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Macintosh Dialup Internet Access through InfoRamp

This note describes how to use a Macintosh to access the Internet through InfoRamp. I will give a very brief description of the Internet, outline the basic protocols of the Internet, and describe the software components that you will need to run on your Mac. Then I will detail how to install and configure these components, and how to connect for the first time.

The Internet itself operates with open, standard protocols. You will use these protocols through a set of easily available software components that run on your Mac. A similar set of programs is available for Windows.

If you want access to the Internet to be really easy, you should wait a few years. If you can't wait, you will have to put up with a certain amount of arcane detail. Bear with me. It's worth it.

Once you have an Internet connection up and running, I recommend two books to help you find your way around. *The Internet Starter Kit* (TISK), Second Edition (Hayden, ISBN 1-56830-111-1) by Adam Engst describes the Internet from a Mac user's point of view, and evaluates the shareware programs that are available for your Mac. For Internet resources in Canada, see *Canadian Internet Handbook*, 1995 Edition (CIH), by Jim Carroll and Rick Broadhead (Prentice Hall).

This note describes a particular set of programs and settings. Once you get up and running, you may wish to experiment with different settings, different programs and different versions. I assume that you are reasonably familiar with installing system software on a Mac.

1   InfoRamp vital data

If you are already familiar with the Internet, you need a few vital bits of information about InfoRamp. Use the details in this section, and see page 7 for MacPPP's connect script. If you are not yet familiar with the Internet, the rest of this document will tell you how to configure your Mac using this information:

Domain name:	inforamp.net
Primary Domain Name Server:	198.53.144.2
Secondary Domain Name Server:	198.53.144.3
NNTP News Server:	news.inforamp.net
SMTP Mail Server:	inforamp.net
POP account/server:	*user_ID*@inforamp.net

2   The Internet

The Internet is a worldwide system that connects computer networks. Today's Internet connects several hundred thousand computers and several million users worldwide.

The core of the Internet comprises computers owned by commercial, government and educational institutions. People that work at these sites access Internet services through their local network interfaces (Ethernet, Token Ring, LocalTalk, etc.). Their transactions go through routers, bridges, gateways and other elements of the Internet infrastructure. Some organizations have installed *firewall* machines that filter transactions between the organization's internal network and the Internet at large, to enforce better security than is possible if all of the organization's hosts were allowed direct access. The organizations are interconnected by various kinds of permanent data connections including dedicated leased lines, packet switched connections and satellite links.

The internet differs from online services such as America Online (AOL) and CompuServe (CIS) in several ways. Online services decide what information is made available, and how it is accessed. Their proprietary nature means precludes competition in the provision of front-end software: you are restricted to the software provided by the service provider. Each online service generally prevents access to other services, except perhaps for a rather restricted e-mail bridge to the Internet. Most systems permit you to do only one thing at a time.

The *TCP/IP* protocols of the Internet are open and standard. A wide variety of commercial, shareware and freeware front-end programs is available. You can establish connections to several hosts at once. The Internet is distributed: there is no central point of control, and no mechanism for censorship. On the flip side, the Internet can be disorganized and chaotic. The Internet is at the moment largely noncommercial, but this is changing.

The following sections describe the high level and low level protocols of the Internet, and the programs that you will use on your Mac to implement these protocols.

3   Concepts

You should understand several concepts in order to install Internet software on your Mac and to make effective use of the Internet.

Host. A *host* is simply a computer on the Internet that is accessible through TCP/IP protocols.

IP address. Every host has a numeric *IP address*, organized geographically and comparable to a telephone number. An IP address is written as a set of four decimal numbers between 1 and 254, separated by periods.

Server addressing. Many service providers have *static* (or *manual*) IP addressing, where your Mac is allocated a permanent IP address for its exclusive use. However IP addresses, like telephone numbers, are in short supply, and you need one only for the duration of your dialup call. InfoRamp uses *Server* addressing: when you establish a dialup connection, a server at InfoRamp assigns an IP address to your Mac from a pool of available addresses.

Hostname. In addition to its address, a host often has an alphanumeric *hostname* comprising a letter *a* to *z* followed by some letters and digits. A hostname may contain a hyphen, but this is frowned upon except for special machines like routers and gateways.

