Network..., Internet Assigned Numbers Authority.

Internet Relay Chat (IRC)
A world-wide "party line" protocol that allows one to converse with others in real time. IRC is structured as a network of servers, each of which accepts connections from client programs, one per user. See also: talk. [Source: HACKER]

Internet Research Steering Group (IRSG)
The "governing body" of the IRTF. See also: Internet Research Task Force. [Source: MALAMUD]

Internet Research Task Force (IRTF)
The IRTF is chartered by the IAB to consider long-term Internet issues from a theoretical point of view. It has Research Groups, similar to IETF Working Groups, which are each tasked to discuss different research topics. Multi-cast audio/video conferencing and privacy enhanced mail are samples of IRTF output. See also: Internet Architecture Board, Internet Engineering Task Force, Privacy Enhanced Mail.

Internet Society (ISOC)
The Internet Society is a non-profit, professional membership organization which facilitates and supports the technical evolution of the Internet, stimulates interest in and educates the scientific and academic communities, industry and the public about the technology, uses and applications of the Internet, and promotes the development of new applications for the system. The Society provides a forum for discussion and collaboration in the operation and use of the global Internet infrastructure. The Internet Society publishes a quarterly newsletter, the Internet Society News, and holds an annual conference, INET. The development of Internet technical standards takes place under the auspices of the Internet Society with substantial support from the Corporation for National Research Initiatives under a cooperative agreement with the US Federal Government. [Source: V. Cerf]

Internetwork Packet eXchange (IPX)
Novell's protocol used by Netware. A router with IPX routing can interconnect LANs so that Novell Netware clients and servers can communicate. See also: Local Area Network.

interoperability
The ability of software and hardware on multiple machines from multiple vendors to communicate meaningfully.

IP
See: Internet Protocol

IP address
The 32-bit address defined by the Internet Protocol in STD 5, RFC 791. It is usually represented in dotted decimal notation. See also: dot address, internet address, Internet Protocol, network address, subnet address, host address.

IP datagram
See: datagram

IPX
See: Internetwork Packet eXchange

IR
See: Internet Registry

IRC
See: Internet Relay Chat

IRSG
See: Internet Research Steering Group

IRTF
See: Internet Research Task Force

IS
See: Intermediate System

IS-IS
See: Intermediate System-Intermediate System

ISDN
See: Integrated Services Digital Network

ISO
See: International Organization for Standardization

ISO Development Environment (ISODE)
Software that allows OSI services to use a TCP/IP network. Pronounced eye-so-dee-eee. See also: Open Systems Interconnection, TCP/IP Protocol Suite.

ISOC
See: Internet Society

ISODE
See: ISO Development Environment

JKREY
Joyce K. Reynolds

KA9Q
A popular implementation of TCP/IP and associated protocols for amateur packet radio systems. See also: TCP/IP Protocol Suite. [Source: RFC1208]

Kerberos
Kerberos is the security system of MIT's Project Athena. It is based on symmetric key cryptography. See also: encryption.

Kermit
A popular file transfer protocol developed by Columbia University. Because Kermit runs in most operating environments, it provides an easy method of file transfer. Kermit is NOT the same as FTP. See also: File Transfer Protocol [Source: MALAMUD]

Knowbot
An experimental directory service. See also: white pages, WHOIS, X.500.

LAN
See: Local Area Network

layer
Communication networks for computers may be organized as a set of more or less independent protocols, each in a different layer (also called level). The lowest layer governs direct host-to-host communication between the hardware at different hosts; the highest consists of user applications. Each layer builds on the layer beneath it. For each layer, programs at different hosts use protocols appropriate to the layer to communicate with each other. TCP/IP has five layers of protocols; OSI has seven. The advantages of different layers of protocols is that the methods of passing information from one layer to another are specified clearly as part of the protocol suite, and changes within a protocol layer are prevented from affecting the other layers. This greatly simplifies the task of designing and maintaining communication programs. See also: Open Systems Interconnection, TCP/IP Protocol Suite.

listserv
An automated mailing list distribution system originally designed for the Bitnet/EARN network. See also: Bitnet, European Academic Research Network, mailing list.

little-endian
A format for storage or transmission of binary data in which the least significant byte (bit) comes first. See also: big-endian. [Source: RFC1208]

