



Express Fax/Modem

User's Guide

 Apple Computer, Inc.

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1

Preface



How to Use This Book

This manual provides complete information for operating the Express Modem.

It is assumed that you are familiar with basic Macintosh desktop operations. If not, refer to the manuals that come with your Macintosh.

- **Chapter 1** explains how fax/modems work and describes the installation of the Express Modem software.
- **Chapter 2** covers the use of the Express Modem for data communications. If you have never used a modem, you should read this part to familiarize yourself with modem operation. Use this chapter as a complement to communications software packages you may own.
- **Chapters 3 through 6** cover the use of the Express Fax software for sending and receiving faxes with your Macintosh. These chapters provide complete information on the easy-to-use Express Fax program.

In the back

- At the back of the book you'll find appendixes, a glossary, and an index. The appendixes include information on the modem technical specifications, the AT command set, and modem tips and troubleshooting.

Communications regulation information

The following information is provided in compliance with US FCC (Federal Communications Commission), Canadian DOC (Department of Communications).

Important

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.

Radio and television interference

The equipment described in this manual generates, uses, and can radiate radio-frequency energy. If it is not installed and used properly—that is, in strict accordance with Apple’s instructions—it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your computer system is causing interference by turning it off. If the interference stops, it was probably caused by the computer or one of the peripheral devices.

If your computer system does cause interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the computer to one side or the other of the television or radio.
- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio. (That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance. Or, contact an experienced radio/television technician for additional suggestions. You may find the following booklet helpful: *Interference Handbook* (stock number 004-000-00345-4). This booklet, prepared by the Federal Communications Commission, is available from the U.S. Government Printing Office, Washington, DC 20402.

Important

Changes or modifications to this product not authorized by Apple Computer, Inc., could void the FCC Certification and negate your authority to operate the product.

This product was tested for FCC compliance under conditions that included the use of shielded cables and connectors between system components. It is important that you use shielded cables and connectors to reduce the possibility of causing interference to radios, television sets, and other electronic devices. For Apple peripheral devices, you can obtain the proper shielded cables through an Apple-authorized dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

DOC Class B Compliance This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Observation des normes—Classe B Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe B prescrites dans les règlements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

情報処理装置等電波障害自主規制について

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをしてください。

Notify your local telephone company

Some telephone companies require that you notify the local business office when you hook up a modem to their lines.

Information you need in the United States

A label on the modem contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, provide this information to your telephone company.

- FCC ID number Part 15: BCGM7784
This number confirms that your modem has been approved by the FCC.
- FCC registration number Part 68
This number appears on your Macintosh.
- Ringer equivalence number: 0.7B
The ringer equivalence number (REN) is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all areas, the sum of RENs of all devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your telephone company to determine the maximum REN for your calling area.
- Model number: M7784
- Manufacturer: Apple Computer, Inc.
- Telephone jack type: USOC, RJ-11

Information you need in Canada

The Canadian Department of Communications (DOC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Warning

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician.

- Load number: 5
The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to the telephone loop that is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices and is subject only to the requirement that the total of the load numbers of all devices does not exceed 100.
- Telephone jack type: CA-11

Telephone line problems

If your telephone doesn't work, there may be a problem with your telephone line. Disconnect the modem to see if the problem goes away. If it doesn't, report the problem either to your local telephone company or to your company's telecommunications people.

Consult the service and support information that came with your computer for instructions on how to contact an Apple-authorized service provider or Apple for assistance. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected or you are sure that the equipment is not malfunctioning.

If your modem causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If the telephone company makes such changes, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

Important

The modem will not work with party lines, cannot be connected to a coin-operated telephone, and may not work with a digital private exchange (PBX).

1

Introducing the Express Modem



In this chapter

This chapter informs you about

- Your modem package
- Other materials
- Modem design
- Express Modem capabilities and features
- Express Fax capabilities and features
- Connecting your Macintosh
- Installing the Express Modem software

Before you begin

Before connecting your Macintosh to your telephone line, be sure you have everything you need.

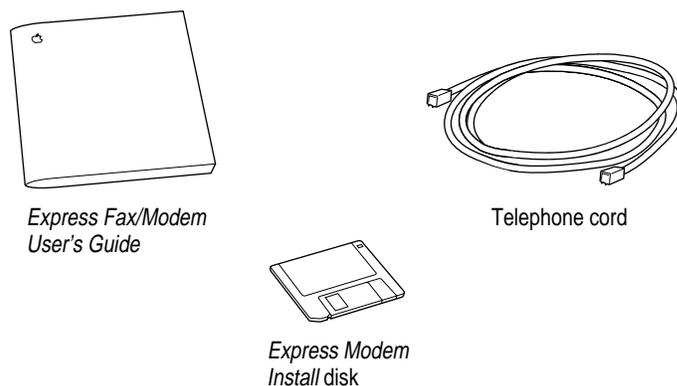
Your modem package

The Express Modem package contains:

- the Express Fax/Modem User's Guide
- a length of telephone cord
- a disk containing the modem and fax software
- depending on your CPU model, a country Data Access Arrangement (not pictured here)

If you're missing something, see the service and support materials that came with your computer for a number to call.

The contents of your package are shown below.



Note: Your telephone cord may look different from the one pictured. Telephone connectors vary by region. Your package contains the telephone cord appropriate for your region.

Other materials

To use your Express Modem, you may also need:

- **A modular connector on your telephone line** If your telephone cord cannot be removed from the wall or has a non-standard jack, you'll need a modular adapter or a new telephone system that provides a modular jack. Ask your local telephone retailer for assistance in selecting the most appropriate solution for a modular jack.
- **An analog telephone line** The Express Modem is designed for use with a traditional telephone system (also called an analog system). Most homes use an analog system.
- **Communications Toolbox compatible software** The Express Modem comes with CTB compatible fax software. If you plan to use a terminal emulator or other data communications package, you must purchase it separately. It should be CTB compatible.
- **PowerBook options** Depending on the PowerBook model you have, you can purchase an approved travel adapter for correct modem configuration in the country you're visiting. Ask your Apple dealer for details.

Other software you can purchase

In addition to the Express Modem and Express Fax software, you can purchase communications software, such as MacTerminal, that fits your own needs. A few types of software are discussed below.

AppleTalk Remote Access

AppleTalk Remote Access software allows you to connect to your office AppleTalk network over telephone lines. With AppleTalk Remote Access you can work anywhere there is a phone line, transferring files and accessing electronic mail, printers, servers, and other network devices. The high speed of the modem (up to 14400 bps) makes the connection time shorter and therefore less expensive. See "Setting up AppleTalk Remote Access" in Appendix C.

On-line services

On-line services offer connection to data bases, bulletin boards, and a variety of other services. Access software is provided at subscription time.

General communications applications

General communications applications allow simple terminal emulation, file transfer, and remote connection. This type of software gives you the broadest range of options, and allows you to take full control of your modem if you decide to use the direct modem AT commands described in Appendix B.

If you want to use your modem for purposes beyond on-line services for example to send a file from your computer to a friend's computer, you should acquire software compatible with the Macintosh Communications Toolbox, such as MacTerminal. However, the Express Modem supports most non-CTB compatible applications.

Some of the information in this guide may not apply to your particular communications software. For in-depth information, see the user's guide that comes with the communications software you purchase.

► *See also:* Appendix A, "Communications Toolbox compatibility."

Modem design

Communications capabilities are built into your modem, but you can't use them without installing the Express Modem and Fax software.

Once installed, the modem software and hardware work together as a team. Many of the modem's traditional functions, such as data compression, are handled by the software.

With most commercially available modems, if you want to take advantage of improved technology, you must buy new hardware. The advantage of having a software modem is that you can easily upgrade your modem just as you upgrade any other software. As such, you can obtain the latest improvements by upgrading your software from a disk or server.

Express Modem software

The Express Modem software consists of:

- Express Modem, a control panel, available from the Apple Menu, for turning the modem application on and off, controlling the modem, and monitoring modem status
- Express Modem Tool, a tool compatible with the Macintosh Communications Toolbox for setting up and using your modem

Express Modem features

Here is a summary of Express Modem features:

- Hayes compatible
- High-speed data transfer at up to 14400 bits per second (bps)
- Error control for data integrity and reliability; data compression for increased data throughput (up to 4 to 1)
- Simple interface that automatically allows the modem to make the best connection without bothersome setup
- Easy upgrades and feature enhancement at lower cost

Express Fax software

The Express Fax software consists of five programs to handle fax functions:

- Fax Terminal, a program for monitoring faxes during send and receive, available from the Apple menu
- Fax Viewer, a program for viewing faxes you have sent or received
- Fax Sender, a printer driver for sending faxes and managing addresses
- Fax Extension, a system extension for managing send and receive between the fax software and the modem
- Fax Cover, a program for making fax cover pages

Express Fax features

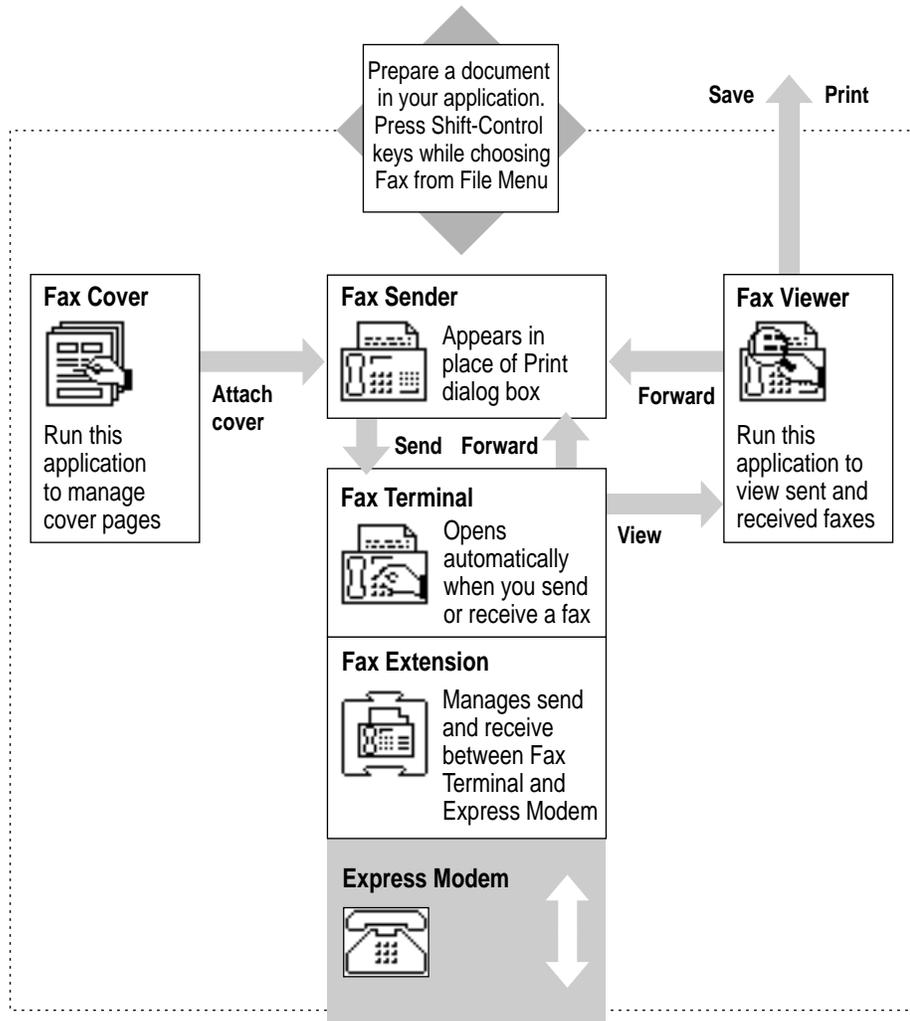
The Express Fax software supports Group 3 fax send and receive capability. Express Fax allows you to convert any Macintosh program document to fax format and send it to another computer capable of receiving faxes or to a dedicated fax machine. Express Fax allows you to receive a fax from a Group 3 remote fax device.

Here is a summary of Express Fax features:

- Easy send and forward of fax documents by printing to a remote fax device
- Fax receive
- V.17, V.29, and V.27 ter CCITT high-speed, reliable fax send and receive (14400, 12000, 9600, 7200, 4800, 2400) for Group 3 fax
- Shortcut selection of Fax Sender
- Viewing, printing, forwarding, and copying of faxes
- Fast imaging
- Fax Quick Send
- Telephone credit card support
- Fax smoothing feature that dramatically improves fax display
- Personalized fax cover page design

Express Fax structure

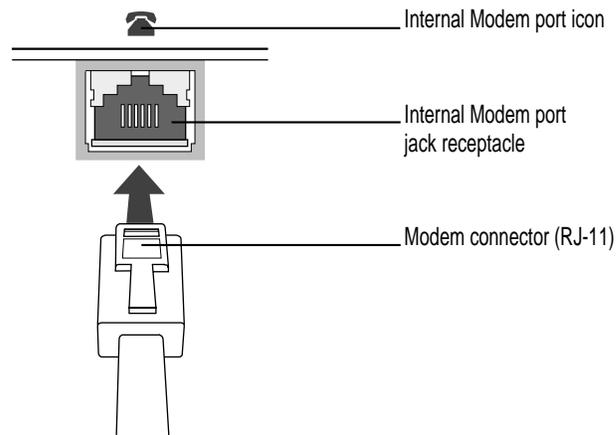
The Express Fax programs handle assembly, transmission, and reception of faxes. The following diagram shows how the programs interrelate.



Connecting your Macintosh

To link your Macintosh to your telephone line, connect one end of the telephone cord to your Macintosh and the other to your telephone line.

- 1 Make sure that your computer is turned off.**
- 2 Locate the internal modem on the back of your computer (RJ-11 receptacle).**
- 3 Plug one end of the cord into your computer's internal modem jack receptacle.**



Note: The Internal Modem port in your CPU may be different than the port pictured above.

- 4 Plug the other end of the cord into your telephone wall jack.**

If a telephone is plugged into the jack you want to use, unplug your telephone cord from the jack.

Note: Before attempting to use your modem over the telephone lines, make sure the modem is properly connected.

Installing the Express Modem software

The Installer places items in your System Folder and Extensions folder. Some of these items are control panels and programs that you will use to send and receive data and fax.

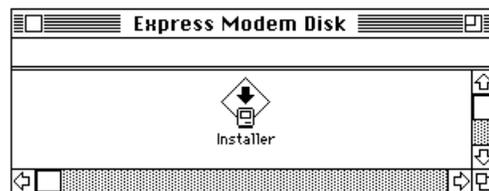
Note: If you are reinstalling or upgrading the modem and fax software, the installer will not overwrite any existing fax phone book or cover pages.

► *See also:* Chapter 2, “Using Your Modem,” and refer to the user’s guide that came with your communications software. To send and receive faxes, see Chapter 3, “Express Fax Quick Start.”

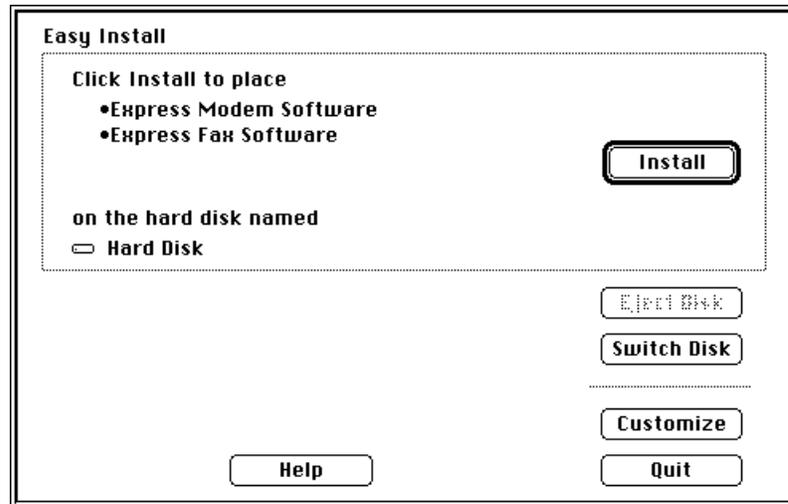
- 1** Turn your computer on, and wait until the desktop appears.
- 2** Insert the Express Modem disk in your disk drive and, if necessary, double-click the disk icon to open the Install window.

The Express Modem window opens.

- 3** To open the Installer, double-click the Installer icon.



The Easy Install dialog box appears. Easy Install automatically detects the Macintosh model you are using and installs the software correctly.



- 4 **Make sure that the hard disk indicated in the box is where you want to install the software.**

If the wrong disk name appears, click the Switch Disk button until the correct disk name appears.

- 5 **Click Install.**

A message informs you when the installation has been successfully completed.

- 6 **Click Restart to restart your computer and activate the software.**

► *See also:* Appendix A for information on using the Express Modem control panel.

2

Using Your Modem



In this chapter

This chapter informs you about

- What modems do
- Reaching another modem

Before you begin

If you have followed the installation steps in Chapter 1, you are ready to connect to another modem.

What modems do

Before two computers can exchange data via a modem connection, they must be able to recognize each other and agree on how data will be transmitted. Without modems, computers cannot exchange data over long distances because the signal will degrade after a few meters. Therefore, to pass across the PSTN (Public Switched Telephone Network), digital information from your computer is converted to a sound modulated signal. The signal is reconverted to digital by the receiving modem.

Modems also dial and establish connections between computers. They control the flow of data across the telephone line so transmission takes place with optimal speed and accuracy.

Setting up a connection

When two computers connect through their modems, the modems' first task is to reach agreement on speed, error control, and data compression. Reaching agreement is called *handshaking*.

Handshaking is equivalent to saying, "I'm German; you're French, but we both speak English. So let's speak English a little slowly. If we're both English, we can speak more quickly."

Your modem is already set to automatically make the best possible handshaking agreement. See Appendixes A and B for a complete list of specifications and default settings.

In general, it is best to accept your modem's automatic settings. If you want to set your own speed, error control method, and data compression type, see the user's guide that came with your communications software and the AT command set in Appendix B.

Determining the speed

Initially, your modem tries to connect at 14400 bps, its fastest speed. If the remote modem can't connect at 14400 bps, your modem falls back to the next highest speed. *Fallback* continues until the two modems agree on their capabilities.

Error control

Error control is used by modems to check data for errors. Your modem and the remote modem must agree on an error control method. Your modem will try to use a method called *V42* and *MNP class 2–4*. If the remote modem doesn't support this type of error control, both fall back until an agreement is reached.

Data compression

Data compression increases the speed of your modem by eliminating gaps and redundancies from the data. For instance, if you connect at 14400 bps with data compression enabled, the speed can increase up to 4 times the non-compression speed.

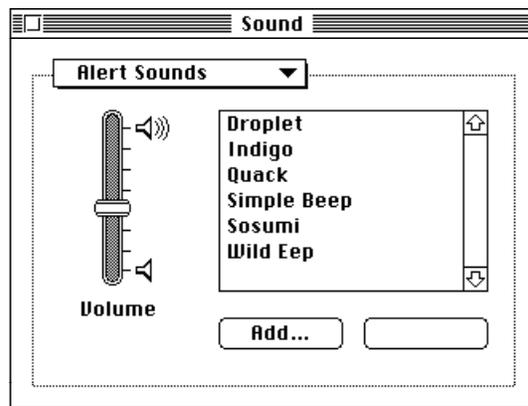
Your modem uses a type of data compression called *V42 bis* or *MNP class 5*. If the remote modem doesn't support these types of data compression, it will not use any.

Reaching another modem

The following example uses MacTerminal, CTB compatible communications program. To use your communications software, you must select the modem connection tool that corresponds to your modem, in this case the Express Modem Tool. Most communications programs are similar, so you can probably use this example with your own software.

- 1 **Double-click the Sound control panel icon in the Control Panels window.**

The Sound control panel appears.

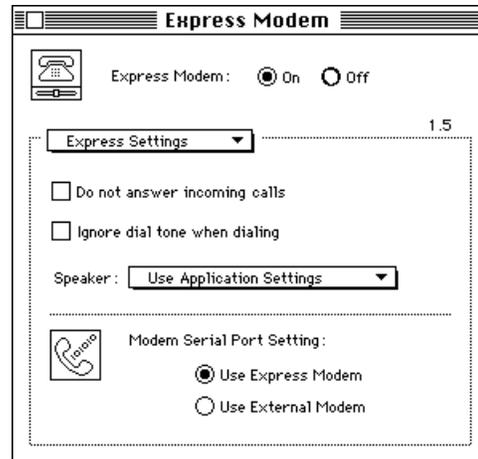


► *See also:* “Express Modem control panel” for additional speaker and other settings and “Communications Toolbox Compatibility” for using non-Communications Toolbox applications in Appendix A.

- 2 **If necessary, set the speaker volume above the lowest mark in the Sound control panel then close the control panel.**

Increasing the speaker volume allows you to listen as the modem dials the telephone number you specify.

- 3 Open the Express Modem control panel and verify that Express Modem is turned on.



