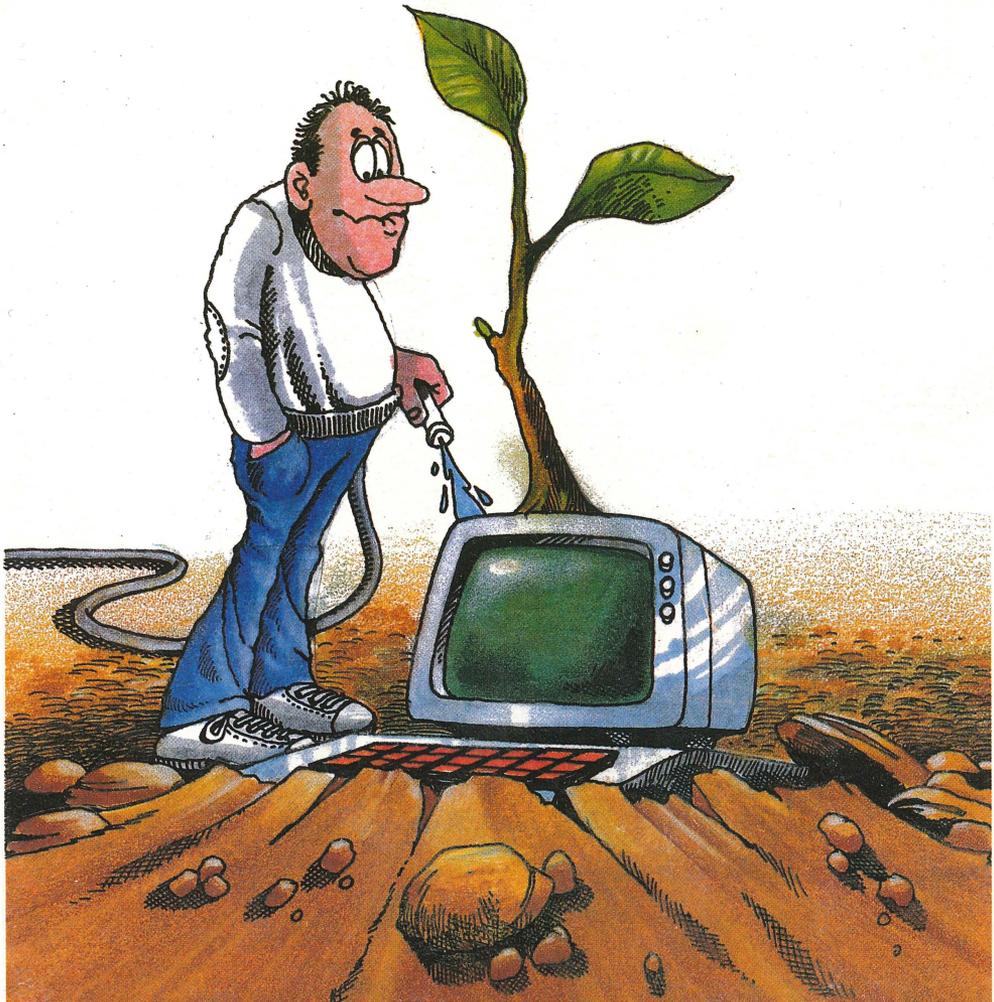


THE MOST POPULAR BOOK EVER WRITTEN ON MAKING APPLES GROW.



**A SIMPLE EASY-TO-READ PICTURE BOOK
FOR THE COMPUTER NOVICE.**

Written by Winn Schwartau and Paul Gitschlag
Illustrated by Dennis L. Busch

**“THE MOST POPULAR BOOK
EVER WRITTEN ON
MAKING APPLES™ GROW.”**

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Produced by Busch & Associates Advertising Inc./San Diego, CA.

GOODBYE INTIMIDATION

Computers aren't so complicated after all.

This little book will give you confidence.

Walking into a computer store can make you feel like you're a long way from home. Salesmen seem to speak a foreign language of technical jargon, and that can be intimidating. This booklet will help. In an easy-going way, it tells you a lot about what happens inside an Apple, and how you can feel more at home with the hardware of personal computing.

The information you learn here will let you solve many of your own computer hardware problems without the help of a too-knowledgeable computer salesman.

This booklet will NOT teach you:

- How to program a computer.
- How to fix a computer.
- How to be a Hacker. (What's a Hacker, anyway?)
- Anything you don't want to learn.

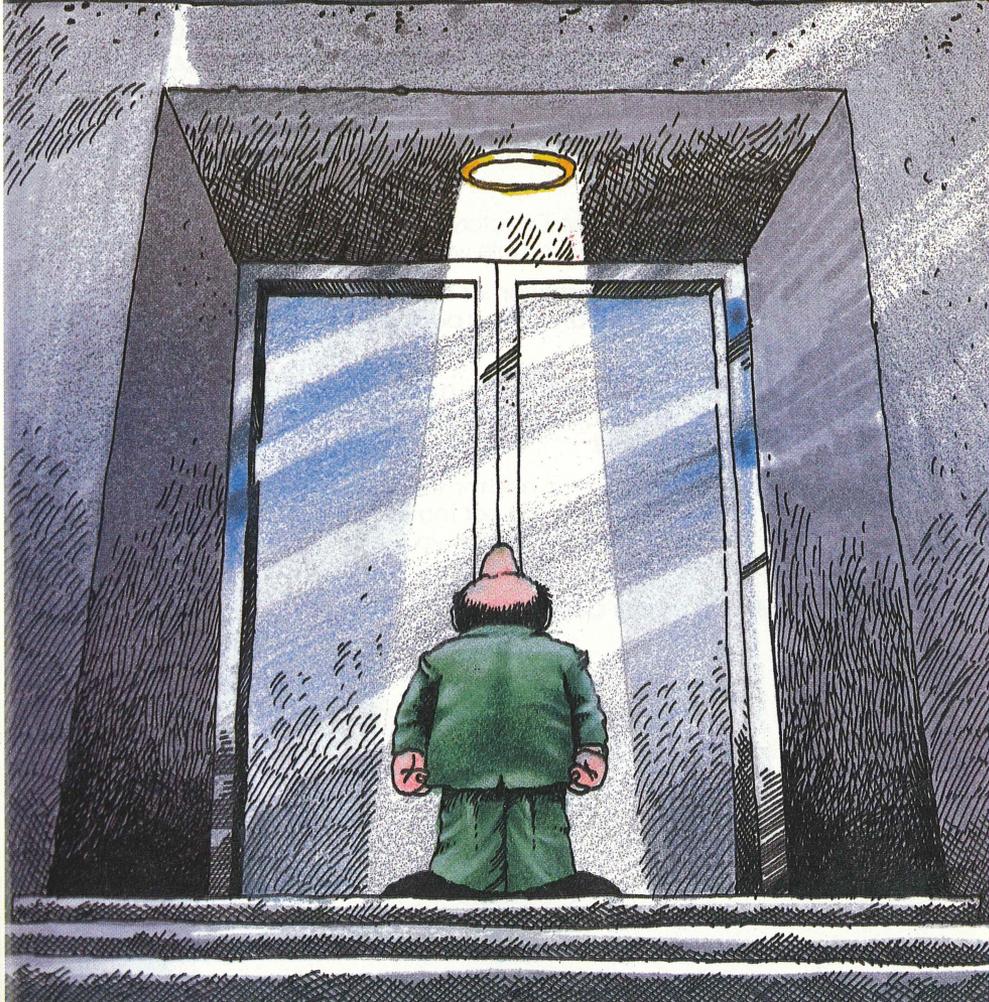
This booklet WILL show you:

- How to solve specific problems, with specific solutions.
- How to get more out of your computer.
- Why to continue loving your Apple.

Interested?

Take a look at the next chapter, "How To Use This Booklet", and see if we can't solve a problem or two real fast.

THE STORE



A computer store can be a very intimidating place.

HOW TO USE THIS BOOKLET

CONGRATULATIONS...

If you've made it this far, you have the interest and motivation to begin solving some common computer problems...all by yourself.

Let's see how this works. The remainder of this book is divided into various sections that address specific areas of concern: Printing, Memory, Video, Telecommunication. These are all subjects on which you will want fast answers.

Look up any subject in the Directory, and turn to that page. Each section gives answers in two simple ways.

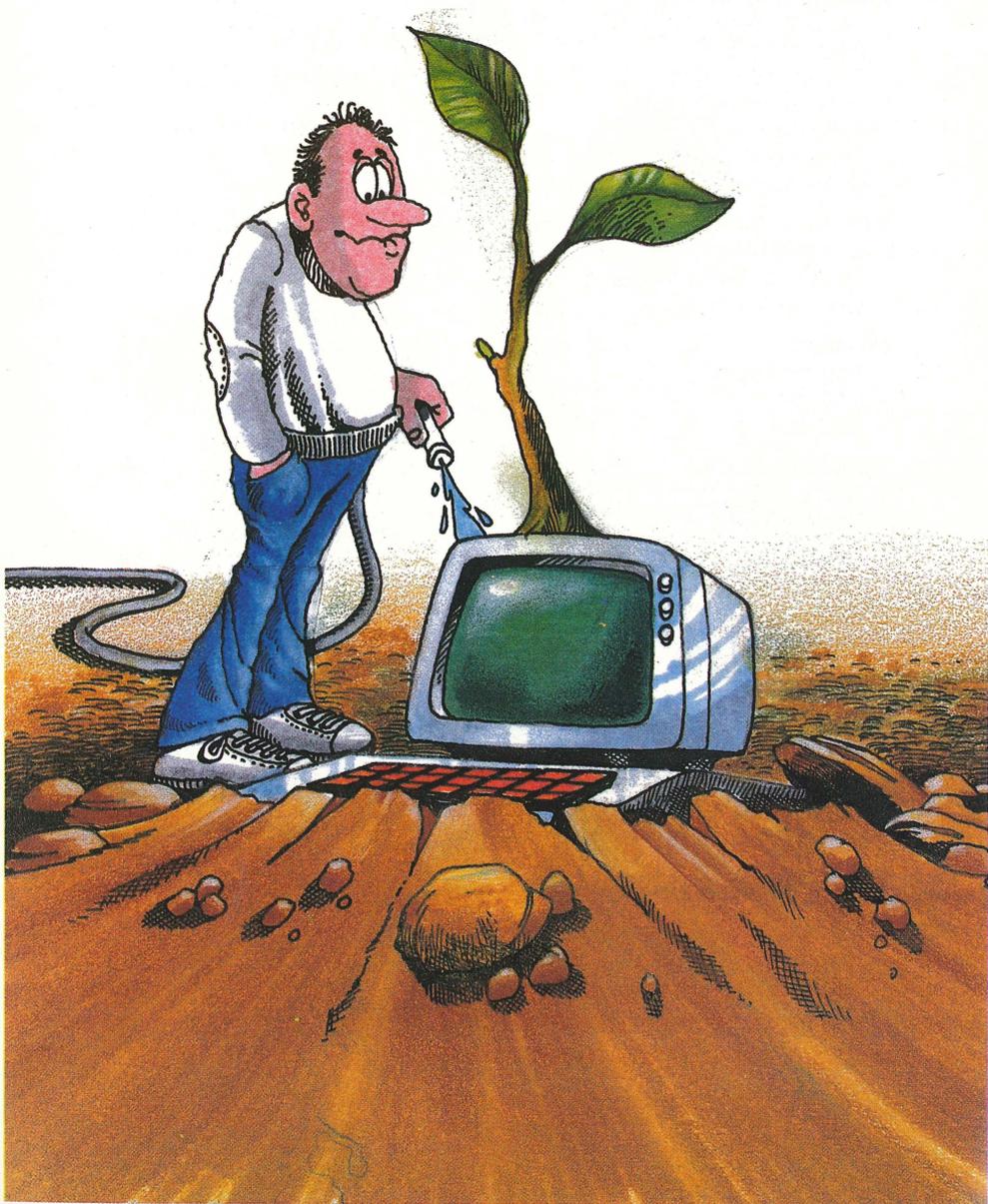
1. There is a pictorial illustration of how things work. In one quick glance you can see how various parts of a computer system work together.
2. After the illustration, you'll find a more in depth discussion. You don't need to read it to solve your particular problem, but it's there if you want more detail.

By utilizing both the illustration and the written material, you'll have the complete picture. Not too much, not too little. Just enough to get you back where you belong. Running your computer with as little headache as possible.

Good Luck and Happy Computing!

TABLE OF CONTENTS

Introduction	2
How To Use This Booklet	4
Contents	5
Slotware	7
PRINTER INTERFACES	9
Serial Printers	
Parallel Printers	
Dot Matrix Printers	
Letter Quality Printers	
Buffering	
Data Compression	
Buffer Box	
COMMUNICATION	20
Modems	
Electronic Bulletin Boards	
On-Line Sources	
MEMORY	24
Spreadsheets	
VisiCalc	
MAGICALC	
DISK EMULATION	30
Disk Drives	
Floppy Disks	
COPROCESSORS	34
CP/M	
MicroSoft	
VIDEO EXPANSION	37
Monitors	
80-Column Display	
COLOR ENHANCEMENT	40
Composite Video	
RGB Color	
COMMENTS	45
GLOSSARY	46-48



CULTIVATING YOUR APPLE WITH SLOTWARE

Most people don't realize that an Apple Computer is made to grow. Not like a flower, of course, but in computing power. This booklet describes how you can make your Apple grow by one simple method.

SLOTWARE:

Slotware™ is a Microtek trademark. It refers to a specific line of products that causes the computing power of your Apple to grow by leaps and bounds. Slotware refers to those devices that plug into slots inside the Apple. By understanding and using these devices, you can get more work done with your Apple and do it faster.

Slotware covers seven major areas, and they are outlined on the opposite page in graphic form to make them easy to understand.

