A complete resource for users of Apple II computers

Fall 1990
What do you think?

We are interested in your thoughts about *The Apple II Guide*. Simply complete, fold this card, affix a postage stamp, and mail it back to us.

1. How did you obtain your copy of *The Apple II Guide*?
   - User Group
   - Dealer
   - Apple Employee
   - Other, please describe

2. In order of preference, which sections of *The Apple II Guide* did you find most useful (1 as most useful)?
   - Apple II—Yesterday, Today
   - Today, and Tomorrow
   - Understanding the Basics
   - Making the Most of Your Apple II
   - Communication Strategies
   - Troubleshooting
   - Apple Sales, Service, and Support
   - Understanding Technical Information
   - Information Resources

3. What additional topics you would like to see covered in future editions of *The Apple II Guide*?

4. Do you have any additional comments, questions, or issues about *The Apple II Guide*?

5. We would like additional information about you and your Apple equipment. (Please check all that apply):

   - What Apple equipment do you own/use?
   - What Apple equipment do you plan to buy during the next 12 to 18 months?
   - Apple II Plus
   - Apple IIe
   - Apple IIc
   - Apple IIc Plus
   - Apple IIgs
   - Macintosh
     (please list type)
   - Other brands
     (please list type)

6. Where do you use your Apple II computer (please check all that apply)?
   - At Home
   - At Work
   - At School

7. Would you like to receive additional information about Apple computer products? If yes, please complete the following:

   Name
   Title
   Company
   Address
   City State Zip

   Telephone Number
The Apple II Guide

A complete resource for users of Apple II computers
Acknowledgements

Many people at Apple Computer, Inc., incCider/A+: Magazine, Redgate Communications Corporation, Compage, and in the Apple third-party product community and user groups, spent countless hours in researching, writing, and producing this publication. All shared a single goal: to help the more than 5.5 million Apple® II computer users worldwide get the ultimate productivity and enjoyment from their computers.

The Apple II Guide project was managed by Apple World Wide Product Marketing and Apple USA Product Marketing, but would not have been possible without the help of the Apple II, developer technical support, and developer tools engineers.

We wish to express our sincere thanks to all our friends who helped create The Apple II Guide.

Project Manager: Jane Lee, Ed.D
Project Managers, Le Guide: Rajiv Mehta, Emile Schwarz
Project Leader: John Santoro

Authors:
Doug Camp, John, Steve Carlson, Jerry Cline, Matt Detharage, Craig Elliott, Randall Jackson, Elizabeth Lynott, Pam Michaelson, Greg Schaefer, Frank Sweetser, Roger Wagner, Allen Watson, Marie-Aurelia Yao

Reviewers:
Sandra Bateman, Greg Branche, Lee Collings, Matt Detharage, Mary Fallon, Cary Farrier, Tim Golden, Matt Gulick, Channing Hughes, Kevin Knabe, Ron Lichty, Gary Little, Jim Merritt, Ray Montagne, Raymond Nasr, Rod Riggenbach, Adam Samuels, Nancy Stark, Steve Williamson, Al Willis

Contributors:
Fern Bachman, Denise Cox, Cheryl Bond, Tim Brennan, Deanne Dougherty, Chris Espinoza, Michele Free, Sue Fox, Tom Marchionna, Debbie Miani, Jim Merritt, Lupe Moran, Kevin O'Keefe, Jane Oros, Pam Quint, Ralph Russo, Laurie Sheldon, Steve Wesolowski

Publishing Services:
Redgate Communications: Dana Bartosch, Sue Hatanaka Burger, Anne Ellingsen, Jennifer English, Ron Errett, Laura Jenkins, Jeff Ludgate, Alfred Mandel, Thomas Mierzwański, Michael Minigan, Judit Muller
inCider/A+: Paul Boule, Cameron Crootty, Dan Muse, Paul Starr
Compag: Cedric Crocker, David Crossman, Judith Hibbard-Mipaas, Hal Lewis, Kathy Vian
Photography: Julie Chase, Greg Leary
Cover Photography: Charles Kemper

© 1990, Apple Computer, Inc.


Mention of third parties is for informational purposes only and constitutes neither an endorsement nor a recommendation. All product specifications and descriptions were supplied by the respective vendor or supplier. Apple assumes no responsibility with regard to the selection, performance, or use of these products. All understandings, agreements, or warranties, if any, take place directly between the vendors and the prospective users.
Contents

Preface

A Note from Steve Wozniak vii
The Apple II Guide viii

Apple II — Yesterday, Today, and Tomorrow

Apple II: More Than a Promise 2
A letter from John Sculley to the Apple II community

Apple’s Vision of Personal Computing 5
Extending Apple’s vision into the future

Apple and Apple II History 9
Apple and the Apple II changed the course of computing

An Apple II Success Story 17
Computers accelerate the education of students and teachers at Meigs Magnet School

Understanding the Basics

The Fundamentals 20
What you really need to know about Apple II computers

The Apple II Computers 29
Key features differentiate the Apple IIs, Apple Ile, and Apple IIc Plus

An Apple II Success Story 33
Equal access to computing is fundamental for Shoshana Brand and her family

Making the Most of Your Apple II

AppleWorks 36
Increase productivity with the quintessential Apple II program

Telecommunication 46
Teach your computer to use the telephone

Video Overlay 52
Bring the world of video to your Apple II

Hypermedia 55
Expand the horizons of your information world

An Apple II Success Story 65
Commedia uses the versatile Apple II to ‘bring the drama’ back to the theater
Communication Strategies

Networking 68
Connect your Apple II to the world beyond your desk

Data Exchange 72
How an Apple II can trade data with a Macintosh computer

An Apple II Success Story 79
High-tech mom masters Apple II-to-Mac and electronic communications

Troubleshooting

Questions? You're Not Alone 82
Commonly asked technical questions — and answers — about the Apple II

An Apple II Success Story 88
Computers used to make this entrepreneur 'nauseous;' now they run his business

Apple Sales, Service, and Support

Dealers 92
How Apple makes Apple II computers available to buyers

Customer Service and Support 93
Apple makes it easy to maintain your Apple II computer

User Groups 97
What user groups are and what they can do for you

Apple Developers 102
How Apple works with developers

An Apple II Success Story 104
Boston Computer Society's Apple Group — More than a User's Group

Understanding Technical Information

The Hardware 108
How the Apple II began and how it grew

The Operating System 117
How Apple II hardware talks to your applications — and how communication has changed over the years

The Apple Ilos System Software, Version 5.0 126
The latest system software can enhance your Apple Ilos

An Apple II Success Story 138
Tyler Weissman may not be the ultimate Apple II 'power user,' but he's close
Information Resources

Apple Product Information  142
Dozens of products to expand and enhance your Apple II

User Group Referral  151
Apple II opportunities are waiting for you at a local user group

Dealer Listings  152
Where to buy Apple II products, and where to get them serviced

Resources for People with Disabilities  189
Empowering people with disabilities through a network of resource and support centers

Third-Party Products  200
A sampling of Apple II third-party products that offer solutions to users

Articles, Books, and Publications  215
Printed materials can keep you up to date on a variety of Apple II topics

On-line Services  230
Access a world of information and software without ever leaving your Apple II
A Note from Steve Wozniak

Apple® was founded on the singular vision of empowering the individual. We believed that individuals, not institutions, were the key to the future. We had enthusiasm for changing society in a positive way. Although we were too young for the 1960s, we still had revolutionary ideas and a belief that individuals can actually make a difference in the world.

This explains why the Apple II was the perfect product. The Apple II pushed technology beyond the limits of conventional wisdom. It gave us an incredible tool for the mind. It was a tool that ignited the revolution of the individual, using high technology to show new ways of doing things.

The Apple II was truly a revolutionary product because it was conceived by the people who were going to use it. It was an easy-to-use computer in the home, school, or the office.

As an Apple II user, you are very special kind of person. You believe that the best way to predict the future is to invent it. And you understand that the real power of what people do with personal computing technology resides not simply in the computer as a tool, but in what people are inspired to do with that tool. The computer taps the most wonderfully unpredictable element of all: your imagination.

Enjoy The Apple II Guide. I hope that it enables you to be even more productive and find more enjoyment with your Apple II computer.
Apple II: More Than a Promise

A letter from John Sculley to the Apple II community

"Apple Computer, Inc. is committed to selling, supporting, and servicing Apple II computers for years to come." You’ve heard this from Apple employees for awhile, but what does it mean? We firmly believe that people will be using Apple IIs for computing in homes, schools, and small businesses across the world well into the 1990s, and we appreciate the loyalty over the years of our Apple II customers to Apple and its products. We intend to reward that loyalty with appropriate service, support, and product enhancements. *The Apple II Guide* is a tangible part of our plan to assist you in getting the most from your Apple II investment.

Apple II owners are a very vocal group. On behalf of Apple, I want to thank each of you for sharing your continued excitement and passion for Apple II computers. Your continued appreciation for our products and suggestions about our products guide us in decisions regarding the future of the Apple II computer line. It is particularly gratifying to myself and Apple employees, especially Apple II engineers past and present, to see that the Apple II, which launched Apple as a business, continues to be heartily endorsed by educators, consumers, and small business owners.

Since last spring, I've become more personally involved in Apple's product research and development efforts. The future of Apple II's development is now in the very capable hands of Roger Heinzen, Apple Products vice president of software, and Ralph Russo, Apple Products director of Apple II development, whose charge is to see that the enhancements to the Apple II on the drawing boards come to fruition, and to propose and carry out new ideas. Within the last year, we've also added employees in both worldwide product marketing and U.S.A. product marketing dedicated to the Apple II line.

In 1989 and 1990, Apple introduced a number of significant technological improvements for the Apple IIGS®, IIc Plus and IIe computers without increasing the price of the basic products. Several important examples of Apple II product enhancements are Apple II GS System Software 5.0; one megabyte of standard memory for new Apple IIGS computers; the Apple II Video Overlay Card; and the new Apple High-Speed SCSI Card.
In response to requests from customers and developers for improved ease of use and functionality, with Apple IIgs System Software 5.0, we improved the system software speed and network capabilities, and made changes to the toolbox that enable the system to handle basic functions, including sound, drawing, scrolling, and memory management about twice as fast as our earlier System Software 4.0.

The new High-Speed SCSI Card is just one example of Apple’s philosophy — based on customers’ need — to allow Apple II users access to many of the same SCSI peripheral devices as Macintosh® computer users. By building bridges between Apple’s two product lines, our customers can take advantage of the strengths of each. Taken together, our recent Apple II products mean significant improvement in functionality and increase the value of Apple IIs for our customers.

Currently, we are working closely with Apple II hardware and software developers to encourage the creation of innovative products for the Apple II family and to provide them with the information they need to make decisions so their businesses continue to be viable. We also offer new development tools that assist developers in co-development for both the Apple II and the Macintosh. A number of developers in the past year have introduced new software and hardware products for the Apple II family as well as made commitments to their customers to continue to introduce creative, new products that support our own Apple II activities. This commitment from a few key Apple II software developers was documented in a video that Apple mailed to more than 12,000 educators last spring.

We also understand our customers’ need for continued enhancements to the product line — including improvements in the way Apple II and Macintosh computers interact on the AppleTalk® network. Apple II customers, particularly primary and secondary schools, want their large installed base of Apple IIs to operate in concert with Macintosh computers. We are currently working on a variety of “bridges” between the Apple II and Macintosh to make that synergy even better. In early 1991, we will offer a card for the new Macintosh LC computer so it can emulate the Apple IIe — and, therefore, run IIe software. This will provide our customers a wider range of functionality in a single platform.
I can reassure our Apple II customers that we value the Apple II product family as an asset, which we will continue to nourish. However, new products aren't the entire answer, and at Apple, we are constantly evaluating the changing needs of the Apple II community to ensure top-notch service. We recently established a one-year warranty for new owners of Apple II computers, and we continue to offer Apple Care to all owners of Apple II computers.

As toolmakers of state-of-the-art personal computers, we recognize that Apple II computers continue to remain versatile and eminently expandable. Millions of educators, consumers, and small business owners worldwide rely on the Apple IIgs, Ile, and IIC Plus and will for many years to come. For those reasons, Apple Computer is committed to continuing to enhance the functionality of Apple II computers, improving our support to customers, and encouraging developers to push the Apple II technology as far as it can go. As Apple develops new entry-level products, the Apple II family will continue to be recognized for the immense value it provides our customers and our company.

We make this commitment here, and we continually make this same commitment to customers and developers in person. This Apple II guide is part of that commitment and was developed to help you improve the functionality, performance, and usefulness of your computer. To assist us in determining your current issues, concerns, and questions about the Apple II, we've included a response card in the back of this Apple II guide for you to fill out and mail in. We hope to hear your ideas and suggestions soon. We believe and hope you agree that The Apple II Guide is another of Apple's continuing efforts, not only to reward your loyalty, but also to make owning and using an Apple II computer the great experience it was meant to be.

