

WIN
A Dream
Computer System!!
See page 93.

Adventure Games: What's Coming

COMPUTE!

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The Leading Magazine Of Home, Educational, And Recreational Computing

Computer Monitors: Making The Right Choice

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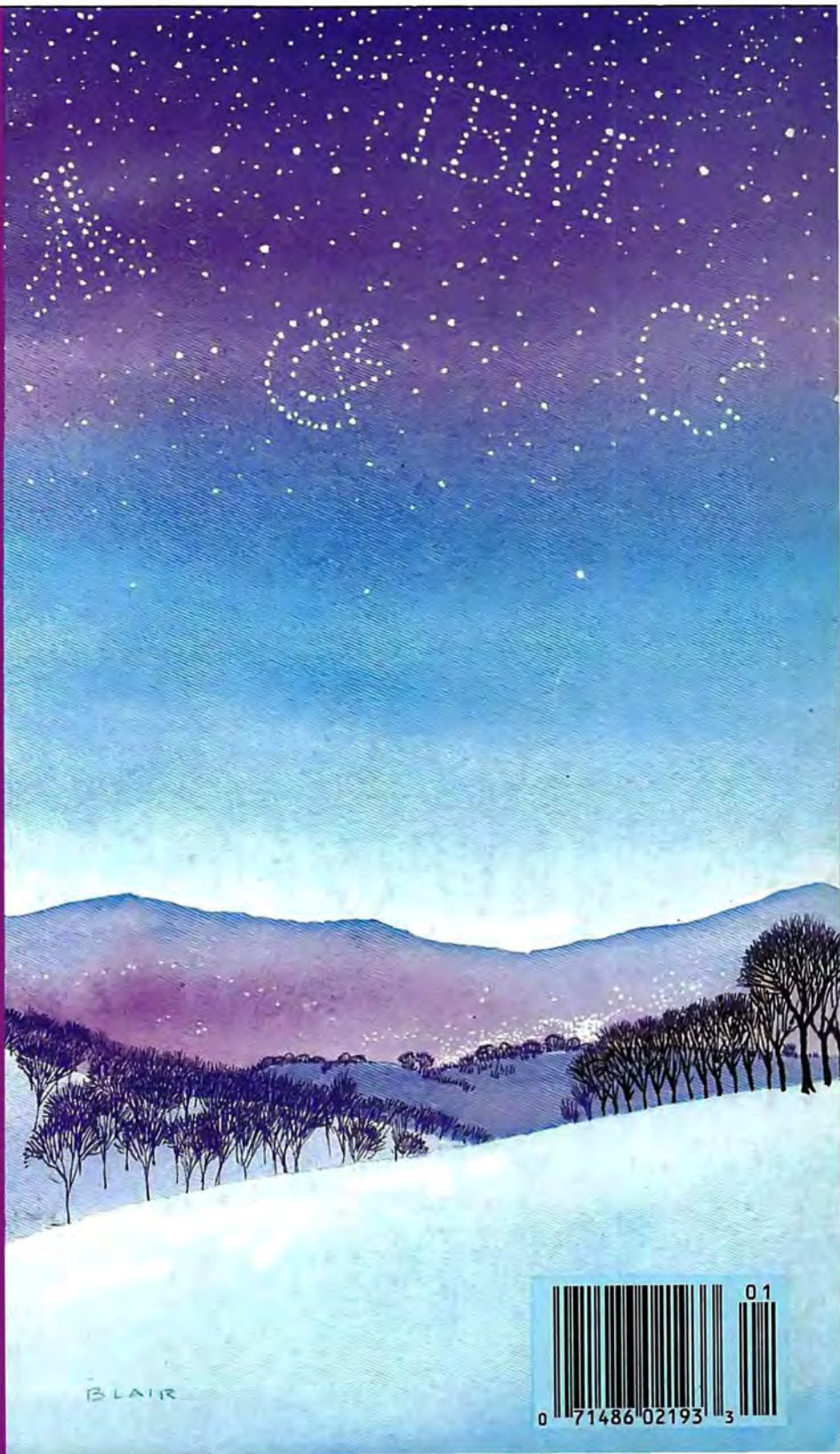
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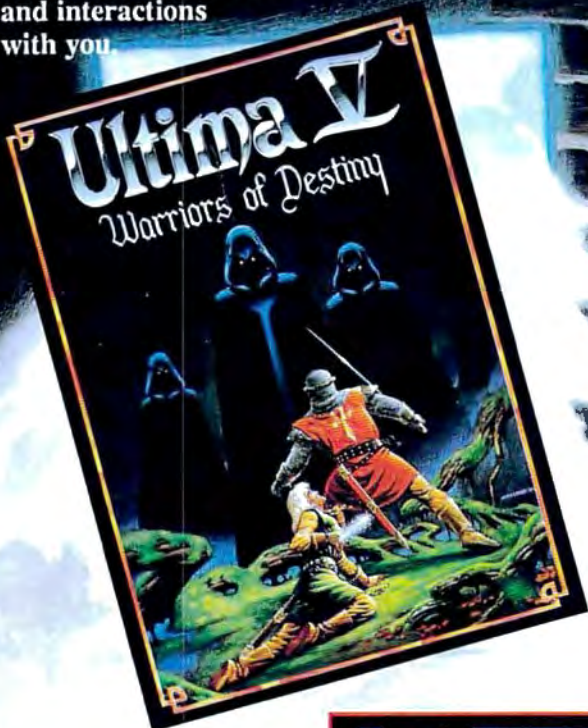


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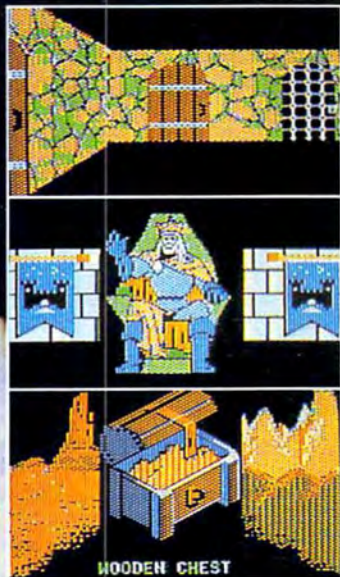
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NUMBER 1
ISSUE 92

FEATURES

- 10** Computer Monitors:
Making the Right Choice Clifton Karnes and Randy Thompson
- 17** Interactive Text in an Animated Age:
Infocom Faces the Challenge Keith Ferrell
- 46** Canfield Ed Reynolds

GUIDE TO ARTICLES AND PROGRAMS

•
•
AP/AT/AM
64/PC/PCjr

REVIEWS

- 31** Video Professor Ervin Bobo
- 32** *The Ancient Art of War at Sea* Keith Ferrell
- 38** *Galileo* for the Amiga Ervin Bobo
- 42** *Award Maker Plus* Carol S. Holzberg
- 44** *Plundered Hearts* and
Nord and Bert Couldn't Make Head or Tail of It James V. Trunzo

PC
PC
AM
AP/Mac/PC

AP/Mac/AT
ST/AM/64/PC

COLUMNS AND DEPARTMENTS

- 6** The Editor's Notes Richard Mansfield
- 20** Readers' Feedback The Editors and Readers of COMPUTE!
- 25** Computers and Society:
The Power of *HyperCard*, Part 1 David D. Thornburg
- 30** Microscope: Go Directly to Jail Sheldon Leemon
- 62** The World Inside the Computer:
Treat Your Kids to Some K-Mail Fred D'Ignazio
- 63** IBM Personal Computing:
Hot Line to the Denver Broncos Donald B. Trivette
- 64** INSIGHT: Atari—Beyond BASIC Bill Wilkinson
- 66** AmigaView: The AmiExpo Sheldon Leemon
- 70** Telecomputing Today: Electronic Funnies Arlan R. Levitan
- 76** ST Outlook: Anatomy of a Desk Accessory Philip I. Nelson
- 78** The Beginner's Page: Drawing Lines C. Regena

•
•
•
•
•
PC
AT
AM
•
ST
•

THE JOURNAL

- 80** Flexible Files Jeff Klein
- 82** Sprite Grabber for the 64 Todd Wostrel
- 84** Softkey for Atari XL/XE John Oakley and Earl R. Davidson
- 91** Time Stamp for IBM Lawrence H. Bannister
- 94** Quick Check: Phone Number and Address Filer
for the ProDOS Ramdisk Ronald G. Jones
- 98** The Elementary Amiga, Part 2 Jim Butterfield
- 79** **CAPUTE! Modifications or Corrections**
to Previous Articles
- 102** **COMPUTE!'s Guide to Typing In Programs**
- 108** **Advertisers Index**

NOTE: See page 102
before typing in
programs.

PC/PCjr
64
AT
PC/PCjr

AP
AM

AP Apple, 65 Apple IIgs, Mac
Macintosh, AT Atari, ST Atari ST,
AM Amiga, 64 Commodore 64,
128 Commodore 128, PC IBM PC,
PCjr IBM PCjr, * General interest

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Editor's Notes

After an association of eight years, and after a year as Editorial Director, I'm leaving COMPUTE! Publications to form a new company with Robert Lock, COMPUTE!'s founder.

Withdrawing, I can see the pathways that led to COMPUTE!'s current status as the only remaining consumer-oriented computer publication in America. I can also see the exciting growth and strength of this publication, how it matured under Robert's guidance from a small quarterly to its present position.

These pathways, the growth and strength, were only aspirations back in 1980 when I wrote some articles and sent them to COMPUTE!. The magazine had a few thousand readers then and was competing with a handful of other consumer publications for the new home computing audience.

The following year, Robert asked me if I would be interested in joining his fledgling staff as an editor. I came to Greensboro and worked with him and the half-dozen other COMPUTE! employees. Over the next six years, he built COMPUTE! into the significant publishing group it is today: more than 200 books in print, six separate magazines, and over one million readers a month.

By 1983 there were around 150 magazines for consumer computer users. Today, COMPUTE! alone addresses the general-interest computer audience. There are several vertical publications which target specific machines, but with the recent repositioning of *Family Computing* toward "home office computing," COMPUTE! is now the only magazine offering an overview of this technology for the nontechnical-, nonbusiness-oriented reader.

We are grateful for the continued support of our readers, and agree with you that computing is too important an issue to be left to the experts. In the coming years, COMPUTE! will continue to evolve, but it will never lose sight of its goal: to explore and explain these fascinating machines for the average intelligent person. In a democracy, of course, the people make the decisions. We believe that few forces in contemporary life are more significant—or will have greater long-term effects—than the impact of computers on society. So it is vital that the public understand this technology and, thereby, bring its collective wisdom to decisions about computing and public policy.

COMPUTE!, of course, also entertains. We have always offered games, graphics, music, and other programs of wide appeal. But, in addition, we feature serious applications, educational programs, tutorials, and even philosophical speculations. These traditions will continue.

Over the years COMPUTE! has attracted some of the most intelligent and talented writers, editors, programmers, and artists in the business. The magazine is now in their capable hands. I'm sure you'll find much to enjoy and much to learn in these pages over the coming years.



Richard Mansfield

THE SECRET LIVES OF AN

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"I thought my habit was under control, but those guys at Accolade know my weaknesses. Six new titles. Six new ways to experience my wildest fantasies. I told my girlfriend Friday night was off. My dog ran away... uh... and he stole all my money!" She bought it. I bought all the new games.



"I booted up **Mini-Putt**, the wackiest miniature golf game in the world. The next morning I found myself in golf knickers on the subway. We hit a tunnel and I panicked. I thought I had puttied us into Hell's Windmill!

to the laundromat cause I'd shoved all my quarters in the disk drive.



"**Apollo 18** put me in the space-suit of an astronaut in a realistic depiction of an actual Apollo moon mission. My neighbor called the cops when I started picking up rocks in his front yard, then stuck a flag in his lawn and claimed his birdbath 'for all mankind'.



"Everything came to a head with **The Graphics Studio**, the powerful and easy-to-use paint program. Suddenly, a man who couldn't draw stick figures was transformed into a Michelangelo. I began wearing a little beanie and speaking with a French accent. Some friends stopped by and caught me pasting all of my print-outs on the ceiling.

"So that's my story. My secret lives are all out in the open. My family is trying to rehabilitate me with some other boring recreational software, but it's useless. I still sneak down to the den in the middle of the night for a little 4th & Inches. Hey, once you've played Accolade, you're addicted."



"Soon all the telltale signs of an Accolade user were there. I played **4th & Inches**, Accolade's action-packed football game. I started wearing a helmet at breakfast. I even sacked the mailman.



"**Pinball Wizard** turned my computer into a virtual pinball parlor. Not only could I play a bunch of killer pinball games, but I could create them as well. I started answering the phone as 'The Prince Of Pinball'. I bought a cape. I couldn't go



"**Test Drive** was no different. It put me behind the wheel of five of the world's most exotic sports cars in a simulation that let me push each car to its limits. The next day I hit a hair-raising 68 mph in my Gremlin and it caught fire.

If you know of someone like Arnold P., please feel free to contact us at Accolade. We'll give them details on how to get an "Accolade Animal" T-shirt. Just call 1-800-423-8366. In CA 1-800-732-2212.

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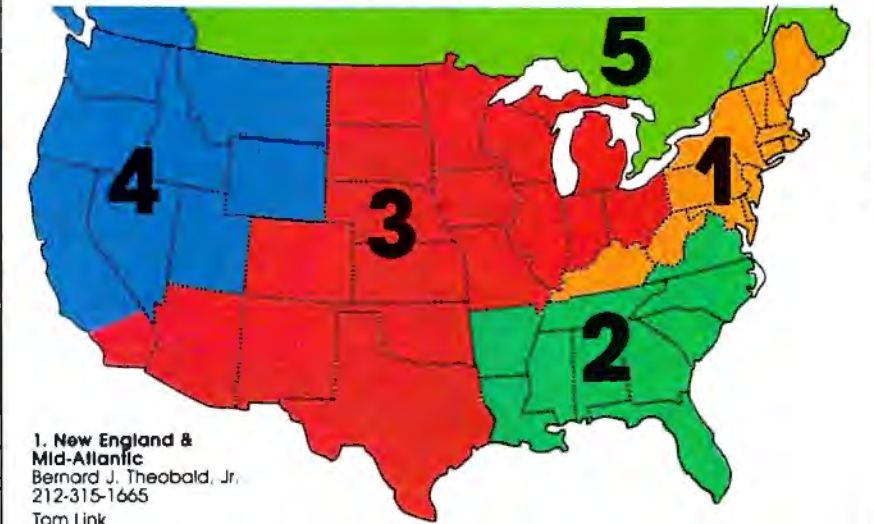
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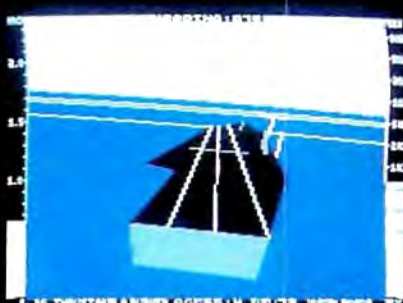
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Computer Monitors: *Making The Right Choice*

Clifton Karnes and Randy Thompson

Whether you use your computer for word processing or world-class game playing, your monitor is the most essential component of your system. No matter what computer you own, this guided tour will help you choose a monitor that offers peak performance for your needs.

You'll use your computer's screen, its *monitor*, more often than anything else in your computer system. It makes sense, then, to take special care when selecting a monitor. The basic question: Do you want color or not?

Color is, of course, important if you plan to play games or work with graphics. On the other hand, all but the most expensive color monitors are harder to read than black-and-white (monochrome) monitors. Also, color monitors can cost anywhere from two to five times more. So, if you're mainly interested in word processing, spreadsheet work, or other text-intensive tasks, you might prefer the sharper and less expensive monochrome.

If you do choose color, but intend to use it often as a text display, you should be sure you will be comfortable reading text on it over extended periods of time. Is the image stable, or does it jitter? Is it sharp, or do the letters blur? There are two basic kinds of color monitors: *composite* and *RGB*. Compos-

ite, which is a lot like an ordinary color TV, is the least expensive. But, as you might expect, the more costly RGB features colors which are mixed more precisely and appear much sharper.

After you've decided whether or not you want color, your final decision about which monitor to buy will be strongly influenced by which computer you use. Atari ST owners, for example, must use monitors made specifically for their computer by Atari. To help simplify the decision-making process, here's a list of the monitor options available, separated into computer-specific categories.

Amiga

There are basically three types of video monitors that you can use with the Amiga: analog RGB, digital RGB, and composite. All Amigas come with RGB output. Most Amiga owners use analog RGB monitors because they provide the best picture and color quality. With the correct cable, you can use a digital RGB monitor like those used on the IBM PC or Commodore 128. These digital monitors, however, display only 16 colors instead of the Amiga's full range of 4,096.

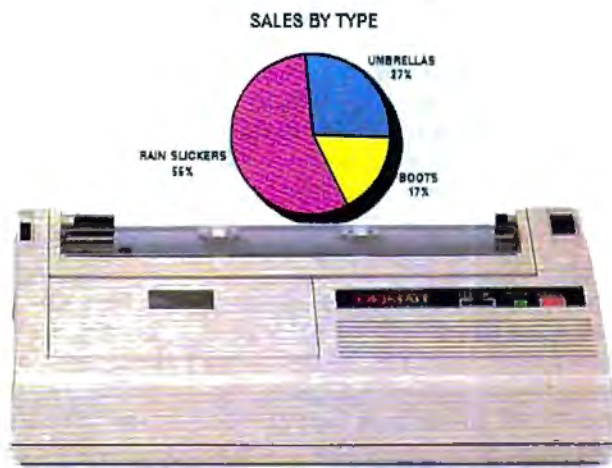
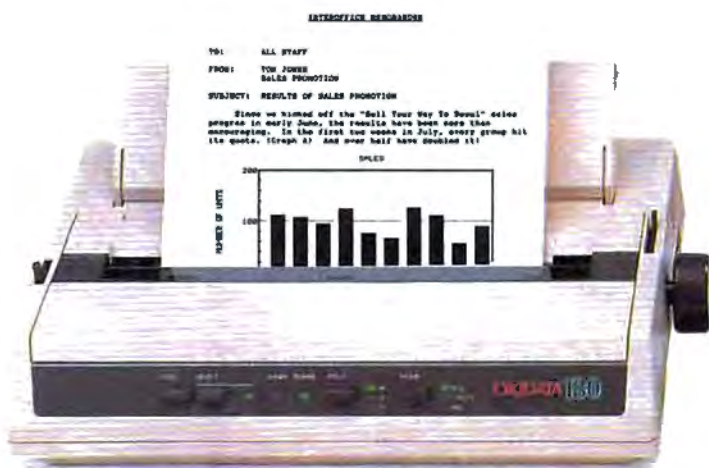
The Amiga 1000 comes with composite color output as well as RGB. The tradeoff here involves image quality. Images that appear sharp on an RGB monitor can look fuzzy on a composite monitor.

Since there are more than 4000 colors available, Amiga 500 owners usually opt for RGB monitors. The Amiga 500 also comes with composite output, but is monochrome composite only. To make up for the lack of color, the monochrome composite output provides a gray scale that produces 4,096 different shades. If you wish, you may hook up a color composite monitor to an Amiga 500, but you'll get a black-and-white picture. Monochrome composite monitors provide a sharp image for text, but when you're using a computer capable of producing outstanding high-resolution graphics in over 4000 different colors, it's something of a waste to view only shades of black and white.

Composite video output is not standard on the 2000. If you wish to use a composite monitor, you must purchase the A2060 composite/RF modulator board.

One type of monitor worth considering is a long-persistence (sometimes called high-persistence) monitor. These monitors are available in both composite and RGB. Long-persistence monitors hold their picture longer than ordinary monitors, thus displaying a steadier image. This can be important when using the Amiga's special interlace modes. With a normal monitor, these extra high-resolution screens tend to jitter. Although more expensive, a long-persistent monitor can be worth the extra cost.

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Apple II

With the exception of the Apple IIgs, which has RGB output, there is really only one choice for Apple IIe and Apple IIc owners: a composite monitor. The big decision here is color or monochrome. Monochrome offers a much more readable display when it comes to text, but if you do a lot of game playing, a color monitor might be worth looking into.

With an RF modulator, you can use your television as a video display. Although not the best quality, the family TV offers a tempting low-priced alternative to a dedicated monitor.

The digital RGB output on the IIgs provides a much clearer picture than its composite output. Because of the IIgs's color and graphics abilities, it's advisable to use an RGB monitor if you can afford one.

Atari (Eight Bit)

The Atari 800 family of computers can hook up directly to a TV or a composite monitor. (Atari 400s have TV output only.) Using the Atari's RF modulated output, you can view your computer's screen output via television channel 2 or 3.

To obtain the best picture, you should use a composite monitor. You may connect either a monochrome or color monitor to the composite output. But because the Atari is a color computer with a wide variety of colorful games available, you'll probably want to consider a color monitor.

Commodore 64

Commodore 64 users—like eight-bit Atari users—have three types of monitors from which to choose. First, with an RF modulator, you can use the family TV. The second choice is a monochrome composite monitor, and the third possibility is a composite color monitor.

