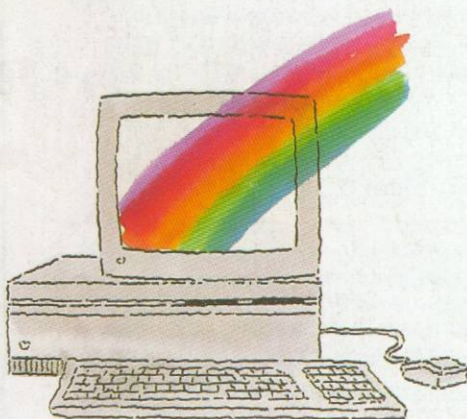# COMPUTE!'s

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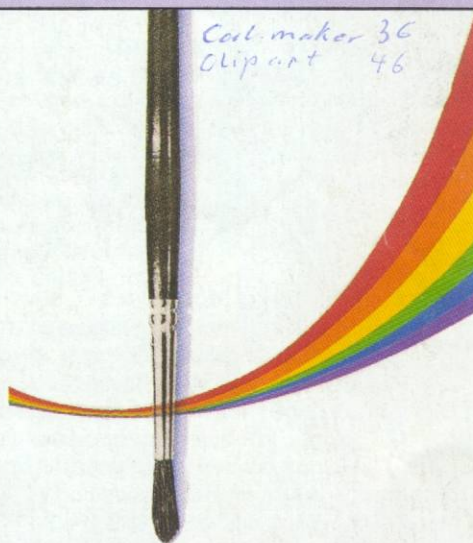
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The IIGS:
A Rainbow Brush, A Fresh Canvas

Lee Noel, Jr., Assistant Editor, Art & Design

When the Apple II made its debut in 1977, it was the first personal computer with color graphics. But recently, Apple II enthusiasts have been watching—probably in dismay—as a whole parade of graphically superior computers has come marching by. In addition to higher screen resolution and more colors, these other computers offer vast increases in speed, power, and memory—three factors which can greatly affect the sophistication of screen graphics. Perhaps the premier example of this new generation is the Commodore Amiga, with its 4096 colors, high-resolution screen, and fast-running Motorola 68000 microprocessor.

With the arrival of the IIGS, Apple II artists and graphics programmers can step into the parade. When the IIGS is not emulating traditional Apple II displays, its graphics capabilities stack up relatively well against the Amiga and the Atari ST. (Compar-
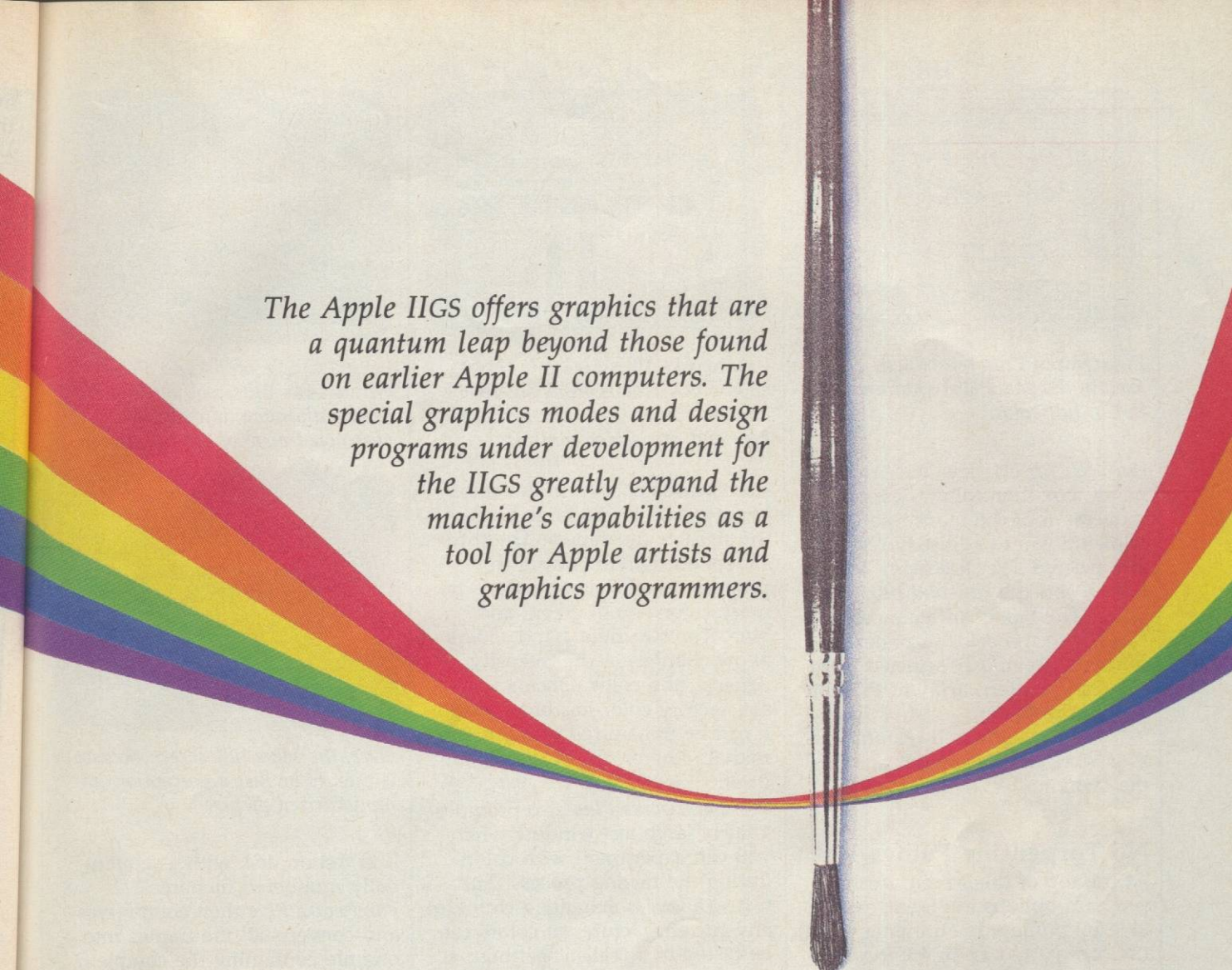
ing the IIGS to Apple's own Macintosh is a little more difficult, since the Mac is strictly a black-and-white computer. But the IIGS nevertheless owes a debt to the Macintosh for the appearance and operation of its software.)

Like the Amiga, the IIGS offers 4096 colors. These are constructed by mixing the three color components of a video screen: red, green, and blue (hence the term *RGB monitor*.) Each component has 16 luminances, or levels of brightness. Sixteen luminances of red, green, and blue yield 4096 unique colors (16 * 16 * 16 = 4096). On the AppleColor RGB monitor, the IIGS display is very clear and distinct, and it appears to be much purer than the display of the Amiga RGB monitor. The Atari ST's display is comparable to the AppleColor screen, but the ST allows only 8 luminances each of red, green, and blue, for a total of 512 possible colors. Although this is sufficient for most pur-

poses, the eight-times-larger range of the IIGS encompasses some delicately subtle shades that cannot be displayed by the Atari.

The entire 4096-color spectrum is available in both of the IIGS's special high-resolution modes, but not all of those colors can be displayed on the screen at once. You can display up to four colors simultaneously on a screen with 640 horizontal and 200 vertical pixels, or up to 16 colors on a screen with 320 horizontal and 200 vertical pixels. (*Pixels*—picture elements—are the individual dots of light that make up an image on a video screen.) Most artists prefer to trade resolution for more colors, so they tend to work with the slightly coarser 320 × 200 mode. (All of the graphics programs we tested, and all of the screen photos accompanying this article, use this mode.)

Although this isn't an exceptionally high resolution—the 320 × 200 screen has been available

The Apple IIGS offers graphics that are a quantum leap beyond those found on earlier Apple II computers. The special graphics modes and design programs under development for the IIGS greatly expand the machine's capabilities as a tool for Apple artists and graphics programmers.

on the Commodore 64 for five years—it is capable of producing stunning displays when coupled with the immense IIGS palette. In fact, since smooth blended-oil and watercolor-wash effects can be easily simulated on the IIGS, pixels can be made to almost disappear, and the resolution can seem almost infinite. Most graphics screens created on the Amiga and ST also use this flexible and effective resolution.

Graphics Software

To take advantage of the IIGS and its magic canvas, the artist—as opposed to the technically skilled programmer—needs some kind of software to make things easier.
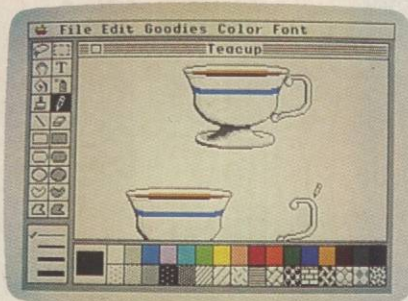
One of the first graphics-design programs to appear for the IIGS was *Paintworks Plus*, published by Activision and developed by Version Soft, creators of the IIGS desktop. *Paintworks Plus* resembles a full-color version of

the popular *MacPaint* program on the Macintosh. Like many other icon-based, mouse-driven programs on the Macintosh, *MacPaint* became an almost instant standard. It inspired several similar programs for the Apple II, but earlier members of the Apple II family were limited by the relatively slow 6502 microprocessor. The 65816 chip used in the IIGS is significantly faster than the 6502, so programs like *Paintworks Plus* operate fairly rapidly.

Like the other graphics-design programs we'll discuss, *Paintworks Plus* offers a full complement of computer art tools. To avoid a lengthy litany of standard features, it's safe to assume that all of these programs—unless otherwise noted—include the usual tools for drawing lines, boxes, ellipses, and circles; for filling shapes with colors and pat-

terns; for magnifying and editing small sections of the artwork; for copying and moving portions of the image; and for saving and printing the screens at various stages of completion.

The icons for tools in *Paintworks Plus* resemble those found in *MacPaint*. Tools are selected from the vertical array of icons at the left edge of the screen. To create a filled box, for instance, all that's necessary is to move the mouse pointer to the solid rectangle near the middle of the icons, click the mouse button once, and move back to the drawing window. From there, another button press fixes one corner of

Paintworks Plus reproduces almost exactly the MacPaint environment, but in full color.

Paintworks Plus makes it easy to choose your colors from the 4096 available hues. Note the test window and five slider controls.

In this simple landscape, the Paintworks Plus tool palettes have been withdrawn, allowing an unobstructed view of the full screen.

Here, the same full-screen landscape is seen to be just a portion of the miniaturized picture.

the box. An elastic-sided "rubberband" box then follows every movement of the mouse pointer, allowing you to adjust the box to any desired size. Releasing the button sets the finished box in place. The box is automatically filled with the color or pattern that you previously selected from the color/pattern array at the bottom of the screen.
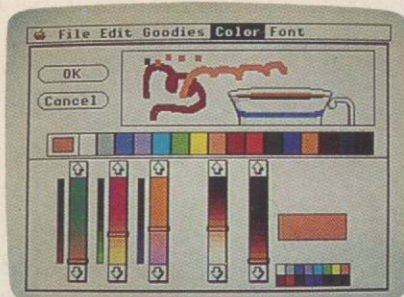
All of the tools in *Paintworks Plus* work in this smooth and simple fashion.

No Turpentine Fumes
At the top of the screen, further program options are made available by pulling down menus from the command bar. In *Paintworks Plus* (as in *MacPaint*), one of the most useful options is called FatBits. This is like a powerful magnifying glass that lets you zoom in and work with the picture pixel by pixel. One excellent feature of *Paintworks Plus* is that all the tools work in FatBits mode—not just one or a few tools as is sometimes the case with other programs.

Another option available from the command bar lets you select from the gigantic IIGS color palette. As you can imagine, picking the desired 16 colors from the 4096 possible hues could be a considerable chore (although not as difficult, say, as mixing and modifying paints with linseed oil and turpentine). Fortunately, the palette options in *Paintworks Plus* make the job relatively easy.

Colors are adjusted with the five slider controls shown in the photo of the palette window. Moving the indicator bar for any of the sliders results in an in-
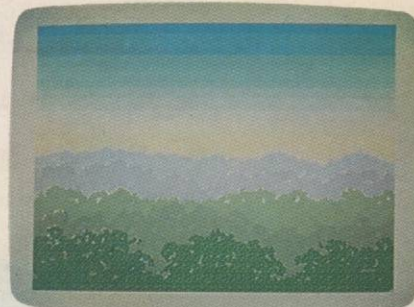
stantaneous change in the color being mixed in the large box at the right of the sliders. The three sliders on the left control the proportions of the computer's primary colors—red, green, and blue. The two right-hand sliders allow changes in the intensity, or density, of a color. Once a satisfactory color has been mixed, it can be transferred into the 16 midwindow blocks of the palette itself.

Paintworks Plus also provides a fairly large test window where you can experiment with colors during the mixing process. The test window is actually a chunk of any current picture, so colors can be tested in a realistic setting. (Tests have no effect on the picture itself.)

The program also lets you save useful palettes into a special palette table. They can be recalled for use in later pictures.

The picture window in *Paintworks Plus* represents only a small portion of a much larger "canvas." The entire picture area can be seen only if printed, but the program includes numerous tools for working with any area of the picture, and even for previewing the whole image in a reduced form.

One feature that sets *Paintworks Plus* apart from many other drawing programs is that it allows the budding cartoonist to make fairly complex animated "films" with relative ease. You start by creating a sequence of pictures, called *frames* or *cels*. Elements common to a number of frames can be readily transferred and manipulated with the wide range of editing tools. Each frame

is saved on disk with a sequentially numbered filename. *Paintworks Plus* then compresses and converts all the frames into one file containing the complete animation and its timing information. This can be played back as a short movie.

The Brush Supreme
DeluxePaint II from Electronic Arts promises to be another powerful picture-making program for the IIGS. Although at this writing there was only a demonstration version available, the program we tested was at least 50 percent functional, and it already incorporated some unique features.

DeluxePaint first appeared on the Amiga in late 1985. Although it doesn't run as fast on the IIGS, it does retain the Amiga version's orientation to the concept of the *brush* as the central drawing tool in most operations. Any section of the screen may be captured and used as a brush. Not only can you paint with the brush, you can also resize, stretch, rotate, or even cast it into perspective. The brush is also the main editing tool, since it

can be copied from one section of the screen to another, or even onto a spare screen.

In some ways, though, *DeluxePaint II* is much like *Paintworks Plus*. Graphics tools are selected from an array of icons (on the right side of the display), augmented by a number of pull-down menus. The range of tools is excellent. Special options include the display of position coordinates for exacting work, several different magnifications for working with individual pixels, and some interesting drawing tools which allow the initial image to be tugged and distorted.
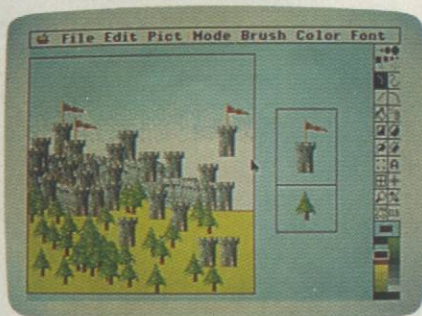
In DeluxePaint II, *the brush is the primary tool. Here, the simple graphics of the pine tree and castle have both been turned into brushes with impressive results.*

The *DeluxePaint II* palette also can be mixed with slide controls, although they don't work exactly the way those in *Paintworks Plus* do. There's no test window, but one particularly useful feature lets you automatically generate a smooth, graduated spread of colors. This process takes the intensity of the hues into account as well as that of the basic colors, and makes it much easier to create the watercolor-wash effects mentioned earlier.