Note: Refer to Appendix A for Express Modem control panel settings information.

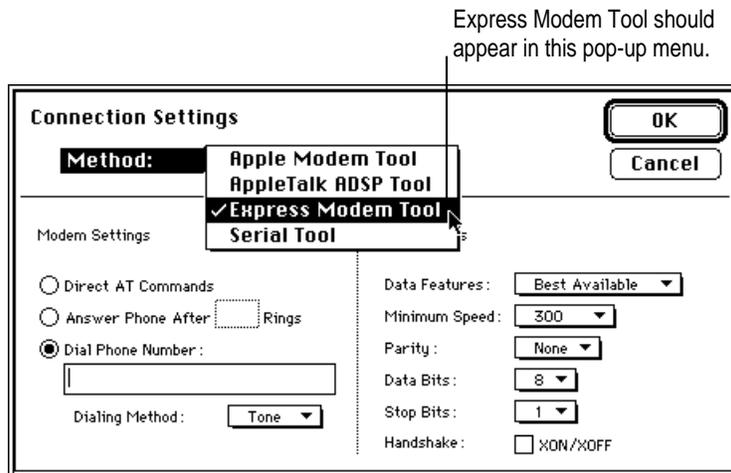
- 4 Turn to the user's guide that came with your communications software.

Your software's user's guide should explain how to choose the type of connection you want and how to connect to another modem. Most communications software programs have menus named *Settings* and *Sessions*, where you will find the options you need. Check in the user's guide for the exact names.

If you have an on-line service, try dialing the service using the instructions found in the user's guide. If you want to connect to an on-line service, you may have to match the service's connection settings. Check the manual or telephone the company that provides the service. (To match your service's settings, refer to Step 6 in this procedure.)

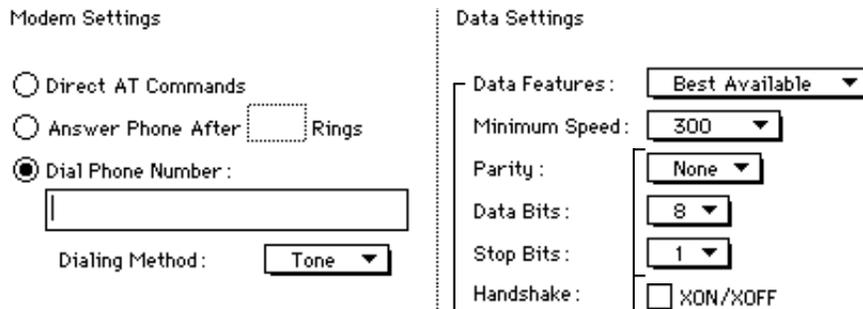
- 5 Open your communications software.

- 6 Choose Connection from the Settings menu and select Express Modem Tool in the Connection Settings pop-up menu.



This selection matches the Connections Method, the Express Modem Tool, to your Express Modem.

You can now modify the Express Modem settings choices.



To make optimal connection, select Best Available. To connect without error correction or data compression, select None.

Match these settings to the remote modem's when connected. Works when any of the above Data Features is selected.

- 7 Click Dial Phone Number under Modem Settings, enter the phone number of a remote modem in the box below it, then click OK.

Modem Settings

Direct AT Commands

Answer Phone After Rings

Dial Phone Number :

Dialing Method:

- 8 If you decide not to use Express Modem Tool, select another tool from the Connection Settings pop-up menu.

For example, you can select Apple Modem Tool, Serial Tool, or another tool.

- 9 Double-click the Internal Modem icon in the Current Port field.

Connection Settings OK

Method: Cancel

Phone Settings

Answer Phone After Rings

Dial Phone Number

Redial Times

Every Seconds

Dial:

Port Settings

Baud Rate:

Parity:

Data Bits:

Stop Bits:

Handshake:

Current Port

Modem Settings

Modem:

Disconnect when NO CARRIER detected

Display Modem Monitor Window

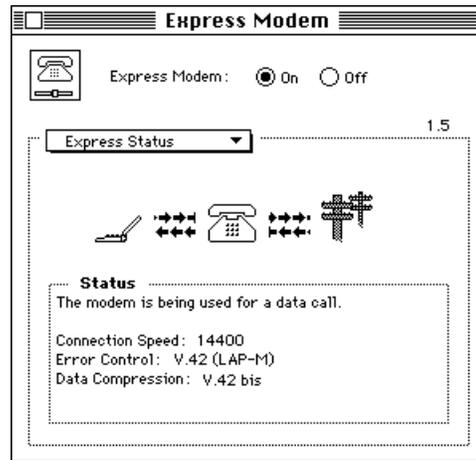
- 10 Choose Open Connection from the Session menu.



Selecting *Open Connection* is the same as lifting up the receiver of your telephone. Depending on the software application you're using, you should be able to hear the modem dialing the telephone number for you if you have entered a phone number. If you can hear a dial tone and the modem dialing the telephone number or a busy signal, you're properly connected to the telephone line.

11 Select Express Status in the Express Modem control panel.

The Express Status field appears in the Express Modem control panel. This field monitors the connection process, providing you with information on connection speed, error and compression protocols, and status messages.



► *See also:* “Express Status” in Appendix A for additional information on this subject.

12 When you want to terminate the connection, choose Close Connection from the Session menu.

If you connect to a service, you may have to log out and use the “hang up” command. Refer to your communications software or service software manual.

Note: Before attempting to use your modem over the telephone lines, make sure you understand how to dial a number and hang up.

3

Express Fax Quick Start



In this chapter

- Using Fax Quick Send
- Receiving and printing a fax

Before you begin

If you have skipped directly to this chapter, please make sure that you have connected your modem to the telephone line, verified your connections, and installed the Express Fax software. See Chapter 1 for software installation.

Using Fax Quick Send

You can start by sending an easy first fax with Fax Quick Send. Use this first fax exercise as a tutorial, then explore more advanced features in Chapter 4, “Getting the Most Out of Your Express Fax.”

- 1 Open the Express Fax Folder, then open “My first fax” by double-clicking it.



My first fax

You can make a fax of a document from any program or any window on the desktop. The TeachText document “My first fax” has been provided for your convenience.

- 2 Hold down the Control and Shift keys while choosing Fax from the File menu.



The Fax Sender dialog box appears in place of the Print dialog.

Sending a fax is like printing to a remote printer.

IMPORTANT Step 2 is a shortcut. You can also select Fax Sender in the Chooser (see Chapter 4, “Selecting Fax Sender”). This shortcut works with all programs, but some applications’ menus may not change Print to Fax. If the menu doesn’t change, choose Print from the File menu.

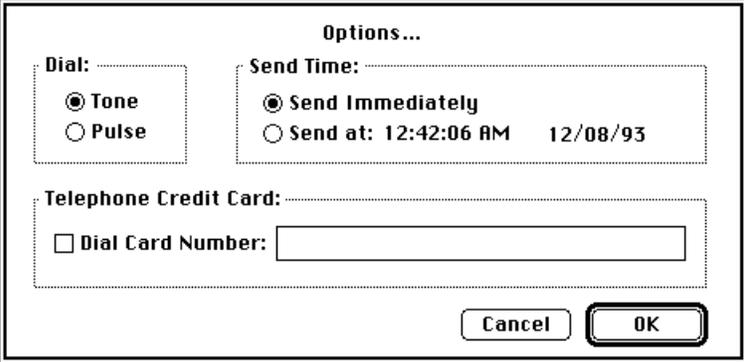
- 3** In the Fax Quick Send field, type the fax number of your recipient.

Put the recipient's fax number in the Fax Quick Send box.

If you use a number to obtain an outside line from your present location, place it in the Dial Prefix box. Insert a comma after the number to indicate a pause.

- 4 Click the Options button.

The Options dialog box appears. Make sure you select Tone or Pulse according to the type of phone you have.



The image shows a dialog box titled "Options...". It contains several sections: "Dial:" with radio buttons for "Tone" (selected) and "Pulse"; "Send Time:" with radio buttons for "Send Immediately" (selected) and "Send at: 12:42:06 AM 12/08/93"; and "Telephone Credit Card:" with a checkbox for "Dial Card Number:" and an empty text input field. At the bottom right are "Cancel" and "OK" buttons.

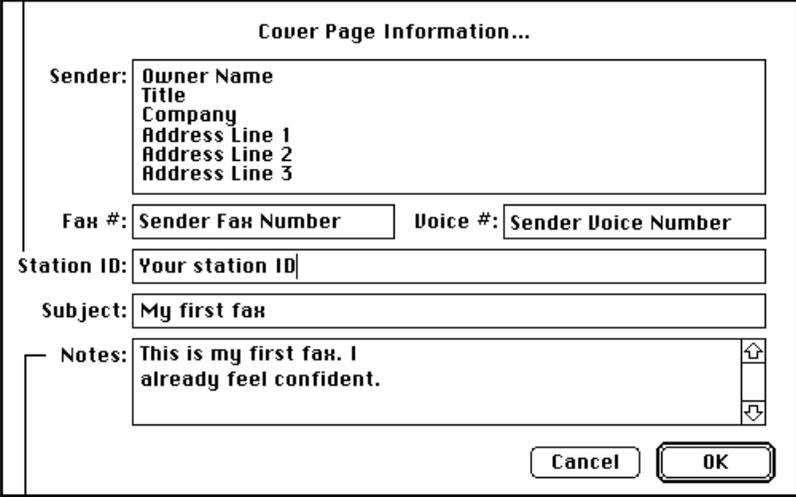
- 5 To save the information you entered, click OK.

You return to the Fax Sender dialog box.

6 To fill in sender information, click the Cover Info button.

Type information about yourself in the Cover Info dialog box. To move from field to field, use the Tab key. The information you type here will appear on your fax cover page.

The Station ID can be any combination of letters and numbers you wish to identify your fax with.



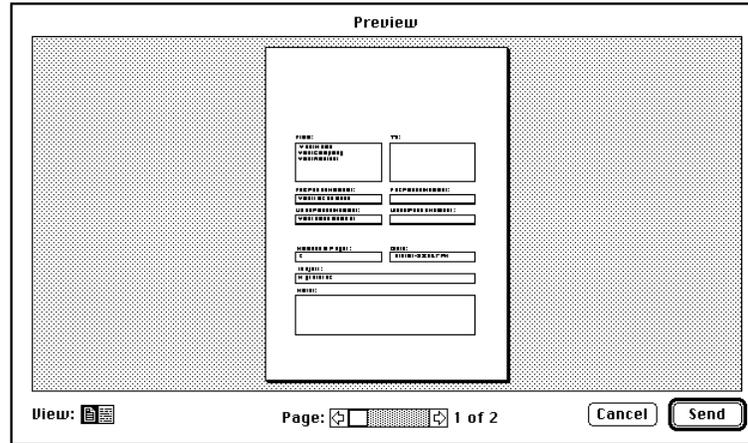
The image shows a dialog box titled "Cover Page Information...". It contains several input fields: "Sender:" with sub-fields for "Owner Name", "Title", "Company", "Address Line 1", "Address Line 2", and "Address Line 3"; "Fax #:" with "Sender Fax Number"; "Voice #:" with "Sender Voice Number"; "Station ID:" with "Your station ID"; "Subject:" with "My first fax"; and "Notes:" with "This is my first fax. I already feel confident." There are also "Cancel" and "OK" buttons at the bottom right.

Type any special messages in the Notes field.

- 7 To save the information you entered, click OK.

The Fax Sender dialog box reappears.

- 8 To see your first fax before sending, click the Preview button.



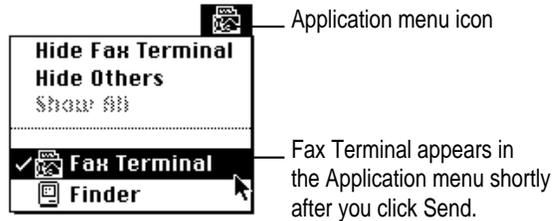
Preview displays the fax with the cover page. The cover page selected is the Standard cover page. The sender information you entered in the Cover Info dialog box is displayed during preview. Click the right arrow in the scroll bar at the bottom of the Preview dialog box to view the other pages of your fax.

- 9 Click Send to transmit your fax.

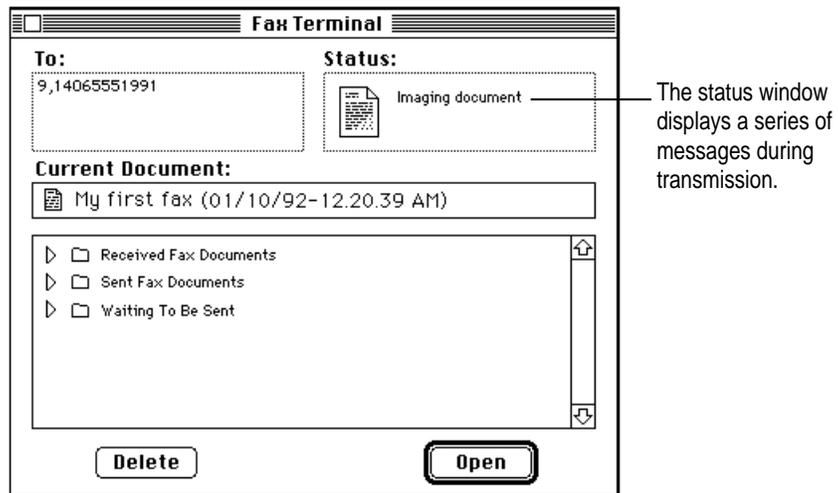
Your fax is transmitted immediately.



- 10 To monitor the sending of your fax, choose Fax Terminal from the Application menu at the right end of the menu bar.



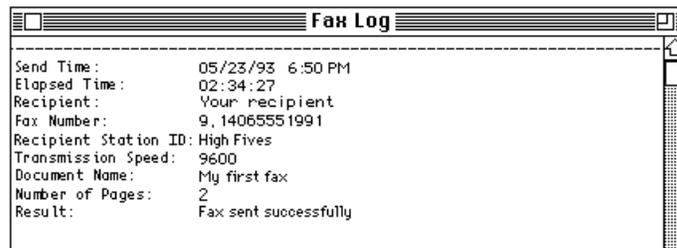
Fax Terminal appears.



Should transmission fail on the first attempt, Fax Sender automatically retransmits your fax twice. (You can change the number of retries in Fax Terminal Preferences; see “Setting Preferences” in Chapter 4.)

11 Choose Fax Log in the Fax Terminal Windows menu.

Once the fax is sent, you can check transmission results in the Fax Log. You have sent your first fax, and, equally important, you have verified that transmission was successful.



If Fax Terminal will not open

Fax Terminal will open in the background only if sufficient memory is available.

- If you are expecting a fax, be sure to quit any unnecessary applications to free up memory. You may want to acquire more RAM memory for your Macintosh; see your Apple dealer.
- If Fax Terminal does not open, it may also be a result of the Fax Terminal Preferences selected. See “Setting Preferences” in Chapter 4. Even if Fax Terminal doesn’t open during reception, fax reception will occur without problem. You won’t lose any faxes.

Receiving your first fax

Your Express Fax receives faxes just like an office fax machine. You can be working on your computer or away from home or office when a fax arrives.

By default, the fax software is not set to receive faxes when it is installed. The *Auto-Answer* checkbox in the Fax Terminal Preferences dialog box must be selected.

To receive a fax in your absence, you must leave your Macintosh turned on, but none of the fax programs need be open.

Getting ready to receive faxes

- 1 Choose FaxTerminal from the Apple menu.

Fax Terminal opens.

- 2 Choose Auto-Answer from the Fax menu.



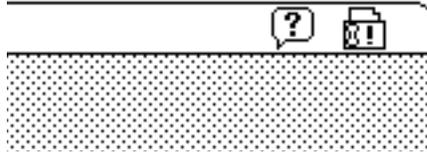
This choice automatically sets the *Auto-Answer* checkbox in Fax Terminal Preferences.

► *See also:* “Setting Preferences” in Chapter 4 and “Auto-Answer” and “Call management” in Appendix A.

Checking for received faxes

- 1 Look for the Fax Terminal icon blinking over the Application menu on the menu bar.

The Application menu is at the right side of the menu bar.

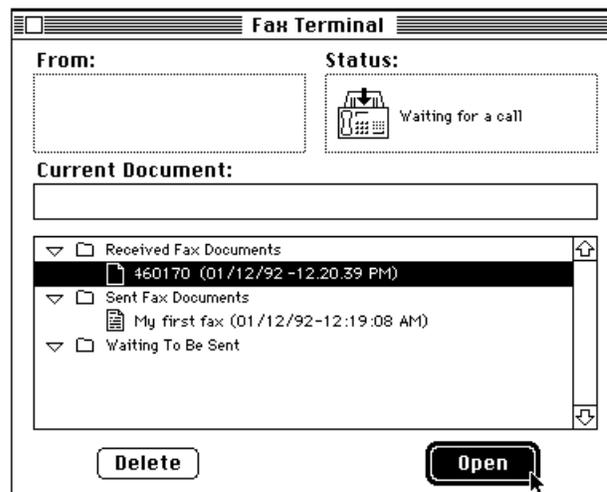


The blinking icon tells you that a fax is waiting in the Fax Terminal Received Fax folder.

- 2 Choose Fax Terminal from the Application menu or the Apple Menu.

Fax Terminal appears.

- 3 To select the received fax you wish to view, click its name in the Fax Terminal queue, then click Open.



You can also manage fax reception yourself.

► *See also:* “Receiving Manually” in Chapter 4.

Opening a document in the Fax Terminal queue automatically opens Fax Viewer, and your fax appears in a Fax Viewer window.



- 4 To set up your fax for printing, choose **Page Setup**, then choose **Print** from the **File** menu.

You can use Fax Viewer to prepare your fax for printing, forwarding, or saving.

► *See also:* Chapter 5, “Fax Viewer,” for a complete reference of the Fax Viewer features.

Most of the time, you will want to print only incoming faxes. Fax Viewer handles printing in the same way any other Macintosh application does.

4

Getting the Most Out of Your Express Fax



In this chapter

- Setting up your fax environment
- Using Fax Sender
- Monitoring incoming and outgoing faxes
- Receiving and opening a fax

Before you begin

Review the material in Chapter 3 to make sure you understand the basic steps of fax operation.

Setting up the fax environment

You can begin by setting up Fax Terminal to take advantage of all features.

Entering fax station information

This information provides your return address, allowing the recipient to identify you from the received cover page. You can enter cover information both in the Fax Sender Fax Cover Info and Fax Terminal Info dialog boxes.

- 1 **Open Fax Terminal.**
- 2 **Choose Fax Terminal Info from the Fax menu.**

A Fax Terminal Info dialog box appears.

- 3 **Type information in the various fields of the dialog box.**

Fax Terminal Info...

Sender: Peter Edwards
President
XYZ Company
125 East Blvd.
Northern, VA 22999

Fax #: (703) 555-3130 Voice #: (703) 555-3840

Station ID: Furniture Follies

Cancel OK

Station ID is a 20-character header line identification of your choice. If your recipient's fax device has the capability, Station ID is printed on the top of each page of the fax document, along with the date and time.

- 4 **Click OK to save the Fax Terminal information.**

Setting Preferences

The Preferences dialog box allows you to control Fax settings.

1 Choose Preferences from the Fax Terminal Fax menu.

The Preferences dialog box appears.

Check this box to activate Fax Terminal while a fax is being sent or received.

Sets auto-answer and number of rings. You can always answer manually. See "Receiving Manually" later in this chapter.

Select this box to save fax files. Check Fax Terminal fax folders from time to time for available disk space.

Displays notification for received faxes, manual dial, and errors. A batch of faxes may be interrupted by one unsuccessful fax. Selecting None allows a batch of faxes to be sent without interruption. Unsuccessful faxes can be resent.

2 Click the options to make your choices.

Table 4-1 summarizes the choices available.

Note: If you select None in the Preferences dialog box, Fax Terminal does not interrupt sending a batch of faxes should a single fax fail for any reason.

3 To save your Preferences, click OK.

WARNING Certain fax image files may use large amounts of disk space. If you frequently receive large files, be sure that you have enough space on your hard disk.

Table 4-1 Fax Terminal Preferences dialog options

Preference fields	Result
Show Fax Terminal window	Allows Fax Terminal window to be displayed automatically during send and receive. If not selected, you can still activate it during send or receive.
Save fax image files	Faxes are transmitted and received as image files. This checkbox allows you to save sent fax image files.
Turn off V.17	If the remote fax does not support V.17, you may have to turn it off.
Turn off ECM	If the remote fax does not support ECM, you may have to turn it off.
Auto-Answer (unchecked by default)	Must be checked to receive faxes automatically. If unchecked, you may still receive manually. Review procedures in "Receiving a fax" in this chapter. Can be set in Fax menu.
When sending fails	
Retry	Sets the number of retries.
Time between tries	Sets the time between tries.
Resend all pages	Resends the entire fax if transmission fails.
Resend only those pages not already sent	Sends only the pages that failed to transmit.
Received Fax, Manual Dial, Error Notification	
None	No notification. Check the log for received faxes or failures. Check Fax Terminal for received faxes.
Display icon	Displays icon in menu bar so that you can check for received faxes and transmission problems.
Display icon and alert	Displays icon in menu bar so that you can check for received faxes and transmission problems. Displays alert box for Manual Dial and Errors.