Sincerely,

[Signature]

John Sculley
Chairman, President and Chief Executive Officer
Apple Computer, Inc.
Apple’s Vision of Personal Computing

Extending Apple’s vision into the future

It is important for Apple II computer users to know that our vision of personal computing is the same today as it was 13 years ago when we began doing business. Apple wants to help people change the world for the better by empowering individuals through personal computing technology.

We believe that personal computers, as we envision them, are becoming humankind’s greatest cultural tools. Personal computers allow people and organizations not only to perform current tasks better, but also to realize dreams and capabilities they have not yet imagined. Consequently, we believe the positive social impact of these developments will change the world in ways we cannot yet foresee.

Our vision is a unique and compelling one. Because we design computers for people, we understand that the true usefulness of personal computing technology grows out of people’s willingness, comfort, and enthusiasm for using it. Everything we do revolves around closing the gap between the individual and the technology to create exceptional tools that amplify human ability and extend each person’s reach.

Apple II computers have already changed the way people work, think, create, and communicate in education, in business, and at home. Apple technology fundamentally alters the way organizations perform: empowering individuals, flattening organizations, and providing better, faster decision making. We plan to continue to act as a catalyst, encouraging human development by opening new frontiers of expression and thought for individual intellectual and creative pursuits.
It is within the context of this original vision that we can best understand where Apple Computer will be going in the future. The power of Apple’s vision of personal computing is evidenced by the company’s meteoric rise from its simple beginnings in a Santa Clara, California garage to a Fortune 100 company doing business in more than 120 countries.

Over the years, Apple maintained a singular vision: to make computing power accessible to people by focusing on the individual. Because the company aims to create products that provide meaningful differences rather than promote conformity, Apple’s technological innovations have pioneered new applications and will continue to expand the market for personal computers throughout the 1990s and into the 21st century. This independent focus on technological innovation has provided the company with significant control over its role and position in the industry and the freedom to hold fast to its corporate identity.

Apple’s corporate identity is based on three charters:

☐ Create great personal computer products. Apple is an applied technology company that creates products that people want to use and that enhance their knowledge and ability.

☐ Change the world. Apple wants to make personal computers a way of life in work, in education, and in the home for any person, regardless of their abilities or disabilities. We want to be a catalyst for improving the way things are done.

☐ Build an exciting environment. Apple wants to make working at Apple a fun, rewarding and exciting experience. Openness, shared vision, and a freedom to learn characterize the environment.

Like crafters of fine art, Apple aims to patiently advance its distinct concept of personal computing. We will continue to focus on the individual as the design point, to craft all the pieces of our technology to fit together seamlessly, and to tighten the relationship between the individual and the personal computer. We are committed to bringing our technology to more and more people. We’re broadening the product family at all levels: from high-end to low-end. This strategy allows us to create computers that are appropriate for all kinds of people: from kindergarten students to business people to scientists and engineers.
The Apple II Family

Apple offers an extensive line of personal computers, communications peripherals, and system software designed to address the needs of individuals and markets. The Apple II, first introduced in 1977, has proven to be an extremely durable technology. Because of the Apple II’s popularity throughout the years, more than 15,000 software programs have been written for education, small business, and personal productivity. The Apple II family is noted for the considerable value it has provided and continues to provide our customers and our company.

The Apple II family of products consists of three central processing units (CPUs): the Apple IIc Plus — a transportable, affordable entry-level computer; the Apple IIe — a flexible, expandable, mid-range computer system; and the Apple IIgs — the high end of the Apple II family, which combines graphics, sound, and enhanced color for sophisticated applications.

Apple and Education

Apple’s ongoing goal — to empower individuals by building great personal computers — prompted the company’s early focus on education. Today, educators throughout the world are using computers in preschool through university classrooms.

For the past 11 years, Apple has granted millions of dollars worth of computer systems to schools, universities, and community organizations to improve education, innovation, and services. True to its reputation as a leader in technology and innovation, Apple is currently encouraging the development of interactive multimedia tools to assist educators, and improve and change education. Much future software will be a combination of text, full-motion video, animation, and sound, all controllable through the computer. To bring this next giant step in education to schools and universities, Apple has established strategic partnerships with noted education organizations and companies including Lucasfilm, the Smithsonian Institute, ABC News Interactive, and the National Geographic Society.
The Apple II product family continues to provide excellent value to more than 5.5 million customers, many of whom are educators and students, who use Apple IIs everyday. Apple’s philosophy is to listen to educators and closely involve them as new solutions and enhancements to our products line are developed. We have continued to maintain software compatibility throughout the Apple II line, and soon Apple II compatibility will be available in the Macintosh family, a key consideration for educators.

Our Commitment
At Apple, our design point is the individual and the individual within the organization — not the organization, agency, environment or the technology itself. It’s what people do with our tools that is most important to us — not megabytes and speed. The real power of personal computing technology is in people’s confidence, enthusiasm, and comfort in using it. We want to encourage all Apple computer owners to push our technology to the limit, and continue to offer suggestions and ideas to help us provide the tools that give you the power to be your best.
Apple and Apple II History

Apple and the Apple II have become legends in their own time, landmarks in the age of computing they helped create. The Apple lore includes many firsts and fascinating facts. Here’s how it happened:

1976 No keyboard, no case, no sound, no graphics — but lots of vision

March
- Steve Wozniak (age 26) finishes work on a prototype for a preassembled computer circuit board. The prototype took about 6 months to design and 40 hours to build. It’s barely a computer by current standards — it has no keyboard, case, sound, or graphics. It’s named the Apple Computer I.

April
- Wozniak — better known as Woz — and Steve Jobs (age 21) form the Apple Computer Company on April Fool’s Day.
- The Apple I debuts at the Homebrew Computer Club in Palo Alto, California.

July
- The Apple I board is released for sale to hobbyists and electronics enthusiasts at the price of $666.66.

1977 The debut of the Apple II

January
- Apple Computer is incorporated by Jobs, Wozniak, and their new partner and chairman, Mike Markkula.
- Apple moves from Jobs’ parents’ garage to a building on Stevens Creek Boulevard in Cupertino, California.

April
- The new Apple II is unveiled at the first West Coast Computer Faire. It’s the first personal computer to generate color graphics and includes a keyboard, power supply, and attractive case.
June

- The Apple II is now available to the general public. Fully assembled and pretested, it includes 4K of standard memory. It comes equipped with two game paddles and a demo audio cassette. The price is $1,298. Customers use their own TV sets as monitors and store programs on audio cassettes.

1978 Hard work to make computing easier

June

- Apple’s Disk II disk drive is introduced at the Consumer Electronics Show. It is the lowest priced minifloppy disk drive ever offered by a computer manufacturer. It’s also the fastest and the easiest to use. At first, production is handled by just two employees, turning out 30 drives a day.

1979 No more typewriters

February

- President Mike Scott declares that Apple should set an example for business everywhere and issues a company-wide mandate: “No more typewriters.”

June

- The Apple II Plus is introduced, available with 48K of memory and a new auto-start ROM for easier startup and screen editing. It costs $1,195.

- Apple’s first printer, the Siltype, is introduced.

October

- Personal Software, Inc., releases VisiCalc for the Apple II. The spreadsheet is the first application to make personal computers a practical tool for people who don’t know how to write their own programs.

December

- Apple II annual sales rate is at 35,000 units, up 400 percent from 1978.

- Apple employs 900 people working out of four buildings.
1980  Apple III joins the Apple II

September  • The Apple III is announced at the National Computer Conference. With a new operating system, a built-in disk controller, and four peripheral slots, the Apple III, priced at $3,495, is the most advanced system in the company’s history.
  • Apple’s employee count breaks 1,000.

1981  “Welcome, IBM. Seriously.”

August  • International Business Machines introduces the IBM Personal Computer. Apple greets its new competitor with a full-page ad in the Wall Street Journal with a headline that reads, “Welcome, IBM. Seriously.”

September  • Apple’s first mass storage system, the 5 MB ProFile™ hard disk is introduced, priced at $3,499.

1982  A billion dollar party

November  • AppleFest® — a showplace for more than 5,000 Apple-related products — opens in San Francisco.
  • Broderbund Software releases Bank Street Writer, a word processing program for the Apple computer. It’s still a fixture in many classrooms.

December  • Apple becomes the first personal computer company to reach a $1 billion annual sales rate. It throws a “Billion Dollar Party” for employees.

1983  It’s the Fortune 500 for Apple, but kids can’t wait

January  • Apple introduces the Apple IIe computer, priced at $1,395, and the Lisa® computer, priced at $9,995. Several new peripheral devices are also introduced.
April  • John Sculley, formerly president of PepsiCo, is hired as Apple’s new president and CEO.

May  • Apple enters the Fortune 500 at number 411 — less than five years after its founding.
      • The “Kids Can’t Wait” program is announced. Apple II computers are to be given to about 10,000 California schools by September.

June  • The 1,000,000th Apple II rolls off the assembly line and is the first of the computers to be awarded in the “Kids Can’t Wait” grant.

November  • AppleWorks®, an integrated word processing, spreadsheet, and database software package, is introduced. It soon becomes the world’s best selling software.

December  • The ImageWriter® printer is introduced and lists for $675.

1984 Macintosh is new, but the Apple II is forever

January  • The Macintosh is unveiled at Apple’s annual shareholders’ meeting, to be sold for $2,495.

April  • The Apple IIc, priced at $1,295, is introduced at the company’s “Apple II Forever™” conference in San Francisco. Two thousand dealers place orders for more than 52,000 units on the spot — an industry record.
      • Development of the Apple III line is discontinued.

May  • Broderbund Software announces The Print Shop, the program that many credit with paving the way for the desktop publishing market.

November  • The 2,000,000th Apple II is sold.
1985 Connectivity is the goal

January
- At its annual shareholder's meeting, Apple introduces the LaserWriter® printer, priced at $6,999, and the AppleTalk® Personal Network, priced at $50.

February
- Wozniak resigns to start a new company that will develop products for the home.

March
- Apple IIc computers are enhanced with four new higher performance chips.

April
- The Apple IIc celebrates its first year of production. More than 400,000 units have been sold.

July
- The AppleLink® telecommunications network goes into service, connecting Apple employees, dealers, suppliers, developers, and vendors through electronic mail and information libraries.
- Apple's Office of Special Education is created to identify the computer-related needs of people with disabilities and assist in the development of responsive programs.

September
- Steve Jobs resigns to start a new computer company.

November
- First Lady Nancy Reagan presents an Apple IIe to the College de Leman International in Versoix, Switzerland during the Reagan-Gorbachev summit.

1986 Super deals, supercomputers, and a super new Apple II

January
- Macintosh Plus and LaserWriter Plus are unveiled at the AppleWorld™ Conference in San Francisco. The Macintosh Plus is priced at $2,599; the LaserWriter Plus at $6,798.
- Apple gives U.S. schools the opportunity to trade in old Apple, IBM, Tandy, and Commodore personal computers for credits toward the purchase of new Apple computers.
- Applied Engineering more than triples the speed of the Apple II with its Transwarp accelerator card.
September  • The Apple IIgs is introduced. It features enhanced graphics, sound, and expanded memory, and the 256K CPU is priced at $999. An enhanced Apple IIc is also introduced.

1987 Updates and innovations

January  • Apple updates the Apple IIE, priced at $829.

March  • The Macintosh SE and Macintosh II are introduced.

April  • Apple announces plans to create an independent software company, later named Claris.

November  • For Apple II users who want to run MS-DOS programs, Applied Engineering offers PC Transporter.

1988 AppleLink—Personal Edition comes on-line

January  • Apple introduces the LaserWriter II family of desktop laser printers.
        • Timeworks ships Publish It!, the first true desktop-publishing program for the Apple II.

March  • Apple introduces the AppleCD SC®, an optical storage device for storing and using huge amounts of information.

May  • Apple and Quantum Computer Services introduce the AppleLink—Personal Edition, an on-line communication and information service designed specifically for Apple II computer owners.

September  • The Apple IIc Plus is introduced. It's faster and less expensive than the original Apple IIc that it replaces. The price of an Apple IIc Plus color system is $1,099. GS/OS®, the enhanced operating system for the Apple IIgs, is also announced. It retails for $39.
• Apple introduces the Macintosh IIx computer, the first Macintosh to use Motorola's 68030 microprocessor and 68882 math coprocessor. The company also introduces the FDHD™ — Floppy Drive High Density — Apple's new 1.44 MB floppy disk drive that can read and write to MS-DOS, OS/2, and ProDOS® disks.

October • Claris releases AppleWorks GS, a powerful program available for the Apple II GS.

November • Apple II GS can be upgraded to 7.0 MHz with Applied Engineering’s Transwarp GS.

1989 Speed, memory, video power

March • Claris upgrades a classic with AppleWorks 3.0.

April • The Apple II Video Overlay Card is introduced. It works with the Apple II GS and the Apple IIe to superimpose screen images — text or graphics — on video images from video tapes or disks.

May • Roger Wagner Publishing turns the Apple II GS into a hypermedia workstation with its revolutionary HyperStudio software.

July • The Apple II GS system software, version 5.0, is announced. It's the first 16-bit operating system for the Apple II GS that operates over the AppleTalk network system.

