



System Utilities

The Apple IIc



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Glossary

Introduction

This book explains how to use the *System Utilities* disk that came with your Apple IIc. You should read *Apple Presents the Apple IIc: An Interactive Owner's Guide* before you read this book.

Utilities is a word you probably associate with water, gas, and electric services. Well, just as home utilities keep your home operating efficiently, system utilities keep your computer operating efficiently.

System is short for **computer system**, which refers to your computer and all its peripheral devices.

System Utilities is a set of programs that gives you control over the information you save on disks. (Which is pretty vital, when you consider all the vital information people entrust to disks: term papers, tax records, novels, financial models, programs.)

A **file** is a collection of information stored on a disk. If you're unfamiliar with this term or others in this book, refer to the interactive owner's guide.

One of the most important things the utilities disk does for you is prepare, or **format**, your data disks. When you format a disk, the utility divides the magnetic surface of the disk into sections where information can be stored in **files**. Formatting is an important utility because you can't save anything on a disk until it has been prepared. Other utilities let you copy disks and individual files, check which files are on a disk, and erase files from disks so you can reuse the disk space.

Mastering these utilities is a giant step toward computer confidence. You won't have to worry about losing valuable information because you'll have backup copies of all your important disks. And you won't have to keep a handwritten record of what's on a disk because you'll know how to check its contents.

While the utilities disk is an invaluable part of your software library, it is not a substitute for application programs. You can't use it to write letters or prepare budgets. But you must use it to format disks that receive your letters and budgets, and once

you have those letters safely stowed in files on disks, you can use the utilities disk to copy them, delete them, rename them, and otherwise organize them.

Some Applications Include Utilities: Some application programs have formatting and other utilities built in. When this is the case, go ahead and use the utilities on your application disk.

Configure the Serial Ports: Another important part of the utilities disk lets you adapt the ports on the back of the Apple IIc for printers, plotters, or modems that don't work automatically with the Apple IIc. Configure the Serial Ports, an option on the Advanced Operations Menu, is explained in Chapter 4.

Experienced Users: The utilities disk works on Pascal, DOS 3.3, and ProDOS disks. It incorporates utilities and conversion functions from the DOS 3.3 *System Master* disk and most of the Pascal Filer and ProDOS utility functions.

Using the Utilities Disk

The best way to learn how to use *System Utilities* is by experience. In the next few pages, you'll get a step by step, guided tour through one of the most valuable utilities—Duplicate a Disk. This utility allows you to copy important disks in your software library so you'll have a backup in case something happens to the original.

All the utilities work pretty much the same way, so once you master Duplicate a Disk, you'll have no trouble using the others.

Hands-On Introduction to Utilities

Don't just read about duplicating a disk, do it! Follow these instructions and make a backup copy of *System Utilities*.

Before you can make a copy of the utilities disk, you need a blank disk. If you don't have any blank disks, go out and get a box at your local computer store. The Apple IIc uses 5¼-inch, single-sided, single-density **flexible (floppy) disks**.

For more on **flexible disks**, review the interactive owner's guide.

Starting Up

First start up *System Utilities*.

1. Put the disk labeled *System Utilities* in the built-in disk drive.
2. Turn on your monitor.
3. Turn on your computer.

In a moment, you see the System Utilities Main Menu (Figure 1-1).

Figure 1-1. *System Utilities Main Menu*

Menu Name	System Utilities Copyright Apple Computer, Inc., 1984	Main Menu
	<hr/>	
	Work on Individual Files	
Highlighted Option	1. <COPY FILES>	
	2. Delete Files	
	3. Rename Files	
Numbered Option	4. Lock/Unlock Files	
	Work on Entire Disks	
	5. Duplicate a Disk	
	6. Format a Disk	
	7. Identify and Catalog a Disk	
	8. Advanced Operations	
	9. Exit System Utilities	
Your Instructions	Type a number or press ↓ or ↑ to select an option. Then press RETURN. _	
How to Get Help	For Help: Press ⌘-? or ⌘-?	

Using 80 Columns? If you are using an 80-column display, your screen will look slightly different.

Duplicate a Disk

You're going to be duplicating a disk, which is the fifth option on the Main Menu, so you want to highlight that option.

You can also choose from a menu by typing the option's number and pressing **RETURN**. In this case, you would press **5** and then **RETURN**.

1. Press **↓** four times.

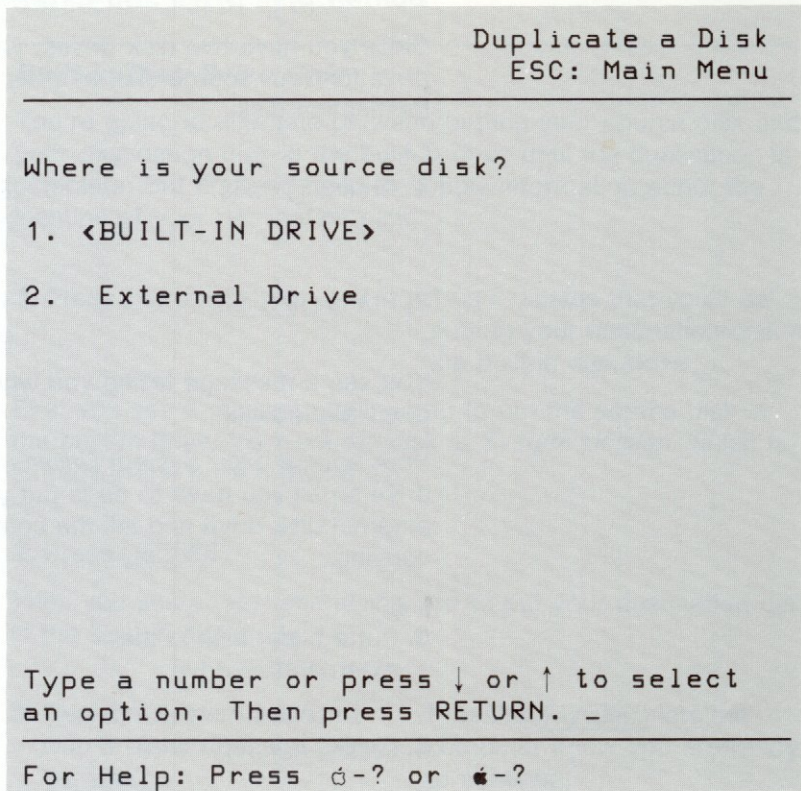
Duplicate a Disk is highlighted (the option is changed to uppercase and enclosed in angled brackets).

2. Press **RETURN**

This accepts the highlighted option.

Your screen looks like Figure 1-2.

Figure 1-2. Source Disk Display



The **source disk** is the original—the disk you're copying from.

The Source Disk display invites you to supply information about the location of the disk you want to copy from (the **source disk**).

You want to make a copy of the *System Utilities* disk, which is in the built-in disk drive.

3. Press (RETURN)

The option you want is highlighted, so you just have to accept it.

The **destination disk** is the new disk—the disk you're copying to.

Now you're asked to supply information about the location of the disk you want to copy to (the **destination disk**).