LLC
See: Logical Link Control

Local Area Network (LAN)
A data network intended to serve an area of only a few square kilometers or less. Because the network is known to cover only a small area, optimizations can be made in the network signal protocols that permit data rates up to 100Mb/s. See also: Ethernet, Fiber Distributed Data Interface, token ring, Wide Area Network. [Source: NNSC]

Logical Link Control (LLC)
The upper portion of the datalink layer, as defined in IEEE 802.2. The LLC sublayer presents a uniform interface to the user of the datalink service, usually the network layer. Beneath the LLC sublayer is the MAC sublayer. See also: 802.x, layer, Media Access Control.

Lurking
No active participation on the part of a subscriber to an mailing list or USENET newsgroup. A person who is lurking is just listening to the discussion. Lurking is encouraged for beginners who need to get up to speed on the history of the group. See also: Electronic Mail, mailing list, Usenet. [Source: LAQUEY]

MAC
See: Media Access Control

MAC address
The hardware address of a device connected to a shared media. See also: Media Access Control, Ethernet, token ring. [Source: MALAMUD]

mail bridge
A mail gateway that forwards electronic mail between two or more networks while ensuring that the messages it forwards meet certain administrative criteria. A mail bridge is simply a specialized form of mail gateway that enforces an administrative policy with regard to what mail it forwards. See also: Electronic Mail, mail gateway. [Source: NNSC]

Mail Exchange Record (MX Record)
A DNS resource record type indicating which host can handle mail for a particular domain. See also: Domain Name System, Electronic Mail. [Source: MALAMUD]

mail exploder
Part of an electronic mail delivery system which allows a message to be delivered to a list of addresses. Mail exploders are used to implement mailing lists. Users send messages to a single address and the mail exploder takes care of delivery to the individual mailboxes in the list. See also: Electronic Mail, email address, mailing list. [Source: RFC1208]

mail gateway
A machine that connects two or more electronic mail systems (including dissimilar mail systems) and transfers messages between them. Sometimes the mapping and translation can be quite complex, and it generally requires a store-and-forward scheme whereby the message is received from one system completely before it is transmitted to the next system, after suitable translations. See also: Electronic Mail. [Source: RFC1208]

mail path
A series of machine names used to direct electronic mail from one user to another. This system of email addressing has been used primarily in UUCP networks which are trying to eliminate its use altogether. See also: bang path, email address, UNIX-to-UNIX CoPy.

mail server
A software program that distributes files or information in response to requests sent via email. Internet examples include Almanac and netlib. Mail servers have also been used in Bitnet to provide FTP-like services. See also: Bitnet, Electronic Mail, FTP. [Source: NWNET]

mailing list
A list of email addresses, used by a mail exploder, to forward messages to groups of people. Generally, a mailing list is used to discuss certain set of topics, and different mailing lists discuss different topics. A mailing list may be moderated. This means that messages sent to the list are actually sent to a moderator who determines whether or not to send the messages on to everyone else. Requests to subscribe to, or leave, a mailing list should ALWAYS be sent to the list's "-request" address (e.g., ietf-request@cnri.reston.va.us for the IETF mailing list). See also: Electronic Mail, mail exploder.

MAN
See: Metropolitan Area Network

Management Information Base (MIB)
The set of parameters an SNMP management station can query or set in the SNMP agent of a network device (e.g., router). Standard, minimal MIBs have been defined, and vendors often have Private enterprise MIBs. In theory, any SNMP manager can talk to any SNMP agent with a properly defined MIB. See also: client-server model, Simple Network Management Protocol. [Source: BIG-LAN]

Martian
A humorous term applied to packets that turn up unexpectedly on the wrong network because of bogus routing entries. Also used as a name for a packet which has an altogether bogus (non-registered or ill-formed) internet address. [Source: RFC1208]

Maximum Transmission Unit (MTU)
The largest frame length which may be sent on a physical medium. See also: fragmentation, frame.