Using Fax Sender

Fax Sender handles all aspects of fax transmission including forwarding.

Selecting Fax Sender

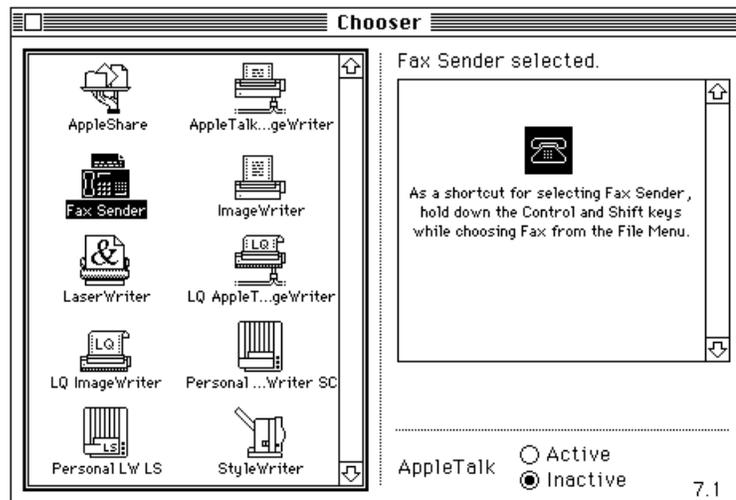
Selecting Fax Sender is like selecting a local or network printer, such as an ImageWriter or a LaserWriter.

- 1 Choose the Chooser from the Apple menu ().

The Chooser window appears.

- 2 Scroll down the icons in the upper-left box, if necessary, until you see the Fax Sender icon.
- 3 Click the Fax Sender icon.

The modem icon appears in the box on the right side of the window.



- 4 Close the Chooser by clicking the close box.

As long as Fax Sender remains selected, all print jobs go to the fax process, not to your printer. Be sure to reselect the printer icon in the Chooser when you have finished sending your fax.

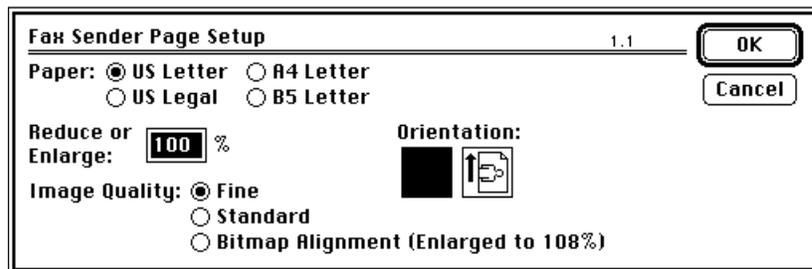
IMPORTANT As an alternative to the above method of selecting Fax Sender, *hold down the Control and Shift keys while choosing Fax from the File menu.* This shortcut does not deselect your regular printer; you return automatically to your previous printer settings for printing after the fax is sent. This shortcut works with all programs, but some applications' menus may not change Print to Fax. If the menu doesn't change, choose *Print* from the File menu.

Fax Sender Page Setup

A number of options are available in the Fax Setup dialog box.

1 Choose Fax Setup from the File menu.

Be sure that you have selected Fax Sender in the Chooser. Otherwise, use the shortcut of holding down the Control and Shift keys when you select Fax Setup from the File menu. Note that the File menu items Print and Page Setup automatically change to Fax and Fax Setup respectively.



2 Select Fax Setup options as needed, and then click OK.

Refer to Table 4-2 for option settings.

Table 4-2 Fax Sender Page Setup options

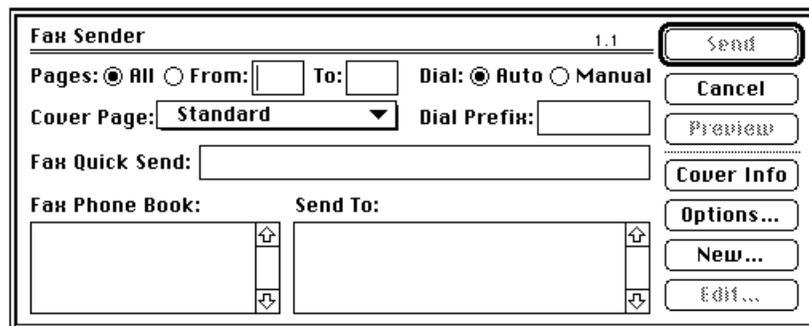
Option	Result
Orientation	
Portrait	Transmits the fax vertically.
Landscape	Transmits the fax horizontally.
Reduce or Enlarge	Reduces or enlarges the fax by the percentage you indicate.
Image Quality	
Fine	Converts fax to highest image quality for sending. Increases the send time.
Standard	Converts fax to normal image quality for sending. Decreases the send time.
Bitmap Alignment	Scales the Macintosh 72 dpi image so that every pixel is matched evenly to the fax machine resolution. Produces the best-quality image for bitmapped documents, but enlarges the printed image to 108% of actual size.

Entering cover page information

The Cover Page Information dialog box is similar to the Fax Terminal Info dialog box. Both dialog boxes provide space for entering return address information to help your correspondent identify you. In addition, the Cover Page Information dialog box provides space for the document subject and a short note.

- 1 Choose Fax from the File menu.

The Fax Sender dialog box appears instead of the usual Print dialog box.



- 2 To fill in cover page information, click the Cover Info button in the Fax Sender dialog box.

The Cover Page Information dialog box appears.

- 3 Type information you want to appear on the cover page of the fax you are sending.

The sender name you see when you first open the dialog box is the Owner Name you entered for AppleShare in the Sharing Setup control panel.

Cover Page Information...

Sender: Peter Edwards
President
XYZ company
125 East Blvd.
Northern, WA 22999

Fax #: (703) 555-3138 Voice #: (703) 555-3840

Station ID: Bemsha

Subject:

Notes:

Cancel OK

If you have already entered your return address information in Fax Terminal, you can change the information, the document name, or add a note. When you change the information in the Cover Page Information dialog box, it changes the information entered in the Fax Terminal Info dialog box, and vice versa.

Using a telephone credit card

The Telephone Credit Card option allows you to use a credit card or calling card to send a fax.

Note: Until the dial card number is changed or deselected, all sent or forwarded faxes use this number. Be careful to remove the number for calls not dialed by credit card.

1 Type the credit card access code in the Fax Sender Dial Prefix box.

2 Click Options in the Fax Sender dialog box.

The Options dialog box appears.

- 3 To charge a fax to your credit card account, click the Telephone Credit Card checkbox, then enter your credit card number.**

Many phone systems send a tone to indicate when the calling card number and PIN should be entered.

To detect the tone, enter a colon (:) in front of the credit card number. If you find that the tone is not being properly detected, enter one or more commas to pause before sending the calling card number.

- 4 To continue setting up your fax, click OK.**

Fax Sender protects your privacy by hiding your credit card number when the Options dialog box is reopened.

Using dial modifiers

Placing a comma in any position in the telephone number, Dial Prefix box, or Dial Card Number field requests a two-second pause. This may be useful when dialing long distance or overseas. To increase the pause time, add more commas.

You may need to put additional dial modifiers after the dial prefix or before the credit card number if your long distance service acknowledges an access code or telephone number with a tone before placing the call. See the Dial command in Appendix B.

Dial Modifier	Result
Comma (,)	Introduces a two-second pause before sending the next character.
“At sign” (@)	Detects a specified period of silence before completing dial string.
Dial tone detect (W)	Detects presence of dial tone before completing dial string.
Colon (:)	Same as W. Detects a wider range of tones, such as Calling Card tones, before finishing dial string.

Selecting a cover page

The fax software comes with three cover page choices:

- Standard is a precomposed text-only cover page. You can use it as is or modify it with the Fax Cover program. Standard appears in the Fax Sender Cover Page pop-up menu as the default selection. (Standard can be deleted as a cover page choice.) ► *See also:* “Installing cover pages” in Chapter 6.
- None means that no cover page is attached to the fax. The first page of the document can be used as a cover page.
- A sample cover page comes with the fax software in the Express Fax Folder. This choice does not appear in the Fax Sender Cover Page pop-up menu unless installed with Fax Cover. ► *See also:* “Installing cover pages” in Chapter 6.

You can create as many customized cover pages as you need.

► *See also:* “Customizing cover pages” in Chapter 6 to compose and modify customized cover pages.

- 1 Select a cover page from the Fax Sender Cover Page pop-up menu.



XYZ Cover is a customized cover page.

Automatic dialing

Auto Dial allows you to use the Fax Phone Book and delayed send features in Fax Sender. For example, you can use Fax Phone Book to send a fax to multiple recipients.

When you send the same fax to more than one person at a time and there is a delivery problem for any recipient, Fax Sender puts the fax to that recipient in the waiting queue for retry (according to the number of tries you selected in the Retry field in the Fax Terminal Preferences dialog box). At the same time, Fax Sender delivers the fax to the other recipients in the order placed in the Send To field.

Auto Dial is the default selection in Fax Sender. When Auto Dial is selected, you can transmit your fax from the Fax Sender or from the Preview dialog box. Auto Dial applies to most cases. See “Manual Dialing” later in this chapter.

Using Fax Phone Book

Fax Phone Book holds a list of recipients along with their addresses and telephone numbers. You can enter, update, and remove entries from the list and then use the list to address your faxes by selecting recipients by name.

Adding addresses

You create a list of recipients one by one. You can add their addresses at send time or whenever you wish.

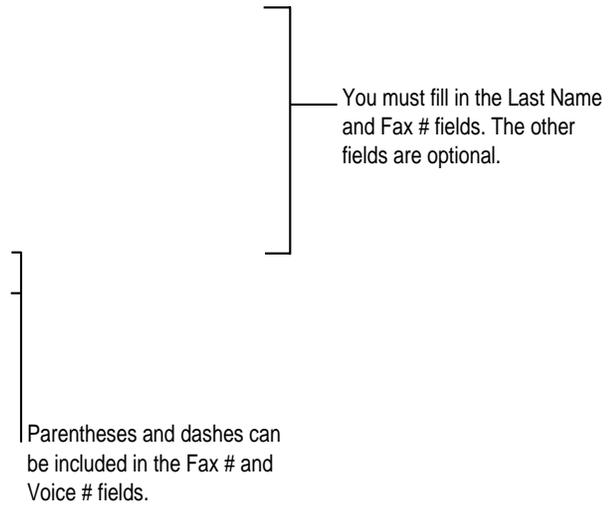
- 1 Click **New** in the **Fax Sender** dialog box.

These are existing Fax Phone Book entries.

This entry has been dragged into the Send To field for sending. A dimmed entry remains in the Fax Phone Book.

A New Entry dialog box appears.

2 Enter the address information and click Add.



New names are added automatically to the Fax Phone Book when you click Add.

Editing addresses

1 To edit an address:

- Select an address in Fax Phone Book and click Edit in the Fax Sender dialog box, or
- Double-click an address in Fax Phone Book while holding down the Option key.

- 2 **Change the information by selecting the text and retyping, and then click one of the buttons when you are finished.**
 - Change saves your edits.
 - Cancel restores the old address.
 - Delete removes the address from the Fax Phone Book.

Removing addresses

To remove an address from Fax Phone Book, select the address, then:

- Press the Delete key on your keyboard (you are asked to confirm the deletion), or
- Press ⌘-X. (You must use the keyboard shortcut for the Cut command.)

To remove addresses from the Send To scroll box:

- Drag the address outside the scroll box, or
- Double-click the address.

Addressing a fax

You can address a fax to one or more recipients. Fax Sender sends the fax to each recipient, one at a time, in the order placed in the Send To field.

To address a fax:

- Double-click the address in Fax Phone Book, or
- Drag names from Fax Phone Book to the Send To field.

To obtain an outside line when dialing from office buildings, you may need to place a number, such as a 9, before the telephone number. Put this number in the Dial Prefix box. By placing the prefix number in the Dial Prefix box, you can keep the numbers in Fax Phone Book independent of the dialing prefix.



Setting send time

You can change the send time in the Fax Sender Options dialog for the current fax and in Fax Terminal for any faxes in the queue.

Sending immediately

If the Send Immediately button is selected, your fax is sent immediately. Send Immediately is the default.

Delaying send time (“Send at”)

Fax Sender allows you to choose the time you want to send a fax.

- 1** Click the “Send at” button in the Fax Sender Options dialog box.

The time displayed is the system time you set in the General Controls panel or with the Alarm Clock.

- 2** Click any element in the time or date displays that you wish to change.

An arrow button appears and the element you are changing is highlighted.

- 3** Click a directional arrow to set the time.

Be sure not to set the time back before the current hour or date.

You can also change the send time while a fax is waiting to be sent.

► *See also:* “Resetting the send time” later in this chapter.

Previewing a fax

Preview is similar to the “print preview” feature of some programs.

- If you wish to see your fax before sending, click Preview in the Fax Sender dialog box.

Scrolling pages

Use the scroll bar at the bottom of the window to view each page. Clicking the arrow at the right end of the scroll bar allows you to move through the fax one page at a time beginning with the cover page.

Changing views

Clicking the View button toggles between a reduced and an actual size view of a page. In actual size, you can move the page with the grabber hand to examine an undiscovered portion of the page.

Note: If you click Cancel while in the Preview dialog box, you go back to your document, not to the Fax Sender dialog box. Names that you have dragged to the Send To scroll box are lost; you will have to select Fax Sender again.

Manual dialing

Most fax machines can be dialed automatically. Occasionally, you may have to use your telephone to manually dial a recipient's fax device. You might have to do this if the line is shared by several devices, is an extension, or needs to be set to receive.

IMPORTANT To use Manual Dial, your telephone must be connected to the same telephone jack as your modem. You can purchase a Y adapter to make this connection.

- 1 Choose Fax from the File menu.
- 2 Click the Manual Dial button.

- 3 Drag a recipient name from your Fax Phone Book to the Send To scroll box or type a number in the Quick Send field.
- 4 Click Send.

After Fax Sender has prepared your Fax for sending, a blinking icon notifies you that your fax can now be sent by dialing manually.

► *See also:* “Setting Preferences” earlier in this chapter.

- 5** When you see the blinking icon at the right end of the menu bar, select Fax Terminal from the Application menu.

The Manual Dial dialog box appears.

- 6** Follow the instructions in the Manual Dial dialog box.
 - Dial your recipient's fax device from your telephone.
 - Click Send when you hear your recipient's fax tone.
 - Hang up the telephone.

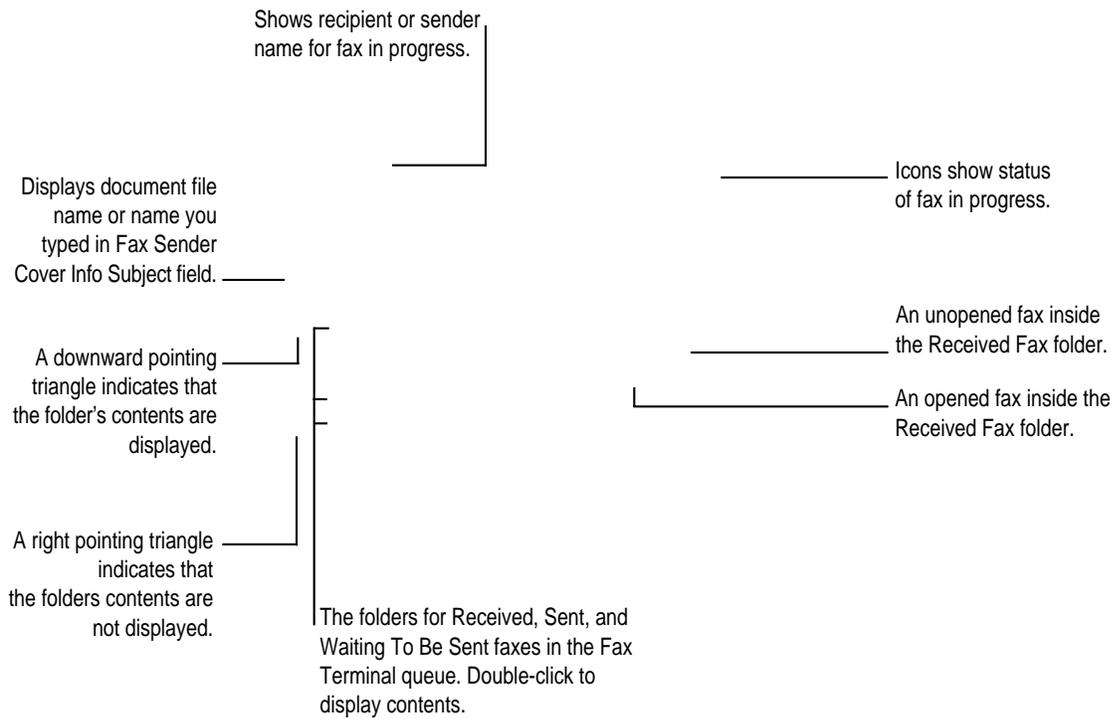
Table 4-3 Fax Sender options

Option	Result
Dial	
Auto	Dials recipient's fax number automatically.
Manual	Allows you to dial recipient's fax number manually.
Dial Prefix	Adds PBX or other access code prefixes at send time. Use commas for two-second pauses.
Cover page	
Standard	Sends fax with text-only cover page.
None	Sends fax without cover page.
Custom choices	Sends fax with cover page designed in Fax Cover.
Fax Phone Book	To add an address, click New. To edit an address, click Edit. To remove an address, select the address and use the Delete key on the keyboard. You are asked to confirm.
Send to	Displays the recipient addresses for the current fax. To remove an address, drag outside the box or double-click.
Preview	Allows you to preview your fax before sending.
Cover Info	
Sender information	Allows you to enter your name, address, voice, and fax numbers.
Subject	Prints document name or name you choose on cover page.
Notes	Prints a short note in cover page Notes field.
Options	
Dial	
<i>Tone</i>	Selects Touch-Tone dial.
<i>Pulse</i>	Selects pulse dial.
Send time	
<i>Send immediately</i>	Sends the fax immediately (default).
<i>Delay send ("Send at")</i>	Allows you to choose the time to send the fax.
Telephone Credit Card	
<i>Dial Card Number</i>	Allows you to automatically append your credit card calling number to the telephone number. All faxes use this credit card number until changed. Place dial modifiers before credit card number if necessary.
New	Allows you to create a new address and add it to Fax Phone Book.
Edit	Allows you to edit and delete addresses in your Fax Phone Book.

Monitoring a fax

Fax Terminal allows you to forward faxes, check the status of faxes currently being sent and received, review the list of sent and received faxes, cancel a currently transmitting fax, delete faxes from any of the queue folders, and reset the send time for faxes. You can also open and view the faxes in your lists.

Fax Terminal contains a log for keeping track of fax results.



Accessing Fax Terminal

Fax Terminal is a program that you will use frequently. For example, you may wish to check Fax Log quickly. As initially installed, Fax Terminal is accessible from the Apple menu (🍏).

While preparing your fax, Fax Terminal opens automatically and its name appears in the Application menu at the right end of the menu bar. Whether you view Fax Terminal automatically at send or receive time depends on the selection you made in the Fax Terminal Preferences dialog box. To bring Fax Terminal to the front:

- If you chose “Show Fax Terminal window when sending or receiving” in the Preferences dialog box, choose Fax Terminal from the Application menu.
 - If you chose not to show the Fax Terminal window, select Fax Terminal from the Application menu and then choose Fax Terminal from the Windows menu.
- ▶ *See also:* “Setting Preferences” in this chapter.

Once transmission is complete, if the fax queue is empty, Fax Terminal closes automatically when you change to another open program.

IMPORTANT If an alert message appears saying you don’t have enough memory to open Fax Terminal at send time, you must quit some of your active programs to provide enough memory for Fax Terminal to open. You won’t lose any work, and your fax is still prepared. As soon as you quit the programs, Fax Terminal opens and your fax is sent.

Table 4-4 Fax Terminal document types

The Fax Terminal queue contains three types of folders: Received Fax Documents, Sent Fax Documents, and Waiting To Be Sent Documents.

Icon	Document type
	Received Fax Documents
	Read These documents have been received and read. They can be forwarded.
	Unread These documents have been received, but not opened. They can be opened and forwarded. See “Opening a fax document” later in this chapter.
	Sent Fax Documents
	Successful These documents have been successfully sent. They can be opened and forwarded.
	Unsuccessful These documents were not sent because of transmission problems. They can be opened and forwarded. The preferences you selected for the original fax in Fax Terminal preferences apply to forwarded unsuccessful faxes.
	Waiting To Be Sent Documents
	Send Immediately (Default) If you send four faxes in rapid succession, one is sent while the three others take a place in the queue. You can change the order of transmission in the queue by dragging a Send Immediately fax up or down to a new position in the list.
	Delayed Send (“Send at”) A Delayed Send document’s send time is set in the Fax Sender Options dialog box. You cannot drag a Delayed Send document to a new position in the queue. See “Resetting the send time” later in this chapter to reset the send time.
	Retry A Retry is a fax that has returned to the queue after unsuccessful transmission. A Retry takes its next send time from the “Time between tries” setting in the Fax Terminal Preferences dialog box. You cannot reset the time of a Retry fax. A Retry becomes an unsuccessful fax after the number of retries expires.