DeluxePaint II also has an animation feature, although it's based on color cycling instead of frame flipping. When using this technique, you specify a range of colors in the palette. Then, in a timed cycle, the program rotates the colors through the selected range. For instance, you could cycle blue, green, and white to simulate foaming waves breaking on a beach. A number of independently operating cycles can be set up.

Dithering Colors

Like most graphics programs, *DeluxePaint II* has a tool for filling closed shapes with color, but it also offers an unusual function that's closely related to the color palette. Ranges established for color cycling can also be used for making gradient fills—that is, fills made up of a range of graduated colors.

Moreover, these fills can be adjusted for the amount of *dithering* in the different colors in the range. In this context, dithering refers to the extent to which pixels of adjoining colors in the defined range are intermixed. For example, if red and yellow were alongside each other, an undithered range would keep the colors completely separate. Dithering would mix together pixels of red and yellow near the common border, creating an orange, border-masking effect.

With dithering, it's possible to create textures ranging from banded metallic to flat, to grainy, or to pebble-like surfaces. These are useful options for an artist, because you're really working only with colored dots of light behind a glass screen.

There are a number of other sophisticated color-related features
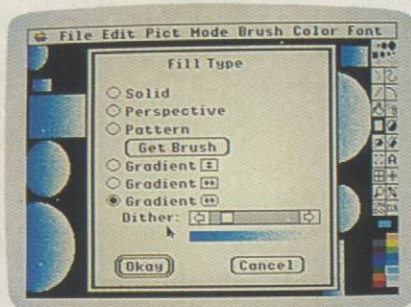
The gradient fill in DeluxePaint II *offers speed and ease of use impossible with traditional art media.*

in *DeluxePaint II*. For instance, you can protect, or mask, certain colors or levels of a picture. In this way, it's possible to draw a complex foreground object and then add an equally complex background without disturbing even a single pixel of the first object. Alternatively, a picture can be built up in several successive layers, each of which is fixed

when satisfactory.

Since good work can be protected from damage, you're free to work only with the strongest elements of any given design.

A Program For All Modes

Another graphics package coming soon for the IIGS is Baudville's *816/Paint*. At the time of this writing, only a nonfunctioning display demo was available. However, the demo and manual do give some hints of what to expect.

For one thing, this program is supposed to work in all of the IIGS screen resolutions, including the normal Apple II modes. It should also be able to access existing graphics files under DOS 3.3. These may prove to be attractive features to artists with a stock of existing material for the Apple II.

Like *Paintworks Plus* and *DeluxePaint II*, *816/Paint* lets you select tools from arrays of icons, but the icons are hidden in pulldown menus instead of being displayed on the screen. Those who find themselves distracted by a host of tiny icons lying atop the artwork may prefer this approach. The menus are clearly related in the Macintosh style, even though their orientation is different.
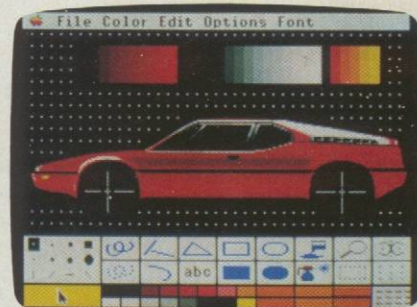
816/Paint is expected to include a wide range of brush effects and color cycling.

More Than Pictures

There is more to graphics than just pictorial material—typography, layout, and page design all fall into this category. And although all the drawing programs described above let you add text to pictures, a program called *GraphicWriter* from DataPak is sharply focused on the text side of graphics.

The core of this program is an up-to-date, mouse-driven, WYSIWYG (What You See Is What You Get) word processor. In a sense, *GraphicWriter* is like a paint program for text. You can enter different kinds of typefaces in different styles (bold, italic, and so on), then edit the text with tools much like those in the drawing programs.

The main display of *Graphic-Writer* simulates a typewriter. Using the mouse to slide small markers across the ruler at the top of the screen, you can set margins, indentation, and various tab positions. The document will be printed exactly as it appears on the screen.

Each paragraph can have its own ruler settings, and the program automatically keeps track of them. As a consequence, text can be typed into paragraphs of different widths and in different styles, so you can manipulate the text in creative ways. As with many other word processors, pages can be forced to break at certain points or left to break automatically, and headers and footers can be added to each page.

Overall, *GraphicWriter* appears to be an adequate word processor for most purposes, although it isn't particularly fast when dealing with large amounts of text.
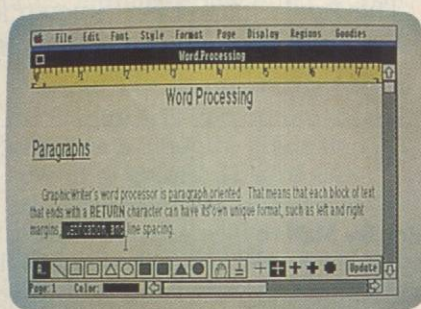
GraphicWriter *utilizes the popular icon-based user environment. Note the ruler at the top of the screen.*

Mixing Text And Graphics

Where *GraphicWriter* really comes into its own is when you want to integrate text and graphics. This is the heart of the new field of desktop publishing, and *GraphicWriter* is clearly intended to play a part here.

Equipped with a fairly good set of drawing tools, *GraphicWriter* lets you easily draw lines, boxes, borders, and so forth, and then color them (if desired). But the artwork thus created is quite different from the images made with a conventional painting program. *GraphicWriter* drawings are *object-based*—that is, every completed item is separate from those created before, and also from those created later. By laying these objects atop one another, you can combine them into complex designs. Because the computer keeps track of each of the objects, they can be peeled apart like the layers of an onion, and even modified or discarded individually.

Objects are restricted to regions, or special screen areas that you define and position as the need arises. Text can be entered into any region. (Actually, the word processing part of *Graphic-Writer* establishes a bottomless, screen-wide region when you start the program. Additional regions fall within this larger, overall region.)

By mixing type, art, and regions, it becomes a relatively simple matter to design pages and covers for virtually any kind of publication. You can easily set up columns of text in any width and length; and artwork—ranging from corporate logos to business graphs to elaborate illustrations—can be handled just as deftly.

GraphicWriter also allows freehand artwork in its "canvas" mode. Here, you define a special canvas region that cannot be mixed with or converted into an object region. The graphics created in a canvas region are pixel-based, like those in the paint programs. The drawing tools in this mode are necessarily restricted, since it forms only a minor part of *GraphicWriter*. But the option is valuable because it allows the straightforward drawing of complex illustrations, something that can be difficult when restricted to an object-only mode.

A Powerful Ally

These programs represent just the first wave of software for the IIGS, but they reveal the computer to be an excellent machine for graphic and artistic expression. In general, the software is of good quality and appears to have benefited from the high standards of Apple and the Macintosh. Like most early programs for a new computer, though, they do have a few problems. For example, the printing options in version 1.0 of *GraphicWriter* were not fully implemented, since they depend on printer drivers that Apple had not delivered by the release date.

One point demonstrated by this software is that the Apple IIGS is graphically comparable to powerful computers like the Amiga and Atari ST, and it may have the best colors of the three. It's even more remarkable that the IIGS maintains compatibility with the old Apple II machines while unleashing some of the best graphics available on a personal computer today.

DeluxePaint II
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$99.95

816/Paint
Baudville
1001 Medical Park Dr. SE
Grand Rapids, MI 49506
$75.00

GraphicWriter
14011 Ventura Blvd., Suite 507
Sherman Oaks, CA 91423
$149.95

PaintWorks Plus
Activision
2350 Bayshore Frontage Rd.
Mountain View, CA 94043
$79.95

With GraphicWriter, *this rather fanciful illustrated news story was laid out in just a few minutes.*

Apple IIGS
Software Buyer's Guide

The Apple IIGS is a computer of power and promise. The power is evident in the computer's sophisticated graphics and sound capabilities—from the super hi-res resolution to the Ensoniq sound chip. The promise, as with all computers, is in the software that's either available or planned.

The software for the newest Apple II ranges from reworkings of popular programs—like *The Print Shop* or *Managing Your Money*—that take advantage of the IIGS's colors or increased memory, to totally new packages that couldn't have been written for any other machine—programs like *DeluxePaint II* or *Talking Text Writer*.

What with this computer's strengths, it's natural that much of the new IIGS software is graphics oriented. Paint programs, some which emulate the Macintosh's *MacPaint*; drawing programs which let you create and manipulate objects with ease; and even desktop publishing programs are just some of what's now available.

Educational software for the IIGS is also starting to make an appearance. That, too, isn't surprising, knowing the number of the IIe computers in classrooms and the soon-to-be-available upgrade from the IIe to the IIGS. Software which takes advantage of the IIGS's sound and speech abilities has already been released. Talking word processors, talking math programs, and talking spelling software are just the first of many products that will entertain and educate at the same time.

The list here isn't an all-encompassing one—instead it presents a variety of the known IIGS programs now (or soon to be) available. Note that prices and availability are subject to change.

Name	Price	Publisher/ Vendor	Category	Description
Business and Personal Productivity				
AppleWorks 2.0	$250.00	Apple Computer	Intregrated package	The IIGS can only run *AppleWorks* 2.0—the newest version of the popular integrated package of word processor, spreadsheet, and database manager.
Award Maker	$39.95	Baudville	Desktop publishing	Create professional quality certificates with colored, detailed borders, specialized graphics, and personalized messages. Easy-to-follow program for creating certificates or awards for any occasion.
Calliope 128	$59.95	Innovision	Productivity	Idea processor and brainstorming tool which clusters ideas and concepts in a structure of the user's choosing.
CommWorks 16	$49.95	PBI Software	Communications	Communications program which features mouse support, color, fonts, pull-down menus, and more. Tranfer formats include ProDOS/*AppleWorks* file transfer, XMODEM, ASCII, and AppleBinary.
DeluxePaint II	$99.95	Electronic Arts	Graphics	A full-featured paint program with 4096 colors, a variety of brushes, zoom capability, variable resolutions, 3-D imaging, fill commands, and variable page size.
DeskTop	$29.95	Simple Software	Productivity	A collection of desktop tools—enhanced calculator, enhanced control panel, scrap book, note pad, cursor editor, and more.
Drawing Table	$89.95	Brøderbund	Graphics	Hi-res object-oriented drawing program that supports the LaserWriter and color printing on the ImageWriter. Built-in rulers aid in precision drawing of everything from floor plans to architectural renderings.
816 Paint	$75.00	Baudville	Graphics	Paint program designed to work with all graphic modes available in the Apple II family. Works in the super hi-res modes of the IIGS.

Name	Price	Publisher/ Vendor	Category	Description
Fantavision	$59.95	Brøderbund	Graphics	Animation and special effects tool which uses the crisper colors, increased processor speed, and super hi-res graphics capabilities of the IIGS. Also supports the computer's impressive sound abilities.
FutureSound	$149.95	Applied Visions	Sound	A digital sound recording package to record, edit, and save digitized sounds directly on the IIGS. Hardware includes two input sources, input volume control, and a microphone.
GraphicWriter	$149.95	Datapak Software	Word processor	Graphics, text, and paint program with over 40 colors available. All three can be done on the same page at the same time.
Managing Your Money	$199.95	MECA	Financial	Personal financial software integrates nine packages for small business and home financial planning. Features accounts payable, accounts receivable, tax forecasting, and more.
MouseWrite 2.6	$149.95	Roger Wagner Publishing	Word processor	Word processor which is now available for the IIGS, *MouseWrite* features pull-down menus, mouse control, mail merge, communications, and a spelling checker. Downloadable fonts and color printing. Shipped in both 5¼- and 3½-inch disk formats.
MultiScribe GS	$99.95	StyleWare	Word processor	Mouse-based word processor that lets you select fonts, character sizes, and type styles. Print on dot-matrix or laser printers.
Music Construction Set	$49.95	Electronic Arts	Music	Compose music, play it back, and print out sheet music. Eight digitized instruments, longer songs, hi-res graphics, and MIDI output are just some of the new features in the IIGS version.
Newsmaker	$89.95	Brøderbund	Desktop publishing	Personal publishing package for the IIGS, *Newsmaker* offers a variety of tools, borders, graphics, and printing capabilities. Design and lay out newsletters, flyers, reports, and presentations.
PageWorks	$125.00	Megahaus	Desktop publishing	Produce newsletters, price lists, publications, bulletins, and more with this desktop publishing program. What-you-see-is-what-you-get editing. Incorporate *AppleWorks* text files.
Paintworks Plus	$79.95	Activision	Graphics	Produce multicolored graphic designs that can come alive in full, animated sequences.
The Print Shop	$69.95	Brøderbund	Graphics	Takes advantage of the IIGS's super hi-res capabilities to aid in writing, designing, and printing greeting cards, signs, letterheads, and banners.
TopDraw	$99.95	StyleWare	Graphics	Object-oriented graphics program for the IIGS. Manipulate shapes and objects with ease. Draw with up to 12 colors at one time. Supports the LaserWriter and color printing on the ImageWriter II.
VIP Professional	$299.00	VIP Technologies	Spreadsheet	*Lotus 1-2-3*-like spreadsheet with more than 50 functions, a 8,192 × 256 cell worksheet, business graphics, and macro abilities. Full-feature mouse interface, color presentation graphics, and more. Reads and writes *1-2-3* files.
Visualizer	$99.95	PBI Software	Graphics	Present spreadsheet data from *AppleWorks* in graph form, using one of several graphic forms: bars, pies, lines, and scatter.
Writer's Choice Elite	$99.95	Activision	Word processor	Takes advantage of all IIGS features, including color. Integrates with *PaintWorks Plus* and includes the cross text feature as well.
Wordperfect Version 1.1	$179.00	Wordperfect	Word processor	A full-featured professional word processing package. *Wordperfect* will automatically reformat text, number pages, assist with hyphenation, and repaginate allowing for headers, footers, and footnotes.

Education

Name	Price	Publisher/ Vendor	Category	Description
CLS Marks	$98.00	Chancery Software	For teachers	Spreadsheet format grading program. Incorporates color and a Macintosh-like interface. View or print students' reports.
First Shapes	$49.95	First Byte	Basic skills	Ted E. Bear helps children ages 3–8 build toys using basic geometric shapes and problem solving.
Homework Helper: Math Word Problems	$49.95	Spinnaker Software	Math	An upgraded package which helps students in grades 7–12 learn step-by-step methods for completing math homework assignments. A built-in calculator solves the equations created by the student.
Homework Helper: Writing	$49.95	Spinnaker Software	Composition	An upgraded package, *Homework Helper: Writing* deals with essays and book reports. Teach students to form and express ideas, then organize the idea into an outline before writing, editing, and printing.
KidsTime II	$39.95	Great Wave Software	Basic skills	Two educational programs—*ABKey* is a letter recognition/keyboard skill program, and *KidsNotes* allows children to play, compose, and experiment with an assortment of simple melodies. Ages 3–10.
KidTalk	$49.95	First Byte	Composition	Children can write, hear, and read their own stories, reports, poems—any form of writing—with this talking notebook. Can correctly pronounce 95 percent of all English words.
MathTalk	$49.95	First Byte	Math	Talking Professor Matt A. Mattics helps children solve addition, subtraction, multiplication, and division problems. Children enter own math problems and receive spoken assistance.
Reader Rabbit	$49.95	The Learning Company	Reading	Four games take advantage of the speech capabilities and enhanced graphics of the IIGS to teach children ages 5–7 the basics of early reading, spelling, and vocabulary.
Speller Bee	$49.95	First Byte	Spelling	Combines speech and enhanced graphics in a spelling mastery program. Ages 5–13.
Talking Text Writer	$249.95	Scholastic Software	Composition	Combines a word processor with a speech synthesizer. Designed to help children in grades K–6 improve their reading and writing skills. Available in both home and school editions.