Server. You will be interested in connecting with hosts on the Internet that are *servers*. A server operates more or less continuously, and offers a set of standardized services to the net through a set of *well-known* port numbers. If you try to access a service that a particular server is not offering, you will receive a message such as *service not available* or *connection refused*.

Domain. A host is addressed symbolically by its host name, a period, and the *domain* in which it lives. Domains are structured in a hierarchical fashion, with successively larger domains being written to the right, separated by periods. A *fully-qualified domain name* has as its rightmost

element a universal qualifier such as *org*, *gov*, *com, edu* or *net*, or a two-letter country code such as *ca* for Canada. California is the *ca.us* domain. InfoRamp's domain is *inforamp.net*.

Domain name server. It is seldom necessary for you or your Mac to remember the numeric address of a host. InfoRamp has a *domain name system* (DNS) server that translates host names to IP addresses. You configure your Mac with the IP address of that server. When you use a domain name server, Internet services can be moved from one host to another or one physical location to another without your having to be aware which particular host is in use at a particular time.

4   High-level protocols

You will use several Mac applications to access the Internet. Each of these applications provides the familiar Mac interface using windows, menus and so on. Different applications handle mail, news, file transfer and so on.

Each of these applications implements high-level protocols that are standardized on the Internet. There are protocols for the transfer of files (FTP), mail (SMTP), news (NNTP) and hypertext documents (HTTP). There is a protocol for remote login (TELNET), and there are protocols for searching services (Gopher, WAIS).

This table gives, for each of several services, the kind of service, the name of the protocol, my favourite Macintosh shareware application program for that protocol, and its latest version.

Service	Protocol	Application Program	Version
Mail	POP/SMTP	Eudora	1.5.1, 2.0 (commercial)
News	NNTP	Newswatcher	2.0b24
File transfer	FTP	Fetch	2.1.2
Hypertext	HTTP	Mosaic Netscape	1.0.3 1.0N
Remote login	TELNET	NCSA Telnet	2.6
Gopher	Gopher	TurboGopher	1.0.7
Archie	Archie	Anarchie	1.4.0 (shareware)
WAIS	WAIS	MacWAIS	1.2.9

These applications are not concerned with the details of network connections: those details are handled by lower-level protocols which I will discuss below.

5   Mail protocols – POP, SMTP

The SMTP protocol that is standard for the transfer of mail on the Internet was designed with the assumption that mail hosts have permanent – or nearly permanent – presence on the net. Your mail program will use SMTP for outbound mail. However, you will be active as a host on the Internet only during the duration of your dialup call. During times that you are not on the net, your mail will be collected for you by a server at InfoRamp. Your mail application will use a protocol called POP to access this server.

6   Low-level protocols – TCP/IP, PPP

The low-level protocol that connects the computers of the Internet is TCP/IP. Different computers have different implementations of TCP/IP. You will use an implementation of TCP/IP for the Mac called MacTCP; version 2.0.4 is an optionally-installed component of Apple's System 7.5.

The TCP/IP protocols were designed for high-speed, shared, permanently-connected networks. People that have access to a permanent network connection – through an Ethernet network attached to their machine, say – may have permanent access to the Internet, subject to security and firewall restrictions at their site. Those people need just the Internet applications and MacTCP.

You will not be a permanent resident on the net. You will need an additional lower-level protocol, PPP, which sits underneath TCP/IP and translates its transactions into a form that can be communicated across a standard asynchronous communication channel using a modem and a dialup line.

7   What you need on your Mac

Install Apple's System 7 on your Mac. You will be able to run in four megabytes, but eight is better. I recommend System 7.5. If you choose to run System 7.1, 7.1.1 or 7.1.2, make sure you install Apple's System Update 3.0.

Obtain MacTCP version 2.0.4 from Apple's System 7.5, from TISK (second edition), or from a commercial software package such as MicroPhone Pro that includes MacTCP. MacTCP is commercial, licenced software. Please do not pirate.

Obtain MacPPP version 2.0.1 from a Mac users group, or from the disk included with TISK.