Media Access Control (MAC)
The lower portion of the datalink layer. The MAC differs for various physical media. See also: MAC Address, Ethernet, Logical Link Control, token ring.

message switching
See: packet switching

Metropolitan Area Network (MAN)
A data network intended to serve an area approximating that of a large city. Such networks are being implemented by innovative techniques, such as running fiber cables through subway tunnels. A popular example of a MAN is SMDS. See also: Local Area Network, Switched Multimegabit Data Service, Wide Area Network. [Source: NNSC]

MIB
See: Management Information Base

mid-level network
Mid-level networks (a.k.a. regionals) make up the second level of the Internet hierarchy. They are the transit networks which connect the stub networks to the backbone networks. See also: backbone, Internet, stub network, transit network.

MIME
See: Multipurpose Internet Mail Extensions

moderator
A person, or small group of people, who manage moderated mailing lists and newsgroups. Moderators are responsible for determining which email submissions are passed on to list. See also: Electronic Mail, mailing list, Usenet.

MTU
See: Maximum Transmission Unit

MUD
See: Multi-User Dungeon

multicast
A packet with a special destination address which multiple nodes on the network may be willing to receive. See also: broadcast.

multihomed host
A host which has more than one connection to a network. The host may send and receive data over any of the links but will not route traffic for other nodes. See also: host, router. [Source: MALAMUD]

Multipurpose Internet Mail Extensions (MIME)
An extension to Internet email which provides the ability to transfer non-textual data, such as graphics, audio and fax. It is defined in RFC 1341. See also: Electronic Mail

Multi-User Dungeon (MUD)
Adventure, role playing games, or simulations played on the Internet. Devotees call them "text-based virtual reality adventures". The games can feature fantasy combat, booby traps and magic. Players interact in real time and can change the "world" in the game as they play it. Most MUDs are based on the Telnet protocol. See also: Telnet. [Source: LAQUEY]

MX Record
See: Mail Exchange Record

NAK
See: Negative Acknowledgment

name resolution
The process of mapping a name into its corresponding address. See also: Domain Name System. [Source: RFC1208]

namespace
A commonly distributed set of names in which all names are unique. [Source: MALAMUD]

National Institute of Standards and Technology (NIST)
United States governmental body that provides assistance in developing standards. Formerly the National Bureau of Standards. [Source: MALAMUD]

National Research and Education Network (NREN)
The NREN is the realization of an interconnected gigabit computer network devoted to Hign Performance Computing and Communications. See also: HPPC, IINREN. [Source: HPCC]

National Science Foundation (NSF)
A U.S. government agency whose purpose is to promote the advancement of science. NSF funds science researchers, scientific projects, and infrastructure to improve the quality of scientific research. The NSFNET, funded by NSF, is an essential part of academic and research communications. It is a highspeed "network of networks" which is hierarchical in nature. At the highest level, it is a backbone network currently comprising 16 nodes connected to a 45Mb/s facility which spans the continental United States. Attached to that are mid-level networks and attached to the mid-levels are campus and local networks. NSFNET also has connections out of the U.S. to Canada, Mexico, Europe, and the Pacific Rim. The NSFNET is part of the Internet.

Negative Acknowledgment (NAK)
Response to receipt of a corrupted packet of information. See also: Acknowledgement.

netiquette
A pun on "etiquette" referring to proper behavior on a network.

Netnews
See: Usenet

network
A computer network is a data communications system which interconnects computer systems at various different sites. A network may be composed of any combination of LANs, MANs or WANs. See also: Local Area Network, Metropolitan Area Network, Wide Area Network, internet.

network address
The network portion of an IP address. For a class A network, the network address is the first byte of the IP address. For a class B network, the network address is the first two bytes of the IP address. For a class C network, the network address is the first three bytes of the IP address. In each case, the remainder is the host address. In the Internet, assigned network addresses are globally unique. See also: Internet, IP address, subnet address, host address, Internet Registry.

Network File System (NFS)
A protocol developed by Sun Microsystems, and defined in RFC 1094, which allows a computer system to access files over a network as if they were on its local disks. This protocol has been incorporated in products by more than two hundred companies, and is now a de facto Internet standard. [Source: NNSC]

Network Information Center (NIC)
A NIC provides information, assistance and services to network users. See also: Network Operations Center.

Network Information Services (NIS)
A set of services, generally provided by a NIC, to assist users in using the network. See also: Network Information Center.