A TV provides a display that is satisfactory for most applications, but for text-intensive work—like word processing or using spreadsheets—either a dedicated monochrome or color monitor is a must.

The 64's composite signal generates a good, clear monochrome display, but for those who want everything—crisp text *and* color—only a composite color monitor will do. The 64 has a special type of

composite signal that separates chroma (color) and luma (intensity). When this signal—called *separated composite*—is fed into a monitor that accepts it (like Commodore's 1702/1802), the results are outstanding for a computer in the 64's class.

Commodore 128

The 128, in addition to its 40-column 64 and 128 video modes, has an 80-column color mode. Since a high-quality 80-column display demands a higher-resolution color signal than is possible with composite video—even separated composite—the 128 uses a special video chip (8563) to produce a digital RGB output for its 80-column color screen.

To take advantage of both of the 128's video modes—composite and digital RGB—you'll need either two monitors, or a monitor capable of displaying both signal formats. Be sure that any monitor you're planning to buy will display both composite and digital RGB signals before you make your purchase, since not every monitor is capable of displaying both types. The 128's RGB port is plug-compatible with the one on IBM's color/graphics adapter, so IBM-style monitors can be used with the 128.

The IBM Standards

The IBM PC's open architecture makes it possible to choose the type of video display you want to use. The computer's display circuitry is usually located—perhaps with other options—on an integrated circuit board called a *card*. (On some IBM compatibles, the video circuitry is built into the system's motherboard.) Video cards can usually be installed and removed without much fuss, so it's easy to change the type of display output you have and, thus, the kind of monitor you use.

Today, in the IBM world, the question of which monitor to use always begins with the question of which video card you have, or want to purchase. In the beginning, though, it was simple.

When IBM first introduced the PC, there were only two display adapters available—the *IBM Monochrome Display and Printer Adapter* (MDPA) and the *IBM Color/Graphics Adapter* (CGA). The mono-

chrome adapter was intended for professional use. It produces a clear, easy-to-read text display, but no graphics. The CGA doesn't have as fine a resolution as the monochrome adapter, but as the name implies, it can display color *and* graphics.

With only two standards, monitor selection was easy. The monochrome card required a TTL monochrome monitor—which is fairly inexpensive—and the CGA card required a digital RGB color display—which is much more expensive. Things started to change when monochrome display users realized they needed graphics capability, too.

Enter Hercules, makers of the *Hercules Graphics Card*. The Hercules card has the same sharp text display as the Monochrome Adapter and it can produce super high-resolution monochrome graphics. Because of its early support by important products like *Lotus 1-2-3*, the Hercules card has become a monochrome standard—but one that IBM has never accepted.

Although IBM has introduced several other video standards, most PC or compatible buyers are faced with a decision between a Hercules (or Hercules compatible) card and a CGA. Let's look at both of these options in more detail.

The Hercules Card

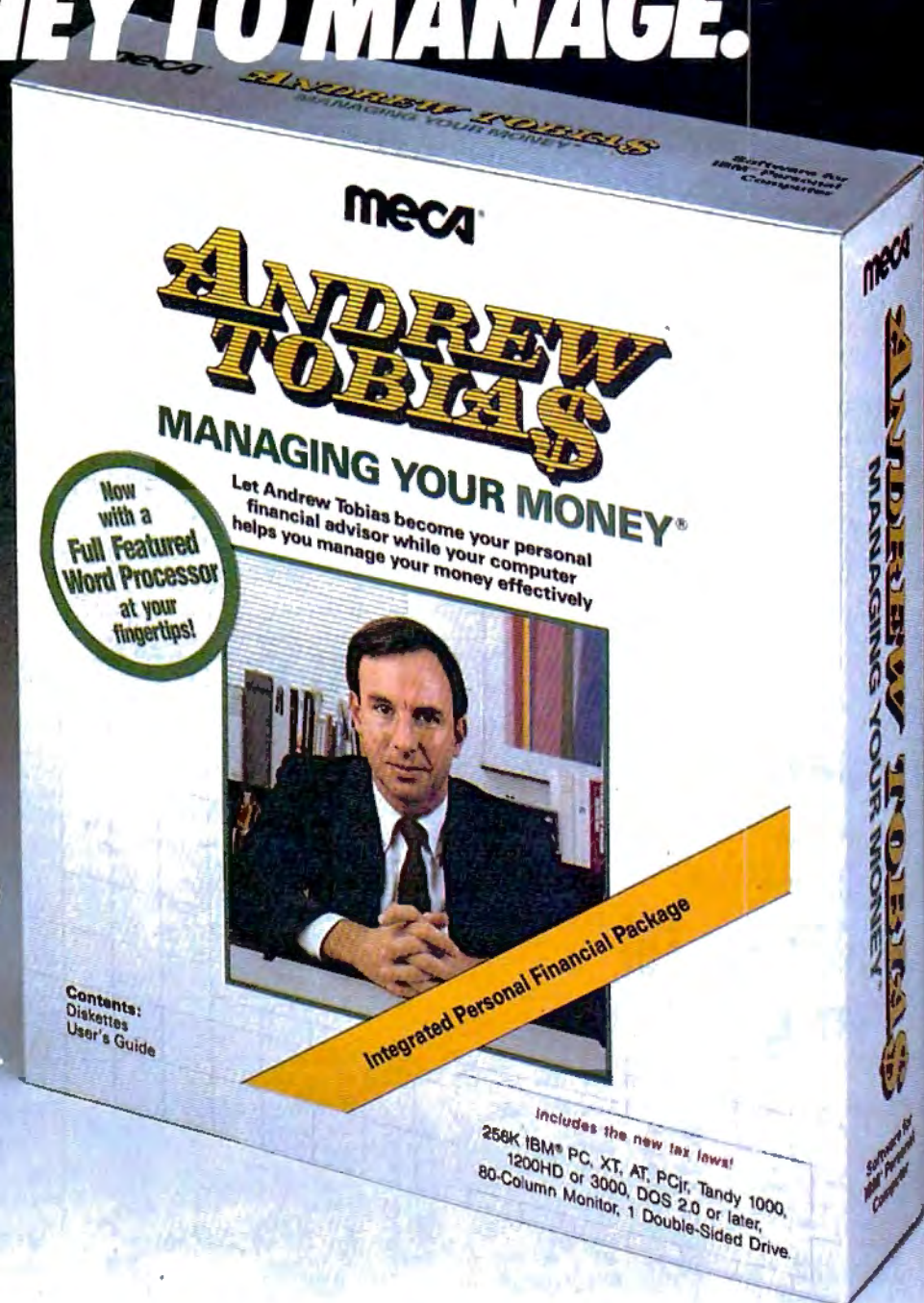
The Hercules card has just two monochrome modes—text and graphics. The graphics mode has a resolution of 720 x 348. For applications that don't demand color, it is an excellent, and inexpensive, choice. Hercules-compatible cards are often sold for under \$100 and the monitors that support this display can be found in the same price range.

Perhaps the biggest drawback to the Hercules card is that IBM's BASICA doesn't support its graphics, so you can't use BASICA's drawing commands. In addition, many games use graphics and expect a CGA card. One solution to these problems is offered by Chuck Guzin in a program called *SIMCGA*, which allows a Hercules card to emulate a CGA card. Your display is still monochrome, but you have CGA graphics compatibility.

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CGA

The CGA card is capable of displaying text and graphics in seven different modes:

- 40-column monochrome text (320 × 200)
- 40-column 16-color text (320 × 200)
- 80-column monochrome text (640 × 200)
- 80-column 16-color text (640 × 200)
- 320 × 200 4-color graphics
- 320 × 200 monochrome graphics
- 640 × 200 2-color graphics

If you want to use color text, color graphics, or both on your PC, then a CGA card along with a digital RGB monitor is a good choice. The CGA card and the monitor it requires are more expensive than their monochrome counterparts, but the price of these components seems to be dropping almost daily, and once you've been seduced by color, it can be hard to return to monochrome.

EGA

In an attempt to combine several standards into one video card, IBM released its *Enhanced Graphics Adapter* (EGA) in 1984. The EGA was intended to replace the Mono-

chrome Adapter, the CGA, and the Hercules card, and to add new video modes. To take advantage of the EGA's higher resolution you'll need a high-quality RGB monitor like IBM's *Enhanced Color Display*. The EGA's text modes offer higher resolution than the CGA's and the EGA has the following additional graphics modes:

- 320 × 200 16-color graphics
- 640 × 200 16-color graphics
- 640 × 350 monochrome graphics
- 640 × 350 64-color graphics

The first two modes offer more colors than the CGA, but at the same resolution. The monochrome graphics mode is IBM's answer to the Hercules card but it is not compatible with Hercules graphics. The last mode, 640 × 350 64-color graphics, requires IBM's *Enhanced Color Display*, or its equivalent. It combines exceptional resolution with a large palette of colors. As you might expect, EGA cards and EGA-compatible monitors are more expensive than their CGA counterparts, but the price of these products, too, is dropping.

PS/2

IBM's new PS/2 line of computers offers a completely new video standard and a new video output— analog RGB—which requires an analog RGB monitor. The new adapters used in the new line are the *Multicolor Graphics Array* (MCGA) for the Model 30 and the *Video Graphics Array* (VGA) for Models 50, 60, and 80. Why has IBM introduced another video standard that requires a new kind of monitor?

IBM wanted the new PS/2 to have spectacular graphics, which means lots of colors and very high resolution. IBM's analog RGB output can display more colors than digital RGB. With IBM's new analog RGB monitors, each red, green, or blue dot can have any one of 64 different values. This means that 262,144 colors are possible—quite a palette. No one is sure what the future of the new PS/2 system will be, but it's a good bet that the PS/2's graphics adapters will become a new standard. ©

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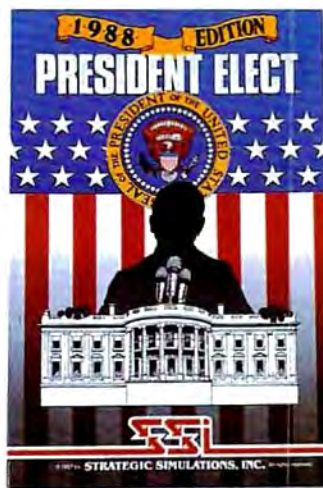
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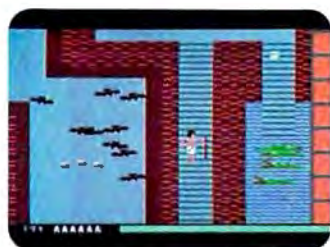
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Interactive Text In An Animated Age

Infocom Faces The Challenge

A Conversation With Joel Berez And Marc Blank

Keith Ferrell
Features Editor

Infocom has ridden through a decade's worth of changes in the computer industry by concentrating on one type of product: interactive fiction. The Zork Trilogy has sold more than a million copies. Other best sellers include The Hitchhiker's Guide to the Galaxy, Planetfall, and Leather Goddesses of Phobos.

Now a wholly owned subsidiary of Activision, Infocom continues to focus on interactive fiction. We were curious about how the market for text adventures was holding up in a marketplace that's more and more graphics-oriented—and where is interactive fiction headed?

COMPUTE!: *It seems that increasing emphasis is being placed on graphics and animation in discussions of computer games and entertainment. How does a text-oriented publisher compete with this trend?*

Berez: It's true that most people think of graphics when they hear the phrase *computer game*. It's been true for years, though.

You're in a hotel room, armed with a tape recorder and stack of notes. Judging from the view, that's Cambridge, Massachusetts, outside. MIT sprawls around your hotel, the university's varied architecture centered, it seems, around a huge dome. Being here, you can't help but think how many facets of computer technology have been shaped here. From mainframes to micros, this is the East Coast center of the computer industry.

Perhaps most important of all, at least for immediate purposes, this is where *Zork* was born. And that's why you're here.

You're not alone in the room. Two men are with you, both eager to talk. One is Joel Berez, president and founder of Infocom. The other is Marc Blank, a member of the original Infocom team, co-author of *Zork*, and lately a free-lance developer and consultant. Blank's latest piece of interactive fiction, *Border Zone* was published by Berez and Infocom late in 1987.

After a moment's orientation, you begin the questioning.

Blank: In fact, most people use the terms interchangeably, especially people who aren't computer owners—they say *video* games when they mean *computer* games.

Berez: In the early days, people saw arcade games before they ever saw a computer. Naturally, when they saw a computer game, they immediately thought it was the same kind of thing translated to a computer.

At Infocom, we've always tried to sell the concept of interactive text-only products.

COMPUTE!: *The word interactive itself has lately been co-opted by manufacturers of VCR games, among other things. How do you position interactive fiction in an entertainment marketplace like this?*

Berez: If you look at the entire marketplace and divide it up, there are arcade games, sports games, simulations, and stories.

Stories are actually a very large segment of the market—perhaps even a quarter of it right now. Story products in general do not have fast-action graphics of the sort that people are used to. Certainly interactive fiction rarely has graphics at all, and even fantasy role-playing games tend to have fairly simple graphics.

So the people who are attracted to the story category tend to discover that graphics and action aren't everything, and aren't necessary for enjoyable games.

Blank: In fact, there are very few graphics adventures in which the

graphics even play an integral part in the story or provide any information that couldn't be provided otherwise. Rather than try to make the stories more complex, the easiest thing to do is to make the product look nicer—to add bells and whistles.

This has been going on for a while. Back in 1981 and 1982, we were told by distributors that we were crazy. Nobody wanted text games any more, we were told, because machines were all becoming graphics machines.

So this [trend toward graphics] isn't anything new. The graphics keep getting better on the machines, so it's not surprising that some people say text is dead.

But for people who like stories, text adventures have just done a better job of telling stories. That's the important point.

COMPUTE!: *With a market increasingly accustomed to graphics adventures, however successful or not, where does Infocom find new customers?*

Berez: In some ways, it's easy to convert people from, say, fantasy role-playing games to text adventures, because they're already into that sort of thing.

But it's been a challenge for years to attract people from other categories. We find that we can get a reasonably high conversion rate if we can get people to sit down at a computer and try one of our games for a while.

COMPUTE!: *Sophisticated graphics capability is being emphasized by the computer manufacturers as well. What sort of response are you getting from the higher end graphics machines such as the Amiga?*

Berez: We've just done a graph of our sales over the last year to see what our penetration is. Our number-one machine is the Macintosh. Number two is a tie between MS-DOS and Amiga. After that come Atari ST, Commodore, and Atari XE.

It turns out that there's no noticeable correlation between graphics machines and our penetration. There is a high correlation between the price of the machine and our sales. We do better on the expensive machines than on the inexpensive machines. People who are putting more money into their machines tend to buy more of our software.

COMPUTE!: *Is advertising an effective means of gathering new customers?*

Berez: We've tried a number of approaches with good results. One ad had the headline, "We stick our graphics where the sun don't shine!"—with an illustration of a brain. Another ad showed a typical computer alien from outer space, with the line, "Would you pay a thousand dollars to match wits with this?"

Blank: The point was that you should be able to expect more from a story than just getting a little animated character to move around on your computer. These are very powerful machines, and they're not really being used to their potential—at least in the storytelling realm.

What Infocom has done from the start is to simulate a universe and then tell a story within that universe.

COMPUTE!: *It's an approach that has evolved over the years, while retaining consistent goals.*

Blank: Yes. Every game has had some level of improvement. It's gotten more sophisticated, smoother; the interaction has gotten better.

But in the long run, as things progress and more of a mass market grows, you'll be reaching more people who look for *story*. People are used to storytelling from other media, whether it's music, or movies, or books. People look for stories. That's what sells books; it's what sells movies.

There's more than just special effects. A lot of people thought after the *Star Wars* movies all you had to do was put in some fancy special effects. But if the movie was junk, and the story wasn't good and didn't pull you in, the special effects alone weren't enough.

My sense is that the best thing to be doing is honing skills for telling stories interactively, and not wasting time on graphics technology that is going to be outdated anyway. In the long run, none of these technologies are what consumers are ultimately going to want. But they *are* going to be interested in some kind of interactive storytelling, whether through text or animation.

COMPUTE!: *Do you face any problems as a result of the decline in literacy? Are Infocom's sales touched by the*

fact that people don't seem to be reading as much as they used to?

Berez: Our audience tends to be composed of heavy readers. We sell to the minority that does read. And there's still a good, solid core of people who do read.

Blank: Part of the trend can be traced to immediate gratification—TV, and so on. There's some relationship, but I think the people who really like stories will still be attracted to interactive fiction. One of the things Infocom has been doing lately in a few stories is trying to make it easier for people, trying to provide more of a short-story feel. We're putting together games now that people can play for a while and then put down, having gotten a good and complete experience out of the game. Then they can pick up



Joel Berez

the game later and have another experience with it, and so on.

COMPUTE!: *So you're willing to relax the format a bit.*

Berez: For a long time we were real purists. Because everything was in the user's imagination, and the games were enjoyable the way we were producing them, we never felt any need to add a little sizzle, or to snazz up the interface.

Right now, though, we're experimenting with a lot of things to make the games a little easier to

play. We're looking at ways to improve the interface, to make it easier for current users and, frankly, to try to get new people to try our products and give them a chance.

If the screen is more visually interesting, it's more likely that somebody who would not have attempted to play one of these games will actually try it.

COMPUTE!: *What has been the response from your existing customers?*

Blank: It doesn't detract at all from the game. It's just another way of reaching a group of people who might not feel that they were in the audience. We've always found that the important thing is for the consumer to give our products a trial run. We know consumers can get hooked on these things, but you have to overcome those barriers: "It's too long; it's going to be too hard; it doesn't look like games I'm used to."

We can address all of that without detracting from the quality of the interactive experience.

Berez: For example, in *Beyond Zork*, because people are tired of drawing their own maps for our games, we've included an automatic on-screen mapping facility.

COMPUTE!: *Why now? What made you decide it was time to enhance the interface and add other effects?*

Berez: One reason we're much more open now to experimenting with other kinds of effects, including sound and graphics, is that machines have gotten to the point where they're powerful enough for us that we can give you the whole experience and add something to it. A few years back, we would have had to compromise the interactive experience to add anything else.

COMPUTE!: *So the charges that Infocom hates graphics aren't accurate?*

Blank: Not at all! All we've ever said was that what's important is the story. The way you tell the story, and the way that story interacts within the user's imagination is very powerful. You don't need graphics.

But we all like graphics games, too. It's a different type of experience. An all-text *Pac-Man* never made sense: Eat dot. Wokka.

COMPUTE!: *Is there a point in interactive fiction, though, at which added effects become obtrusive?*

Berez: This is experimentation, and if something doesn't work so well, it won't be continued. In *Beyond Zork*, you can turn the new features off if you don't care for them.

COMPUTE!: *Marc, you've said that all the features are subordinated to storytelling. How far can you go with this? Are we moving toward a new art form that merges the storytelling of fiction with the puzzle approach that has typified text adventures? How do you approach these questions when writing a new game?*

Blank: I've just finished a new game, *Border Zone*, and my goal in writing it was to make it a storytelling experience. The story is *very* important—there are puzzles, of course, but the puzzles are so embedded in what's happening in the story itself that you almost forget that they're puzzles you're doing. It's an intrigue game, with three different scenarios, and you're a different character in each scenario. Also, I've added real-time to the game.

COMPUTE!: *Tell us about that.*

Blank: In a game of intrigue and suspense, where you want people to feel that sense that things are happening all around them, that they're trapped and they have to get out, being able to use real-time is very effective. There's one point where you have to set a fuse on a bomb to go off in a certain number of minutes. Once you do that, it starts ticking. No matter what else you're doing in the game, you're aware that bomb is getting closer and closer to detonating.

What's important about these extra elements is using ones that are appropriate. It's not something just tacked on as a bell and whistle—it's an integral part of the story.

COMPUTE!: *You're seeking ways to make the problem-solving and puzzle elements serve the cause of narrative.*

Blank: Yes. Stories have a sense of time and progression and dramatic thrust that's hard to achieve in this medium. But we are constantly experimenting, and getting closer to real fictional experiences.

Berez: These are a form of literature, but you can't just translate a book into a computer game. There has to be some advantage to using the computer, or the user would be better off reading a book.

In the early days, the advantage was the feeling that you are there. The puzzles added to that—they gave you reasons for interacting with the environment we put you in.

Now we're experimenting with other approaches that may in fact feel much less puzzle-oriented. They may actually be much less puzzle-oriented. But you'll still be drawn through the story. You'll get a certain feeling that you wouldn't get just reading a book.



Marc Blank

COMPUTE!: *Zork came out of mainframes. You've found great success in the micro market. What about the next generation of computer technology? Can we look for Compact Disc-Interactive (CD-I) games from Infocom?*

Berez: What we do is interactive storytelling, and that implies that we'll do things for any medium that can be interactive. We've produced books. CD-I is definitely something we want to work on.