You will need shareware applications for the services you wish to use: Eudora for mail, News-Watcher for news, Fetch for file transfer and Mosaic or Netscape for access to the WorldWide Web. Get these from TISK. Scan the documentation of these applications before using them on the Internet. Mosaic is best utilized with several *helper* applications. Read the documentation for details. To make it easier to unpackage files attached to news postings, you will need uuUndo 1.0.

Macintosh files on the Internet are stored in several formats. Obtain the freeware StuffIt Expander 3.5.2 to decode these files. You may wish to purchase the commercial StuffIt Deluxe product.

You will need a modem capable of 9600 bits per second (b/s) or higher. Internet access is technically feasible but not pleasurable at data rates less than this. Your modem – and its cable – must be set for *hardware flow control* (RTS/CTS). Software (XON/XOFF) flow control must be disabled.

If you want mail service, select a *user name* for your mailbox; mine is *poynton*.

8   What you need from InfoRamp

Inform InfoRamp that you would like dialup PPP service. You can mention that you have a Mac with MacPPP and MacTCP, although the service is exactly the same as if you had a Windows or UNIX machine. InfoRamp will ask about your modem capabilities, register your user name, then give you a password and the phone number for InfoRamp's terminal server.

## 9   installing applications, MacTCP and MacPPP

Each Internet application is installed like any other Mac application: just drag it onto your disk. You may wish to make a folder called *Internet Apps*. My habit is to put each application, and its files, in a folder named for the application and its version (for example, *Fetch 2.1.2*). Within that folder is the application itself, without its version number (*Fetch*). When a new version arrives, I can replace it without disturbing its links from aliases, menu launching programs and such.

Install MacTCP. If you are installing it from Apple's System 7.5, use the *Custom Install* option and find it in the Network section. It comprises a single control panel.

Install the MacPPP package. It comprises a control panel *ConfigPPP* and an extension *PPP*.

Restart your Mac to activate MacTCP and MacPPP.