How you answer this question, and how you proceed, depends on whether or not you have an external disk drive. If you have an external disk drive, read the next section. If you don't have an external disk drive, skip the next section and read the section "Built-in Disk Drive Only."

Built-in Disk Drive and External Disk Drive

Since you have two disk drives, you can use the built-in disk drive for your source disk and the external disk drive for your destination disk.

1. Press **(↓)** once.

External Drive is highlighted.

2. Press **(RETURN)**

This accepts the highlighted option.

You see a message telling you where to put your source and destination disks.

Your source disk, *System Utilities*, is already in the built-in disk drive so all you have to do is put your destination disk in the external disk drive and tell the computer you're ready to start copying.

3. Put a blank disk in the external disk drive.

4. Press **(RETURN)**

You see a message telling you the source disk's operating system, and then you see a message requesting a name for your copy and a **default** answer:

A **default** is what the program thinks you will want.

Volume is another word for **disk**.

Enter Name of New Volume: /UTILITIES

UTILITIES is the name of the *System Utilities* disk. That name will be fine for the destination disk, so accept it.

5. Press **(RETURN)**

UTILITIES is used to name your destination disk.

A short while after that, you see this message: **Formatting...** (Disks have to be formatted before information can be recorded on them for the first time.) Then you see: **Done!**

After that, you see this message: **Duplicating...** Then you see: **Done!** That's all there is to it.

Skip the next section for single disk drive users and proceed to the section "Finishing Up."

Built-in Disk Drive Only

You're going to alternate between putting your source disk and your destination disk in the built-in drive until the duplication is complete. But first you need to supply information about the location of your destination disk.

1. Press `(RETURN)` This indicates that you'll be putting your destination disk in the built-in disk drive.

First you see a message telling you to put the source disk in the built-in drive. Your source disk is *System Utilities*, which is already in the built-in disk drive.

2. Press `(RETURN)`

Then you see a message telling you to put your destination disk in the built-in disk drive.

3. Replace *System Utilities* with a blank disk and press `(RETURN)` Pressing `(RETURN)` lets the computer know you are ready to continue.

You see a message telling you the source disk's operating system, and then you see a message requesting a name for your copy and a **default** answer:

A **default** is what the program thinks you will want.

Volume is another word for **disk**.

```
Enter Name of New Volume: /UTILITIES
```

UTILITIES is the name of the *System Utilities* disk. That name will be fine for the destination disk, so accept it.

4. Press `(RETURN)` UTILITIES is used to name your destination disk.

After a few seconds, you see this message: **Formatting...** (Disks have to be formatted before information can be recorded on them for the first time.) Then you see: **Done!**

After that, watch for messages on the screen telling you when to swap *System Utilities* (the source disk) for your blank disk (the destination disk). Be patient—the copy procedure involves quite a few swaps. When it's all over, you see this message: **Disk Copy Complete.**

Finishing Up

Take your new backup copy of *System Utilities* out of the disk drive and label it using a felt-tip pen (using a ball-point pen or a pencil can damage the disk).

Put the original *System Utilities* disk in a safe place and use your backup copy from now on.

Copying Disks: You can use Duplicate a Disk to copy all the disks that come with the interactive guide, but don't be surprised if you can't duplicate every application program you buy. Many manufacturers copy protect their disks to protect themselves from software pirates who illegally duplicate and distribute their programs.

Return to the Main Menu by pressing (ESC).

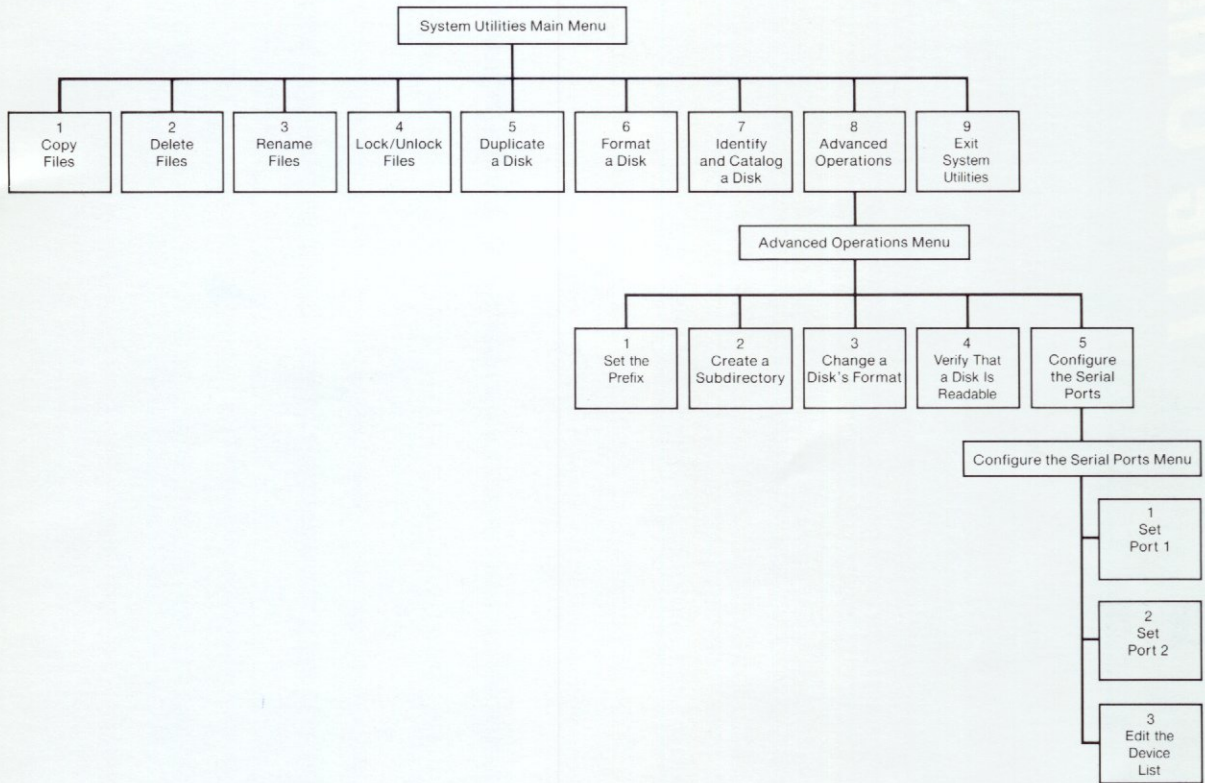
Now What?

Now that you've had some hands-on experience with Duplicate a Disk, you're probably eager to see what else *System Utilities* can do.

- Chapter 2 summarizes the utilities available on the disk.
- Chapter 3 offers some general instructions for using the disk.
- Chapter 4 explains how to adapt the ports on the back of the Apple IIc for printers, plotters, or modems that don't work automatically with the Apple IIc.

For those who like the big picture, here's a roadmap of *System Utilities*.

Figure 1-3. Utilities Roadmap



The Utilities

This chapter summarizes the utilities on the *System Utilities* disk.