Forwarding a fax

You may forward any fax you've sent or received.

1 Select a fax document in either the Received Fax or Sent Fax Documents folders.

2 Choose Forward Fax from the File menu.

The Fax Sender dialog box appears. The Send button changes to Forward.

3 Enter a fax number in the Quick Send field or select an address from the Fax Phone Book.

► *See also:* "Addressing a fax" in this chapter.

4 To forward your fax, click Forward.

You can limit the number of pages to forward by entering a range of page numbers.



- Received faxes are forwarded as received with the original cover page if one was attached, and with your cover page if you select one.
- Sent faxes are forwarded without the original cover page, but you can select and include one when you forward.
- To forward a fax without attaching your cover page, select None from the Cover Page pop-up menu.

Resetting the send time

You can reset the send time of a delayed fax in Fax Terminal. You cannot drag a delayed fax in front of another fax in the queue because you have already assigned it a specific send date and time in the Fax Sender Options dialog box, but you can change the assigned send time. See Table 4-4 “Fax Terminal document types.”

- 1 To reset the send time of a delayed fax, open the Waiting To Be Sent folder and select a delayed fax by clicking its name.**
- 2 Choose Set Send Time from the Fax menu.**

- 3** To reset the send time, select the element of the date or time you want to change.
- 4** Click the arrow buttons in the Set Send Time box, then click OK.

In this example, the time of the second fax is set ahead so that it can be sent before the first fax.

Canceling a fax

Canceling a fax stops sending or receiving of the fax in progress.

- 1 **Bring the Fax Terminal window to the front.**
- 2 **Choose Cancel Sending or Cancel Receiving from the Fax menu.**

This menu item changes to Cancel Receiving, as the case may be.

The current fax stops sending or receiving after a few seconds and Fax Terminal becomes available again. Cancel Sending does not affect faxes in the queue.

Deleting faxes

You can delete faxes from the lists inside the folders in the Fax Terminal queue. You can select several faxes discontinuously by opening the folders, holding down the Shift key, and clicking faxes.

- 1** Open one or more folders.
- 2** Select one or more faxes to delete.
- 3** Click the Delete button or press the Backspace or Delete keys.

Using the Fax Log

The Fax Log keeps information about fax transmissions. This information may be useful to prove that a fax was actually sent or received at a given time. The log is especially useful when you need to check the results of delayed faxes.

Each fax, whether sent or received successfully or not, is automatically recorded as an entry in the log. When transmission is finished, you can check transmission results in the log.

- To see the log, choose Fax Log from the Windows menu.

The Fax Log appears and you can scroll up or down.

Managing log entries

For easy log management, you should limit the number of entries in the log, then archive the log by saving the contents as an archive file with a new file name. For example, you might name the archive files Faxes Jan, Faxes Feb, and so on.

- 1 Choose Set Log Entries from the Fax menu and set the number of entries you wish.**

The preset limit for the number of entries in the log is 50. To avoid losing entries, save the log under a different name as you approach the limit.

- 2 To save the log under a new name, choose Save Log As from the File menu.**

- 3 Type the name you want for the file, then click Save.**

Clearing the log

Once you've saved the log as an archive file, you can clear the old entries from the log.

- To clear the log, choose Clear Log from the Fax menu.

This clears the entries in the log. Because you have saved the contents of the log under another name and then cleared the log itself, no information is lost.

IMPORTANT It's up to you to save the log under another name when you are approaching the limit. If you reach the limit without saving, the oldest entries are removed automatically so that the log never contains more than the chosen number of entries.

To check historical information on the results of a given fax, you can display any archived logs by opening them with TeachText or a word processor. You cannot open the Fax Log with TeachText or a word processor.

Table 4-5 Fax Terminal Fax Log

Menu option	Result
File	
Save Log As	Saves log under a different name. Archived logs can be opened by TeachText.
Fax	
Set Log Entries	Specifies the number of entries the log contains. Preset value is 50.
Clear Log	
	Clears entries in the log. (You should archive the log under a different name before clearing.)
Window	
Fax Log	Displays Fax Log. Log may be printed during display.

Receiving a fax

Faxes can be received automatically or manually. The Fax Terminal application doesn't have to be open to receive a fax. Make sure your computer is correctly set to receive.

► *See also:* “Auto-Answer” in “Express Settings” in Appendix A.

Setting Fax Terminal preferences for receiving

If you want to receive faxes automatically, you must set Fax Terminal preferences or use the shortcut.

1 Choose Preferences from the Fax menu.

Choosing Auto-Answer is a shortcut for clicking Auto-Answer in Fax Terminal — Preferences.

2 Click the “Auto-Answer” checkbox in the Preferences dialog box, set the number of rings, then close the dialog box.

IMPORTANT If you deselect the Auto-Answer checkbox, faxes can only be received manually.

Checking for received faxes

Faxes are placed in the Received Fax Documents folder.

According to the choice made in the Fax Terminal Preferences dialog box, Fax Terminal provides the following notification for received faxes.

Fax Terminal Preferences choice	Fax Terminal notification
None	No notification. To see if you have received a fax, open Fax Terminal and look for received fax documents in the queue or a blinking arrow in the Status box. You can also check Fax Log.
Display icon	Fax Terminal displays a blinking icon in the menu bar when a fax is received. See example below.
Display icon and alert	Fax Terminal displays a blinking icon in the menu bar when a fax is received. See example below.

The following example assumes that Display icon is selected.

- 1 When you see the blinking icon, choose Fax Terminal from the Application menu.

The Fax Terminal window appears.

- 2** Look for the blinking arrow above the icon in the Status box.

_____ A blinking arrow tells you when a fax has been received.

Receiving a fax while you're working

If you set *Show Fax Terminal Window* in Fax Terminal Preferences and you are working at your Macintosh, the Fax Terminal status field indicates the progression of a fax received.

Opening a fax document

When you open a fax document in Fax Terminal, the Fax Viewer program automatically starts.

- 1** Click a fax document in the Sent Fax Documents or Received Fax Documents folders.
- 2** To view your fax document in Fax Viewer, click Open.

The Fax Viewer program opens and your document appears in a Fax Viewer window.

► *See also:* “Viewing a fax” in Chapter 5.

Receiving manually

Manual receive provides the option of sharing the same telephone line for fax and voice calls. If you receive faxes occasionally, you can keep your line open for voice calls and still receive faxes on the same line when you hear the fax tone.

Manual receive is always enabled. Even if Auto-Answer is disabled, you can always receive faxes manually.

- 1 Answer the telephone.**
- 2 When your correspondent informs you he is ready to send you a fax or when you hear the fax tone, choose Receive Manually from the Fax menu.**

A Receive Fax dialog box appears.

- 3 When you hear the fax tone, click Receive.**

When reception is complete, the fax appears in the Fax Terminal Received Fax Documents folder.

5

Fax Viewer



In this chapter

This chapter explains the Fax Viewer program features in the most likely sequence of events for handling a received fax

- Opening a fax
- Viewing a fax
- Improving fax display
- Editing the pages of a fax or resequencing it
- Selecting part of a fax to paste into a document created by a graphics program
- Printing a fax
- Converting a fax to PICT format
- Forwarding a fax

Before you begin

You should be familiar with the information in Chapters 3 and 4 on receiving faxes.

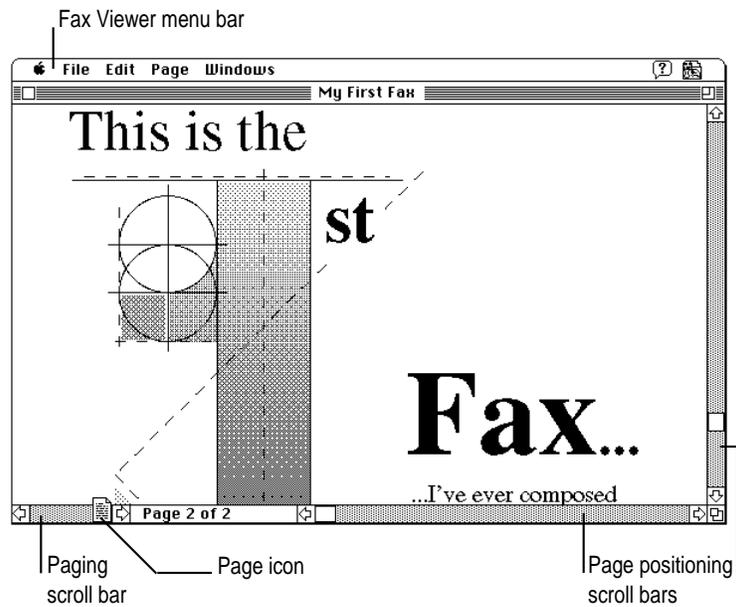
Opening a fax

You can use several methods to open a sent or received fax for viewing in Fax Viewer.

■ **Open a Fax Viewer document by one of the following methods:**

- Double-click a document in the Sent or Received Fax Documents folders in the Fax Terminal queue.
- Select a document from the Sent or Received Fax Documents folders in the Fax Terminal queue, and then click Open.
- Open a Sent or Received Fax document in Fax Viewer using the Open command in the File menu.
- Double-click a Fax Viewer document in the Finder.

Your fax document appears in a Fax Viewer window.



Viewing a fax

You can view a fax document at different resolutions by choosing options in the Page menu:

- **Actual Size** displays your fax at the real page size (default).
- **Fit in Window** displays a full page of your fax on your screen.
- **Fax Resolution View** means that each dot of the 200 dots per inch (dpi) fax is displayed as a pixel on the Macintosh screen. The resulting view is approximately 277% of actual size.

Positioning a document

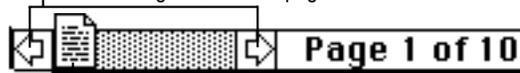
Your screen may be too small to display an entire page within the active window.

- **To examine undisplayed portions of a page, use the vertical and horizontal page positioning scroll bars at the right of the Fax Viewer window.**

Scrolling pages

- **To scroll pages, use the paging scroll bar at the lower left of the Fax Viewer window.**

Clicking the arrow at each end of the paging scroll bar scrolls through the fax one page at a time.



To scroll to an approximate page, move the page icon along the scroll bar. For example, to view page 5 in a 10-page document, move the page icon to the center of the scroll bar.

In addition to the paging scroll bar, the Page menu offers commands for changing pages:

- **Previous Page** allows you to move backward one page.
- **Next Page** allows you to move forward one page.
- **Go To Page** displays a dialog box for moving to a specific page.

Changing the page orientation

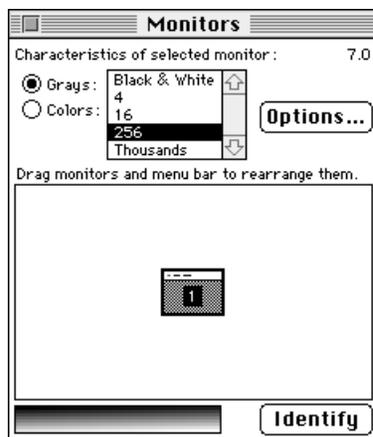
You may want to change the orientation of a page if a fax you received is turned the wrong way, for example upside down.

- **Choose the orientation you wish from the Page menu.**
 - Rotate Right turns the current fax page 90 degrees clockwise.
 - Rotate Left turns the current fax page 90 degrees counterclockwise.
 - Flip Vertical rotates the current fax page 180 degrees.
 - Flip All Pages rotates all the pages in the current fax 180 degrees.

Improving fax display

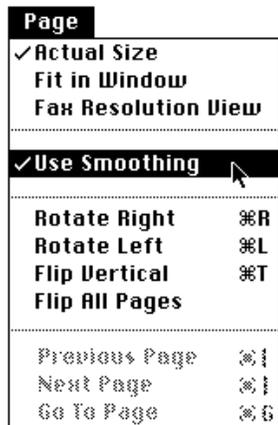
Fax Viewer has a special smoothing feature that allows you to optimize fax display. Smoothing increases the sharpness of a fax on your screen, permitting easier reading and scanning with OCR software.

- 1 **Set your monitor to Color or 256 Grays in the Monitors control panel.**



Depending on the content of the received fax, you can experiment with the monitor settings and the *Use Smoothing* command to get the best resolution for display. Smoothing is enabled by default.

- 2 Choose Use Smoothing from the Page menu.



How smoothing works

The resolution of a fax is 200 dots per inch (dpi). Your Macintosh converts the 200 dpi fax resolution to the 72 dpi of the Macintosh screen. The conversion process concentrates gray areas together, making the document appear darker. The smoothing feature looks for dark areas, and then applies a special algorithm known as dithering to improve document resolution.

Editing a fax

You may need to resequence, eliminate, or combine pages from several faxes.

Cutting a page

Entire pages can be cut to the Clipboard for later use.

- 1 Make sure you're viewing the page you wish to cut.**
- 2 Choose Cut Page from the Edit menu.**

Cut Page cuts the entire page. Notice that the page count decreases by one page.

Copying a page

Pages can be copied from a document to keep the original fax intact.

- 1 Make sure you're viewing the page you wish to copy.**
- 2 Choose Copy Page from the Edit menu.**

The Clipboard holds one page at a time. Be sure to paste the page into a Fax Viewer or Paint program document before copying another page. Notice that the page count remains the same. Copied pages are not removed from the current fax.

Pasting a page

You may paste a cut or copied fax page into any Fax Viewer or Paint program document.

- 1 Select the page you want and cut or copy it to the Clipboard.**
- 2 Use the Scroll Bar to display the page that will precede the page you want to paste in.**
- 3 Choose Paste Page from the Edit menu.**

Notice that the page count increases by one page and that Fax Viewer places the page after the one displayed.

Clearing a page

Clear Page deletes one page at a time.

- 1 **Make sure you're viewing the page you wish to delete.**
- 2 **Choose Clear Page from the Edit menu.**

You can use Undo to restore the deleted page. The current page is deleted from the fax and the following page takes its place in the order. Notice that the page count decreases by one page.

Selecting a portion of a page

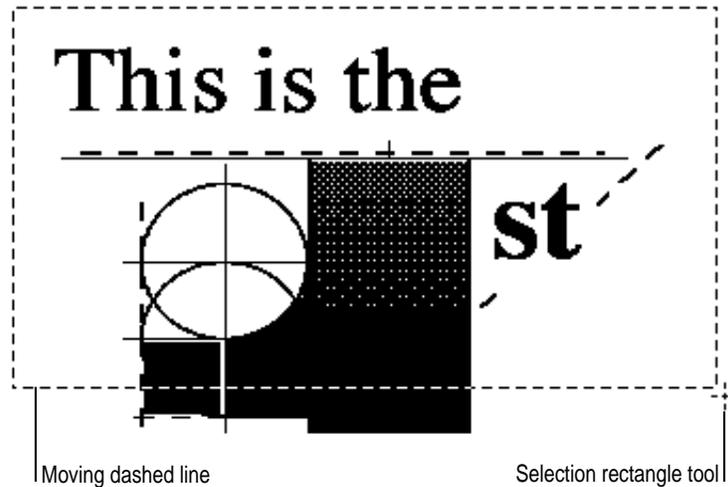
You may want to select a portion of a page for pasting into a document created by another program, such as MacPaint. Fax Viewer provides a selection rectangle tool for selecting and copying portions of documents.

- 1 **Select the page you wish to copy from.**
- 2 **Move the pointer over the page.**

Notice that the arrow pointer becomes a crosshair. It now functions as a selection rectangle tool for selecting rectangular areas.

- 3 Drag the selection rectangle tool across the image from the upper left to the lower right, releasing the trackball or mouse button when the image is enclosed.

A moving dashed line encloses the selected image.



- 4 Choose Copy Selection from the Edit menu.

Fax Viewer places the selected image at current resolution in PICT format in the Clipboard.

Note: To place a copy of your selection in the Clipboard at *Actual Size* regardless of what the viewing resolution is, press ⌘-Option while choosing Copy Selection from the Edit menu.

- 5 Make your Paint program document the active window, and then choose Paste from the File menu.

The selected image appears in your document.

Resequencing a fax

By using a combination of Cut, Copy, Paste, and Clear Page, you can resequence a fax. In fact, you can open several faxes and copy pages into a new Fax Viewer document.

Printing a fax

You print a fax the same way you print any document. See “Print a Document” and “Printing Your Work” in your Macintosh user’s guide. Make sure the printer is selected in the Chooser.

Converting a fax document to a PICT file

Fax Viewer allows you to save in Fax Viewer or in PICT file format. Fax Viewer documents can be opened only by the Fax Viewer program. PICT files may be opened by other programs, such as MacDraw or TeachText. In other words, the Save As command acts as a conversion tool for fax documents.

1 Choose Save As from the File menu.

The Save As dialog box appears. Notice the pop-up menu, titled Format at the bottom of the dialog box.

2 Change the document type using the Format pop-up menu.

In the following example, Fax Viewer is checked because the document is a Fax Viewer document. Dragging to PICT selects PICT format.



3 When you’re finished, click Save.

The current page is converted to PICT format (72 dpi) and placed in the folder of your choice.

Conversion file formats	Use
Fax Viewer	Can be opened only by Fax Viewer
PICT 72 dpi	Standard PICT format
PICT 200 dpi	High definition PICT format

Fax Viewer is a program for viewing and manipulating the fax documents you receive. Because a fax is a graphic image, it is similar to documents created in a Paint program. This means that you cannot edit the text as you can in a word processor.

IMPORTANT Fax files can be quite large in size. Check the size of your Sent and Received Fax folders from time to time to make sure you are not running out of disk space. It is best to delete faxes that you don't need to keep. Print them or make backup copies before deleting. You can use Fax Log to keep transmission records.

Forwarding a fax

Fax Viewer forwards your faxes in the same way Fax Terminal does.

- 1 **Open a Fax Viewer document using any of the several methods, then choose Forward Fax from the File menu.**

► *See also:* “Opening a fax” earlier in this chapter.



Choosing Forward Fax forwards an already imaged fax in the Sent or Received Fax Documents folders.

Choosing Fax Setup and then Fax reimages an existing fax document before sending.

The Fax Sender dialog box appears.

- 2 **Forward your fax as you would in Fax Terminal.**

► *See also:* “Forwarding a fax” in Chapter 4.

6

Fax Cover



Fax Cover allows you to create, manage, and store fax cover pages.

In this chapter

- Customize the fields on a cover page
- Align fields
- Add graphics to a cover page
- Install and remove cover pages

Before you begin

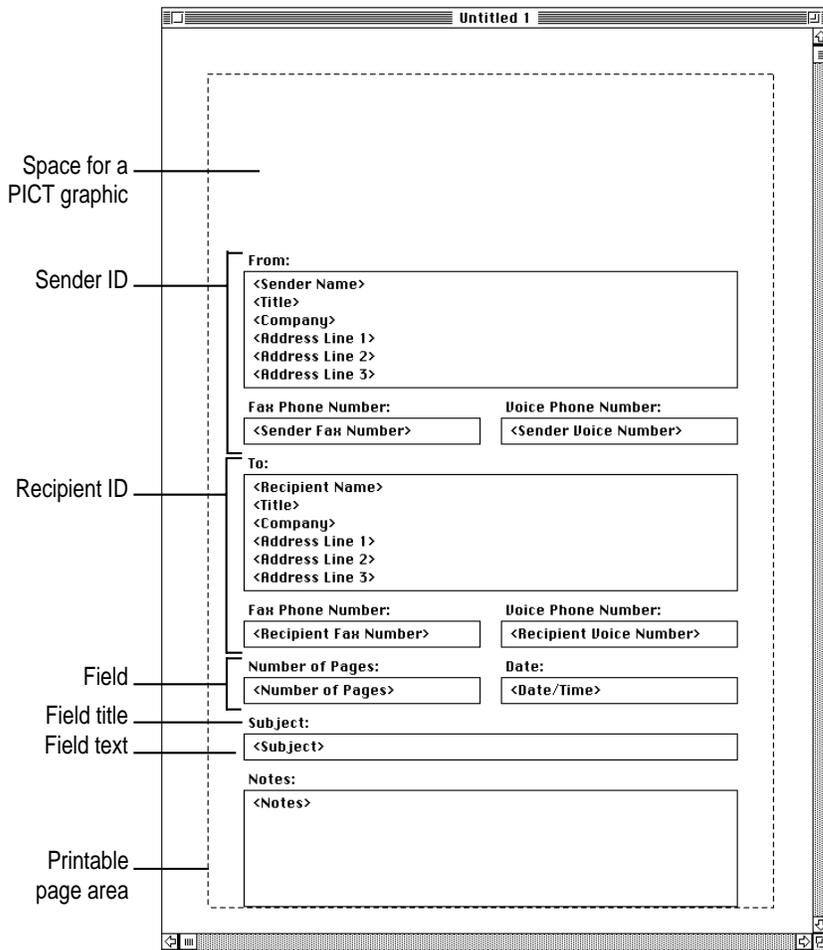
You don't have to attach a cover page to a fax before sending. If you wish to use customized cover pages with your faxes, you must read this chapter.