SLOTWARE™

HOW TO MAKE YOUR APPLE™ GROW



COLOR ENHANCEMENT

When you want to see brighter, more colorful pictures and whiter text, get the facts on how you can do it with our Color Enhancement brochure.



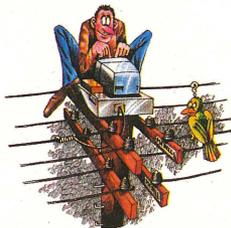
PRINTER INTERFACES

When you want to see your words and pictures on paper, get the facts with our Printer Interface brochure.



VIDEO EXPANSION

When you want to see twice as much on the screen, get the facts and the whole picture on how to do it with our Video Expansion brochure.



COMMUNICATIONS

When you want to tap into the outside world, get the facts on how to do it with our Communications brochure.



MEMORY EXPANSION

When you want your Apple to think bigger, get the facts on how to do it with our Memory Expansion brochure.



DISK EMULATION

When you want to speed up your Apple, get the facts on how to do it with our Disk Emulation brochure.

COPROCESSORS

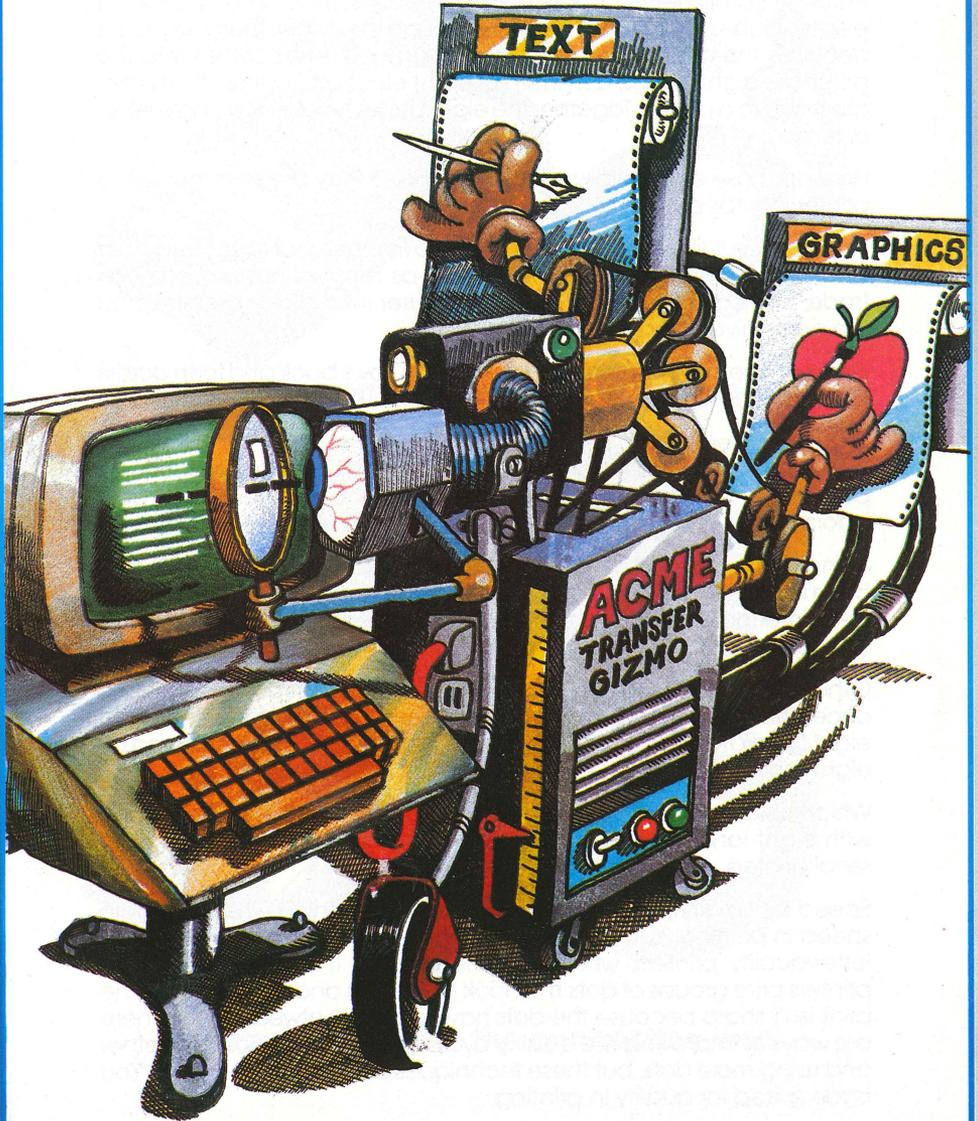
When you want to add another "brain" to your Apple get the facts on how to do it from your dealer.



Ask for "The Most Popular Book Ever Written on Making Apples Grow!" Your dealer has 'em here!

M SLOTWARE™ BY
MICROTEK

PRINTER INTERFACES



PRINTER INTERFACES: GETTING IT DOWN ON PAPER

Unfortunately, ink doesn't flow through wires. If it did, we could send information from computer to printer by pushing electronic ink through a cable.

Instead, computers encode each letter or symbol into a series of electric pulses, and send the pulses through the cable. Then the printer decodes the message at the other end. Each letter comes into the printer as eight pulses, a pattern of eight electronic "blips" that have meaning to a printer. Together the eight pulses represent a single letter or symbol.

How do those eight blips get to the printer? They are sent through a printer interface.

An interface is like a border between two friendly countries. Resources flow back and forth across the border as the two nations carry on trade. In a computer system, the computer lives in one country, and the printer lives in another.

Between them is the interface. Information flows back and forth across the interface like people and money flow across an international border.

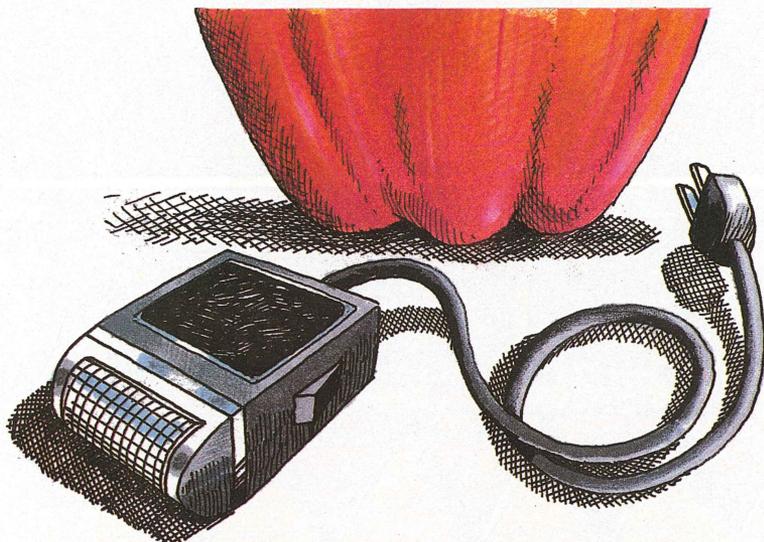
You hear a lot of talk about serial and parallel printers. Serial and parallel are two ways of going from one place to another. Geese do it in formation; railroad cars do it single file. Data bits do it both ways.

Some border crossings have a very narrow check point where cars have to line up single file to get across. This is like a serial interface. In a serial interface, the "blips" (they are really called bits) have to line up and go through the cable single file, like railroad cars.

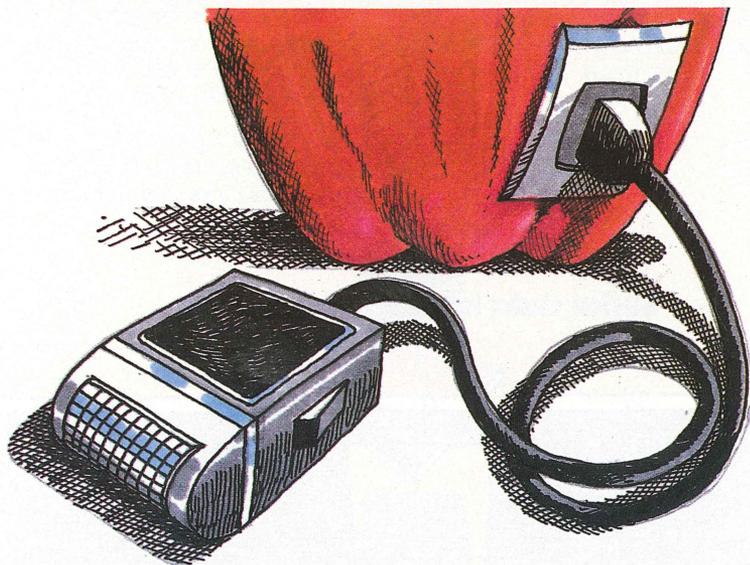
Other borders have a wider crossing where eight cars can go across at once. This is like a parallel interface. In a parallel interface, there are eight separate wires, so eight bits enter the printer at once, followed by eight more.

Which kind of border crossing can handle the most traffic? The one with eight lanes. That is why parallel printers tend to be faster than serial printers.

Speed isn't everything, however. You lose something when you gain speed in printing. You lose quality. The best print quality comes from letter-quality printers, which are the slowest. The faster dot matrix printers print groups of dots that look like letters and numbers. But the print isn't sharp because the dots have spaces between them. There are ways of improving the quality by putting the dots closer together and using more dots, but these techniques slow down the printer. You trade speed for quality in printing.



Accessories don't connect directly to the Apple.



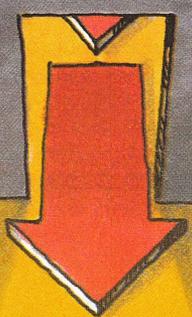
An Interface makes the connection work.



Parallel data travels in groups of eight.



Serial data travels in single file.



PRINTER GRAPHICS

Getting your printer to print text is one thing, but getting it to draw pictures is another. By now, you have probably noticed that the Apple can put lots of nice pictures on the screen. Printing these pictures on your printer is a complicated process.

Pictures don't break down easily into an alphabet like words do. The best computer pictures are composed of tiny dots, thousands of them. To print these pictures, you need a printer that is good at making dots.

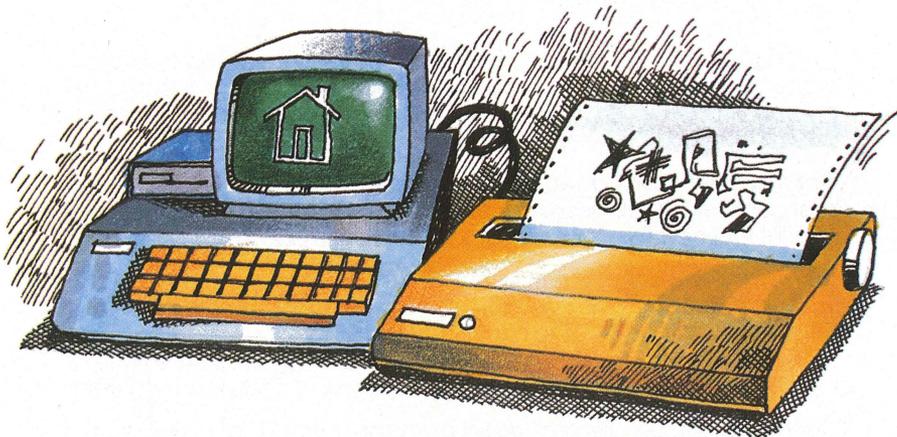
There are dozens of different printers on the market, but they mostly fit into two basic types: letter quality and dot matrix. Letter quality printers print letters, numbers, and a few characters for punctuation. They aren't very good at making dots. In order to print graphics with one of these, you have to beat the period to death and it takes a long time.

Dot matrix printers are very good at making dots. That's all they do. They have a set of little pins that can make just about any pattern of dots in a space the size of a letter. These pins move across the paper to put the dots anywhere, and any of the dots can print or not print.

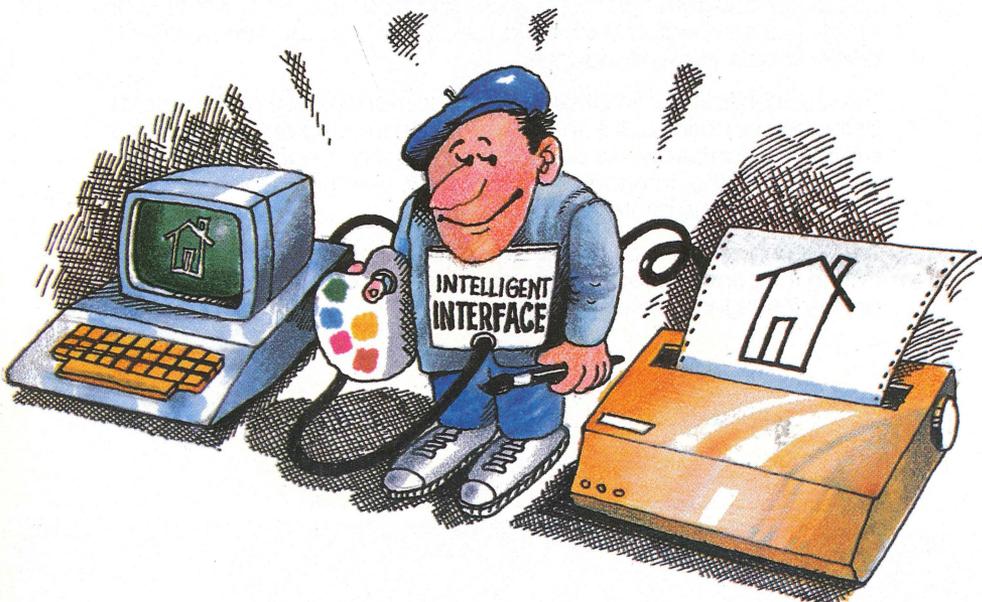
Each dot matrix printer has its own method of taking signals from the computer and turning those signals into dots. This means that your Apple has to speak the same language as your printer, but each printer speaks its own language.