August • Apple introduces a new Apple II GS with 1 MB of RAM standard, at a price of $1,149.

• Claris proves AppleWorks can get better with the release of AppleWorks 3.0 Networked Version.

September • Apple announces two new Macintosh computers: the Macintosh Portable and the Macintosh IIci. The Macintosh Portable is a full-function Macintosh in a portable design. The Macintosh IIci is a high-performance version of the Macintosh IIcx, with 25 MHz and built-in video.
1990 The next step toward the future

**March**
- The new Apple II High-Speed SCSI Card is introduced.
- The Macintosh IIfx is introduced, Apple's most powerful computer to date.

**April**
- In a videotaped message to educators in the United States, Apple reaffirms its commitment to Apple II users, and to bridging the Apple II and Macintosh lines. John Sculley promises that a future, entry-level Macintosh will have an option to run Apple II software.
An Apple II Success Story

Computers accelerate the education of students and teachers at Meigs Magnet School.

What is eight years old, exists in a building that predates the Civil War, and has more than 150 Apple computers? The answer is the Meigs Magnet School for fifth- to eighth-grade students in Nashville, Tennessee. According to Mike Smith, computer coordinator at Meigs, the school serves all of Davidson County in the Metro Nashville area and has 575 students, all of whom were specially selected for the school’s accelerated academic program.

Currently, the school has 50 Apple II GS computers, 27 Apple IIe computers, 11 Apple IIc computers, seven Apple III computers, and 64 Apple Macintosh computers, all networked together via 3,000 feet of cable.

The school uses thousands of software applications during the course of a school year, all available on the network from a dedicated Macintosh network file server. The programs can be called up by any
teacher or student from any computer on the network. Of all the programs available on the system, Smith says that AppleWorks GS and GraphicWriter are two mainstays that every student learns to use.

The advanced curriculum at Meigs is designed to better prepare a child to meet the rigors and challenges of modern life in a high-tech world. "The basic skills needed in today's society have changed. They're no longer reading, writing, and arithmetic. We define the new skills as advanced mathematics, communications, and computer skills," Smith says.

Computers are used in all academic areas, but the school's goal is not to turn out computer programmers. "A main goal is to eliminate computer fears and phobias," says Smith. "Our students learn that a computer is merely sand (silicon, the main component of a computer chip, is made from sand) and solder that requires input from a human source to become an effective tool. We use Apple computers because they are the easiest to learn and operate, and they work the most logically — the way people think and speak. So does the software written for Apple computers."

Some of the school's faculty members also had to be taught not to fear the computers. Many teachers at first felt it was not necessary to include the computers in their curriculums. After providing personalized instruction, Smith says that all faculty members now use the computers for most of their classroom and administrative tasks. "Paper gradebooks are a thing of the past here," he says.

After graduating from Meigs, students can go on to a magnet high school to continue their accelerated education. Both schools are free of charge to the students, but they must pay for transportation. "This cost savings allows a school to provide the best faculty members and classroom equipment — such as our Apple computers," Smith concludes.

Please see the "Third-Party Products" listing in the Information Resources section for more information about third-party products mentioned in this Apple II success story.
Ease of use has always been a guiding principle in the development of Apple computers. As an Apple II user, you don’t need technical skills to use your computer.

This section gives you a behind-the-scenes glimpse of fundamental computing concepts. And in case acronyms like RAM and ROM make you a little uncomfortable, the section eases you into the technical language of computers by including the definitions of terms and concepts. There is also an introduction to the specifications of the three Apple II computers.

After mastering the basics, if you are ready for more technical information about Apple II hardware and operating systems, please see the Understanding Technical Information section.
What you really need to know about Apple II computers

by Pam Michaelson and Frank Sweetser

Maybe you've heard the buzzwords — input, output, CPU, ROM, RAM, and all the rest. But maybe you don't know what they mean. Maybe you use these words, but sometimes aren't sure what the engineers have in mind when they use them. Maybe you want things spelled out. If so, this article is for you.

A computer is a magic gateway to the world's knowledge, to people everywhere, to adventure and mystery and beauty. It's an always up-to-date reference library, a complete office, and a publishing system. It's a studio for the arts — for music, for painting, for poetry, for the imagination. It's a tool for handling information.

The modern computer electronically handles all kinds of information. Text, such as the words you're reading now. Graphics, such as the pictures in this book. Sounds. Animation. Or numbers, like those in your checkbook. The ability to handle all these kinds of information rapidly and effectively gives the computer its apparently magical qualities.

But the computer is actually a system — a set of equipment that receives and stores information and then acts on it. One of these pieces of equipment is the main system unit — a box with a processor that handles your information. A variety of peripheral devices attach to this box. Storage devices such as a disk drive keep a permanent record of your information. The keyboard and other input devices help you "talk" to your computer. The monitor and other output devices, such as printers and modems, allow the computer to "talk" back.
Your computer is a system — a box that contains the central processing unit, plus peripheral devices, system software, and applications that help you work more productively.

The Box — What makes your Apple II so smart?

Most people think of a computer as a box. This “box” contains the central processing unit (CPU) — the source of the computer’s intelligence. These days it’s usually called the microcomputer.

The microcomputer is like an orchestra conductor, telling the parts how to work together in harmony. In it, you’ll find the actual decision-making microprocessor chips, special kinds of computer “memory” called RAM and ROM, and a variety of circuit boards and other microprocessor chips used to coordinate and connect additional devices such as the keyboard, the monitor, disk drives, modems, and printers.

Quickly defined, ROM is the read-only memory that holds the permanent instructions for the computer. These instructions tell the computer how to do things like add, subtract, and recognize the letter A. They tell it how to access the printer, disk drive, and other peripheral devices. These instructions are always available to the computer as soon as you switch on the power.

RAM is random-access memory, which is temporary memory. It’s erased every time you turn off the computer. It changes when you use a different program.
When you turn on your computer, the ROM tells the computer to look in the disk drive. If the computer finds a disk there, it loads the program from the disk into RAM memory. You don't see this happening. You see a menu of program options or the opening screen after the light on the disk drive goes out.

You will hear people describe the amount of ROM and RAM in terms of bytes, kilobytes, and megabytes. A byte is a basic unit of measurement for a computer's memory, about enough to remember a single letter of text. A kilobyte (K) is about 1,000 bytes, and a megabyte (MB) is about 1,000,000 bytes.

Input — The story of keyboards, mice, and your Apple II

Information you send to your computer is called input, and when you send it you are inputting data. The most common way to input information is through the keyboard. Each of the Apple II computers has a slightly different keyboard, but they all work the same way. You use the keyboard when you're typing documents, filling in forms in a database, using numbers in a spreadsheet, or sending instructions to applications.

There are other input devices as well. The mouse is a hand-held device you move across the surface of your desk. As you move the device, the mouse "senses" the direction and distance, and converts this information into coordinates (x and y) that correspond to positions on the computer screen. You can use a mouse in many applications to perform basic operations, but it's particularly useful as a drawing tool in graphics applications. A cable connects the mouse to the back of your computer (on the IIe, IIc, or IIc Plus) or to your keyboard (on the IIGS). With the Apple IIe, you'll need to put an interface card inside your computer. An interface card is a circuit board that you plug into a slot inside the computer's box to link a peripheral device to the computer. In this case, the interface card interprets the movements of the mouse.
A trackball operates on the same principle as a mouse. It attaches to your computer in the same way but remains stationary as your fingers rotate a built-in ball. A joystick is another type of input device, usually used to control the movement of characters, creatures, or objects in a computer game.

Output — When the Apple II shows what it can do for you!

Output is the way that your computer talks back to you. There are several tools for this purpose.

Your monitor displays text or graphics on a television-like screen. A monochrome monitor screen shows text and graphics in amber, green, white, or another single color against a solid background, usually black or dark blue. A color monitor can display a range of colors on the screen, depending on the program you're using. There are two kinds of color monitors: a composite color monitor that uses composite signals to create color images on the screen, and an RGB color monitor that uses red, green, and blue dots to simulate a range of colors on the screen.

A printer can print out on paper the letter you've been writing or that graphic design you "painted" with your mouse. Several different types of printers are available for use with the Apple II line of computers. The ImageWriter is a dot-matrix printer, which uses tiny pins that strike the paper in combination to create recognizable letters or graphics, either in black on white paper or in color. A daisy-wheel printer uses a pinwheel with preformed letters for text printing only. When the microprocessor tells it to use an "a," it types an "a," just like a typewriter. The third type of printer is the laser printer, which gives you near-typeset quality for your letter or newsletter and can print on both plain paper and transparencies.

Your computer has a built-in speaker, with many possible uses. Its basic use is to alert you to mistakes — it beeps whenever you do something wrong. But with proper software, it also permits the computer to speak instructions out loud to a user, a capability that can help a person with a visual disability use the computer just like anyone else. And with a speaker, you can make beautiful music, as well as beautiful text and graphics, with your computer.
MIDI  Abbreviation for Musical Instrument Digital Interface. This software and hardware standard, set by the music industry, allows electronic instruments to communicate with one another and with computers.

To make the most of the built-in speaker, you may want to use some of the sound cards that are available for the Apple IIe and Apple IIgs. The Apple IIgs comes with an Ensoniq synthesizer chip already built in, so you can produce high-quality music right away. You can also add sound cards that take advantage of the Ensoniq chip’s special capabilities. While some of these sound cards can use the internal speaker, external speakers are more commonly used. You can also add stereo cards, audio digitizers, and MIDI interfaces to musical instruments to further enhance your creative abilities with the Apple IIgs.

A home control device is another kind of output device. It sends information from your computer to an electrical appliance in your home. You can plug it into an electrical outlet and program the computer to turn on a light, coffee maker, stereo, sprinkler, or a host of other appliances.

Another way of sending (and receiving) information is through a modem. A modem connects your computer to telephone lines, allowing it to communicate with other computers throughout the world. Telephone lines were originally designed for human voices, but a modem translates your computer’s “digital” output into a form that can be transmitted over these lines. A modem on the other end of the line puts the data back in the correct form for use by the receiving computer.

You can communicate with another computer by calling directly, or you can dial into a bulletin board or commercial on-line service. Bulletin board systems (BBS) are an inexpensive means of communicating with other computer users. Commercial services offer more options but charge fees — some higher than others — to use those services.

Storage Devices — Where to save all that information
That letter that you are writing on your computer is only in the computer’s RAM memory, which disappears when you turn off your system. To store it permanently, you must save it on a disk. Then, if you want to return to the letter at a later date, you will be able to load it from your disk and work on it some more or print it out and mail it.
Data, such as a letter, is only one kind of information that can be saved on disks. Programs — also called software or applications — are also saved on disks. Programs that you purchase come on either a 3.5-inch or a 5.25-inch disk. The 3.5-inch disk is a hard-plastic-cased disk with a metal sliding closure that protects the storage medium inside. It can hold up to 800K of information or about 500 pages of text. The 5.25-inch disk has a thin, flexible plasticized case and holds 140K of information — not quite 100 pages of text. Its storage medium is exposed, so you should always keep a 5.25-inch disk in a protective sleeve when you’re not using it.

You need a disk drive to use or save your data on one of these types of disks. When you purchased your Apple II computer system, you also purchased a disk drive. A disk drive reads the information on a disk or saves information from RAM on a disk for later use. On the Apple IIe and II Plus computers, disk drives are attached, through the back of the computer, to interface cards in slots inside the computer. The Apple IIC and IIC Plus have built-in drives: a 5.25-inch drive in the IIC and a 3.5-inch drive in the IIC Plus. You can add a drive to the Apple II GS or an Apple IIC or IIC Plus simply by plugging the drive’s cable into the back of the computer. A drive icon shows you where to plug in the cable.

Another important storage device is a hard disk. (By contrast, 3.5-inch and 5.25-inch disks are sometimes called floppy disks.) A hard disk is a high-capacity drive that can hold anywhere from 5 MB of programs and data to more than 300 MB — about 200,000 pages of text! Obviously, one advantage of the hard disk is the ability to store many programs, as well as all your data files, on a single disk. Plus, hard disk drives access programs and data much faster than the smaller capacity drives.

Hard disks may be attached to your computer in much the same way as a 3.5- or 5.25-inch disk. Such disks are called external hard disks. However, some hard disks now fit inside the computer. They are called internal hard disks.
CD-ROM: Acronym for compact disc, read-only memory. These discs use laser technology to store data.

CD-ROMs are gaining popularity as storage devices. They are the champs when it comes to storage volume: They can store up to 500 MB of information. But compact discs are read-only discs. You can't store or save new information on them. They come with all the programs and information they will ever contain. To use CD-ROMs, you need a CD-ROM reader such as the AppleCD SC. You plug this reader into your Apple II computer the same way as an external hard disk.

Software — How your Apple II knows its job

Software is a “program that gives the hardware something to do.” A program is a set of instructions for the computer written in a form the computer understands. You don't have to know how to program to use your computer. Software comes on a disk, ready to use as soon as you insert it.