Customizing cover pages

Cover pages contain fields for address information. Each field has field title and text. Field titles are labels, such as “To” and “From.” Field text is information you enter, such as your recipient’s name. You customize a cover page by rearranging the appearance and positions of the individual fields and by adding graphics.

Customizing fields

You can decide which fields to display, change title names, edit field title and field text appearance, and position and resize fields on the cover page.

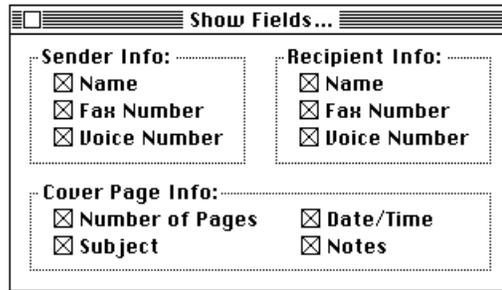


- 1 **Open the Fax Cover folder (installed on your hard disk) and double-click the Fax Cover icon.**

When a new cover page appears, it displays fields of titles and text. You can identify field text by the angle brackets (< >) surrounding it. Text in angle brackets acts as a placeholder for the text you enter in the Cover Page Information dialog box and Fax Phone Book in Fax Sender.

- 2 **Choose Show Fields from the Layout menu.**

Initially, all fields are selected. The Show Fields command displays a dialog box for specifying which fields will be shown on the cover page. Clicking a field deselects it (removes the checkmark), and it will not appear on the page.



3 Position the cursor on a field title to change the field title name.

Clicking a field title automatically selects the entire title. When the arrow pointer is positioned over any part of a field title, it changes to an I-beam. You can edit all or part of the field title by selecting and typing over existing characters or by placing an insertion point in the field title and inserting or appending characters.

Recipient:

<p><Recipient Name> <Title> <Company> <Address Line 1> <Address Line 2> <Address Line 3></p>
--

4 To change the font, size, and style of the field title, select all or part of the field title and use the Font and Style menus.

You can use Select All Field Titles from the Edit menu, or you can Shift-click to select combinations of fields to edit simultaneously.

Use the Font menu to customize the font and size. Use the Style menu to customize the style (bold, italic, and so on) and alignment (left, center, and so on).

5 To change the font, size, and style of the field text, click anywhere in the text area to highlight the field text and use the Font and Style menus.

You can use Select All Field Text from the Edit menu, or you can Shift-click to select combinations of fields to edit simultaneously.

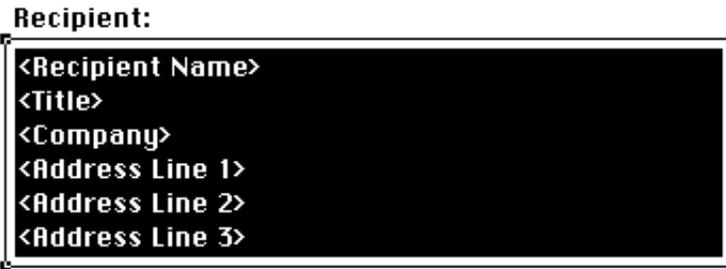
Use the Font menu to customize the font and size. Use the Style menu to customize the style (bold, italic, and so on) and alignment (left, center, and so on).

Positioning and resizing fields

You can position and resize fields individually or in groups.

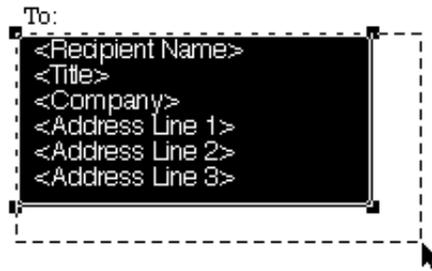
- 1 To select a field, click anywhere in the field text, not on the field title.

Clicking inside the field will highlight the text within the field, and handles will appear at the field corners.



- 2 To resize the field, drag one of the handles.

If you choose a font, size, and style for the field that would require vertical space greater than the current size of the field, the field will automatically increase to the required height.



- 3 To reposition a field, drag the field by its center (not by a handle) to a new location on the page.

When a field is being moved, the outline of both the field and its title will be displayed to indicate that the field title is moving with the field.

Using the grid

The grid allows you to align fields easily as you move them. When the grid is turned on, fields that you move or resize will automatically snap to the nearest grid line whether visible or not.

- 1 To turn the grid on, choose **Turn Grid On** from the **Layout** menu.
- 2 To see the invisible grid lines, choose **Show Grid Lines** from the **Layout** menu.

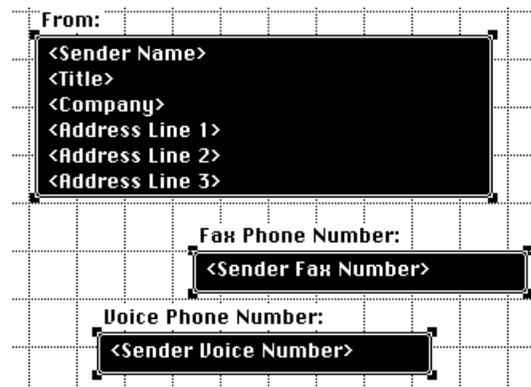
Aligning fields

You can align fields to the grid or to each other. The following examples show you how to align three fields to the grid and then three fields to each other.

Example 1: Aligning fields to a grid

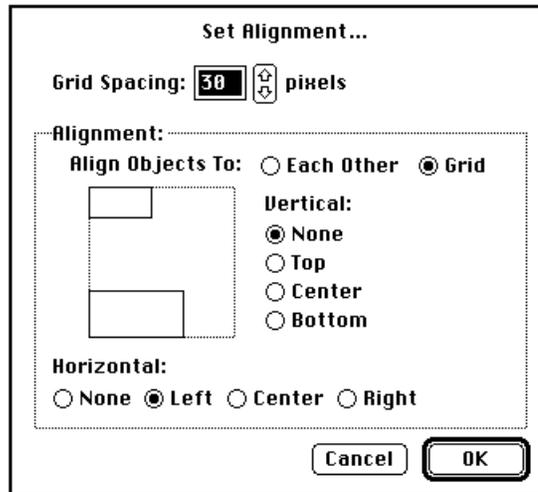
- 1 **Shift-click** three fields to select them.

You might choose fields at random in the following positions.

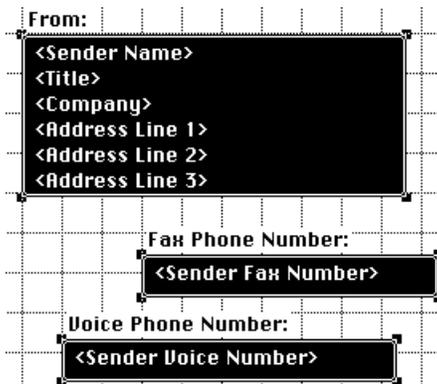


- 2 Choose Set Alignment in the Layout menu.

The following dialog box appears.



- 3 Set Grid Spacing to 30 pixels.
- 4 Click the Align Objects To Grid button.
- 5 Click Left under the Horizontal option and None under the Vertical option.
- 6 Click OK.

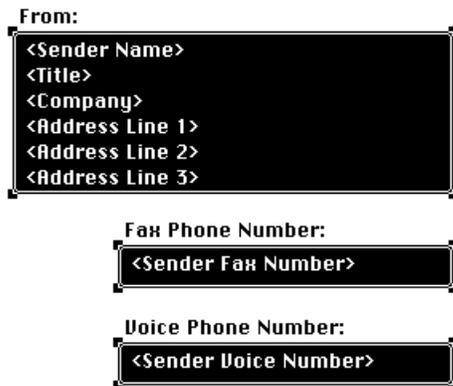


The fields snap to the nearest left gridline.

Example 2: Aligning fields to each other

Notice that the grid lines have been turned off in the Layout menu.

- 1 Shift-click three fields to select them.
- 2 Choose Set Alignment in the Layout menu.
The Set Alignment dialog box appears.
- 3 Click the Align Objects To Each Other button.
- 4 Click Right under the Horizontal option and None under the Vertical option.
- 5 Click OK.



The fields snap to the farthest right side of the farthest right field.

Note: To reuse the same alignment settings, just choose Align from the Layout menu. The settings stay the same until you change them.

Adding graphics

You can import previously created PICT graphics to a cover page and resize and combine them with text. You can use the clipboard or the Import PICT command in the Fax Cover File menu to import a PICT file.

- 1 **Select a graphic to add to your cover page.**

The following graphic was created with MacDraw and saved as a PICT file. See your graphics software documentation to learn how to create graphics and save them as PICT files.



IMPORTANT Only PICT files can be imported to cover pages.

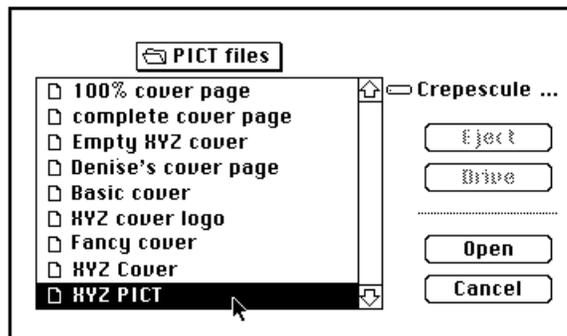
- 2 **Choose Import PICT from the Fax Cover File menu.**

The Open file dialog box appears.

- 3 **Double-click the name of the graphic you wish to import.**

Use the scroll box and pop-up menu to find the PICT file you want.

Your graphic appears inside the printable area of the cover page form. You can import up to sixteen PICT graphics into one cover page.



4 To reposition the graphic, just drag it to a new location on the page.

You can resize an imported graphic by dragging the handles, and you can move it to an empty space on the cover page or place it in the background behind superimposed text fields. You may have to reposition the text fields to find the best arrangement.

The diagram illustrates a form layout for a document cover page, enclosed in a dashed border. The form contains the following elements:

- From :** A large text field containing the following text:
 - <Sender Name>
 - <Title>
 - <Company>
 - <Address Line 1>
 - <Address Line 2>
 - <Address Line 3>
- Fax Phone Number :** A text field containing <Sender Fax Number>
- Voice Phone Number :** A text field containing <Sender Voice Number>
- To :** A large text field containing the following text:
 - <Recipient Name>
 - <Title>
 - <Company>
 - <Address Line 1>
 - <Address Line 2>
 - <Address Line 3>
- Fax Phone Number :** A text field containing <Recipient Fax Number>
- Voice Phone Number :** A text field containing <Recipient Voice Number>
- Number of Pages :** A text field containing <Number of Pages>
- Date :** A text field containing <Date/Time>
- Subject :** A text field containing <Subject>
- Notes :** A text field containing <Notes>

Below the form, there is a large empty rectangular area, also enclosed in a dashed border, with a mouse cursor pointing at it, indicating where a graphic can be placed.

You will be able to see your completed fax with the cover page at send time by selecting Preview in the Fax Sender Print dialog box.

The sample cover page below was prepared with TrueType outline fonts. Installing TrueType fonts will allow you to send fax text—even in large character sizes—with excellent character definition.

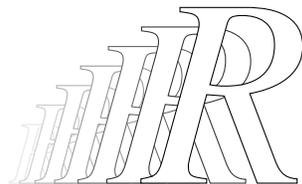
BEMSHA	05.23.93	13:01
From:		
Peter Edwards President XYZ Company 125 East Blvd. Northern, Va 22999		
Fax Phone Number:	<input type="text" value="(703) 555-3138"/>	Voice Phone Number:
		<input type="text" value="(703) 555-3840"/>
To:		
Brian Allen Supervisor of Training East West Furniture Co. 21212 Idlewild Drive Raleigh, NC 29444		
Fax Phone Number:	<input type="text" value="(919) 555-6789"/>	Voice Phone Number:
		<input type="text" value="(919) 555-6776"/>
Number of Pages:	<input type="text" value="2"/>	Date:
		<input type="text" value="04/23/94"/>
Subject:		
<input type="text" value="Latest Figures"/>		
Notes:		
<input type="text" value="Here are the latest cost projections for the next quarter."/>		
		

Outline fonts and high-definition fax

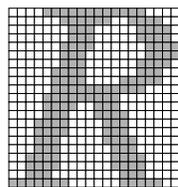
To obtain the highest-quality printed text image, install outline type fonts, such as TrueType fonts, on your system. The fax imaging process takes a picture of your Macintosh screen. Because the Macintosh screen has a much lower resolution than the 200 dots-per-inch resolution of a fax machine, bitmapped fonts will give you jagged character edges. In contrast, outline fonts produce clear, crisp images without “jaggies” across the entire range of font sizes by mathematically scaling fonts to the selected size.

If you have outline and bitmapped fonts installed, be sure to use only the outline fonts for cover pages and documents. Outline fonts produce excellent results across the entire range of font sizes.

Outline fonts



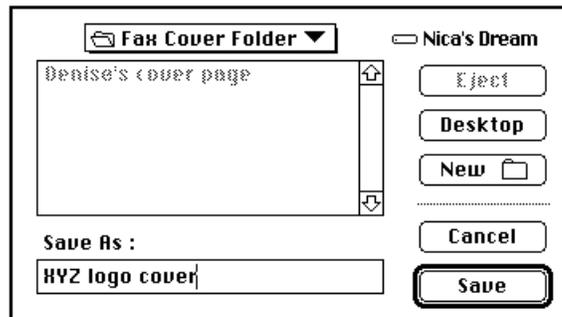
Bitmapped fonts



Installing cover pages

A new custom cover page must be saved and then installed in the Fax Sender cover page library. You install it only once. When you edit an existing cover page, the changes are saved without reinstalling.

- 1 Choose **Save As** from the **File** menu.
- 2 Type a name for your cover page and click **Save**.



- 3 With your cover page open, choose **Install Cover Page** from the **File** menu.

The current cover page is installed in the Fax Sender cover page library under the name you selected, in this case, “XYZ logo cover.” You will be able to choose it from the Fax Sender pop-up menu at send time.



Note: To modify an installed cover page, open the cover page, modify it, and then save it. The cover page remains installed.

Removing a cover page

- 1 Choose Remove Cover Page from the File menu.

A dialog box appears with a list of all currently installed cover pages.

- 2 Select the cover page you want to remove in the Remove Cover Pages scroll box.



- 3 Click Remove.

You can remove multiple cover pages by Shift-clicking their names to select them.

IMPORTANT Once removed, a cover page will no longer be available in the Cover Page pop-up menu in the Fax Sender Print dialog box. It still exists as a Fax Cover document, however, and you can open, edit, and reinstall it later.

- 4 Quit Fax Cover when you're finished with the program.

Table 6-1 summarizes the options available in the Fax Cover menus.

Table 6-1 Summary of Fax Cover menu options

Menu option	Action
File	
Import PICT	Allows you to import a PICT file into a cover page.
Install Cover Page	Puts a cover page in a library of cover pages. Cover pages are available from Fax Sender Cover Page pop-up menu.
Remove Cover Page	Removes an existing cover page from cover page library. Removed cover pages can be reinstalled.
Edit	
Select All Field Titles	Selects all field titles in an open cover page document.
Select All Field Text	Selects all field text in an open cover page document.
View	
Actual Size	Sizes to real cover page size.
Fit in Window	Sizes to current window size.
Reduce	Offers 25%, 50%, 75%, and 100% views.
Enlarge	Offers 25%, 50%, 75%, and 100% views.
Layout	
Show Fields	Allows you to choose the fields for cover page display.
Turn Grid On	Activates and deactivates grid.
Show Grid Lines	Makes grid visible.
Align	Aligns selected fields according to Set Alignment dialog settings.
Set Alignment	Allows you to set alignment parameters.
Use Default Size	Restores selected PICT to original size.
Font	Allows you to set font type and size for text.
Style	Allows you to set style and alignment for text.
Windows	Shows names of open cover pages.

A

Technical Information



In this appendix

This appendix informs you about

- Express Modem control panel
- Turning the modem on and off
- Express Settings
- Express Status
- Communications Toolbox compatibility
- Call management
- Software specifications
- Hardware specifications

Express Modem control panel

The Express Modem control panel is the nerve center for controlling and monitoring modem functions.

Setting the modem

The Express Modem control panel contains a field for setting certain modem functions. Most communications applications allow you to set the same functions. It is important to understand how to override application settings.

Overriding application settings

Because the Express Modem opens associations with up to three applications at a time (see *Call Management* in this Appendix), for the sake of easy management, it is important to be able to override application settings.

Express Settings take precedence over application settings as explained below, so remember to check Express Settings if an application does not behave as intended.

Monitoring the modem

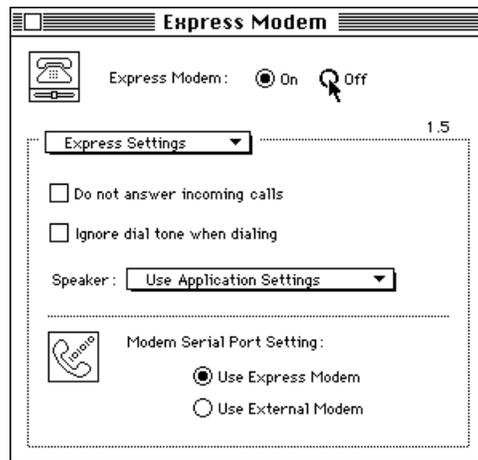
The Express Modem control panel contains a status field for monitoring modem functions such as, call progress and connection state before, during, and after a call is made.

Turning the modem on and off

While on, the modem uses some of your system's memory (600K). You may want to turn the modem off when it isn't needed. The On/Off buttons in the Express Modem control panel indicate whether the modem software is running.

However, you needn't reset the Express Modem control panel to restart the modem. Opening one of your communications programs opens the modem application.

- **To turn the modem off, open the Express Modem control panel and click off.**



Express Settings

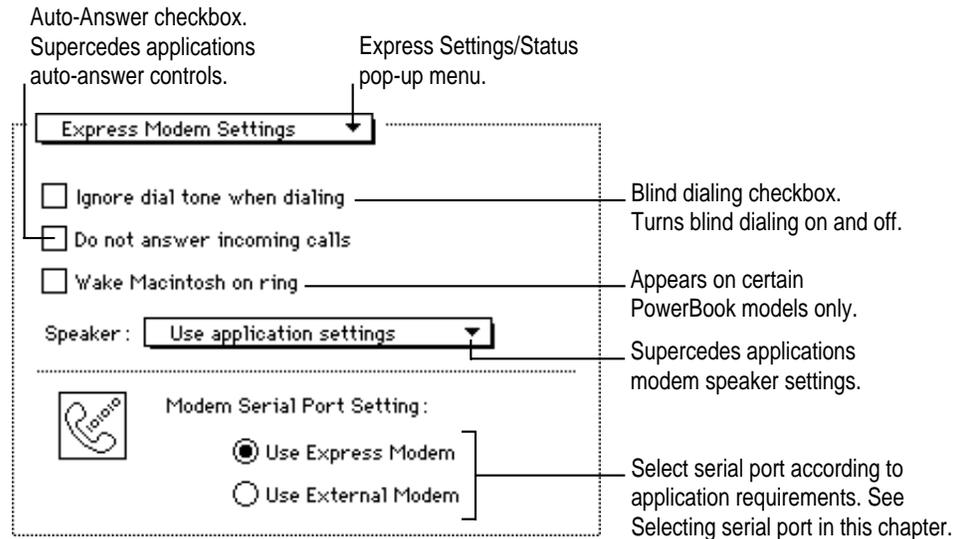
The Express Modem control panel contains a field for configuring the modem.

Selecting Express Settings

- 1 Select Express Settings in the Express Settings/Status pop-up menu if not already active.



The following field is displayed inside the Express Modem control panel.



- 2 Make choices according to the your needs.

Express Settings are explained below.

Blind dialing

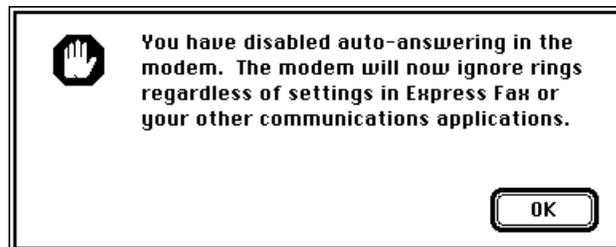
Blind dialing means that the modem dials out even though a dial tone cannot be detected. Blind dialing is useful in certain situations, such as hotel rooms where the modem may have difficulty recognizing the dial tone on the hotel PBX. The ATX command controls blind dialing. Clicking the *Ignore dial tone when dialing* checkbox has the effect of setting ATX=3 for all applications.