Copy Files

Copy Files lets you copy a file or files from one disk to another. It comes in handy when you want to share a financial model or a program you've written with a friend or business associate. (If you want to copy all the files on a disk, you're better off using the Duplicate a Disk utility.)

Delete Files

Delete Files lets you permanently erase files that have outlived their usefulness so you can reuse the disk space. It's the disk equivalent of spring cleaning. (If you want to delete everything on a disk, it's quicker to use the Format a Disk utility.)

Rename Files

Rename Files lets you rename a file without changing its contents. It comes in handy for the author who decides that Chapter 1 should be Chapter 3, and for anyone else who has ever changed his mind.

Changing the Name of a Disk: If you want to rename a disk, make a copy of the disk using Duplicate a Disk and give the new copy the new name.

Lock/Unlock Files

Lock/Unlock Files lets you lock files so you don't delete them, rename them, or change their contents by mistake. If you're sure you want to delete or alter a locked file, you can also use this utility to unlock it.

Duplicate a Disk

As you discovered in Chapter 1, Duplicate a Disk lets you make an exact copy of a disk. If you believe in insurance for your home and car, you'll want to take out some disk insurance with this invaluable utility.

If any of the disk-related terms, such as **write-enable notch** and **write-protect tab**, are new to you, see the interactive owner's guide.

Don't Take Chances: When you're making copies of important disks, it's a good idea to cover the notch on your source disk with one of the sticky **write-protect tabs** that come with blank disks—just in case you get your source and destination disks confused during the copy process. (Some disks don't have **write-enable notches**. You couldn't change the contents of the disk even if you wanted to, so with these disks you don't have to worry about using a write-protect tab.)

Format a Disk

Formatting a disk means dividing the magnetic surface of the disk into sections where information can be stored. You can't store information on a blank disk until it has been formatted.

An **operating system** is a program that controls things: for instance, the way information is loaded into memory, the way the computer works with information, and the way information is stored on a disk. There are three operating systems available for the Apple IIc: ProDOS, Pascal, and DOS 3.3.

So why don't blank disks come preformatted? Disks don't come preformatted because different **operating systems** store information on disks in different ways. Your word processing data disk has to be formatted for the operating system your word processing program uses. If your home finance program has a Pascal operating system and your word processing program has a ProDOS operating system, you'll need two different data disks.

If you know which operating system your program requires (it's often printed on the label or mentioned in the manual), you can save time by supplying that information when the formatting utility asks for it. If you don't have a clue, the utilities disk can figure out the operating system and format the disk accordingly.

DOS 3.2 is an early Apple II operating system.

Early DOS: The Apple IIc doesn't recognize DOS 3.2 files and disks (except to catalog them), but you can use the Change a Disk's Format utility (one of the options on the Advanced Operations Menu) to convert a DOS 3.2 disk to DOS 3.3 format.

Although you must format blank disks before you can use them, disks don't have to be blank to be formatted. It is important, however, that the information on the used disk is expendable. When you format a disk, *everything* that was stored on the disk is erased.

The **destination disk** is the disk you copy to.

The only time you don't have to format blank disks before you use them is when you use the Duplicate a Disk utility. Duplicate a Disk formats the **destination disk** before copying information onto it.

BASIC Programmers: If you want to create a ProDOS startup disk, see the appendix.

Identify and Catalog a Disk

Identify and Catalog a Disk displays a list of what's on a disk. It's a valuable tool because you can't open a disk, as you can a book, to see what's inside, and it's a nuisance to keep a written record of every file you save on a disk.

One **block** equals 512 bytes, and it takes one byte to store one character.

In addition to telling you which files are on a disk, Identify and Catalog a Disk tells you the disk's operating system, the disk's name (or number in the case of DOS 3.2 or DOS 3.3 disks), each file's type, each file's size (measured in **blocks**), the number of files on the disk, the number of blocks taken up by the files, and how many blocks are available on the disk.

Advanced Operations

In addition to the utilities listed on the Main Menu, there are five advanced utilities: Configure the Serial Ports, Verify That a Disk Is Readable, Change a Disk's Format, Create a Subdirectory, and Set the Prefix. (Create a Subdirectory and Set the Prefix only apply to ProDOS disks.)

To get to the Advanced Operations Menu, select Advanced Operations from the System Utilities Main Menu.

Set the Prefix (ProDOS Only)

A **prefix** is the first part of a pathname. A **pathname** is the full name of a file. It begins with the name of the disk (or volume), then lists any subdirectories (if you use subdirectories), and ends with the filename. Each name in the pathname is separated with a slash. For example:
/USA/UTAH/SALT.LAKE

Set the Prefix lets you store the first part of a **pathname** (the volume name and any subdirectory names) in the memory of the computer so you can access files in that directory or subdirectory simply by typing the rest of the pathname (usually just the filename). Once you set the **prefix**, it stays set until you change it or turn off the computer.

Create a Subdirectory (ProDOS Only)

When a disk is first formatted, two things happen: the disk's recording surface is divided into sections where information can be stored and the disk gets a directory (or catalog). Every file you save on the disk is listed in that directory.

If your disk is ProDOS formatted, you can set up subdirectories within the disk directory and group related files together. Before you can put files into a subdirectory, you must create it, using this utility.

Subdirectories are like drawers in a file cabinet. Imagine a disk named MONEY with two subdirectories—one called INCOME, the other called EXPENSES. To access a file called FREELANCE in the INCOME subdirectory on this disk, you'd supply the file's pathname: the name of the disk, then the name of the subdirectory, and, finally, the name of the file (each name separated with a slash). Here's how it would look:

/MONEY/INCOME/FREELANCE

Subdirectories Aren't for Everyone: If at first you find the idea of subdirectories confusing, don't use them.

If you organize your files into subdirectories, you must supply the ProDOS pathname to get to your files—instead of the location of the disk (built-in or external disk drive).

If you're going to be using files in the same subdirectory for a while, you can save typing time by setting a prefix (see "Set the Prefix").

Verify That a Disk Is Readable

Verify That a Disk Is Readable checks to see if a disk is OK. Disks are sturdy enough to withstand hundreds of trips in and out of the disk drive, but they become temperamental if you leave them on the dashboard all afternoon in the hot sun or otherwise abuse them. Occasionally, disks are damaged during manufacture.

Use Verify That a Disk Is Readable to check newly formatted disks before entrusting valuable data to them. You can also use this utility to check disks you suspect have been damaged. If you discover that a disk is bad, use Copy Files to salvage any files you can to another disk. Then reformat the disk and check it again using this utility. If it's still bad, throw it away.

Change a Disk's Format

Change a Disk's Format lets you convert disks from DOS 3.2 to DOS 3.3, DOS 3.3 to ProDOS, and ProDOS to DOS 3.3.



Warning

Converting programs from DOS 3.2 to DOS 3.3 is no problem, but when you convert programs of other operating systems, you usually have to make substantial changes to the program before it will run under the new operating system.

Configure the Serial Ports

Configure the Serial Ports lets you set up the printer and modem ports on your Apple IIc to communicate with devices that don't work automatically with the Apple IIc. This utility is explained in detail in Chapter 4.