The situation calls for an intelligent printer interface, sort of a translator at the border check point. The interface has to put graphics data into a form that can be understood by a number of dot matrix printers. Then you just tell the interface which printer you have, and it feeds information to the printer accordingly.

The result is pictures on paper without you going to the trouble of writing the complicated code to do it. Remember, for printer graphics, get an intelligent printer interface.



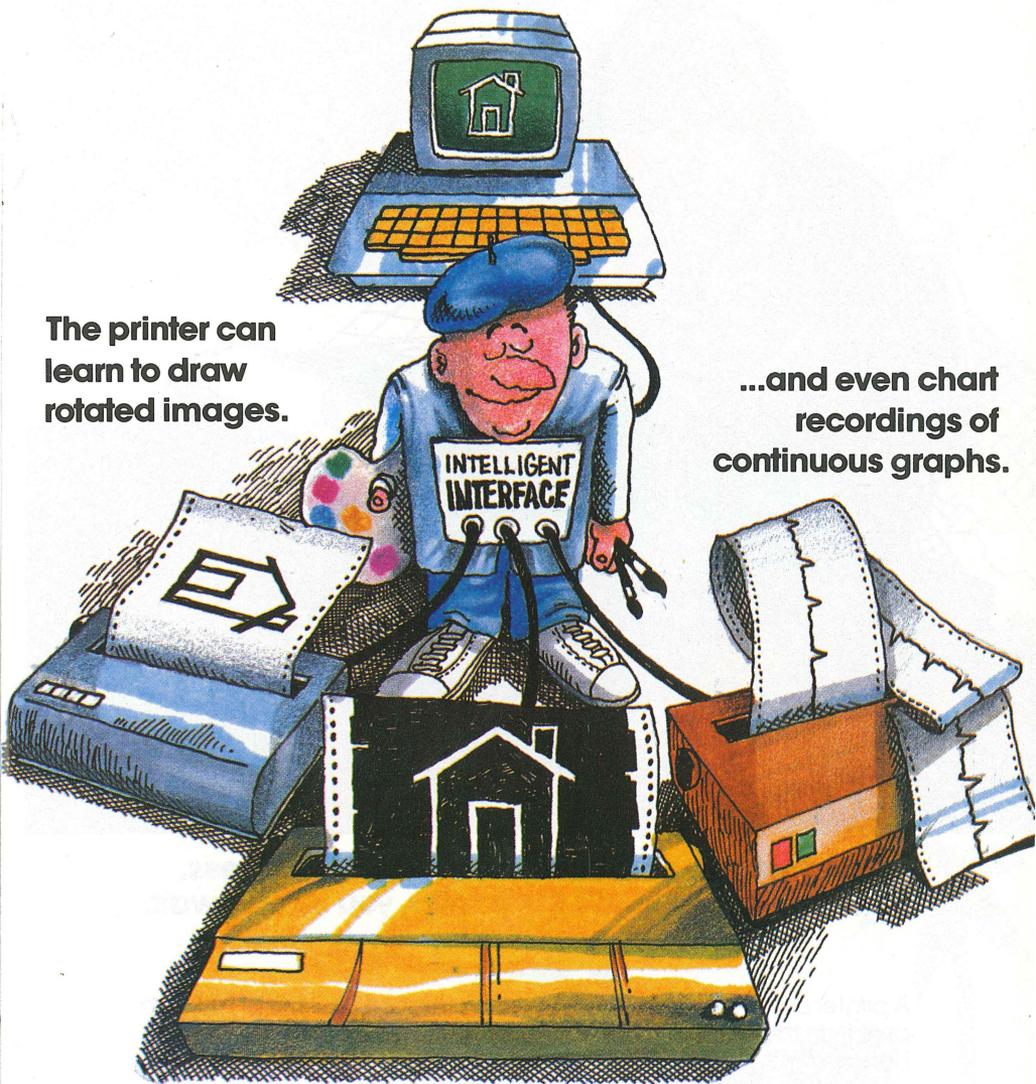
Printers don't understand pictures.



An intelligent interface can teach the printer to draw.

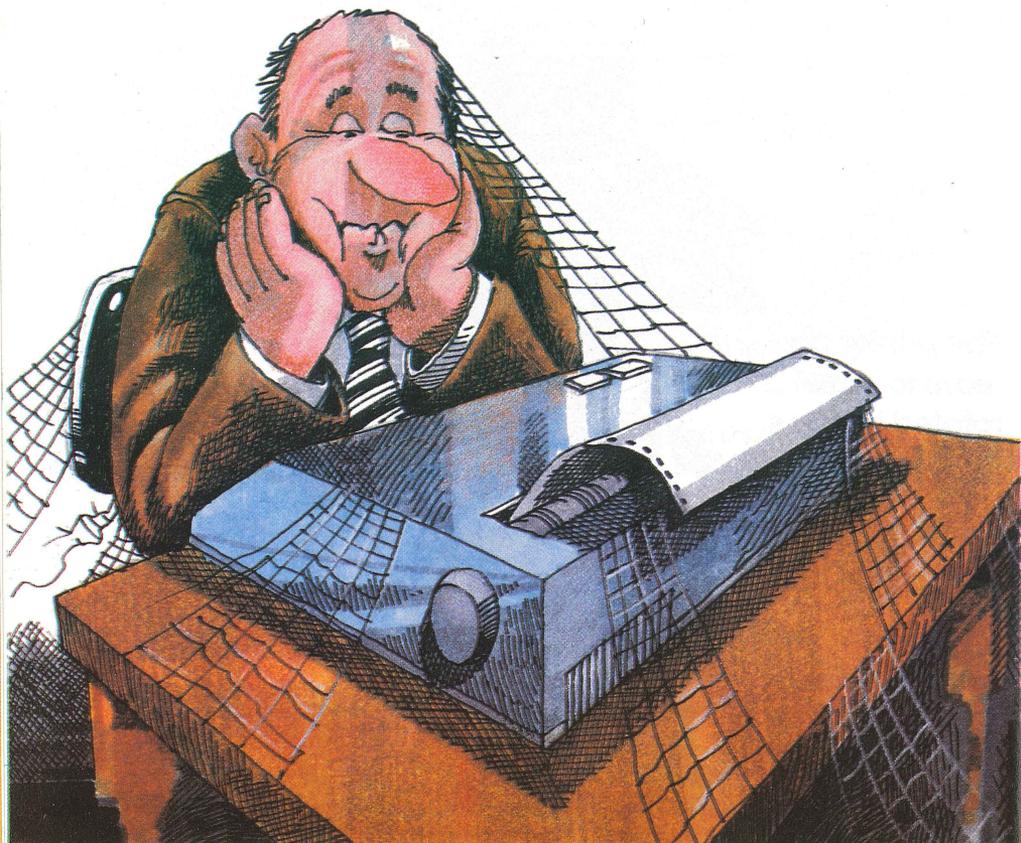
**The printer can
learn to draw
rotated images.**

**...and even chart
recordings of
continuous graphs.**



**...and inverted images
...and enlarged images**

PRINTER BUFFERING: WHY YOU NEED IT.



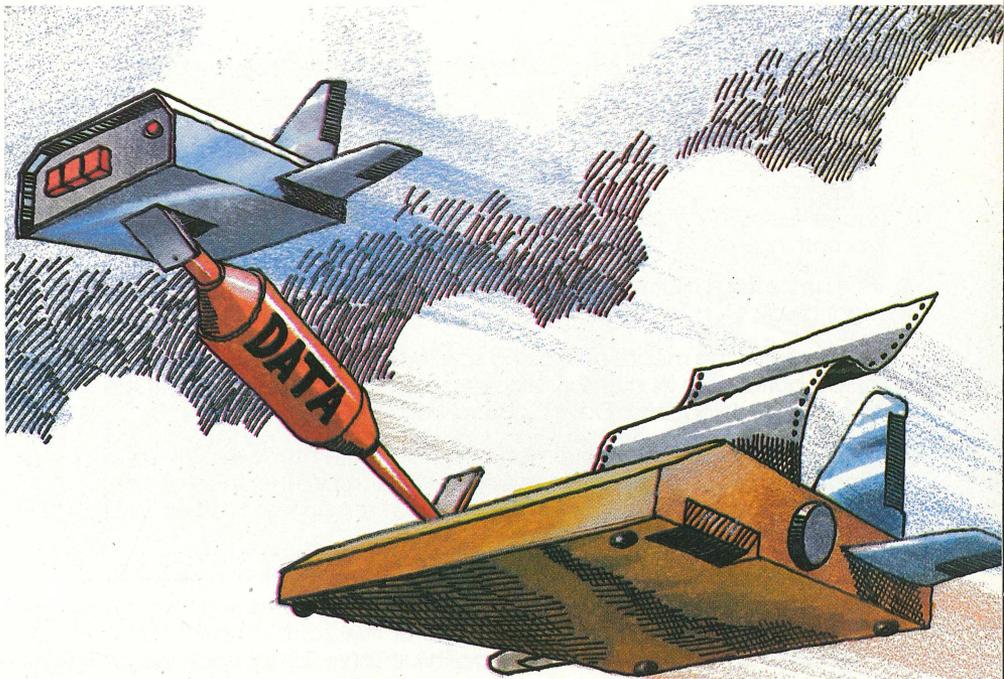
**Printing can be a slow, time-wasting process.
When the Apple feeds the printer, you sit and wait.**

A printer buffer is a device that holds information until the printer can print it. In the simplest terms, a printer buffer saves you time. Lots of it. Here is why.

Printers are mechanical and computers are electronic. This means that printers go slower than computers. When a fast computer feeds a slow printer, you get a bottleneck. It is like a fire hydrant filling a swimming pool through a soda straw.

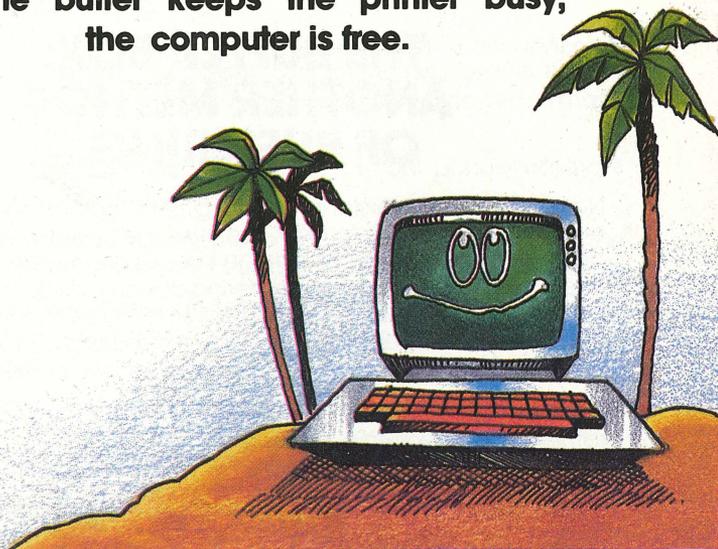
To get information printed, the computer must slow down to the printer's speed. If the printer isn't ready, it tells the computer to "wait" until it is ready. This way, the computer does a lot of waiting.

While the computer is waiting, it is also considered "busy" and the keyboard is inactive. That means that you cannot use your Apple while



A buffer holds data and feeds it to the printer.

**When the buffer keeps the printer busy,
the computer is free.**



you're printing. So what do you do while the printer is active? You sit and wait. A terrible waste of time.

The solution to this is actually quite simple. You put a large holding tank between the computer and the printer. The tank is called a buffer. It can accept information as fast as the Apple can send it. Then the buffer feeds the information slowly to the printer while the Apple does something else for you.

The net result is that the computer is free for you to use again. Almost right away.

Efficient storage means no wasted space, and this is true for buffers. A good buffer uses its memory efficiently, with no wasted space. One method of doing this is Data Compression.

Imagine that you have to remember two phone numbers: 267-0915 and 555-5555. Which one is easier to remember? The second one. Instead of seven different numbers, you just remember the five, and how many times it repeats.

A computer can look at numbers the same way. If a certain number, or letter, or even a space is repeated three or more times in a row, it is more efficient to just count the number of fives, or D's, or any other character and remember it that way. This is Data Compression, and it creates a tremendous savings of space.

Spreadsheets, for example, have a lot of spaces that can be compressed. In fact, a typical spread sheet may be compressed three to four times. This means that you can hold a 200K spreadsheet in a 64K buffer. That's compression. It's very, very efficient and you don't even have to know it's working. It's automatic.

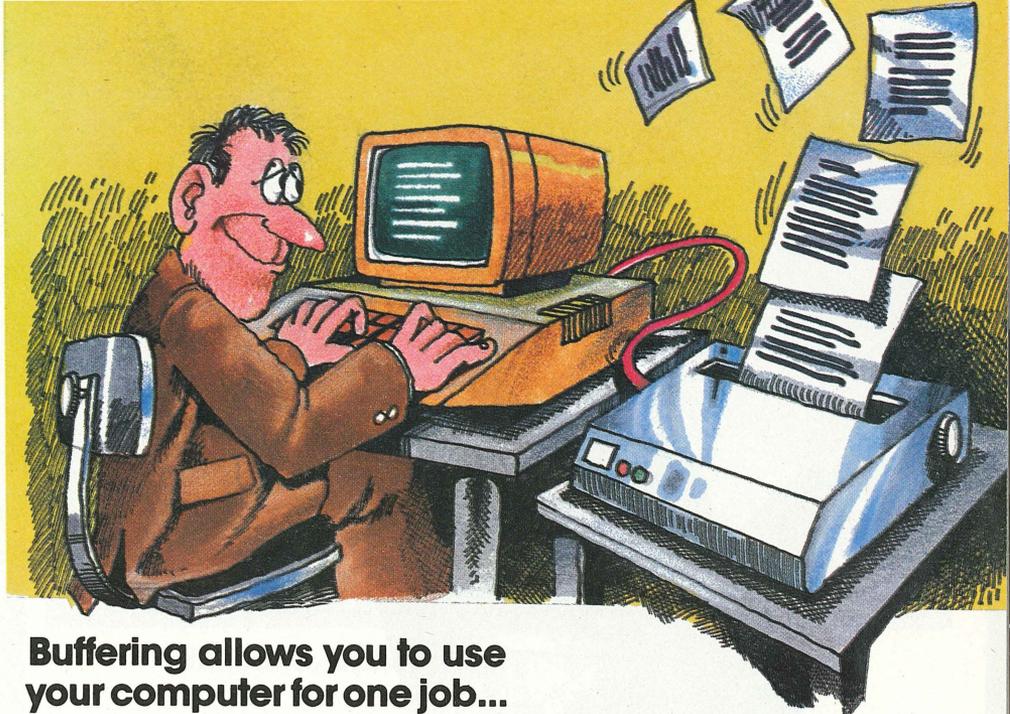
Besides being efficient, a good buffer is expandable. If you buy a buffer with only 16K of memory, you should be able to increase the memory capacity easily. That way, when your printing volume grows and you need a larger buffer, you won't have to buy a new buffer, just more memory to put inside your old one.