There are several types of software. **Application software** includes all the programs that do the many things you want to do with your computer, from writing letters and reports to balancing your checkbook to relaxing with a game or two.

**System software** gives your computer its personality. It is the set of instructions that tells the hardware how to communicate with you and your application software. The Apple II line can use several different operating systems: DOS 3.3, ProDOS, and GS/OS. ProDOS is the standard operating system for the Apple II Plus, the Apple IIe, and the Apple IIc, and it also runs on the Apple IIgs. The standard operating system for the Apple IIgs is GS/OS. Each system software version has different capabilities and operates in a different way. As a rule, you don't have to worry about which operating system to use, because most Apple II programs come with the system software already on the program disk. They depend on the system software to provide the computer “environment” they need to run.

**Utility software** provides useful tools for the computer user. With it, you can copy files from disk to disk, make backup copies of important programs or data disks, delete old files that you're no longer using, and even retrieve files you've accidentally deleted.
Most software you use will be commercial software. But you may also want to take advantage of public-domain software. Public-domain software is written by people who like to program and aren’t necessarily doing it for the money. In some cases, they have spent a lot of time and effort on a program and have copyrighted it, but offer it for a minimal cost — usually less than $40 — on a pay-on-your-honor basis. Such programs are called shareware. Public-domain and shareware programs are available through user groups and bulletin boards.

Copying commercial software to give to your friends is illegal. By purchasing your own copy of the software and sending in the enclosed registration card, you can be sure to receive notices of updates. You usually also get a special price for updates. More important, you guarantee that developers continue to spend the time and money necessary to develop first-class applications for the Apple II.

Expansion — Who knows what your Apple II will be when it grows up!

All the computers in the Apple II line can grow. You can add peripheral devices such as printers, additional disk drives, a modem, or a mouse. You can also improve the computer’s internal intelligence and memory capabilities.

The Apple IIc, IIc Plus, and IIgs have external connectors called ports for adding peripheral devices. These ports have icons that show exactly where the cable for each type of peripheral device should be plugged in. All the other computers in the Apple II line have expansion slots that allow the computer to grow and expand its capabilities. By adding extra circuit board cards in these expansion slots, you can add extra memory to your computer, speed up its processing, control the various kinds of disk drives, and add other guide capabilities. You can also add special-purpose cards such as the Video Overlay Card. (See the “Video Overlay” article in the Making the Most of Your Apple II section for details.)
Another way to increase your computer's power is by adding chips to the *motherboard* — the main circuit board that covers the bottom of your microcomputer. The microprocessor chip called the Zip Chip, for example, can speed up your Apple IIe or Apple IIc.

**Now you know**

The box. The input and output. The storage devices. The software. These are the basics of your Apple II computer. From these basics spring all the magic, the mystery, the adventure. But perhaps now, the magic won't be quite so mysterious, and you can pursue the adventures of Apple II computing with a lot more confidence.

---

*Pam Michaelson is Co-director of Apple/Boston, Boston Computer Society. She is also the owner and editor of the International New Product Newsletter and, with her husband, Tom, owns an advertising/marketing agency.*

*Frank Street is active in Apple/Boston, Boston Computer Society. His work and interests are diverse — he's a machinist, a science-fiction fan, and an adult literacy volunteer.*
The Apple II Computers

The Apple II family of computers has grown and changed over the years. These three models listed here are the most prevalent today.

Apple IIgs
The Apple IIgs is the most powerful and most colorful Apple II computer ever made. Combining the best of the previous Apple II computers — built-in accessory ports for easy addition of peripherals, and versatile expansion slots for system customization — the Apple IIgs provides an easy-to-use interface, high-resolution color graphics and 15-voice sound capabilities. Its features include:

- Microprocessor □ 16-bit 65C816
- □ 2.6 MHz
- Memory □ 1 MB of RAM
- □ Expandable to 2 MB with Apple II Memory Expansion Card, or to 8 MB with third-party cards
- □ System software built into two 128K ROMs
- Peripheral capabilities □ 8 slots — 7 general-purpose, 1 for memory expansion
- □ Built-in ports for serial printer, modem, NTSC or RGB monitors, 3.5-inch and 5.25-inch drives, joystick, and AppleTalk
- □ Apple Desktop Bus™ (ADB) port for mouse, keyboard, and other input devices
- □ Apple II High-Speed SCSI Card supports devices such as hard disks, CD-ROMs, and tape backup (not included with CPU)
Memory
- 128K of RAM
- Expandable to 1.13 MB with a third-party Memory Expansion Card
- 32K of ROM

Peripheral capabilities
- Composite video output
- Disk drive connector for daisy-chaining up to 3 external 3.5-inch and/or 5.25-inch disk drives
- Joystick, game paddle, and mouse port
- Two RS-232-C compatible serial ports
- Video port for third-party LCD monitors

Keyboard
- Built-in 53-key, full-size keyboard
- Choice of QWERTY or Dvorak layouts
- Speaker volume slide control

Display
- 40- or 80-column text
- Monochrome or composite color monitors
- Low resolution: 16 colors, 40 by 48 blocks
- High resolution: 6 colors, 280 by 192 dots
- Double high resolution: 16 colors, 560 by 192 dots

Sound
- Audio generator with built-in speakers
Equal access to computing is fundamental for Shoshana Brand and her family.

In 1983, Steve and Jackie Brand became frustrated when they began looking for ways to help their six-year-old daughter Shoshana, who has cerebral palsy and a vision impairment, use a computer to keep up with the other children in school. So Steve took a one-year sabbatical from his teaching job and went to computer school, and Jackie met with other families with similar needs. The result was that Shoshana got a specially equipped Apple II Plus and her parents founded the Disabled Children's Computer Group (DCCG) to help other families like themselves. Apple's Office of Special Education and Rehabilitation, which is dedicated to the concept that personal computers are changing what it means to be disabled today, soon learned of the Brand's work and DCCG. Apple then joined forces with the Brands to create a nationwide organization now called the Alliance for Technology Access (ATA) which "focuses on increasing the awareness, understanding, and implementation of microcomputer technology to benefit people with disabilities of all ages."
Today Shoshana uses computers at home and at Pinole Valley High School, California, where she is a freshman. “For the first time in her life, she can do homework without the aid of an adult,” Jackie says. Shoshana uses her Apple IIgs at home more often than she uses the computer at school. She tape records each class and in the evening transcribes necessary information from the tapes and does her homework on her computer. Her computer system is equipped with an Adaptive Firmware Card (AFC) that serves as an interface to a Unicorn Membrane Keyboard. The Unicorn keyboard is touch-sensitive and specially programmed to make it easier for Shoshana to use her Apple IIgs. Shoshana also uses an Echo Speech Synthesizer, which allows her to hear what she is entering into the computer.

“One of the most exciting ways Shoshana has used her Apple IIgs for school was for two science fair projects,” says Jackie. While at Adams Middle School in Richmond, California, Shoshana researched how well children vs. adults and males vs. females understand a voice synthesizer. She had people listen to voice synthesizer audio samples and then repeat what they heard into a tape recorder. To present the results of her research at the science fair, Shoshana used her Apple IIgs to make bar graphs, to create a display board, and to write her report. “It was a great experience for her and her classmates. The project renewed the kids respect for Shoshana’s skills and showed them how the technology worked,” Jackie says. “Shoshana learned more about voice synthesis. She even shared her results with the people at Street Electronics! (makers of Echo Speech Synthesizer).”

Jackie believes that the Apple IIgs is a “terrific” asset for Shoshana as well as kids without disabilities because it enables them to interact. “There’s no way in the world Shoshana could be in a regular school without computer technology,” Jackie says. And the kids without disabilities learn that people like Shoshana are really no different from themselves.

Please see the “Resources for People with Disabilities” and “Third-Party Products” listings in the Information Resources section for more information about ATA resource centers and third-party products mentioned in this Apple II success story.
Making the Most of Your Apple II

More than 15,000 products have been developed for Apple II computers to help you at school, home, or work. For example, Apple II users can compile lists in databases; create videos, graphics and animation; publish newsletters; send mail electronically; and play and create music. More importantly, an Apple II makes these jobs easy and fun. Programs are available for every educational topic from elementary school to college level — including language arts, math, history, geography, science, physics, and more. And, a wide variety of games can entertain you for hours.

While we cannot explore all the possibilities in this section, we will introduce you to four applications: Apple Works to increase personal productivity; telecommunication to communicate with others; video overlay to access incredible video capabilities; and hypermedia to blend access to stored information with on-screen graphics, music, and animation. Please check the “Third-Party Products” article in the Information Resources section to learn about other products to enhance your Apple II computer.
Increase productivity with the quintessential Apple II program

by Warren Williams and Steve Carlton

Ask Apple II users how they use their computer and you will soon hear about personal productivity and AppleWorks. If you already own an Apple II, you undoubtedly know that AppleWorks is an integrated program that combines word processing, database, and spreadsheet functions in one convenient, easy-to-use package. You might also have heard some of the folklore that surrounds this popular program.

In this article, we explore the reality and myths about the development of AppleWorks and describe some unique applications that have contributed to the overwhelming success and popularity of the program.

AppleWorks: Folklore and Reality

It's not often that a computer program generates its own folklore, however, AppleWorks is not a typical program. Robert Lissner's name on the AppleWorks startup screen tells you who wrote the program. But how and why he wrote it is a mystery to many.

Unfortunately, most of the exotic rumors about the development of AppleWorks are not true. No, Lissner did not write the program during a short vacation in Alaska. Nor did he write AppleWorks over an intensive weekend at a summer cottage in California. And, no, Lissner is not a recluse who wrote AppleWorks in a log cabin in the mountains, while powering his Apple with a portable generator. Like most folklore, the creation of AppleWorks is more mundane than these myths suggest.
Lisner, who holds a degree in electrical engineering from Stanford University, bought his first Apple II computer in 1979. Interested in programming as much as in engineering, he soon designed and developed QuickFile®, one of the first successful database programs for the Apple. QuickFile was a flexible, easy-to-use program that appealed to Apple's Steve Jobs, who recognized the program's potential and agreed to market QuickFile through his rapidly growing company.

Lisner recognized that the characteristics that lead to the success of QuickFile could be generalized to other personal productivity programs, and he set out to develop another product. The introduction of Apple's Lisa Office System gave Lisner the idea to produce a program that integrated word processing, database management, and spreadsheet capabilities into a single package that would run on Apple II series computers. In 1982, Lisner started developing Apple Pie, a program that would offer all three modules in one integrated package.

Apple Pie, later called AppleWorks, took two years to design, program, and bring to market. Lisner wrote the program entirely in machine language, working alone in his home office. However, his friends at Apple offered many ideas and suggestions during all phases of the process.

An interesting part of Lisner's work relates to the computers he used to write AppleWorks. In late 1980, Apple introduced the Apple III business system, which was a significant technical achievement for its day. Because Apple was the first company to announce a no typewriters policy, many of the Apple staff in Cupertino had Apple III computers on their desks. Lisner wanted the people at Apple to use Apple Pie, so he wrote his program simultaneously for both the Apple II and III systems. When it came time to market the program, Apple exercised its option to market the Apple II version and left Lisner with the rights to the Apple III product. Lisner sold those rights to a marketing company. The Apple III version of Apple Pie is still available as a program called //E-Z Pieces, which is fully compatible with all except the latest version of AppleWorks.
The Impact of AppleWorks

AppleWorks soon became the most popular program in the history of computing, with more than one million users. It is difficult to overstate the program's impact on the computing community. At home, users replaced their typewriters with Apple II systems and AppleWorks. At school, administrators, teachers, secretaries, and students used the program to enhance their personal productivity. Schools even developed courses around the program and educators used AppleWorks to prepare students for a computer-oriented society. Thousands of businesses started using AppleWorks to help with communications, finances, and inventory management tasks.

The popularity and flexibility of AppleWorks led to the development of a variety of AppleWorks-related ventures. Four companies (Beagle Bros, Pinpoint Publishing, JEM Software, and PBI Software) introduced products that added more than 100 features to AppleWorks. Dozens of developers produced AppleWorks enhancements and templates, and AppleWorks became the model for programs that run on other computers. For example, Claris Corporation (which developed the latest version of AppleWorks) released AppleWorks GS, a more powerful, graphically oriented program that takes advantage of the graphic capability of the Apple IIgs computer.

AppleWorks also spawned the development of the National AppleWorks Users Group (NAUG), the industry's largest single-product users group, which offers valuable resources and services to support the AppleWorks community.

How AppleWorks is Used

Many applications of AppleWorks are predictable. People use the word processor to produce reports, letters, memos and other documents. The database serves to store information that would normally go on 3" x 5" or 5" x 8" cards. And the spreadsheet serves to maintain financial data and other numeric information. But the program's flexibility has led users to utilize AppleWorks in ways that Lissner never expected. Here are some brief vignettes of these unique uses.
AppleWorks for Butchers
Pricing butchered meat in a grocery store is not as easy as it sounds. The butcher buys a cow and must decide how to price each cut to yield a profit on the entire piece of meat. To complicate matters, butchers often price one or two cuts as sale items below their actual cost and must be price competitive on the remaining cuts.