COMPUTE!: *What form might an interactive CD-I take?*

Berez: Audio is a particularly good medium for translating Infocom games. Listening *uses* your imagination. The key, though, is to use sound, or any enhancements, the same way we use text—as something that adds to the imaginative experience. ©



Readers Feedback

The Editors and Readers of COMPUTE!

If you have any questions, comments, or suggestions you would like to see addressed in this column, write to "Readers' Feedback," COMPUTE!, P.O. Box 5406, Greensboro, NC 27403. Due to the volume of mail we receive, we regret that we cannot provide personal answers to technical questions.

Telecomputing For Beginners

I have three questions about modems. Can you use a modem if you have a two-party phone line? Is it cheaper in the long run to buy a 1200-baud modem for \$100, or a 300-baud modem for \$40? When you use services like CompuServe, that charge by the minute, do you have to pay long-distance bills for calling them?

Kevin Smith

A modem can be used on a two-party line, but if the other party picks up the phone while you're telecommunicating, you'll probably lose some data; you might even be disconnected. If you plan on downloading long programs from the service, you'll probably want to switch to a single-party line.

The key phrase in your second question is "in the long run." Although you'll save a few dollars in the short run if you buy the 300-baud modem, you'll save more in the long run by choosing the 1200-baud modem. If you use your new modem often, you'll make up the \$60 difference in the prices quickly.

As to your third question, it depends. Many cities have a local access number—you can reach the service with a local call. If you don't have a local access number, you'll have to pay for a long distance call. For details, check with the service you're interested in. An alternative to long distance calls, known as the PC Pursuit Service, is available from GTE Telenet. This service is designed for data only (no voices) and is available in only certain area codes. For a \$25 sign-up fee and \$25 a month, you can make an unlimited number of calls from 6 p.m. to 7 a.m. weekdays, and at any time during the weekend. For more information, call the PC Pursuit Bulletin board at 1-800-835-3001 (data only).

Amiga 2000 Confusion

I enjoyed Sheldon Leemon's April 1987 AmigaView column about the new Amiga 2000. In it, I read that the Amiga 2000 has slots for two- or eight-megabyte RAM cards and a special slot for a coprocessor card, but does not support more than 512K of chip memory or a math coprocessor. What distinction is he drawing?

Bob Trent

As to the memory question, all Amiga computers have a reserved area of 512K bytes of memory known as chip memory. This is the only memory that's accessible to the special hardware chips that control sound and graphics. The microprocessor in the Amiga, on the other hand, can access all the RAM that you can put into the Amiga. Having more chip memory would allow for improved animation and sound. Contrary to some rumors that circulated before the introduction of the 2000, that machine has the same amount of chip memory as the 1000.

The Amiga 2000 does not use a math coprocessor, which would speed up numerical applications like spreadsheets and three-dimensional graphics. However, it does have a special slot that can hold a coprocessor like the 68020, which is an improved version of the 68000 processor that all Amigas use.

Programming The Atari

I own an Atari 800XL and a 1050 disk drive. I know BASIC and some machine language. I like to program, especially with player/missile graphics. What I would like to know is how to detect collisions between players and missiles. Also, is there a way to move players vertically other than shifting all the player data in memory?

I have read that POKE 1913,80 speeds up the disk drive when saving programs. Is there a POKE I can do to speed up loading?

Thane Maxwell

Player/missiles are similar to the sprites on other computers—they are movable objects that are independent of the background screen. However, player/missiles do not have vertical position registers, so you cannot move them up and down with-

out physically moving the image data. Fortunately, player/missiles stretch the entire height of the screen (and even beyond the top and bottom of the screen), so player/missiles can be on any portion of the screen.

The player/missile graphics system has collision registers that can tell you when any given player or missile has overlapped any given color on the screen, when any player has overlapped any other player, and when any player has overlapped any missile. There is no provision, however, for detecting collisions between two missiles. Many books cover player/missile programming. Mapping The Atari from COMPUTE! Books and De Re Atari from Atari are among them.

The POKE you mentioned for speeding up disk saves works by turning off the verify mode. Normally, each save is followed by a simulated load which compares each saved byte to the corresponding byte of memory. If any of the bytes don't match, the save is automatically retried. POKEing 80 into 1913 turns off this verify mode. There is no simple POKE that can speed up disk reads.

The Amiga Family

I'd like to buy an Amiga 500, but I don't know how compatible it is with the Amiga 1000. How compatible is it? Can it run IBM software like the 1000?

Yip Man Tsang

The Amiga 500 is basically a repackaged Amiga 1000. It has all the powerful features of an Amiga 1000—multitasking (the ability to run several programs at the same time), excellent sound, and the most impressive graphics system of any home computer. The keyboard, while not detachable, has been expanded and enhanced. Most people agree that the 500's keyboard has a better feel than the 1000's. The Amiga 500 comes with more standard RAM than the 1000 (512K vs. 256K for the 1000), and is easily upgradable to one megabyte (1024K). Best of all, the 500 has a much lower price.

The Amiga 500 is compatible with all software written for an Amiga 1000 running version 1.2 of Kickstart and Workbench. It will not run some software written for version 1.1 (remember, Kickstart 1.2 has been placed in ROM on the

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- Mapping the Atari 2386094

Amiga 500). This shouldn't be a problem since nearly all commercial software is now written for version 1.2.

Some hardware designed for the 1000 does not work on the 500. Before you plug anything into your 500's expansion connector, make sure to ask whether it is compatible with your computer. Now that there are three Amiga models, most manufacturers clearly state which model or models their products work with.

Currently, only the Amiga 1000 and 2000 have the ability to run IBM PC software. The Amiga 2000 offers an optional bridge card (an 8088 microprocessor on a board), and the 1000 has a hardware add-on (called the Sidecar) for IBM compatibility. Commodore has not mentioned any details for running PC software on the 500, but there's always hope—the numeric keypad includes IBM cursor-control keys.

128 To CP/M File Transfer

I use Word Writer 128 for word processing. As you may know, it stores files in sequential format.

My question is this: Is there a way to transfer these files to a Commodore CP/M disk so they can be read in CP/M mode? I would like to be able to do this to keep from having to purchase a CP/M word processor or text editor.

I would appreciate any help you could give me.

Robert Kupfer

In the July 1986 issue of your sister publication, COMPUTE!'s Gazette, the article "A Hands-On Introduction to 128 CP/M" makes reference to downloading a program from a BBS in 64 or 128 mode, and then transferring it from a Commodore disk to a CP/M disk. Since the two disk formats are not compatible, can this transfer be accomplished using a single 128 computer and 1571 disk drive?

Paul Lynas

There are several ways to transfer files from a 128 disk to a 128 CP/M disk. First, there are programs available in the public domain that will do this for you. Programs for one- and two-drive systems are available on CompuServe, QuantumLink, and on most bulletin board systems (BBSs) that support Commodore computers. If you don't have a modem, your best bet is to contact a local user's group for one of these programs.

If you are unable to locate one of these programs, there is a simple way to accomplish the transfer (assuming your files are less than 50K in length.) This method requires only a 128, 1571, the DOS Shell program that comes with the 1571, the CP/M system disk that comes with the 128, and one short BASIC program.

In a nutshell, this technique involves

loading a file—originally either sequential or program—into the 128 in 128 mode, booting CP/M and saving the information to a CP/M-formatted disk. It's not an especially complicated procedure, but it does involve several steps.

First, in order to be BLOADED into the 128's memory, the file you want to transfer must be a PRG file. If the file is in sequential format, there's a simple way to convert it.

Boot the DOS Shell program that came with your 1571. When the shell is in memory, press f1 to activate it. Choose the DELETE FILES option from the menu. Delete the file you want to change from SEQ format to PRG (make sure you have a backup copy of this file on another disk). Now, choose the option to RESTORE FILES. Specify the filename of the file you just deleted. When the shell asks what type of file the restored file is, simply select the PRG option.

Now that your sequential file is a PRG file, you can load the file into the 128's memory at a place where CP/M will be able to find it. Use the following command:

```
BLOAD"filename",B1,P7170
```

where filename is the name of the file you want to transfer. This will place the file in bank 1, at address 7170 (\$1C02). Next, there are two details to which we must attend. The BLOAD command assumes the first two bytes of your file are its load address—they aren't, they're part of the file you want to transfer—so we need to read these two bytes and put them where they belong. Second, we need to determine the file's ending address. To accomplish these two tasks, type in and run the following short program, again replacing FILENAME with the name of the file you wish to transfer:

```
10 DOPEN#2,"FILENAME,P,R"
20 GET#2,A$:IFAS$=""THENAS=CHR$(0)
30 BANK1:POKE7168,ASC(AS)
40 GET#2,A$:IFAS$=""THENAS=CHR$(0)
50 BANK1:POKE7169,ASC(AS)
60 GET#2,AS
70 BYTE=BYTE+1
80 IFST=0THEN60
90 DCLOSE#2
100 PRINT"ENDING ADDRESS = "HEX$(7169+BYTE)
```

Write down the ending address—you'll need it in just a moment.

Now, place your CP/M system disk in the drive and type BOOT. (Be sure not to reset your 128 or turn it off, just type BOOT.)

When the 128's CP/M is loaded, take the disk that has the CP/M command SAVE on it and put it in the drive. (SAVE is on the flip side of the CP/M system disk that came with your 128.) Now type SAVE at the A> prompt. When the prompt returns, type SAVE again. Now place the

CP/M disk you want to save the file to in drive A. CP/M first asks you the filename you want to use. Supply any legal name you like. If the file is a binary or executable file, be sure to use the extension .COM. Next you're asked for the starting address. Type 1C00 and press RETURN. Finally, CP/M asks for the ending address. Type in the ending address you wrote down earlier.

If you've done everything correctly, your 128 file is now on your CP/M disk.

The Atari 65XE

I have a 65XE and I am told that it cannot be expanded like the other computers in the XL and XE series. If it can be expanded, please tell me how.

Joe Stinsky

The first generation of Atari computers, the 400 and 800, did not have an expansion bus connector on the machines. This made it difficult to connect accessories and exotic peripherals to the computers.

When the XLs first appeared, one of the big selling points was the addition of an expansion port. Unfortunately, few manufacturers took advantage of this port until recently. Atari decided to make the 65XE their entry-level computer, so they did away with the expansion port to reduce the cost of the computer. The 65XE's big brother, the 130XE, does have an expansion port.

Date Stamping ProDOS Files

I do not have a clock on my Apple IIe, so my files are never dated properly when saved to disk. I often have two different versions of the same file with the same date on separate disks. It would be handy if I could tell which file was the most up to date. Could you develop a program which allows me to manually set the date of ProDOS files?

Leslie Gene Hunter

The program below allows you to set the system date on the Apple IIe or Apple IIc without the use of a hardware clock. (The Apple IIgs does not need such a program because it comes with a built-in clock.)

```
10 HOME:PRINT"SET DATE (ENTER TWO-DIGIT NUMBERS ONLY)":PRINT
20 INPUT"MONTH: ";M$:IF M$ < 1 OR M$ > 12 THEN PRINT"ILLEGAL MONTH"CHR$(7):GOTO 20
30 FOR I = 3 TO 0 STEP -1:M$(I) = M$ / 2 ^ I:M$ = M$ - 2 ^ I*(M$ >= 2 ^ I):NEXT
40 INPUT"DAY: ";D$:IF D$ < 1 OR D$ > 31 THEN PRINT"ILLEGAL DAY"CHR$(7):GOTO 40
50 FOR I = 0 TO 2:D$ = D$ + 2 ^ (I + 5)*M$(I):NEXT
60 INPUT"YEAR: ";Y$:IF Y$ > 99 THEN PRINT"ILLEGAL YEAR"CHR$(7):GOTO 60
70 FOR I = 6 TO 0 STEP -1:Y$(I)
```


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```

) = YX / 2 ^ I: YX = YX - 2 ^
I * (YX > = 2 ^ I): NEXT
80 FOR I = 0 TO 6: YX = YX + 2 ^
(I + 1) * YX(I): NEXT I: YX =
YX + MX(3)
90 POKE 49040,DX: POKE 49041,YX
: PRINT : PRINT "DATE SET"

```

You must run this program every time you boot your computer. If you wish, you may include this code as part of your startup program.

When run, you are asked to enter the month, day, and year using two-digit numbers. To set the date to November 20, 1988, for example, enter to numbers 11, 20, and 88. If you make a mistake, simply rerun the program. After the program has been run, ProDOS automatically stamps all newly created or updated files with the appropriate date.

64/128 Assembler Update

PAL 64, Buddy 64, and Buddy 128, previously available from Pro-Line Software in Canada, are now distributed in the United States by Spinnaker as part of its Better Working series. PAL (for Personal Assembly Language) is available in The Programmer's Tool Box along with Power 64 and More Power (both programmer's aids). Buddy 64 and Buddy 128, together with a host of programmer's utilities, are found in Spinnaker's Power Assembler package. The Programmer's Tool Box retails for \$19.95 and Power Assembler for \$39.95. They are widely available in department stores and from Spinnaker Software, One Kendall Square, Cambridge, MA 02139.

128 Video Displays

I currently own a Commodore 64 computer and am thinking of upgrading to a 128. My only problem is that I have heard that the 128 can be used only as a 64 without the 1902 monitor. I don't see how this can be true. I know that without the 1902, the 128 can only display 40 columns and not 80, but is there any truth to not being able to use the 128 in different modes without the 1902 monitor?

Eric Mohn

The 128 has two video chips that produce two different video signals. The VIC II (8564) chip produces a composite signal, which is used in 64 mode and in the 128's 40-column mode. The other signal—RGBI—is generated by the VDC (8563) chip, which is responsible for the 128's 80-column display. Either display mode can be used in 128 or CP/M mode.

You can display the 128's 40-column output on any composite monitor—color or monochrome. The 80-column output must have an RGBI display for 80-column color, but you don't necessarily have to have a Commodore 1902. The 128's RGB connec-

tor is the same as that on the IBM PC, so any RGBI color monitor that works with a PC will also work with a 128. The advantage of the 1902 is that it can display both composite and RGB video—a feature not found on many monitors. There's also another alternative. The 128 does provide a composite version of the 80-column video signal, but only in monochrome. You can get a good monochrome 80-column display using a composite monitor and a special cable available at most computer stores for this very purpose.

ML Load Addresses

I would like to know something about machine language programs. If I type in a program with the starting address of \$C000 and save it to disk, and then I later type in another program with the same starting address, can I save the latter program to the same disk without erasing the first one?

John Potter

The starting and ending addresses given for machine language programs refer only to the addresses of these programs while in the computer's memory. When you store these, or any other programs, on a disk, the disk operating system (DOS) determines the disk location for the programs irrespective of their starting and ending address in memory.

So, you can safely have any number of programs with the same starting address stored on the same disk.

Amiga 500 Pricing Update

In "Close Up: The Amiga 500" (October COMPUTE!), we stated that the list price of the 500 was \$595. This statement was based on information received before the ship date of the machine. At delivery, Commodore announced that the Amiga 500 would carry a \$699 list price with a \$599 suggested retail price.

Saving Double-Hi-Res

I really enjoy using DOS 3.3 and double-hi-res graphics on my Apple IIc, and I recently started using your Chrome program. But when I BSAVE a double-hi-res picture and BLOAD it later, only half the picture is displayed. Could you please show me an easy way to save and load double-hi-res pictures?

Kobie Gantt

When an Apple is in double-hi-res mode, it stores the picture in an unusual way. Half of the picture goes in the hi-res page 1 memory area, addresses \$2000-\$3FFF, and the other half goes in the alternate memory bank in the same \$2000-\$3FFF range. Only Apples with more than 64K of memory have this alternate memory bank. Machine language programs can access this

area by telling the Apple's hardware to read or write to the alternate bank. Unfortunately, DOS 3.3, ProDOS, and the AppleSoft BASIC interpreter all lack a direct way to access this bank.

The solution is a simple ML (machine language) program that copies the contents of the alternate bank over into main memory. Then, you can BSAVE a big block of main RAM that contains both halves of the picture. Later on, when you BLOAD the file back in, you can use another ML program to put half of the picture back into alternate RAM where it belongs. Listed below are two BASIC file-creator programs. When you type in and RUN the first one, it creates a binary file called DHGRSAVE. This ML program puts a double-hi-res picture entirely into main RAM. After typing BRUN DHGRSAVE, you can save the picture with this command:

```
BSAVE picture,AS$2000,LS$4000
```

where picture is the name you wish to use for the picture file.

Type in and RUN the second program to make a binary file called DHGRLoad. It prepares a file for display as a double-hi-res picture. If your Apple II is in text mode when you BLOAD a picture, you'll need to enable double-hi-res to see what you've loaded. To do this, first type PR#3 to enable the 80-column text display. Then type these three POKES:

```
POKE 49246,0
POKE 49239,0
POKE 49232,0
```

Although Chrome and Chrome II work with DOS 3.3 only, the ML programs below work in ProDOS as well. If you create a picture with Chrome and BSAVE it, you can transfer it to ProDOS if you like.

```

70 FOR I = 6144 TO I + 47: READ
A: POKE I,A: C = C + A: NEXT
80 IF C < > 8244 THEN PRINT "DA
TA ERROR": STOP
90 PRINT CHR$(4); "BSAVE DHGRLO
AD,AS$1000,LS$30"
100 DATA 160,0,132,252,132,254
110 DATA 169,32,133,253,169,64
120 DATA 133,255,141,1,192,173
130 DATA 87,192,177,252,141,85
140 DATA 192,145,252,141,84,192
150 DATA 177,254,145,252,200,20
8
160 DATA 239,230,253,230,255,16
5
170 DATA 253,201,64,208,229,96

```