THE BUFFER BOX: ANOTHER METHOD OF BUFFERING...

Now that you understand buffering, let's look at one other way to buffer your printer. Up to now, everything we have described can be done by placing a buffer card in your Apple in one of the slots. An alternative method puts the buffering device outside the Apple, sitting between the computer and the printer. This type of device is known as a stand-alone buffer, or buffer box. A stand-alone buffer doesn't fit into another device. It has its own case and it's own power plug.

There are a number of distinct advantages to having a buffer box rather than a Slotware buffer, but only you can decide what you need:

- 1. The Buffer Box can store more data or information than a buffer that plugs into the Apple.**



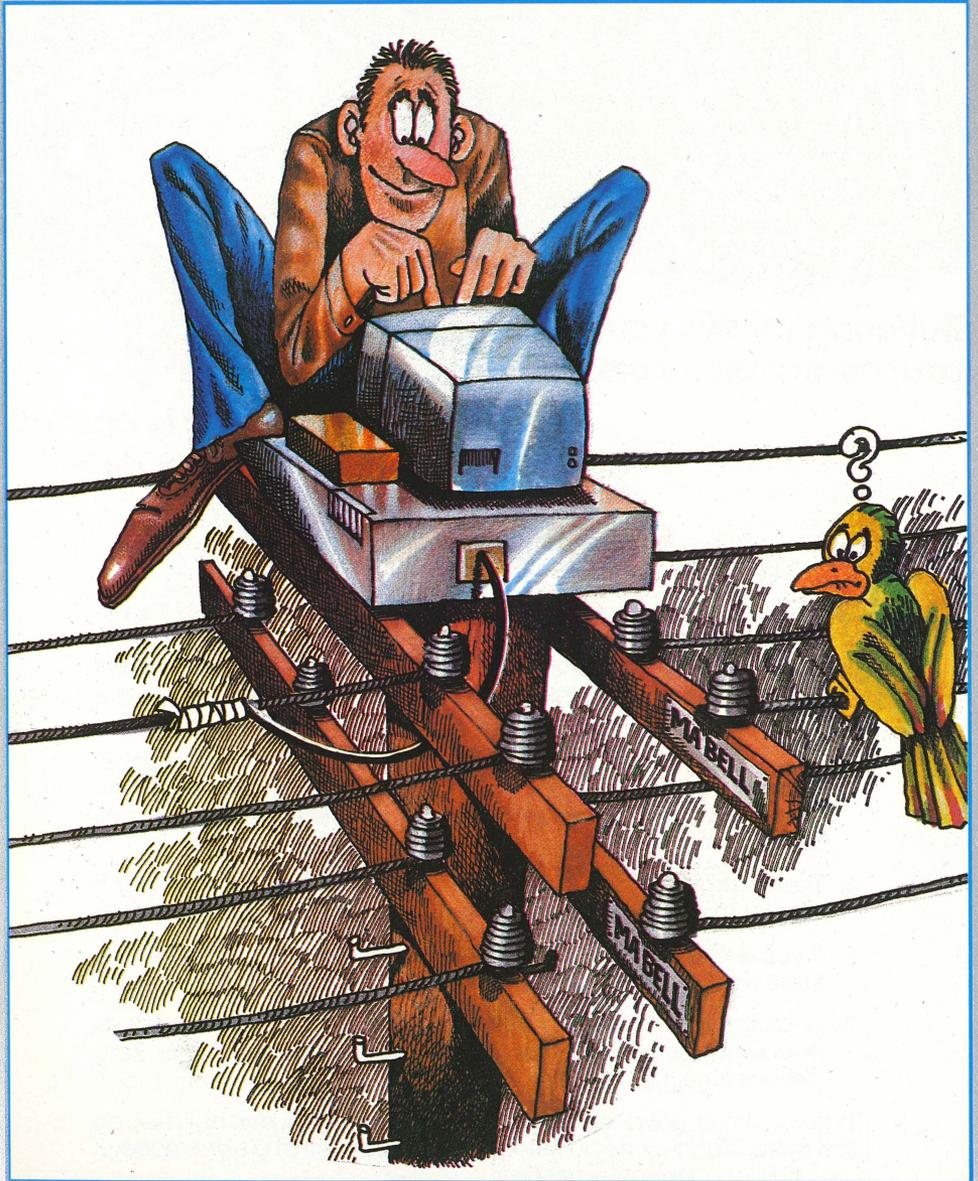
Buffering allows you to use your computer for one job...

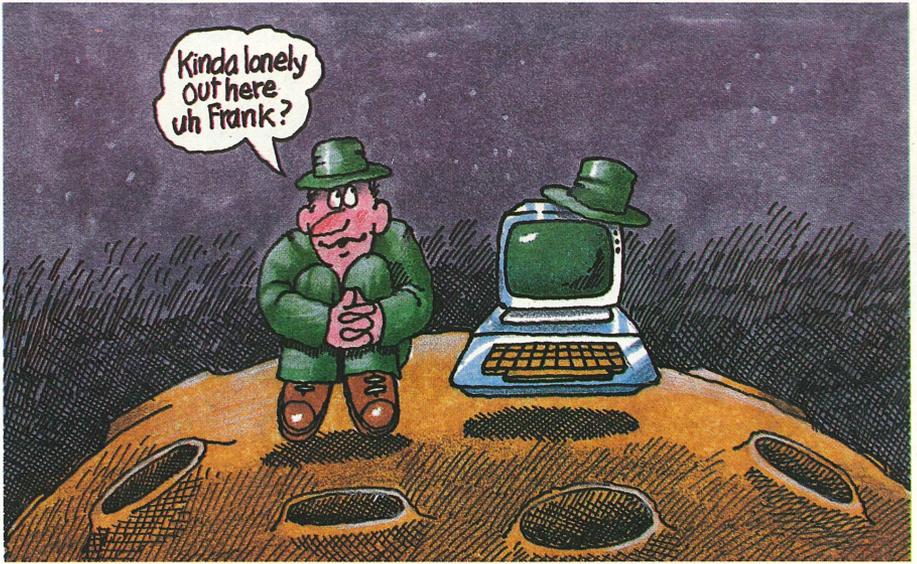
While your printer is zipping off the previous jobs.

- 2.** You can turn the Apple off, and still print-all night long if you want. The Buffer Box does the work while your Apple rests.
- 3.** You can make multiple copies of the same document. It's like having a copy machine in your Apple. These copies, by the way, can be made while you're at work, sleeping...or at the beach. The Buffer Box and your printer do the work. Just make sure you have given the printer enough paper.
- 4.** You can print out on letter head paper as well as conventional form-feed paper with the guide holes on the side. Letters, listings, messages can be directly printed onto your own paper, as many times as you want.
- 5.** The controls for the Buffer Box are on its front panel, making it simpler to use than a Slotware version.
- 6.** If you ever upgrade your Apple to another type of computer, the Buffer Box will travel with you. You can use it on any computer at all.
- 7.** By plugging the Buffer Box in just right, you can buffer your modem, and send long messages without tying up your Apple for long periods time.

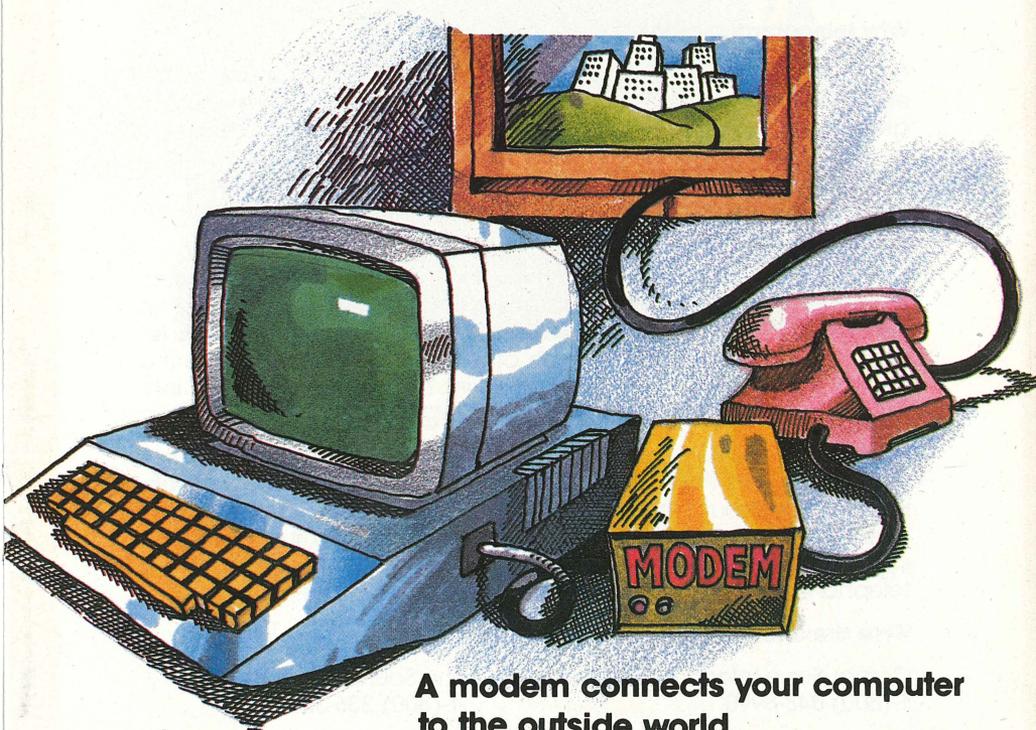
There are a lot of good reasons to have this type of buffer, but they do cost more. Stand-alone buffering may well be worth the extra money if you do a lot of extensive printing.

PHONE COMMUNICATION





Without telephone communication, you can become isolated.



A modem connects your computer to the outside world.

PHONE COMMUNICATIONS TALK TO THE ENTIRE WORLD FROM YOUR COMPUTER

A computer by itself is a miracle. Add the power of a telephone and you have a sort of electronic room service, the world at your fingertips. The device that adds telephone power to the computer is called a modem.

There are three basic different types of modems, but they all serve the same purpose: to connect a computer to a phone.

1. An acoustic modem uses the telephone's earpiece and microphone to do the actual sending and receiving of data.
2. A Slotware modem fits into a slot inside the computer and connects directly to the phone jack on the telephone.
3. A stand-alone modem sits nearby the computer and connects to the Apple through a serial interface card.

In simple terms, a modem turns computer signals into telephone signals and vice versa. That's all there is to a modem. But oh, what you can do with it. A modem lets you call up powerful computer networks and get any kind of information you want.

Why telecommunicate?

Maybe you just want information. You can dial up stock market trends, encyclopedias, sports information, world news, movie reviews, shop-at-home services, and even college courses are available to computer owners through modems. Many universities have data bases that can be accessed this way. Libraries are setting up data base services, as are software companies that let you try out programs before you buy them.

Or, if a friend of yours lives in another city, and he has a computer too, you can exchange computer data over the phone lines. One variation on this is known as Electronic Mail, which many companies use to let their regional offices talk to each other. You aren't restricted to the phone company either. MCI and Sprint can also be hooked into modems.

Most communities also have electronic bulletin boards that are accessible via telephone from any computer. They contain information about local computer groups, courses, workshops, and items for sale or swap. You can also use these to just chat with computer "hackers". In short, just about anything you can do with a telephone can be done with a computer and a modem.