General Instructions

Prompts are messages on the screen.

As you discovered when you used *System Utilities* to make a backup copy, using the utilities is fairly straightforward. Messages on the screen tell you what your options are and ask you for information the program needs. Rely on these **prompts** and you should have no trouble using any of the utilities on this disk.

Getting Help

Press (F1)-(?) or (F2)-(?) for helpful hints.

If you hit a snag, press (F1)-(?) and you'll get a screen full of on-line coaching. If the help screens don't answer your questions, review the general instructions in this chapter and in Chapter 2.

Selecting From a Menu

There are two ways to select items from a *System Utilities* menu:

- Type the number of your selection and press (RETURN).
- Press (↑) or (↓) to highlight your selection and then press (RETURN).

Selecting the Disk Drive

The **source disk** is the disk you're copying from.

The **destination disk** is the disk you're copying to.

A **pathname** is the full name of a file. It begins with the name of the disk (or volume), then lists any subdirectories (if you use subdirectories), and ends with the filename. Each name in the pathname is separated with a slash.

Once you pick the utility you want to use, you're usually asked to select the location of the disk you'll be working on. If you're going to put the disk in the built-in disk drive, select option 1, Built-in Disk Drive. If you're going to put the disk in the external disk drive, select option 2, External Disk Drive. It's as simple as that.

With some utilities, like Duplicate a Disk and Copy Files, you are asked for the location of two disks: the disk you're copying from (the **source disk**) and the disk you're copying to (the **destination disk**). If you have an external disk drive, you can put your source disk in one drive and your destination disk in the other. If you don't, select the built-in disk drive as the location for both the source and destination disks and watch for messages on the screen telling you when to swap the source disk for the destination disk.

Selecting by Pathname: If the disk you're working on is ProDOS-based, you may have the option of identifying files by **pathname** (the third option) instead of by disk drive. If you use subdirectories, you must use this option.

Selecting Files

What happens after you select a utility and disk drives depends on whether you're working on the disk as a whole or on individual files. If you're working on the disk as a whole, your job is practically finished. Watch the screen for any remaining instructions. If you're working on files, you are asked whether you want to select some of the files on the disk or all of the files.

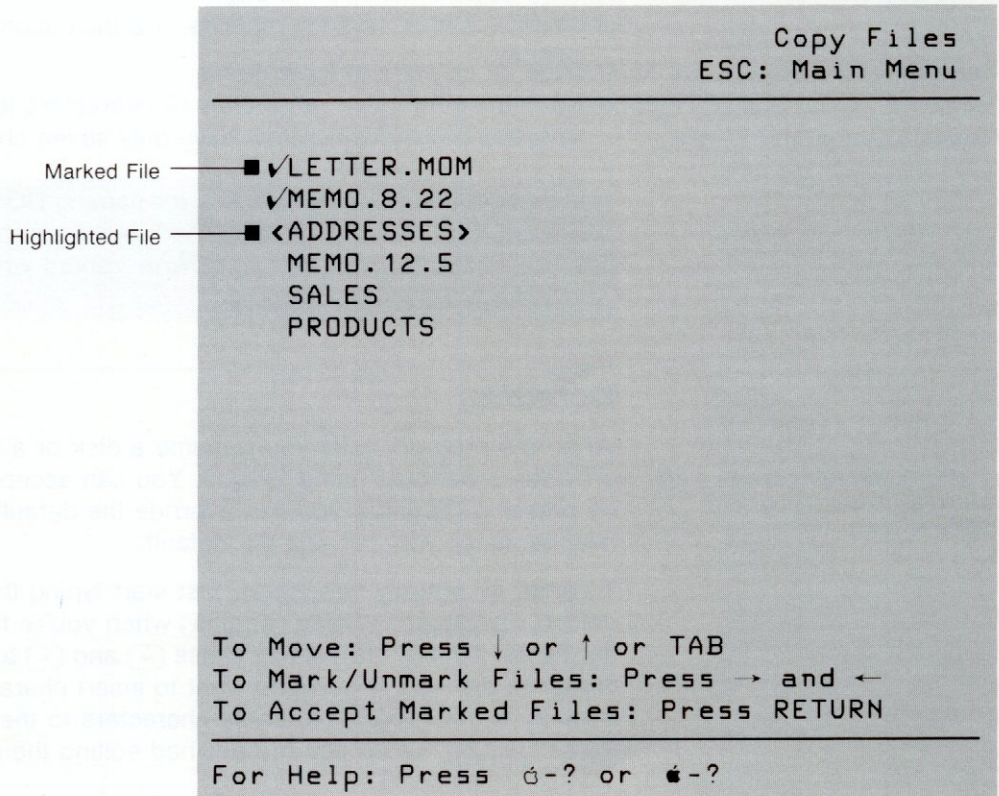
If you want to copy, delete, or lock all the files on the disk, press (A), for *All*, and then (RETURN). Then watch for messages on the screen telling you what to do.

If you want to select only some of the files on the disk for copying, renaming, or whatever, press (RETURN) to accept the default. The next screen you see is a list of all the files on the disk.

Press **(↓)** or **(↑)** to highlight a file you want to work on. Press **(→)** to mark the file. A check will appear next to the file. (If you change your mind, you can unmark the file by moving the highlight to it and pressing **(←)**.)

If there is more than one row of files on the screen, press **(TAB)** to move back and forth between rows.

Figure 3-1. Marking Files



When you've marked all the files, press **(RETURN)**. Then watch for screen messages telling you what your Apple IIc is doing and what you should do.

Naming Disks and Files

Some utilities will ask you to give your disk or file a name. You can be as creative as you want, within these guidelines:

- Names must begin with a letter.
- Names must be made up of only letters, numbers, and periods.
- Names cannot have any spaces or punctuation other than periods.
- Names cannot have more than 15 characters (except Pascal **volume** names, which can have only seven characters).

Volume is another word for disk.

Naming DOS 3.3 Files: Rules for naming DOS 3.3 files are different from the ones just outlined, but if you follow these general rules, you won't have to worry about which operating system you're working with.

Defaults

It's called a **default** because it will be used by default if you don't provide an alternative.

When the program asks you to name a disk or a file, it usually provides a **default** name for you. You can accept the default by pressing (RETURN), you can override the default by typing in a new name, or you can edit the default.

To enter an entirely new name, just start typing the name. (The default disappears.) Press (RETURN) when you're finished typing the name. To edit the default, press (→) and (←) to move the cursor to the spot where you want to insert characters and type them in. Press (DELETE) to erase characters to the left of cursor. Press (RETURN) when you are finished editing the name.

Making Your Escape

Wherever you are in *System Utilities*, you can press (ESC) to return to the previous menu.

Pressing (ESC) while you are in the middle of a file utility lets you stop what you are doing at the first opportunity. This comes in handy if you change your mind after you start using a utility.

Quitting

When you are finished using *System Utilities*, select the last option on the Main Menu: Exit System Utilities. You are asked if you are sure you want to leave *System Utilities*. If you are sure, answer *Yes* by pressing (RETURN), and you'll exit to Applesoft BASIC.