Leaving *Ignore dial tone when dialing* unchecked allows you to control blind dialing at the application level.

► *See also:* ATX command in Appendix B.

Auto-Answer

Clicking the *Do not answer incoming calls* checkbox has the effect of setting ATSO=0 for all applications, including terminal emulation and communications programs, and takes precedence over all application settings. In fact, once you have clicked this button restricting incoming calls, typing ATSO=2 in a communications program, such as MacTerminal, will return OK, but the modem will not answer and the modem profile won't change.



Leaving *Do not answer incoming calls* unchecked allows you to control auto-answer at the application level. You may wish to do this because you want to answer manually with a certain application or for other reasons.

► *See also:* "Setting auto-answer at the application level" in this Appendix.

Wake Macintosh on ring

Some PowerBook models have a special feature, Wake Macintosh on ring, that will automatically wake up your Macintosh from system sleep to respond to an incoming call. This allows you to conserve battery power while waiting to receive a fax or a file. (See the Macintosh PowerBook user's guide for your model for more information on system sleep.)

Speaker pop-up menu

The Speaker pop-up menu allows you to choose from three different settings.

Menu setting	Meaning
Use Application Settings	Allows you to control the speaker volume from the application setting and Sound control panel.
Modem Sound Always Off	Turns the speaker off for applications that use the modem. Same as setting ATM=0 for all modem applications.
Modem Sound On until Carrier	Leaves the speaker on until the carrier is established. Same as setting ATM=1 for all modem applications.

Selecting the serial port

If you use a non-compatible CTB application, you should leave the Modem Serial Port set to *Use Express Modem*.

If you use a CTB compatible application, you can leave the Modem Serial Port set to *Use External Modem*.

If you then want to use some other serial device on your Modem Port after this, you will need to reselect *Use External Modem*.

To use AppleTalk Remote Access, you can leave the Modem Port set to *Use External Modem*. Use of AppleTalk Remote Access is described more fully in Appendix C.

Express Status

Express Status is for viewing call progress and modem status before, during, and after connection.

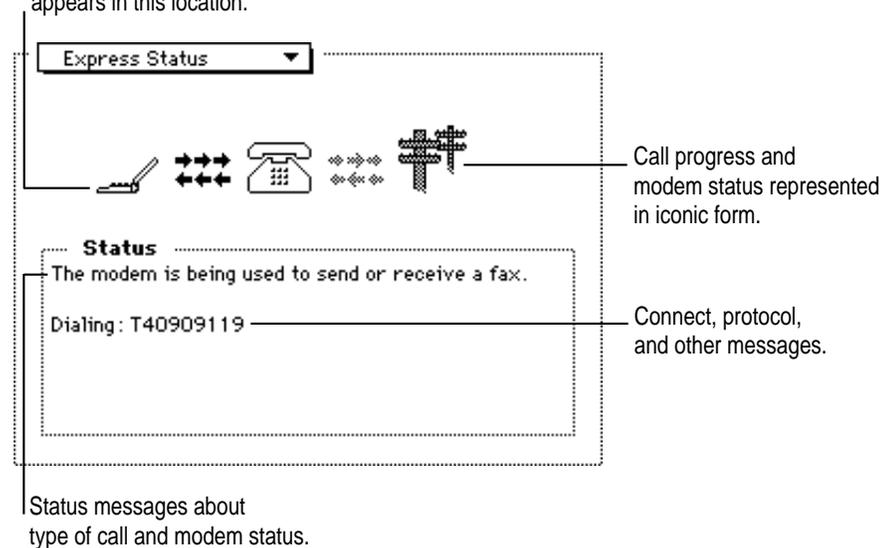
Selecting Express Status

- 1 Select Express Status in the Express Settings/Status pop-up menu.



The status field appears.

Icon for your CPU appears in this location.



You can view the connection process by stages: idle, preparing for connection, opening a connection, and during connection. Express Status monitors each stage, displaying messages and icons. You do not need to be connected to view Express Status. For example, even while the modem is off or when you open a connection to the modem in your communications program (the equivalent of picking up the receiver), messages are displayed.

► *See also:* Express Modem status messages in Appendix C.

Communications Toolbox compatibility

The Express Modem is designed to work with the Communications ToolBox (CTB). The Express Modem Tool, a CTB connection tool, is designed to work specifically with the Express Modem. If you use an application which uses the CTB, it is preferable to choose the Express Modem Tool, rather than selecting the Serial Tool, the Apple Modem Tool, or disabling the CTB.

The Express Modem provides access for those serial driver applications which do not support the CTB. Selecting Use Express Modem in the Express Modem control panel will enable applications using Serial Port A (Modem Port) to communicate with the Express Modem.

Applications that use a non-standard means of accessing a modem (for example, bypassing the serial driver and directly controlling the hardware, or implementing an alternate to the standard serial driver) have no means of accessing and using the Express Modem.

Call management

Your modem is designed to manage communications with Express Fax, AppleTalk Remote Access, and your communications program. This function is known as call management.

Your computer has just one physical modem port, which appears on the back panel where your modem is connected to the main logic board. To manage calls, the Express Modem software creates three “logical” ports—that is, non-physical ports. The Express Modem software generally sends incoming data to the logical port associated with the program. In other words, the modem sends fax data to the fax logical port, and so on. (For an exception to this rule, read “Setting auto-answer at the application level” in this chapter.)

Even with call management, your modem can still only connect to one telephone line at a time. If your modem is in use, and one of your communications programs tries to dial out to a different number, a Modem in use message is displayed in that program.

The modem serves your programs according to the following set of priorities:

Type of program	Priority
Data User programs	
MacTerminal and other CTB terminal emulator programs or front-end programs, such as AppleLink	Highest priority over other program types to allow user control of modem at all times for both sending and receiving data.
Data Server programs	
AppleTalk Remote Access	Lower priority than Data User. Allows Data Server and other servers to run in background while user program controls modem. When Data User program releases modem, Data Server is ready for incoming calls.
Fax Server programs	
The Express Fax software	Same priority as Data Server. Runs in background while user program controls modem. When Data User program releases modem, Fax Server is ready for incoming calls.

Setting auto-answer at the application level

Express Fax, AppleTalk Remote Access, and your communications program all contain an auto-answer command that sets your modem to answer calls automatically. Each program's auto-answer setting—the S0 register—affects call management in the following ways:

- **Only a Data User or a Server program (Fax or Data) is open.**
 - If the program is set to auto-answer, the modem answers after the number of rings designated in the S0 register of the open program.
 - If S0=0, the modem answers only when the manual answer command is given.
- **Both a Data User and a Server program (Fax or Data) are open.**
 - If both programs are set to auto-answer, the modem answers after the number of rings designated in the Data User program.

If the call is a fax call, it is passed to the fax server.

If the call is intended for the data server, it is not passed to the data server (data user programs take precedence over data server programs) because the data port cannot distinguish between the two data programs.

- If the Data User program has set S0=0, the modem will not answer.
- **Both Fax and Data Server programs are open.**
 - If both programs are set to auto-answer, the modem answers after the number of rings equal to the minimum of the two S0 values. The call is passed to the correct logical port.
 - If one program has S0=0, the call is passed to the program whose S0>0, if appropriate. If both server programs have their respective S0=0, the modem does not answer, but calls may still be placed.

Auto-answer is set differently for each type of communications program. If you want to set auto-answer yourself, use the following table as a guide.

Type of program	How to set auto-answer
MacTerminal and other terminal emulators	Set the program's S0 register. See the program's user's guide for information on setting the S0 register, or use the AT commands listed in Appendix B.
AppleTalk Remote Access and other servers	Use an AppleTalk Remote Access CCL script. CCL scripts are included on the Express Modem disk. See Appendix C.
The Express Fax software	Select Auto-Answer in Fax Terminal Fax menu and set the number of rings in Fax Terminal Preferences. See Chapter 4.

You may also want to turn off auto-answer when your modem shares the line with a telephone to make sure that the modem does not answer your incoming calls before you do. Installing a separate phone line just for the modem is another solution.

Answering manually

Communications software programs contain an Auto-Answer command that sets your modem to manage calls automatically. The Auto-Answer command sets your modem's S0 register.

The modem cannot auto-answer a call if its S0 register is set to 0. In this case, a communications program must be open and must issue the ATA command in order to answer a call. (See Appendix B for information on the ATA command—and all the AT commands.)

To set a communications program to issue the ATA command, see the following table.

Type of program	How to manually answer (issuing the ATA command)
MacTerminal and other terminal emulators	Issue the ATA command. For information, see the AT command set listed in Appendix B.
AppleTalk Remote Access and other servers	Use auto-answer in most cases.
The Express Fax software	Choose Receive Manually in the Fax Terminal Fax menu. See Chapter 4 for information.

Software specifications

Command set

Extended Hayes AT command set

Data communications standards

14400, 12000, 9600, 7200, 4800 bps	CCITT V.32 bis
9600, 4800 bps	CCITT V.32
2400 bps	CCITT V.22 bis
1200 bps	Bell 212A
1200 bps	CCITT V.22
300 bps	CCITT V.21
300 bps	Bell 103

Group 3 Fax communications standards

2400, 4800 bps	CCITT V.27 ter
7200, 9600 bps	CCITT V.29
12000, 14400 bps	CCITT V.17

Error control

Full CCITT V.42 compliance	
MNP Classes 2–4	
Fax Error Correction Mode	CCITT T.30

Data compression

CCITT V.42 bis (up to 4:1 compression)
MNP Class 5 (up to 2:1 compression)

Dialing capability

Tone/pulse dialing
Auto or manual dialing and answering

Data transmission and format

Full or half duplex operation

Asynchronous or framed modes

Character formats:

5, 6, 7, 8 data bits

1 or 2 stop bits

Odd, even, or no parity

Software

Modem application software includes:

Express Modem control panel

Express Modem Tool connection tool

Express Fax software includes:

Fax Terminal, Fax Viewer, Fax Sender, Fax Cover, Fax Extension

Memory requirements

The Express Modem uses 600 K of system RAM when the modem application is turned on.

Hardware specifications

Your modem is compatible with your CPU.

B

Modem Command Set



This appendix offers technical reference information for tuning and controlling your modem. If you use front-end programs such as AppleLink or programs like Express Fax included with your modem, or server programs such as AppleTalk Remote Access, you may never need to use the AT commands and other technical information in this appendix.

In this appendix

This appendix presents the AT commands recognized by your Express Modem. Commands are listed alphabetically and numerically, and grouped by functional category into tables.

Modem states

The Express Modem has two functional states: command state and on-line state. Command state allows you to enter commands that control the modem, such as configuration parameters. In command state, the modem is not capable of sending or receiving data. In on-line state, the modem sends and receives data through the telephone system. To enter commands from the AT command set, the modem must be in command state.

Moving between command and on-line states

When the modem is turned on or after reset, the modem always goes to command state. It automatically enters on-line state after successfully making a connection with a remote modem, either when answering or originating a call.

While the modem is in on-line state, you can issue a command that takes it back to command state. When you control the modem in this fashion, it is in local command state. While in local command state you can send commands to the modem from your keyboard.

- 1 Open your communications software program, and choose the option that lets you enter AT commands.**

Consult the user's guide that came with your software to find out how to enter AT commands from your keyboard.

- 2 Type the escape sequence +++.**

Wait one second (or a period equal to the guard time set in register S12). Do not type any other commands or make entries before or after the escape sequence while you wait. After a moment the message OK will appear.

You may now enter AT commands. Once you have done so:

- To go back to on-line state, type ATO.
- To hang up, type ATH.

Using AT commands

A command example is:

```
AT&Q5DT2125556767
```

This command line instructs the modem to attempt a V.42 bis connection, and then dial the number (212) 555-6767.

In this example, the modem's command line interpreter—the AT command set—issues instructions to the modem. If you look up these commands in this appendix, you will find:

- AT** The attention command
- &Q5** Attempt V.42 bis connection
- DT** Use Touch-Tone dial
- 212...** Make this string the dialed number

Entering AT commands from MacTerminal

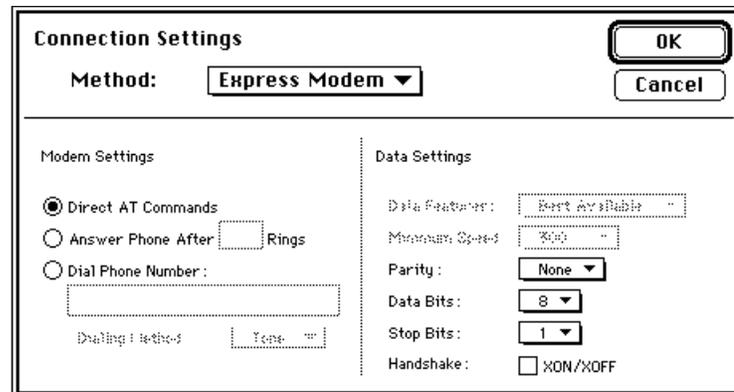
If you have MacTerminal, you can enter AT commands as follows:

- 1 Choose Connection from the Settings menu.**

The Connection Settings dialog box appears.

- 2 Select the Express Modem.**

The lower half of the dialog box changes.



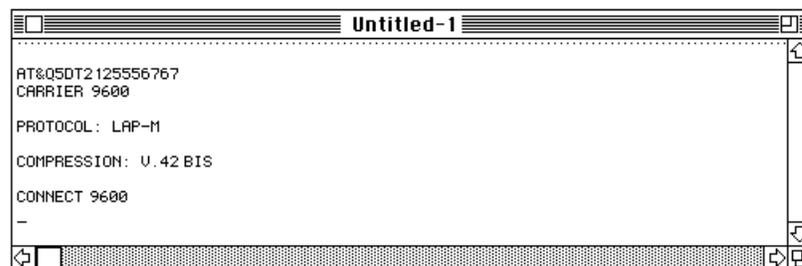
3 Select **Direct AT Commands** in **Modem Settings**, and then click **OK**.

4 Choose **Open Connection** from the **Session** menu.

This is equivalent to lifting the telephone off the receiver.

5 Enter the command string **AT&Q5DT2125556767** on your keyboard, then press **Return**.

The modem will dial the number and make the connection. The messages displayed on your screen will be similar to the following:



```
AT&Q5DT2125556767
CARRIER 9600

PROTOCOL: LAP-M
COMPRESSION: U.42 BIS
CONNECT 9600
-
```

6 To hang up:

- enter **+++** to go to command state
- type **ATH**
- and then press **Return**.

Commands documented in this appendix

This appendix documents the command set recognized by the Express Modem. The command set is compatible with the V series Hayes AT command set, a subset of the Microcom AX series MNP command set, and the class 2 TR-29/89-21R7 AT+F Fax extension set. This document does not describe the Fax AT+F subset.

Integrated (non-serial port) modems

Traditional modems—external modems or even modems that plug into a slot on a main logic board—use an RS-232-like serial connection protocol between the CPU (Data Terminal Equipment–DTE) and the modem (Data Communications Equipment–DCE). Your modem does not use this type of serial connection.

Since your modem has no DTE-DCE serial interface, all commands related to the serial interface have no effect. The commands themselves still exist for script compatibility reasons.

Command set rules

The command line can contain any number of commands and their options as long as the total number of characters, not including the attention characters or the line termination character, does not exceed 64, the length of the command line buffer. With only a few exceptions, described later in this appendix, the command line begins with the attention characters AT and ends with a return character, called a carriage return <CR>.

If the command line exceeds 64 characters, the result code ERROR is returned and no commands are executed. If the number of characters is less than or equal to 64, the commands are processed in order from the AT to the <CR>. If a command is invalid or unrecognized, processing of the command line ends at that command. Any commands following the error are ignored and the result code is returned to your computer.

The commands can be either upper or lowercase characters. However, both attention characters must be in the same case (for example, AT or at). The modem must be in command state to recognize and execute these commands, with the exception of the escape sequence.

When a line of commands is executed, only the last result code for the command is displayed. If any command needs to display information different from the result code, it will be displayed. All intermediate result codes are canceled.

Interpreting the default

If a value required for a particular command is not supplied, your modem will normally interpret the value as 0. The value supplied by the modem when you do not alter it is called the default. It's the value the modem assumes when you first start it up or after the original factory settings are restored. You can restore the original settings by using the AT&F command described later.

Interpreting valid parameter ranges

Some commands are accompanied by options, typically 0 and 1. An italic *n* appears beside the title of a command to indicate the availability of these optional settings. If you use one of these commands without a number, the modem assumes the value to be 0. Every optional value is evaluated in modulo 256. For example, ATE1 yields the same result as ATE257 because $(1 \bmod 256) = (257 \bmod 256) = 1$. After evaluating the argument modulo 256, if the value is not supported then ERROR is returned. Any argument greater than 999 in a command will generate an ERROR result code.



Setting the S registers

The S command is used to assign values to various registers in the modem's memory. Most of the S registers deal with certain aspects of timing. You can customize the behavior of the modem by setting the values in the S registers. Whatever the setting of register S3, the <CR> character (ASCII 13) is always recognized. The option in the Set Register command (Sn=) is also evaluated modulo 256 before setting the register to the new value. See the S registers for details of the effects of setting a given register value out of range.

Any attempt to set or read a reserved or unused register will generate an ERROR.

AT command set

AT refers to the command prefix (attention sequence) that precedes each command to the modem. With the exception of A/, all commands must be preceded by AT and end with a carriage return <CR>. In this appendix, the modem's default value and description are shown in boldface type.

Special Commands

A/ **Repeat last command** The A/ command instructs the modem to repeat the last command line. A command line termination character <CR> is not required for the execution of this command that is; the command is executed as soon as the slash is typed.

+++ **Return to command state (escape sequence)** The escape sequence is used to force the modem back to local command state from on-line state. Do not type any other commands or make entries before or after the escape sequence for a period equal to the guard time set in register S12 (default is one second).

The modem sends an OK result code to the terminal and switches to command state.

The actual escape character is specified by register S2, expressed as the ASCII value of the escape character (default is 43=+).

Standard AT commands

AT The attention command prefix The prefix AT must precede every command. The remainder of the command line contains commands for the modem. The command line must end with a carriage return. If AT is sent alone (that is, it is followed by a <CR>), then no command is executed but an OK result code is returned.

A Answer The A command forces the modem to go off-hook in answer mode. The modem then starts sending the answer tone (CCITT answer tone independent from the B setting) unless the modem is set for leased line (&L command) state. If no carrier signal is received from the telephone line within the number of seconds specified by register S7, the modem goes on-hook.

This command must be the last on a command line. Sending any character to the modem during call establishment will abort the command and generate a NO CARRIER result code.

En Communication protocol category preference This command determines which communication standard will be used for the next connection.

0 CCITT mode

1 **Bell 103 and Bell 212A, instead of V.21 and V.22, in case of fallback**

D Dial This command signals the modem that the numbers, letters, and commas that follow are all part of the telephone number it should dial.

You may include other dial command characters in combination with the D command: T, P, comma (,), W, colon (:), “at” sign (@), exclamation point (!), R, semicolon (;), and S=*n*. Each of these optional modifiers is described in the following sections. For clarity sake, you may also use other characters or symbols (for example, parentheses, hyphens, and spaces) without affecting the number.

In addition to the digits 0 through 9, your modem can also dial the six special characters (*, #, A, B, C, D) found on some Touch-Tone dial telephones.

- T** *Touch-Tone dialing* All subsequent numbers are Touch-Tone dialed until the P command (for pulse dialing) is selected.
- P** *Pulse dialing* Selects pulse dialing, with the dialing speed fixed at 10 pulses per second.
- You can mix Touch-Tone and pulse dialing within the same telephone number. The digits immediately following a P command will be pulse dialed; those following a T command will be Touch-Tone dialed.
- ,** *Pause* The comma modifier introduces a delay time before dialing the next dial character or executing the next character in the dial string. The pause time is the value of the S8 register (default=2 seconds).
- W** *Dial tone detect* The W modifier is used to make the modem detect a dial tone before sending the next digit. If the tone has been detected by the modem before the S7 register time delay, the modem continues dialing the rest of the characters in the dial string. If no tone is detected, the modem goes on-hook, returns the NO DIAL TONE result code to the host, and enters the local command state.
- This modifier can be embedded anywhere in the dial string.
Example: ATDT9W5551234.
- :** *Calling Card tone detect* Same as W. The colon can detect most calling card tones. Place the colon in the dial string when you want to detect a wider range of frequencies.
- @** *Wait for quiet answer before dialing* For the time specified in the S7 register (default=50 seconds), the modem attempts to detect 5 seconds of silence. This period of silence confirms that the call has been answered. When 5 seconds of silence are detected, the modem dials the remaining numbers in the command line. The remaining numbers may be a security code, another telephone number, or an extension. If no quiet time is detected, the modem hangs up and returns NO ANSWER. The following is an example using the @ modifier:
- atdt312555-1432@4622

- ! *Flash* This modifier causes the modem to go on-hook then back off-hook, as if the receiver on the telephone set had been pressed momentarily. This modifier can be placed anywhere in the dial string.
- R *Reverse mode* The R modifier changes the modem from originate mode to answer mode once the dialing process has been completed. This command is used only at the end of the dial string.
This modifier is used for compatibility with old originate-only modems.
- ;*Return to local command state after dialing* The semicolon (;) modifier may be put at the end of the dialing command. It forces the modem back to the local command state after dialing a number. The modem does not attempt a connection. This allows you to use the modem as a dialer (you must pick up the telephone handset at the end of the dial command) or dialing numbers in two or more steps.
- S=*n Dial telephone number stored at location n* Dials telephone number stored in location *n*, where *n* is 0, 1, or 2. You must have previously saved the value with the AT&Z command.
- L *Dial last telephone number* Redials the last number dialed when placed after the D command.
- E*n Echo off/on* When the echo is turned on, the characters sent to the modem in command state are echoed back by the modem to the host computer. The E command is functional only when the modem is in command state.
- 0 Turns off the echo command.
- 1 **Turns on the echo command.** This allows you to see that characters you have sent to the modem have been received and sent back.