Open the MacTCP control panel to obtain the dialog below. In the network choices panel, choose PPP. I have an Ethernet interface on my machine, so I am presented with a few choices; you may have only LocalTalk and PPP. This dialog reflects an IP address for your Mac of all zero. Do not set this field: MacPPP will provide your IP address to MacTCP when you connect:
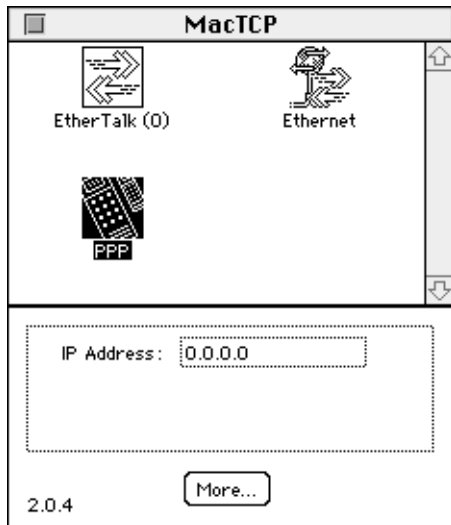
Click *More…* to obtain the secondary dialog shown below. In the lower right-hand corner, under *Domain Name Server Information*, enter the name of InfoRamp's domain, *inforamp.net,* in the Domain column of the first row. Put a period at the end of the domain name. Enter the IP address of InfoRamp's primary domain name server, 198.53.144.2, in the IP Address column. Check the *Default* radio button for this row. In the second row enter a domain name comprising a single dot, and in the right column the same IP address 198.53.144.2. On the third line, enter *inforamp.net* again, followed by a single dot again, and the IP address of InfoRamp's *secondary* name server 198.53.144.3. The dialog box should look like this:
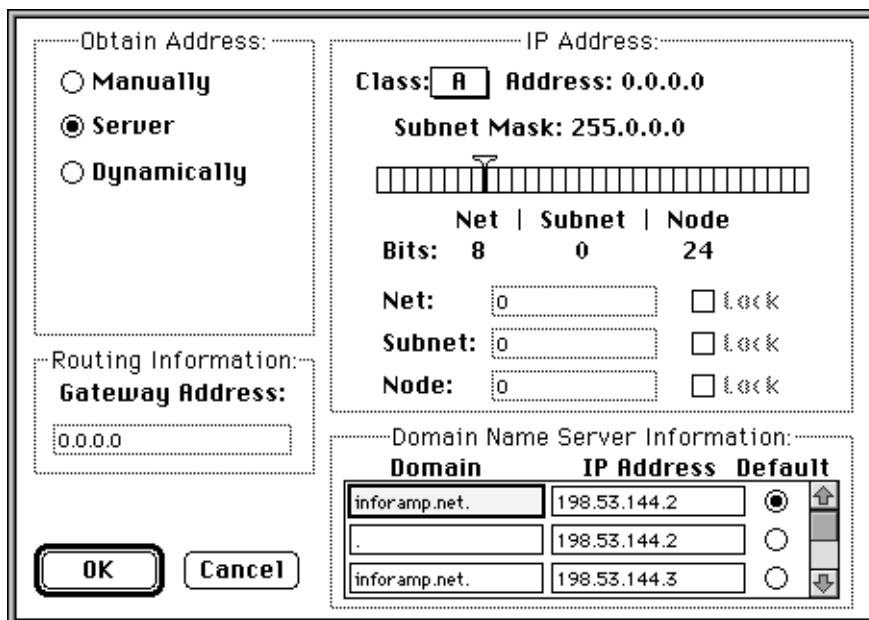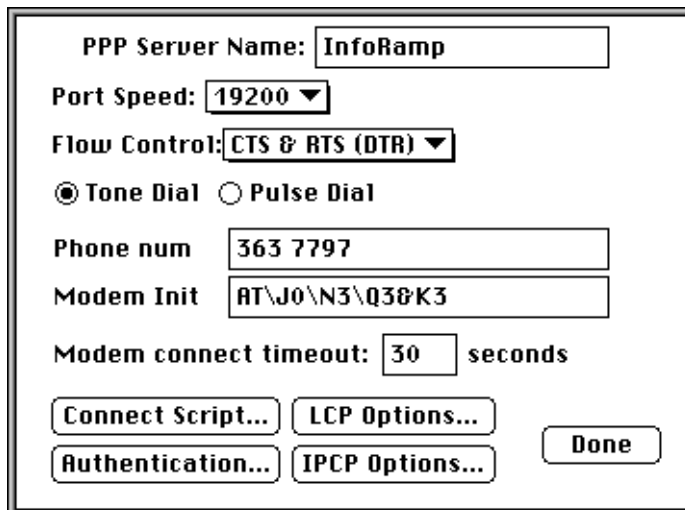

All of the other fields can be left zero or blank; their settings will be determined by *MacTCP* when it connects to InfoRamp's network. Review this dialog carefully, then click *OK.*

Now, open ConfigPPP. Make choices in the main dialog like this:

```
┌──────────────────────────────────────────┐
│ ▣ ▦▦▦▦▦▦ Config PPP ▦▦▦▦▦▦              │
│  ⊗~⊗    ( Open )    ( Soft Close )         │
│  PPP                                       │
│  DOWN   ( Stats... ) ( Hard Close )        │
│                                            │
│ Port Name: Modem Port ▼                    │
│ Idle Timeout (minutes): 5 ▼                │
│ Echo Interval (seconds): Off ▼             │
│ □ Terminal Window                          │
│ ⊠ Hangup on Close                          │
│ ⊠ Quiet Mode                               │
│                                            │
│ PPP Server: Untitled ▼                     │
│ (Config...)  (New...)  (Delete...)         │
│                              v2.0.1        │
└──────────────────────────────────────────┘
```

Click *New...* and enter *InfoRamp* as the name that MacPPP will use to save your configuration information. Click *Config...* to access the configuration dialog box, and set the fields like this:

```
┌────────────────────────────────────────────┐
│                                              │
│    PPP Server Name: InfoRamp                 │
│  Port Speed: 19200 ▼                         │
│  Flow Control: CTS & RTS (DTR) ▼             │
│  ◉ Tone Dial  ○ Pulse Dial                   │
│                                              │
│  Phone num    363 7797                       │
│  Modem Init   AT\J0\N3\Q3&K3                 │
│                                              │
│  Modem connect timeout: 30   seconds         │
│                                              │
│  (Connect Script...) (LCP Options...)        │
│                                   ( Done )   │
│  (Authentication...) (IPCP Options...)       │
└────────────────────────────────────────────┘
```