For 20 years, John Casselina ran the meat department in his Cleveland, Ohio grocery by using paper and pencil to do the necessary calculations and ensure the profitability of his department. But the development of AppleWorks changed that. Now John loads his pricing and inventory templates into AppleWorks, enters his figures, and has the prices for each cut in minutes. When John isn’t using his free time to improve the meat department at his store, he is out showing other butchers how to save time with AppleWorks.

AppleWorks and the Post Office
Apple II computers are closely tied to education, but here is an educational application you might not have expected.

The U.S. Postal Service (USPS) uses Apple II computers and proprietary software to train machine operators. The computers simulate the operation of expensive letter sorting machines by presenting trainees with a letter that scrolls horizontally onto the screen. The computer then captures the trainee’s keyboard entries.

Each regional training center uses this propriety software to develop lessons for the machine operators. The center maintains a database of local addresses to ensure that operators sort the mail correctly for that region.

The software written for the USPS was developed before the advent of AppleWorks. However, requests from the regional training centers for AppleWorks compatibility led the Postal Service to rewrite the original programs so they could accept data stored in AppleWorks. Now many centers use AppleWorks to store the data used in the letter sorting machine exercises.
To encourage his colleagues to share information between training facilities, Jim Travis, the manager of training at the USPS Boston General Mail Facility, recently installed an Apple II-based electronic bulletin board at his center, which can be accessed through the Postal Service telephone network. With AppleWorks as the common element between the centers, Jim and others post their lesson plans and templates in AppleWorks format files on the electronic service for downloading by other centers.

**AppleWorks and the Native Tongue**

During the day, John Carson teaches special education courses in a suburb of Montreal. At night, he teaches educational technology courses in Canada's northern tier, more than 1,000 miles from home.

John's students are teachers taking advanced courses in the Distance Education program offered by McGill University. Students and teacher meet only during his rare trips north. Instead, he "lectures" through electronic mail and uses telecommunications services and facsimile equipment for the two-way transfer of information between his home office and his students hundreds of miles away.

Like students everywhere, John's pupils do their work on Apple II computers using AppleWorks. However, these students go beyond using AppleWorks as a personal productivity tool. John's students recently developed a font of the characters in the Inuktitut language. These teachers now use AppleWorks and Beagle Bros' TimeOut SuperFonts to prepare native language printouts without special printing presses and expensive equipment. Following up on this success, students are developing fonts for other native populations. Students and instructor, alike, are pleased to use their equipment and software to maintain and improve students' native language skills.

**Volunteer Program Relies on AppleWorks**

Anthony Vasek started his computing career in 1945 with punched cards and sorting machines. By the early 1950s, he was developing inventory management systems for Univac Model 1004 computers, a computer that was programmed by changing 2.5' x 2.5' hand-wired boards containing the "software." Now this 72-year-old retired software developer volunteers his skills to help coordinate the Meals on Wheels program in Grand Rapids, Michigan.
Meals on Wheels delivers hot meals to the homes of 160 shut-ins throughout the city. Anthony uses AppleWorks and two popular AppleWorks enhancements, TimeOut UltraMacros, and ReportWriter, to schedule the 122 volunteers who prepare and deliver the meals. AppleWorks also lets him maintain a database of the 22 different menus used by the group. Anthony uses AppleWorks to track the current food inventory, determine the amount that must be ordered to prepare each week’s meals, and to compute the cost of the program’s operations.

The voice of experience speaks when Anthony says, “My computer, AppleWorks, UltraMacros, and ReportWriter gives me more programming power than I had with mainframe computers in the 1960s.”

Art on Disk

Walk into June Sullivan’s apartment in the Philadelphia suburbs and you will probably find her at her well-used Apple II GS. June’s computer is her paint brush and pallet, her means of artistic expression. Using a mouse and AppleWorks GS, she draws familiar objects, edits them until they look the way she wants, and adds them to her collection of more than 1,500 images stored on disk.

Ask June how she started using her computer and you will hear interesting stories about how she got started with other exciting projects — like the time she told her family she was going shopping and instead took flying lessons at the local airport.

Unlike one of her other projects (a dismal failure trying to learn to play the bagpipes), June’s work with AppleWorks GS is an unqualified success. At age 66, she recently formed her first business and sold 300 of her disk-based images to a software publisher. Now June is working on two other exciting projects she would like to publish.

When asked why it took AppleWorks GS to help her discover her artistic potential, June says, “I love manipulating images and I couldn’t do that with paper and pencil. Now, when I erase a mistake from my computer, it is gone forever.”
AppleWorks and Property Management

Bruce Rapee, who operates more than 320 apartment units and mobile home park spaces in southern Florida, uses AppleWorks as an integral part of his business management strategy.

An astute businessman, Bruce used an UltraMacros-enhanced copy of AppleWorks to develop an automated, menu-driven system that maintains accounts receivables, tenant rosters and demographics, lease maintenance and renewals, and tenant incident records. The system generates receipts, tenant account histories, deposit slips, rent due reports, Florida's Statutory Rent Due Notice, leases, and parking violation notices. The customized menus on the screen make it easy for operators to enter and locate data, and generate reports without understanding AppleWorks. As a result, AppleWorks saves his staff hours of work while making his real estate venture less dependent on the availability of computer-trained personnel.

One of Bruce's more esoteric applications helps conserve energy and save money. He uses AppleWorks and TimeOut Graph to track water usage in his properties. When consumption rises above the moving average for the past 12 months, he calls a plumber who goes through the units and fixes all the leaking faucets, showers, and toilets.

AppleWorks and Automobile Appraisals

It's summer vacation and you're not thinking of AppleWorks as you wait at the motel for an appraiser to assess the damage from yesterday's automobile accident. But AppleWorks will probably help get that appraiser to your door.

Insurance companies can't keep appraisers in every city and town, so they turn to Bob Rice's Inspection Management Services company to help get your car appraised. Bob and Sue Rice maintain a list of more than 6,500 appraisers who do the necessary inspection and appraisal work. They get the appraiser to the scene, file the necessary reports, and help your insurance company get you on your way.
Bob and Sue use four Apple II computers to manage their business. They log all calls into an AppleWorks database, then AppleWorks helps them locate and contact appraisers throughout the country. They enter appraisers' findings into AppleWorks and use the program to generate all billings.

Their business is growing quickly, and AppleWorks proved so powerful, flexible and easy to use they would not consider any other software package. However, they do plan to buy a Macintosh to let their Apple II computers share files on an AppleShare network.

Positive Self-Concept for Poor Achievers
Underachieving students can enter a downward spiral. Their poor school performance reinforces negative self-concepts. As a result, these students often do not complete their work and fall further behind their classmates.

Rosemary Parmigiani, who teaches junior high school low achievers in Bristol Borough, Pennsylvania, uses AppleWorks to break this cycle. Rosemary teaches her students AppleWorks. She believes that the program is so easy to use that her students' success helps them feel good about themselves and about computing. Once they are comfortable with AppleWorks, she encourages them to use the program to improve their writing and to gather information about the world.

Rosemary finds that students who use AppleWorks are more likely to complete their assignments than students who work by hand. She attributes this finding to the fact that the word processor lets you change your mind about what you write. So, entering a sentence into a word processor document represents less of a commitment than writing on paper. Therefore, her students get better grades, improve their self-image, and try harder at school.

Rosemary's students use the AppleWorks spreadsheet module to learn mathematics. She encourages students to help each other diagnose problems with spreadsheet formulas. As a result, her students develop a better understanding of mathematics and positive feelings about their mathematics skills. Certainly, AppleWorks cannot solve the problem of poor school achievement, but the
program does help many students overcome some of the barriers that inhibit their success.

**AppleWorks Support**

AppleWorks users benefit from the most comprehensive support infrastructure available for any software package. Claris Corporation, developer of both AppleWorks 3.0 and AppleWorks GS 1.1, offers unlimited support to AppleWorks owners through the company's technical support line. In addition, AppleWorks users get support from all the major on-line services, including CompuServe, GENie, and America Online. There are more than two dozen books that help every level of AppleWorks user. And most local Apple users groups and public school Adult Education programs have AppleWorks experts who are anxious to help solve problems that others experience with the program.

NAUG's more than 15,500 members in 42 countries receive the *AppleWorks Forum*, a 36-page monthly newsletter that describes tips, techniques, and hints to help users get more from AppleWorks. The *AppleWorks Forum* also includes news of product releases and reviews of AppleWorks enhancements and AppleWorks-compatible software.

NAUG members have access to more than 150 volunteer consultants who provide free telephone support for their fellow members. A list of consultants and their areas of expertise appears in each issue of the *AppleWorks Forum*.

Members get unlimited access to NAUG's multi-user electronic bulletin board, which lets you communicate with other AppleWorks users, get answers to questions, and download AppleWorks templates and programs. To date, the Electronic Forum has handled more than 44,000 calls from NAUG members seeking help or sharing information with their NAUG colleagues.

NAUG's Public Domain Library contains dozens of disks and hundreds of AppleWorks utilities, enhancements, and templates. The group publishes a 44-page catalog describing the disks in this AppleWorks library. In addition, NAUG members have access to the group's Disk Rescuers Program, professionals who can recover damaged AppleWorks data disks. And NAUG members receive
significant discounts on AppleWorks products from the group and AppleWorks developers.

For more information, contact NAUG, Box 87453, Canton, MI 48187, (313) 454-1115.

Teachers who use AppleWorks should also contact the Teacher’s Idea and Information Exchange (TI&IE) and The AppleWorks Educator. TI&IE publishes disks filled with excellent templates, lesson plans, and other ideas that are valuable to teachers. TI&IE has published more than 40 disks that educators should consider for their collection of AppleWorks resources.

You can contact TI&IE at Box 6229, Lincoln, NE 68506 (402) 483-6987.

The AppleWorks Educator is a 16-page newsletter published eight times a year with articles that describe how to use AppleWorks in the educational environment.

The AppleWorks Educator, AACE, Box 2966, Charlottesville, VA 22902.

For Additional AppleWorks Resources

To obtain a comprehensive AppleWorks bibliography, please send your request with a mailing label to Janet Vratny-Watts, Information Scientist, Apple Library, Apple Computer, Inc., 10381 Bandley Dr., Cupertino, CA 95014. Please refer to “Third-Party Products” in the Information Resources section for more information on the third-party products listed in this section.

Dr. Warren Williams is a Professor of Educational Technology at Eastern Michigan University in Ypsilanti, Michigan. He is the President of the National AppleWorks Users Group and has written more than 75 articles and given more than 100 seminars on AppleWorks throughout the country.

Steve Carlton is the AppleWorks Family Product Manager at Claris Corporation.
Teach your computer to use the telephone  
by Jerry Cline and Greg Schaefer

So you've heard a thing or two about telecommunication. Perhaps you even thought you might like to give it a try. But then you thought it might be too expensive or too complex. Besides, you know it involves the use of your telephone line, so the phone company might want to know what you are doing, and if you're not sure yourself, perhaps you would rather not get involved. If these kinds of concerns are keeping you from discovering the value of telecommunication, this introduction to the topic should ease your mind and get you started.

Telecommunication is a way to use your Apple II computer to find — and share — information. Not just any information, but the particular kind of information that interests you. For example:

☐ If you are a student, you can get the information you need to write a report from an on-line library. Today, many libraries have reference information available on computer. You can call up the computer and get the information without ever leaving your desk. You can also check the library's card catalog remotely to see whether they have the book you want and whether it's available or checked out.

☐ If you use your computer to manage your stocks, you can get up-to-the-minute stock quotations and enter them directly into your stock management program for analysis.

☐ If you are part of the growing revival of cottage industries, telecommunication can help you run your business from home. You can live away from busy populated areas and use your computer and telephone to maintain the business contacts essential to your success.
If you're a professional scholar or even an armchair scholar, you can use telecommunication to keep up-to-date with the latest developments in your field of interest by joining a special-interest group that "meets" electronically.

If you want to communicate with a friend, you can fire up your computer and compose a letter with your word processor. You can type your friend's name and address and then instruct your computer to dial the number of an on-line service. Within a couple of minutes, your letter is in your friend's electronic mailbox.

If you want to tap the enormous body of freeware and shareware, you can use on-line services to find the programs that interest you and, moments later, have them on your computer, ready to use.

To use telecommunication for any of these purposes, you need a telephone line, a modem, a serial card or port, and your Apple II computer. You also need software and someone to call.

The Telephone Line — The phone company doesn't care who's talking

Your telephone line puts the "tele" in telecommunication. Using the phone line for a telecommunications call is no different than using it for a voice call, except that your computer is "talking" instead of you.