AppleWorks Forever

Christopher Van Buren

AppleWorks is—by far—the bestselling software package for the Apple II series of personal computers. AppleWorks expert Christopher Van Buren explains what makes the program so popular, and lists some add-on programs which customize AppleWorks.

What makes one program stand out from all others in its class? Is it the number of features, its ease of use, or something even more subjective?

Perhaps one of the best indicators is simple popularity. There's more to software than raw performance and power, and a large number of satisfied users is one of the strongest software recommendations around.

And when it comes to numbers of users, *AppleWorks* comes out far ahead of any other Apple II product. Apple claims that there are over 500,000 *AppleWorks* users—other sources say that the number is closer to one million. Whether half a million or twice that, these numbers provide stability. With that many people relying on *AppleWorks* for business and education, it's unlikely that another program will take its

place. And first-time computer users feel safest with a product that has been tried and tested.

A Stable And Secure Investment

When you spend $2,000 or more for a computer, monitor, printer, disk drives, and other equipment, you hope the investment isn't just temporary. You want to believe that the computer won't quickly become obsolete. With its huge following, *AppleWorks* has insured the longevity of the Apple II computer. In fact, since *AppleWorks* was introduced, there has been a strong revival in the Apple II market.

More copies of *AppleWorks* have been sold than of any single Apple II program—ever. Its integration of word processing, database management, and spreadsheet analysis has made *AppleWorks* virtually a necessity for many Apple II users.

Ironically, however, most *AppleWorks* users don't take full advantage of its powers and expandability. Many users have never ventured into the spreadsheet, using only the database and word processor. Learning to use a spreadsheet for the first time can be a challenge. But here's where

the abundance of *AppleWorks* users can help. Most likely, somebody is already doing what you want to do with *AppleWorks*.

AppleWorks Users Can Help

A huge following does more than just increase a product's life span. It provides a wealth of information for solving problems with your computer and software. *AppleWorks* user groups are sprouting up all over the country. Local Apple groups are forming *AppleWorks* SIGs (Special Interest Groups). And there are a few national groups dedicated to *AppleWorks*, with memberships in the thousands.

User groups often have libraries which include scores of public domain programs and *AppleWorks* templates (predesigned files). Most user groups publish newsletters with reviews of software products, tips, and other pertinent information. Just as important are user group meetings, where local *AppleWorks* experts are usually available to answer questions.

Additional help can be found in the number of good *AppleWorks* publications around—a recent count yielded over 30 *AppleWorks* books.
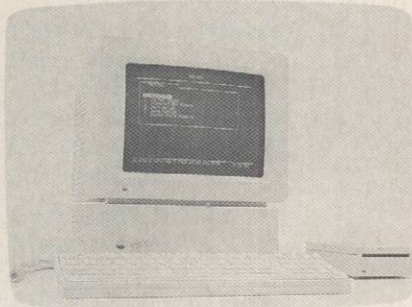
Quicken, *a check-writing and -printing program, works on the Apple IIGS. The program writes and prints your checks, helps balance your bank statement, and even transfers data to* AppleWorks *so that you can analyze your expenses and income.*
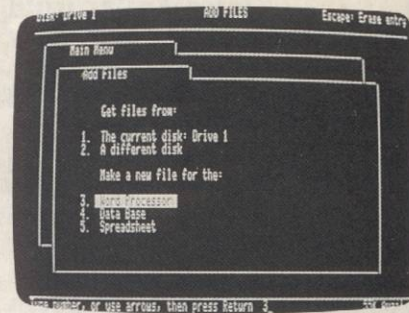

"Quick-Dumper" is just one of the five printer support utilities found in Print-Quick. *With Quick-Dumper, you can print all or part of any hi-res screen.*

AppleWorks' *familiar file folder-like desktop is just one of the things that have made it the bestselling program for the Apple II—series computers.*

Adding To *AppleWorks*

But all the user groups and help in the world can't change *AppleWorks* itself. You may find ways around some of the deficiencies in *AppleWorks*—taken individually, the program's three modules can't stack up against more powerful stand-alone software—but to truly get the most from *AppleWorks*, to make it do exactly what you need and want it to do, you'll need help from a different quarter.

AppleWorks scores even more points here, for it's supported by a variety of third-party software and hardware manufacturers. Using add-on products from third-party companies, you can customize your *AppleWorks* system so that it rivals any specialized software on the market.

There are three levels of add-on products for *AppleWorks*. Some products merely exchange files with *AppleWorks* files or let you convert files between the programs. After converting an *AppleWorks* spreadsheet, for example, you might use a graphing program to graph the data.

Other products can read *AppleWorks* files directly, even though these programs are separate, stand-alone software. For example, *FontWorks* from The Software Touch reads *AppleWorks* word processor files and then prints them with fancy fonts. You must leave *AppleWorks* to use these kinds of add-on products.

The highest degree of compatibility is found in the programs that "patch" *AppleWorks*. A program that patches *AppleWorks* actually changes *AppleWorks* itself—on a source code level. Patches usually add features or correct problems in *AppleWorks*. Most important, however, is that these programs are not separate from *AppleWorks*. They become part of *AppleWorks*. You never have to leave *AppleWorks* to use them.

Such power is not without drawbacks: Often, patches made by different manufacturers won't work together. Patching *AppleWorks* can also be confusing. Sometimes several patches are needed before your system works properly. And if a manufacturer updates its patch program, you usually have to repatch everything. But for the dedicated *AppleWorks* user, patches are difficult to live without.

Some Of The Enhancements

If you're an avid database user, you'll find many products that increase the size of the *AppleWorks* database. Most companies which create memory expansion hardware for the Apple II also provide an *AppleWorks* add-on that increases the program's database limits—letting you take advantage of the extra memory. Companies like Applied Engineering and

Checkmate Technologies lead the field in these enhancements (which, by the way, are patches).

If you've run into limitations building database reports, you can expand these capabilities with a program called *ReportWorks* from Megahaus. *ReportWorks* lets you build any kind of report from *AppleWorks* information (including full-page forms) and lets you relate information among several *AppleWorks* files. You can sort these reports, calculate information in them, and even search for information. *ReportWorks* isn't a patch—it reads *AppleWorks* files and writes its files in *AppleWorks* word processor format. *ReportWorks* also enhances the *AppleWorks* spreadsheet, giving you more math capabilities.

Other spreadsheet enhancements include utilities which print sideways (for extra-wide spreadsheets), programs that provide graphing for data in spreadsheets, and more predesigned spreadsheet files than you can imagine. These predesigned files offer capabilities like trigonometric calculations, amortization, loan analysis, accounting, billing, and much more. Many of these templates are in the public domain, while others are available from commercial publishers.

You can also get word processor add-ons which offer more printing power for documents, including the ability to print using fancy type styles (fonts). Other

word processor add-ons correct errors in spelling and grammar. *Sensible Speller* and *Sensible Grammar* (both from Sensible Software) are two products in this category. Still other products provide mail-merging capabilities.

Accessories And Macros

Pinpoint Publishing introduced a completely new kind of add-on, called an *accessory*. An accessory is a small program which can be used while you're using *AppleWorks*. Popularized by the Macintosh computer (where the small applications are called *desk accessories*) and the IBM line (called *memory-resident utilities*), these programs include tools such as calculators, notepads, spelling checkers, and more.

Perhaps the most powerful kind of *AppleWorks* add-on you can get is a *macro* program. This lets you create, store, and run a macro—a series of keystrokes that have been "recorded" and which can be "played back" by pressing one or two keys—within *AppleWorks*. A simple macro might hold your name and address. By pressing one or two keys, you get the macro to automatically retype your name and address. Macros save time, and, when substituted for complex chains of commands, are easier to remember.

But macros can do much more than hold typed information such as names. They can also store commands and use functions—akin to a programming language. By combining these functions in a macro, you can overcome almost any *AppleWorks* limitation. For example, *Super MacroWorks* (Beagle Brothers) has sample macros that will automatically type the current date in several date formats (*AppleWorks* normally has only one date format), and one that will let you draw pictures in the word processor using characters.

These examples only hint at the tremendous power of macros. And you don't even have to create your own macros since many macros are available from publishers of the macro programs, and others from user groups.

It's easy to see why *AppleWorks* is the number-one program on the Apple II computer, and one of the top three bestselling computer programs ever. Just when you think you've mastered it, you'll find several new add-ons that increase its powers and give you more for your original *AppleWorks* invest-

ment. In a sense, *Appleworks* always seems to be growing and changing. It's a rich, protean program and, most users find, it's quite difficult to do without.

Christopher Van Buren is editor and publisher of AppleWorks Exclusive Reference *newsletter, and author of several books on* AppleWorks.

Add-On Software For *AppleWorks*

Macro Products

MacroWorks/Super MacroWorks
Beagle Brothers
3990 Old Town Rd.
San Diego, CA 92110
$34.95 (MacroWorks)
$49.95 (Super MacroWorks)

Super MacroWorks is probably the most powerful macro product available. It's flexible and full of features for creating custom macros. All special functions can be accessed in a record mode. Ten of its special functions can be used at any time during *AppleWorks*—it's like having more *AppleWorks* commands. Requires *AppleWorks* version 2.0.

Key Player
Pinpoint Publishing
P.O. Box 13323
Oakland, CA 94661
$49

Key Player has an easy-to-use interface. Recording custom macros is simple. *Key Player* has all the most important special macro functions such as logic statements, date formatting, and string functions. *Key Player* also works with other Pinpoint accessories.

AutoWorks
The Software Touch
9842 Hibert St., Suite 192
San Diego, CA 92131
$49.95

Like *Key Player*, *AutoWorks* also contains all of the important functions for custom macros. Overall, however, *AutoWorks* has the fewest functions of the macro programs. Newest versions of *AutoWorks* work with Pinpoint accessories on expanded memory. *AutoWorks* comes with an excellent mail-merge feature.

Print/Font Improvement

Power Print
Beagle Brothers
3990 Old Town Ave.
San Diego, CA 92110
$39.95

Power Print is a font downloader that lets you generate your own fonts to use on dot-matrix printers. It comes with several ready-made fonts and works with most printers and interface cards. You'll find this a useful program for adding borders and special graphics to your *AppleWorks* printouts.

Print Quick
Third Wave Technology
11934 Lorain Ave.
Cleveland, OH 44111
$49.95

Print Quick also lets you generate your own fonts and graphic images. It supports proportional spacing of fonts and offers a lot of space for creating a font. *Print Quick* comes with several other print enhancements, including a hi-res screen dump. Ask about extra font disks.

FontWorks
The Software Touch
9842 Hibert St., Suite 192
San Diego, CA 92131
$49.95

FontWorks is made specifically for *AppleWorks* word processor files. It provides excellent fonts and lets you use up to four fonts per file. You can alter the height and width of the fonts. This is a simple program to use.

Sideways

Funk Software
222 Third St.
Cambridge, MA 02142
$69.95

Sideways lets you print ProDOS, DOS 3.3, and *AppleWorks* spreadsheet files sideways down the length of the paper. Its main use is to print large spreadsheet files.

Slalom

Big Red Apple Computer
1105 S. 13th St., Suite 103
Norfolk, NE 68701
$5.00

Prints spreadsheets sideways.

Graphing/Graphics

GraphWorks

PBI Software
1111 Triton Dr., Suite 201
Foster City, CA 94404
$79.95

A graphing product made specifically for the *AppleWorks* spreadsheet. Import your spreadsheet data to *GraphWorks* and the graphs are generated automatically. Does have a limit in spreadsheet size that can be graphed. Graphs use hi-res graphics.

App-Stat

StatSoft
2832 East 10th St., Suite 4
Tulsa, OK 74104
$99

This isn't specifically made for *AppleWorks*, but it reads information from DIF files. Print your *AppleWorks* spreadsheet to a DIF file and you can use the powerful graphing capabilities in *App-Stat* to generate great-looking graphs.

Graph On

The Q-mar Group
5677 Oberlin Dr.
San Diego, CA 92121
$49.95

A set of template files for *AppleWorks*. The files use spreadsheet formulae to generate graphs within *AppleWorks*. The graphs, as a result, are low resolution, but are easy to manipulate and print within *AppleWorks*. The product shows you how to use the word processor to enhance the graphs. You can optionally print the graphs in color on the ImageWriter II printer.

Accounting

BusinessWorks

Manzanita Software
One Sierra Gate Plaza, Suite 200A
Roseville, CA 95678
$95 (System Manager, required)
$395 each (Accounts Payable, Ledger, Inventory modules)
$445 (Payroll module)

The most powerful (and the most expensive) accounting package available for the Apple II. This program has five modules and covers all the accounting tasks you might need. Reports can be printed to *AppleWorks* spreadsheet files so you can access the data in the spreadsheet.

General Ledger

The Q-mar Group
5677 Oberlin Dr.
San Diego, CA 92121
$89.95

A set of *AppleWorks* spreadsheet templates. The files are set up so that you can begin entering your transactions on a monthly basis. The program balances your accounts and prints your financial statements. Good for the small business that is currently using *AppleWorks*.

Quicken

Intuit
540 University Ave.
Palo Alto, CA 94301
$49

A check-writing and -printing program that works with *AppleWorks*. Enter your checks into the system and they're automatically printed. The complete check register can be printed to the *AppleWorks* spreadsheet so you can analyze the information.

Other

Pinpoint Accessories

Pinpoint Publishing
P.O. Box 13323
Oakland, CA 94661
$89

A complete accessory package for the Apple II. Since Pinpoint introduced their accessories for *AppleWorks*, they have made them work with many other Apple II programs and systems, including BASIC, *AppleWriter*, and others. Now Pinpoint has announced their *Toolkit*, which makes accessory programming available to anyone. Most Pinpoint products for

AppleWorks are written in this accessory environment and work together. Accessories include a calculator, notepad, quick labeler, communications, and graph merge.

ThinkWorks

Megahaus
5703 Oberlin Dr.
San Diego, CA 92121
$49.95

ThinkWorks is an outline processor for *AppleWorks*. Although outlines are not entered into *AppleWorks* itself, you can print your work to an *AppleWorks* word processor file.

ReportWorks

Megahaus
5703 Oberlin Dr.
San Diego, CA 92121
$49.95

A powerful reporting program for *AppleWorks* spreadsheet and word processor files. Using *ReportWorks*, you can overcome many limitations in *AppleWorks*.

Templates

There are numerous templates available for *AppleWorks*. Here are a few sources:

The AppleWorks User Group
Box 24789
Denver, CO 80224

The Q-mar Group
5677 Oberlin Dr.
San Diego, CA 92121

Applied Scientific
416 Arnold
Boseman, MT 59715

Works Access
2636 Churn Creek Rd.
Redding, CA 96002

Buyer's Guide
To Business Software

Apple's breakthrough into the business world has been nothing short of phenomenal. Last year was *the* year of the Macintosh—the introduction of the Macintosh Plus and the popularity of its power software made it Apple's designated business computer.

Over the last six months, more has been done to make the Mac an attractive alternative to IBM in business than ever before. There are more peripherals, from the LaserWriter Plus to several large display screens; more networking possibilities, from PhoneNet to TOPS; and especially more software, from seminal packages like *AppleShare* to integrated products like Microsoft *Works*.

Desktop publishing, word processing, and communications seem to be the most active areas in the Macintosh software world. That's evident in this guide—the number of word processors, for instance, has mushroomed with the unbundling of *MacWrite*. Networking and desktop communications—the latter, Apple's latest marketing phrase—has also increased in both the number and sophistication of packages.