```

10 FOR I = 4096 TO I + 47: READ
A: POKE I,A: C = C + A: NEXT
20 IF C < > 8244 THEN PRINT "DA
TA ERROR": STOP
30 PRINT CHR$(4); "BSAVE DHGRBA
VE,AS$1000,LS$30"
40 DATA 160,0,132,252,132,254
50 DATA 169,32,133,253,169,64
60 DATA 133,255,141,1,192,173
70 DATA 87,192,177,252,145,254
80 DATA 141,85,192,177,252,141
90 DATA 84,192,145,252,200,200
100 DATA 239,230,253,230,255,16
5
110 DATA 253,201,64,208,229,96

```




The Power Of HyperCard, Part 1

Last month I started talking about *HyperCard*, Apple's new programming language being shipped with all new Macintosh computers. This product is also being made available to existing Mac owners for a very low price in the hope that everyone will soon have their own copy. Unlike traditional programming languages such as C or Forth, *HyperCard* can be used by neophyte programmers who, within a week of starting, can build sophisticated applications that would require a lot of effort in any other language.

I'm going to explore *HyperCard* for the next two months for several reasons. First, it proves that the proper design of a language can open up programming to people who would never think of themselves as programmers. Second, the underlying metaphors of *HyperCard* are interesting to look at in their own right.

The Problem With Macs

Just as the Macintosh is tremendously easy to use, it is also (until now) extremely hard to write programs for. *HyperCard* applications are both easy to use and easy to create. This combination of ease in both domains opens the world of Mac programming to hundreds of thousands of people who would not otherwise enjoy the experience of creating their own applications.

This does not mean, however, that all of *HyperCard's* programming environment is easy to master. It isn't. But, unlike some other "easy to master" products, *HyperCard* provides a seamless transition between those tasks that are easy and those that are not. This keeps the new programmer from running against a brick wall after reaching a certain proficiency level.

In some ways *HyperCard* is like a fourth-generation database language in that it allows the user to

create custom applications as templates. Other programs of this sort that come to mind are *Filevision* (for the Mac) and *Quickview System's* excellent product, *Zoomracks* (for the Atari ST and MS-DOS machines). However, one must be

careful when comparing *HyperCard* against other tools of the type mentioned. While *HyperCard* can be used in a template-construction mode, it is far more powerful than the other products in that it provides the user with a full-function

Figure 1

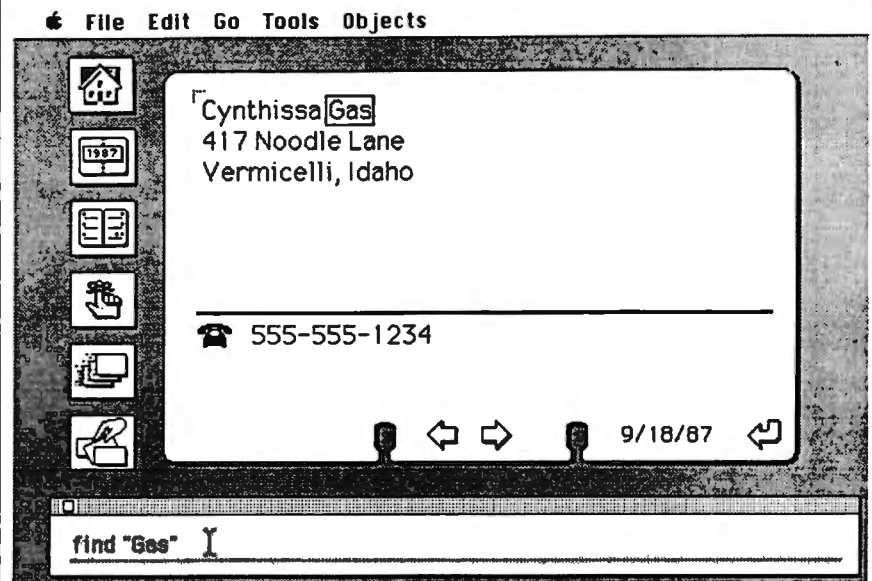
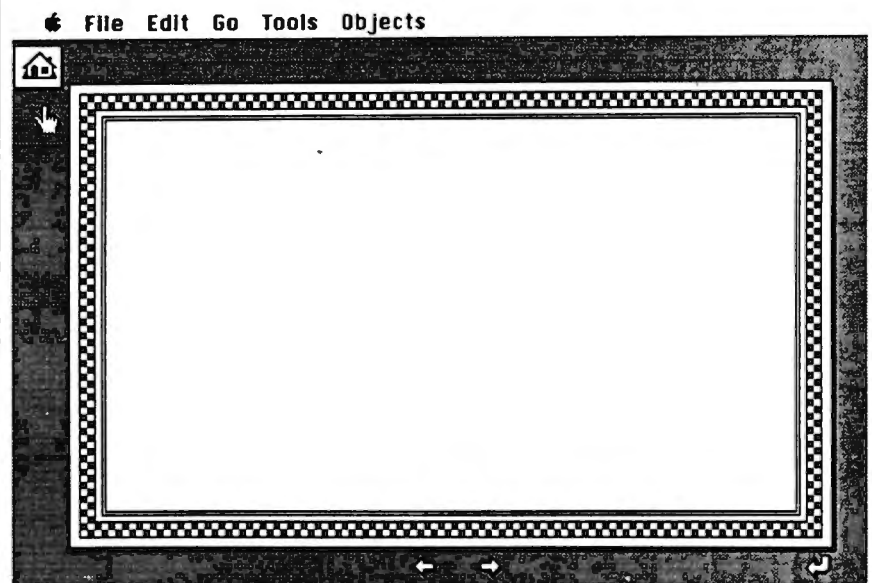


Figure 2



extensible programming language from which completely new applications can be created.

More Than Macs

If *HyperCard*-like languages were to appear only on the Mac, they wouldn't be as interesting to explore. According to an interview with Bill Atkinson, Apple Fellow, who was the principal designer of *HyperCard*, the file formats will be made public so that MS-DOS versions of the product can exchange data with the Mac version. He is also working on a version for the Apple II. (His interview appears in Danny Goodman's excellent book, *The Complete HyperCard Handbook*, Bantam Books, \$29.95.)

A Quick Look At An Application

HyperCard applications are called *stacks*, since the underlying metaphor is one in which the user is presented with a stack of cards that contain information: buttons that perform certain actions and fields in which data can be entered and results of calculations can be displayed. (This stack concept is similar in many ways to Paul Heckel's earlier "zoomrack" metaphor of a rack of cards.) Figure 1 shows a sample card from the "address stack."

The central figure in this image looks like a Rolodex™ card containing a name-and-address field and a phone-number field. This particular card was picked from the stack by using a "find" command issued in the message box at the bottom of the screen. By clicking the mouse on the telephone-shaped button, the phone number is dialed automatically. The buttons to the left of the card image launch other applications and provide other capabilities such as sorting the stack alphabetically. The entire operation of this stack, including the creation of new entries, is based on the fundamental Macintosh model of "type and click."

At any time the user is free to build a fresh address stack using this one as a template. This new stack can have the buttons and text fields in different places, and unwanted features can be discarded and new ones added.

HyperCard is shipped with a

collection of sample stacks that cover a wide range of common database activities such as maintaining calendars, phone lists, and so on. Each of these applications can be launched from a special stack called the *home stack*. Many *HyperCard* applications have a home button that, when pressed, takes you back to this stack.

Buttons can be used to perform myriad operations. Their most common use is to branch to another card or to another stack. They can even be used to launch other applications that have nothing to do with *HyperCard*, such as starting a word processing program. To get a feel for

how easy it is to become a *HyperCard* author, I've created a small stack designed to let people explore the different parts of a fish. As the user clicks on different areas of a fish, the program displays the name of the area being touched and presents a brief description to the user.

Some Background Work

For our application, I started with an existing background template consisting of a frame and four buttons. These buttons came preset with the ability to go to the home stack, to advance or go back one card at a time, and to go to the first card in the stack. See Figure 2.

Figure 3

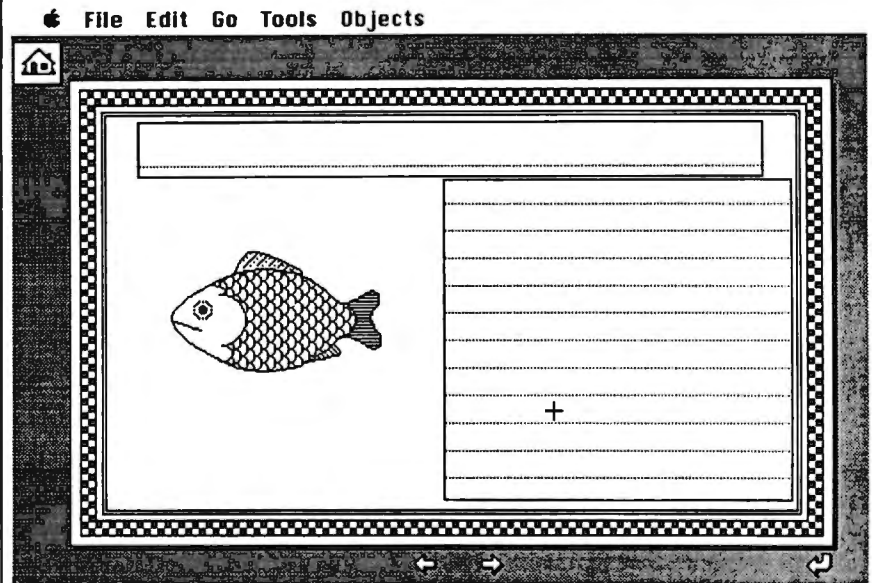


Figure 4

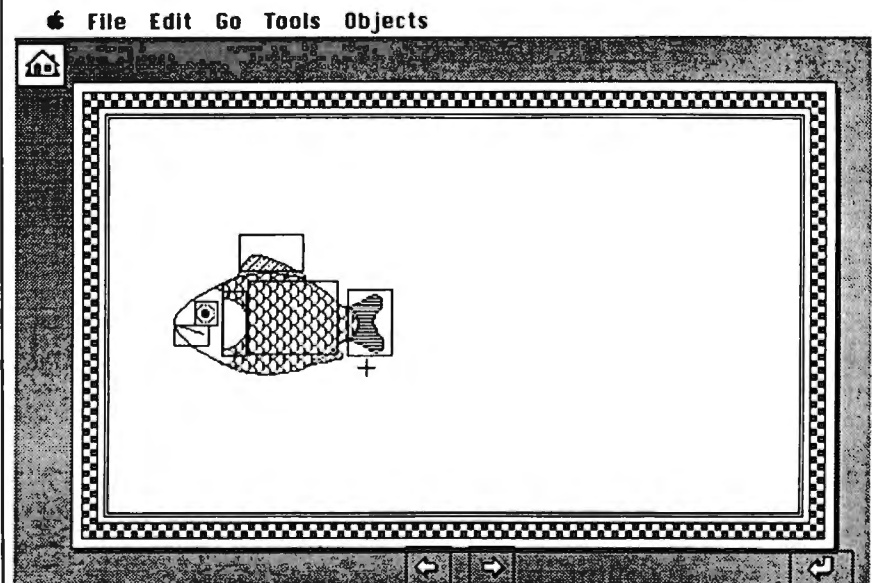


Figure 5

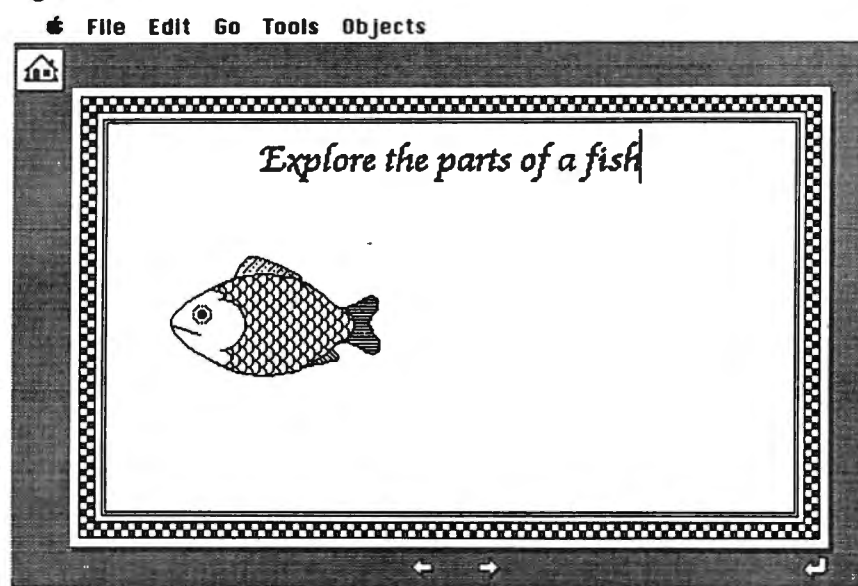
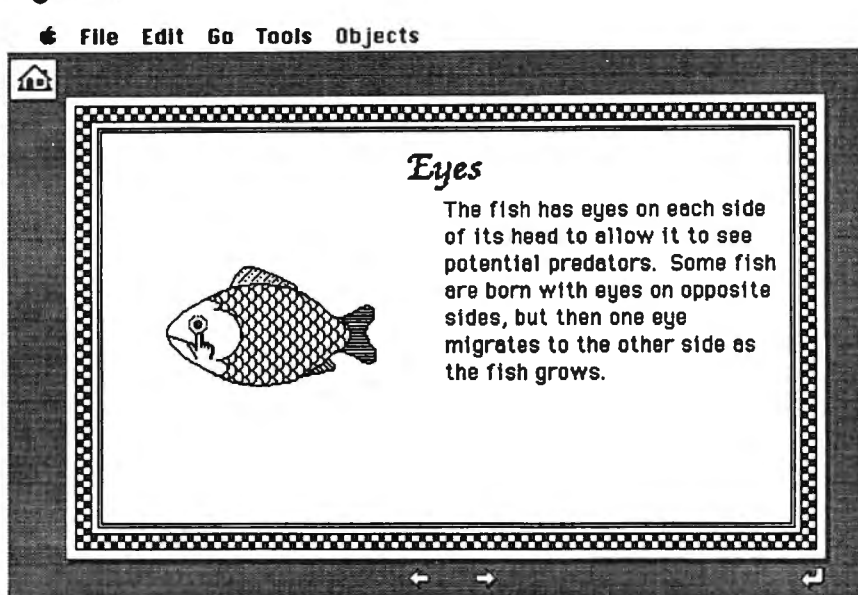


Figure 6



My application was built by pasting a clip-art picture of a fish onto the background image and by creating two text fields to contain the card title and the description of the card. This is shown in Figure 3.

The next step was to place a series of transparent buttons on the various parts of the fish that I wanted to identify. These buttons are hidden from view when in use, but are shown as rectangles in Figure 4.

At this point the stack consists of one card whose background image has a picture of a fish, two text fields, and a lot of buttons (most of which don't do anything yet.)

The next task was to label the first card by moving the cursor to

the top text field and typing in its name, as shown in Figure 5.

Next, I created six more cards (each created with a single keystroke) in which I added text to identify the tail, body, gills, fins, eyes, and mouth of the fish. Once this task was complete, all that remained was to link each of my transparent buttons to the correct card in the stack. *HyperCard* makes this task very easy. The user simply selects the button, advances to the destination card and indicates that these two objects are to be linked. After the stack is created, the new buttons can be hidden from view so that, as soon as the user clicks on a part of the fish (its eye, for example), the

appropriate card is instantly brought into view. See Figure 6.

A Look At The Watch

This application isn't very sophisticated but took only a few minutes to create. It is important to note that, except for the text associated with the parts of the fish, this program required no typing—it was constructed by direct manipulation of the programming tools. I have written extensively on direct-manipulation languages in the past, and *HyperCard* is (so far) the best example of this type of language I have encountered.

Next Month

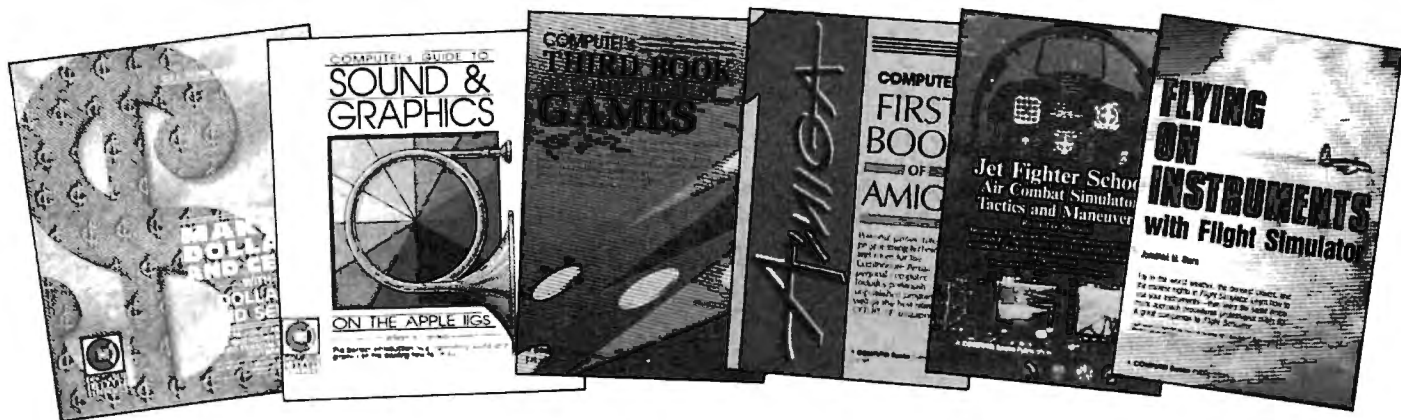
Next month, we'll lift the hood and look closely at the underlying metaphor of *HyperCard*. We will also explore *HyperCard's* programming language, *HyperTalk*. *HyperTalk* is used to create the "real" programs that are hidden from view. Once *HyperTalk* is mastered, you are able to create fresh *HyperCard* applications from scratch.

Dr. Thornburg welcomes letters from readers and can be reached at P.O. Box 1317, Los Altos, CA 94023. ©

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Go Directly To Jail

Monopoly™ is one of the most popular board games ever produced, so it should come as no surprise to anyone that it's one of the most popular computer games as well. In the last few years, versions have been written for the Commodore 64, Atari 800, IBM PC, Macintosh, Atari ST, and Amiga. Although none of these programs are sold commercially, they have been widely distributed by information services, BBS's, user groups, and public domain software copying services.

What most computer owners don't realize is that as open and widespread as the distribution of these programs has been, it happens to be illegal. Most people assume that if there were a legal problem, Parker Brothers, the company which holds the trademark and copyright for Monopoly™, would have complained.

As it turns out, the company has been completely unaware of what was going on. It was not until a user named David Addison made and distributed a particularly detailed version of the game on the Amiga that Parker Brothers became aware of the problem. This program contained the phrase "A Parker Brother game" on its title screen, which apparently made someone think that Parker Brothers might be interested. They were not only interested, but appalled to learn how many computer versions were being circulated.

Parker Brothers has since mounted a vigorous campaign to remove these programs from circulation. It's going to be an uphill battle, however, considering the number of users who are distributing these programs to their friends.

Patents, Copyrights, And Trademarks

Since a large segment of the population never uses computers, it's not

really surprising that the board game manufacturer didn't find out until now. What is surprising is that the computer community, which usually tries to police itself in such matters, didn't catch on earlier. With the large number of "look and feel" lawsuits going on, distributors of public domain software have become careful to screen out programs that too closely mimic popular commercial video games. Apparently, they aren't quite so sensitive when it comes to the legal perils of appropriating other types of intellectual property via computer.

Some of the confusion may stem from the fact that the laws protecting intellectual property are numerous and complex. The idea for a board game like Monopoly™ can be protected by a patent. This excludes anyone else from marketing a game with the same object, style of play, and so on. In addition, the expression of that game idea is protected by copyright for a term of 75 years. The game's expression includes the graphics used for the game board and card, the shapes of the playing pieces, and the text of the instructions.

Even after the copyright expires, Parker Brothers will still be protected by trademark law. This law is designed to prevent a company from confusing the public into thinking that its product is actually that of another, more famous company.

The most obvious violation is using another company's brand name, like Monopoly™, for your program. But a distinctive graphic design or logo can also constitute a trademark, and thus trademark law can protect a graphic long after the copyright has expired. For example, it would be silly to expect that everybody will be able to use the Mickey Mouse character after the copyright expires. That character has become so strongly associated

with Disney that using Mickey in your advertising would be unfair. It would suggest that your product is in some way associated with Disney. The same law applies to the distinctive elements of the Monopoly™ game, like the locomotive, or the little man with the mustache. The fact that you're giving the game away, rather than selling it, doesn't make it any more legal.

The Moral Of The Story

The lesson here is that you have to be very careful when creating computer counterparts of existing games. A few games, like backgammon, chess and checkers, are ancient in origin, and are best known by a name which is in common usage and cannot be trademarked. Such games can be freely implemented on the computer. Other games which are ancient in origin are best known by names that are the trademark of the present-day companies that manufacture them. For example, the ancient Indian board game pachisi is known by the trademarked name Parchisi™. So, while it's okay to program computer versions of pachisi, yacht, or reversi, you must be sure not to call them Parchisi™, Yahtzee™, or Othello™. With modern games like Monopoly™ you must be more careful.

It would probably be OK to program a game that played by the same rules as Monopoly™, as long as you didn't use any of the same names, playing pieces, board graphics, or card text, but there's hardly any point in doing so. Computers present the opportunity to create fantastic new games that could never exist in the physical world. Programmers would be better off trying to build the future, rather than recreate the past. ©

Video Professor

Ervin Bobo

Requirements: VHS-format video cassette player, and IBM PC or compatible.

The link between video recorders and computers is usually found in the recording of computer graphics, or the use of the VCR as a means of data storage. The Video Professor series, however, is an attempt at using the VCR as a teaching tool, and the good news is that it works.

With seven tapes currently available in the series (a total of 26 will be available by January), Data Link is covering what it considers to be the ripest areas for computer education. I would guess that a check with your local computer store would show these to be the topics most requested by those seeking professional classroom instruction: Introduction to and Advanced Personal Computing; Introduction to and Advanced Lotus 1-2-3; Introduction to dBase III; and WordPerfect (two levels).

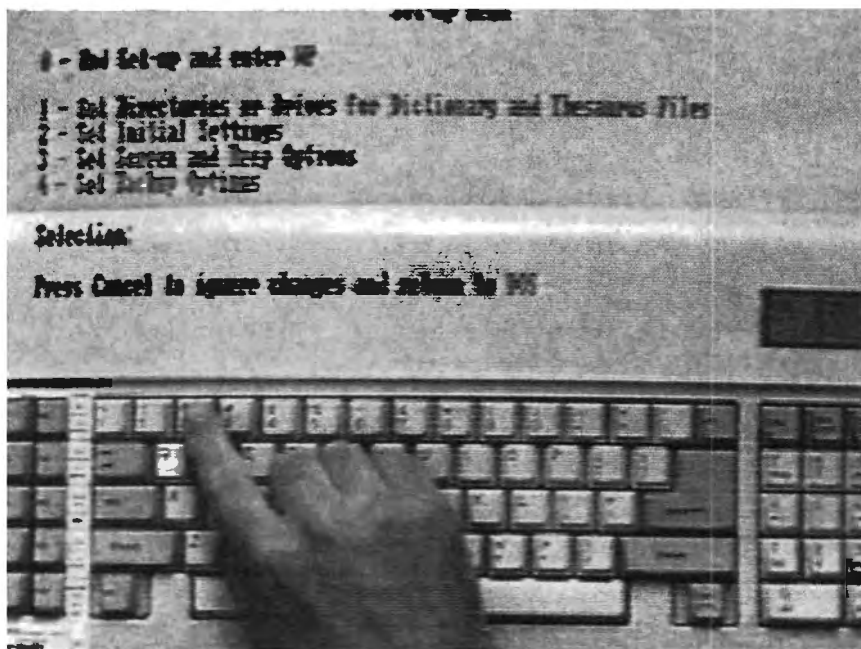
The video cassettes are not meant to replace software documentation or instruction manuals, but are designed to be used as a supplement. It is, in fact, quite likely that after studying the tape, you'll find the actual documentation much easier to understand.

Meet Your PC

The two cassettes on Personal Computing are aimed at the beginner. Introduction to Personal Computing starts with basics, showing you how to connect the components of a PC. This section is limited to connecting keyboard, monitor, and printer. While the camera does go inside the computer to point out the CPU and RAM chips, there is no mention of installing boards or of setting DIP switches. Presumably your computer salesperson did this for you.