Our phone lines were designed for analog voice transmission in which tone, frequency, and volume change gradually, like shades of gray. The computer, however, speaks a digital language, in which everything is black and white — no shades of gray. It understands the controls of switches and whether they are turned on or off. Because the computer speaks only this language of electronic on/off pulses, represented as 1s and 0s, and the phone system can only transmit tones, volume, and frequency, a translating device is necessary.
The Modem — A translating device

A modem is a device that connects your computer to the phone line. It uses a process called modulation to change a tone (its frequency and phase) based on the data you are sending. The result is that the 1s and 0s your computer sends to the modem are changed into tones that can be sent across a phone line. The receiving modem uses demodulation to change the tones back into 1s and 0s. The word modem is a contraction of modulator and demodulator.

**baud** A unit of measure for transmission speed, usually equal to one bit (or pulse) per second.

The most important thing to know about a modem is its baud rate — the speed at which it sends and receives information. Standard baud rates for modems are 300, 1200, 2400, and 9600 baud. At 300 baud, your computer can send about 30 characters per second. At 9600 baud, it can send about 960 characters per second. Obviously, when you are calling long distance or paying by the minute for an on-line service, fast is cheaper than slow. (However, some on-line services charge a higher per-minute fee for higher speed transmissions. So get out your calculator!)

Higher speed modems cost more initially. In fact, the ultra-high-speed 9600 baud modem costs several hundred dollars more than a 2400 baud modem. Also, many services are not currently available at 9600 baud. Today, 2400 baud modems have become quite affordable and are certainly adequate for most telecommunications tasks. High-speed modems can usually be used at lower speeds, and most are designed to determine the speed of the calling modem automatically.

You can get an internal or external modem for your Apple II. An internal modem comes on a card that plugs into a slot inside your computer and is powered by your computer’s power supply. An external modem has its own case and power supply. You plug it into a serial card or port in your computer.
The Serial Connection — Built in or added on?
You connect a modem to your Apple II with a cable to a serial port (unless you’re using an internal modem). If you have an Apple IIc or Apple IIgs, the serial port is built into the computer. All you need to do is plug the modem into the port.

The Apple IIc doesn’t have a built-in serial port. You need to buy and install a serial communications card, such as the Apple Super Serial Card, and then connect the modem’s cable to the card.

Software — Instructions for you, your modem, and the computer you’re calling
In addition to the hardware, you need software to connect to the outside world. Just as you use a word processor to write reports or letters and a spreadsheet program to calculate budgets, you need a telecommunication program to make connections, and send and receive information.

You use the telecommunication software to make choices about settings — to set the baud rate for your transmission, for example. Software can also save you time by automatically dialing the phone numbers of services you use frequently. You can use software to compose, address, and send messages. You can also use it to send files from your computer to another computer, or to save messages and files that you receive.

Like any application, the features and ease of use depend on the software you choose. Many telecommunications programs are available for the Apple II. According to *InCider/A+* magazine, the two leading programs are ProTERM, by InSync Software, and Point-to-Point, by Beagle Bros. Some telecommunications services have their own proprietary software, designed to help you get the most out of their system (America Online is an example).
Someone to Call — On-line services and bulletin boards

You can use your Apple II, your modem, and your telecommunication software to send information to someone directly — a business associate who needs the terms of a contract quickly, for example, or a friend who wants to see your list of favorite places to rent for a summer vacation. You just let your software dial the recipient’s phone number, and then you can send the information directly to his or her computer.

More often, however, you’ll be using a telecommunication service. Two types of telecommunication services are available: large commercial services that many users can call at the same time and smaller bulletin board systems, which usually have only one phone line.

The large commercial services, generally known as on-line services, provide a variety of information. For example, you can use an on-line service to make travel reservations, get the latest news, or play games. You can “chat” with other people who are on-line at the same time as you by typing messages back and forth. Or you can leave messages to be retrieved by someone later. You can also upload and download freeware and shareware programs that the author has authorized for electronic distribution. These services normally charge for usage by the hour, but in most metropolitan areas, you can reach the service with a local phone call, which can save you phone charges if you want to send information to someone in another city.

A bulletin board system — or BBS — is an electronic version of the message exchange board often found at a social gathering place such as the local grocery store. You can tack a note on the board to announce an item for sale, or look for announcements of services or items you need. The subjects of discussion on a BBS may be varied — from how to learn more about your computer to photography or skin diving. You can peruse the bulletin board and download files that interest you. You can also join in a discussion by posting question or ideas in the form of bulletins. Such discussions are called threads, and you can create or follow any thread that interests you and others.
A BBS is often a local service, and many communities have several. Unlike the large commercial services, which use large mainframes or minicomputers to manage the information exchange, a local BBS probably runs on a computer similar to your own. Like your computer, these systems normally run with a single modem and phone line, so only one person can use the system at a time. If you call and the system is in use, you get a busy signal.

**Telecommunications Help — Where to get it**

If you need help getting started with telecommunication, you can get help from several sources. First, contact your local Apple user group. User groups are sure to have members who can answer questions you have about telecommunication hardware and software. They will almost certainly know about all the local bulletin board systems and may even have one of their own. You can also contact an on-line service. Most on-line services have introductory packages that help you get started and let you sample their services. You'll find information about user groups, software, and on-line services in the Information Resources section of this book.

Jerry Cline started and is the system operator for the Arizona Apple Tree bulletin board system in Phoenix. In May 1990, Jerry started InSync Software with Greg Schaefer.

Greg Schaefer rewrote the popular ASCII Express from DOS 3.3 to ProDOS when he was 17. He designed, wrote, and published GBBS and GBBS Pro, the benchmark bulletin board system for his publishing company, which he started when he was 18. His new company, InSync Software, is a joint venture with Jerry Cline.
Video Overlay

Bring the world of video to your Apple II

by Doug Campelojohn

Have you ever wanted to add your own captions and notes to educational or home videos — to bring a physics concept down to earth, for example, or to enliven footage of a family vacation trip? Well, that's what the Apple II Video Overlay Card — and this article — is all about.

Using a combination of hardware and software, the Apple II Video Overlay Card offers new possibilities for learning and creativity by merging two powerful channels of communication — video and computing. With the Video Overlay Card, you can superimpose Apple II screen images on top of video images. You create the screen images using any software package, such as a paint or animation program. You get the video images from a VCR, a videodisc, video camera, or television. You display the combined images on an RGB monitor or composite monitor and record them directly to another VCR.

Sound difficult? It's not. All you need is the Video Overlay Card and your Apple IIe or Apple IIgs.

The Card's Job — Synchronize your computer and video source, then mix the images

You're probably already familiar with the concept of video overlay because the technique is used in television all the time — for captions on news broadcasts and for diagrams on sport replays. The Apple II Video Overlay Card creates a video overlay using a two-part process.

First, the Video Overlay Card detects the incoming video signal and synchronizes the Apple II with the video signal using a process called *genlock*. Then the images are mixed and displayed. The graphics chips on the card determine whether each pixel displayed will be video, graphics, or some combination of the two.

**genlock** A process that locks the video signal generated by a computer in synchronization with the signal from another video source, such as videocassette tape or video camera, to display the two signals together on a single screen.

52 THE APPLE II GUIDE
Your Job — Create images, decide where they go
Here’s what you actually do. Start by using any Apple II application to produce your own text, graphics, or animations. For example, you could write descriptive captions for video footage of a ski trip to Aspen, make detailed diagrams to illustrate the cross-section of a flower, or even draw your dream house on a video of property you’re thinking of buying.

Then, using the VideoMix software included with the Video Overlay Card, decide where you want your overlays to appear and blend the video and graphics images to achieve the results you want. To display your finished product, you need your computer and an RGB monitor, such as the AppleColor™ RGB monitor, or a composite monitor, such as the AppleColor Composite Monitor. You can also record your overlay images on videotape as you display them, using a VCR. What you see on the screen is recorded on the tape, so you can play the tape back later on your computer or on your television screen.

Along with the Apple II Video Overlay Card you get an RGB cable, a video in/out cable, an easy-to-follow owner’s guide, and VideoMix (a utility application that comes in both Apple IIgs and Ile versions). You need to add a video source and some software of your own choosing to create the overlay images. You also need an Apple IIgs with 512K of RAM and ROM 01 (or a later version), or an Apple Ile with 128K of RAM and a revision B or later motherboard.
The Possibilities — Everything from instructional material to Hollywood effects

The Video Overlay Card is a tool with lots of possibilities for educators and home users alike.

As an educator you can label or highlight video images on instructional video material. You can run or even author interactive laserdisc video applications that use overlays to combine video and graphics. And, of course, you can help students design their own creative projects.

At home you can add titles, captions, or scrolling credits over video productions. You can also create a range of Hollywood effects such as fades or dissolves and add other creative touches. The only limit is what you can imagine and create with your software.

Doug Camplejohn is a product manager for Video Integration Products at Apple. His responsibilities include the Video Overlay Card. He attended Carnegie Mellon University, where he received his electrical engineering and MBA degrees.
Stacks of cards. Buttons, text fields, and graphic items. These are the elements of a new world of information where just about anything can happen — in just about any order. It’s the world of hypermedia, and you can get your introduction here.

Ever since the Egyptians learned to take papyrus reeds and make written records with scrolls, people have been recording information and expressing ideas in a linear form. With the early scrolls, the very nature of the physical medium dictated a linear structure to the information. It’s not very convenient to move from the beginning to the end and then back to the middle in a scroll, so information soon became organized into a one-pass, beginning-to-end presentation. Even when someone figured out how to fold the scroll up like an accordion and called it a book, the linear nature remained.

With computers, however, movement through documents of any kind became much easier, and in the early 1960s, a new term was coined to describe this new ability — hypertext. In the hypertext model of information, a researcher who is viewing a document on a computer terminal in a library might come across an author’s name, another book title, or an interesting term, and instantly move to another document, using words and phrases in the current document as a jumping off point.
Hypertext was promising, but a new term has introduced a much more ambitious goal. That term is hypermedia, and it describes the seamless integration of all the modern modes of information: words, graphics, video, and sound, all combined onto the pages of a magic book, the modern personal computer. Hypermedia means more than just combining information, however. It's also a way for an information user to be an active participant in the information display. The user determines the order of presentation by pointing to things on the screen and clicking with the mouse. Each click can lead to a new part of the total information environment. And with computers like the Apple II and Macintosh, which can manage large amounts of information, display text and graphics on the screen, and add the excitement of sound and full-motion video, the information environment is, indeed, diverse.

Sometimes people confuse hypermedia with multimedia. In years past, multimedia was usually thought of as a slide projector with a record player set up alongside to add an audio background. With today's technology, the computer can control not only external devices, such as projectors and sound equipment for formal presentations, it can be the entire show itself — integrating many sensory forms of information. But in the strict sense, multimedia is a passive experience. Hypermedia, on the other hand, is set apart by the user's interactive participation.

**Basic Elements — Stacks of cards**

The basic element of a hypermedia application on the Apple II is a card. A card is a single computer screen of information. Like a file card in a recipe box or Rolodex, it usually has one piece of information — one recipe, one person's address, or a description of one kind of boat.

A group of these screens, or cards, is called a stack. A stack is like a complete application and is usually stored as a single file on your disk. But the grouping of cards does not create fixed boundaries. Movement between stacks is as easy as movement between cards in a single stack.
Each card in a stack has some sort of a graphic background that gives the card a context for the information presented. The graphic background may be a representation of a page from an address book, a map of a building, or just a simple solid color or pattern. If you are creating a stack, you can draw the background yourself, or you can construct it from existing graphics of background screens or clip-art borders and other graphic decorations.

The basic element of a hypermedia application is a card. Cards are combined to build stacks.

Information appears as objects on top of this background. You can use different kinds of objects for different kinds of information. For example, you would use text fields for names, addresses, or paragraphs of explanatory text. You can also use graphic items for pictures or illustrations that are not part of the background. The most important objects, however, are buttons.

Buttons are the action spots on a card. When you point to a button and click with your mouse, something happens. This “something” can be anything the computer can do. You can click a button to move to another card or stack. You can click a button to play a sound or video from a laserdisc. Buttons can start a computer animation, record a test result, or run another computer program.
Buttons make hypermedia interactive. With buttons, you become an active participant in the experience, controlling not only the rate at which you view the information, but the order in which you see it and even the parts you see. What's more, buttons allow you to respond to questions or other prompts from the application, and your responses become part of the stack.

Buttons can be pictures, like this one that returns to the home card.

A text field

A single card can combine text, graphics, and buttons.

Applications — You can be both viewer and creator
Each stack may be an application, stored as a separate file on your disk. Different applications can look quite different to their users, depending on the design of the stack and its screens and buttons. Hundreds of megabytes of information are currently available in public-domain, educational, and commercial stacks for the Apple II family of computers. Popular applications range from family trees and ABC storybooks to stacks on popular ski resorts and magic tricks.
But hypermedia is not only a way to browse through information that someone else has compiled and presented. It's also a powerful tool of expression for anyone with special knowledge, talents, or experience that they want to share with others. For example, it's easy to see how hypermedia makes a great presentation tool for teachers, but it's also a terrific environment for students creating their own reports. For young children with the creative urge or for students looking for a more engaging medium than traditional pen and paper, hypermedia provides a friendly environment whose end results are much more like the graphic and dynamic experiences of the real world.