Hn Hook (hang up)

When the modem is on-line, you must first enter the +++ escape sequence to take the modem back to command state before issuing the hang up command ATH.

- 0 Forces the modem on-hook. Hangs up the modem's connection to the telephone line.
- 1 Forces the modem off-hook.

In Information

- 0 Asks the modem for its product ID code.
- 1 Returns a modem code.
- 2 Returns OK.
- 3 Returns the modem's country code.
- 4 Returns a list of modem features.
- 9 Returns Apple product code and firmware version of the modem.

Ln Speaker volume This command has no effect, as the speaker is a component of the Macintosh and set in the Sound control panel. The command is included for compatibility purposes.

Mn Speaker on/off/auto

- 0 Disables speaker.
- 1 Turns on the speaker until carrier is established.**
- 2 Leaves the speaker on throughout the entire connection.
- 3 Turns the speaker on until a carrier is detected, except during dialing.

Nn Communication protocol preference Sets the modem protocol.

- 0 Use S37 for speed selection. If S37=0, connect at highest possible speed. Otherwise, connect at speed specified in S37.
- 1 Connect at highest possible speed according to value of S37.** Fallback if necessary.
- 2 Same as N1 for compatibility reasons.

Note: For N1 or S37=0, the setting of ATB is ignored. The modem automatically determines Bell or CCITT mode.

- On* **Return to on-line state** Returns modem to on-line state from command state.
- 0 Is used to return to the on-line state after having entered the command state using the escape sequence.
 - 1 Same as above and will retrain the carrier (possibly at a lower speed) before reentering on-line state.
- P* **Enable pulse dialing** Sets the default dialing mode to pulse mode. This command can also be used as a subcommand of the *D* command.
- Qn* **Quiet** (refer to command *Vn*)
- 0 Allows result codes to be sent to your screen.**
 - 1 Turns off the result code messages.
 - 2 Returns result codes when originating a call, but not when answering.
- Sn* **Select an S register** The *S* registers refer to memory locations used for configuration.
- Most of the *S* registers deal with some aspect of timing. The *S* commands are used to assign values to various registers in the modem's memory.
- n?* The *Sn?* command (*n*=register number) is used for checking the contents of a register. The result is always expressed as a three-digit number, where the leading digits or all digits may be 0.
- Sn=r* is used to change an *S* register value (where *n* is the number of the register and *r* is the assigned value).

S registers

	Default	Range	Units
S0	Number of rings to auto answer		
	0	0:255	Number of rings
	The S0 register determines the number of times your telephone must ring before your modem will automatically answer it. When S0 is set to 0, the modem is in manual answer mode.		
S1	Ring counter		
	0	0:255	Number of rings
	The S1 register is cleared if no rings are detected throughout an 8-second interval. S1 is automatically set by the modem.		
S2	Escape Character		
	43 <+>	0:127	ASCII Decimal
	The S2 register determines the ASCII character to be used as the escape character. The escape sequence is used to force the modem from the on-line state to the local command state.		
S3	Line-termination character		
	13 <CR>	0:127	ASCII Decimal
	The S3 register determines the ASCII character to be used as the line-termination character. No matter what value S3 is set to, ASCII 13 is always recognized.		
S4	Line-feed character		
	10 <LF>	0:127	ASCII Decimal
	The modem returns the ASCII character programmed in the S4 register as the line-feed character when the modem sends response codes to the computer.		
S5	Backspace character		
	8 <BS>	0:127	ASCII Decimal
	The S5 register determines the ASCII character to be used as the backspace character.		

Verbalize result codes

- 0 OK Command is correct and has been completed
- 1 CONNECT Connection established
- 2 RING Incoming ring detected
- 3 NO CARRIER No connection or lost the carrier
- 4 ERROR Bad command
- 5 CONNECT 1200 Connection established at 1200 bps
- 6 NO DIALTONE Dial tone not detected in S7 seconds
- 7 BUSY Busy tone detected
- 8 NO ANSWER See ATD...@...
- 10 CONNECT 2400 Connection established at 2400 bps
- 11 CONNECT 4800 Connection established at 4800 bps
- 12 CONNECT 9600 Connection established at 9600 bps
- 15 CONNECT 7200 Connection established at 7200 bps
- 24 CONNECT 300/REL Connection with MNP 300 bps
- 25 CONNECT 1200/REL Connection with MNP 1200 bps
- 26 CONNECT 2400/REL Connection with MNP 2400 bps
- 27 CONNECT 4800/REL Connection with MNP 4800 bps
- 28 CONNECT 9600/REL Connection with MNP 9600 bps
- 29 CONNECT 7200/REL Connection with MNP 7200 bps
- 30 CONNECT 12000/REL Connection with MNP 12000 bps
- 31 CONNECT 14400/REL Connection with MNP 14400 bps



Protocol negotiation progress codes that work with ATW1 and S95.

40 CARRIER 300 Carrier detected at 300 bps
46 CARRIER 1200 Carrier detected at 1200 bps
47 CARRIER 2400 Carrier detected at 2400 bps
48 CARRIER 4800 Carrier detected at 4800 bps
49 CARRIER 7200 Carrier detected at 7200 bps
50 CARRIER 9600 Carrier detected at 9600 bps
51 CARRIER 12000 Carrier detected at 12000 bps
52 CARRIER 14400 Carrier detected at 14400 bps
66 COMPRESSION: CLASS 5 MNP class 5
67 COMPRESSION: V.42BIS V.42 bis compression
69 COMPRESSION:NONE No compression
70 PROTOCOL:NONE Asynchronous mode
77 PROTOCOL:LAP-M Error control mode with LAP-M protocol
80 PROTOCOL:ALT Error control mode with MNP protocol
128 MODEM IN USE Modem already in use for this or another application

Wn Progress result codes The ATW setting determines whether progress result codes are displayed in addition to the ATX codes. Register S95 determines which progress result codes will be displayed.

- 0 Progress codes 40 through 80 disabled.
- 1 Progress codes 40 through 80 enabled.**
- 2 Progress codes enabled; identical to W1.

When writing a CCL script, pay attention to result codes for scripts that require a specific response. If progress codes are enabled, the following strings appear on the screen during a connection (in this example, V.22 bis connection with no error control):

- CARRIER 2400
- PROTOCOL:NONE
- CONNECT 2400

Xn **Active result code** The result codes listed in *Vn* are divided into subsets that can be selected by the *X* command. Dial tone detection is enabled by *X2* or *X4*. Busy tone detection is enabled by *X3* or *X4*. The commands *X0*, *X1*, and *X3* are appropriate for blind dialing. Blind dialing means the modem dials out even though a dial tone is not detected.

- 0 Selects result codes 0 through 4 and 8.
- 1 Selects result codes 0 through 5, 8, and 10 through 28.
- 2 Selects result codes 0 through 6, 8, and 10 through 28.
- 3 Selects result codes 0 through 5, 7, 8, and 10 through 28.
- 4 Selects all result codes.**

Yn **Remote break handling** This command sets modem behavior for responding to a long break signal received from a remote modem:

- Greater than 1.6 seconds for an asynchronous connection.
- An attention frame for MNP or V.42.
- 0 The modem ignores any long breaks received from the remote modem.**
- 1 On receiving a long break from the remote modem, the modem goes on-hook (hangs up) and returns to command state.
- 2 On receiving a long break from the remote modem, the modem returns to command state but remains connected to the remote modem (does not hang up).

Zn **Reset** The *Z* command tells the modem to perform a software reset.

- 0 Loads Profile 0 into the active profile.
- 1 Loads Profile 1 into the active profile.

&Cn **DCD options** Since bus modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.

- 0–2 Return OK.

&Dn DTR options Bus modems do not have a DTR line. For bus modems, an on-to-off DTR transition occurs when you close the connection tool or the application currently using the modem. In this case, the modem goes on-hook.

This command has no effect and remains for scripting compatibility.

0–3 Return OK. Default value is 3.

&F Recall default profile The current active profile is replaced by the default factory configuration.

&Gn Guard tones This command specifies whether guard tones should be transmitted. Guard tones are used in some telephone systems to allow proper data transfer over the network. They are not used in the United States.

0 Disables guard tone.

1 Same as 2.

2 Sends 1800 Hz guard tone.

&Kn Local flow control This command specifies which kind of local flow control is used. Since bus modems have built-in flow control mechanisms between the DTE and the DCE, this command has no effect. Flow control characters generated by the application software are always passed to the line.

This command has no effect and remains for scripting compatibility.

0–5 Respond OK, no action taken.

&Ln Switched/Leased line This command affects the modem's behavior during the call setup and carrier handshake phases at the beginning of a connection.

0 Selects switched (dial-up) line.

1 Selects conditioned leased line.

&Pn Pulse mode make/break ratio

0 Sets the dial pulse make/break ratio at 39%/61%.

1 Sets the dial pulse make/break ratio at 33%/67%.

- &Qn Connection mode** This command allows you to enable and disable error control mode. The &Q command setting has precedence over \N command setting and registers S36 and S48.
- 0 Asynchronous mode (no error control, disables V42 and MNP).
 - 5 **Error control mode** Instructs the modem to make a connection using V42/MNP, and fallback as necessary (see S36 and S48 registers).
- &Rn CTS/RTS** Since bus modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.
- 0-1 Return OK.
- &Sn DSR** Since bus modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.
- 0-2 Return OK.
- &Tn Self-tests** The following diagnostic tests are provided. These tests are available only when no error protocol is engaged. The duration of each test is controlled by register S18.
- 0 **Terminate the test** Used to terminate (escape from) a test in progress and return to command state, if S18=0.
 - 1 **Local analog loopback** Initiates a local analog loopback test. The escape sequence must be entered to terminate this test. This mode tests the local modem and the local data terminal equipment.
 - 3 **Local digital loopback** Initiates a local digital loopback test. The modem echoes characters back to the remote modem exactly as received.
 - 4 **Enable the remote digital loopback** Enables the modem to respond to a remote modem attempting to place it in digital loopback test. If a remote modem places the local modem in remote digital loopback mode, the local modem echoes characters back to the remote modem exactly as received from the remote modem.
 - 5 **Disable the remote digital loopback** Prevents the modem from responding to a remote modem attempting to place it in the digital loopback mode.

- 6 **Remote digital loopback test** In this mode, characters sent to the remote modem are echoed back to the local modem exactly as they were received by the remote modem. This mode tests both local and remote modems and telephone circuits.
- 7 **Remote digital loopback with self-test** Initiates a Remote Digital Loopback (like &T6) with self-test data pattern generation and error checking.
- 8 **Local analog loopback with self-test** Initiates a Local Analog Loopback (like &T1) with self-test data pattern generation and error checking.

The tests terminate when an AT&T0 command is issued or when register S18 expires. In the self-test mode, an error counter counts the number of errors and sends the final result to the host at the end of the test. The maximum number of errors that can be counted is 255.

Note: &T1 takes an optional parameter (a single character, A or O) to indicate whether the analog loopback must be done in originate (default) or answer mode.

&Un **Trellis coding** Enables/disables Trellis code modulation in V.32.

- 0 **Enable Trellis coding.**
- 1 Disable Trellis coding.

&Vn **Display profiles** Displays the following information:

- Active profile
- Stored profile 0
- Stored profile 1
- Stored telephone numbers (see AT&Z).

&Wn **Profile saving** This command saves the current active profile:

- 0 Saves the active profile into profile 0.
- 1 Saves the active profile into profile 1.

&Xn Synchronous clock source Ignored. Always returns OK. The modem does not support synchronous modes.

&Yn Specify start-up profile Allows choosing between two different configurations at start-up.

0 Specifies saved profile 0 as start-up configuration.

1 Specifies saved profile 1 as start-up configuration.

&Zn=s Store phone number

Stores the dial string *s* (64 characters maximum) in location *n*. The value of *n* can be equal to 0, 1, or 2. Note that the dial string *s* is constructed in the same fashion as the ATD command. It therefore must be the last command on the command line and no other characters should follow it in the dial string.

MNP-specific AT commands

\Bn Send break Sends a break on the line for *n* times 100 milliseconds (*n* ranges from 1 to 9).

%Cn Compression enable Enables/disables MNP Class 5 data compression during MNP reliable connections.

0 Disables data compression.

1 **Enables MNP 5 data compression.**

\Gn DCE flow control Enables/disables modem-to-modem flow control. Coupled with \X, it determines whether flow control characters are passed through or filtered.

0 **Disables modem-to-modem flow control.**

1 Enables modem-to-modem flow control.

\Nn MNP feature selection Determines whether MNP error control is used in connections. The \N command setting also updates register S36. The &Q command setting has precedence over \N command setting and registers.

0-1 *Normal mode* MNP disabled.

2 *Reliable mode* The modem will interrogate the remote modem for MNP capabilities. If the remote modem does not support MNP, the local modem hangs up.

- 3 **Auto-reliable mode** The modem interrogates the remote modem for MNP capabilities. If the remote modem supports MNP, a reliable connection is established. If the remote modem does not support MNP, a normal connection is established.
- \O **MNP link negotiation** Treated as AT00 command. Modem returns to on-line state. MNP Link is not negotiated.
- \Tn **Inactivity timer** Where *n* is a decimal integer between 0 and 90 specifying minutes. Sets the number of minutes the modem waits before automatically hanging up when data is not sent or received. The default option *n*=0 disables the timer.
- \U **MNP link negotiation** Treated as AT00 command. Modem returns to on-line state. MNP link is not terminated.
- \Vn MNP result codes
 - 0 **Disables modified MNP result codes.**
 - 1 Enables modified standard MNP result codes 24 to 28.
 - 2 Returns OK. No effect.
- \Xn Flow control processing
 - 0 **No pass-through flow control** If modem-to-modem flow control is enabled, AT\G1, XON/XOFF characters received from the line are filtered out of the data stream; they are not passed to the DTE.
 - 1 **Pass-through flow control** If modem-to-modem flow control is enabled, AT\G1, XON/XOFF flow control characters received from the line are passed through to the DTE.
- \Y **MNP link signaling** Treated as AT00 command. Modem returns to on-line state. MNP link is not negotiated.
- \Z **MNP termination** Treated as AT00 command. Modem returns to on-line state. MNP link is not negotiated.

ASCII character set

ASCII code	Character	ASCII code	Character	ASCII code	Character	ASCII code	Character
0	NULL	32	space	64	@	96	`
1	SOH	33	!	65	A	97	a
2	STX	34	"	66	B	98	b
3	ETX	35	#	67	C	99	c
4	EO	36	\$	68	D	100	d
5	ENQ	37	%	69	E	101	e
6	ACK	38	&	70	F	102	f
7	BELL	39	'	71	G	103	g
8	BS	40	(	72	H	104	h
9	HT	41	)	73	I	105	i
10	LF	42	*	74	J	106	j
11	VT	43	+	75	K	107	k
12	FF	44	,	76	L	108	l
13	CR	45	-	77	M	109	m
14	SO	46	.	78	N	110	n
15	SI	47	/	79	O	111	o
16	DLE	48	0	80	P	112	p
17	DC1 (XON)	49	1	81	Q	113	q
18	DC2	50	2	82	R	114	r
19	DC3 (XOFF)	51	3	83	S	115	s
20	DC4	52	4	84	T	116	t
21	NAK	53	5	85	U	117	u
22	SYN	54	6	86	V	118	v
23	ETB	55	7	87	W	119	w
24	CAN	56	8	88	X	120	x
25	EM	57	9	89	Y	121	y
26	SUB	58	:	90	Z	122	z
27	ESC	59	;	91	[	123	{
28	FS	60	<	92	\	124	|
29	GS	61	=	93	]	125	}
30	RS	62	>	94	^	126	~
31	US	63	?	95	_	127	DEL



Tips and Troubleshooting

In this appendix

Your modem is designed to provide years of trouble-free service. Should difficulties arise, however, this section may provide a quick solution. A good rule of thumb for solving any problem is to start by checking the installation and telephone line.

Checking the installation

Problems that arise during setup can often be remedied simply by double-checking the installation.

- 1 Unplug and reconnect the telephone cord to ensure a good connection. Check all other connections.**
- 2 To make sure that the modem is turned on, choose Control Panels from the Apple menu and Double-click the Express Modem control panel icon.**

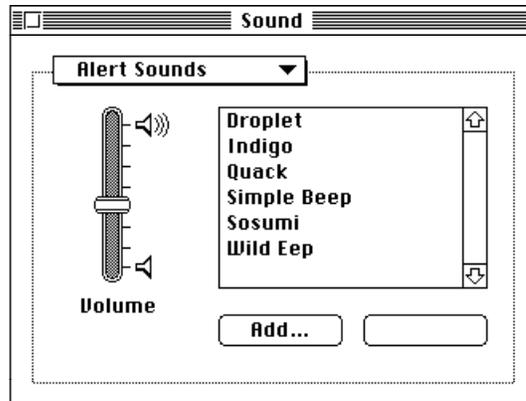
The Express Modem control panel appears. If the On button is not selected, click On. If you click the On button and it doesn't stay selected or if the Express Modem control panel doesn't appear, see the resource materials that came with your Macintosh for a service number to call. Your service provider will make sure that the modem software is correctly installed on your computer and that your modem is functioning properly.



Checking the telephone line

Make sure your modem is communicating with the telephone line.

- 1 Choose Control Panels from the Apple menu. Double-click the Sound control panel icon.
- 2 Be sure the volume is set above the lowest mark.



- 3 Close the Sound control panel.

Increasing the volume does not affect the status of your modem. It just allows you to verify that there is a dial tone when you try to open communications, and that the modem can dial telephone numbers.

- 4 Open your communications software and enter terminal mode.

If you don't know how to enter terminal mode, see your communications software user's guide. Terminal mode means that any characters that you type on your keyboard will be sent to your modem and that any characters received by your computer from your modem will be displayed on your screen.

- 5 Try dialing your own telephone number.

You'll hear a busy signal if you are properly connected.

6 Type ATH1 and press Return (or choose the Dial command of your application).

If the modem is properly connected to the telephone line, you'll hear a dial tone. You can then type ATH0 to hang up (or choose the hang up command of your communications software).

7 If you don't hear a dial tone, test your telephone line by connecting a working telephone and cord to the line.

Plug the telephone into the wall jack to verify the dial tone. If there is none, you will know the telephone line is the source of the problem.

8 If you hear a dial tone on your telephone but not through your modem, test your modem's telephone cord by connecting it to the wall jack and to the telephone.

If there is no dial tone, the telephone cable is the source of the problem. Return it to your dealer for replacement.

9 If your modem still has no dial tone, see the service and support information that came with your computer for a number to call.

WARNING If your modem needs repair, take it to an authorized Apple service provider.



Verifying that your software is installed

To be sure that the Express Modem software is properly installed, watch the bottom of your screen when you restart your computer. You will see the Modem and Fax icons, as illustrated below. If the Express Modem software is installed, the icons are animated: the paper emerges from the fax machine on the fax icon and the buttons on the phone are pressed on the modem icon.



You can also check the Express Modem control panel. If the Express Modem software is installed and the modem application is open, the Modem button in the Express Modem control panel will be on.

Common problems

In terminal mode, I type AT and press Return once, but don't get an OK response.

- If you're unable to get the OK response, check that all telephone cables are securely in place and that your software displays the correct settings.
- If you still have trouble getting your modem to work, see the service and support information that came with your computer for a number to call.

I want to reset the modem.

You can reset your modem—that is, return it to the original factory default setting—by using an AT command.

- To reset your modem, type the direct command “AT&F”

The AT commands may not be echoed on the screen when you type them. Resetting the modem should also correct this problem.

I see unreadable characters mixed in with normal characters.

You may see a strange mix of characters in an otherwise readable message. This may be due to noise or interference on the telephone line.

- Wait a while. The problem may go away by itself.
- If the problem persists, hang up then redial.

I have Call Waiting and experience loss of connection

If you use your modem on a telephone line with Call Waiting, you run the risk of being disconnected or losing data when someone else tries to call. The best solution is to temporarily disable Call Waiting if possible. In certain cases, you may solve the problem by placing *70 or *71 in your dial string, either before or after the number you are dialing.