The Apple II family of computers hasn't been disregarded by business, though—certainly not by small businesses or people who work at home. There are an impressive number of Apple IIe and IIc computers in businesses, and the introduction of the Apple IIGS offers an even better reason for investing in Apple II technology for the workplace. The trend toward making Apple II software more Macintosh-like—something started more than a year ago and best evident in the IIGS—is bringing a standard and easy-to-use interface to these machines.

This buyer's guide reflects a wide-ranging sample of the software products released between July 1986 and January 1987. It's not an exhaustive list, but it certainly provides a look at some of the newest and best business software.

Note that prices and machine availability may change at any time.

Name	Price	Publisher/Vendor	Systems	Description
Word Processing				
Bank Street Writer Plus	$79.95	Brøderbund	IIe, IIc, IIGS	A 60,000-word dictionary, an online thesaurus, an editor, pull-down menus, and single-key commands are all included in this word processor.
Business Writer	$95.00	Stone Edge Technologies	II+, IIe, IIc, IIGS	Word processing and mail merge. Write anything from simple notes and memos to longer documents.
Feima	$395.00	WU	Mac, Mac+	Consists of a Chinese file manager, a Chinese word processor, and a multi-Chinese input system.
Fleet System 3	$79.95	Professional Software	IIe, IIc	Word processor—90,000-word dictionary; spell-checks ten pages per minute; thesaurus and mail merge.
Guide	$134.95	OWL International	Mac, Mac+	A hypertext system that incorporates the features of word processors and outline processors as well as information management and retrieval systems.
Habamerge	$49.95	Haba Systems	II, II+, IIe, IIc	Menu-driven form-letter and mailing-label program. Allows you to take your *AppleWorks* database and word processing files to create your own custom form letters and labels.
Habaword	$199.95	Haba Systems	Mac, Mac+	Allows you to view and edit text and graphics in multiple columns. Text may "snake" from the end of one column to the top of the next, as well as run vertically regardless of rulers or page breaks.
Laser Author	$199.95	Firebird	Mac	Full-featured word and page processor with sophisticated desktop publishing capabilities. Output to laser printers or digital typesetting computers via PostScript.

Name	Price	Publisher/Vendor	Systems	Description
Megaspell	$59.95	Megahaus	II, II+, IIe, IIc	A spelling checker with a 40,000-word dictionary.
Microsoft Word 3.0	$395.00	Microsoft	Mac, Mac+	Fast word processing system offering flexible menus, page switching, page preview, the ability to place graphics and text side by side, and all other standard word processing features.
MindWrite	$125.00	MindWork Software	Mac, Mac+	Word processor with integrated outlining power, innovative editing, sorting, automatic labeling, formatting, and more.
MultiScribe 2.0	$69.95	StyleWare	IIe, IIc	Macintosh-like word processor with pull-down menus, multiple fonts, five print qualities, and header and footer placement.
Spelling Champion	$39.95	Champion Swiftware	Mac, Mac+	Three accessories to help write. Includes fast spelling checker for *MacWrite* and Microsoft *Word*, abbreviations expander, and document analyzer.
Thunder!	$49.95	Batteries Included	Mac, Mac+	A realtime 50,000-word spelling checker. Corrects your spelling as you type or corrects an entire document when you're finished.
Voilà!	$99.95	Target Software	Mac	A desk accessory outliner that supports the LaserWriter. Works under the Apple pull-down menu.
Webster's Thesaurus	$49.95	Target Software	Mac, Mac+	This library adds 45,000 entries, with up to 1.4 million combinations of synonyms, to *MacLightning*, the desk-accessory spelling checker.
Word Handler for the Macintosh	$79.95	Advanced Logic Systems	Mac, Mac+	Full-function word processing program for the 512K Macintosh and beyond. Incorporates the ease of use of *MacWrite* with the power of *Word*.
WordPerfect Version 1.1	$179.00	WordPerfect	IIe, IIc, IIGS	A full-featured professional word processing package. *WordPerfect* will automatically reformat text, number pages, assist with hyphenation, and repaginate allowing for headers, footers, and footnotes.

Spreadsheets And Database Management

Name	Price	Publisher/Vendor	Systems	Description
Basic Accounting Worksheet Macro	$9.00	Heizer Software	Mac, Mac+	This command macro sets up a user prompted X × Y worksheet, complete with numbered rows and columns. Compatible with *Excel*.
Customer Database	$15.00	Heizer Software	Mac, Mac+	Data entry form and database set up to record information about each customer. Compatible with *Excel*.
Filing System for AppleWriter	$99.95	Minuteware Publishing	IIe, IIc	Word processing or text-oriented filing system. There's no limit to field length, so you can store paragraphs, reviews, or other information.
Megafiler 2.1	$195.00	Megahaus	Mac, Mac+	File manager database. Prints out labels, mailing lists, and more.
1986 Federal Tax Forms	$39.95	SKY Computer Resources	IIe, IIc, IIGS	*AppleWorks* spreadsheet templates that calculate and reproduce 12 commonly used tax forms. *AppleWorks* required.
Omnis 3 Plus	$494.00	Blyth Software	Mac, Mac+	A complete business solution database including accounts receivable and payable, inventory control, sales management, and so on. Unlimited number of data files and simultaneous usage for up to 64 users.
Reflex on the Mac	$99.95	Borland International	Mac, Mac+	Relational database with various flexible layouts and calculation capabilities.
Sideways	$69.95	Funk SoftWare	II series	Prints wide *AppleWorks* spreadsheets on standard-width, continuous-form computer paper by rotating the text 90 degrees and printing lengthwise.
Tax Templates	$25.00	Heizer Software	Mac, Mac+	Forms for 1985 included 1040; 1040-ES; 2441; 3903; 4136; 4137; 4562; 4797; 5695; 6251; W-2; schedules A–G, R, SE, and U; and tax tables. Compatible with *Excel*.
Trapeze	$295.00	Data Tailor	Mac, Mac+	Versatile spreadsheet with more than 100 functions and formulas. Uses a block format rather than rows and columns.

Finances And Accounting

Name	Price	Publisher/Vendor	Systems	Description
Accountant's Choice Package	$297.00	Enchanted Software	Mac, Mac+	Versatile accounting package delivers ease of use, customized reports, database management. Limited only by disk space.
Asset Control Package 1.0	$295.00	Effective Solutions Consultant	Mac, Mac+	Reports by department, property code, type, and work order. Easy to use, this program has simple one-step data entry, selections, additions, and changes.
Decide Right Fixed Asset Accounting System	$500.00	Crowe, Chizek, and Company	Mac, Mac+	Management tool that calculates depreciation and generates reports designed to assist in the decision-making process.
Insight Accounts Payable	$594.86	Layered	Mac, Mac+	Supports either cash or accrual method of payable tracking. Capacities are unlimited.
Managing Your Money	$199.95	MECA	II series	Seven integrated programs such as checkbook management, tax planning, insurance and retirement planning, and portfolio management for home and small-business financial management.
On Balance	$99.95	Brøderbund	IIe, IIc	A personal-finance program with up to 175 different accounts like cash, checking, savings, auto, mortgage, and others.
Personal Accountant	$49.95	Softsync	II+, IIe, IIc	Double-entry bookkeeping system for personal or small-business use. Compiles financial reports and includes a name-and-address database.
Receivable/Payable Manager	$595.00	Microsystems Consulting	Mac, Mac+	Contains accounts-receivable and accounts-payable functions in one package. Allows posting to virtually unlimited income/expense accounts; maintains debit/credit values for bank accounts; maintains accounts-receivable and accounts-payable gain/loss numbers.
Small Business Works	$50.00	Heizer Software	Mac, Mac+	Twelve programs to automate tracking from sales/receivables through records to a balance sheet for the small business. Requires Microsoft *Works*.
Turbo Maccountant 2.0	$495.00	Digital	Mac	An integrated accounting program of payroll and budgeting.

Name	Price	Publisher/Vendor	Systems	Description
Stocks				
Buysel	$154.95	Dynacomp	Mac, Mac+	Comprehensive package for performing analyses of stocks, commodities, and options.
Compusec Portfolio Manager	$79.95	Dynacomp	II+, IIe, IIc	Full-featured stock portfolio manager which ranks stocks, shows which stock should be reduced or eliminated, calculates compound growth rate, and more.
Market Analyzer-XL	$395.00	N-Squared Computing	II+, IIe, IIc	All features of the *Market Analyzer* version 4.5 and more, including eight additional operations to create indicators and manipulate data.
Market Pro	$395.00	Pro Plus Software	Mac, Mac+	A fully integrated portfolio-management system. Portfolio manager has eight detailed reports.
Portfolio I	$15.00	Heizer Software	Mac, Mac+	Fulfills all routine trading-record needs for most investors in stocks, bonds, and other securities. Compatible with *Excel*.
Stock Watch	$39.00	Encycloware	Mac, Mac+	Low-cost stock folio-management software.
Desktop Publishing				
Artmaker Electronic Clip Art	$35–$40	Artmaster	Mac	Electronic clip art for use in desktop publishing. Over 72 disk titles are planned, with 150–200 art proofs and graphics on each disk.
Desk Design	$69.95	Manhattan Graphics	Mac	Desktop publishing templates are included for ads, brochures, facts sheets, newsletters, and business forms. Its preformatted documents save time and require no previous design experience.
The DGI Type Shop	$175.00	Decision Graphics	II, II+, IIe, IIc	Create text signs, overhead transparencies, and more. Includes 14 fonts from formal to Greek.
GraphicWorks 1.1	$99.95	Mindscape	Mac, Mac+	Page-layout program for documents which require text and graphics on one page. Contains all the drawing features of paint programs and supports high-resolution scanners.
Letrapage	$495.00	Letraset	Mac, Mac+	Newsletters, manuals, flyers, and reports can be written, edited, laid out, and printed to a professional standard.
News Master	$39.95	Unison World	II+, IIe, IIc	Creates a variety of publications—one to ten columns per page, ten fonts in a variety of sizes, over 100 pieces of artwork, and automatic text flow around artwork, from column to column, and from page to page.
Notes for PageMaker	$78.86	Layered	Mac, Mac+	Makes learning and using *PageMaker* easier for beginners and intermediates. Installs as desk accessory.
PageMaker Portfolio: Designs for Newsletters	$79.00	Aldus	Mac, Mac+	A package of 21 newsletter formats to be used with *PageMaker*. The designs are on disk, and a manual is included in the package.
Ready, Set, Go! Version 3	$295.00	Manhattan Graphics	Mac, Mac+	Create any documents from office memos to full-length novels with this desktop publishing software. Integrates a versatile word processor with a powerful desktop publishing program to save production time.
Springboard Publisher	$139.95	Springboard	IIe, IIc, IIGS	Page layout, word processing, and graphics creation all in one program for the Apple II series. Pull-down menus and mouse control.
Productivity				
Desk Necessities	$29.95	Microsparc	Mac, Mac+	A grab bag of nine utilities, including *Desk Writer*, a word processor in a desk accessory.
Everybody's Planner	$99.95	Abracadata	II series	A project management tool with a flowchart program that helps users plan projects more quickly and efficiently.
inLARGE	$95.00	Berkeley System Design	Mac	Magnifies screen display 2–16 times for the visually impaired.
KIX	$49.95	Kyan Software	II series	A hard-disk manager for users who want to increase productivity and ease of use of the hard disk.
Macflow	$125.00	Mainstay	Mac, Mac+	A visual tool for logic and project flow. Features include resizing graphic elements for quick changes, quality output, and more.
Notepro	$59.95	Learning Skills	Mac, Mac+	An educational package for college and high school that teaches organization and use of notes. Five parts which can be used individually or as a whole.
Pert Program Evaluation and Review Technique	$23.00	NCSU Software	II+, IIe, IIc	Project management. Prints critical path, early and late start times, and prints Gantt charts.
Integrated Packages				
AutoWorks 2.0	$49.95	Software Touch	IIe, IIc, IIGS	Adds several important features to *AppleWorks*, including mail merge, file organizing, macros, *AppleWorks* commands, and mouse commands.
Lotus Jazz 1A	$395.00	Lotus	Mac, Mac+	A fully integrated, comprehensive, business-applications software product for the Macintosh personal computer. Combines the five most commonly used software functions of spreadsheet, database, graphics, word processing, and data communications in one integrated package.
Notes for Works	$78.86	Layered	Mac, Mac+	This desk accessory makes learning and using Microsoft *Works* easy, while providing complete reference to all of *Works'* functions.
PFS:Workmates	$250.00	Software Publishing	IIe, IIc	Includes *PFS:Write*, *PFS:File*, *PFS:Plan*, and *PFS:Report*. *PFS:Write* includes an integrated spelling checker.
Ragtime	$395.00	Orange Micro	Mac, Mac+	An integrated page processing program that includes desktop publishing, word processing, spreadsheet, and forms generation.
Utility Works	$50.00	Heizer Software	Mac, Mac+	Databases, templates for business forms and outlining, mailing label and font tools, and a Microsoft *Works* resource directory. Requires Microsoft *Works*.