Network News Transfer Protocol (NNTP)
A protocol, defined in RFC 977, for the distribution, inquiry, retrieval, and posting of news articles. See also: Usenet.

network number
See: network address

Network Operations Center (NOC)
A location from which the operation of a network or internet is monitored. Additionally, this center usually serves as a clearinghouse for connectivity problems and efforts to resolve those problems. See also: Network Information Center. [Source: NNSC]

Network Time Protocol (NTP)
A protocol that assures accurate local timekeeping with reference to radio and atomic clocks located on the Internet. This protocol is capable of synchronizing distributed clocks within milliseconds over long time periods. It is defined in STD 12, RFC 1119. See

also: Internet.
[Source: NNSC]

NFS
See: Network File System

NIC
See: Network Information Center

NIC.DDN.MIL
This is the domain name of the DDN NIC. See also: Defense Data Network..., Domain Name System, Network Information Center.

NIS
See: Network Information Services

NIST
See: National Institute of Standards and Technology

NNTP
See: Network News Transfer Protocol

NOC
See: Network Operations Center

Nodal Switching System (NSS)
Main routing nodes in the NSFnet backbone. See also: backbone, National Science Foundation. [Source: MALAMUD]

node
An addressable device attached to a computer network. See also: host, router.

NREN
See: National Research and Education Network

NSF
See: National Science Foundation

NSS
See: Nodal Switching System

NTP
See: Network Time Protocol

OCLC
See: Online Computer Library Catalog

octet
An octet is 8 bits. This term is used in networking, rather than byte, because some systems have bytes that are not 8 bits long.

Online Computer Library Catalog
OCLC is a nonprofit membership organization offering computer- based services to libraries, educational organizations, and their users. The OCLC library information network connects more than 10,000 libraries worldwide. Libraries use the OCLC System for cataloging, interlibrary loan, collection development, bibliographic verification, and reference searching. [Source: OCLC]

Open Shortest-Path First Interior Gateway Protocol (OSPF)
A link state, as opposed to distance vector, routing protocol. It is an Internet standard IGP defined in RFC 1247. See also: Interior Gateway Protocol, Routing Information Protocol.

Open Systems Interconnection (OSI)
A suite of protocols, designed by ISO committees, to be the international standard computer network architecture. See also: International Organization for Standardization.

OSI
See: Open Systems Interconnection

OSI Reference Model
A seven-layer structure designed to describe computer network architectures and the way that data passes through them. This model was developed by the ISO in 1978 to clearly define the interfaces in multivendor networks, and to provide users of those networks with conceptual guidelines in the construction of such networks. See also: International Organization for Standardization. [Source: NNSC]

OSPF
See: Open Shortest-Path First Interior Gateway Protocol

packet
The unit of data sent across a network. "Packet" a generic term used to describe unit of data at all levels of the protocol stack, but it is most correctly used to describe application data units. See also: datagram, frame.

Packet InterNet Groper (PING)
A program used to test reachability of destinations by sending them an ICMP echo request and waiting for a reply. The term is used as a verb: "Ping host X to see if it is up!" See also: Internet Control Message Protocol. [Source: RFC1208]

Packet Switch Node (PSN)
A dedicated computer whose purpose is to accept, route and forward packets in a packet switched network. See also: packet switching, router. [Source: NNSC]

packet switching
A communications paradigm in which packets (messages) are individually routed between hosts, with no previously established communication path. See also: circuit switching, connection-oriented, connectionless.

PD
Public Domain

PDU
See: Protocol Data Unit

PEM
See: Privacy Enhanced Mail

PING
See: Packet INternet Groper

Point Of Presence (POP)
A site where there exists a collection of telecommunications equipment, usually digital leased lines and multi-protocol routers.

Point-to-Point Protocol (PPP)
The Point-to-Point Protocol, defined in RFC 1171, provides a method for transmitting packets over serial point-to-point links. See also: Serial Line IP. [Source: FYI4]

POP
See: Post Office Protocol and Point Of Presence

port
A port is a transport layer demultiplexing value. Each application has a unique port number associated with it. See also: Transmission Control Protocol, User Datagram Protocol.