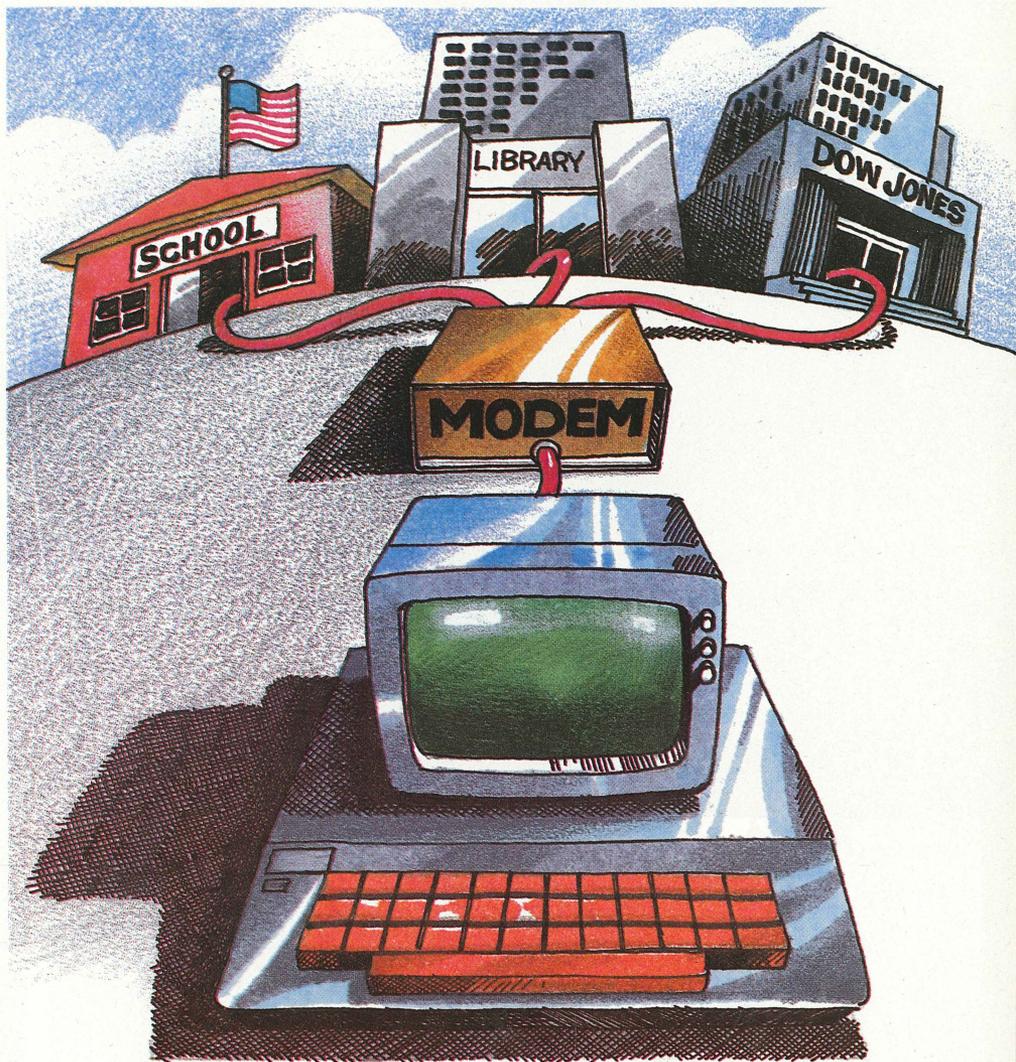
Here are a few on-line information sources:

CompuServe Information Service
1-(800) 848-8990

The Source
1-(800) 336-3366

Dialogue Information Services
1-(800) 227-1927

Dow Jones News/Retrieval
1-(800) 345-8500, Ext. 5

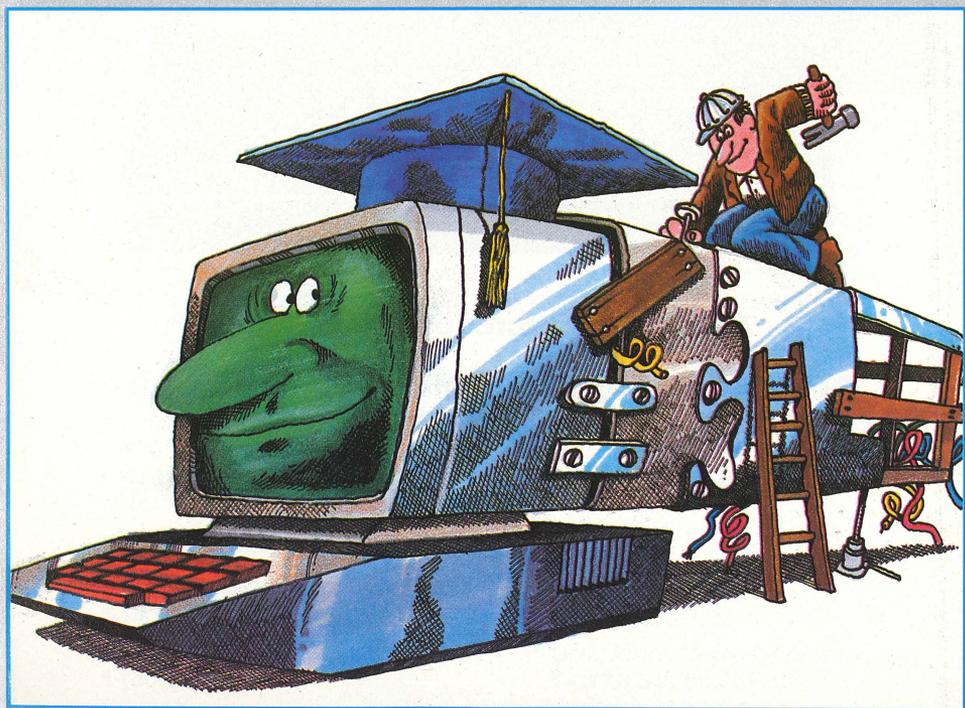


Access huge libraries of information.

**Get an education over phone lines with a modem
and your Apple.**

**Get up-to-the-minute Dow Jones information
at home.**

MEMORY EXPANSION

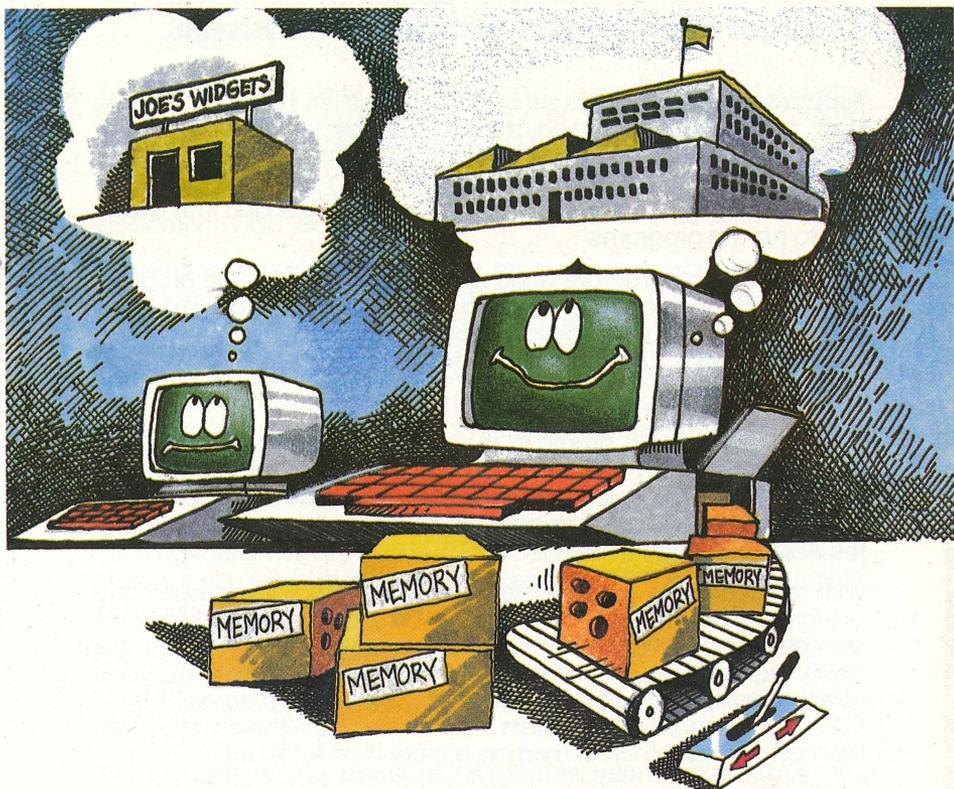


WOULDN'T IT BE NICE TO HAVE A BETTER MEMORY?

If each of us had a better memory, we could remember more things. Like more phone numbers. We wouldn't need a phone book. Or all of our recipes. Viola! No more cookbook. There are hundreds of items we have to look up because we don't have a perfect memory.

A computer, on the other hand, does have a perfect memory. It remembers whatever you tell it, and recalls it immediately. But, even a computer has some memory size limitations.

Your Apple comes standard with either 48K or 64K of memory. That's equal to about 30 pages of this booklet. If you need to have your computer think in bigger terms than that, you need to expand the memory of your Apple. When would you need your Apple to think in bigger terms? Here are few situations:



**To think big, your Apple needs a bigger memory.
Memory comes in several sizes.**



Larger memory allows larger spreadsheets.

Suppose you want to run a set of programs written in PASCAL. PASCAL and other high-level programming languages require a 16K language card to run on the Apple II or II+. This expands the II or II+ from 48K to 64K. (The IIe does not need this card.) The language card allows the Apple to "talk" in the particular language, and thus allows you to run the programs.

Another example. You are working on a spreadsheet. The program takes up a certain amount of the Apple's memory. That doesn't leave you very much room to build a work sheet. OPPS! You need more memory. Graphics programs also require large amounts of memory to be truly useful.

Memory expansion is simple in the Apple because the Apple was designed to expand to your specific needs. Apple memory expansion is done with plug-in cards. These cards come in three sizes: 16K, 64K and 128K. This is like adding about 7, 30, or 60 pages of space inside the Apple's memory.

With more memory, you can use spreadsheet programs to build and use larger spreadsheets. VisiCalc is an example. VisiCalc spreadsheets may be expanded up to 150K by adding extra memory and running a small pre-boot program that tells VisiCalc how to use it. Other spreadsheets automatically recognize additional memory. MAGI-CALC, for example, can address 512K of memory without a pre-boot. For most purposes 512K of memory is more than sufficient.

Adding memory to your Apple is a simple task, only limited by your needs. Whether it is to make spreadsheets larger, or to allow longer letters, term papers, or legal briefs, extra memory is the easiest way to expand your computing power without the need to purchase an entirely new computer.

WHAT IS A SPREADSHEET ANYWAY?

A spreadsheet is the term used to describe one of the most valuable tools in personal computing. Think of a spreadsheet as being a fast sophisticated, and accurate game of

WHAT IF?

WHAT IF is a powerful method of keeping track of large amounts of numbers arranged in very specific ways. Let's start out simple, and work up.

Your check book is a very simple spreadsheet. You enter your initial balance, and then subtract the amount of each check written. You also add in your deposits. You also subtract all bank charges and fees. In one column of your check book, a running balance is kept. This is your own personal spreadsheet, although a simple one. You can't though, easily figure, What if I buy a new car, how much money will that leave me left each month for the movies? For that, you need to have a personal budget.

Your household budget is another form of spreadsheet. First you write how much money you make each month. Then, in another column, you subtract your expenses: Rent, Utilities, Phone, Food, Insurance, Car Loan, etc. Hopefully at the end you have a few dollars left over for your computer. Now let's say you want to move to a bigger house or apartment. Can you afford it?

By using a spreadsheet, you can enter all your expenses and see what's left over. Now, change the rent you pay. Is there enough left over? Hmmm. What if I cut down on the phone? All you have to do is change the individual numbers and the answers will appear. No, maybe you need to save a few more dollars. What if I cut out one dinner-out a month. Put that number in. That helps. What if I get the \$10 raise I was promised. How will that affect things. Just enter that change and you'll see.

An electronic spreadsheet can calculate anything you want. The game of "What If?" is used by businessmen also. Let's say you are running your own small business. Maybe a hardware store, a stationary store, or you're a sales rep. The spreadsheet can give you infinite amounts of help.

Right now, you are figuring your costs and expenses by hand. The salaries you pay, the rent, and other overhead, maybe including cost of goods that you resell. Here's a question that would take hours to do by hand:

What if I charged my clients all 21% more for each item they buy. How much more money will I make this year?

If you have all of your expenses and costs in a spreadsheet, plus how much of what you sell at what price, you can ask that question and get an answer in seconds.

What if my business grows by 15% this year. Do I need another employee? Answered in seconds once you have all the information in the computer. What if my costs go up by 6%. How much more do I have to charge my clients?

The game of "What If?" isn't really a game as you can see. It's a powerful tool that allows you to do the creative thinking, and the computer to do the number crunching. The applications for spreadsheets are endless. Just about any "What If?" situation you can ever imagine can be put into a spreadsheet and the answers will be at your fingertips in a second or two.

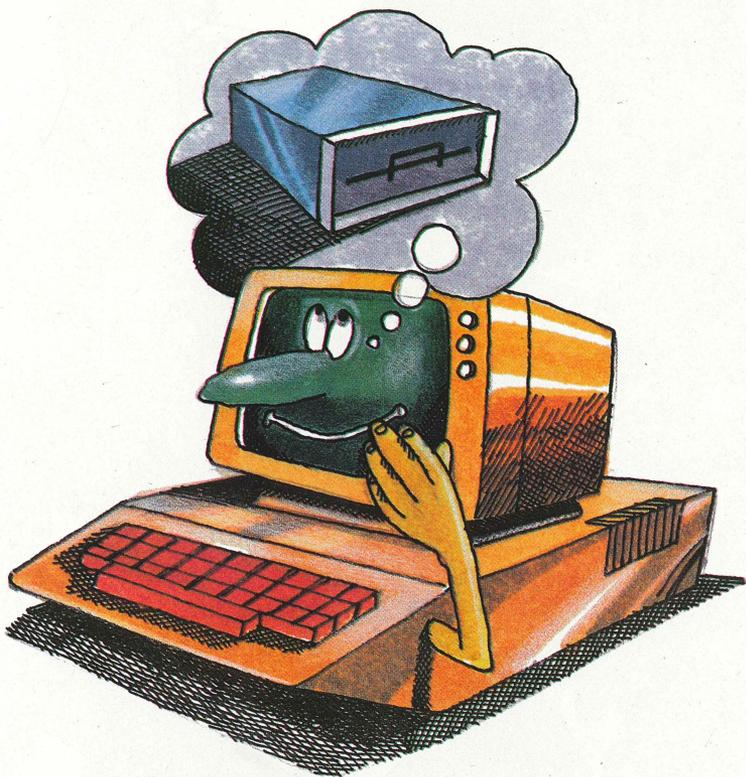
From the simplest check book, to running a small business, or for running larger business's, spreadsheets are the most creative tool of this generation. Students use spreadsheets to work on term papers or theses. Teachers use them to keep track of their students, their averages, their grades, their attendance. Advertising people can monitor their ad budgets for years in advance. Forecasting business trends is simple and fast with spreadsheets. We could go on forever telling you all of the things you can do with a spreadsheet.