Name	Price	Publisher/Vendor	Systems	Description
Communications And Networking				
AppleShare	$799.00	Apple Computer	Mac+	Software that lets Macintosh users on the *AppleTalk* network share and exchange files. Requires a dedicated Mac+ and *AppleTalk* network.
ASCII Express—Mouse Talk	$149.95	United Software	IIe, IIc, IIGS	Advanced telecommunications package. Data-transfer features include standard ASCII, XMODEM, and receive to printer. Provides a built-in text editor.
Commworks Version 1.3	$95.00	PBI Software	IIe, IIc, IIGS	A complete telecommunications package. *Commworks* has advanced features, yet is extremely easy to learn and use.
Electronic Messaging System 3.0	$99.95	Snapp Systems	Apple II, II+, IIe, IIc	A powerful mail and messaging host for the Apple II family. Fully customizable: The user can create prompts, menus, and more.
Inbox	$295.00	Think Technologies	Mac, Mac+	Business communications and electronic mail for the *AppleTalk* network. Communicate within work groups, departments, and project teams.
Intermail	$300.00	Internet	Mac, Mac+	A comprehensive electronic Macintosh system for *AppleTalk*-compatible network systems. Allows the user to send messages and files across the *Appletalk* network to as many people as desired.
MacLink Plus	$195.00	Dataviz	Mac, Mac+	Translates documents and spreadsheets, and transfers any file between the Macintosh and the PC.
Phonelink	$99.95	Borland	Mac, Mac+	Automatically dials even while the modem is in use on some other task.
Point-to-Point 1.0	$129.00	Pinpoint Publishing	Apple IIe, IIc	A telecommunications program which features the *AppleWorks* filecard interface.
Telescape Pro VT100	$125.00	Mainstay	Mac, Mac+	Features include a communication directory, 40 onscreen softkeys (programmable), and both text and XMODEM file-transfer capabilities. The softkeys are particularly useful to automate repetitive operations for a given communication partner.
TOPS	$148.87	Centram Systems West	Mac, Mac+	Local area network which connects Macintoshes and IBM PCs in a transparent interface.
Graphics				
Clickart Business Image	$49.95	T/Maker	Mac, Mac+	A design portfolio and graphics template for creating a corporate identity. Contains the tools needed for producing newsletters and business letterheads, such as coordinated alphabets and symbols, professional and industry images, and borders.
Comic Strip Factory	$89.95	Foundation	Mac. Mac+	Character parts can be moved with the mouse to create new characters and whole comic strips. Backgrounds and dialogue balloons are also included.
816 Paint	$75.00	Baudville	IIe, IIc, IIGS	Designed to work with all graphics modes available in the Apple II family, including the new super-hi-res modes of the IIGS.
MGM Station: Professional CAD for Mac	$799.00	Micro CAD/CAM	Mac, Mac+	A sophisticated CAD program for professional engineers.
Quickplot Version 1.2	$49.95	Desktop Engineering	Mac, Mac+	Easy-to-use plotting program reads data from text file or the Clipboard, and creates line and scatter plots.
Super Paint	$99.00	Silicon Beach Software	Mac+	Combination of *MacPaint* and *MacDraw* with 300-dots-per-inch editing. Supports LaserWriter fonts and correct object/bitmapped printing.
VideoWorks Authoring System	$500.00	Macro Mind	Mac, Mac+	Advanced version of *VideoWorks*. Can create market-research interactive documents, training disks, and demos.
Z-3D	$99.00	Computer Graphics Center	Mac, Mac+	Three-dimensional modeling program for text and objects. Ability to show shadows cast by text and objects from variable sources.
Fonts And Images				
Adobe Typeface Library	$185.00	Adobe Systems	Mac, Mac+	Downloadable typefaces for all PostScript laser printers, including LaserWriter, LaserWriter Plus, and the Linotype Linotronic 100.
Artfolio 1	$74.86	Dynamic Graphics	Mac, Mac+	A potpourri of illustrations and symbols—amimals, common objects, people, occupational art, and many more. More than 300 graphics stored as *MacPaint* documents.
Clip Art Collection—Volume 3	$29.95	Springboard Software	II+, IIe, IIc	Over 600 pieces of clip art featuring sports and recreational activities. This latest edition of clip art adds real value to owners of *The Newsroom*.
Drawart Version 1.0	$49.95	Desktop Graphics	Mac, Mac+	A collection of publishing-quality graphics images created with *MacDraw*.
Fontographer Fonts—Goudy Newstyle	$59.95	Altsys	Mac	Font which includes regular uppercase and lowercase letters, as well as a set of small caps for paragraph lead-ins and emphasis anywhere in a line.
Food & Feasting	$30.00	Image World	Mac, Mac+	Graphics from the turn of the century: festive food, table settings, menu frames, and scenes of people eating and feasting.
Graphics Scrapbook Chapter I: Sports	N/A	Epyx Computer Software	II+, IIe, IIc	One hundred images covering more than 15 sports. Requires *Print Shop*.
MacAtlas USA and World	$119.00	Micro: Maps	Mac, Mac+	*MacPaint*- and *MacDraw*-format map templates.
MacMatbook Volumes 1–3	$99.95	Electronic Publisher	Mac, Mac+	Professional-quality graphic images in *PictureBase* format which can be copied to *MacWrite*, *MacDraw*, *MacPaint*, *PageMaker* and others. Design stationery, greeting cards, invitations, business cards, and newsletters, and enhance any word processing document.
Print Shop Graphics Library Holiday Edition	$24.95	Brøderbund Software	II+, IIe, IIc	Over 100 custom graphics, fonts, and borders especially designed for 27 holidays.

Educational
Software Buyer's Guide

Apple Computer and educational computing are almost synonymous. In classrooms, there are more Apple II–series computers than any other type of computer. On college campuses, the Macintosh is the computer of choice for thousands of students in every subject area.

The company's newest computer—the IIGS—can only make Apple's position in education stronger. The IIGS's sophisticated graphics and sound capabilities seem perfect for high-powered educational software. Some of that potential is already showing up in programs like *Talking TextWriter* and *Reader Rabbit*.

It's hard to imagine Apple being displaced in the educational arena. With thousands upon thousands of programs already available and hundreds of new packages appearing each year the choices teachers, parents, and students face are nearly overwhelming.

To help select the right educational software, we've put together a list of the newest and best Apple II and Macintosh programs. Th programs included here are just some of those released since July 1986. This buyer's guide isn't an exhaustive one, but it does give you an idea of what's available.

Note that prices and machine availability can change.

Name	Price	Publisher/ Vendor	Systems	Description
Composition and Spelling				
Commas	$18.00	Right On Programs	II+, IIe, IIc	Practice inserting commas and separating word series, introductory phrases, nonrestrictive clauses, parenthetical expressions.
Developing Reading Power	$49.95	Learning Well	II+, IIe, IIc	Improve literal comprehension using Cloze formula-proven structure in a set of graded stories or by creating your own story. Students develop ability to use syntactic and semantic clues.
Grammar	$39.95	Gamco Industries	II, II+, IIe, IIc	Combines guided drill in basic grammar skills, a student/program management system, and an arcade-style reward game.
Improving Writing Style Basic	$90.00	Right On Programs	II+, IIe, IIc	Aimed at the user who would like to write more effectively.
Mastertype's Writing Wizard	$79.95	Scarborough	IIe, IIc	Word processor for the whole family.
Please Help Me!— Spelling Grades 3/4	$69.00	Focus Media	II, II+, IIe, IIc	Enter your weekly spelling list, and the program creates all the activities based on your word list.
Run-On Sentences	$18.00	Right On Programs	II+, IIc	Reviews basics of comma and end mark use of to avoid run-on sentences and comma errors.
Spelling Worksheet Generator	$54.86	D. C. Heath & Company	II+, IIe, IIc	Creates spelling worksheets from lists of up to 40 words or syllables, which the teacher can save on a disk.
Story Writer	$49.95	Learning Well	II+, IIe, IIc	Word processing program that invites students to enjoy the writing process. Allows students to write and illustrate their own stories.
Term Paper Writer	$59.95	Activision	II, II+, IIe, IIc	A multipurpose software program for writing and formatting school term papers. Includes notetaker, outliner, writer, and both footnote compiler and bibliography compiler.
Text Tiger	$39.99	Mindplay	II series	A word processing package for grades 1–12 that includes four skill-building games—*Keyboard Quest, Tiffy Text, Cursor Rally,* and *Eagle-Eye Editor*—to teach word processing skills.
Writing Well Series	$199.00	Learning Well	II+, IIe, IIc	Combined package of *Story Writer, Pre-write, That's My Story,* and *Poetry Express.*

Name	Price	Publisher/Vendor	Systems	Description
Writing With a Micro	$65.86	D. C. Heath & Company	IIe, IIc	Develops and stimulates students' writing skills using the cinquain, triolet, and short story. Grades 4–12.
Word Attack	$49.95	Davidson & Associates	Mac, Mac+	The classic vocabulary program, now with speech synthesis. Type or select a word and the computer speaks it.
Working with Antonyms	$49.95	Custom Micro Systems	II, II+, IIc	Used in vocabulary development under a no pressure environment. Controlled vocabulary is used, and antonyms are applied in context.

Reading

Name	Price	Publisher/Vendor	Systems	Description
Alphabet Zoo	$29.95	Spinnaker	II+, IIe, IIc	Children develop and sharpen their spelling and vocabulary skills as they race through the maze after letters that fit the picture. Ages 3–7.
Branching Story	$34.95	Albion	II, II+, IIe, IIc	A story is presented, and the unfolding of the plot depends on the choice of options after each paragraph.
Flights into Fiction Package	$109.00	Focus Media	II, II+, IIe, IIc	Contains fairy tales, classic stories, and modern stories.
Giant World	$39.95	Gessler Educational Software	II+, IIe, IIc	Available in French, Spanish, German, and English versions to teach students vocabulary and reading comprehension skills.
Novel Approach—Lord of the Flies	$59.95	CBS Interactive Learning	II, II+, IIe, IIc	Helps students to focus on aspects of *Lord of the Flies*. Grades 7–12.
Phonics Prime Time: Final Consonants	$20.00	Minnesota Educational	II+, IIe, IIc, IIGS	Grades K–1. Children practice recognizing final consonants of everyday words.
Picture It with Words	$35.00	Micro Learningware	II, IIe, IIc	Grades 1–2 will learn 100 words and have fun with over 300 brightly colored hi-res pictures, bold graphics, letters and music.
Reading Well Series	$538.80	Learning Well	II+, IIe	Twelve reading comprehension skills programs—getting the main idea, drawing conclusions, context clues, and more.
Ready to Read	$39.95	Rune	Mac, Mac+	Teaches preschoolers and first graders reading-readiness skills.
Super Wordfind	$49.95	Hartley Courseware	II, II+, IIe, IIc, IIGS	Word puzzles to introduce new vocabulary in any content area. Super Wordfind lets the user prepare larger puzzles.
Talking Text Writer with Echoboard	$249.95	Scholastic	II, IIe, IIc, IIGS	Aids beginning readers and writers by repeating aloud whatever is typed into it. Combines word processing with speech synthesizing.
Word Pairs	$39.95	CBS Interactive Learning	II+, IIe, IIc	Two-part program offers instruction and practice on correct and incorrect word pair usage.

Math

Name	Price	Publisher/Vendor	Systems	Description
Addition Circus	$39.95	Gamco	II, II+, IIe, IIc	Uses exciting arcade games to provide drill on basic number facts.
Algebra II	$49.95	True Basic	Mac, Mac+	Includes systems of equations, quadratics, repeating decimals, inequalities, prime factoring, and more.
Fractions: Multiplication & Division	$39.95	Gamco	II, II+, IIe, IIc	Interactive guided drill in math skills in an arcade-style game.
Green Globs and Graphics Equations	$58.86	Sunburst	II, IIe, IIc	Provides four activities that help students learn about graphing equations.
Gulp!!/Frenzy	$34.95	Milliken Publishing	II, II+, IIe, IIc	Consists of two programs that deal with the basic facts problems of addition, subtraction, multiplication, and division.
Heath Arithmetic Classroom: Grade 6 Package	$209.86	D. C. Heath & Co.	II+, IIe, IIc	Helps students to master basic math skills. Packages available for all other grades.
High School Math Competency Series Worksheet Generator.	$49.95	Developer For CBS Interactive	II+, IIe, IIc	Print your own worksheets for drill and remediation. Grades 9–12.
Intelligent Tutor—Algebra 1	$40.95	Intelligent Software	II+, IIe, IIc, IIGS, Mac, Mac+	Helps students master the principles and concepts of elementary algebra and develop problem-solving skills.
Mathematics Unlimited: Adventures in Problem Solving	$99.00	Holt Rinehart and Winston	II+, IIe, IIc	A series of mini-adventures puts students' reasoning and computational skills to the test.
Math Rabbit	$39.95	The Learning Company	II+, IIe, IIc	Players begin by matching sets of objects to numbers. Later, *Math Rabbit* teaches children how to add and subtract numbers.
Math Skills	$40.00	Diversified Educational	II+, IIe, IIc, IIGS	A two-part program designed to motivate students to develop math skills and use deductive reasoning. Grades 5–10.
Math Talk	$79.95	First Byte	Mac, Mac+	Mathematics learning tool that will increase ability to solve basic addition, subtraction, multiplication and division problems.
New Arithmetic Classroom: Problem Solving	$99.86	D. C. Heath & Co.	II+, IIe, IIc	An elementary school mathematics program covering whole numbers.
Speedway Math	$49.00	Minnesota Educational	II+, IIe, IIc	Encourages students to practice their basic math skills to increase their speed and accuracy.
Time Explorers	$39.95	Gamco	II, II+, IIe, IIc	By answering questions correctly, players work their way through the tunnels of a cavern in an attempt to be the first to discover gold.

Science

Name	Price	Publisher/Vendor	Systems	Description
All About Simple Machines	$49.95	Ventura Educational Systems	II, II+, IIe, IIc	Presents easy-to-understand information about the history and also the function of the gear, inclined plane, pulley, screw and wheel.
Biology Dissection: Crayfish	$29.95	Cross Educational Software	II, II+, IIe, IIc	Teaches students how to dissect a crayfish.

Name	Price	Publisher/Vendor	Systems	Description
The Blood System: A Liquid of Life	$39.95	Marshware	II series	Plasma, platelets, red and white bood cells, transfusions, blood diseases, and more are covered in this tutorial on blood.
Botanical Gardens	$59.00	Sunburst	II series	This greenhouse simulation teaches students in grades 6–12 the importance of controlling variables and analyzing data in scientific experiments.
Designer Genes	$50.00	QED Educational Software	II, II+, IIe, IIc	An introduction to the study of heredity and human genetics.
Diet Analysis	$49.95	Albion	II, II+, IIe, IIc	Breaks down the foods into energy, protein, fat, carbohydrate, calcium, iron, and, if required, vitamins. Check the nutritional value of menus from the school cafeteria.
Dr. Know 1.0	$49.95	Ventura Educational Systems	II, II+, IIe, IIc	A comprehensive introduction to the periodic table for grade 7 through adult. Presents the elements of the periodic table according to their symbol, classification, and position.
Great Knowledge Race: Biology Series	$49.00	Achievement	II+, IIc	Covers a year of high school biology. Four categories of questions to choose from, plus a miscellaneous pot luck category.
Human Systems: Series 3	$119.00	Focus Media	II, II+, IIe, IIc	Teaches about the respiratory system, the excretory system, the reproductive system, and human genetics. Use as a tutorial, a drill-and-practice, a game program, or all three.
MacKids: Bodyworks	$34.95	Nordic Software	Mac, Mac+	Identify different parts of the human anatomy in a fun way.
Moving Molecules	$69.99	HRM Software	II+, IIe, IIc	Demonstrates the behavior of gases as temperature changes during diffusion of gases and liquids and within an ideal gas. Grades 7–12.
Observatory	$64.95	CBS Interactive Learning	II+, IIe, IIc	Comprehensive astronomy program which can transform a classroom computer into an exciting and informative simulation of the sky. Includes a "software telescope" which students can set up anywhere on Earth.
Orbiter	$49.95	Spectrum HoloByte	Mac, Mac+	Space shuttle simulation with 16 missions, including satellite repair and space walks. Command the shuttle from launch to landing with this sophisticated and educational program.
Planetarium on Computer: The Solar System	$69.00	Focus Media	II, II+, IIe, IIc	Three programs about the solar system. Moving through the solar system, your weight, and your age on the planets.
The Science Professor	$39.00 each	Bergwall Educational Software	II+, IIe, IIc	Ten self-paced programs for grades 4–6. Topics include insects, machines, muscles and bones, and more.
Tribbles Revisited	$40.00	Conduit	II, II+, IIe, IIc, IIGS	Gives students a working understanding of the scientific method.
Weather Forecasting	$49.95	Albion	II, II+, IIe, IIc	Students identify the type of weather situation from one of 24 simulated weather maps.
Visifrog 2.0	$39.95	Ventura Educational Systems	II, II+, IIe, IIc	A vertebrate anatomy learning program using computer graphics that display the anatomy of the frog.
The Vocabulary of Science	$45.00	Focus Media	II series	A series of four separate programs—All About Your Body, Living Things in the Environment, Our Home Planet, and All About Matter and Energy—that help students in grades 5–8 learn science vocabulary words.