If you left *System Utilities* by mistake, answer *No*, and you'll find yourself back at the Main Menu.

If you want to start up an application program, put the program disk in the built-in drive and hold down (⌘) and (CONTROL) while you press (RESET).

Configure the Serial Ports

Serial devices send and receive information one bit at a time while **parallel** devices send and receive information eight bits (one byte) at a time.

Most of the utilities on *System Utilities* are related to files or disks. The exception is Configure the Serial Ports, one of the options on the Advanced Operations Menu.

Configure the Serial Ports lets you adapt the printer or modem ports on your Apple IIc to communicate with devices that don't work automatically with your computer.

Important! You will need to use this utility only if your peripheral device doesn't work automatically with the Apple IIc.

When you turn on the power, the Apple IIc serial ports are automatically set up, or configured, to communicate with an Apple Imagewriter printer in the printer port (port 1) and an Apple 300 Baud Modem in the modem port (port 2). If you have these devices, or a device that uses the same configuration (speaks the same language), just plug in your printer or modem, and you're ready to go.

The easiest way to find out if your printer will work automatically with the Apple IIc is to plug it into the printer port and try printing a catalog of *System Utilities*. If it works, your device has a standard configuration. If you get a page full of garbage, you need to change the switch settings as described in your printer manual or configure the port.

Printing a copy of a catalog is one of your options when you use the Identify and Catalog a Disk utility.

Try Your Application Programs: Some application programs will override the configuration, so try printing something after starting up your application program. If it works, you don't need to configure your printer port.

To find out if your modem will work with the Apple IIc, plug it into the modem port and try sending or receiving a message. If it works, you don't need to configure your modem port. If it doesn't, you'll need to configure one of the ports for your modem.

The nice thing about the serial ports is that you're not limited to Apple and similarly configured devices. The serial ports can be configured to accommodate a wide variety of peripheral devices. Configuring a port tells the port how to communicate with a particular peripheral device.

Using the Utility

You don't have to be a programmer to configure a serial port on the Apple IIc. All you have to do is answer a set of multiple choice questions about your peripheral device, and the configuration utility will tell the port how to communicate with your device.

You should be able to find the answers to all of the multiple choice questions in the manual that came with your device. If you can't find the answer, accept the default. (The default answers are the most common settings.) If that doesn't work, you'll find a set of troubleshooting tips later in this chapter, and you can use trial and error to find the right configuration for your device.

Once you answer the multiple choice questions about your device, the configuration utility

- Displays a **product identification number (PIN)** for your device
- Configures port 1 or port 2 for your device
- Gives you the chance to save your device's PIN on your utilities disk as the new default configuration for port 1 or port 2.

A **product identification number (PIN)** describes a device's characteristics and is used to configure the serial ports of the Apple IIc.

More Than Two Serial Devices: If you have several devices that will share ports 1 and 2, or if you have different configurations for the same device—maybe you use the same modem to communicate with two information services with different configuration requirements—the configuration utility lets you list all of your devices and their PINs. That way, when you swap devices, all you have to do is select the device from the list and let the utility set up the port for you. (You'll learn how in "Editing the Device List.") If you have one or two devices, you don't need to list them, you can just make their PINs the defaults for ports 1 and 2.

Saving PINs for Next Time


Random-access memory is explained in the interactive owner's guide.

Once you've figured out a device's PIN, you never have to do it again. That PIN can be saved on your utilities disk. But when you turn off the computer's power, your new serial port configuration is erased from the computer's memory (because PINs are stored in **random-access memory**). So, you need to configure the serial ports for your devices every time you turn on the power. Fortunately, it's very simple.

All you have to do is start up your copy of the utilities disk. Once you see the Main Menu, your customized serial port configuration is set. Then replace your utilities disk with the application program's disk and restart the computer by holding down (⌘) while you press (CONTROL)-(RESET).

Some Application Programs Configure Ports for You:

Some application programs, designed for the Apple IIc, will ask for PINs and configure the serial ports for you so you won't have to start up your utilities disk before starting up the application. If you don't know the PIN for your device, use the configuration utility or Figure 4-1 to derive it.

Switching Application Programs: If you leave the computer's power on, you should be able to switch from one application program to another without reconfiguring the serial ports. However, some programs may inadvertently interfere with the PIN settings (by using the same part of memory). If you lose touch with your peripheral devices, start up your utilities disk (to reconfigure the ports), then start up your application program by pressing ()-(CONTROL)-(RESET).

So much for background. The first step in configuring a serial port is determining your device's product identification number.

The Parts of the PIN

Some printer and modem manuals provide the PIN for the device, allowing you to bypass the multiple choice questions.

Here's what goes into determining your device's PIN (product identification number). You might want to look up the information for your device (and write it down on the form at the end of this section) before using the configuration utility. That way, when the utility asks for your device's baud rate, data format, and so on, you'll have the answers at your fingertips. If you already know the PIN for your device, you can skip this section and go on to "Setting the Serial Ports."

Mode

Mode is a general purpose computer term. In this case, it refers to the method of communicating with a peripheral device. If you're configuring the port for a printer or plotter, choose printer mode. If you're configuring the port for a modem, choose communications mode.

1. Printer Mode
2. Communications Mode

Data Bits and Stop Bits

The computer sends and receives each character of information (or data) as a string of bits (zeros and ones). Characters can be represented with six, seven, or eight data bits. Stop bits indicate the end of a character. You can have one stop bit or two. You have six options:

1. 6 Data Bits / 1 Stop Bit
2. 6 Data Bits / 2 Stop Bits
3. 7 Data Bits / 1 Stop Bit
4. 7 Data Bits / 2 Stop Bits
5. 8 Data Bits / 1 Stop Bit
6. 8 Data Bits / 2 Stop Bits

If you can't find this information in your manual (data bits and stop bits are usually listed under "data format" or on a specifications page), the most common data format for printers is eight data bits and two stop bits.

Choosing the data format for a modem depends on the information service you're using. Consult the manual provided by the information service to find out what data format to use. If you can't find any specifications for data format, use the most common format for modems: eight data bits and one stop bit. (If that doesn't work, try seven data bits and two stop bits.)

Baud Rate

Computers send and receive information at a certain speed measured in bits per second, also known as the **baud rate**. You have seven options:

1. 110 Bits per Second
2. 300 Bits per Second
3. 1200 Bits per Second
4. 2400 Bits per Second
5. 4800 Bits per Second
6. 9600 Bits per Second
7. 19200 Bits per Second

You'll usually find this information on a specifications page in the manual that came with your printer or modem. The most common printer speed is 9600 baud. The most common modem baud rate is 300. The important thing is that your printer and computer, or your modem and the information service, are using the same baud rate.

Parity

Some devices use a parity bit for error checking—to make sure data doesn't get garbled during transmission. You have five options:

1. No Parity
2. Even Parity
3. Odd Parity
4. Mark Parity
5. Space Parity

When in doubt, choose option 1.