But, the only way you'll really know the full advantages of them is to play with one, and get into the game of "What If?".

Large memory cards also offer additional features that make computing easier and a lot faster too. Many 128K memory cards can operate as disk emulators.

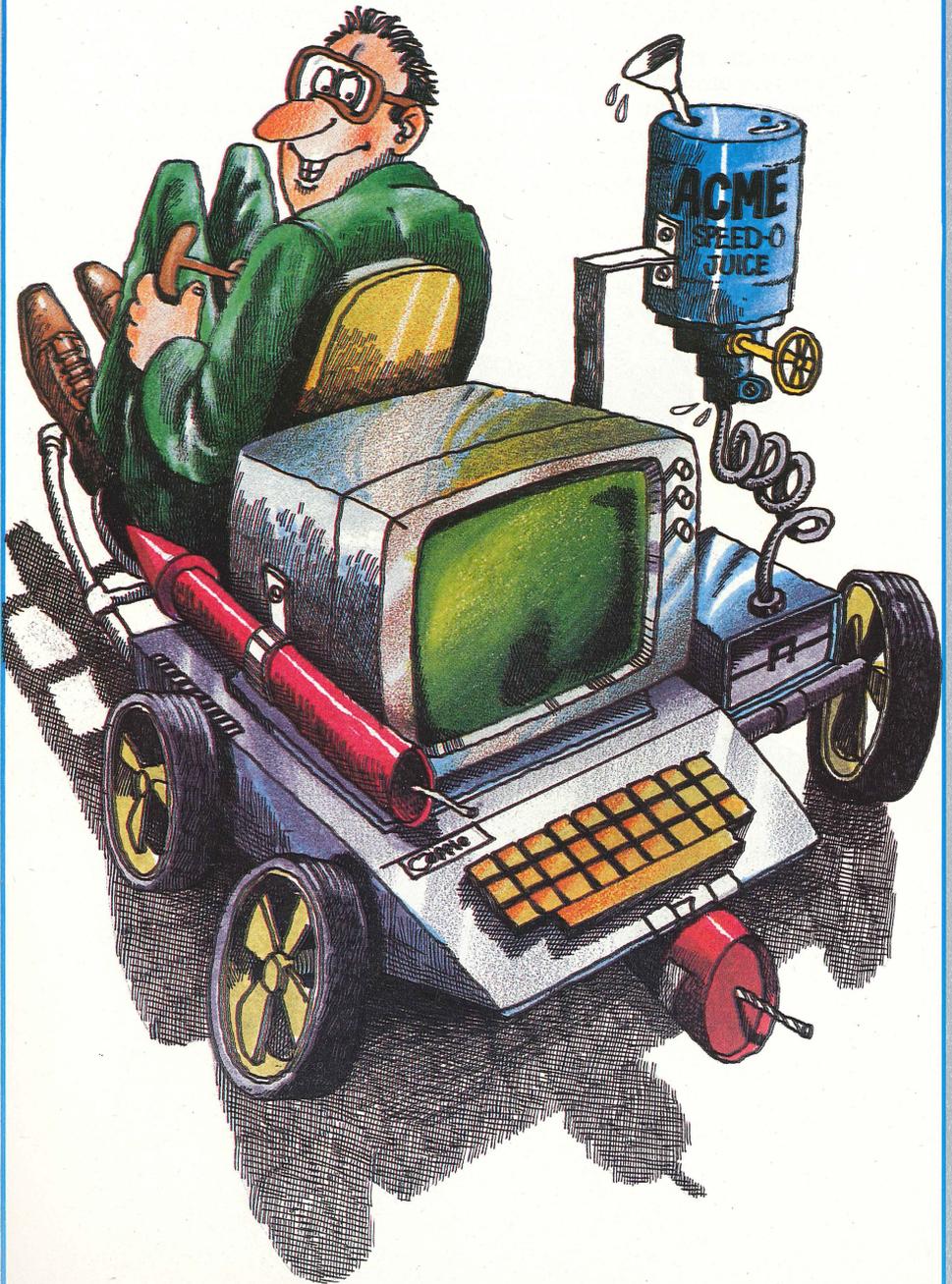
Disk emulation, a speedy way of moving data, is catching on as larger and larger programs requiring more and more memory are taking too much time to run. Disk emulation is also fully described in this booklet.

As you can now see, adding extra memory to your Apple does more than one would think at first. You can not only use and run more complex programs, work with better graphics programs, write longer documents, and calculate with larger spreadsheets; you also can get the benefits of high speed processing with disk emulation and specific spreadsheet enhancements.

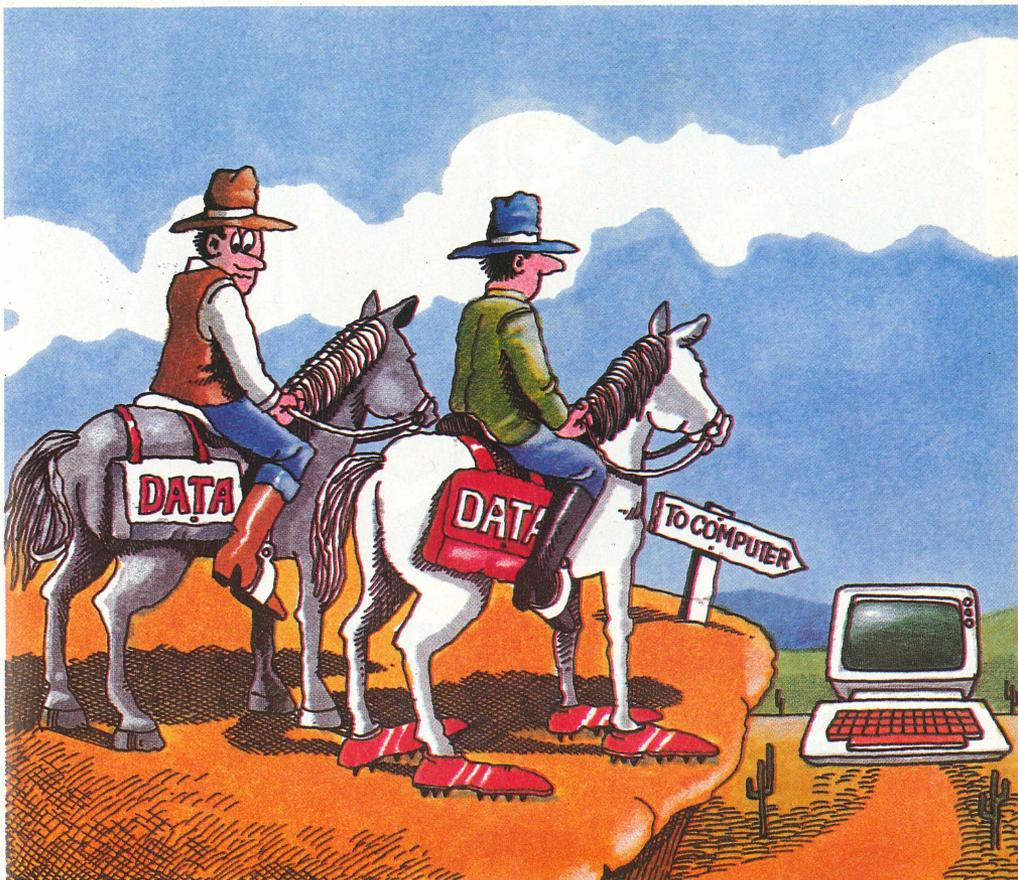


**Extra memory can be used as an
invisible disk drive.**

DISK EMULATION



DISK EMULATION: LESS WAITING



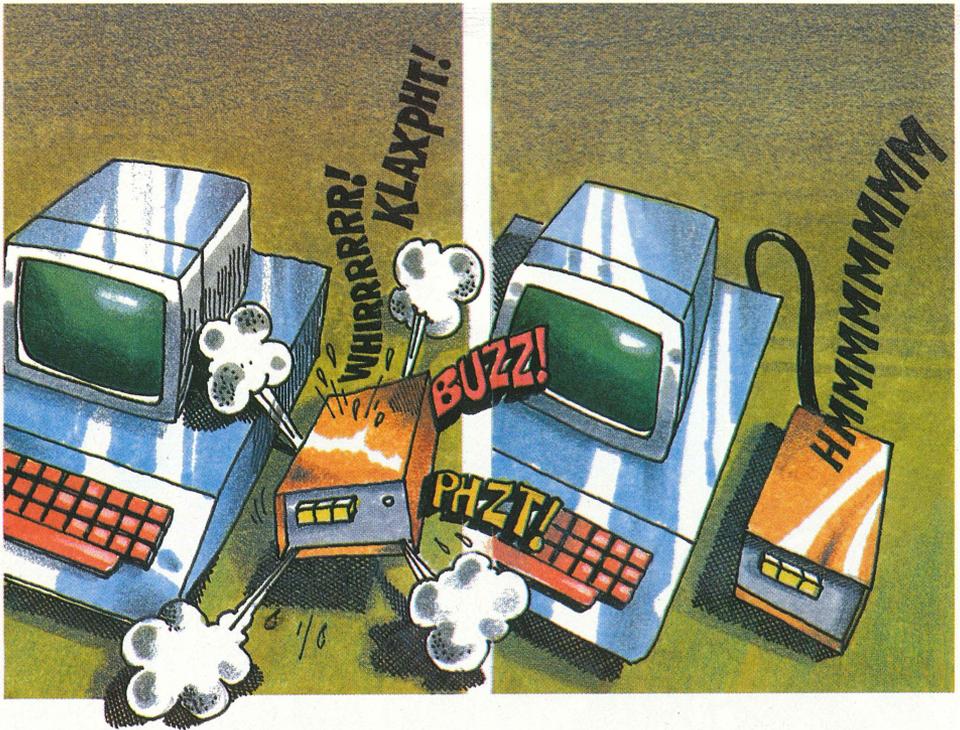
A disk drive is a mechanical way of moving data.

A disk emulator is a faster way of moving data.

A disk emulator is a faster way of moving data. And a lot of data processing is data movement.

Don't be afraid of the word emulation. Emulation means "acting like, or behaving like". It's that simple. So the term disk emulation means nothing more than "behaving like a disk". Simple.

Why are microwave ovens so popular? Less waiting. The food gets to the table faster. A microwave acts like a normal oven, but it's faster. A disk emulator is like a microwave oven for data. It gets the data into and out of the Apple faster.



**WITHOUT DISK EMULATION:
17 MINUTES, 40 SECONDS**

**(Your disk has to really keep
chugging along!)**

**WITH DISK EMULATION:
3 MINUTES, 25 SECONDS**

(...and your disk is taking a break.)

Most of your programs and data are stored on floppy disks. When you want to work with this data, you first have to move it from the floppy disk to the Apple's internal memory. Normally this is done with a disk drive.

A disk drive is a spinning mechanical device, like a record player. It has a motor that spins the disk and a read/write head that moves over the magnetic surface of the disk to pickup and deposit information. The entire process is controlled from the computer by a program called DOS, or Disc Operating System.

There are couple of major drawbacks to this. First, they break. A disk drive is a mechanical device, and thus subject to the kind of wear and tear a car engine might receive.

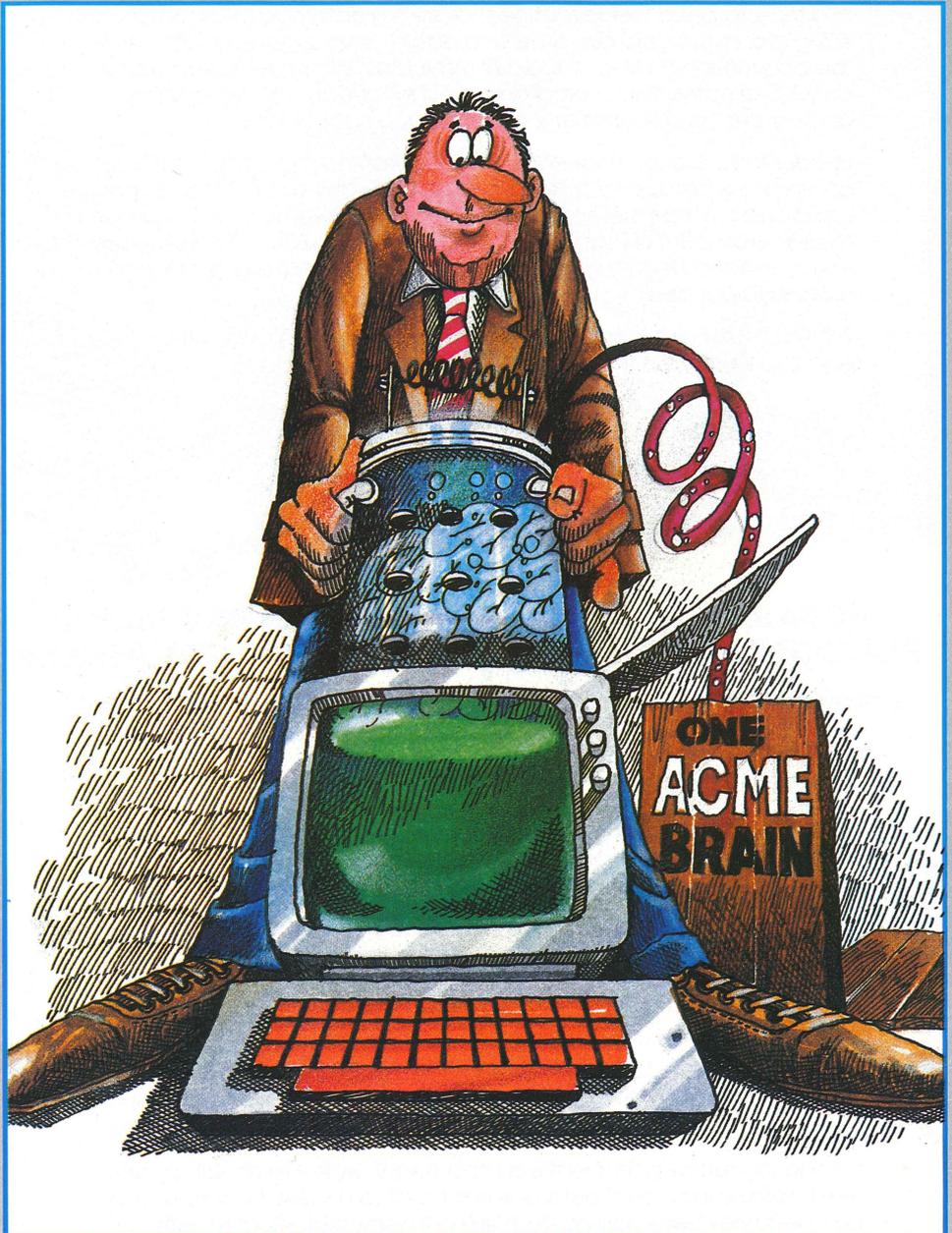
Also, a disk drive is slow. When data is either being written to, or read from a disk, it takes time. That time is wasted time, your wasted time. The effect is multiplied when the disk must be accessed very often. You must wait for the slow, mechanical, and noisy disk drive to complete it's job before you can get back to yours. This is where the disk emulator can help.