Post Office Protocol (POP)
A protocol designed to allow single user hosts to read mail from a server. There are three versions: POP, POP2, and POP3. Latter versions are NOT compatible with earlier versions. See also: Electronic Mail.

Postal Telegraph and Telephone (PTT)
Outside the USA, PTT refers to a telephone service provider, which is usually a monopoly, in a particular country.

postmaster
The person responsible for taking care of electronic mail problems, answering queries about users, and other related work at a site. See also: Electronic Mail. [Source: ZEN]

PPP
See: Point-to-Point Protocol

Privacy Enhanced Mail (PEM)
Internet email which provides confidentiality, authentication and message integrity using various encryption methods. See also: Electronic Mail, encryption.

Prospero
A distributed filesystem which provides the user with the ability to create multiple views of a single collection of files distributed across the Internet. Prospero provides a file naming system, and file access is provided by existing access methods (e.g., anonymous FTP and NFS). The Prospero protocol is also used for communication between clients and servers in the archie system. See also: anonymous FTP, archie, archive site, Gopher, Network File System, Wide Area Information Servers.

protocol
A formal description of message formats and the rules two computers must follow to exchange those messages. Protocols can describe low-level details of machine-to-machine interfaces (e.g., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (e.g., the way in which two programs transfer a file across the Internet). [Source: MALAMUD]

protocol converter
A device/program which translates between different protocols which serve similar functions (e.g., TCP and TP4).

Protocol Data Unit (PDU)
"PDU" is internationalstandardscomitteespeak for packet. See also: packet.

protocol stack
A layered set of protocols which work together to provide a set of network functions. See also: layer, protocol.

proxy ARP
The technique in which one machine, usually a router, answers ARP requests intended for another machine. By "faking" its identity, the router accepts responsibility for routing packets to the "real" destination. Proxy ARP allows a site to use a single IP address with two physical networks. Subnetting would normally be a better solution. See also: Address Resolution Protocol [Source: RFC1208]

PSN
See: Packet Switch Node.

PTT
See: Postal, Telegraph and Telephone

queue
A backup of packets awaiting processing.

RARE
See: Reseaux Associes pour la Recherche Europeenne

RARP
See: Reverse Address Resolution Protocol

RBOC
Regional Bell Operating Company

RCP
See: Remote copy program

Read the F*cking Manual (RTFM)
This acronym is often used when someone asks a simple or common question.

reassembly
The IP process in which a previously fragmented packet is reassembled before being passed to the transport layer. See also: fragmentation. recursive See: recursive

regional
See: mid-level network

remote login
Operating on a remote computer, using a protocol over a computer network, as though locally attached. See also: Telnet.

Remote Procedure Call (RPC)
An easy and popular paradigm for implementing the client-server model of distributed computing. In general, a request is sent to a remote system to execute a designated procedure, using arguments supplied, and the result returned to the caller. There are many variations and subtleties in various implementations, resulting in a variety of different (incompatible) RPC protocols. [Source: RFC1208]

repeater
A device which propagates electrical signals from one cable to another. See also: bridge, gateway, router.

Request For Comments (RFC)
The document series, begun in 1969, which describes the Internet suite of protocols and related experiments. Not all (in fact very few) RFCs describe Internet standards, but all Internet standards are written up as RFCs. The RFC series of documents is unusual in that the proposed protocols are forwarded by the Internet research and development community, acting on their own behalf, as opposed to the formally reviewed and standardized protocols that are promoted by organizations such as CCITT and ANSI. See also: For Your Information, STD.

Reseaux Associes pour la Recherche Europeenne (RARE)
European association of research networks. [Source: RFC1208]

Reseaux IP Europeenne (RIPE)
A collaboration between European networks which use the TCP/IP protocol suite.

Reverse Address Resolution Protocol (RARP)
A protocol, defined in RFC 903, which provides the reverse function of ARP. RARP maps a hardware (MAC) address to an internet address. It is used primarily by diskless nodes when they first initialize to find their internet address. See also: Address Resolution Protocol, BOOTP, internet address, MAC address.