Video Echo

How you set video echo for a modem depends on whether you're communicating with a full duplex or a half duplex modem. (Most information services use full duplex.) A full duplex modem will echo every character you transmit back to your video monitor. So you should choose option 1. (If you choose option 2, you'll get two of every character on your screen.)

A half duplex modem won't echo the characters you transmit, so if you want to see what you're sending out, you must echo the output, option 2.

It's best to set option 1 for printers because echoing output to the screen can limit the line width of what you're printing to the line width of the screen.

1. Do Not Echo Output on Screen
2. Echo Output on Screen

When in doubt, choose option 1.

Line Feed

Some printers and some application programs automatically generate a line feed (go to the next line) after each carriage return; others don't.

When in doubt, generate a line feed, option 2, and try printing something. If it looks right, you're in business. If everything is double-spaced, make sure the automatic line feed switch on your printer is *off*. If you still get double-spacing, the extra line feed is coming from your application program and you should change to option 1.

LF stands for **line feed**. CR stands for **carriage return**.

1. Do Not Insert LF After CR
2. Insert LF After CR

Line Width

Line width indicates the number of characters that your printer will print per line (before generating a carriage return). Set it to the greatest width your printer can handle. The most common setting is 80 characters. Many application programs let you set the width from within the program. If that's the case, or if you find the computer adding carriage returns where they don't belong, choose option 1 and the computer won't try to control line width.

Always choose option 1 for plotters.

1. Do Not Insert CR
2. Insert CR After 40 Characters
3. Insert CR After 72 Characters
4. Insert CR After 80 Characters
5. Insert CR After 132 Characters

Important! If you selected Communications Mode, the utility picks option 1 for you.

Write It Down

Here's a summary of the defaults for each port. You might want to fill in your own settings for reference and comparison. Remember, if you can't find one of the settings in the manual supplied with your device or information service, go with the default.

Port 1 Default

Your Device

Printer Mode

8 Data Bits / 2 Stop Bits

9600 Bits per Second

No Parity

Do Not Echo Output on
Screen

Insert LF After CR

Insert CR After 80 Characters

Port 2 Default

Your Device

Communications Mode

8 Data Bits / 1 Stop Bit

300 Bits per Second

No Parity

Do Not Echo Output on
Screen

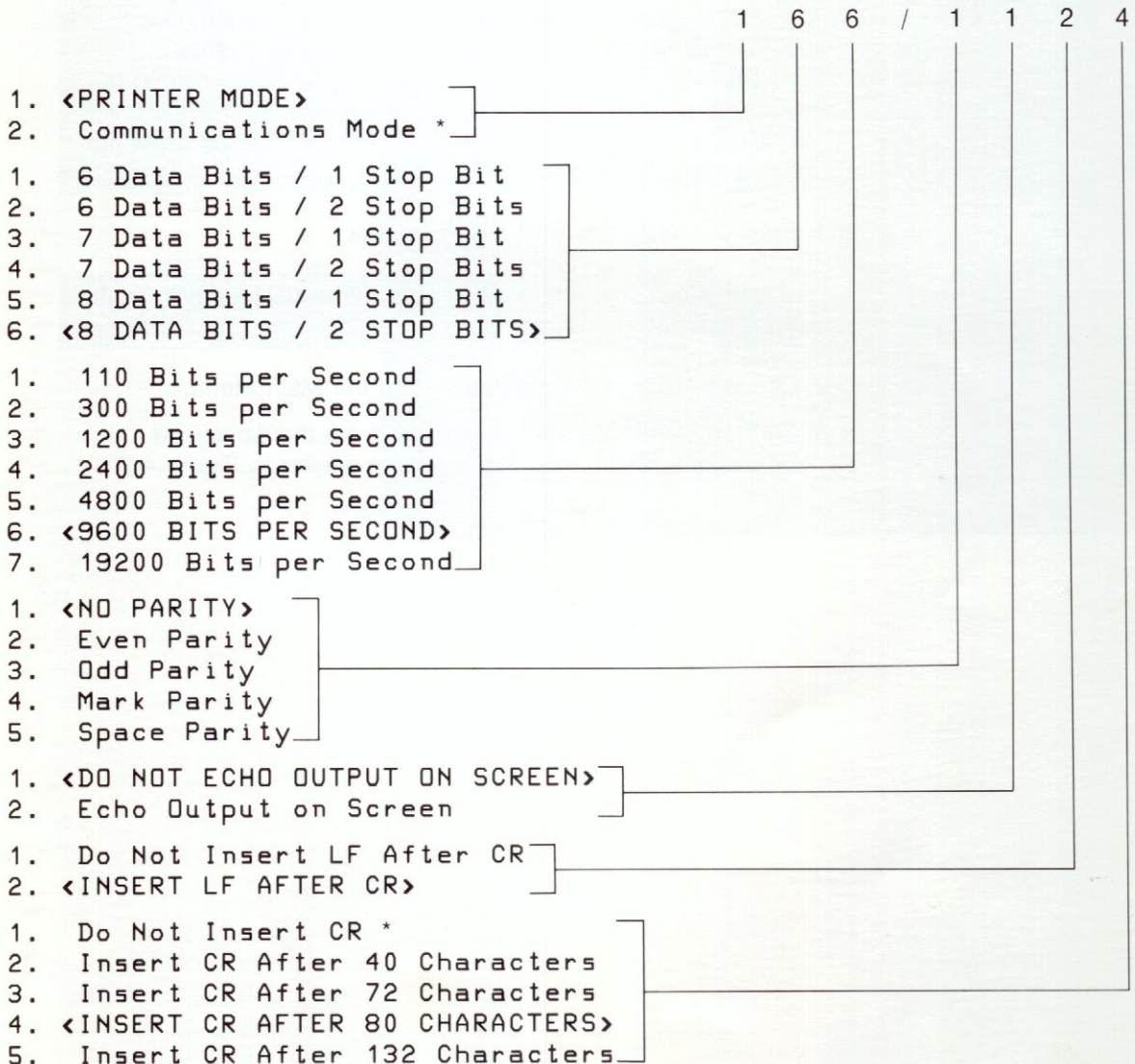
Insert LF After CR

Do Not Insert CR

Figuring Out Your Own PIN

Once you know the baud rate and other information about your device, you can either let the program derive your PIN or you can figure it out yourself using Figure 4-1.

Figure 4-1. Determining a PIN. The number is made up of seven digits. Each digit corresponds to an option number.



* If you select Communications Mode, digit 7 must be 1 (Do Not Insert CR).

Setting the Serial Ports

Once you know which settings you need or have found out your device's PIN, you're ready to use the Configure the Serial Ports utility.

Use Duplicate a Disk to make a copy of *System Utilities*. You'll find a step by step tutorial in Chapter 1.