Choose a port data rate ("speed"). This can be set higher than the highest line rate of your modem, since high speed modems have buffering, but your Mac may not be able to keep up with a rate higher than 19,200 b/s, or 9600 b/s if you have a PowerBook slower than a PowerBook 180. Choose hardware flow control (RTS/CTS), also known as *hardware handshaking*. This requires a modem cable that properly connects the RTS and CTS control wires. Enter InfoRamp's telephone number.

Enter a setup string for your modem. The string above is for my Global Village TelePort Gold; your modem may have different requirements. It is important to enable hardware (RTS/CTS) flow control (or *handshaking*) and to disable software XON/XOFF flow control.

The four buttons at the bottom of the main ConfigPPP dialog access subsidiary dialogs. Only *Connect Script* needs to be changed from its default.

Click *Connect Script …* and fill in the indicated fields. Put your name in place of *poynton*, and your password in place of *gobbled1g00k*. Space characters are invisible in this and most other dialogs; here there are no spaces here except between the words *ppp* and *default.* Don't forget the <CR> checkboxes at the right:

```
┌────────────────────────────────────────────────┐
│                                                  │
│   Wait timeout: [ 40 ]   seconds                 │
│                                          <CR>    │
│   ⦿ Out ◯ Wait [                        ]  ☒     │
│   ◯ Out ⦿ Wait [ name:                  ]  ☐     │
│   ⦿ Out ◯ Wait [ poynton                ]  ☒     │
│   ◯ Out ⦿ Wait [ word:                  ]  ☐     │
│   ⦿ Out ◯ Wait [ gobbled1g00k           ]  ☒     │
│   ◯ Out ⦿ Wait [ >                      ]  ☐     │
│   ⦿ Out ◯ Wait [ ppp default            ]  ☒     │
│   ⦿ Out ◯ Wait [ \d                     ]  ☐     │
│                        ( Cancel )   (  OK  )     │
│                                                  │
└────────────────────────────────────────────────┘
```

Click *OK* to accept the Connect Script.

Restart your Mac. You are now ready to connect.

10 Connecting for the first time

Open the ConfigPPP control panel and place it on the right-hand side of your screen so you can watch its status indicator, currently PPP DOWN.

Click *Open*. MacPPP will put up an alert indicating its status and then commence dialing the phone.

InfoRamp's modem should answer, and you'll hear the modems negotiating. MacPPP will notify you of its progress through the connect script, from *Connecting*, to *Waiting for text*, through *Establishing*, through *Network*. Finally MacPPP's alert will dismiss and its control panel will reflect PPP UP.

You are connected to the Internet. You can now open an Internet application and access the net.

As a test, open Fetch. Upon startup, Fetch anticipates that your first action will be to open a connection, so it immediately presents the *Open Connection* dialog proposing a User ID of *anonymous*. Cancel that dialog for the moment, and choose Customize→Preferences→General. Enter