A lot of data processing consists mostly of reads and writes to and from disk storage. Word processing, for example, does a lot of data movement to and from disk storage. Many business programs are like this too.

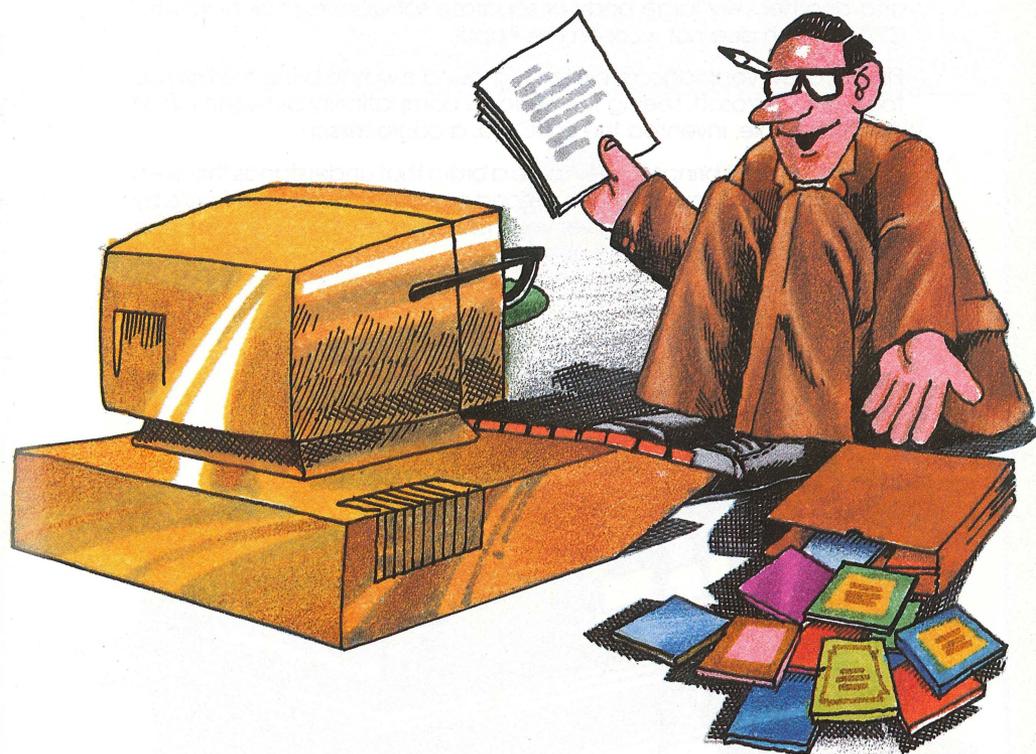
In a recent speed test, a routine that sorts a data base was run once using a conventional disk drive and again using a disk emulator. With the conventional drive, it took 17.6 minutes. With the disk emulator, only 3.5 minutes. If your programs do a lot of data movement (input and output), a disk emulator can save you a lot of time.

Besides the increase in speed, and the lack of moving parts, there is yet another advantage to a disk emulator. The disk emulator may also function as a large memory expansion unit. A disk emulator has about the same amount of usable memory that an Apple disk has. This allows you to expand certain spreadsheets and run larger programs, and to process larger files.

With a disk emulator on your Apple, you can do more work in less time. And you won't miss that whirring and clicking.



COPROCESSOR: ANOTHER BRAIN FOR YOUR APPLE



A coprocessor is like an expert consultant for your Apple.

A coprocessor makes a new world of software available.

Buying a coprocessor is like making friends with an extraterrestrial. You gain a vast cultural advantage immediately.

The field of microcomputing has grown like wild flowers on exotic islands. Each island, being isolated from the others, has spawned its own unique techno-subculture.

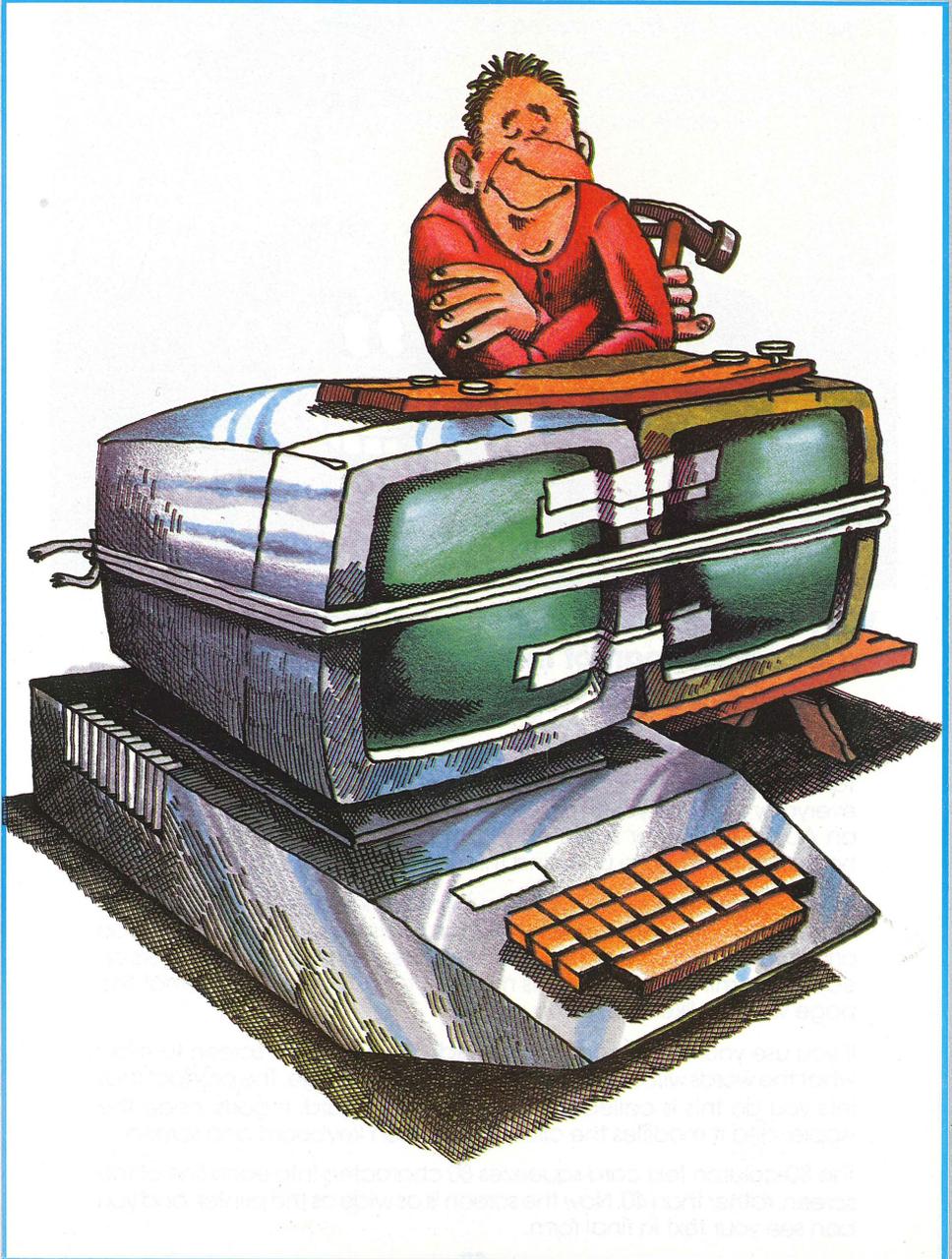
A group of people in one location get an idea and work very intensely to develop it. The result is a popular microcomputer, the Apple. In another location, a different group with a different idea works just as intensely in a different direction. Their result is a versatile piece of software, sort of a brain, called CP/M, (Control Program for Microcomputers).

Because the two groups didn't communicate in the beginning, these two developments did not grow together. Each one accomplished a great deal independently, and each developed a group of followers. Soon there was a very large body of software that worked on the Apple and another very large body of separate software that worked with CP/M, which does not work on the Apple.

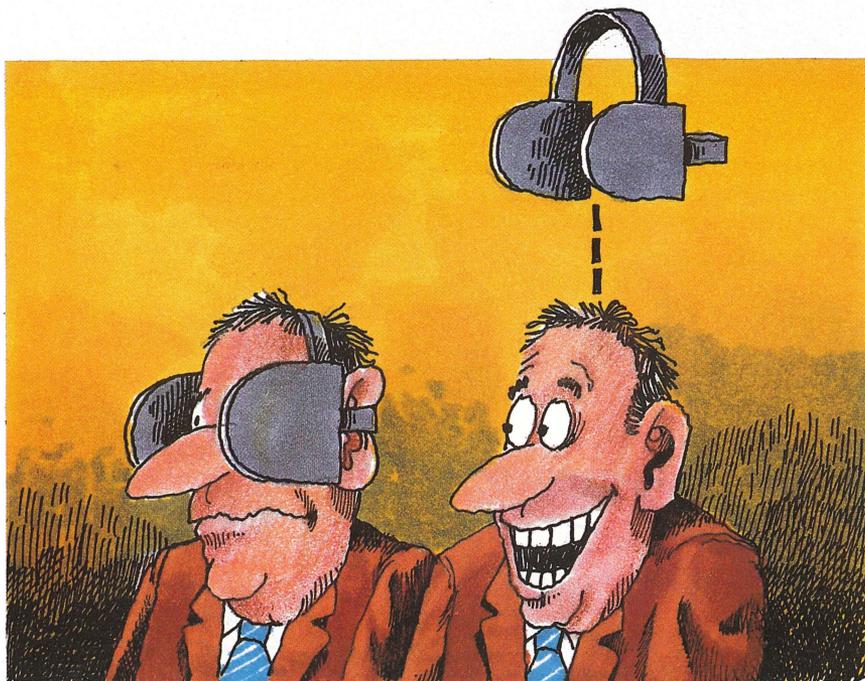
Finally, a few years ago, a third group found a way to bring the first two together. Microsoft, seeing the need for compatibility between CP/M and the Apple, invented the SoftCard, a coprocessor.

This coprocessor brings to the Apple a brain that understands the alien dialect of CP/M. You can put a second computer inside your Apple by installing a coprocessor. It gives you instant access to a large selection of software that is otherwise unavailable.

VIDEO EXPANSION



VIDEO EXPANSION A BIGGER WINDOW



**With no video expansion,
you only get part of the
picture.**

**Video expansion
lets you see more.**

Television is something we all take for granted. The TV screen, a part of everyday life, hardly seems worthy of attention. But the video screen in an Apple computer system is an important part of the system. It is housed in a separate unit, and this unit is called the monitor.

When you type on the Apple keyboard, the letters appear on the monitor. As you type, you see 40 characters on each line. When you print information on a printer, the printer usually puts 80 characters on each line, minus margins. This makes it hard for you to see what the page will look like before you print it.

If you use your Apple to process words, you want the screen to show what the words will look like on the final printed page. The product that lets you do this is called an 80-column text card. It goes inside the Apple, and it modifies the circuitry between keyboard and screen.

The 80-column text card squeezes 80 characters into each line of the screen, rather than 40. Now the screen is as wide as the printer, and you can see your text in final form.

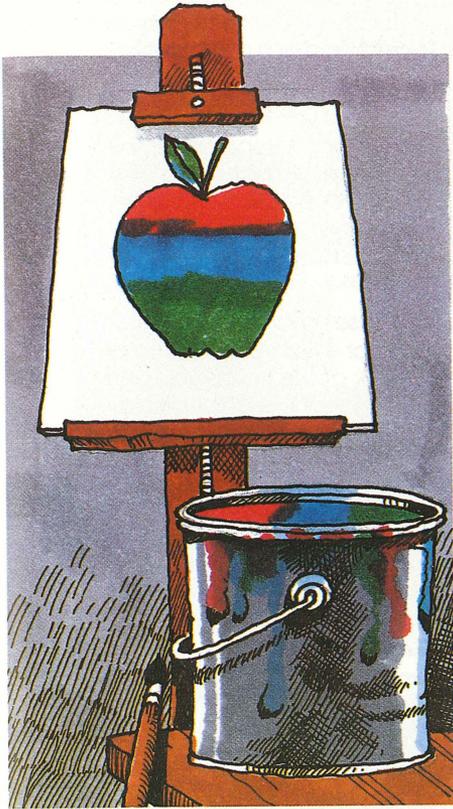
There are 3 types of 80-column expansion cards available. Your choice will depend upon your specific needs.