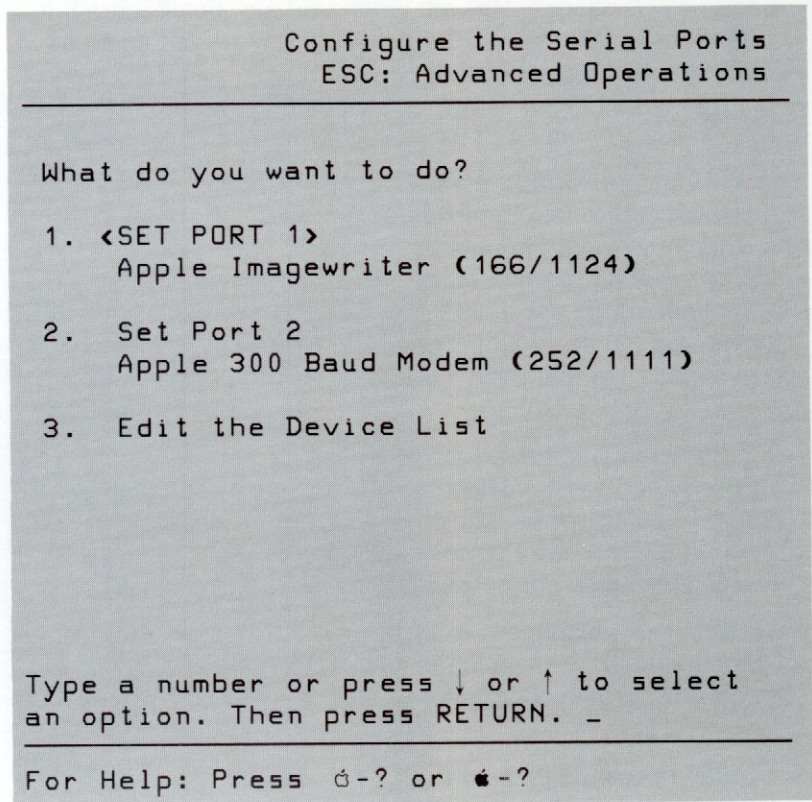
Important! Before you go any further, make a copy of *System Utilities* (if you haven't already), and use the backup copy when you configure your serial ports. The configuration program writes information on the disk (if you save your configuration), and you can't alter the original *System Utilities*—it's write protected to prevent you from erasing or writing over valuable information by mistake. And since the utility writes on the disk, be sure your backup copy does not have a write-protect tab.

1. Start up your copy of the utilities disk.

By the Way: If you're already using your utilities disk, return to the Main Menu by pressing (ESC).

2. Choose Advanced Operations from the Main Menu.
3. Choose Configure the Serial Ports from the Advanced Operations Menu. You see a screen similar to Figure 4-2.

Figure 4-2. Configure the Serial Ports Menu. The current device is listed with its PIN.



4. Choose the port you want to configure. You see your device list. It looks like Figure 4-3.

Figure 4-3. Typical Device List

```
Set Port 1
ESC: Configure the Serial Ports
-----

Select the Device for Port 1:

1. <APPLE IMAGEWRITER (166/1124)>
2. Apple 300 Baud Modem (252/1111)
3. Apple 1200 Baud Modem (253/1111)
4. Apple Color Plotter (163/1111)
5. Your Device
6. Your Device
7. Your Device

8. I Know My PIN
9. I Don't Know My PIN

Type a number or press ↓ or ↑ to select
an option. Then press RETURN. _

For Help: Press ⌘-? or ⌘-?
```

5. If your device is listed, choose it.

If it's not listed, but you know the PIN, choose 8. You see a message asking you to type the PIN. Type the number and press **(RETURN)**. You are asked if the PIN is correct. If the PIN is correct, answer *Yes* by pressing **(RETURN)**. (If it's not, answer *No* and press **(RETURN)**, and you can try again.)

If you don't know the PIN, choose 9. Supply the information that is requested about your device. (If you're unsure about any of the answers, accept the default.) When you supply all the information, you see a screen summarizing the information and displaying your PIN. If the information is correct, answer *Yes* by pressing **(RETURN)**. (If it's not, answer *No* and press **(RETURN)**, and you'll have another chance at all the settings.)

6. Then you are asked if you want to save the configuration on your utilities disk. If you answer *Yes* by pressing **(RETURN)**, the information is saved on your disk as the default PIN for the port you are configuring. If you answer *No*, the port is configured, but the PIN isn't saved on the disk for later use.

That's all there is to it. If you need to reconfigure the other port, do so the same way. When you've got both ports configured, start up the program you want to use by holding down **(\bar{C})** and **(CONTROL)** while you press **(RESET)**.

Try printing something or sending a message through your modem. If you have any problems, consult the troubleshooting section that follows.

Troubleshooting

If you had to guess at any of the settings, don't be surprised if your first crack at configuring the serial ports didn't work. Here are some guidelines to help you decide which settings are wrong and how you should adjust them.

Trial and Error: Don't be afraid to experiment with different settings until you find one that works—you won't break the computer or your peripheral device. But do it systematically. The most common cause of garbage is the wrong baud rate. Other problems have distinctive symptoms that will suggest what the problem is and what you can do about it.

Troubleshooting Tips

Here are some suggestions for getting your ports configured correctly. Try the suggested solutions one at a time until you find one that works.

Symptom

Solution

Unintentional double or triple spacing.

Turn the automatic line feed switch on the printer (or change the application program's line feed setting) to *off*.

Change the PIN so a line feed after a carriage return is not inserted.

Both of the above.

Lines are printing on top of each other.

Turn the automatic line feed switch on the printer to *on*.

Change the PIN so a line feed after a carriage return is inserted.

Symptom

Solution

Characters are lost during data transfer.

Change to a lower baud rate, if possible, on both the sending and receiving ends.

General garbage.

Check the baud rate you are using against the device's manual—if it's wrong, change the PIN or change the switch on your printer or modem.

Check the data format (data bits/stop bits/parity) against the device's manual—if it's wrong, change the PIN or change the switch on your printer or modem.

Unintentional carriage returns.

Change the line width so that a carriage return is not generated. This lets the application program insert its own carriage returns.

Text runs off the page.

Set the line width to a lower number.

Two of every character appears on the screen while sending messages through a modem.

Change the PIN so output is not echoed on the screen.

Information sent through a modem doesn't appear on the screen.

Change the PIN so output is echoed on the screen.

Output to a printer is the same width as the screen when you wanted it wider.

Change the PIN so output is not echoed on the screen.

Troubleshooting Techniques

Some symptoms give you unmistakable clues to what the problem is. For example, if you're getting too many line feeds after a carriage return, you know that you have to adjust the line feed on your printer—through your application program or by changing the PIN. Problems with line width and echo are equally easy to detect and solve.

Problems with baud rate and with data format (data bits/stop bits/parity) are a little tougher to diagnose. They all produce a string of unrelated characters (**garbage** in the computer vernacular).

If you get garbage on your printer or display, start by checking the baud rate in the manual. (If you can't find the baud rate for your printer or plotter, try 9600, then 1200. If you can't find the baud rate for your modem, try 300, then 1200.)

If baud rate isn't the problem, experiment with different data formats, starting at the top of Table 4-1 (for printers) and Table 4-2 (for modems) and working your way down. Use the boxes on the right to check off the combinations you've tried.