RFC 822
The Internet standard format for electronic mail message headers. Mail experts often refer to "822 messages". The name comes from "RFC 822", which contains the specification (STD 11, RFC 822). 822 format was previously known as 733 format. See also: Electronic Mail. [Source: COMER]

RIP
See: Routing Information Protocol

RIPE
See: Reseaux IP Europeenne

Round-Trip Time (RTT)
A measure of the current delay on a network. [Source: MALAMUD]

route
The path that network traffic takes from its source to its destination. Also, a possible path from a given host to another host or destination.

routed
Route Daemon. A program which runs under 4.2BSD/4.3BSD UNIX systems (and derived operating systems) to propagate routes among machines on a local area network, using the RIP protocol. Pronounced "route-dee". See also: Routing Information Protocol, gated.

router
A device which forwards traffic between networks. The forwarding decision is based on network layer information and routing tables, often constructed by routing protocols. See also: bridge, gateway, Exterior Gateway Protocol, Interior Gateway Protocol.

routing
The process of selecting the correct interface and next hop for a packet being forwarded. See also: hop, router, Exterior Gateway Protocol, Interior Gateway Protocol.

routing domain
A set of routers exchanging routing information within an administrative domain. See also: Administrative Domain, router.

Routing Information Protocol (RIP)
A distance vector, as opposed to link state, routing protocol. It is an Internet standard IGP defined in STD 34, RFC 1058 (updated by RFC 1388). See also: Interior Gateway Protocol, Open Shortest Path First....

RPC
See: Remote Procedure Call

RTFM
See: Read the F*cking Manual

RTT
See: Round-Trip Time

Serial Line IP (SLIP)
A protocol used to run IP over serial lines, such as telephone circuits or RS-232 cables, interconnecting two systems. SLIP is defined in RFC 1055. See also: Point-to-Point Protocol.

server
A provider of resources (e.g., file servers and name servers). See also: client, Domain Name System, Network File System.

SIG
Special Interest Group

signature
The three or four line message at the bottom of a piece of email or a Usenet article which identifies the sender. Large signatures (over five lines) are generally frowned upon. See also: Electronic Mail, Usenet.

Simple Mail Transfer Protocol (SMTP)
A protocol, defined in STD 10, RFC 821, used to transfer electronic mail between computers. It is a server to server protocol, so other protocols are used to access the messages. See also: Electronic Mail, Post Office Protocol, RFC 822.

Simple Network Management Protocol (SNMP)
The Internet standard protocol, defined in STD 15, RFC 1157, developed to manage nodes on an IP network. It is currently possible to manage wiring hubs, toasters, jukeboxes, etc. See also: Management Information Base.

SLIP
See: Serial Line IP

SMDS
See: Switched Multimegabit Data Service

SMI
See: Structure of Management Information

SMTP
See: Simple Mail Transfer Protocol

SNA
See: Systems Network Architecture

snail mail
A pejorative term referring to the U.S. postal service.

SNMP
See: Simple Network Management Protocol

STD
A subseries of RFCs that specify Internet standards. The official list of Internet standards is in STD 1. See also: For Your Information, Request For Comments.

stream-oriented
A type of transport service that allows its client to send data in a continuous stream. The transport service will guarantee that all data will be delivered to the other end in the same order as sent and without duplicates. See also: Transmission Control Protocol. [Source: MALAMUD]

Structure of Management Information (SMI)
The rules used to define the objects that can be accessed via a network management protocol. This protocol is defined in STD 16, RFC 1155. See also: Management Information Base. [Source: RFC1208]

stub network
A stub network only carries packets to and from local hosts. Even if it has paths to more than one other network, it does not carry traffic for other networks. See also: backbone, transit network.

subnet
A portion of a network, which may be a physically independent network segment, which shares a network address with other portions of the network and is distinguished by a subnet number. A subnet is to a network what a network is to an internet. See also: internet, network. [Source: FYI4]

subnet address
The subnet portion of an IP address. In a subnetted network, the host portion of an IP address is split into a subnet portion and a host portion using an address (subnet) mask. See also: address mask, IP address, network address, host address.

subnet mask
See: address mask

subnet number
See: subnet address

Switched Multimegabit Data Service (SMDS)
An emerging high-speed datagram-based public data network service developed by Bellcore and expected to be widely used by telephone companies as the basis for their data networks. See also: Metropolitan Area Network. [Source: RFC1208]

Systems Network Architecture (SNA)
A proprietary networking architecture used by IBM and IBM- compatible mainframe computers. [Source: NNSC]

T1
An AT&T term for a digital carrier facility used to transmit a DS-1 formatted digital signal at 1.544 megabits per second.