Asking what hypermedia can be used for is a little like asking what can be done with books, but a look at one hypermedia program, HyperStudio, may give you some ideas on how you can get started in this exciting new area of computing.

**HyperStudio — Autoscripting makes it easy**

HyperStudio is the first hypermedia environment designed specifically for the Apple IIgs. It runs on any Apple IIgs with at least 1 MB of RAM and a 3.5-inch disk drive. HyperStudio provides creative flexibility without requiring users to know a programming language. The secret to its ease of use is *autoscripting*.

Stacks are created with scripts that tell the computer what to do when you click a button on the screen. With autoscripting, you don't need to know a special script language to create these scripts. You can build a stack with buttons by choosing actions from a dialog box. HyperStudio automatically does all the work to ensure that the buttons do the right things when someone clicks them. For example, when you create a button, you can choose these actions:
With autoscripting, you can build stacks and define buttons by choosing options from a dialog box.

On the left are the actions that connect cards and stacks. These include moving to other cards in the stack (the next card or previous card, for example), returning to the Home Stack, or even launching another program, such as AppleWorks, Point-to-Point, or any other Apple II program.

However, buttons don't always have to lead to other cards or programs. So on the right of the menu above, you'll find another set of possible button actions. These include playing a sound (music and voice can be stored on disk or recorded live within the program), playing a video sequence from a laserdisc player, or activating an animation. Another option is a button that automatically performs delayed actions — and you set the length of the delay.

The HyperStudio test function lets you test yourself or others. By identifying a button as a “correct” or “alternate” answer, you can automatically create a stack that records all the buttons a user clicks and calculate a score based on how many correct buttons were chosen.

Of course, if you're a programmer and want to develop more elaborate scripts for a stack, you can add routines written in assembly language, Pascal, or C to any HyperStudio stack. HyperStudio's "Trigger Xcmd" makes it possible.
Examples — From autobiography to geography
Although the idea of hypermedia may sound imposing, it is actually an environment that makes the computer more accessible than ever to teachers and students, parents and children.

Here's a screen from a stack created by Brie Anne Zimmerman, age 7. It tells about her hobbies, school, pets, and other interests.

This home card is a visual index to the stack.

If you click on different parts of Brie's home card, you branch to other cards in the stack:

In the stack, you can hear Brie's voice as she tells you about each card.
Here's another example from a stack created by parents to teach their children about the United States. The starting card is a map of the entire United States. The card shown here appears when you click Arizona.

Geography comes to life with graphic buttons that lead to information about plants, animals, climate, and even a peek at the Grand Canyon.

This card contains 13 buttons that take you to other cards with information about the history of the state, its plants and animals, its population, the state flag, and more. When you click on the Grand Canyon, you get to see a picture of the canyon, accompanied by music from "Grand Canyon Suite."

**Video — Using hypermedia to create multimedia**

The Apple II, with a hypermedia program like HyperStudio, is an ideal multimedia platform for several reasons. The Apple II software is designed with the nontechnical user in mind. In general, if you can use a paint program, you can use any of the hypermedia programs available.
Second, you can combine the power of a hypermedia program with the video capabilities of the Apple II Video Overlay Card. With this card, you can put a video image from a VCR, video camera, or laserdisc player on your computer monitor. Then, using the overlay capability, you can superimpose computer graphics, such as labels, circles, arrows, or even buttons on the video image. On the Apple IIgs, when you add fantastic sound quality in the form of music and natural voices, 1 MB of memory, and superb color graphics, you have the ultimate interactive video machine.

The ultimate multimedia setup is to connect a laserdisc player, such as the Pioneer 2200, 4200, or 8000 to the modem port on the Apple IIgs (or Super Serial Card on the Apple Ile). In this configuration, the computer controls the laserdisc player, which can hold up to 100,000 individual photographs, or up to two hours of full-motion video. Imagine “reading” a stack about the U.S. space program and clicking on a graphic of the space shuttle to suddenly hear the roar of the engines and see it lift from the launch pad. This exciting application of hypermedia is actually happening in thousands of classrooms around the world every day.

Even without additional hardware, however, the Apple Ile, IIc, and IIgs are video naturals. They can be connected directly to any VCR, and whatever is on the screen will be recorded, along with sound if you like. This means that students can take home their “computer reports,” and home users can make their own video presentations.

The 1990s — The decade of the hypermedia revolution

Hypermedia used to be a dream. But with the combination of software and hardware available today, hypermedia is poised to change the world of computing. Products like the AppleCD SC, which can play CD-ROMs with more than 500 MB of data and audio tracks, provide the kind of memory needed to support hypermedia stacks that would have seemed impossible a few years ago.
If you haven't had an opportunity to see a hypermedia application on the Apple II, be sure to stop by your local Apple dealer or visit a user group or school that's using it. Whether you already own a computer or are just now investigating what an Apple computer has to offer, don't miss this opportunity to take part in the newest revolution in personal computing!

Roger Wagner was a math and science teacher until he founded Roger Wagner Publishing, Inc., a company dedicated to the Apple II family of computers and to creating software that helps individuals make computers do what they want to do.
Commedia uses the versatile Apple II to 'bring the drama' back to the theater

Everyone is familiar with the saying “the show must go on,” but not many of us incorporate the sentiment into our daily lives. George and Kurt Herman, a father-and-son team that runs Commedia, Inc., in Portland, Oregon do, however. The company they founded in 1983 publishes original plays; a catalog of published works; and instructional manuals written for high school, college-level, and amateur and professional thespian groups and drama clubs. The Hermans have since started a second business, Theatrends, which produces seminars and workshops for teachers or anyone interested in learning about the theater or theatrical production.

George Herman, a playwright and former college professor at Villanova University, writes many of the plays published by Commedia, Inc. on an Apple II+ and also develops and conducts the seminars. His original play “A Company of Wayward Saints” is highly regarded, and is produced many times each year by high

A COMPLETE RESOURCE FOR USERS OF APPLE II COMPUTERS 65
school and college drama departments, and drama clubs and organizations around the country.

His son, Kurt, handles the actual production of the plays and instruction manuals — also on an Apple II GS. "I use my computer to format and lay out the copy for final printing," Kurt says. "We're well known for publishing plays that are very easy for actors to follow and use, directly from the printed page. The II GS, a LaserWriter printer, and our AppleWorks GS word processor and Paintworks Plus creativity software give us all the flexibility we need to produce such a finished product."

Kurt also uses his Apple II GS and a Sonic Blaster digitizer to record, amplify, edit and play back sounds in stereo during plays, which are produced as part of the seminars and workshops. Using a MIDI device and the Music Studio music-creation program, he also orchestrates the musical scores his father writes for many of the plays published by Commedia, Inc.

In addition to George Herman, the company has an award-winning playwright under contract. Her name is Jenelle Riley, a Portland high school student whose one-act play "Just Julie" was recently published by Commedia, Inc. after she entered it in and won a competition judged by the Hermans. "Jenelle's play was very well written," says Kurt. "She has a lot of talent, and we hope to further her ambitions as a playwright and, through such activities, also help advance the theater as a profession." Jenelle is currently working on a second play, for which Commedia, Inc. will give first-refusal rights to a larger publishing company — in hopes of advancing Jenelle's career.

If a major publishing opportunity does not present itself, the Hermans will publish the play themselves on their Apple II GS, which alone may guarantee Jenelle's success.

Please see the "Third-Party Products" listing in the Information Resources section for more information about third-party products mentioned in this Apple II success story.
Communication Strategies

The Apple II is a personal computer, but it can become an interpersonal productivity tool when connected to the world beyond. In the coming decade, personal computers will become increasingly important communication tools, supporting groups of people with joint goals, common interests, and information to share.

Computers communicate easily today via networks of dedicated cables. The “Telecommunication” article in the Understanding the Basics section introduced you to ubiquitous telephone lines that can be used for communicating over longer distances. This section explains how to use your Apple II for communication through networking. It also explains how to make sure that the information you want to share is in a form that others can use, even if they’re not using an Apple II computer.
Networking

Connect your Apple II to the world beyond your desk

by Emile Schwarz

A single computer can do a lot. But it can do even more when it’s connected to other computers and to devices like printers — that is, when it’s part of a network. To build a network, you need cables and a way to manage the flow of information through those cables. You also need to know a few basic networking concepts.

A network is a group of computers and peripheral devices linked by cables that carry information. When you connect your computer to a network, you can share printers with other users on the network. You can share information and applications without carrying a disk from one computer to another. You can even exchange mail.

If you have an Apple IIe or an Apple IIgs, you can take advantage of Apple’s network system. This system has three components — AppleTalk, LocalTalk, and AppleShare.

**AppleTalk — The rules that make communication possible**

AppleTalk is Apple’s network architecture. It’s the rules for exchanging information. These rules are called protocols, and they are built into the ROM in the Apple IIgs computer, the Macintosh computer, and the LaserWriter printer. You can also use a special interface card to add these protocols to an Apple IIe, an ImageWriter printer, or even an MS-DOS-compatible computer.

AppleTalk conforms to the OSI — Open Systems Interconnection — standard for networks, so you can connect not only Apple computers and devices, but other types of computers, as well.
LocalTalk — The cables that connect
To build a network, you need one or more LocalTalk Locking Connector Kits, which include all the cables and connectors necessary to link devices to the network. You need one kit per computer or printer.

LocalTalk is a type of network. The AppleTalk network system includes several types of networks, such as LocalTalk and EtherTalk®. All of these use the AppleTalk protocols. So when you plug your computer into the network, you can access all of the network’s services, regardless of the network type.

When you connect your computer to a network, it becomes a workstation. If your network is large, it may be subdivided into zones. Zones make access to the network and services more convenient. Your network can also be connected to other types of networks. This larger system of networks is called an internet.

AppleShare — The software that provides the services
To share information on a network, you need an AppleShare file server. A file server is a computer that is equipped with special software and one or more mass storage devices, such as hard disks. The software allows computer users in a network to store and share applications, documents, and other information. In an AppleTalk network, the server computer is usually a Macintosh. The special software is AppleShare.

An AppleShare file server can have several storage devices — hard disks and CD-ROMs. Each disk is known as a volume. By contrast, the disks connected directly to your workstation may be called local disks.

When you select a file server volume, its icon appears on your desktop. You can open the icon just as you would open any other disk icon, and you can use the file server volume the same way you use other disks — to create folders, open applications, and save documents, for example. The main difference between a server volume and a local disk is that many people can have access to a server volume at the same time.
Of course, you may not want everyone on the network to have access to all your files. So AppleShare provides a security system to make sure that only the appropriate people have access to the information stored on file server volumes. This security system defines two kinds of users: registered users and guests. Registered users have a user name that is assigned by the network administrator. When you log on to the network as a registered user, your user name identifies you to the file server. Registered users also have passwords. You use your password to confirm that you are who you say you are. Guests, by contrast, have a standard user name, <Any User>, and no password.

The AppleShare file server software has a feature called access privileges that lets you restrict access to information in particular folders if you’re a registered user. When you create a folder or a file server volume, the folder is automatically set up as a private folder and you, as a registered user, are its owner. You control access to the folder. You can limit access to yourself or to a group of registered users that your network administrator has set up — people who need access to the same information. You can also limit what others do with the information. You can let them view folders only, view folders and files, or make changes to the contents of a folder or file.

In addition to an AppleShare file server, you may need a print server if you want to be able to store files from several different users to be printed as the printer becomes available. You can use the same computer as both the file server and print server, if you have both the AppleShare File Server and AppleShare Print Server software.

AppleShare Aware — Applications that can be shared on a network
You can share applications as well as information on a network if:

- you have a multi-use license for the applications (or the applications are in the public domain)
- the applications are AppleShare aware
An application is AppleShare aware if it can be used safely with an AppleShare file server. With such an application, you should be able to launch the application from the file server and store the documents on the file server so that other users can simultaneously access those documents without inadvertently destroying each other's work.

For More Information

Now that you know a little about how networks work and how you can use them to work more effectively with other computer users, you may want more detailed instructions for setting up and using an Apple network. You'll find these instructions in the following guides:

- AppleTalk Network User's Guide for the Apple IIgs
- LocalTalk Cable System Owner's Guide
- AppleShare File Server Administrator's Guide

Emile Schwarz works in the Product Marketing Group in Apple Computer France, writes for two Apple II magazines, and has written one Apple II book, with a second book currently underway.
Data Exchange

Have you ever wanted to use a MacPaint image on your Apple II? Or write a book on your Apple II, but format and print it on a Macintosh? Have you been using an Apple II for years to manage your accounting, but have recently decided to move all your accounting to a Macintosh? There are lots of reasons for Apple II and Macintosh computers to trade data. And it's possible — with the right tools. Some of those tools are described here.

Apple currently sells two lines of computers — Apple II and Macintosh. Each has its own operating system. The differences in these two operating systems mean that an Apple II cannot directly read files created by a Macintosh and vice versa. But that doesn’t mean they can’t exchange data.