- 1.** A simple 80-column card which only expands the screen display can plug into the Auxiliary Slot of Apple IIe's. This is the least expensive option.
- 2.** An 80-column card with enhanced features: Inverse Video puts black letters into a white background. Alternate character sets, such as Greek or Danish can be programmed into the card for special applications. (Apple II or Apple IIe.)
- 3.** A combination card containing both the 80-column feature and an additional 64K of memory will plug into the Apple IIe.

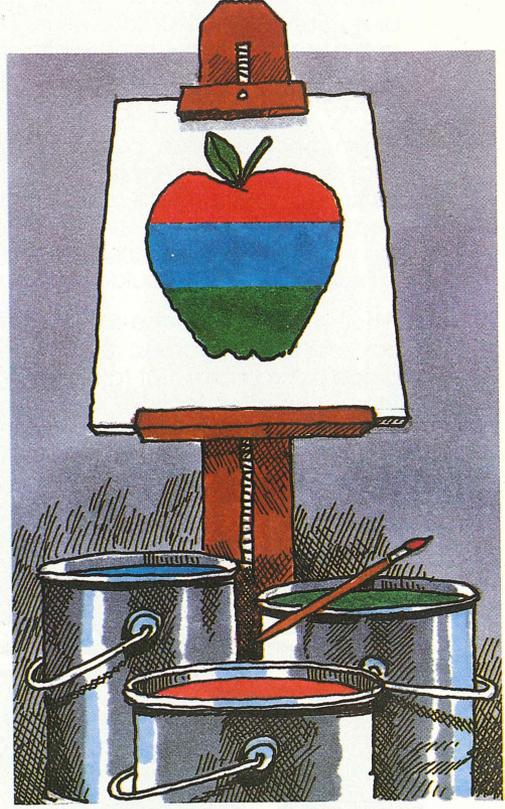
COLOR ENHANCEMENT



CUSTOM COLORS



**Normal color video
does not keep colors
separate.**



**RGB color video
makes the most out of
red, blue and green.**

The monitor is your window into the computer. Through it, you can see just about anything that happens inside the computer's memory. Besides being an inspection window, the monitor is also a display window. It is a showplace for computer artwork.

Color graphics add interest and visual appeal to computer programs. Pictures and illustrations make it easier to understand and work with new ideas. When these pictures are in color, they are even more effective. There are two ways for a computer to send a color picture to a monitor.

One way is for the Apple to mix all the colors together and send them along one wire to the monitor. The monitor sorts out the colors and produces the picture. This is called composite video. It's a little like giving three colors of paint to an artist in the same bucket. The colors do not remain distinctly separate, they get smeared together a little

bit, but you can still tell which color is which. That is basically how the Apple produces a color picture.

The other way is to send three separate basic colors, red, green, and blue, along three separate wires. The monitor can then mix the three colors together in the proper intensities to get hundreds of new colors and still keep the boundaries crisp. This is like giving the artist three separate buckets of paint to work with. This way is best.

When the three basic colors are sent to the monitor separately, the final result is a clearer picture with sharper more distinct colors. This method of color production is called RGB, which stands for Red, Green, and Blue. Not all monitors work this way, and television sets do not work this way. Only RGB analogue color monitors do. They are a little more expensive, but you should see the color pictures.

When you buy an off-the-shelf Apple, you can use any color monitor, or color TV to play games, run color programs, or write your own color graphics programs. But take a good hard look at the colors you get! There is an effect called "smearing", which makes the color display look fuzzy. There is also a secondary by-product of smearing in the text of a color graphics display. The text is not white. You will see that there are quite a few pieces, or pixels of color in each letter. This makes the reading of the text difficult. The effect is known as "color fringing", and it is undesirable. Are there alternatives? Yes, and they truly do clean up the Apple's color.



Normal color video has color "fringe" around text.



RGB color eliminates “fringing”. Text is really white.

Now, before you go off and buy one, remember that a special type of monitor is needed to take full advantage of such a card. It's called an RGB monitor. An RGB monitor handles each of the three colors separately, and mixes them in varying degrees.

When you add an RGB color card to the Apple, your monitor will come fully alive with vibrant colors that were never there before. The effect is similar to walking into a dark room with sunglasses on, and then taking them off. Suddenly you can see things you never saw before.

The advantages of RGB Color over Composite Color are immense. Let's take a comparative look at the two methods and see what you think:

COMPOSITE VIDEO

(Conventional Color from an Apple without and RGB card)

- 1.** Color is smeared; like a TV picture that is out-of-focus.
- 2.** Text with Graphics is not white, making it difficult to read.
- 3.** Low quality picture with conventional monitor. Picture isn't crisp and sharp!
- 4.** Limited color range: only 16 colors.
- 5.** Colors cannot be changed.

RGB COLOR

(Separately controlled colors with an RGB card)

- 1.** Colors are crystal clear. No color smearing.
- 2.** Text is pure white. Easy to read; no fringing.
- 3.** Highest quality picture professional quality. Picture is crisp and clear.
- 4.** Colors expandable: up to 256 color spectrum!
- 5.** Colors are programmable.

Those last two items on the list may be a little confusing. Let us explain. The Apple's color signal allows 16 colors to be displayed. There are RGB cards which expand the capability of the display to a full spectrum of 256 colors: Now that's a rainbow!

In fact, you can even CHANGE the colors of your programs so they don't get boring. For example: If Donkey Kong has a Red background and the attack balls are green, you can select any of up to 256 colors for any item in the program. That would be like the color control on your TV changing blue cars to red, or any color you want. You and your Apple have total color control.

Remember though, not all RGB monitors have this capability. Some just improve the overall picture quality and clean up the text. So, if you want to have Total Color Control, select the right monitor.

THIS PAGE IS FOR YOUR COMMENTS.

This booklet was written for you, the new computer user. We have attempted to give you an insight into some of the many possibilities that your Apple computer offers. Hopefully, we have done that.

Now it's your turn to say what's on your mind, and let us know what YOU think about this book, and what we can do in the next edition to improve it. Here are a few ideas that might get you to drop us a line and offer suggestions.

Thank You.

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1. Did you understand everything in this booklet? If not, how could we have made it easier to understand?
 2. Did the pictures and graphics aid in your understanding?
 3. Did anyone other than yourself have the chance to read this booklet? If so, how many?
 4. Do you think that this booklet is suitable for children too? What age group?
 5. What areas did we not cover that you wanted to know more about? What would YOU like to know more about?
 6. Did the glossary help you?
 7. Can this booklet serve as a reference piece for you? Why?
 8. Did this booklet help you decide to either buy an Apple computer, or expand the one you already have?
 9. Please feel free to make any comments you want. It will help us and the next readers of this booklet.
-

GLOSSARY

ALPHANUMERIC: Composed of letters and numbers.

ASCII: American Standard Code for Information Interchange. The computer code that turns letters, numbers and symbols into electronic pulses.

ASSEMBLY LANGUAGE: A "low level" language that is easy for the computer to read, but is difficult for people to decipher.

BASIC: Beginners All-purpose Symbolic Instruction Code. The most popular "high level" programming language. Made up English words, abbreviations and common mathematical symbols.

BAUD RATE: The rate at which data moves between two devices. Expressed in units of bits per second. Modems typically operate at 300 or 1200 Baud (300 or 1200 bits per second).

BINARY SYSTEM: A counting system that uses only "0" and "1" in combinations that the computer understands. Is easily translated into electronic pulses.

BIT: The smallest piece of computer information, either a "0" or "1" or electronically "on" or "off". Usually a group of 8 bits represent a single ASCII character.

BPS: Bits Per Second. (See Baud Rate)

BOOT: To get a system running from a "cold start". The name comes from the computer's effort to get itself off the ground by pulling up on its own bootstraps.

BUFFER: A device or area in memory that is used to hold data temporarily.

BYTE: A string of bits representing a letter, number or symbol.

CRT: Cathode Ray Tube. The actual screen on your computer's monitor. Don't let the term scare you. Your TV screen is a CRT.

CPU: Central Processing Unit. The single chip where the computer does most of it's thinking. In a computer system, a larger unit may be called the CPU.

CHIP: A small electronic component (INTEGRATED CIRCUIT), containing the equivalent of hundreds of other electronic pieces. A memory chip is capable of holding thousands of Bits of information.

COMMAND: An order you give to your computer by using your keyboard, causing it to perform a specific task.

COMPATIBLE: Able to operate together.

COMPUTER: Any device that can receive, store, and then act on a set of instructions in a predetermined fashion.

CP/M: Control Program for Microcomputers. A popular Operating System for business oriented programs. Your Apple needs a Z-80, or CP/M card to run CP/M programs. (See Operating Systems; DOS)

DATA: Information of any kind.

DATA BASE: A large quantity of data organized in a way that makes it easy to sort, retrieve and use.

DISK: A flat round object that can store vast amounts of data. Data is stored on a disk, magnetically, much like music is stored on tape or cassettes.

DISK DRIVE: A mechanical unit that reads information from a disk into a computer and writes information from a computer onto a disk.

DISK OPERATING SYSTEM (DOS): The set of instructions that tells the computer how to "talk to" the disk drive unit. Apples have DOS built-in to the computer itself. Other computers require it to be "booted" when needed.

DOS: (See Disk Operating System)

DISPLAY: The visual output from a computing device.

DUMP: To transfer large amounts of data from the computer to another device.

EPROM: Erasable Programmable Read Only Memory. (See ROM)

FILE: A set of records.

FLOPPY DISK: (See Disk)

GRAPHICS: Pictures, maps, charts, histograms...anything but letters that appears on the computer's display.

HANDSHAKING: A method of data traffic control. Handshaking tells a computer or a printer, when to send or receive data.

HARD COPY: A permanent copy of information on paper.

HARDWARE: The physical parts of a computer.

HIGH-LEVEL LANGUAGE: A code that is more intelligible to humans than it is to machines.

INPUT: (1) The data that you feed into your computer. (2) The process of feeding data into a computer, printer or modem.

I/O (Input/Output): The process of exchanging information between a computer and the outside world.

INTEGRATED CIRCUIT (IC): (See Chip)

INTERFACE: The place where two systems meet.

JOYSTICK: A game device used to move the cursor around the monitor screen.

K: Stands for the greek "Kilo", meaning one thousand. In common usage, K means 1024.

KB: KiloByte, 1024 bytes.

KILOBYTE: 1024 bytes.

LANGUAGE: A code understood by programmers and computers.

LOW-LEVEL LANGUAGE: A code that is more intelligible to machines than it is to humans.

LSI: Large Scale Integration. LSI is a method of compressing large quantities of electronic circuits into smaller places. Many chips or Integrated Circuits use LSI technology to make computers smaller and lighter.

LIGHT PEN: A device that attaches to the computer and allows the user to either draw graphics on the screen, or interact with programs.

MACHINE LANGUAGE: The lowest level language that a computer can understand. Machine language is usually expressed in ones and zeroes.

MB: (See MEGABYTE)

MEGABYTE: Mega is a prefix meaning 1 million. 1 MB is 1,000,000 bytes.

MEMORY: The place inside a computer where information is stored.

MENU: A list of choices.

MICROCOMPUTER: A computer that is based on a microprocessor chip. (See CPU)

MICROPROCESSOR: An integrated circuit that understands and executes machine language programs. (SEE CPU)

MODE: A condition or set of conditions under which a rule applies.

MODEM: Modulator/Demodulator. A device that allows the computer to speak to other computers over the phone lines.

MONITOR: A TV screen or other video display unit which lets the computer communicate with the user in a form we humans can understand.

NETWORK: A system of computers linked together by communication lines.

ON-LINE: The condition of being connected to a working computer.

OPERATING SYSTEM: A program that allows the computer to communicate with you, the user.

PARALLEL: A method of data transmission in which a number of bits (usually 8) are transmitted simultaneously.

PASCAL: A high-level language named after a French Mathematician.

PERIPHERAL: Any device that is extra to the computer.

PINOUT: A description of the function of each pin on an IC, presented in the form of a diagram.

PIXEL: The smallest point of light that can appear on a monitor or video screen.

PORT: A connector, socket, or plug on your computer where devices or peripherals can be attached.

PRINTED CIRCUIT BOARD: The thin board on which the chips are mounted.

PROGRAM: A set of instructions which tell the computer what to do under what conditions.

PROM: Programmable Read Only Memory. (See ROM)

QWERTY: The name given to a standard typewriter keyboard. The name comes from the arrangement of letters on the first six alphabetic keys.

RAM: Random Access Memory. RAM is the main working memory of the computer. The values in RAM memory are lost when the computer is turned off.

READ: The process of moving data from a permanent storage medium such as a floppy disk, into the computer's main memory.

ROM: Read Only Memory. A portion of memory in which the contents can be read but not erased or changed. ROM usually contains the programs or data most needed for the computer to operate. ROM can also refer to the chips that contain Read Only Memory.

RGB MONITOR: A color video monitor that receives three separate color signals (Red, Blue and Green). The video resolution is much higher than in normal color monitors, which receive one composite signal.

RS-232C: A standard set of rules that govern the sending and receiving of data in serial form.

SERIAL: A method of data transmission in which bits enter and leave a system component single file.

SLOTWARE: Any Microtek device that plugs into a slot inside your Apple computer.

SOFTWARE: The programs in a computer that tell the hardware what to do.

SPEECH SYNTHESIS: A technique that converts computer data into sounds that imitate human speech.

SPREADSHEET: A program that allows large amounts of data to be entered, arranged and rearranged in logical patterns defined by the user.

STORAGE: The places where a computer keeps information. ROM, RAM, cassettes and floppy disk are all storage media.

SYSTEM: All of the pieces around and including a computer.

TELECOMMUNICATIONS: The transmission and reception of data over radio, telegraph, satellite or more commonly telephone. A modem is required to effect this means of data transfer.

VOICE RECOGNITION: A technique that allows a computer to respond to a set of instructions spoken by a human voice.

WORD PROCESSING: A type of computer program that allows the user to create, modify, edit and print various documents.

WRITE: To store data on a permanent storage medium such as a floppy disk.



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