T3
A term for a digital carrier facility used to transmit a DS-3 formatted digital signal at 44.746 megabits per second. [Source: FYI4]

TAC
See: Terminal Access Controller (TAC)

talk
A protocol which allows two people on remote computers to communicate in a real-time fashion. See also: Internet Relay Chat.

TCP
See: Transmission Control Protocol

TCP/IP Protocol Suite
Transmission Control Protocol over Internet Protocol. This is a common shorthand which refers to the suite of transport and application protocols which runs over IP. See also: IP, ICMP, TCP, UDP, FTP, Telnet, SMTP, SNMP.

TELENET
A public packet switched network using the CCITT X.25 protocols. It should not be confused with Telnet.

Telnet
Telnet is the Internet standard protocol for remote terminal connection service. It is defined in STD 8, RFC 854 and extended with options by many other RFCs.

Terminal Access Controller (TAC)
A device which connects terminals to the Internet, usually using dialup modem connections and the TACACS protocol.

terminal emulator
A program that allows a computer to emulate a terminal. The workstation thus appears as a terminal to the remote host. [Source: MALAMUD]

terminal server
A device which connects many terminals to a LAN through one network connection. A terminal server can also connect many network users to its asynchronous ports for dial-out capabilities and printer access. See also: Local Area Network.

Three Letter Acronym (TLA)
A tribute to the use of acronyms in the computer field. See also: Extended Four Letter Acronym.

Time to Live (TTL)
A field in the IP header which indicates how long this packet should be allowed to survive before being discarded. It is primarily used as a hop count. See also: Internet Protocol. [Source: MALAMUD]

TLA
See: Three Letter Acronym

TN3270
A variant of the Telnet program that allows one to attach to IBM mainframes and use the mainframe as if you had a 3270 or similar terminal. [Source: BIG-LAN]

token ring
A token ring is a type of LAN with nodes wired into a ring. Each node constantly passes a control message (token) on to the next; whichever node has the token can send a message. Often, "Token Ring" is used to refer to the IEEE 802.5 token ring standard, which is the most common type of token ring. See also: 802.x, Local Area Network.

topology
A network topology shows the computers and the links between them. A network layer must stay abreast of the current network topology to be able to route packets to their final destination. [Source: MALAMUD]

transceiver
Transmitter-receiver. The physical device that connects a host interface to a local area network, such as Ethernet. Ethernet transceivers contain electronics that apply signals to the cable and sense collisions. [Source: RFC1208]

transit network
A transit network passes traffic between networks in addition to carrying traffic for its own hosts. It must have paths to at least two other networks. See also: backbone, stub network.

Transmission Control Protocol (TCP)
An Internet Standard transport layer protocol defined in STD 7, RFC 793. It is connection-oriented and stream-oriented, as opposed to UDP. See also: connection-oriented, stream-oriented, User Datagram Protocol.

Trojan Horse
A computer program which carries within itself a means to allow the creator of the program access to the system using it. See also: virus, worm. See RFC 1135.

TTFN
Ta-Ta For Now

TTL
See: Time to Live

tunnelling
Tunnelling refers to encapsulation of protocol A within protocol B, such that A treats B as though it were a datalink layer. Tunnelling is used to get data between administrative domains which use a protocol that is not supported by the internet connecting those domains. See also: Administrative Domain.

twisted pair
A type of cable in which pairs of conductors are twisted together to produce certain electrical properties.