When you want to exchange data between the two machines, you must first get the information from one machine to the other. To do so, you can:

- carry the information from one machine to the other on a disk
- use a file server as the intermediary between computers that are connected via an AppleTalk network
- send the file from one computer to the other via a telephone line

Once you get the information transferred, you must translate it. The logical organization of data in a file is different in Apple II and Macintosh applications. So your Apple II applications can’t directly read files created by Macintosh applications and vice versa.
Several software programs are available to help you transfer information between Apple II computers and Macintosh computers and then translate files to be used with applications on those machines. These include Apple File Exchange, AppleShare, and telecommunication software as well as file translators.

**Apple File Exchange — Using disks to exchange data**

Apple File Exchange (AFE) is a Macintosh application that comes on the Macintosh utilities disks. It is designed to convert information on Apple II disks to a format that the Macintosh can read and vice versa. Even if your Apple II computer uses a 3.5-inch disk, you can't simply insert this disk in a Macintosh and read it directly, because the data is organized differently on the two disks. Apple File Exchange solves this problem.

To use Apple File Exchange to transfer data from an Apple II to a Macintosh, you begin by storing the Apple II data on a ProDOS 3.5-inch disk. If your data is stored in DOS 3.3 format or Pascal UCSD format, you can use one of the following programs to translate it to ProDOS format:

- Apple II System Utilities
- Copy II Plus
- ProSel

To transfer data on either a 3.5-inch disk or a 5.25-inch disk from DOS 3.3 or Pascal UCSD format to ProDOS format, you also need the following hardware:

- Apple IIe with a UniDisk® 3.5-inch disk drive and its interface card
- Apple IIc with a UniDisk 3.5-inch disk drive
- Apple IIgs with a 3.5-inch disk drive and a 5.25-inch disk drive

All the copy utilities for the Apple II can copy from a 5.25-inch disk to a 3.5-inch disk.

Once you have your information stored on a 3.5-inch ProDOS disk, you follow these steps to transfer and translate the files:
Open Apple File Exchange on the Macintosh computer.
Your Macintosh now accepts the 3.5-inch ProDOS disk that it would normally eject with an error message such as "This is not a Macintosh disk."

Specify the source disk and the destination disk.
The source disk is the disk with the files you want to translate. The destination disk is a disk you select to receive translated files. If you are transferring data from an Apple II to a Macintosh, the source disk is your 3.5-inch ProDOS disk. You can also select a particular folder on the destination disk where you want to save the translated files.

Select the files you want to translate from the source disk.

Choose the type of translation you want from one of the translation menus.
Apple File Exchange has several translation menus for different types of translations. For example, one of the menus is the ProDOS to Mac menu. This menu lists the translators that you can use with the ProDOS files you select. When you choose the translator you want, Apple File Exchange performs the translations.

For more details about each of these steps, see Chapters 7 and 8 of the Macintosh Utilities User's Guide.

AppleShare — Using a file server to exchange data
Another way to transfer data between an Apple II and a Macintosh is to use an AppleShare file server on a network. The file server is a computer dedicated to storing and managing files and applications that are shared by several users, each with their own computer. Some of the computers may be Apple II computers and some may be Macintosh computers. All of them can store files and folders on the file server.
The file server may have one or more disks, known as volumes. Apple II computers store their data on ProDOS volumes, while Macintosh computers store their data on Macintosh volumes. With the AppleShare software, a Macintosh can directly open a text file on a ProDOS volume, and Apple II computers can read text files from a Macintosh volume. No translation is necessary.

If you want to share nontext files, however, you can use Apple File Exchange to translate the files as described above. You simply specify the ProDOS and Macintosh volumes as the destination and source disks and then select the files you want to translate.

For more information about using networks to share data, see the “Networking” article earlier in this section.

Telecommunication Software — Using a serial connection to exchange data

A variety of telecommunication software makes it possible to exchange data via a serial connection such as a telephone line or a direct serial connection. To use a direct serial connection to transfer data from an Apple II to a Macintosh or vice versa, you need:

- a serial cable connecting the modem ports of the two machines
- communication software

For the Apple IIe you also need an Apple Super Serial Card. (Be sure that the jumper is in the Modem position.) For the Apple IIc and the Apple IIgs, you simply connect the cable to the modem port.

Once the computers are connected, you can transfer data by following these steps:

- Start the communication programs on both the Apple II and the Macintosh.
- Set one computer to receive and the other to send.

All communication programs have options for both sending and receiving information. You can set these options to transfer data in either direction.
Set the communication parameters.
Before you send data over a serial link, you must set several parameters. In general, you should use these settings:

<table>
<thead>
<tr>
<th>On the Apple II</th>
<th>On the Macintosh</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTY terminal</td>
<td>TTY terminal</td>
</tr>
<tr>
<td>LF+CR</td>
<td>Line feed</td>
</tr>
<tr>
<td>8 bits</td>
<td>8 bits</td>
</tr>
<tr>
<td>XON/XOFF</td>
<td>XON/XOFF</td>
</tr>
<tr>
<td>9600 baud</td>
<td>9600 baud</td>
</tr>
<tr>
<td>No parity</td>
<td>No parity</td>
</tr>
<tr>
<td>Half duplex</td>
<td>Half duplex</td>
</tr>
<tr>
<td>Automatic return</td>
<td>Automatic return</td>
</tr>
<tr>
<td>80 columns</td>
<td>In line</td>
</tr>
<tr>
<td></td>
<td>Auto wrap around</td>
</tr>
<tr>
<td></td>
<td>Modem connection</td>
</tr>
</tbody>
</table>

Send the data.
You can now use the software’s commands for sending data. As with AppleShare, you can read text files directly without a translator. For other files, you must use Apple File Exchange to translate the files once they are transferred.

File Translation — Exchanging text, spreadsheets, and graphics
If you have transferred untranslated Apple II files to a Macintosh — or vice versa — you can use a variety of translators to translate them to the correct format. Apple File Exchange comes with a couple of built-in translators. You can also add translators to the Apple File Exchange folder, or you can use a free-standing translation program to perform the conversions.
**DIF Data Interchange Format** DIF files can be spreadsheet or database files. A file in this format contains information about the size of each record, in addition to the actual data.

**Apple File Exchange** Apple File Exchange can convert spreadsheets, database files, and word processing files from Apple II to Macintosh formats. As a rule, it's best to convert all spreadsheet files to DIF files and all database files to text files. Most corresponding Macintosh applications can then read these files and convert them to the proper format. You can also use MacWrite II to open files from Apple II word processing applications. In addition, a Works-to-Works translator is available for use with Apple File Exchange; you can use it to convert AppleWorks files to Microsoft Works files.

**The Graphic Exchange** With the Graphic Exchange Software, you can read Macintosh disks and import MacPaint files directly from those disks. You can also create a graphics file and convert it to MacPaint format on a ProDOS disk. You can then transfer the graphics files to a Macintosh disk using Apple File Exchange. The Graphic Exchange is published by Roger Wagner Publishing, 1050 Pioneer Way, Ste. P, El Cajon, CA 92020.

**SHRConvert** This shareware program is designed especially for the Apple IIgs. It converts graphics created on a Macintosh and other computer platforms to Apple II formats. It comes with built-in help instructions. You can order it from developer Jason Harper, 1480 Michelle Ct., Apt. A, Colorado Springs, CO 80916.

Once you have translated your files, be sure to open them and see what they look like. The accuracy and completeness of translation varies, depending on three factors:

- the differing structures of the source and destination operating systems
- the similarities and differences between the source and destination applications
- the quality of the translation software
As you become familiar with Apple File Exchange, as well as the translators and applications you're using, you'll find that nearly all the information you need is translated intact from computer to computer.

Emile Schwarz works in the Product Marketing Group in Apple Computer France, writes for two Apple II magazines, and has written one Apple II book; a second book currently underway.
An Apple II Success Story

High-tech mom masters Apple II-to-Mac and electronic communications

Carol S. Holzberg of Shutesbury, Massachusetts is one of the premier Apple II/Macintosh free-lance writers in the country. Her feature stories, columns, and software and hardware product reviews have appeared in a number of prominent mass-market and trade-association computer publications, including the Apple II & Mac Buyer's Guide, Booklist, Classroom Computer Learning, Compute, Computer Buyer's Guide, InCider, Macintosh Buyer's Guide, Macintosh News, PC Games, VAR Business, and many, many more.

Carol's writing career did not begin because of any deep-seated interest in computers, however. Her discovery of what a valuable tool a computer could be occurred rather innocently several years ago. She was working in a business office and using an Apple II for word processing. "At the time, I hadn't given much thought to the machine's educational capabilities," she says. "One day we got a home plug-in cartridge system made by Magnavox that worked with..."
a TV set. A light bulb went off in my head when I saw my 3-year-old son's total fascination with the letters he was ‘typing’ on the TV screen using the system’s rather strange-looking keyboard. I realized then and there that the technology was something special.”

Today, Carol has an Apple IIgs and a Macintosh SE sitting side by side in her office at home. She can put a Macintosh software program through its paces on the SE and write a review about it on the IIgs or vice versa, saving lots of time and providing fresh, spontaneous commentary about the product. On the Apple IIgs, she uses AppleWorks GS for word processing and the Point-to-Point telecommunications program, which allows her to send her articles electronically via telephone lines to the intended publication through a DataLink 1200-baud modem and the MCI Mail system. “This way is faster than regular mail, less expensive than special overnight deliveries, and flexible enough to allow minor edits and major copy revisions to be made the same day. It’s wonderful,” she says.

Carol also works as a consultant one day each week at the Shutesbury Elementary School. She helps teachers and students learn how to use software programs, set up hardware, and solve computer-related problems. “All the teachers have Apple IIs in their classrooms,” she says, “but they are often too busy to learn about new applications or how to use certain software programs, so I provide that assistance and information.” Also, because of understandable budget constraints, part of Carol’s job is to recommend the best, most cost-effective products to add to the school’s software and hardware libraries.

Considering Carol’s expertise as reviewer of software and hardware for national magazines, it’s safe to say that the computer department at the Shutesbury Elementary School is in excellent hands.

Please see the “Third-Party Products” listing in the Information Resources section for more information about third-party products mentioned in this Apple II success story.
Troubleshooting

If you turned to this section, you probably have a question or two about your Apple II computer. This section will help you deal with the unexpected. When you're using your computer, things may not always happen as you expect. Don't think of unexpected events as mistakes — think of them as learning opportunities. The more adventurous you are, the more likely you are to come across new situations — and to learn from them.

As you read this section, keep in mind that Apple provides many resources for your Apple II. If this section does not answer your questions, you might begin by reading the troubleshooting section in the manual that came with your computer. If you don't have a manual, you can purchase the appropriate Apple II computer hardware manual through the service department of your authorized Apple dealer. Also, your authorized Apple dealer, your local user group, and on-line services can be a valuable source of information about your Apple II computer. To find a dealer, user group, or on-line service, please check the Information Resources section.
Questions? You’re Not Alone

Commonly asked technical questions — and answers — about the Apple II

Be aware that the cardinal troubleshooting rule is don’t panic! Instead, observe and analyze. Every Apple II user needs answers to questions at one time or another. Following these general troubleshooting tips may help you out. Of course, there are thousands of questions, and we couldn’t answer them all here. So, it may be helpful to ask questions of a friend or user group member who is familiar with the program you are trying to use. Also, you can check your software manuals for tips. Some software companies even have a telephone hotline to help you with questions about their software.

Why can’t I see anything on the screen?
If nothing appears on the screen when you switch on the power, make sure the computer and monitor are plugged into a power source. If the computer and monitor are plugged into a power strip, make sure the power strip is switched on. Make sure the monitor is connected to the computer. Make sure the computer and monitor are switched on. Check the monitor’s contrast and brightness setting.

If you are working with a TV set, is the RF modulator properly installed and is the switch properly set? If your TV set has a built-in video jack, check the switch on the back of the TV. Is it set to “TV” or to “Video”?

If you’re working with an RGB card in an Apple IIe, is the card properly installed and is the cable properly connected? Make sure the card is not in slot 3.
Why doesn’t the computer respond to my typing?
If the computer doesn’t respond when you type something, check your typing or press the “Return” key. The computer is very literal. If you type RYN for RUN, it will respond with an error message, as it will if you type the letter l instead of the number 1, or the letter O instead of the number 0.

You might want to press Caps Lock down. Very old software programs designed for earlier models of the Apple II accept entries only in uppercase.

If you are working on an Apple IIGS computer, be sure that the keyboard is plugged into the computer and the mouse is plugged into the keyboard.

Why does my computer stall when I turn it on?
Sometimes, if you switch the power off and back on without pausing a few seconds, you can cause the computer to stall. This is actually a feature in the Apple power supply that protects the circuitry from voltage overloads. If this happens, turn the computer off and wait at least one minute before turning it back on.

What does it mean when I see only a square bracket and the cursor on my screen?
When trying to restart the computer by pressing Command-Control-Reset, you released Command and Control too soon after pressing and releasing Reset. Try again, being sure to release Reset first.

You may be using a public domain program or one written by a friend that isn’t self-staring. Ask the friend who gave it to you how to start it.