Following this, you are taught some of the basic PC-DOS commands, such as DIR, COPY, FORMAT, FORMAT/S; use of the keyboard; common errors to avoid (such as erasing your disk); and basic computer techniques (such as how to store your disk).

Advanced Personal Computing



The Video Professor series offers hands-on instruction by means of video cassette.

may not be as advanced as some would wish—which could leave room for a third tape in this series—but it does cover more areas of PC-DOS, including copying disks; structure of directories and subdirectories; batch files and the autoexec routine; and the fundamentals of hard drive operation.

Easy As 1-2-3

Introduction to Lotus 1-2-3 includes an overview of Lotus; basic commands; explanations of cells, rows, and columns; screen scrolling; and an explanation of the menus. Subjects treated with greater depth include range commands and math functions.

The WordPerfect entry consists of an introduction and a Level II cassette. In the introduction, you get an overview of the program, loading instructions, how to make and save documents, use of the spell checker, and text manipulation. Level II carries on with search-and-replace functions, automatic backup, page layout, switching and windowing documents, and so on.

In addition to the tapes previewed for this article, there is Advanced Lotus 1-2-3 and Introduction to dBase III.

Clear Presentation

The tapes display solid production values. They do not look as though they were produced by ABC, but they weren't quickly produced or kludged together, either. Overall brightness, lighting, and clarity are fine. The tapes looked good on a 19-inch TV monitor and required no tracking adjustment on my VCR—which generally speaks well for the method of duplication.

The instructional format of the tapes is a dialogue between the off-screen professor and an assistant named Pam. The professor states a rule, such as using the Alt key, and Pam demonstrates it by typing on the keyboard. In other instances, Pam asks questions, allowing the professor a chance to expound on a particular principle.

In presenting visual examples—which is the point of having the lessons on video tape—a split-screen effect is used. Pam's hands and the keyboard are at the bottom of the screen, while a transparent overlay on top shows the effects that will occur on your monitor. This overlay is the actual monitor output and is intercut with closeups showing a particular detail on the screen or a

key on the keyboard. It is a good idea and much more effective than simply photographing a monitor screen.

Other visual interludes include statement and restatement of rules and principles done in animated graphics in a variety of fonts. Chapter headings and chapter reviews are also handled this way, as is an illustration of a *Lotus* worksheet divided by horizontal and vertical lines in an effort to better explain the concept of cells. Obviously, the graphic interludes are not only designed for visual appeal, but also are intended to help break a routine that might otherwise be monotonous.

All the tapes I viewed are on T-60 cassettes. After subtracting the introduction and the ending credits, you'll have just a bit less than one hour of instruction per tape. Since students in a classroom may ask questions that do not interest you, the tapes may provide more information than a one-hour class.

Professor Problems

My one quarrel with the Video Professor series is the professor himself. He sounds like a pale imitation of Sid Caesar's professor—though not deranged and with a less pronounced accent—I see no reason at all for the intrusion of what probably was meant to be a comic European accent. That idea had its heyday long ago and it is strange to think that some producer or director considers it funny, cute, or necessary in this context.

There are a few minor inconsistencies. In Introduction to Personal Computing, it is stated that drive A is usually on top, but in one of the *Word-Perfect* tapes, drive B is on top. And while we are supposed to be seeing Pam typing the professor's commands, the hands shown are clearly male. But these are minor and in no way detract from the tapes' educational content.

Lessons Learned

As to the worth of the video lessons themselves, I can see several areas where they could prove to be of high value. I think that the form of the lessons—with dialogue, questioning, statement and restatement of principles and conventions—effectively captures one tried-and-true method of teaching.

Given that one can learn from the tapes, it means you also can learn at your own speed. For review, simply rewind the tape and study the idea as many times as necessary.

I can also see how these tapes might be added to a growing video library of college adult education courses. Also, an enterprising computer store might use them in either a rental or loaner library, thus offering an alter-

native to more expensive classroom teaching.

It is also possible that such a library might be used by persons considering the purchase of software. They could obtain a working overview of a program and evaluate it in terms of their particular needs and in their ability to learn.

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\$79.95 each

The Ancient Art Of War At Sea

Keith Ferrell, Features Editor

Requirements: IBM PC, XT, AT, or compatible; 256K RAM; joystick or keyboard driven; not compatible with MS-DOS 3.2 or PC-DOS 3.2.

The heroic age of fighting sail continues to exert a powerful influence on the imagination—centuries after sail was superseded by steam, wooden hulls by armored ones. There's something romantic and adventurous about the thought of well-trained sailors scurrying through high riggings, crack cannon crews loading and firing broadsides, stalwart captains placing their flagships in harm's way for crown and country.

Of course, there was a dark side to such romance, as there is to any colorful conception of combat. Life at sea was harsh, morale could sink as rapidly as a scuttled ship, and close combat after grappling was brutal and bloody.

Now Brøderbund has captured both aspects of the heroic days of naval combat in *The Ancient Art of War at Sea*. This handsome, ambitious package puts players in charge of fleets of flagships, frigates, and ships-of-the-line, facing armadas of determined enemies. The program disk contains several recreations—or near recreations—of classic naval battles.

There are also several built-in scenarios of unspecified date, designer wars at sea pitting your fleet against huge navies and impossible odds. Some of the scenarios play the "what if?" game: What if the *Bismarck* had been a powerful sailing vessel two centuries before World War II? And if the scenarios aren't sufficient in number and variety, there's a powerful game generator/designer that let's you custom tailor your own naval battles to your own tastes.

Screen Games

War at Sea is a game of many screens, each serving a particular function. Upon booting up, you're asked if you wish to go to war. Enter no, and you can choose from game design, alteration of defaults, and visits to "Ye Olde Options Shoppe" to add or remove frills from the campaigns. Enter yes, and you're presented with the first of a series of parchment scrolls; these are *working* scrolls, by the way. Nicely animated, they furl and unfurl at your command, with a cutlass-shaped cursor by which you adjust options and select scenarios. Via the scrolls, you can also alter aspects of each scenario, making shallow and rough waters more or less dangerous, increasing the speed at which ships are repaired, and so on.

The 11 scenarios strike me as well selected, with enough variety to give a sense of all the different strategies and tactics possible in seafaring war. Since the package also includes a game designer, there's a near-infinite combination of conflicts.

Five of the prepared scenarios are imaginary; four are based pretty closely upon historical conflicts; two are "what if" scenarios; the eleventh is, as nearly as I can figure, the product of a vicious designer. (It's my favorite of all the scenarios.) Each scenario comes with a designated enemy commander, each with his own set of tactics and skills. You have the option of changing the commander, though, and testing yourself against, say, Blackbeard at Trafalgar, or Lord Nelson and the Spanish Armada.

Once you've selected a scenario, a story scroll unrolls, giving you background information on what you're up against. And soon, you're actually up against it.

The imaginary scenarios have much in common. You're up against implacable and, at first, seemingly inexhaustible fleets of enemy ships. Your own resources would be stretched thin if they were fully supplied—but they're not. It's up to you to allocate resources, put ships in port for repair and resupply, and position your squadrons where they stand the best chance of holding off the enemy, at least for a while.

Of course, if you're bold enough, you can take the offensive, driving deep into enemy waters in hopes of capturing their crown before they capture yours. As admiral, you must choose both offensive and defensive squadrons carefully—the loss of your flagships means the enemy has won.

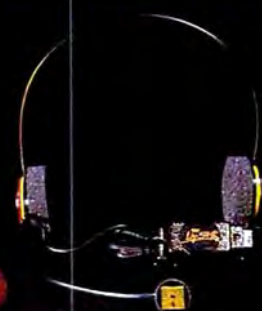
Navigation is accomplished on a scrolling scenario map that shows land masses, shallow and rough waters, wind direction, and the position of both friendly and unfriendly forces. Crown

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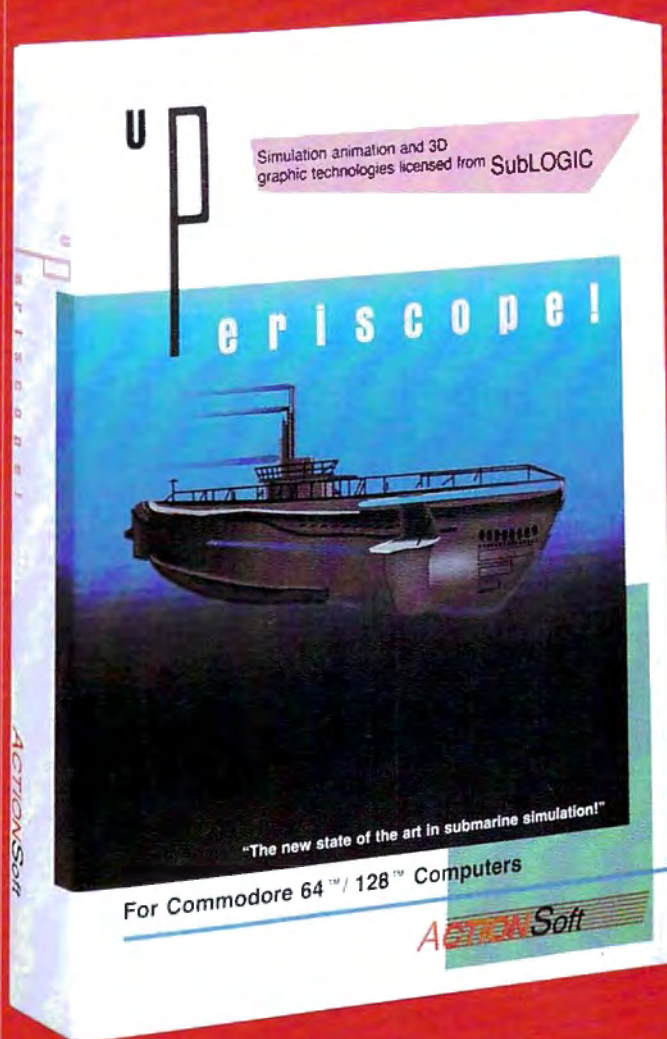
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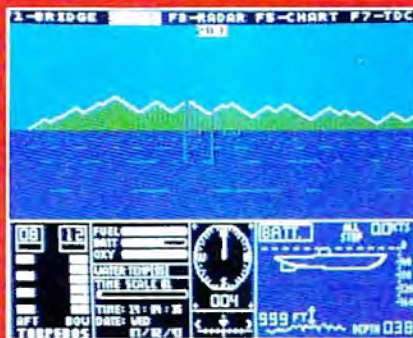
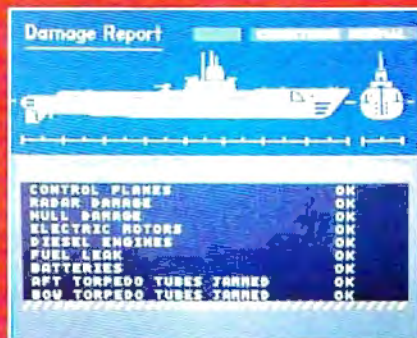
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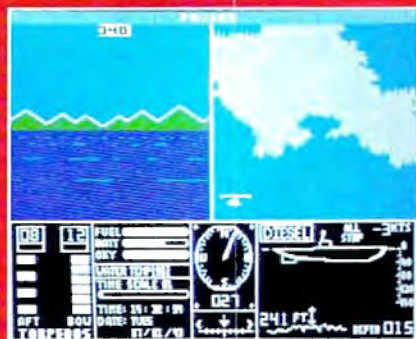
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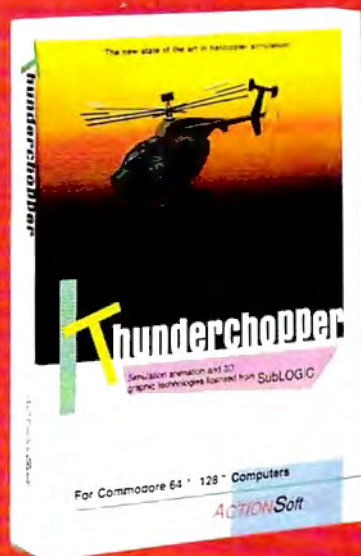


C84 Screens shown. Other computer versions may vary.



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cities are shown on the map, as are ports. Ports must be supplied by merchant vessels, which are easy prey for the enemy.

At The Helm

At the beginning of the scenario, your craft are at anchor. Position the cursor over one of the anchor icons and you have several choices. *Info* tells you how many ships are present and what their supply, hull, and sail status are, and whether they are frigates, flagships, or ships-of-the-line. A fleet information option gives you a sense of the odds you face.

With a sense of the ships available, you can put squadrons in motion as provided by the scenario, or detach ships to form other squadrons of up to three vessels. Since some of the squadrons must sail quite a distance, you can take advantage of the time speed-up options offered on the master menu, increasing the rate of time passage for long sailing and slowing it for close maneuvering or combat.

While your ships sail, so do the enemy's. This phase of the game, viewed on the map screen, takes the form of a deadly dance, with dark black enemy icons moving into your territory while your own white icons move along the courses you've set for them. As the results of engagements show, victory in a sea battle is strongly affected by position, with the flotilla running with the wind at a decided advantage over ships positioned against it. Tackling for wind advantage becomes crucial as fleets near each other.

Wind isn't everything, though. A crack crew can help you through even the toughest of odds. Crews don't become crack, however, automatically. Brøderbund addresses this with a practice option that lets you drill your crews until you're familiar with their operations. No amount of drill can fully prepare you for combat, though.

Close For Action!

When combat occurs, it is realistic. A message line on the navigation screen informs you of looming encounters. When an encounter takes place, ship icons transform into crossed cutlasses. Placing the cursor over the encounter presents you with two options. One is informational—you can discover the forces you have, and those you're up against—the other option, *Zoom*, shifts your perspective to the battle screen.

This screen gives you a close-up view of the battle at hand. You've got the choice of two views: a long view of the battle that's useful for maneuvering, and a close view for combat. Watch the wind direction. Adjust your sails as



In The Ancient Art of War at Sea, screen maps let you position your forces in harm's way.

necessary—*War at Sea* teaches you pretty quickly the disastrous results of getting caught with sails furled, as well as the advantages reaped by catching your enemy bare masted.

Close view is where the action takes place. Here the ships are revealed in detail. Practice has taught you the capabilities of your crews and their craft. You can quickly get a sense of the enemy's strategy by way of their actions upon initiating combat. Some of the adversaries simply force their way forward, heedless of the damage into which they sail. Others fight a more thoughtful battle, tacking to get the wind on their side, firing when the shot is sure to do the most damage.

Your own strategy takes shape as well. If you have a squadron, you must order the other ships to follow your lead, or shift your command from ship to ship as you move through the firing order. The cannon can fire from one side of the ship at a time, and it takes time to change firing sides; reload time must also be figured into your combat plans.

There is a stateliness to these battles that belies their viciousness. Even as damage is taken, men are lost, and ships are sundered, the spectacle of high-masted warships maneuvering around each other takes on an almost chess-like elegance. The elegance, as well as the damage incurred, is well-represented by *War at Sea's* excellent graphics and animation. Ship types are easily recognizable, movement is smooth, course alterations are realistically depicted, and damage is evident as sails are shredded. Separate sections of the command screen deliver vital information about wind, sails, and headings.

Some battles can be resolved at a distance. Other situations, though, call for grappling and boarding—or for being grappled and boarded by your opponent. In either case, another screen is revealed and you are placed in command of sailors armed with swords and marines armed with rifles. You can order attacks and crossings from railing, quarterdeck, or poopdeck, or you can

stand and try to repel enemy boarders. Again, animation is exemplary, even when delivered via a Hercules card rather than a CGA. The game's designers are helping put to rest accusations that PCs can't animate. Your men move from place to place as ordered. When killed, a figure collapses to the decks. In victory, the victors raise their arms in salute before you are returned to the main navigation screen to ready yourself for the next battle.

History At Sea