UDP
See: User Datagram Protocol

Universal Time Coordinated (UTC)
This is Greenwich Mean Time. [Source: MALAMUD]

UNIX-to-UNIX CoPy (UUCP)
This was initially a program run under the UNIX operating system that allowed one UNIX system to send files to another UNIX system via dial-up phone lines. Today, the term is more commonly used to describe the large international network which uses the UUCP protocol to pass news and electronic mail. See also: Electronic Mail, Usenet.

urban legend
A story, which may have started with a grain of truth, that has been embroidered and retold until it has passed into the realm of myth. It is an interesting phenonmenon that these stories get spread so far, so fast and so often. Urban legends never die, they just end up on the Internet! Some legends that periodically make their rounds include "The Infamous Modem Tax," "Craig Shergold/Brain Tumor/Get Well Cards," and "The $250 Cookie Recipe". [Source: LAQUEY]

Usenet
A collection of thousands of topically named newsgroups, the computers which run the protocols, and the people who read and submit Usenet news. Not all Internet hosts subscribe to Usenet and not all Usenet hosts are on the Internet. See also: Network News Transfer Protocol, UNIX-to-UNIX CoPy. [Source: NWNET]

User Datagram Protocol (UDP)
An Internet Standard transport layer protocol defined in STD 6, RFC 768. It is a connectionless protocol which adds a level of reliability and multiplexing to IP. See also: connectionless, Transmission Control Protocol.

UTC
See: Universal Time Coordinated

UUCP
See: UNIX-to-UNIX CoPy

virtual circuit
A network service which provides connection-oriented service regardless of the underlying network structure. See also: connection-oriented.

virus
A program which replicates itself on computer systems by incorporating itself into other programs which are shared among computer systems. See also: Trojan Horse, worm.

W3
See: World Wide Web

WAIS
See: Wide Area Information Servers

WAN
See: Wide area network

WG
Working Group

white pages
The Internet supports several databases that contain basic information about users, such as email addresses, telephone numbers, and postal addresses. These databases can be searched to get information about particular individuals. Because they serve a function akin to the telephone book, these databases are often referred to as "white pages. See also: Knowbot, WHOIS, X.500.

WHOIS
An Internet program which allows users to query a database of people and other Internet entities, such as domains, networks, and hosts, kept at the DDN NIC. The information for people shows a person's company name, address, phone number and email address. See also: Defense Data Network Network ..., white pages, Knowbot, X.500. [Source: FYI4]

Wide Area Information Servers (WAIS)
A distributed information service which offers simple natural language input, indexed searching for fast retrieval, and a "relevance feedback" mechanism which allows the results of initial searches to influence future searches. Public domain implementations are available. See also: archie, Gopher, Prospero.

Wide Area Network (WAN)
A network, usually constructed with serial lines, which covers a large geographic area. See also: Local Area Network, Metropolitan Area Network.

World Wide Web (WWW or W3)
A hypertext-based, distributed information system created by researchers at CERN in Switzerland. Users may create, edit or browse hypertext documents. The clients and servers are freely available.

worm
A computer program which replicates itself and is self- propagating. Worms, as opposed to viruses, are meant to spawn in network environments. Network worms were first defined by Shoch & Hupp of Xerox in ACM Communications (March 1982). The Internet worm of November 1988 is perhaps the most famous; it successfully propagated itself on over 6,000 systems across the Internet. See also: Trojan Horse, virus.

WRT
With Respect To

WWW
See: World Wide Web

WYSIWYG
What You See is What You Get

X
X is the name for TCP/IP based network-oriented window systems. Network window systems allow a program to use a display on a different computer.The most widely-implemented window system is X11 - a component of MIT's Project Athena.

X.25
A data communications interface specification developed to describe how data passes into and out of public data communications networks. The CCITT and ISO approved protocol suite defines protocol layers 1 through 3.

X.400
The CCITT and ISO standard for electronic mail. It is widely used in Europe and Canada.

X.500
The CCITT and ISO standard for electronic directory services. See also: white pages, Knowbot, WHOIS.

XDR
See: eXternal Data Representation

Xerox Network System (XNS)
A network developed by Xerox corporation. Implementations exist for both 4.3BSD derived systems, as well as the Xerox Star computers.

XNS
See: Xerox Network System

Yellow Pages (YP)
A service used by UNIX administrators to manage databases distributed across a network.

YP
See: Yellow Pages

zone
A logical group of network devices (AppleTalk).

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## Security Considerations

While security is not explicitly discussed in this document, some of the glossary's entries are security related. See the entries for Access Control List (ACL), authentication, Computer Emergency Response Team (CERT), cracker, Data Encryption Key (DEK), Data Encryption Standard (DES), encryption, Kerberos, Privacy Enhanced Mail (PEM), Trojan Horse, virus, and worm.

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