Call Waiting will return as soon as you hang up. You will have to disable it for each telephone call. Call Waiting can also be disabled for fax.

I see a complete screen full of unreadable characters.

A complete screen of random text may be caused by a bad connection, or may occur when your modem's automatic settings don't match those required by the remote computer.

Here are some possible solutions:

- Reconnect your telephone cord firmly. It doesn't happen often, but an improper connection can turn your data into unreadable text.
- If the problem persists, hang up and dial again.
- If you are sure you have a normal connection, but the problem persists, check with your communications software user's guide to confirm that your modem is set correctly for speed, error checking, and data compression.
- Check with the person (or information service) at the other end of the line to be sure your transmission rates (14400, 9600, 4800, 2400, 1200, 300 bps) are the same.
- Try another parity setting until the transmission is normal.
- If you can't see what you type, turn on your local echo setting (some software applications call this the duplex setting). If you see two of everything you type, turn off your local echo setting. An incompatible echo setting can cause double lines of text to appear on your screen; it can also prevent any text from appearing on the screen.
- Try another setting until the transmission is normal.

To manually set speed, parity, and other parameters, see "Reaching another modem" in Chapter 2 and look for information on adjusting settings in your communications software user's guide.

I have trouble connecting to the remote modem

- Make sure you are calling the correct telephone number. Verify that the number has not been discontinued.
- You may need to type a digit, such as a 0 or 9, at the beginning of the telephone number to get an outside line.
- Make sure that the number you're dialing connects to a modem and not to a regular telephone. Try calling the modem number from a regular telephone. If you hear a high-pitched tone after you dial, you have reached another modem.
- If the problem persists, try the recommendation on "Connecting to older modems" later in this appendix.

Do not reconnect a faulty modem until it has been repaired. If you leave a faulty modem connected when it is adversely affecting the telephone line, the telephone company may disconnect your service until you have corrected the problem.

I have trouble connecting to a remote fax

- If telephone line quality is poor, you may need to send the fax several times.
- The high-speed fax feature (V.17) allows you to send and receive at 14400 bps. If the remote fax does not support V.17, turn it off in Fax Terminal Preferences.
- Error Corrected Mode (ECM) permits sending and receiving under poor conditions and over cellular lines. If the remote modem does not support ECM, turn it off in Fax Terminal Preferences.

Try sending faxes with both V.17 and ECM turned on. If you encounter difficulties, turn off V.17 first. If the problem persists, turn off ECM.

Other screen display problems

If you have screen display problems other than the ones listed in this appendix (such as lines of text running off the screen), you may have a problem with your communications software.

The problem generally shows up as soon as you begin to send or receive data. Check the user's guide that came with your communications software to confirm that your modem is set correctly.

If you're dialing an on-line service, verify that your system is set to match what the service requires.

The following table lists some of the display problems you may encounter. Solutions will vary depending on your communications software.

What you see	Possible cause	Possible solution
Data sent by the remote modem appear as random text on your screen.	Speed (bps rate), parity setting, or data bits setting is incorrect.	Consult your software manual, call your on-line service to find out what bps rate is expected, or experiment until you find a bps rate that works.
Data appear as double characters.	Both correspondent's and your software are echoing characters.	Turn off your local echo; that is, change to a full duplex setting.
Lines of incoming data are double-spaced.	Both correspondent's and your software are sending line-feed (also called newline) commands.	Turn off your program's line-feed (or newline) command.
Incoming data write over the same line.	Correspondent expects your software to begin a new line.	Turn on your program's line-feed (or newline) command.
Incoming characters disappear off the right side of the screen.	Correspondent expects your software to provide word wrap.	Turn on your program's word wrap command.

Messages and alerts

Express Modem control panel status messages

The modem is off.

The modem software is not running.

The modem is on.

The modem software is running.

The modem cannot be run on this Macintosh.

The modem software is not properly installed. Try reinstalling your modem software from the disk that came with your Express Modem.

The modem is set to receive a fax.

Fax Terminal Preferences is set to *Auto-Answer*. The modem is waiting for a call.

The modem is set for data.

Communications software has opened a connection. The modem is waiting for a call.

The modem is set for data and fax.

Fax Terminal Preferences is set to *Auto-Answer* and Communications software has opened a connection. The modem is waiting for a call.

The modem is being used for fax.

A fax is being sent or received.

The modem is being used for data.

Data is being sent or received.

Express Modem Tool alerts

There is not enough memory to open the connection. Closing windows or quitting application programs can make more memory available.

You can also use virtual memory or acquire more memory from your dealer.

Express Fax messages

Manual fax reception has failed because the modem is not available. Please check that the modem is correctly set up.

To find out why manual fax reception failed, check the Express Modem control panel.

Fax reception has been deactivated because the modem is not available. Please check that the modem is correctly set up.

To find out why manual fax reception failed, check the Express Modem control panel.

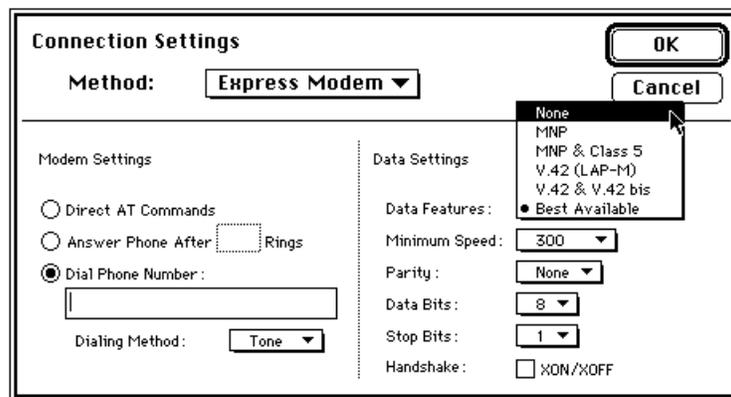


Connecting to older modems

Certain computers may have older modems that do not support the speeds, error control methods, or data compression types your modem is using. If you try to connect to such a computer using your modem's automatic settings, your modem may disconnect in which case you'll get a No Carrier message.

If you are using communications software:

- 1 **Open your communications software.**
- 2 **Open the Connection Settings dialog box.**



- 3 **Choose None under Data Settings in the Data Features pop-up menu.**

This forces the modem to connect in a mode acceptable to the remote modem and at the highest speed it can support.

- 4 **Match your Data Settings to those of the remote modem.**

You can also change the Data Settings once you have connected to the remote modem by simply reselecting Connection from the Settings menu.

If you are using AT commands (see Appendix B):

- Use the AT&Q command to force the modem into asynchronous mode.

Setting up AppleTalk Remote Access

Connecting to your office network with AppleTalk Remote Access allows you to use all the Chooser devices from your office Macintosh AppleTalk network, including printers, servers, and electronic mail.

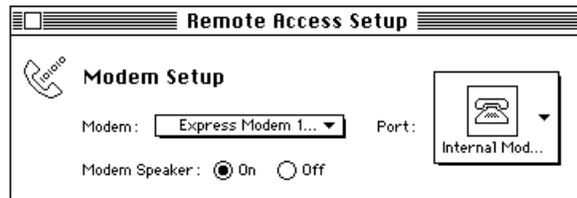
To enable you to use AppleTalk Remote Access, a file containing special commands, called a *CCL file*, is included on your modem installation disk. You must put the file in your Extensions folder before using AppleTalk Remote Access.

IMPORTANT For Data Server programs, such as AppleTalk Remote Access, which do not use the modem connection tool, a serial driver replacement translates serial driver information to a modem connection tool equivalent. In this way, non-modem connection tool applications function as if they were using an external modem over serial port A.

If the Express Modem 14400 CCL does not appear when you open the Modem pop-up menu in the Remote Access Setup control panel, you should use the following procedure:

- 1** Make sure AppleTalk Remote Access is properly installed.
- 2** Insert the Express Modem Disk in your disk drive and double-click the disk icon, if necessary, to open the disk window.
- 3** Open the Modem Documents folder.
- 4** Drag the Express Modem 14400 CCL icon from the Modem Documents folder into your Extensions folder in the System folder on your hard disk.

- 5 Double-click the Remote Access Setup control panel.



- 6 Click the Modem pop-up menu and choose the Express Modem 14400 CCL and Internal Modem from the Port pop-up menu.
- 7 Close the Remote Access Setup control panel and open the AppleTalk Remote Access program.

Refer to the *AppleTalk Remote Access User's Guide* to continue the connection procedure.

Setting up AppleLink

To enable you to use AppleLink, a CCL file containing special commands is included on your modem installation disk. You must put the file in your AppleLink Connection Files folder if you want to use AppleLink with your modem.

IMPORTANT In front-end applications such as AppleLink, the CCL script is used to select the modem connection tool automatically. All commands to the modem are made by menu selection.

- 1 Insert the Express Modem Install in your disk drive and double-click the disk icon, if necessary, to open the disk window.
- 2 Open the Modem Documents folder.
- 3 Drag the Express Modem CCL icon from the Modem Documents folder into your AppleLink Connection Files folder on your hard disk.



Express Modem CCL

- 4 Open AppleLink and choose Set up Connection from the Network menu.
- 5 Select Express Modem CCL from the Connection File pop-up menu.

Using this CCL file makes setting *Modem Speed* or *Connection Port* unnecessary.

► *See also: Getting Started With AppleLink 6.1*, which comes with your AppleLink package, for more information on setting up an AppleLink connection.



Glossary



A

analog data Data in the form of continuously variable physical quantities. Compare digital data.

analog loopback test A simple self-test that directs the modem to display characters on the monitor screen as they are typed.

analog-to-digital converter A device that converts data from analog to digital form.

analog transmission Transmission of a continuously variable signal as opposed to a discretely variable signal. Physical quantities such as temperature are continuously variable and so are described as analog. Data characters, on the other hand, are coded in discrete separate pulses or signal levels, and are described as digital. The normal way of transmitting a telephone or voice signal has been analog, but now digital encoding is coming into use over trunk lines. Compare digital signal.

answer mode The connection mode in which the modem answers the telephone.



application program A program that puts the resources and capabilities of the computer to use for some specific purpose or task, such as word processing, database management, graphics, or telecommunications.

ASCII Pronounced “ask-ee,” an acronym for American Standard Code for Information Interchange; a code in which the numbers from 0 to 127 stand for text characters (including the alphabet, digits 0–9, punctuation marks, special characters), and control characters. Used for representing text inside a computer and for transmitting text between computing devices.

asynchronous Not synchronized by or with a clocking signal.

asynchronous transmission Transmission in which each information character is individually synchronized, usually by the use of start and stop bits. The gap between each character isn’t necessarily fixed. Compare synchronous transmission.

auto-answer A modem capability that allows automatic “pickup” when the phone rings.

auto-dial The ability to make a connection with another modem automatically.

B

background application An application that runs without the user knowing. May have a user interface, but usually starts itself.

baud Unit of analog signaling speed taken from the name Baudot. The speed in baud is equal to the number of signal events per second, regardless of the information content of those signals. Compare bps.

BBS Bulletin Board System. A small database, usually accessible free of charge, in which you can share information and programs with other computer users.

binary The representation of numbers in terms of powers of 2, using the digits 0 and 1. Commonly used in computers, since the values 0 and 1 can easily be represented in physical form in a variety of ways, such as the presence or absence of current, positive or negative voltage, or a white or black dot on the display screen.

bit A binary digit (0 or 1); the smallest possible information unit, consisting of a simple two-way choice, such as yes or no, on or off.

bitmapped fonts Characters composed of pixel maps. As size is increased, character edges become more jagged.

blind dialing Blind dialing allows the modem to dial out even when no dial tone can be detected.

bps (bits per second) The basic unit for measurement of digital data communications transfer rate. Usually refers to the rate at which the information is transmitted. Sometimes inaccurately referred to as the baud rate.

buffer The memory region for temporarily storing data for display or later use.

C

carrier A signal of known characteristics (for example, frequency) that is altered (modulated) to transmit information.

CCITT Comité Consultatif International Télégraphique et Téléphonique, an international organization that devises and proposes recommendations for international telecommunications.

CCL An abbreviation for communications control language. This language is used to write connect sequence files, sometimes called CCL files or scripts.

channel (1) In data communications, a one-way path in data communications along which signals can be sent between two or more points. Contrast with circuit. (2) In telecommunications, a one- or two-way transmission path between two or more points. Provided by a common carrier; also called a link, line, circuit, or facility.

character Any symbol that has a widely understood meaning. Some characters, such as letters, numbers, and punctuation, can be displayed on the monitor screen and printed on a printer. Others are used to control various functions of the computer (see control character).

checksum A method that confirms that a unit of data contains the correct information.

circuit A two-way path along which signals can be sent between two or more points. See also channel.

code A number or symbol used to represent some piece of information in a compact or easily processed form.

command A communication from the user to a computer system (usually typed from the keyboard) directing it to perform some immediate action.

command state The state the modem is in when keyboard input is recognized by communications software as command codes to be executed. Contrast with terminal mode and on-line state.

communications session The condition of being connected to and accessible by another computer.

configuration A list of changeable modem characteristics that must be properly set to allow a computer to communicate with a modem.

connector A physical device such as a plug, socket, or jack used to connect one hardware component of a system to another.

connect time The amount of time spent on line with an information service, usually billed at an hourly rate.

control character Any character assigned a numeric ASCII value inferior to the Space character. Also, a symbol you can create by pressing one of your computer's keys while holding down the Command key. These symbols are not usually printed, and are generally used to control screen formatting.

crosshair pointer The tool used to select a portion of a page in a PICT or Fax Viewer file.



D

data Any type of information, such as numbers, letters, or symbols, that can be processed by a computer.

database A collection of information organized in a form that can be accessed and processed by a computer system.

data communications A broad term covering any exchange of information between computers or similar systems over telephone lines or computer networks.

data compression The various methods used to save storage space by reducing or eliminating gaps, redundancies, empty fields, or unnecessary data.

data server program A program that passively awaits an incoming call for connecting to a server. AppleTalk Remote Access is an example of a data server program.

data user program A terminal emulation or front-end program that takes control of the modem and places an outgoing call. Has priority over server programs.

dB The abbreviation for decibel, the unit of measurement for sound volume.

DCE An abbreviation for Data Communications Equipment. A device like your modem used to establish and transfer data across a communications link.

decimal The common form of number representation used in everyday life, in which numbers are expressed in terms of powers of 10, using the ten digits 0 through 9.

default A value, action, or setting that is automatically used by a computer system when no other explicit information has been given.

demodulate To recover the information being transmitted by a modulated signal; for example, a conventional radio receiver demodulates an incoming broadcast signal to convert it into sound emitted by a speaker.

device A piece of equipment connected to a computer. A modem is a device.

dial tone A call progress signal returned by a telephone switching machine to indicate that it is ready to accept a telephone number.

F, G

facsimile (dedicated fax) machine A machine that can scan a page and then transmit the image of the page over telephone lines; a receiving machine prints a copy of the original page.

fallback The process modems use to find a common connection speed, starting at the highest rate supported or set by your modem.

fax server program A program that passively awaits an incoming call for sending and receiving faxes. Express Fax is an example of a fax server program.

flow control A method of signaling between computers so that pauses in data transmission allow time for data to be received.

font In typography, a complete set of characters, letters, and symbols in one size and style.

foreground application An application that runs under user control. When several applications are running, only one foreground application is accessible (or active).

format The form in which data is stored, manipulated, or transferred.

full duplex (1) A setting causing characters that you enter on your computer to be echoed from a remote system. (2) A four-wire communications circuit or protocol that allows simultaneous two-way transmission.

Group 3 fax A digital document facsimile transmission procedure on the Public Switched Telephone Network.

H

half-duplex (1) A setting causing characters that you enter on your computer to be echoed not from a remote system but on your screen. (2) A two-wire circuit designed for communications in either direction but not both directions simultaneously.

handshaking A protocol for devices to exchange information about the communications connection itself, such as when to start and stop transmitting.

hertz The unit of frequency measurement. For example, 1 hertz equals 1 cycle per second. Abbreviated Hz.

hexadecimal The representation of numbers in terms of powers of 16, using the digits 0 through 9 and the letters A through F. Hexadecimal numbers are easier for people to read and understand than binary numbers but can be converted easily and directly to binary form. Each hexadecimal digit corresponds to a sequence of four binary digits, or bits.

host computer The Macintosh in which your modem is installed.

I

input (1) Information transferred into a computer from some external source, such as the keyboard, a disk drive, or a modem. (2) The act or process of transferring such information.

integrated circuit An electronic component consisting of many circuit elements fabricated on a single piece of semiconducting material, such as silicon.

interface The devices, rules, or conventions by which one component of a system communicates with another.

I/O Input/output; the transfer of information into and out of a computer. *See also* input.

J

jack A socket used for a telephone line or other electrical connections.

jaggies Jagged character borders that occur when viewing on-screen bitmapped fonts. Characters are composed of separate pixels.

L

local echo A method of communication in which your modem or software displays data “locally” on your screen, without relying on the host computer to echo the characters back.

log off To type a command to the host computer that terminates the communications session.

log on To enter a series of responses to prompts by the host computer to identify yourself, your password, sometimes your terminal, and so forth, to start a communications session.

M

mainframe computer A large computer whose speed and storage capacity allow it to handle huge amounts of data and work with many terminals.

millisecond One thousandth of a second; abbreviated ms.

MNP An abbreviation for Microcom Networking Protocol. MNP Classes 2–4 are error control protocols. MNP Class 5 is a data compression protocol.

modem A device for converting serial information into tones that can be transmitted over telephone lines. The tones are modulated (changed in pitch) to represent the information; modem stands for “modulator/demodulator”.

modulate To modify or alter a signal to transmit information; for example, conventional broadcast radio transmits sound by modulating the amplitude (amplitude modulation, or AM) or the frequency (frequency modulation, or FM) of a carrier signal.

O

odd parity Use of an extra bit set to 0 or 1 as necessary to make the total number of 1 bits in a character an odd number. For example, the 7-bit ASCII code for the letter A (1000001) has two 1 bits; for odd parity, the transmitting device appends an eighth bit equal to 1 (11000001) so that the total number of 1 bits remains odd. The receiving device can count 1 bits as a way of checking for transmission errors.

off-hook Your equipment takes control of the telephone line (picks up the receiver).

on-hook Your equipment releases (hangs up) the telephone line.

on-line state The state the modem is in when data is being exchanged with another computer over the telephone line. Contrast with terminal mode.

originate mode The connection mode in which the modem places a call.

outline fonts Characters described as a series of mathematical shapes. Can be automatically scaled to any dimension with no loss of definition.

P

parity A method of detecting errors in data transmission. Due to higher-quality telephone lines and higher-level error control protocols, many host computers don't support parity.

parity bit A check bit appended to an array of binary digits to make the sum of all the binary digits, including the check bit, always odd or always even.

parity error Absence of the correct parity bit in a received character.

PBX Private Branch Exchange. An automatic switchboard for handling large concentrations of telephones (usually digital extensions).

peripheral device A device, such as a video monitor, disk drive, printer, or modem, used in conjunction with a computer. Often (but not necessarily) physically separate from the computer and connected to it by wires, cables, or some other form of interface.

port The point of connection, usually a physical connector, between a computer and a peripheral device, another computer, or a network.

protocol An agreement between computers about the form and content of the information they exchange.

protocol negotiation The process of reaching agreement between computers about the form and content of the data they exchange.

PSTN Public Switched Telephone Network.

pulse An abrupt and relatively short change in voltage, either positive or negative, resulting in the conveyance of data in a circuit.

R

register A location in a computer or peripheral processor where an item of information, such as a byte, is held and modified under program control.

remote computer A computer other than your Macintosh, but connected to it, either directly or through your modem and telephone lines. A remote computer can be at any distance from your computer, from right beside it to thousands of miles away.

RJ-11 The modular phone jacks and receptacles for telephone equipment used in the United States and Canada.

RS-232-C A physical and electrical interface between computers, terminals, modems, and communications lines. A standard developed by the Electronics Industries Association (see serial interface connection).

throughput The effective data transfer rate measured in bps. This rate is a combination of the connection rate and data compression. A compressed version of a file transfers more quickly than an uncompressed version even though the connection rate is the same.

tone-dialing A method of dialing by sending dual-tone modulated frequency (DTMF) signals over the phone line.

V

V.32 A CCITT protocol defining the frequency and modulation used between two high-speed modems (9600, 4800 bps).

V.32 bis A CCITT protocol defining the frequency and modulation used between two high-speed modems (7200, 12000, 14400 bps).

V.42 A CCITT error control protocol.

V.42 bis A CCITT data compression protocol.

X

XModem A protocol devised by Ward Christianson to send files from one computer to another that informs you if an error occurs. Also known as MODEM7.

XON/XOFF A handshake protocol (transmit-On/transmit-Off) used by computers and intelligent terminals to control the flow of data between the systems.

Y

Y-connector A special connector that converts one jack into two, so that two phone lines can be plugged into one receptacle. Also known as a Y-jack.



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