The program spans the great age of fighting sail, with historical scenarios that range from the Spanish Armada in 1508 to Trafalgar in 1805. As impressive as the imaginary scenarios are, it is in the recreations of history that *The Ancient Art of War at Sea* really came to life for me. You can get a sense of the sorts of odds faced by participants in classical battles, try your hand at changing the course of history (not always wittingly—under my command, the English fleet fell to the Spanish Armada more than once), and pit yourself against some of the great fleets and commanders.

The historical scenarios include: the Spanish Armada (1588), with you as the English; the Nile, merging battles that occurred in 1676 and 1798, with you facing the French; Quiberon Bay (1759), in which you play the French and face the English; and Trafalgar (1805), in which you take Nelson's place and attempt to match his skill in facing powerful enemy fleets.

As the mingling of history in the Nile scenario indicates, not all of the battles are purely historical. This is especially true of one of the most anachronistic of the scenarios—*Bismarck*. This scenario involves sailing ships, as do they all, but the setup is that of the *Bismarck*, which you command. You have a great battleship and a companion ship of near-equal size, as well as two smaller warships. The British have placed every ship on alert, with orders to sink you at all costs before you reach open sea. It's anachronistic, but challenging.

There are a few other anachronisms. One of the enemy commanders you face is Thor Foote, a bold and headstrong Viking. Ship names seem to be drawn from all over, with quite a few American presidents lending their names to ships in, say, a battle that occurred years before those presidents were born. These sorts of liberties, though, seem restricted to the imaginary battles.

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campaign designer is well thought-out and thorough. It consists of five screen pages of components. These range from coastlines and inland areas, to deep waters, rough and shallow waters, wind cherubs to indicate direction of the wind, even identifiers and decorative pieces. An onscreen grid is used for positioning each piece of the map. Rules for positioning are clearly presented, and have been kept simple.

Ship selection doesn't vary from the prepared campaigns—you have frigates, ships-of-the-line, and flagships. As in the main game, these are classic versions of those ships, standards that represent the class of ship in question rather than any particular vessel. If one could wish for anything more from this very complete package, it would be the ability to custom design new ships and classes of ships. Another would be for a wider selection of opponents.

Build squadrons after you've built a map. Name the ships yourself, and position friend and foe on the screen. Give the new campaign a title. The campaign designer includes a blank scroll on which you can write your own account of the battle you've created. New campaigns may be stored on formatted disks, and *data disk* becomes an option on the introductory menu. Although the manual is not completely clear on this, *The Ancient Art of War at Sea* can be copied to hard disk or backup disk, but requires the original master disk as key disk in drive A when the game is played.

Manual Labor Of Love

The impressiveness of the onscreen game is matched by the documentation that accompanies the program. Documentation, in fact, is too restrictive a word for *War at Sea's* manual. This is a handsome book of well over 100 pages, printed on high-quality coated stock and filled with well-reproduced illustrations.

Actual game instruction occupies only a portion of the manual. The rest is concerned with giving historical perspective on, appropriately enough, the art of warfare under sail. The program's authors, Dave and Barry Murry, are talented historians as well as game designers. The history lessons included in the manual are clearly written, with judiciously selected illustrations and illustrative quotations.

Especially interesting was their look at the evolution of naval combat tactics. Lessons learned from these pages can be applied with good effect to the battles you encounter on the computer. A reference glossary is included in the appendices, but, oddly and unfortunately, there is no bibliography or

guide to further reading. It would have been nice to know which sources the authors drew upon for their recreation. (Source citations are given beneath the illustrations and can be used as a starting point for more reading on this fascinating subject.)

The Ancient Art of War at Sea is the kind of game that won't be gathering many barnacles on my shelf. I'll be sailing this one for some time to come.

The Ancient Art of War at Sea
Brøderbund Software
17 Paul Dr.
San Rafael, CA 94903-2101
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Galileo For The Amiga

Ervin Bobo

Requirements: Amiga with a minimum of 512K.

Astronomy programs exist for every leading personal computer, but it is only now, with a combination of *Galileo* and the Amiga, that one of the major obstacles to a realistic astronomical display has been overcome. Previously, the limitation of computer graphics made it necessary to show every star, planet, and deep space object at the same level of brightness. While this was a workable situation, it required that the magnitudes of heavenly bodies either had to be stated in text or ignored. This may seem a small matter—but it is not, and your first look at the working screen of *Galileo*, with nine distinct levels of brightness, should be enough to make you catch your breath.

Following that, you'll have other opportunities for surprise, and perhaps at least one for dismay.

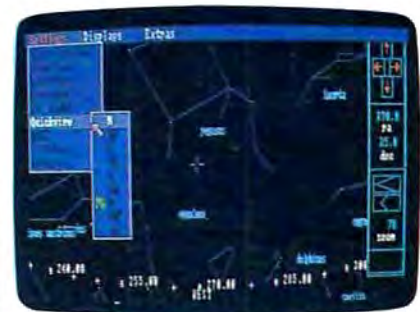
Star Light, Star Bright

Once booted, *Galileo* presents you with a picture of the night sky and, at the left of the screen, a control panel. Activated by mouse-clicks, this panel allows you to scroll the screen in four directions and to zoom in on portions of the sky. In addition, this panel displays the coordinates of the object currently under the onscreen crosshairs, as well as indicating whether you are in Planetarium, Local, or Flashcard mode.

Planetarium mode displays the stars in absolute form, with the Pole Star at screen center. Local mode shows you the heavens as they would appear from your selected location (as well as

selected date and time). Once you choose a location, that information can be saved to your working disk, and this will become the default setting whenever you select a Local view. Then, by using either Quickview or the scrolling arrows, you can select a direction for viewing that will be the same as that obtained when standing on your back porch, or anywhere else you may choose.

Flashcard has nothing to do with viewpoint. Instead, it presents a constellation for your identification. You may click on the left mouse button to see whether your guess is correct. As its name implies, Flashcard is a learning tool.



Galileo takes advantage of the stunning graphics capabilities of the Amiga, and displays a realistic skyscape with nine different levels of brightness.

Any Time, Any Place

Via pulldown menus, you can enter the date and time for which you're interested. *Galileo* is said to have reasonable accuracy for any date 400 years in the past or future. Beyond those points, accuracy will diminish because of certain movement factors not considered by the program.

Next, select the location from which you wish to view the sky. An appendix provides latitude and longitude for over a hundred major cities around the globe, thus making it possible for you to teleport to Buenos Aires if that happens to be the best place from which to observe a solar eclipse or a planetary conjunction.

Lighting, either Bright or Normal, can be selected, and this changes the intensity of the display without altering the relative brightness of the stars. (It is suggested you use *Galileo* in a dim or darkened room to obtain the fullest effect, and to avoid distracting reflections on your monitor screen.)

You may also select the amount of Skylight (though *ground scatter* is the more familiar term). With this, you duplicate the ambient light of cities, towns or country. Switching from Country to City light, with the consequent disappearance of dimmer stars, shows you just how much city dwellers miss. On

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the other hand, it is probably easier for them to identify major objects and constellations without the crowded background of other stars.

Magnification Factors

The Telescope option opens a magnifying window on the screen. Use your mouse pointer to select an object in which you are interested, and an enlarged view of it will appear in the window. Such views are relative to the size and distance of the object—while the moon almost fills the window, Saturn is barely large enough for you to distinguish its rings. Since even highly enlarged stars are still points of light, the telescope is useful only for the objects within our solar system.

For deep-sky objects, another form of identification is provided: You may choose to display Messier Objects, 110 of which are identified by the *M* number. Alternatively, NGC (New General Catalog) objects are represented by colored dots—though if your field of view is less than 30 degrees, there will be room for their labels to be displayed.

Still another identification system is invoked by choosing the Brightstar option from the menus. When this is done, 35 of the brightest stars will be identified.

In addition to these, constellation lines and names, as well as planetary names, may be toggled on or off from the proper menu. During such toggling, or any other changes made such as direction of view, time, and so on, there will be a wait while the screen redraws itself. While this may seem tedious, bear in mind the complexity of calculations your computer must consider in order to effect a change and still maintain accuracy.

Another unique feature from the Extras pull-down menu is the What's Up? option. By selecting this, you'll be told in graphic form what planets are visible for this particular day and time, for the time of sunrise and of sunset, for the different phases of the moon, and for the date of the next meteor shower.

Although meteor showers are not displayed by *Galileo*, solar eclipses and planetary eclipses are included. Unfortunately, the documentation gives you the times and coordinates for only one of each, so you'll have to refer to your astronomy books and magazines for others.

The Size Of The Universe

It's possible there may be some lamentations among the more serious students or professionals in astronomy: only 35 bright stars identified, only 110 Messier Objects, only 340 NGC objects. Granted that those are but small por-

tions of what is really out there, we should keep in mind that we are dealing with a whole universe, and that all of it could simply not be stuffed into a computer of 512K. What is here is choice—and it is well worth your while.

Documentation is very good, serving as a primer on many aspects of astronomy, with brief discussions of planetary conjunctions, an overview of meteor showers and deep sky objects, and much more.

For me, the one serious deficiency in *Galileo* is that it does not have the ability to print what you see on your screen. Nor will it run in conjunction with any of the screen dump programs in my library. There are times when hard copy would fill a great need: A beginning student could make a print out of the sky with constellation lines in place and take it outside with him that night as an aid to identification.

Despite that one shortcoming, I think you'll find *Galileo* to be a highly valuable tool.

Galileo
Infinity Software
1144 65th St., Ste. C
Emeryville, CA 94608
\$59.95

(An upgrade, expected in late 1987, will be priced at \$69.95.)

Award Maker Plus

Carol S. Holzberg

Requirements: Apple II-series with a minimum of 64K (reviewed here), Macintosh, IBM PC and compatibles. Printer required.

Do you have any school, family, or office occasions that merit distinctive awards? How should you demonstrate your appreciation to your children when they clean their rooms without being told? Is it time to give official recognition to the members of your local town council, church subcommittee, or community PTA for their many hours of dedicated, unpaid committee work? Well, there's a new program on the market that can help you show your thanks.

Award Maker Plus makes it possible to create quality awards without going through the bother and expense of professional typesetting. The program comes on two double-sided disks, with seven pages of simple program instructions, and an Award Style Catalog that pictures different styles of awards. It will print out 286 awards (including certificates, licenses, coupons, and di-

plomas), in eight typestyles, with ten different color or black-and-white borders, depending on the capabilities of your printer and ribbons. Award categories include: academic, family, sports, humor, office, general, and hi-res picture.

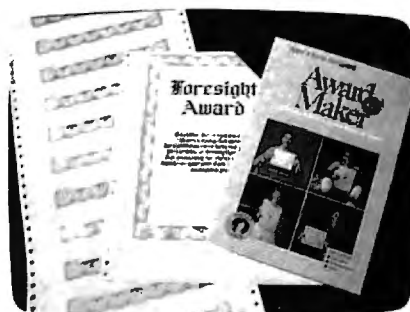
Step-By-Step

The program provides onscreen prompts to guide you through the design and printing processes. Arrow keys move the cursor through the menus to highlight activity options. Pressing RETURN makes a selection, but if you change your mind, you can press the ESCAPE key to back up to previous screens. It took me eight steps to print out my first award. These steps were: entering the award style number; selecting name and text font; entering award text; entering signature line; entering date; selecting border style; selecting border color; and printing award. Before printing, I had to configure my printer setup to match my hardware requirements. Setup only needs to be done once, as the configuration can be saved to disk.

There are plenty of features to give your certificates a professional touch. In addition to printing colored borders, if you have a color printer with multicolored ribbons, some of the awards allow you to use your own hi-res pictures for the graphics. These pictures must be a standard binary file copied onto a ProDOS-formatted disk, so make sure you have transferred those DOS 3.3 binary files before you begin. *Print Shop*-compatible border graphics also can work with *Award Maker Plus* as long as the graphics are copied onto a properly formatted data disk.

The Name Game

Another nice feature of *Award Maker Plus* is its ability to generate several copies of a certificate with a different name on each award. You can do this by first initializing a data disk and selecting the CREATE/EDIT NAME LIST option that appears either on the Main



Award Maker Plus can print up to 286 different awards in a variety of type styles and borders.

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The first three tools that any serious programmer needs are an assembler, a linker and a debugger. So we've installed all three, complete with sample GEOS applications that teach you the latest programming tricks in seconds.

geoAssembler not only reads directly from geoWrite files, but contains enough Pseudo Ops to