Social Studies and Economics

Name	Price	Publisher/Vendor	Systems	Description
Business Simulations Package	$325.00	Albion	II, II+, IIe, IIc	Nine business simulations, each documented with student and teacher manuals containing background information.
Campaign	$49.95	Albion	II, II+, IIe, IIc	Students assume the role of Edward III during the Normandy Campaign of 1346.
Choice or Chance	$111.00	Rand McNally	II+, IIe, IIc, IIGS	The Florida swamps, the Santa Fe Trail, and the white-hot steel industry are yours to conquer in these simulations.
Decisions, Decisions—Colonization	$89.95	Tom Snyder Productions	II+, IIe, IIc	Promotes in-depth class discussions and decisions in our new age of exploration. Grades 5–12.
Decisions, Decisions—Foreign Policy	$89.95	Tom Snyder Productions	II+, IIe, IIc	Students in grades 8–12 confront challenging foreign policy issues.
Drugs: Their Effects on You	$49.95	Marshware	II series	Teaches students about commonly used drugs and their positive as well as harmful effects. Includes discussions on peer pressure.
Economics: What, How, and For Whom?	$159.00	Focus Media	II, II+, IIe, IIc	Overview of economics, including its laws and definitions, a comparison of traditional, market, and command economies, and more.
Great World History Knowledge Race	$79.00	Focus Media	II, II+, IIe, IIc	Students attempt to answer challenging questions drawn from a traditional secondary-level world history curriculum.
MacKids: Lemonade Stand	$34.95	Nordic Software	Mac, Mac+	An economic simulation that helps young enterpreneurs learn to make solid business decisions.
Presidential Profiles	$49.95	CBS Interactive Learning	II, II+, IIe, IIc	Trace the records of each of the U.S. presidents through four activities. Grades 5–12.
Sailing Ships	$44.95	Albion	II, II+, IIe, IIc	Simulate navigating a large sailing ship around the world's oceans.
Surveys Unlimited	$49.95	Learning Well	II+, IIe, IIc	Introduction to designs and uses of this vital social science tool. For grades 3 and up.
Teddytronic	$59.95	Albion	II, II+, IIe, IIc	Introduction to the problems in running a business. Run a teddy bear factory successfully and respond to random problems.
Time Tunnel: Sports History	$39.00	Achievement	II+, IIe, IIc	Go back into history and meet famous athletes of the 20th century.
Voyages of Discovery	$69.00	HRM Software	II, II+, IIe, IIc	Challenging, colorful game that simulates the historic Lewis and Clark expedition of 1804–06. Puts the player in charge of the expedition from its formation at St. Louis on the Missouri River.

Name	Price	Publisher/Vendor	Systems	Description
Watergate Simulation	$20.00	NCSU Software	II+, IIe, IIc, IIGS	Decision-making game/tutorial in which the student plays the roles of journalists Woodward and Berstein during Watergate. Illustrates political dynamics and journalistic strategies.

Geography

Name	Price	Publisher/Vendor	Systems	Description
Continents and Countries	$49.95	CBS Interactive Learning	II, II+, IIe, IIc	Students travel around the world learning facts and improving their knowledge of nations and their people. For grades 5–12.
Geoworld	$79.95	Tom Snyder Productions	II+, IIe, IIc	Illuminates concepts in world geology, mineral distribution, and rock formation. Grades 5–12.
Ghost Hunt	$49.95	Learning Well	II+, IIe, IIc	Discover how much fun map reading can be by learning map skills. Grades 1–3.
Great States Race	$34.95	Milliken Publishing	II+, IIe, IIc	The players race across the states in hot air balloons and answer questions about the state they're flying over.
MacChoro	$295.00	Image Mapping Systems	Mac, Mac+	A menu-driven data classification and statistical mapping program that can be used to create maps and much more.
MacKids: Earthworks	$34.95	Nordic Software	Mac, Mac+	A powerful learning tool for geography and related topics that teaches the names of states, capitols, and major cities.
Satellite Down: World Edition	$79.00	Focus Media	II, II+, IIe, IIc	Students' mission is to determine the location of each satellite using their wits and their knowledge of geography.
Travels With ZA-ZOOM: Around the U.S.	$39.00	Achievement	II+, IIe, IIc	User travels on a magic carpet with ZA-ZOOM to learn about all 50 states.

Early Childhood

Name	Price	Publisher/Vendor	Systems	Description
Does It Belong?	$35.00	Micro Learningware	II, IIe, IIc	Three games to introduce children, grades K–1, to classification, discrimination, and problem-solving skills.
First Shapes	$59.95	First Byte	Mac, Mac+	Ted E. Bear teaches shape identification and size relationships in a playful environment.
Learning Is Fun	$39.95	Rune Software	Mac	Teaches preschool and first grade children about circles, rectangles, squares, and triangles.
Learning to Write Series	$60.00	Right On Programs	II+, IIe, IIc	Children learn letter shapes and each stroke needed to write them.
MacKids: Shapeworks	$34.95	Nordic Software	Mac, Mac+	In an entertaining manner, teaches children to recognize sizes, shapes, and patterns.
Read and Rhyme	$39.95	Unicorn Software	II, II+, IIc	Four teaching programs, covering rhyming, alphabetizing, and reading.
Shape Starship	$39.95	Gamco Industries	II, II+, IIe, IIc	Provides reinforcement of basic readiness skills, includes a program/student management system.
Size and Logic	$35.95	Hartley Courseware	II, II+, IIe, IIc, IIGS	Animated graphics help to improve the ability to discriminate among objects according to size.
"Talking" Reader Rabbit	$44.95	The Learning Company	II, IIe, IIc, IIGS	Four animated games help develop and improve reading, spelling, word recognition, vocabulary, and concentration.

Graphics

Name	Price	Publisher/Vendor	Systems	Description
Award Maker	$39.95	Baudville	II+, IIe, IIc, IIGS	Create professional quality certificates with colored, detailed borders; specialized graphics; and personalized messages.
Card Shop	$49.95	Artsci	Mac, Mac+	Create greeting cards. Load with MacPaint, or any other application which uses MacPaint documents.
Cardware	$9.95	Hi Tech Expressions	II+, IIe, IIc, IIGS	Birthday greeting disk and all-occasion card maker. Animated birthday story set to music.
Electric Crayon	$14.95	Polarware	IIe, IIc	Series of computer coloring books for children ages 3–13. Children can color line drawings on the screen, print line drawings and color by hand, or create monthly calendars.
Greeting Card Maker	$39.95	Activision	II, II+, IIe, IIc	Design cards, invitations, and announcements for any occasion. Print in color or black and white.
Imaginator	$88.50	Hearlihy & Co.	II+, IIe, IIc	Create, edit, manipulate, and display 3-D graphics images from any viewpoint. Students can "fly" their images around using special orbital routines.
Print Shop Mac	$79.95	Brøderbund	Mac, Mac+	Simplifies the process of designing and printing out greeting cards, banners and signs. Clip art selections included on disk.
Walt Disney Card and Party Shop	$39.95	Bantam Books	II, II+, IIe, IIc	Create cards, banners, posters, and signs. Great for parties.

Test Preparation

Name	Price	Publisher/Vendor	Systems	Description
College Entrance Examination Prep Verbal Strategy	$160.00	Educational Technology	II+, IIe, IIc	Prepares for the SAT or aptitude tests by mastering verbal strategy such as analogies, reading comprehension, and sentence completion.
Intelligent Tutor—SAT Math 1.0	$69.95	Intelligent Software	II+, IIe, IIc	Helps students prepare for the math section of the SAT exam and develops their math problem-solving skills.
Smart Words: College Prep Vocabulary	$49.95	Addison-Wesley	II, II+, IIe, IIc, Mac, Mac+	Includes many words that are found on standardized college placement examinations. To give students an edge when taking the exams.

Computer Skills

Name	Price	Publisher/Vendor	Systems	Description
Apple's Core Parts I and II	$99.95	The Professor	II, II+, IIe, IIc	Introduction to Applesoft computer programming.
Basic Animation Kit	$39.95	Sierra Vista	II+, IIe, IIc	Lessons in programming lo-res and hi-res animation. Teaches, step-by-step, how to write basic animation programs.
Math Worlds: Turtle Symmetry Level 1	$69.86	D. C. Heath & Company	II+, IIe, IIc	Students learn a form of Logo and use this language to construct geometric drawings on the computer.

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18 Intriguing Computer Bulletin Boards

Are you searching for a special or out-of-the-ordinary electronic bulletin board? Telecommunications expert Arlan Levitan has located some of the most interesting and unusual boards around. Use your Apple or Macintosh, modem, and the phone to sign on and give them a try.

Arlan R. Levitan

It's difficult to pinpoint when the first bulletin board appeared. Medieval royal proclamations were posted in the town square. Even further back, the hunters of antiquity told tales and passed down information about their prey through colorful cave drawings.

The modern bulletin board, made up of a wide variety of messages tacked to almost any surface, abounds in our supermarkets, factories, community centers, and city halls. Bulletin boards involve more than just giving away kittens or selling tires; they are where people who have a message reach out to the entire community.

The desire to share thoughts and ideas hasn't slackened in this age of instant information. In fact, the huge volume of data thrown at us every day makes something like a bulletin board even more valuable. Information must be sifted—using the experience of others is one of the most valuable filtering devices around.

That's why electronic bulletin board systems, often referred to as *BBSs*, are so popular. With all due respect to the myriad sources of information available about computers today (including this magazine), there's no substitute for that special kind of interaction possible only between two or more like minds.

The thousands of computer-based BBSs online today offer much more than simple messages. Imagine trying to maintain a series of communications with other people using a regular bulletin board at a supermarket. Actually traveling to the market every time you want to leave a message makes the idea inconvenient at best. Even if you made the trip regularly, you might miss the very reply you were looking for.

The fact that BBS systems can be accessed without leaving home makes an ongoing dialogue simple. A computer running a BBS manages the messages—not only numbering and indexing them, but also automatically notifying its many users of messages intended specifically for them. And just like a cork-and-tack bulletin board, messages posted on BBSs are public. The question-and-answer exchanges can be seen by others, who often throw in their own opinions. Even if you just "watch," you'll still learn by following the flow of conversation.

In recent years, BBSs have begun expanding into new areas. While most continue to be microcomputer related, a growing number of BBSs have steered off the beaten track. BBSs dedicated to everything from law to genealogy are appearing with increasing frequency. People with common interests search out BBSs focused on their special topic.

But such themes as medicine and real estate are almost old hat by now. For the truly unusual, the out of the ordinary, one has to look even further afield.

Here's a sampling of just some of the BBSs that are among the most unusual. All are free; your sole cost is the phone call. All phone numbers were correct and operating as of January 28, 1987. Please observe each board's rules and keep common courtesy in mind. Remember, you are a guest in the system operator's (SYSOP's) "house."

Arlan Levitan has written several computer books and writes a monthly column for COMPUTE! magazine, "Telecomputing Today."

Entertainment

Videoman
(213) 666-8588
Hollywood, CA
SYSOP: Norman H.

A public access computer for the Hollywood entertainment industry. For producers, directors, writers, and editors. Discussions of production technologies and creative techniques.

Electronic Call Board
(718) 499-1633
Brooklyn, NY
SYSOP: Bobby Ballard

Dedicated to the performing arts. Participate in electronic role playing. Aspiring actors can check for casting notices and participate in special-interest sections covering theater, film, video, music, and art. Also includes listings of stage shows playing around the country.

Call Sheet
(818) 363-3192
San Fernando, CA
SYSOP: Wayne Parsons

Primarily intended for film and television industry professionals. Messages about upcoming productions, crews, locations, and equipment needs.

The Hotline
(818) 766-6442
N. Hollywood, CA
SYSOP: None listed

If you're interested in the latest TV ratings, most popular albums, compact discs, and home videotapes, it's all here. Also some interesting BBS lists

Aviation

Aviation Connection
(214) 245-5633
Dallas, TX
SYSOP: None listed

The Aviation Connection is dedicated to those interested in flying. Drop the flaps on your modem and check in.

Cryptography

Cryptologic Research
(703) 237-4322
McLean, WV
SYSOP: Robert Jueneman
Hours: 5:30 p.m.–8:00 a.m. EST (M–F)

A service to the International Association for Cryptologic Research (IACR) and to anyone else interested in cryptography and computer security.

Hacking

The Guideboard
(415) 864-3858
San Francisco, CA
SYSOP: Unknown

Get a cabbie's eye view of the "City by the Bay." Restaurant and entertainment information also.

Gambling

The Casino BBS
(609) 652-6030
Atlantic City, NJ
SYSOP: "Dave"

Feel lucky? Find out what's happening by the Boardwalk. Bulletins cover Atlantic City casino information, and include nightlife and entertainment guides.

Collectibles

Collector's Network
(213) 204-0646
Los Angeles, CA
SYSOP: Harry Rosenfeld

Information on coins, stamps, baseball cards, and just about anything else that's collectible. Heavy trading action in the message base. Excellent BBS lists.

The Train Board
(513) 398-0928
Mason, OH
SYSOP: Decker Dogget

Information on train collecting and radio-control hobbies.

Real Genius?

MensaBBS
(305) 842-1861
Palm Beach, FL
SYSOP: Molly Campbell

A stern warning informs callers that this system is restricted to Mensa members (an association of people with very high IQs).

Guns

Bullet 'N Board
(703) 971-4491
Silver Spring, VA
SYSOP: Tanya Metaksa

F & W Guns
(714) 653-0494
Sunnymead, CA
SYSOP: None listed

Both BBSs are dedicated to the Second Amendment and firearms. News on the latest legislative happenings and weaponry. Gun show schedules and National Rifle Association information abound. One interesting note: These boards are free, but require that you register.

Law Enforcement

Crime Prevention BBS
(214) 578-1311
Plano, TX
SYSOP: Captain Lyndon Payne and others

Who needs a police scanner? Follow the saga of crime in Plano, Texas. Tips on spotting con artists, prevention of criminal mischief, and personal protection. Take a look at the "Crime of the Week."

Electronic Music

Midi World Network BBS
(213) 826-4288
Los Angeles, CA
SYSOPs: R. Moore, S. Daystrom, and J. Fitzpatrick

Excellent BBS devoted to MIDI-related computer use. Highly recommended if one of your keyboards has black and white keys.

Sports

Sports
(213) 559-7306
Los Angeles, CA
SYSOP: None listed

The latest betting lines, weather, injuries, and points. Up-and-coming game information and spirited discussion.

Top of the Rockies BBS
(303) 963-3688
Roaring Fork, CO
SYSOP: Barry Clements

Ski information for Aspen, Snowmass, Sunlight, and the rest of the country. Also tasty recipes and nutrition information.

Survival

Survival Communication Forum Fido
(707) 545-0746
Napa Valley, CA
SYSOP: Don Kulha

Pack the freeze-dried food, hop in the jeep, and head for the mountains. And don't forget your modem-equipped laptop. Forums on survival, self sufficiency, and emergency preparedness. Discussion areas on medicine, food, alternative energy, radio communications, weaponscraft, and survival vehicles.

Getting To Know The Apple SIGs

Chuck Doherty

An immense amount of Apple-oriented information, software, and conversation hums across telephone lines and into American homes and businesses every day. Learn how to tap into the information conduit that the special-interest groups (SIGs) and forums dedicated to Apple personal computers have to offer.

Local users' groups and electronic bulletin boards provide Apple enthusiasts with a wide array of programs and advice, but few local services can match the scope available on the national information services. Large, time-share systems such as The Source, Delphi, CompuServe, GEnie, and others have much to offer Apple owners, and are often a valuable resource for technical information, user-supported and public domain software, and lively discussion.

Getting On

Although these services may be located thousands of miles away, most provide local telephone numbers in larger metropolitan areas, or an 800 number at a slight surcharge for connecting to the database. And even if a local access number is not available, services such as Tymnet and Telenet can usually be reached locally. These systems, called *packet-switching services*, let you connect to a commercial information service at a lower cost than long-distance dialing.

Connect charges vary from service to service, and are usually higher during prime operating hours, normally between 7:00 a.m. and 6:00 p.m. Monday through Friday. The Source, for example, charges $0.43 per minute ($25.80 per hour) during prime time at 1200 bps. After 6:00 p.m. on weekdays or on weekends or holidays, though, this rate drops to $0.18 per minute ($10.80 per hour). In addition, some services charge more when you're connected at 1200 or 2400 bits per second (bps) than for 300-bps access.

Logging onto (connecting with) any service requires a valid account number and password. Some services provide an online registration feature which lets you call in without an account and establish one over the phone. CompuServe offers a subscription kit through computer retailers or directly through the mail. In this $39.95 kit, you'll find a valid account number and password, an operator's manual, and a credit for $25.00 worth of connect time.