your POP mail address and click OK. Now click *Open Connection*, and connect anonymously to the file server of Adobe Systems Inc. by entering its hostname, *ftp.adobe.com*:
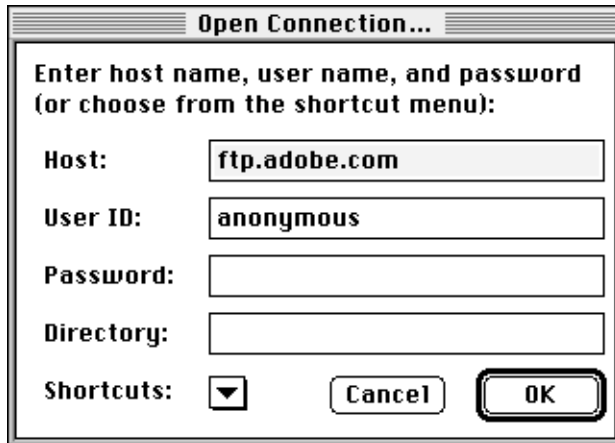
Click *OK*. Providing the file server is operating, which it almost always is, in a few moments you will be presented with a directory list. You are connected to Adobe's server, in California. Double-click on *pub* to access the public directory, then double-click on *adobe* to access Adobe's own files. The main dialog box of Fetch will now show a directory something like this:
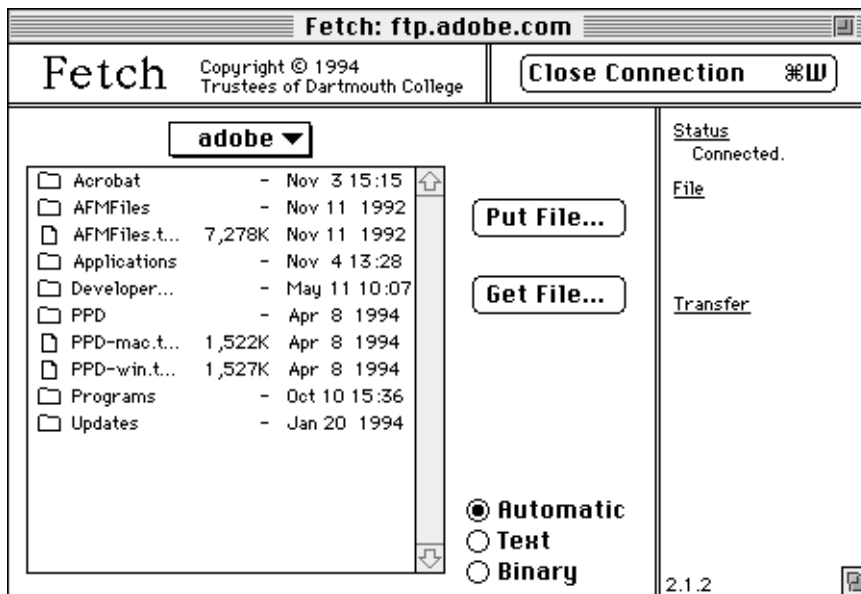
Browse the file server if you wish, then click Close Connection when you're done.

11 If you can't connect the first time

If you were successful in connecting the first time, congratulations! You can ignore this section!

If you click ConfigPPP's *Open* with the Terminal Window checkbox enabled, *MacPPP* will ignore the Connect Script and instead present you with a small terminal emulator window. You can use this to debug. When you enter *AT* followed by Return, if your modem doesn't respond *OK* then the connection to the modem is faulty. When you enter your modem setup string you should get another OK prompt, and not ERROR. Then issue a dial command and wait for the terminal server to answer the phone. Hit *Return*, wait for the terminal server's prompt, then manually run through the connect sequence. When you issue the terminal server command that causes the terminal server to

enter PPP mode, you may see a line or two of binary data that displays as *gibberish*. Click the *OK* button to cause MacPPP to enter the Establishing phase. If you can establish a PPP connection manually but not with your connect script, check the script very carefully. If you are sure that the script is correct, contact InfoRamp.

12 Update MacTCP to version 2.0.6

Now that you are online, you can obtain from Apple an application program that will update MacTCP to version 2.0.6. This version repairs several problems with version 2.0.4, and I recommend that you install it. This file is distributed through conventional channels, but now that you're on the net you can obtain it immediately from Apple's ftp site. The file is named *MacTCP 2.0.6 Update.hqx*; the *universal resource locator* (URL) of the directory that contains the file is this:

<ftp://ftp.support.apple.com/pub/Apple SW Updates/Macintosh/
Networking & Communications/>

Paste this URL into Fetch's Open Connection dialog box, or manually connect to *ftp.apple.com*. "Get" the updater; read its associated Read Me file, then follow the installation instructions.

13 Subsequent connections

I suggest that you use ConfigPPP directly to open a dialup connection. Alternatively, you can initiate a connection to the Internet by opening one of your Internet applications: it will call MacTCP, which will call MacPPP, which will in turn dial the phone and establish the connection.