```

geos: file | edit | options | page | font | style | 1 | SuperDraw
-----
LEFTM CENTERM RIGHTM TBLD ← JUSTIFICATION  LINE SPACING → 18 120 20
-----
#### Super Draw ####
include macroFile           ; use macro library file
include constants          ; add constants file

ProgStart:
LoadV 0, GraphicsTable    ; point to graphics string table
Jsr   GraphicsString      ; let GEOS draw it
LoadV 0, MainMenu         ; point to menu structure
Jsr   DoMenu              ; add draw means
Jsr   rts                 ; initialization done
; dump data for brush icon
BrushIcon:

```

*Also available for 80 col. C128's.

allow all kinds of conditional assemblies. It has all the state-of-the-art features you'd expect, including some you probably never thought possible. For example, integrating graphics is as simple as cutting and pasting the image from geoPaint directly into your program.



geoLinker ties your program modules together, supporting GEOS SEQ and VLIR applications and desk accessories. You can even use geoAssembler and geoLinker to create non-GEOS applications.

geoDebugger allows your program to be tested in memory with full symbolic disassembly, along with line assembly for patching code in memory. It also allows your code to be single-stepped or top-stepped, with sub-routines fully executed. It can stop a running program with one key, or use up to eight conditional breakpoints. When your program hits the breakpoint, it prominently displays the error in an overlay window, leaving the applications screen intact.

Pro enough for you yet? Well, that's only a *partial* list of what you're in for.

If you understood all that, read on.

Chances are that we lost a lot of readers by now. But if you're still with us, hang in there. You have the makings of a real GEOS pro. All you need now are the right tools.

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Menu when the program is first booted or on the Print Menu after you have already completed your certificate design. Then, enter the names you plan to use or edit an existing list.

When you finish entering the names, onscreen prompts will instruct you to enter a filename for the list so you can save it to your data disk. *Award Maker Plus* then gives you an additional option. You can use all the names on your list or print only selected names. This feature will come in handy if, for example, you want to print certificates of completion for all the students in your class or merit badges for the members of your local scout troop, and so on.

The program comes with an Award Style Catalog, Program Instructions, and 20 gold-embossed press-on seals. Baudville is offering an additional 20 gold seals free with the purchase of *Award Maker Plus* pinfeed-stock French Parchment paper. The parchment paper is expensive but it does give an air of professionalism to the finished document.

Also included with the program is a sheet of special instructions. This

sheet lists the disk and side for each award style number and offers some tips on font selecting, name lists, and printing. Baudville suggests that people having two disk drives might want to keep the main program, Disk A Side 1, in drive 1 and copy Side 2 onto another disk so that it can be placed in drive 2. This would minimize disk swapping and make operating the program more convenient.

All in all, *Award Maker Plus* is a useful addition to the desktop publishing market. The program is versatile and well-suited to a variety of purposes. The focus is on creating and printing rather than on learning or remembering a roster of special commands, keys, codes, or symbols. For the price, it offers value that will measure up to all your expectations.

Award Maker Plus
Baudville
1001 Medical Park Dr., S.E.
Grand Rapids, MI 49506
\$39.95 Apple II series version
\$49.95 Macintosh and IBM PC/compatibles versions

Plundered Hearts And Nord And Bert Couldn't Make Head Or Tail Of It

James V. Trunzo

Requirements: IBM PC, XT, AT or compatible; Apple II series (48K, 16 sector); ST; Amiga; Macintosh; Commodore 64; Atari XL/XE (Plundered Hearts only).

Infocom has extended its philosophy of "Something for Everyone" with the release of two new products: *Plundered Hearts* and *Nord and Bert Couldn't Make Head or Tail of It*. Each of these programs aims at what appears to be a specific audience, although of the two, *Nord and Bert* is a bit more far-reaching in its scope.

Pirates And Passions

Plundered Hearts addresses romance-novel fanatics by placing players in the role of a beautiful young Englishwoman, who, while traveling to the West Indies to care for her ailing father, has been carried off by a handsome, passionate pirate. However, the pirate—dashing Nicholas Jamison—proves to be the least of your worries. As you work your way through this text adventure, encounters with crocodiles, lecherous evildoers, explosives, and shipwrecks demand as much attention as your growing desire for the bronzed-armed, blue-eyed buccaneer.

This 17th-century, high-seas adventure does for text adventures what Rosemary Rogers did for romance novels. Amy Briggs, the author of *Plundered Hearts*, has thoroughly captured the essence of the romance novel, including all the elements of the genre: love, passion, danger, passion, intrigue, and adventure. . . and passion. If you didn't catch the hint, there's some passion involved in the storyline—nothing that could be termed lewd and crude—but it is a bit suggestive. Those on the prudish side should consider themselves forewarned.

The prose is excellent and the exotic flavor of the days of skull and crossbones, bodices, and damsels in distress permeates the text. Can it be enjoyed by someone other than a member of the fairer sex? Certainly—if you don't feel strange reading about your craving for the arms of another man.

Upun My Word

Nord and Bert is a horse of a different color. A collection of eight short stories as opposed to a single adventure, this program will delight all who enjoy a good play on words. Each of the eight stories brings into play a different type of word game: clichés, spoonerisms,

puns, homonyms, and so on. This verbal trickery makes for delightful and challenging play in what is sure to be one of the most unique software packages of the season.

Nord and Bert departs from the typical Infocom format in more ways than one. Not only does the program contain a collection of stories rather than just one, *Nord and Bert* is the first Infocom game not to require mapping. Instead, a status line at the top of the screen tells you which places you can get to next.

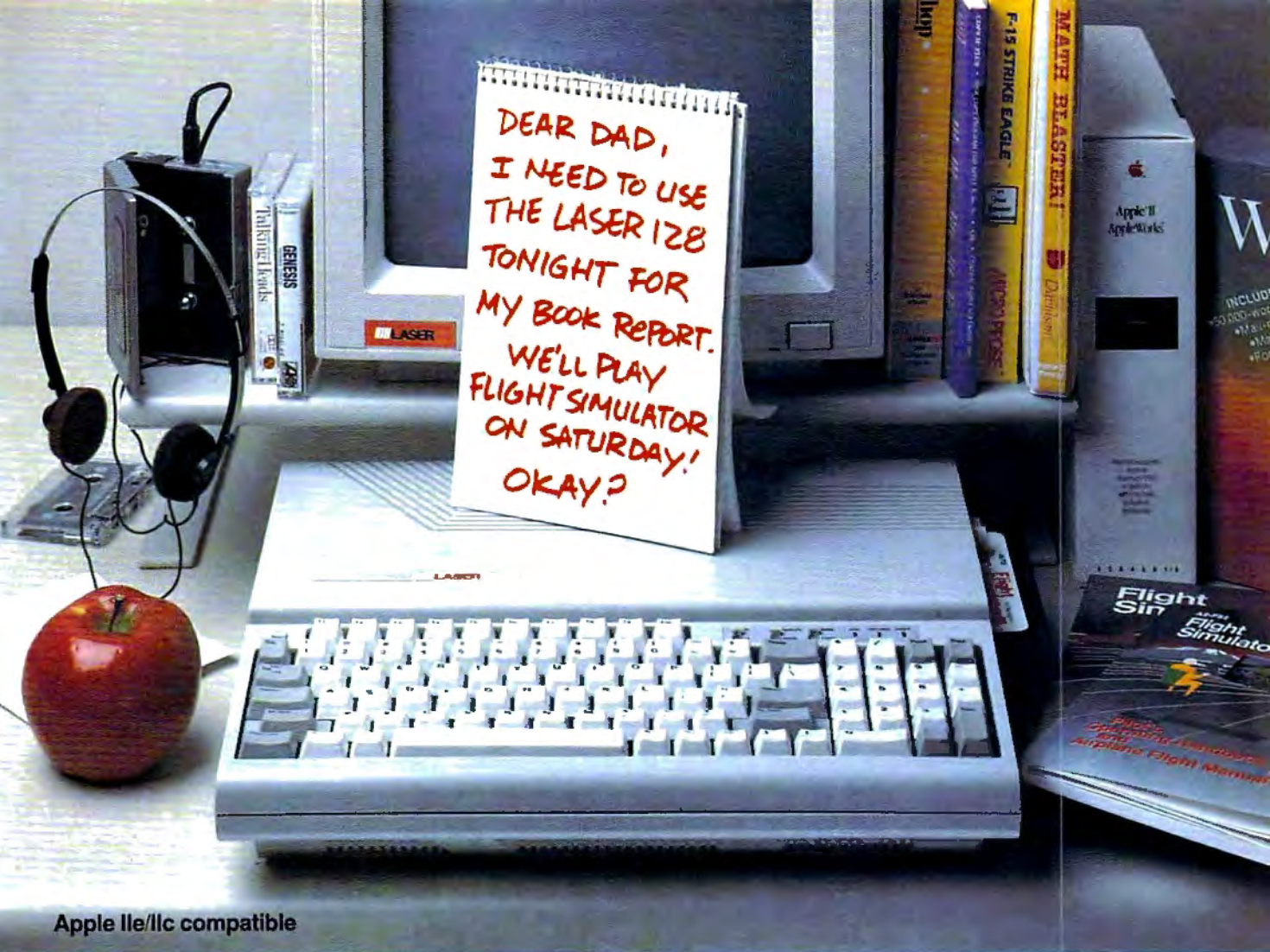
Yet another new approach to playing text adventure games, at least for Infocom, is the inclusion of hints. By typing HINT in any of the scenarios, you evoke a new screen that provides you with a list of subjects relevant to the story on which you're working. By highlighting a subject, you can receive several hints or even the answer, should you so choose.

While none of the stories are related, successfully completing segments results in the revelation of a password. Gamers will need seven passwords to get into the scenario labeled "Meet the Mayor."

One element of *Nord and Bert* that I found especially appealing was that a story could be completed in one sitting. I knew before starting a segment that I could relax and enjoy the game for half an hour and have a tangible result at the end of that time. For someone looking to kill a little time, this product is perfect.

The stories themselves are humorous to the point of making me laugh out loud. The play on words is excellent, and the various word puzzles are challenging and creative. This game is more cerebral than it might appear. To successfully complete the game without relying too heavily—or completely—on hints, a good vocabulary is essential and a knowledge of old, familiar sayings is more than a little helpful. If you've never heard of "making a mountain out of a molehill" or "watching the fur fly," you might be too young or too modern for parts of this program. Of course, that's a perfect reason to make this game a family affair. Dad and mom or grandpa and grandma might be of great assistance when playing *Nord and Bert*.

Plundered Hearts
Nord and Bert Couldn't Make Head or Tail of It
Infocom, Inc.
125 Cambridge Park Dr.
Cambridge, MA 02140
\$39.95—Apple II, Macintosh, IBM, Amiga, and Atari ST versions
\$34.95—Commodore 64 version; Atari XL/XE (*Plundered Hearts* only)



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More and more students are learning with computers. However most parents haven't been able to work a computer into their budget. The Laser 128 Apple-compatible computer will let you do all those things that you and your family want to or have to do – homework, write reports, even play games for a fraction of the cost of an Apple. With a Laser you can work out your budget on a computer, instead of breaking it with one. The Laser lets you take advantage of the largest software library available, so your child can learn more at home with the same programs they learn on in school. And, you can do your work at home on the Laser, too.

The Laser 128 with all its features: built-in disk drive; 128K RAM (expandable to 1 megabyte); serial, parallel, modem and mouse interfaces; 80 column text mode; numeric keypad; and an expansion slot; makes for a pretty educated buy. When you do your homework on which computer to buy, you'll find the Laser 128 at the head of the class with value. For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 400 Anthony Trail, Northbrook, IL 60062, or call (312) 272-6760.



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Ed Reynolds

Play a hand of this high-stakes turn-of-the-century solitaire game on your computer. You start with \$500, and Fortune is beckoning. You can break the bank or lose your shirt in one of the best computer card games we've ever published. Originally written for the Commodore 64, we've included versions for the Atari eight-bit computers, Apple II series, IBM PC/PCjr and compatibles, and the Amiga. All versions require a disk drive. The PC version requires BASICA or GW-BASIC, and a color/graphics card and Cartridge BASIC for the PCjr. The Apple II version works on any Apple II-series computer, under either DOS 3.3 or ProDOS.

Among the many games that people play, solitaire card games have long been among the most popular. Such games are ideal candidates for computerization. With this in mind, I set out to find a unique solitaire game. After a bit of research, I discovered "Canfield," a game that was in vogue around the turn of the century. Although I did eventually find a few people who still play the game, it is basically unknown nowadays. Canfield is as intriguing and challenging as any solitaire game around, and it has a fascinating history.

In the latter part of the nineteenth century, there existed, in Saratoga Springs, New York, a lavish casino—the Saratoga Springs Club House. It was known as the "Monte Carlo of America" and entertained European royalty, U.S.

senators, and scores of American millionaires. Its founder and proprietor, Richard A. Canfield, retired a multimillionaire when a wave of antigambling sentiment eventually caused the permanent closing of the casino in 1914.

One of the more popular games offered by the casino was a solitaire game invented by and named after the casino's founder. The player would "purchase" a deck of cards from the casino for \$50 (a princely sum in those days). Under the watchful eye of one of Mr. Canfield's croupiers, the player would deal the layout and try to beat the odds. The object was to get all 52 cards (or as many as possible) on four foundation piles. For each card placed upon a foundation pile, the player would receive \$5. Sound simple? Just wait.

The computerized version of Canfield presented here preserves the spirit of the original game, but the tedious tasks of shuffling and dealing the layout have been usurped by the computer.

As with all card games, Canfield's rules seem more complicated in print than when you're playing the game. Since the computer won't let you make an illegal move, you can learn to play by trial and error. For those who want to know what they're getting into, complete rules are presented below.

The Rules Of The Game

A standard deck of 52 cards is shuffled. (In the computer version, a *T* is used to designate the number 10 cards.) Then, 13 cards are counted

off, face-down, into a pile, which is then placed face-up to the player's left, to form the stock. One card is dealt face-up above and to the right of the stock for the first foundation. Then, four cards are placed face-up in a row, to the right of the stock, to form the tableau. The remaining 34 cards (held face down) constitute the pack.

In play, the cards in the pack are turned up in batches of three and placed on a talon pile to the right of the pack. The top card of the talon is available for play. When all of the pack has been played onto the talon, the cards are then turned over and become the pack once again.

The other three cards of the same rank as the first foundation card are also foundation cards, and if they become available during play, they must be placed up alongside the first. You must then build up on the foundations in suit and sequence until each foundation pile contains 13 cards.

Note that the ranking in each suit is circular—the ranking *wraps around* the king and ace. For example, if the queen of hearts is the foundation, you would build hearts on this pile by playing next the king, then the ace, then the deuce, and so on. Your computer will give you a little help here. Whenever a foundation card is exposed during play, the program will automatically place the card in the proper place in the foundation row.

On the tableau piles, you build downward in alternate colors. The top cards can be played only on



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ACCOLADE™



"Canfield," an intriguing solitaire card game for the 64.

foundations. To build on another tableau pile, you must move an entire pile as a unit. If any pile is moved away leaving a space, the top card of the stock must be used to fill the space. Here again, your computer will help by moving the card automatically until the stock is exhausted. Once the stock is exhausted, spaces can be filled from the talon, but at this time, a space may be kept open as long as you want.

In this version of Canfield, your computer will shuffle the deck and deal the layout. You move cards to and from screen locations by pressing these keys:

- S Move a card from the stock.
- T Move a card from the talon.
- F Move a card to its foundation.
- P Turn over the pack of cards.
- 1 Move a card to or from tableau 1.
- 2 Move a card to or from tableau 2.
- 3 Move a card to or from tableau 3.
- 4 Move a card to or from tableau 4.

Computer Canfield

All versions provide a way for you to keep your money across games. To accomplish this, Canfield checks a data file on disk to see how much money you had when you last quit the game. When you're asked for your name, that name will be used as a filename to store your account on disk. If it's your first game, or if you drop to zero dollars, you'll start with 500 dollars. Remember that it costs 50 dollars to buy a deck of cards to play the game.

Commodore 64 Version

Press f1 to quit, or f7 to start a new game with a new deck. Program 1 is written in BASIC. Type it in and save a copy to disk before running it.

Atari Eight-Bit Version

In the Atari version (Program 2), the four suits are all the same color, so



The Atari 400/800/XL/XE version of "Canfield."

you'll have to remember that hearts and diamonds are red, and clubs and spades are black. Press Escape to quit, and Q to start a new game with a new deck. This version of Canfield is written in BASIC. Type it in and save a copy before playing.

Apple

Canfield for the Apple consists of two files—one in BASIC and one in machine language. Program 3 is the machine language part, along with the high-resolution character set data. Type it in using MLX, the machine language entry program located elsewhere in this issue. When you're prompted for starting and ending addresses, respond with the following values:

STARTING ADDRESS? 8000
ENDING ADDRESS? 86A7

When you've finished typing, be sure to save the program with the name CANFIELD.ML, since that's the name Program 4 looks for.

Program 4 is the BASIC part of Canfield. Type it in and save it to disk. When this program is run, it loads Program 3 automatically.

The keyboard commands for this version of the game are the same as the original. Press CTRL-E to quit. Press <RET> to start a new game with a new deck.

IBM PC/PCjr

This version of Canfield (Program 5) is written in BASIC. Type it in and save a copy before playing. Press F1 to quit. Press F10 to start a new game with a new deck.

Amiga Version

This version of Canfield (Program 6) is written in Amiga Basic. Type it in and save a copy before playing it. Press F1 to quit. Press F10 to start a new game with a new deck.



The Apple II version of "Canfield" features hi-res playing cards.



"Canfield" for the IBM PC/PCjr and compatibles.



The Amiga version of "Canfield."

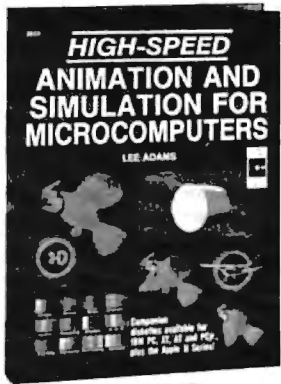
For instructions on entering these programs, please refer to "COMPUTE!'s Guide to Typing in Programs" elsewhere in this issue.

Program 1: Commodore 64 Canfield

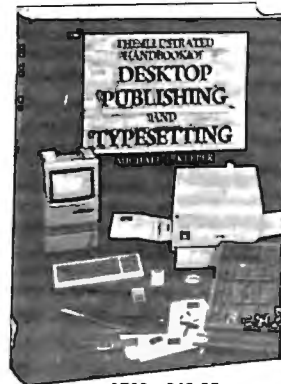
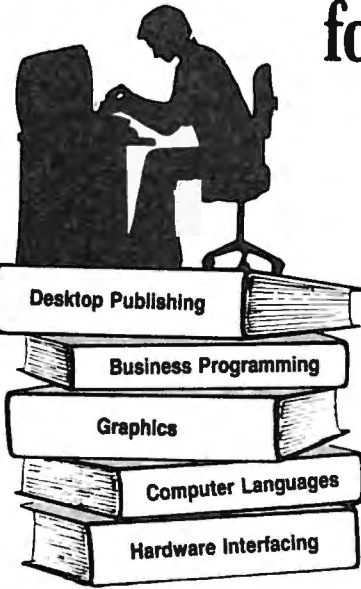
```
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JA 5 PRINT"{CLR}{2 SPACES}COPY
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CATIONS"
HB 6 PRINTTAB(11)"ALL RIGHTS R
ESERVED"
SG 8 FOR I=1 TO 456:READ A:CK=
CK+A:NEXT:RESTORE:REM CHE
CK DATA
CF 9 IF CK<>40791 THEN PRINT"E
RROR IN DATA":STOP
HQ 10 PRINTCHR$(142):PRINTCHR$
(147):POKE53280,6:POKE53
281,6
```


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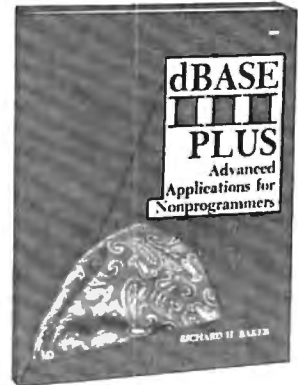
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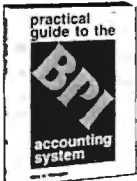
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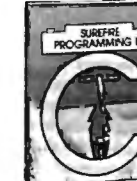
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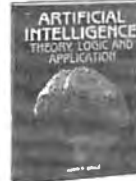
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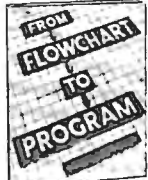
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```

SH 20 GOSUB2300:POKE56,132:CLR
:SD=54272:GOSUB2420
GR 30 GOSUB1800
BF 40 Q=FRE(0):POKE34639,32:PO
KE34679,32:IFPC<>52THEN1
60
CX 50 FORI=1TO1000:NEXT:N$=MID
$(STR$(BR),2):PRINT"
{CLR}"
JR 60 POKE53280,6:POKE53281,6:
POKE646,1
EH 70 POKE214,9:PRINT:PRINTTAB
(12)"CONGRATULATIONS!":P
OKE53280,1
QS 80 POKE214,11:PRINT:PRINTTA
B(7)"YOU HAVE BEATEN THE
ODDS!":POKE53280,6
FD 90 GOSUB2870:GOSUB2930
QH 100 POKE214,13:PRINT:PRINTT
AB(3)"YOU HAVE A TOTAL
{SPACE}BANKROLL OF $";N
$:POKE53280,1
FB 110 POKE214,22:PRINT:PRINTT
AB(16)"CONTINUE PLAYING
?(Y/N)":POKE53280,6
QQ 120 POKE53280,1:GETAS
SQ 130 IFA$="Y"THENGOSUB2550:G
OTO30
QR 140 POKE53280,6:IFA$<>"N"TH
EN120
SQ 150 GOTO320
EB 160 IFSC=0THEN180
KA 170 R=FNR(S(1)):IFR=FFTHENN
=F(0)+1:F(0)=N:GOSUB750
:GOTO40
PQ 180 IFTC=0THEN200
GH 190 R=FNR(P(TC)):IFR=FFTHEN
N=F(0)+1:F(0)=N:GOTO107
0
PE 200 E=0:FORI=4TO1STEP-1:IFT
(I,0)=0THENE=I
PS 210 NEXT
EA 220 IFE=0THEN280
HM 230 IFSC=0THEN280
AB 240 T(E,1)=S(1):T(E,0)=1:SC
=SC-1
XX 250 FORI=1TO SC:S(I)=S(I+1)
:NEXT:S(SC+1)=-1
BS 260 K=S(1):L=LS:GOSUB1650
CJ 270 K=T(E,1):L=LT+4*E:GOSUB
2830:GOSUB1650:GOTO40
FJ 280 POKE198,0
SE 290 GETAS:IFA$=""THEN290
XS 300 ON C$(ASC(A$)) GOTO 127
5,305,920,470,310,600,3
0
FD 305 GOSUB 2850:GOTO40
AQ 310 N$=MID$(STR$(BR),2):IFB
R<50THENBR=0
AQ 320 PRINT"{CLR}":POKE53280,
6:POKE53281,6:POKE646,1
:POKE53272,21
DB 330 POKE214,9:PRINT:PRINTTA
B(7)"THANKS FOR PLAYING
,";NM$
QH 340 POKE214,11:PRINT:PRINTT
AB(3)"YOU HAVE A TOTAL
{SPACE}BANKROLL OF $";N
$
HH 347 OPEN15,8,15:PRINT#15,"S
":F1$:CLOSE15
AX 350 OPEN8,8,8,F$+"W":PRINT#
8,BR:CLOSE8
ME 360 POKE214,13:PRINT:PRINTT
AB(9)"COME BACK AGAIN S
OON!"
SP 370 FORI=1TO4000:NEXT:SYS64
738:END
BD 470 IFPC=0THEN40
RP 480 IFPC=TCTHENGOSUB1810
HE 490 IFP(TC+1)=-1THENTC=0
BB 500 IFP(TC+2)=-1THENTC=TC+1
:GOTO530
SC 510 IFP(TC+3)=-1THENTC=TC+2
:GOTO530
QC 520 TC=TC+3
JH 530 POKE34604,32:IF(PC-TC)=
0THENPOKE34605,32:GOTO5
50
FD 540 N$=MID$(STR$(PC-TC),2):
LL=LEN(N$):POKE214,19:P
RINT:PRINTTAB(14-LL)N$
GS 550 POKE34609,32
DR 560 N$=MID$(STR$(TC),2):LL=
LEN(N$):POKE214,19:PRIN
T:PRINTTAB(19-LL)N$
QX 570 IFP(TC+1)=-1THENK=-1:L=
LP:GOSUB1650
SF 580 K=P(TC):L=LN:GOSUB2830:
GOSUB1650:GOTO40
AK 590 GOTO40
AM 600 POKE214,20:PRINT:POKE64
6,6:PRINTTAB(7)A$:POKE6
46,12:IFSC=0THEN40
XE 610 R=FNR(S(1))
SF 620 GETB$:IFB$=""THEN620
KK 630 ON C$(ASC(B$)) GOTO 790
,690,680,680,310,680,30
RE 680 GOSUB2850:GOTO40
SE 690 POKE214,21:PRINT:POKE64
6,6:PRINTTAB(7)B$:POKE6
46,12
QJ 700 IFR=0THENNF=S(1)+12:GOT
O720
FB 710 NF=S(1)-1
DJ 720 N=0
CE 730 N=N+1:IFN=5THENGOSUB285
0:GOTO40
JC 740 IFF(N)<>NFTHEN730
XR 750 F(N)=S(1):FC=FC+1:SC=SC
-1:BR=BR+5
MM 760 FORJ=1TOSC:S(J)=S(J+1):
NEXT:S(SC+1)=-1
BQ 770 K=S(1):L=LS:GOSUB1650:G
OSUB2830
CG 780 K=F(N):L=LF+4*N:GOSUB16
50:GOSUB1830:GOTO40
DS 790 I=VAL(B$):POKE214,21:PR
INT:POKE646,6:PRINTTAB(
7)B$:POKE646,12
CM 800 IFT(I,0)=0THENJ=0:GOTO8
80
XG 810 IFR=12THENN1=S(1)+1:GOT
O830
KJ 820 N1=S(1)+14
HP 830 IFN1>51THENN1=N1-52
RM 840 N2=N1+26:IFN2>51THENN2=
N2-52
FH 850 J=T(I,0)
SC 860 IFT(I,J)=N1THEN880
PR 870 IFT(I,J)<>N2THENGOSUB28
50:GOTO40
QC 880 J=J+1:T(I,J)=S(1):T(I,0)
)=T(I,0)+1:SC=SC-1
GH 890 FORN=1TOSC:S(N)=S(N+1):
NEXT:S(SC+1)=-1
PF 900 K=S(1):L=LS:GOSUB1650:G
OSUB2830
RG 910 K=T(I,J):L=FNL(X):GOSUB
1650:GOTO40
AE 920 GOSUB2810:POKE214,20:PR
INT:POKE646,6:PRINTTAB(
7)A$:POKE646,12:IFTC=0T
HEN40
DQ 930 R=FNR(P(TC))
RJ 940 GETB$:IFB$=""THEN940
FR 950 ON C$(ASC(B$)) GOTO 113
0,1010,1000,1000,310,10
00,30
JM 1000 GOSUB2850:GOTO40
FQ 1010 POKE214,21:PRINT:POKE6
46,6:PRINTTAB(7)B$:POK
E646,12
FF 1020 IFR=0THENNF=P(TC)+12:G
OTO1040
CM 1030 NF=P(TC)-1
PE 1040 N=0
CF 1050 N=N+1:IFN=5THENGOSUB28
50:GOTO40
JA 1060 IFF(N)<>NFTHEN1050
EM 1070 F(N)=P(TC):FC=FC+1:PC=
PC-1:TC=TC-1
KK 1080 FORI=(TC+1)TOPC:P(I)=P
(I+1):NEXT:P(PC+1)=-1
DP 1090 IFTC=0THENGOSUB1820:GO
TO1120
MH 1100 K=P(TC):L=LN:GOSUB1650
:POKE34609,32
JC 1110 N$=MID$(STR$(TC),2):LL
=LEN(N$):POKE214,19:PR
INT:PRINTTAB(19-LL)N$
GA 1120 GOSUB2830:K=F(N):L=LF+
4*N:GOSUB1650:BR=BR+5:
GOSUB1830:GOTO40
EC 1130 I=VAL(B$):POKE214,21:P
RINT:POKE646,6:PRINTTA
B(7)B$:POKE646,12
QS 1140 IFT(I,0)=0THENJ=0:GOTO
1220
HX 1150 IFR=12THENN1=P(TC)+1:G
OTO1170
EM 1160 N1=P(TC)+14
AB 1170 IFN1>51THENN1=N1-52
RC 1180 N2=N1+26:IFN2>51THENN2
=N2-52
AE 1190 J=T(I,0)
BE 1200 IFT(I,J)=N1THEN1220
KG 1210 IFT(I,J)<>N2THENGOSUB2
850:GOTO40
GJ 1220 J=J+1:T(I,J)=P(TC):T(I
,0)=T(I,0)+1:PC=PC-1:T
C=TC-1
KE 1230 FORN=(TC+1)TOPC:P(N)=P
(N+1):NEXT:P(PC+1)=-1
GX 1240 IFTC=0THENGOSUB1820:GO
TO1270
AR 1250 K=P(TC):L=LN:GOSUB1650
:POKE34609,32
GE 1260 N$=MID$(STR$(TC),2):LL
=LEN(N$):POKE214,19:PR
INT:PRINTTAB(19-LL)N$
DG 1270 GOSUB2830:K=T(I,J):L=F
NL(X):GOSUB1650:GOTO40
RE 1275 GOSUB 2810:I=VAL(A$)
RF 1280 POKE214,20:PRINT:POKE6
46,6:PRINTTAB(7)A$:POK
E646,12:IFT(I,0)=0THEN
40
JC 1290 GETB$:IFB$=""THEN1290
ED 1300 ON C$(ASC(B$)) GOTO 14
80,1360,1350,1350,310,
1350,30
KD 1350 GOSUB2850:GOTO40
KC 1360 POKE214,21:PRINT:POKE6
46,6:PRINTTAB(7)B$:POK
E646,12:J=T(I,0):R=FNR
(T(I,J))
RQ 1370 X=T(I,J):R=FNR(X)
GK 1380 IFR=0THENNF=T(I,J)+12:
GOTO1400
CX 1390 NF=T(I,J)-1
SM 1400 N=0
AX 1410 N=N+1:IFN=5THENGOSUB28
50:GOTO40
PS 1420 IFF(N)<>NFTHEN1410
CM 1430 F(N)=T(I,J):FC=FC+1:T(
I,0)=T(I,0)-1:BR=BR+5
CE 1440 K=-1:L=FNL(X):GOSUB165
0:GOSUB2830
GF 1450 IFT(I,0)<>0THENJ=J-1:K
=T(I,J):L=FNL(X):GOSUB
1650
GP 1460 K=F(N):L=LF+4*N:GOSUB1
650:GOSUB1830
CG 1470 GOTO40
AS 1480 A=VAL(B$):POKE214,21:P
RINT:POKE646,6:PRINTTA