Regardless of how a particular service requires you to register, you must have a valid account before you can use any of the service's features.

The Popular Services

One of the oldest and largest services is CompuServe, based in Columbus, Ohio. CompuServe offers a wide array of services, including several computer special-interest groups (SIGs). The menu-driven operating system of CompuServe makes it easy to find your way around and to locate the SIGs you're interested in.

CompuServe

CompuServe has six separate Apple-specific special-interest sections, with something for everyone. CompuServe's MAUG (Micronetworked Apple Users' Group), has a wide selection of technical and programming info, bug work-arounds, and general operating tips.

There's a considerable amount of information on CompuServe for Apple IIGS users, including diagnostic, graphics, and utility programs. In addition, Apple II users will find numerous tips on *AppleWorks*, various Applesoft BASIC utilities, and even hardware and repair techniques for every part of the system.

In a quick visit to the Apple Software Forum, I found a helpful tip for converting the Apple IIe/IIc delete key into a destructive backspace, along with several other interesting ideas.

The Source

The Source has its own share of Apple-specific information, and several interest groups for Apple II and Macintosh users. The Source appears to have a generally slower response time and a more complex command structure. In fact, I found it necessary to download and read several help files before I was able to use even the simplest parts of the system.

Nevertheless, the sheer size of The Source guarantees plenty of up-to-date information. And the more you use the system, obviously the more familiar you'll become with its command structure. The Source provides a lower rate when you're using some of the special-interest sections, and offers some services (such as its necessary operating tutorial) free.

Delphi

Delphi has been around now for several years and has all of the features found in the older, more established systems such as CompuServe and The Source.

Delphi's menu-driven, prompted operating system is extremely easy to use.

Delphi has several Apple special-interest groups (called *groups* or *clubs* on Delphi), although at times the level of user activity in some is low. Although this makes it seem that there's little going on, it's more a case of Delphi providing so many different subsections that not all of them are used to the fullest.

The selection of programs for downloading on Delphi is good, and many programs are available for free (public domain) or as *shareware* (where you pay the author a set fee only if you decide to use the program), while others entail a surcharge. The latter include many high-level utilities and diagnostic programs, and are almost always a bargain.

GEnie

General Electric's national telecommunications service, GEnie, is the new kid on the block, and is aggressively offering a wide array of features and low connect charges. Despite a somewhat unusual log-on sequence, GEnie's easy-to-follow, menu-driven system makes it a snap to use.

The structure of GEnie's conferences, or *round tables*, as they're called, takes some getting used to. Each conference is divided into categories, and each message is assigned a topic.

At first, the number of commands necessary to reach a particular message seems overwhelming, but after a while the logic behind the commands becomes apparent and operation is a breeze.

GEnie's downloading facility is very easy to operate and is consistent with a wide variety of telecommunications software. The selection of software for Macintosh users is outstanding, and includes many new programs that you're not likely to find anywhere else. Apple II and IIGS users will also find plenty to choose from. A list of files available for download showed over 1200 different programs available.

Downloading Software

There are a number of methods by which you can download programs and text from online services. The simplest is the *capture*.

This is a function in which the information coming from the service is recorded and stored as an ASCII (American Standard Code for Information Interchange) file, and is found in most communications software. You can use the capture method to record Applesoft BASIC programs as text files, which may then be converted into BASIC programs with the Applesoft EXEC command.

When downloading binary or machine language programs, you must usually use some type of error-correcting protocol. One of the most popular communications protocols is XMODEM, which sends data in 128-byte blocks and verifies each block as it's received. At 1200 bps, XMODEM protocol sends about one block per second. This technique prevents line noise errors from resulting in lost data. Each of the major services supports XMODEM protocol, and

most popular Apple communications software (such as *ASCII Express*) do as well.

The actual process for downloading a program is easy—simply select the program you want (either by name or number), specify the protocol to be used, and the communications software does the rest. The time required to download a file depends on its size. Some large programs can take as long as 20 or 30 minutes to download at 1200 bps, and four times longer at 300 bps, although a typical program downloads in just a minute or two.

Discussion Groups

On most services, discussion groups are organized in such a way that you can follow the course of a particular subject, without reading every message in the system to see which are related. For instance, one message may ask for technical help in getting a certain program to work with a particular hardware option. Several days and dozens of messages later, someone leaves a reply with a solution. A few days after that, another user checks in with a further comment. The message-handling part of the system automatically groups these related messages together, making it easier to follow the discussion.

On Delphi, I followed the course of an interesting discussion regarding Apple IIe system crashes caused by a particular modem/serial-card combination. After a few messages passed back and forth, a user was able to come up with a software-based solution that seemed to do the trick.

The level of technical discussions on the services runs the gamut from simple, "How do I get this to do that?" questions to very advanced subjects from professional software developers.

Because there's such a wide array of subject matter, novice users have no reason to feel intimidated by asking a basic question, and experienced users know that it's likely there is someone on the service who can answer any question asked.

Along with message-and-reply-style conferences, all of the

services offer realtime conferences with users throughout the country. In one such conference, I "chatted" with an Apple user in Seattle, another in Dayton, and still another in Boston. These online conferences are available by subject (such as for Apple II or Macintosh enthusiasts), or in an open format where any subject may come up. In some online conferences, the discussions can become quite lively.

Most services schedule special-interest conferences ahead of time to allow anyone who is interested ample time to check in. In addition, some services schedule guest speakers, often well-known computer developers, to address users via a realtime conference. Users can usually ask questions of the speaker and get a reply immediately. Because some of these conferences can attract a large number of users, they're often structured to allow only a limited amount of two-way communications.

Getting The Most From A Service
Because the connect charges for online services can add up quickly, it's best to have a clear idea of what you want to do before logging on. One technique that works well, especially when downloading programs, is to log on and download a list of available programs, then disconnect from the service and print out the list. After reading the descriptions and selecting the programs you want, log back onto the system and download only those programs you're interested in.

Although there are many national services to choose from, most users select one service and stick with it. After using one system for a while, you'll learn shortcuts that will allow you to go quickly from one section to another, saving both time and money. In addition, you'll soon develop a group of online friends who share your skills and interests.

Chuck Doherty is a freelance writer and computer consultant whose work has appeared in a variety of computer and audio publications.

Gems In The Rough
Gregg Keizer, Editor

One of the major attractions to large, well-run Apple SIGs is the sheer number of high-quality applications, games, utilities, and just plain strange software you can download. For many people, downloading new software, then trying it out, is what services like CompuServe, The Source, GEnie, and Delphi—all of which have extensive program libraries—are all about.

Almost everyone knows you can download software from commercial services. But just what *kind* of software? Software junk or software jewels?

At The Oasis
One example of the topnotch software you can download from an Apple SIG is the Macintosh program called *Oasis*. A Finder replacement that's best used on a hard disk, *Oasis* is *shareware*. That means you pay the author only if you use the program. If you decide the program's not for you, you simply pass it on to someone else or erase it from your disk.

There's a reason for replacing the Finder, especially when you're using a hard disk. Every time you quit from an application, the

Finder must rebuild the desktop before it's displayed. If there's a large number of files, folders, or even volume partitions, it can take the Finder a long time—sometimes close to a minute—to rebuild the desktop. Using a Finder substitute like *Oasis* means that delays when quitting are minimal.

Once properly installed in the System folder on your disk, *Oasis* effectively takes the place of the Finder. Anytime you quit another application, you return to *Oasis*, not the Finder. And it's within the *Oasis* environment that you'll do all your desktop-style work, from copying or deleting files to renaming or commenting them.

But that's just a small part of what *Oasis* does. Its primary function is to launch applications, something you normally do by double-clicking on an icon found on the desktop. Finding an application on a folder-strewn hard disk desktop can be difficult, but with *Oasis* all you have to do is click on a labeled button.

With *Oasis* you can customize the screen with application-launching buttons in whatever size or pattern best fits your needs. Even better, you can create buttons that, when clicked, open a
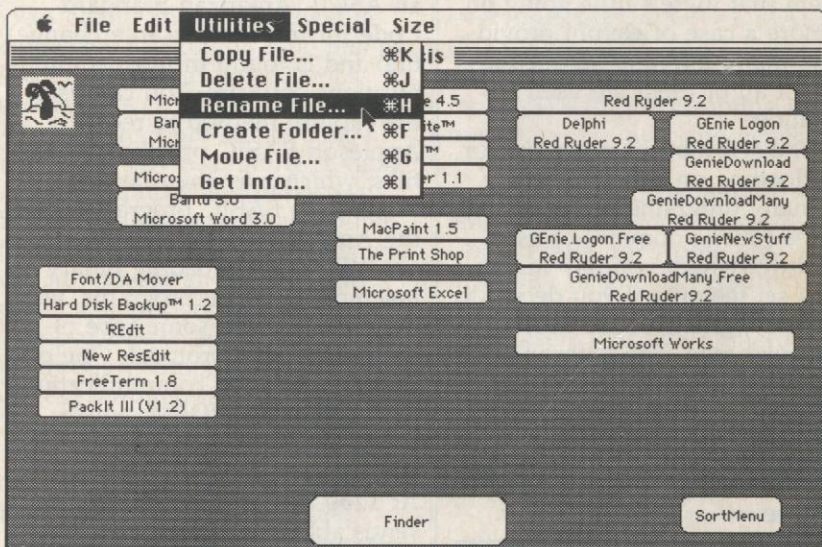
Oasis is an excellent Finder replacement which you can easily customize. Simply click on any of the buttons to launch an application. Note the utilities available in the pull-down menu.

particular document of a specific application (the only restriction seems to be that both the application and the document must be in the same volume—on the same disk if you're using floppies; in the same drawer or partition if your hard disk allows these things). This is the same as double-clicking on a document (assuming its application is available), but faster—you don't have to paw through folders looking for the document.

Creating, resizing, moving, deleting, and renaming your custom buttons is usually as simple as clicking the mouse. File maintenance—renaming, deleting, copying, and so on—is easily done from within *Oasis*. If you want, you can even create a button labeled *Finder* that sends you to the Finder.

In several months of operation, *Oasis* hasn't presented any significant problems. It's well-designed, fast, and efficient, all hallmarks of high-quality software.

Your Servant

Another example of the kind of quality you can find in SIG software is *Servant*, another Finder replacement. Written by Andy Hertzfeld, who wrote portions of the Macintosh's system software, a beta test version (in other words, a prerelease version) of *Servant* can be found in several of the Apple SIGs.

Not every feature of *Servant* is implemented, but what does work clearly shows the program's potential. You still see a desktop, but when you open a volume by double-clicking on a disk, the window looks different.

Servant is an application that combines functions of the Finder, *Switcher*, and a resource editor. When *Servant* is fully functional, you'll still be able to carry out all the traditional desktop maintenance duties (copying and deleting files, organizing files in folders, and the like). But when you run an application under *Servant*, another menu selection appears at the top of the bar. Pull down this menu and you'll see *Servant* listed. Select it and the desktop-style window appears on
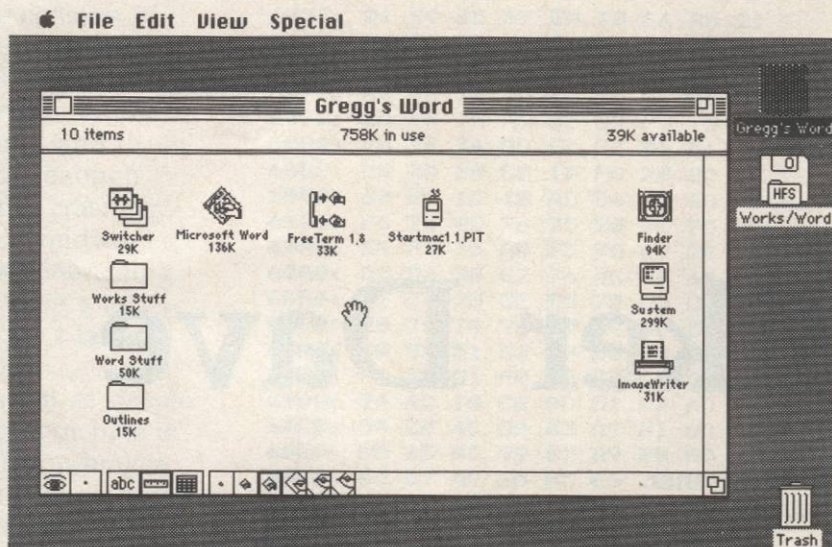
Servant's *desktop window looks considerably different from the usual Finder. The icons at the bottom of the window control the movement and size of the icons, as well as what's displayed beneath them.*

the screen. From here you can run another program (or more if your computer has the memory). You've effectively duplicated *Switcher*—the Macintosh program which lets you keep more than one program in memory at a time. It's easy to move back and forth between applications, cutting and pasting from one to the other. For the moment, you still must use *Switcher* to size the partitions—if you don't, they default to 256K each.

Not only do you have Finder- and *Switcher*-style features at your command, but you can also edit an application's resources, the data that makes the program what it is. For instance, you can alter the menu items by renaming them or adding (or changing) the Command key sequences. Or you can modify an icon on the desktop, turning one of those bland generic Macintosh icons into something a bit more descriptive.

Servant isn't finished yet—a number of features are still not functional. That's part of the attraction of the program, though, for few computer users get a chance to see software as a work in progress. Much of the software found in the Apple SIGs, however, is just that—still in progress. Software authors who upload their work to a SIG (whether that software is free or shareware) often seem to be more interested

in the process than the finished work, going so far as to continually update their program(s).

Jewels And Junk

Oasis and *Servant* are just two samples of the kind of Apple programs you can find on a broad-based SIG. You'll find some junk software as well, but jewels like these make SIG membership what it is—interesting, useful, and informative.

Reviews

The Toy Shop
Karen G. McCullough

Every once in a while, someone finds another way to use personal computers. A few years ago it was the electronic spreadsheet; more recently it was desktop publishing. Now it's building things in your home. One of the first programs in this newest genre is *The Toy Shop*, from Brøderbund Software, which lets you make toys with your Apple II or Macintosh computer.

The idea of creating toys may at first seem unworkable (designing them, sure, but not actually *making* them). You've probably heard about CAD (Computer Aided Design) systems, but you don't expect to find them on 128K personal computers. And its sister acronym, CAM (Computer Aided Manufacturing), is definitely a factory phenomenon. Is it possible that Brøderbund has brought CAD/CAM to the home computer? Not quite, but *The Toy Shop* comes closer than anyone but the designers would have thought possible.

An Entire Hobby Store
In brief, *The Toy Shop* prints a toy's components on standard-sized paper. You adhere the printed pieces to heavy cardstock (included), cut them out, and assemble the three-dimensional toy much like the plastic models you get at hobby stores. There are 20 different toys in all, from a fairly simple flying propeller to an elaborate, fabulously detailed, moving carousel. It's a nice assortment, and includes an antique car and truck, a mechanical bank, medieval catapult, and a zoetrope—a wider variety of toys than you'll find in most hobby shops.

But building the toys is only part of the fun. You can also customize and personalize them before printing. Customizing involves choosing paint patterns, decals, and text to go in various places on the model. On the balancing jet, for instance, you can choose paint patterns for the base, pedestal, stripe, fuselage and fins, decals for the pedestal, and text on the base plaque.

The procedure for decorating and printing is intuitive and remarkably painless. It's clear that thought went into the design and implementation of the user interface. The manual explains the program functions in a clear, well organized fashion, but it isn't really needed. I sat down and whipped out a model (rather neatly customized) without cracking the manual.