When you have finished a session, Quit all your Internet applications, then access the ConfigPPP control panel and click *Soft Close*. MacPPP occasionally tries to contact its server to finish up some private business after an Internet application has been used, even if all of your Internet applications are closed. Forestall this behaviour by clicking *Hard Close*, or by Restarting your Mac if you plan to leave it Mac unattended following a PPP session.

14 Reliability

When you transfer a large file, you should achieve throughput of roughly 80% of your modem's rate. Fetch reports its rate in bytes per second. In asynchronous communication there are ten bits in each byte, so a 9600 b/s modem should transfer between about 800 bytes per second in Fetch. If your connection is reliable but you experience slow throughput, click *Stats ...* in ConfigPPP's main dialog. If the statistics report an excess of *overrun* errors, you should suspect that your computer can't keep up. Choose a slower rate. If the statistics report a large number of CRC errors and a much smaller number of overruns, suspect a noisy dialup line or a handshaking problem.

15 Once you're on

Now that you're on the net, consult TISK and CIH for information about where to visit.

Read the companion document *Configuring Internet Applications for InfoRamp* to learn about configuring Eudora and NewsWatcher. Both of these programs have provisions to append a signature to every piece of mail or news that you send. Set your signature, and make it brief and informative. Try out mail by mailing something to yourself. Then send mail to *staff@inforamp.com* to say that you're up and running! Communicate with a colleague on the internet to familiarize yourself with addressing and replying.

News is stored on the server *news.inforamp.net* at InfoRamp's facility. Read NewsWatcher's Full Group list to determine what newsgroups are maintained. If you encounter a reference to a group that you cannot find, ask InfoRamp to consider subscribing to that group.

Please read news for a week or two, and read the group *news.announce.newusers*, to get a sense of the etiquette and procedures of the net before you post a news article. Please do not post to the entire net vacuous items like "Yeah, I sure agree with that!" or "Send a copy to me too please." Send private mail to the individuals instead. Participants of many newsgroups have compiled answers to "frequently asked questions" (FAQs). These are posted periodically, and are maintained on well-known servers such as *rtfm.mit.edu* and *ftp.uu.net*. Consult the FAQ for a group before asking a naive question. Do not quote – or permit your news application to include – the entirety of as previous posting that you are following-up. Instead, edit down to the pertinent portion. Do not request, post or offer to post commercial software against the terms of its licence. If you can't determine the status of a piece of software by reading the FAQ, ask the question in a posting.

16 Internet E-mail

Your Internet e-mail address has the form *user_ID@inforamp.net*. If you have Internet mail, you can exchange e-mail with users of commercial online services such as Compuserve, America Online and AppleLink. These services have their own internal mail address formats. Sending mail involves augmenting these internal addresses with Internet addressing information. To send to an AppleLink subscriber, append *@applelink.apple.com* to his AppleLink ID. For America Online, append *@AOL.com*. An internet mail address cannot include space or comma characters. To send mail to a Compuserve subscriber, replace the comma in his address with a period and append *@compuserve.com*. For other online services, have your correspondent ask his online service provider for details of exchanging Internet e-mail.

There are several competing standards for e-mail attachments. I indicate in my mail signature that I use Eudora, with MIME capability, so that my correspondents can easily determine how to attach files that are easy for me to decode. Many commercial and shareware programs are available to encode and decode attachments. Depending on the capabilities of your correspondents' systems, you may have to resort to cutting and pasting to get attachments into or out of mail messages.

Commercial online services usually strip attachments from e-mail that crosses an Internet gateway. Although the Internet can generally handle e-mail messages of up to about 250 KB, online services usually place severe size limits on Internet e-mail. For example, America Online discards anything past 24 KB, AppleLink anything past 32 KB. This makes it difficult to exchange any significant amount of data between Internet e-mail and the online services. The easiest way to exchange large files or binary files is to conduct the exchange through an ftp server.

17 The World-Wide Web (WWW)

Now that you are on the Internet, you can use ftp to obtain a web browser application. You can obtain the freeware NCSA Mosaic browser, available at <ftp://ftp.ncsa.uiuc.edu/>. Alternatively, you can obtain the Netscape browser which is free for individual noncommercial use; it is available at <ftp://ftp.mcom.com/>. These are both easy to configure and a pleasure to use.

Have fun!