One Thing at a Time: Whatever you do, don't change all the settings at once. Alter one setting at a time, then make a test before going on to the next variation. And keep track of what you've tried so you don't keep going over the same ground.

Table 4-1. Common Printer Settings

Data Bits	Stop Bits	Parity	
8	2	off	<input type="checkbox"/>
7	2	off	<input type="checkbox"/>
8	2	odd	<input type="checkbox"/>
8	2	even	<input type="checkbox"/>
7	2	odd	<input type="checkbox"/>
7	2	even	<input type="checkbox"/>

Table 4-2. Common Modem Settings

Data Bits	Stop Bits	Parity	
8	1	off	<input type="checkbox"/>
7	2	off	<input type="checkbox"/>
7	1	off	<input type="checkbox"/>
8	1	odd	<input type="checkbox"/>
8	1	even	<input type="checkbox"/>
7	2	odd	<input type="checkbox"/>
7	1	even	<input type="checkbox"/>

Important! Because of timing peculiarities in the baud rate generator of the Apple IIc, some modems may require a different data format than the one listed in the modem or information service manual. Experiment with different settings until you find the one that works.

Editing the Device List

If you have several devices that share the serial ports, you should add all of your devices and their PINs to the device list so that the ports are easy to reconfigure. The device list includes several popular Apple devices and has place holders for other devices. If you run out of space, you can replace the Apple devices that you don't plan to own. Here's how:

1. Select option 3, Edit the Device List, from the Configure the Serial Ports Menu.
2. Highlight the line you want to replace and press **(RETURN)**. You see a new screen and this message:

Enter New Device Name:

.....

3. Type a name for your device and press **(RETURN)**.
4. You are asked if you know the device's PIN.

5. If you know the PIN, answer *Yes* by pressing **(RETURN)**. Then type the number. You are asked if the PIN is correct. If you answer *Yes*, you see a new device list with your device's name and PIN.

If you don't know the PIN, answer *No* by pressing **(RETURN)**, then choose the options that describe your device. (If you don't know which option to pick, accept the default by pressing **(RETURN)**.) When you finish supplying the information, you see a screen, like Figure 4-4, that summarizes the information you supplied and displays the PIN. If the information is correct, answer *Yes* by pressing **(RETURN)**.

Figure 4-4. Checking the Parts of the PIN

```
Set Port 1
ESC: Configure the Serial Ports
-----

Printer Mode
8 Data Bits / 2 Stop Bits
1200 Bits per Second
No Parity
Do Not Echo Output on Screen
Insert LF After CR
Insert CR After 80 Characters

The PIN is 163/1124

Is this information correct?
<YES> No

Type Y for Yes or N for No, or press ←
or → to change. Then press RETURN.
-----

For Help: Press ␣-? or ␣-?
```

6. Then you are asked if you want to save the configuration on your utilities disk. If you answer *Yes* by pressing **(RETURN)**, the revised device list is copied onto your copy of the utilities disk so that you can use the information later.

Once all your devices are on the list, it's easy to swap port configurations. Here's how:

1. Start up your utilities disk.
2. Choose option 8, Advanced Operations, from the Main Menu.
3. Choose option 5, Configure the Serial Ports.
4. Choose the port you want to configure.
5. Choose the device you want to use.
6. Start up your application by putting the program disk in the built-in disk drive and holding down **(C)** while you press **(CONTROL)-(RESET)**.

For BASIC Programmers

Applesoft BASIC is built into the computer. (You can get to it by starting up the Apple IIc without a disk in the built-in disk drive. You'll see a message to check the disk drive. Just ignore the message and hold down **CONTROL** while you press **RESET**.)

But to save your programs, you must load the ProDOS operating system into the computer before you start programming.

There are three ways to do this.

- Start up *Getting Down to BASIC*, of the interactive owner's guide, and select the Quit option.
- Start up *System Utilities* and select Exit System Utilities from the Main Menu.
- Create a disk that automatically loads ProDOS and puts you into BASIC (see the next section).

Creating a ProDOS Startup Disk

You can create your own startup disk by following these steps.

- 1.** Format a disk (for ProDOS).
- 2.** Copy the files PRODOS and BASIC.SYSTEM from *System Utilities* to your formatted disk.

Starting up this disk loads ProDOS and puts you into BASIC.

If you want one of your programs to run automatically, put it on a ProDOS startup disk and name your program STARTUP.

Glossary

backup: A copy of a disk. (It's a good idea to make backup copies of all your important disks and use the backup.)

baud: Bits per second. A designation for how fast peripheral devices can receive and/or send data.

carriage return: The event that occurs when the print head reaches the end of a line and returns to the start of the line.

configuration: In the case of *System Utilities*, the way your serial ports are set up.

copy protect: To render a disk impossible to duplicate by ethical means.

CR: See **carriage return**.

data bits: The computer sends and receives information as a string of bits. These are called **data bits**.

default: A recommended response to a question in a program. The response will be used by default unless you supply an alternative.

destination: The disk you're copying to. Compare **source**.

DOS 3.2: An early Apple II operating system. DOS stands for *Disk Operating System*; 3.2 is the version number.

DOS 3.3: One of three operating systems used by the Apple IIc. DOS stands for *Disk Operating System*; 3.3 is the version number.

file: A collection of information that you store on a disk (like a program or a memo).

format: To divide a disk into sections where information can be stored. Blank disks must be formatted before you can save information on them for the first time.

highlight: In the case of *System Utilities*, a pair of angled brackets that distinguishes your selection from others in a list.

LF: See **line feed**.

line feed: Act of advancing to the next line.

line width: Number of characters that fit on a line on the screen or on a page.

mode: Manner of operating—in the case of *System Utilities*, either printer or communications (modem) mode.

modem: Short for *modulator/demodulator*. A device that links your computer to other computers via phone lines.

operating system: A program that, among other things, controls the way information is loaded into memory, the way the computer works with the information, the way information is stored on a disk, and the way the computer talks to printers and other peripheral devices. ProDOS, DOS 3.3, and Pascal are three operating systems available for the Apple IIc.

parity: A bit used to check for errors during data transmission.

Pascal: Both an operating system and a programming language.

pathname: The full name of a file. A pathname begins with the disk (volume) name, then lists any subdirectory names, and ends with the filename. Each part of the name is separated by a slash (/).

PIN: See **product identification number**.

prefix: The first part of a pathname stored in memory.

ProDOS: The primary operating system for the Apple IIc.

product identification number: A seven-digit number that describes a device's characteristics, such as baud rate, used to configure the serial ports on the Apple IIc.

prompt: A message on the screen.

serial: Things occurring one after another. A serial device sends and receives information one bit at a time. See **serial port**.

serial port: Outlet for a peripheral device on the back of the Apple IIc.

source: The original—the disk you're copying from. Compare **destination**.

stop bits: One or two bits that indicate the end of a character.

subdirectory: A directory within a directory.

utilities: A set of file and disk management programs.

volume: Another word for **disk**.

write protect: To prevent accidental changes to the contents of a disk by covering the write-enable notch with a write-protect tab.



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