In the Apple II version, everything you do (except for actually creating your own paint patterns or decals) involves moving the cursor over a set of menu choices until the one you want is highlighted. In some cases you use the space bar to turn certain features on or off (entering text messages, telling the program to use underline or bold face, and so on). Adequate directions are always available on the screen, and pressing Escape always takes you back to the previous step.

Browse Through The Shop
The first menu offers you the choices of browsing toys, choosing by name, setup, and quit. *Browsing* lets you look at each toy in turn. *Choosing by name*, the option you'll use most frequently, lets you begin work on a toy by picking its name from a list.

Setup configures the program to your hardware—on the Apple II version that means choosing your printer, interface card, slot number, and number of disk drives. *The Toy Shop* works with most of the best-known dot-matrix printers and interface cards, but check
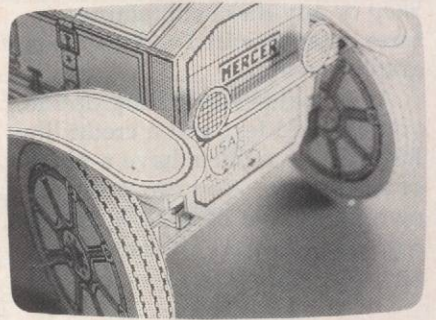
The detail seen on this antique automobile is typical of the results you'll get when you customize, print, and build any of the 20 models found in The Toy Shop.

the list on the back of the package before you buy.

When you choose a toy, you can print it immediately by using the pre-set paints, decals, and text. Or if you prefer, you can customize any or all of these elements. Some of the models have areas which are filled with a pattern, something *The Toy Shop* calls *paints*. More than 30 patterns are available, and, if you're the creative kind, you can design your own or alter an existing one. If you really like your design you can save it to a disk and load it again later.

Decals are pictures or graphic designs that decorate some of the models. For any spaces on the model that can use decals, the preset option is displayed when that area is highlighted. Changing a decal is easy—highlight the area you want to modify and press Return, then make your selection from a screen.

As with the paint patterns, you can create your own decals or edit existing ones. Designs are drawn using either keyboard or joystick on the Apple II and using the mouse on the Macintosh. And you can save them to disk and load them again later. Graphics can also be loaded from *The Print*

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Shop or any disks containing pictures created with The Print Shop's graphics editor.

As a final personalizing option, you can add text and a credit line. Most of the models have a plaque or nameplate—you can print your own name or a friend's, a title, or a greeting in your choice of font and type styles.

Ready To Print

Now that you've got the toy exactly the way you want it, you're ready to either print it or save it to print later. An *align paper* option helps you get the paper positioned precisely in the printer, important because the toy may not work properly if parts are printed over perforations. Once the paper is aligned and you're sure the set up is correct, you're ready to print.

You can make as many copies of a toy as you want (refill packs of cardstock and supplies are available), and if you make a mistake you don't have to reprint the entire toy—the program lets you choose which page or pages you want to reprint.

The toys are detailed and often have a lot of pieces crammed on a page, so printing can take a long time. Add frequent disk access to this and you have a wait—the more complicated designs may take up to 30 minutes to print.

Unfortunately, the review copy of the program we used had a bug which caused the printer to slip out of graphics and into text mode while printing some toys. This happened only on older Apple II+s; the program worked perfectly on an Apple IIe. The odds are good that the problem will be fixed by the time you read this.

End A Into Slot B

The fun isn't finished when the toy is printed. You still have to put it all together. Pieces are applied to the self-adhesive cardstock and then cut out with scissors and a hobby knife. If you don't already own a graphic arts knife, you should get one. You'll find it extremely helpful for most of these projects.

Unfortunately, the manual—which has been so clear to this point—now gets murky. You have to read several pages of general instructions, then go to the specific directions for your toy. Page flipping begins here. The somewhat terse instructions constantly refer you back to the construction diagram (which is often on another page), and also occasionally require you to go back and reread some of the general instructions. You can get the job done, but you may find yourself short of fingers and sporting slightly less hair than when you began the project.

There's no call for despair, however. Remember, if you make a mistake you can always print out another copy—what other put-together toy do you know that gives you unlimited spare parts? And besides, I managed to make one of the easier toys without much difficulty. I didn't even glue my fingers together.

By the way, as improbable, even impossible as it looks, the balancing jet really does sit happily on the point of a pin.

The Toy Shop
Brøderbund Software
17 Paul Dr.
San Rafael, CA 94903-2101
Apple II+, IIe, IIc, IIGS, version $59.95
Macintosh, Macintosh Plus version $64.95

Disk Express
Gregg Keizer, Editor

Some utilities are like gifts from friends you thought had joined the Peace Corps and moved to Mali—they're an unexpected pleasure and find a home in your (or your computer's) heart.

Disk Express from ALSoft is such a utility for the Macintosh. It does several things—all related to optomizing your floppy and hard disks—and it does them well. Nothing earth shattering, perhaps, but definitely unpretentious.

You need something like *Disk Express* if you begin to notice that applications are starting slowly, documents seemingly take forever to open, database sorting makes you drowsy, or word processor search and replace begins to feel like it's heading into the next geologic age. All these symptoms mean that your files are *fragmented*.

Fragmentation

As data is written to new disk—whether it's a floppy or a hard disk, the procedure is the same—data is placed in a logical pattern that makes the most efficient use of the disk. Data may not be in contiguous *blocks*, or sections of the disk, but it's written in such a way that the disk drive can read it at the fastest possible speed. But that's only when you have a new, little-used disk.

As time goes by, and you read and write from and to the disk, new data for an application or document is simply placed at the next available block. That may not be in a location on the disk that makes best use of the drive. The disk drive head may have to search much longer to find these new sections, slowing down functions such as opening, closing, and sorting files. Little pieces of your applications and documents are lit-

Reviews

grow unnecessarily large. If you're using a hard disk, DeskTop files of 40K+ aren't uncommon. Though you can eliminate unneeded information in the DeskTop file by pressing Tab-Option-Command, this manual method erases all comments you may have placed in files' Get Info dialog boxes. It may also transform some custom icons into the drab generic Macintosh icons. When *Disk Express* squeezes the DeskTop file, nothing's lost—the only thing that happens is the file gets smaller, freeing up more room for other files. On one 800K floppy disk, for instance, *Disk Express* reduced a 9K DeskTop file to just over 5K. You'll see far more spectacular results with a hard disk.

The most important function of *Disk Express* is optimizing disks or volumes. This takes time, but is well worth it. *Disk Express* looks at each file, collects each piece of it, and then writes it to contiguous blocks. If you want, you can select something called *Prioritize Files*, which puts the files in an order according to how likely they'll change. *MacServe* volumes go first (since they'll change least), then applications, then documents, and finally the DeskTop (which changes each time you use that disk or volume).

The final function of *Disk Express* erases free space that's been made available. When you move files to optomize the disk, the data actually remains in the old position and could conceivably be read by someone with a disk editor. If you're concerned about data security (especially if you're running *Disk Express* on a hard disk in a network environment), you'll want to use this option.

Progress In Motion
Decide what you want *Disk Express* to do to a disk or volume,

select Express from a menu, and watch the screen. A scale appears and shows you the progress of the operation (Figure 2). Some things take time—optimizing, especially when you prioritize at the same time, takes quite a long time.

When you're through and your files are back together, try opening a long file. If you're using a hard disk, the increase in performance should be noticeable. It's more difficult to tell when you've optimized a floppy, simply because there was less data on it to begin with.

Results will vary, of course, and depend on the size of your files (longer files tend to become more fragmented), how often you changed them (a 50K *Word* document I edited and added to over a month's time opened at least 30 percent faster once I ran *Disk Express*), and the way your hard disk is partitioned (the larger the volume, the more blocks there are to place fragmented files).

Compared to the hard disk alternative—backing up every file, reformatting the disk, then returning files to the hard disk—*Disk Express* is painless and fast. And on frequently altered floppy disk files, *Disk Express* can shorten the time you spend staring at a blank Macintosh screen.

Disk Express
Macintosh 512K, Macintosh 512K Enhanced, Macintosh Plus
ALSoft, Inc.
P.O. Box 927
Spring, TX 77383
$39.95

Animate
Bob Guerra

If you're at all interested in animation, you've probably tried your hand at its most primitive form—drawing a series of sequential pictures on successive pieces of paper, then fanning through them with your thumb.

Fortunately, just as computers can quickly solve complicated mathematical problems that would take hours using pencil and paper, they can also save a great deal of time in creating detailed animation.

In *Animate*, Brøderbund has provided Apple users with a powerful tool that lets you use your computer to create double-hi-res animation.

Dual Utilities
Animate is actually two integrated utilities—*The Graphic Designer* and *The Scene Designer*. Used together, they let you design characters and backgrounds, then combine them into animated scenes complete with sound and text. Both programs use a convenient system of pull-down menus and can be operated with a mouse, Apple graphics tablet, *KoalaPad*, or joystick.

You use *The Graphic Designer* to create animated characters and backgrounds. Although the user's manual suggests you use a separate program (such as Brøderbund's *Dazzle Draw*) to create your backgrounds, the tools available in *Animate*'s Draw/Preview mode are adequate for some applications.

The Graphic Designer's tools include a palette of 16 colors, square and round brushes in three sizes, and a zoom option for close-up work. In addition, sections of the screen may be captured and then flipped horizontally or vertically,

cut from the drawing, pasted in a new location, or simply copied into new locations while the original section is left intact. This is a great timesaver—just as in the classic hand-drawn form of animation, most of the drawings on your worksheet in *Animate* will be very similar from cell to cell.

Unlike Brøderbund's *Fantavision*, another Apple animation program, *Animate* doesn't use *tweening*, a process that automatically generates a number of the frames or cells of the animation. Instead, each cell must be drawn individually or modified from the last. With a little imagination and hard work, though, the results can be just as rewarding.

Depending on the size of the character you're creating, you may begin by filling the screen with 18, 42, or 80 standard frames. You can also create your own custom frame and then copy it as many times as needed so that all your frames are uniform. Once you've drawn all the cells for a particular animated sequence, you can preview the character's movement by selecting the order in which the frames will be shown and setting the appropriate speed. If the character doesn't move just right, you can rearrange the order, eliminate unnecessary frames, or even draw entirely new ones, until the movement is exactly as you want it. Up to 255 separate frames can be used in the creation of a single character's animation.

Finally, both the finished character and the worksheet of individual frames that make up the character's animation can be saved as separate files. Having the worksheet on file is useful if you decide to modify the character in any way or if you want to create a similar character using the original as a model. You can even make a color or black-and-white printout of a character's cells in their

proper sequence and then use them to make your own flip books and other animation toys. (For a list of some of the printers and interface cards that work with *Animate*, be sure to check the back of the package before you buy it.)
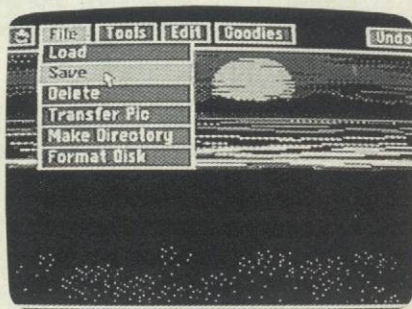
Animate's *pull-down menus let you select functions and commands with the mouse, a joystick, or a graphics tablet. Here, a background is saved to disk.*

Making A Scene
Once you have all the characters you'll need and a background saved to disk, you can proceed to *The Scene Designer*, where you'll set the paths that your characters will follow. This can be done in one of three ways: 1) By using your mouse, pad, or joystick to manually move them around the background while the computer records the action; 2) by selecting both a starting position and a destination for characters that will move in a straight line; or 3) by selecting a specific screen location for each cell of the character's sequence.

As many as 15 additional characters can easily be added to the scene by selecting the frame where you want the new character introduced and then setting the new path in any of the ways already described. You should be aware, however, that the addition of each new character noticeably slows the movement of all the others.

Unfortunately, the animation is also slowed by the addition of sound. While *Animate*'s sound feature conveniently lets you add simple sound effects and music using a four-octave, onscreen keyboard, the animation stops while the computer plays any music for a particular frame. Therefore, to make music seem to accompany the action in your scene, you must enter only one note for every two or three frames of animation. Better alternatives may be to use music only when the action is stopped, or to limit the audible portion of your scene to short sound effects.

Doodlers And Experts
These problems aside, *Animate* should please both doodlers and serious students of cell animation. It comes with a well-organized manual to guide you through the program step-by-step, and an illustrated booklet called *The Art of Animation* that's full of tips on how to make your animation realistic and lifelike. There's even a "quick start" reference card for those who hate reading all the directions before jumping right in.

The real fun comes when you use *Animate* to create your own characters and background, and then combine these into finished scenes. While the animated cartoons you create may not rival Disney's *Snow White*, you'll have hours of enjoyment making them, and, along with your family and friends, you'll have just as much fun watching.

Animate
Apple IIe (128K required), IIc, or IIGS (in 8-bit mode); one disk drive (two strongly recommended)
Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
$69.95

Reviews

Shanghai

Todd Heimarck, Assistant Editor

You can play Activision's *Shanghai* without even reading the help screen that explains how the game works. That's because there's really just one rule—find two tiles that match and remove them from the playing field. The goal of the game is to clear the screen. Sounds simple, doesn't it? And you may even believe that—until you run into your first deadend and the hair-pulling starts.

The game uses 144 mah-jongg tiles, divided into 36 groups of 4. There are four North winds, four green dragons, four 9-of-bamboo tiles, and so on. The tiles are shuffled and dealt out in what the game calls a *dragon pattern*. Some pieces can't be seen because they're covered by others. Some tiles, blocked by those to the left and right, can be seen but not played until the neighboring pieces are removed. When the game begins, 35 pieces are open; 109 are blocked.

It sounds easy enough, but most first-time players don't win. (It's difficult for even experienced players to win regularly.) The simplicity of the game masks a subtle depth of strategy. *Shanghai* is one of those rare computer games that rewards patience and thoughtful deliberation. And it's one that's almost viciously addictive.

Don't Jump Right In

You may be tempted to jump right in and start matching up tiles. Here's a red dragon; there's another one; click on them to make them disappear. This technique doesn't usually work.

When you lose a game, the problem is orphaned tiles. Say there's a 2 of dots at the right edge of a row. It can't be removed because two of the matching tiles

In the Apple II version of Shanghai, *stacked tiles are indicated by horizontal bars.*

The increased resolution of the Macintosh makes more tile detail possible. Though there's no three-dimensional look to the game, it's quite easy to pick out stacks of tiles.

have already been taken from the board and the only 2 of dots left is in the middle of another row. It can't move because it's blocked by a flower. The matching flower is nowhere to be seen, buried somewhere beneath another piece.

When no pairs are open, the game is over, although you can undo previous moves all the way to the beginning of the game if you want to try over.

Another potential disaster is interleaved tiles. The pattern 3-7-3-7, for example, is gridlocked. The 3 on the left is open, but its partner is surrounded by 7's. The 7 on the right is available, but it matches a 7 blocked by 3's. Each tile is part of a set of four, so there should be

two other 3's and two 7's elsewhere on the board. But if you previously removed the other 3's and 7's, you're in trouble.

When a tile and all three of its matching pieces are open, it's safe to click them into oblivion. They'll no longer be a factor in the game.

Fast And Slow

Blitzkrieg tactics—frenetically matching tiles without thinking—will surely lead to failure. But excessive caution is also dangerous; indecision brings paralysis. Sometimes you have to take a risk that may or may not pay off. A winning *Shanghai* strategy requires a balanced approach: not too fast and not too slow.

There are options for competing (or cooperating) with a second player, but the main game is just you against the dragon. If you like solitaire games, you'll enjoy *Shanghai*.

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