```

```

B(7)B$:POKE646,12:R=FN
R(T(I,1))
KJ 1490 IFR=12THENN1=T(I,1)+1:
GOTO1510
XK 1500 N1=T(I,1)+14
HS 1510 IFN1>51THENN1=N1-52
MH 1520 N2=N1+26:IFN2>51THENN2
=N2-52
AP 1530 B=T(A,0):IFB=0THENGOSU
B2850:GOTO40
DC 1540 IFT(A,B)=N1THEN1560
QD 1550 IFT(A,B)<>N2THENGOSUB2
850:GOTO40
GM 1560 FORJ=1TOT(I,0):K=-1:L=
FNL(X):GOSUB1650:NEXT
DE 1570 FORJ=1TOT(I,0):B=T(A,0
)+J:T(A,B)=T(I,J)
RJ 1580 K=T(A,B):L=33995+4*A+4
0*B:GOSUB2830:GOSUB165
0:NEXT
FC 1590 T(A,0)=T(A,0)+T(I,0):T
(I,0)=0:GOTO40
PD 1600 FORI=1TO4:
QD 1610 IFT(I,0)=0THEN1630
DS 1620 J=T(I,0):K=T(I,J):L=FN
L(X):GOSUB1650
AK 1630 NEXT
RG 1640 RETURN
QM 1650 IFK<>-1THEN1690
EQ 1660 FORZ=0TO3:POKEL+Z,32:N
EXT
FS 1670 FORZ=40TO43:POKEL+Z,32
:NEXT
HR 1680 GOTO1800
KM 1690 SUIT=INT(K/13):R=K-(13
*SUIT):COL=0
DP 1700 IFSUIT=1THENCOL=2
KF 1710 IFSUIT=3THENCOL=2
PM 1720 POKEL,38:POKEL+DF,COL
BS 1730 POKEL+1,64+(2*R):POKEL
+1+DF,COL
MD 1740 POKEL+2,91+(2*SUIT):PO
KEL+2+DF,COL
FB 1750 POKEL+3,28:POKEL+3+DF,
COL
BB 1760 POKEL+40,27:POKEL+40+D
F,COL
PB 1770 POKEL+41,90+(2*SUIT):P
OKEL+41+DF,COL
MG 1780 POKEL+42,65+(2*R):POKE
L+42+DF,COL
XK 1790 POKEL+43,29:POKEL+43+D
F,COL
EA 1800 RETURN
DD 1810 POKE646,6:POKE214,20:P
RINT:PRINTTAB(11):Z$:P
OKE646,12:RETURN
RB 1820 POKE34609,32:POKE34610
,32:K=-1:L=LN:GOSUB165
0:RETURN
BS 1830 FORA=0TO5:POKE34583+A,
32:NEXT
FK 1840 N$=MID$(STR$(BR),2):PO
KE646,6:POKE214,18:PRI
NT:PRINTTAB(31)N$:POKE
646,12
DE 1850 RETURN
BP 1860 IFBR>49THEN1960
AD 1870 N$=MID$(STR$(BR),2)
GJ 1880 PRINT"{CLR}":POKE53280
,2:POKE53281,2:POKE646
,1
CK 1890 POKE214,9:PRINT:PRINTT
AB(11)"YOU HAVE ONLY $
":N$:"I":FORI=1TO3000:
NEXT
MS 1900 POKE214,12:PRINT:PRINT
TAB(15)"TOO BAD!":FOR
I=1TO2000:NEXT
QM 1910 POKE214,22:PRINT:PRINT
TAB(22)"PLAY AGAIN? (Y
/N)"
PS 1920 GETA$:IFA$=""THEN1920
XD 1930 IFA$="Y"THENBR=500:GOS
UB2550:GOTO1960
ED 1940 IFA$="N"THENBR=0:POKE5
3272,21:GOTO320
DS 1950 GOTO1920
PX 1960 F(2)=-1:F(3)=-1:F(4)=-
1:TN=-1:FC=0:TC=0
BJ 1970 POKE34604,32:POKE34605
,32:POKE34609,32:POKE3
4610,32
MJ 1980 K=-1:L=33879:GOSUB1650
:L=33883:GOSUB1650:L=3
3887:GOSUB1650
CB 1990 L=33891:GOSUB1650:L=LS
:GOSUB1650
JR 2000 FORI=1TO4:J=0
DJ 2010 J=J+1:IFJ=13THEN2040
BQ 2020 IFT(I,J)=-1THEN2040
GP 2030 L=FNL(X):GOSUB1650:GOT
O2010
AA 2040 NEXT
SX 2050 L=LP:GOSUB1650:L=LN:GO
SUB1650
CG 2060 BR=BR-50:GOSUB1830:FOR
I=1TO17:GOSUB2830:NEXT
:GOSUB2930
MM 2070 FORI=52TO1STEP-1:C=INT
(I*RND(-TI/37))+1:P(53
-I)=D(C):D(C)=D(I):NEX
T
RD 2080 FORI=1TO52:D(I)=P(I):N
EXT
GB 2090 FORI=1TO13:S(I)=P(I):N
EXT:SC=13
AB 2100 F(1)=P(14):F(0)=1:FC=1
:FF=F(1)-13*INT(F(1)/1
3):PC=34
JD 2110 FORI=1TO4:T(I,0)=1:T(I
,1)=P(14+I):FORJ=2TO12
:T(I,J)=-1:NEXT:NEXT
KS 2120 FORI=1TOPC:P(I)=P(I+52
-PC):NEXT:P(PC+1)=-1
FJ 2130 K=S(1):L=LS:GOSUB2830:
GOSUB1650
QS 2140 K=F(1):L=33879:GOSUB28
30:GOSUB1650:BR=BR+5:G
OSUB1830
EK 2150 FORI=1TO4:K=T(I,1):L=L
T+4*I:GOSUB2830:GOSUB1
650:NEXT
HC 2160 GOSUB1810:POKE214,19:P
RINT:PRINTTAB(12)"34"
MR 2170 R=FNR(S(1)):IFR<>FFTHE
N2220
DC 2180 N=F(0)+1:F(0)=N:F(N)=S
(1):FC=FC+1:SC=SC-1:BR
=BR+5
RS 2190 FORJ=1TOSC:S(J)=S(J+1)
:NEXT:S(SC+1)=-1
QQ 2200 K=S(1):L=LS:GOSUB1650:
GOSUB2830
XD 2210 K=F(N):L=LF+4*N:GOSUB1
650:GOSUB1830:GOTO2170
RQ 2220 I=0
CA 2230 I=I+1:IFI=5THEN2290
FJ 2240 R=FNR(T(I,1)):IFR<>FFT
HEN2230
FK 2250 N=F(0)+1:F(0)=N:F(N)=T
(I,1):FC=FC+1:BR=BR+5
EQ 2260 K=-1:L=LT+4*I:GOSUB165
0:K=F(N):L=LF+4*N:GOSU
B2830:GOSUB1650:GOSUB1
830
AG 2270 T(I,1)=S(1):T(I,0)=1:S
C=SC-1:FORJ=1TOSC:S(J)
=S(J+1):NEXT:S(SC+1)=-
1
SF 2280 K=S(1):L=LS:GOSUB1650:
K=T(I,1):L=LT+4*I:GOSU
B1650:GOTO2170
EB 2290 RETURN
QB 2300 POKE53280,6:POKE53281,
0:POKE646,4
PG 2310 POKE214,10:PRINT:PRINT
TAB(12)"INITIALIZING..
."
AF 2320 FORI=0TO999:POKE33792+
I,32:NEXT
DK 2330 POKE56334,PEEK(56334)A
ND254:POKE1,PEEK(1)AND
251
QQ 2340 FORI=0TO511:POKE34816+
I,PEEK(53248+I):NEXT
DX 2350 POKEL,PEEK(1)OR4:POKE5
6334,PEEK(56334)OR1
CC 2360 POKE56578,PEEK(56578)O
R3
EJ 2370 POKE56576,(PEEK(56576)
AND252)OR1:PRINT"{CLR}
"
EP 2380 POKE53272,(PEEK(53272)
AND15)OR16
AP 2390 POKE648,132
KD 2400 POKE53272,(PEEK(53272)
AND240)OR2
JG 2410 RETURN
RQ 2420 POKE214,10:PRINT:PRINT
TAB(12)"ALMOST READY..
."
EH 2430 DIM D(52),P(52),S(13),
T(4,12),C%(255)
JX 2432 C%(ASC("F"))=2:C%(ASC(
"T"))=3:C%(ASC("P"))=4
:C%(133)=5:C%(ASC("S"
))=6
DM 2434 C%(136)=7:FORI=49 TO 5
2:C%(I)=1:NEXT
AR 2440 FORJ=1TO48:READA:FORI=
0TO7:READB:POKE34816+A
*8+I,B:NEXT:NEXT:PRINT
"{CLR}"
BR 2450 FORI=1TO6:READH1(I),L1
(I),H2(I),L2(I):NEXT
JG 2460 POKE198,0:POKE19,1:INP
UT" {0 DOWN|ENTER PLA
YER'S NAME: ";NM$
PR 2470 IFNM$=""THEN2470
HG 2475 F1$=NM$+".BANKROLL"
JF 2480 PRINT"{CLR}":F$="0":"+N
M$+".BANKROLL,S," :OPEN
8,8,8,F$+"R":INPUT#8,B
R:CLOSE8
BE 2485 OPEN15,8,15:PRINT#15,"
S:F1$:CLOSE15
XG 2490 OPEN8,8,8,F$+"W":PRINT
#8,0:CLOSE8
MJ 2500 IFBR<50THENBR=500
AC 2510 FORI=1TO52:D(I)=I-1:NE
XT
RE 2520 DF=21504:LF=33875:LS=3
3953:LT=34035:LN=34648
:LP=34643
KE 2530 DEF FN R(X)=X-13*INT(X
/13):DEF FN L(X)=33995
+4*I+40*J
JS 2540 Z$="&@&@{DOWN}
{4 LEFT}[@@]"
DE 2550 POKE53280,13:POKE53281
,13:POKE646,12
PG 2560 PRINT"{CLR}":TAB(11)"O
UNDATION":POKE33802,62
:POKE33802+DF,2
MD 2570 POKE214,2:PRINT:PRINTT
AB(25)"&-----&
PRINTTAB(25)"* F1 QUIT
{4 SPACES}+
PRINTTAB(8)"#1
{2 SPACES}#2{2 SPACES}
#3{2 SPACES}#4
{3 SPACES}* F7 CONCEDE
+
DH 2600 PRINTTAB(25)"[,,,,,,
,,,,]

```



```

HR 2610 POKE34032,60:POKE34032
+DF,2:POKE214,5:PRINT:
PRINTTAB(1)"TOCK
CS 2620 POKE646,2:POKE214,8:PR
INT:PRINTTAB(25)"&-----
-----f
EK 2630 POKE646,1:PRINTTAB(26)
"&-----f
FB 2640 PRINTTAB(26)"*
{10 SPACES}+
CB 2650 PRINTTAB(26)"[,,,,,,
,,]
CX 2660 POKE646,2:PRINTTAB(25)
"[,,,,,,]
SD 2670 POKE646,6:POKE214,10:P
RINT:PRINTTAB(28)"CANF
IELD":POKE646,12
JJ 2680 POKE214,15:PRINT:PRINT
TAB(26)"&-----f
PG 2690 PRINTTAB(26)"* BANKROL
L +
PC 2700 PRINTTAB(26)"*
{10 SPACES}+
QJ 2710 PRINTTAB(26)"*
{3 SPACES}{6 SPACES}+
JB 2720 GOSUB1830
GM 2730 PRINTTAB(26)"[,,,,,,
,,]
RM 2740 POKE214,19:PRINT:PRINT
TAB(0)"&-----f
AD 2750 PRINTTAB(0)"* FROM:
{2 SPACES}+
SB 2760 PRINTTAB(0)"*
{3 SPACES}TO:
{2 SPACES}+
GE 2770 PRINTTAB(0)"[,,,,,,]
";
MC 2780 POKE34723,59:POKE34723
+DF,2:PRINTTAB(12)"ACK
";
HK 2790 POKE34728,61:POKE34728
+DF,2:PRINTTAB(17)"ALO
N
GS 2800 RETURN
CR 2810 POKESD+4,0:POKESD+5,0:
POKESD,50:POKESD+1,55:
POKESD+24,15:POKESD+4,
33
RA 2820 RETURN
CE 2830 POKESD+4,0:POKESD+5,17
:POKESD,50:POKESD+1,58
:POKESD+24,15:POKESD+4
,129
PC 2840 RETURN
MJ 2850 POKESD+4,0:POKESD+5,55
:POKESD,50:POKESD+1,5:
POKESD+24,15:POKESD+4,
33
BF 2860 RETURN
GX 2870 GOSUB2930:POKESD+5,85:
POKESD+6,85:POKESD+12,
85:POKESD+13,85
BS 2880 POKESD+24,15:POKESD+4,
33:POKESD+11,17
MK 2890 FORI=1TO6:POKESD+1,H1(I
):POKESD,L1(I):POKESD
+8,H2(I):POKESD+7,L2(I
)
BR 2900 IFH1(I)=50THENFORT=1TO
200:NEXT
BX 2910 FORT=1TO100:NEXT:NEXT
EH 2920 POKESD+4,32:POKESD+11,
16:FORW=1TO500:NEXT:RE
TURN
EA 2930 FORCL=SDTOSD+24:POKECL
,0:NEXT:RETURN
RB 2940 DATA0,219,102,60,219,2
19,60,102,219,27,3,3,3
,3,3,3,3,1
EH 2950 DATA28,128,192,192,192
,192,192,192,192,29,19
2,192,192,192,192,192,
192,128

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```

CR 2960 DATA38,1,3,3,3,3,3,3
,42,3,3,3,3,3,3,3
CR 2970 DATA43,192,192,192,192
,192,192,192,192,44,0,
0,0,0,0,0,0,255
PG 2980 DATA45,255,0,0,0,0,0,0
,0,59,131,153,153,131,
159,159,159,255
PF 2990 DATA60,195,153,159,195
,249,153,195,255,61,12
9,231,231,231,231,231,
231,255
HP 3000 DATA62,129,159,159,135
,159,159,159,255,64,25
5,0,24,60,102,126,102,
102
GX 3010 DATA65,0,24,60,102,126
,102,102,255,66,255,0,
60,102,12,48,96,126
SR 3020 DATA67,0,60,102,12,48,
96,126,255,68,255,0,60
,102,12,6,102,60
EF 3030 DATA69,0,60,102,12,6,1
02,60,255,70,255,0,6,3
0,102,127,6,6
AA 3040 DATA71,0,12,60,204,254
,12,12,255,72,255,0,12
6,96,124,6,102,60
BK 3050 DATA73,0,126,96,124,6,
102,60,255,74,255,0,60
,96,124,102,102,60
QJ 3060 DATA75,0,60,96,124,102
,102,60,255,76,255,0,1
24,12,24,48,48,48
FD 3070 DATA77,0,62,6,12,24,24
,24,255,78,255,0,60,10
2,60,102,102,60
FQ 3080 DATA79,0,60,102,60,102
,102,60,255,80,255,0,6
0,102,62,12,24,48
KG 3090 DATA81,0,60,102,62,12,
24,48,255,82,255,0,126
,24,24,24,24,0
HF 3100 DATA83,0,126,24,24,24,
24,0,255,84,255,0,30,1
2,12,108,56,0
GC 3110 DATA85,0,30,12,12,108,
56,0,255,86,255,0,60,1
02,102,60,14,0
EB 3120 DATA87,0,60,102,102,60
,14,0,255,88,255,0,102
,108,120,108,102,0
QX 3130 DATA89,0,102,108,120,1
08,102,0,255,90,8,28,6
2,127,127,28,62,255
RX 3140 DATA91,255,16,56,124,2
54,254,56,124,92,0,54,
127,127,62,28,8,255
FR 3150 DATA93,255,0,108,254,2
54,124,56,16,94,0,24,2
4,126,126,24,60,255
QK 3160 DATA95,255,0,24,24,126
,126,24,60,96,8,28,62,
127,62,28,8,255
BR 3170 DATA97,255,16,56,124,2
54,124,56,16,160,0,0,0
,0,0,0,0,255
JQ 3180 DATA25,30,18,209,33,13
5,25,30,42,62,31,165
HG 3190 DATA50,60,37,162,42,62
,31,165,50,60,37,162

```

**Program 2: Atari
400/800/XL/XE Canfield**
Version by Bill Chin, Editorial
Programmer

```

CN 100 REM COPYRIGHT 1988 CO
MPUTE! PUB
JI 110 ? CHR*(125);"COPYRIGH
T 1988 COMPUTE! PUBLI
CATIONS"

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6B 120 POSITION 11,2:?"ALL
RIGHTS RESERVED":FOR
I=1 TO 500:NEXT I
ML 130 OPEN #1,4,0,"K:"
AM 140 PRINT CHR*(125)
NP 150 GOSUB 2160
OB 160 GOSUB 2080
BK 170 GOSUB 1660:GOSUB 2360
FB 180 POSITION CX,CY:?" ":
POSITION CX,CY+1:?" ":
":IF FC<>52 THEN 290
FB 190 REM WINNER
AH 200 FOR I=1 TO 1000:NEXT
I:PRINT CHR*(125)
HD 210 POSITION 10,5:PRINT "
CONGRATULATIONS!"
MM 220 POSITION 8,7:PRINT "Y
OU HAVE BEATEN THE OD
DS!!"
HA 230 POSITION 3,9:PRINT "Y
OU HAVE A TOTAL BANKR
OLL OF $";BR
OM 240 POSITION 16,22:PRINT
"CONTINUE PLAYING? (Y
/N)"
DI 250 GET #1,A
NM 260 IF A=89 THEN 160
NM 270 IF A=78 THEN 440
BK 280 GOTO 250
PA 290 IF SC=0 THEN 310
CK 300 X=S(1):GOSUB 2400:IF
R=FF THEN N=F(0)+1:F(
0)=N:GOSUB 730:GOTO 1
80
OM 310 IF TC=0 THEN 330
GD 320 X=P(TC):GOSUB 2400:IF
R=FF THEN N=F(0)+1:F
(0)=N:GOTO 1000
AL 330 E=0:FOR I=4 TO 1 STEP
-1:IF T(I,0)=0 THEN
E=I
BP 340 NEXT I
JN 350 IF E=0 THEN 410
DP 360 IF SC=0 THEN 410
OC 370 T(E,1)=S(1):T(E,0)=1:
SC=SC-1
EN 380 FOR I=1 TO SC:S(I)=S(
I+1):NEXT I:S(SC+1)=-
1
AJ 390 K=S(1):LX=SX:LY=SY:GO
SUB 1520
ND 400 K=T(E,1):LX=TX+3*E:LY
=TY:GOSUB 2310:GOSUB
1520:GOTO 180
DB 410 GET #1,A
JH 420 ON C(A) GOTO 1210,430
,170,440,520,620,900
DL 430 GOSUB 2330:GOTO 180
IN 440 IF BR<50 THEN BR=0
BA 450 PRINT CHR*(125)
KA 460 POSITION 7,9:PRINT "T
HANKS FOR PLAYING, ";
NM$
JP 470 POSITION 3,11:PRINT "
YOU HAVE A TOTAL BANK
ROLL OF $";BR
CE 480 REM SAVE BANKROLL FIL
E
ML 490 POSITION 9,13:PRINT "
COME BACK AGAIN SOON!
"
AP 500 OPEN #2,8,0,F*:? #2:B
R
NA 510 POKE 752,0:END
OO 520 IF PC=0 THEN 180
AF 530 IF PC=TC THEN GOSUB 1
610
IK 540 IF P(TC+1)=-1 THEN TC
=0
FP 550 IF P(TC+2)=-1 THEN TC
=TC+1:GOTO 580
GC 560 IF P(TC+3)=-1 THEN TC
=TC+2:GOTO 580
GF 570 TC=TC+3
DI 580 GOSUB 2360

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```

HL 590 IF P(TC+1)=-1 THEN K=-
-1:LX=PX:LY=PY:GOSUB
1520
OI 600 K=P(TC):LX=NX:LY=NY:G
OSUB 2310:GOSUB 1520:
GOTO 180
OJ 610 GOTO 180
OK 620 GOSUB 2380:IF SC=0 TH
EN 180
OL 630 X=S(1):GOSUB 2400
OM 640 GET #1,B
ON 650 ON C(B) GOTO 770,670,
170,440
OP 660 GOSUB 2330:GOTO 180
OQ 670 GOSUB 2390
OR 680 IF R=0 THEN NF=S(1)+1
2:GOTO 700
OS 690 NF=S(1)-1
OT 700 N=0
OU 710 N=N+1:IF N=5 THEN GOS
UB 2330:GOTO 180
OV 720 IF F(N)<>NF THEN 710
OW 730 F(N)=S(1):FC=FC+1:SC=
SC-1:BR=BR+5
OX 740 FOR J=1 TO SC:S(J)=S(
J+1):NEXT J:S(SC+1)=-
1
OY 750 K=S(1):LX=SX:LY=SY:G
OSUB 1520:GOSUB 2310
OZ 760 K=F(N):LX=FX+3*N:LY=F
Y:GOSUB 1520:GOSUB 16
30:GOTO 180
P0 770 GOSUB 2390:I=B-48
P1 780 IF T(I,0)=0 THEN J=0:
GOTO 860
P2 790 IF R=12 THEN N1=S(1)+
1:GOTO 810
P3 800 N1=S(1)+14
P4 810 IF N1>51 THEN N1=N1-5
2
P5 820 N2=N1+26:IF N2>51 THE
N N2=N2-52
P6 830 J=T(I,0)
P7 840 IF T(I,J)=N1 THEN 860
P8 850 IF T(I,J)<>N2 THEN G
OSUB 2330:GOTO 180
P9 860 J=J+1:T(I,J)=S(1):T(I
,0)=T(I,0)+1:SC=SC-1
P0 870 FOR N=1 TO SC:S(N)=S(
N+1):NEXT N:S(SC+1)=-
1
P1 880 K=S(1):LX=SX:LY=SY:G
OSUB 1520:GOSUB 2310
P2 890 K=T(I,J):GOSUB 1510:G
OTO 180
P3 900 GOSUB 2380:IF TC=0 TH
EN 180
P4 910 X=P(TC):GOSUB 2400
P5 920 GET #1,B:GOSUB 2390
P6 930 ON C(B) GOTO 1060,950
,170,440
P7 940 GOSUB 2330:GOTO 180
P8 950 IF R=0 THEN NF=P(TC)+
12:GOTO 970
P9 960 NF=P(TC)-1
P0 970 N=0
P1 980 N=N+1:IF N=5 THEN GOS
UB 2330:GOTO 180
P2 990 IF F(N)<>NF THEN 980
P3 1000 F(N)=P(TC):FC=FC+1:P
C=PC-1:TC=TC-1
P4 1010 FOR I=(TC+1) TO PC:P
(I)=P(I+1):NEXT I:P(
PC+1)=-1
P5 1020 IF TC=0 THEN GOSUB 1
620:GOTO 1050
P6 1030 K=P(TC):LX=NX:LY=NY:
GOSUB 1520
P7 1040 GOSUB 2360
P8 1050 GOSUB 2310:K=F(N):LX
=FX+3*N:LY=FY:GOSUB
1520:BR=BR+5:GOSUB 1
630:GOTO 180
P9 1060 I=B-48:GOSUB 2390

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CO 1070 IF T(I,0)=0 THEN J=0
:GOTO 1150
PD 1080 IF R=12 THEN N1=P(TC
)+1:GOTO 1100
PE 1090 N1=P(TC)+14
PF 1100 IF N1>51 THEN N1=N1-
52
PG 1110 N2=N1+26:IF N2>51 TH
EN N2=N2-52
PH 1120 J=T(I,0)
PJ 1130 IF T(I,J)=N1 THEN 11
50
PK 1140 IF T(I,J)<>N2 THEN G
OSUB 2330:GOTO 180
PL 1150 J=J+1:T(I,J)=P(TC):T
(I,0)=T(I,0)+1:PC=PC
-1:TC=TC-1
PM 1160 FOR N=(TC+1) TO PC:P
(N)=P(N+1):NEXT N:P(
PC+1)=-1
PN 1170 IF TC=0 THEN GOSUB 1
620:GOTO 1200
PO 1180 K=P(TC):LX=NX:LY=NY:
GOSUB 1520
PP 1190 GOSUB 2360
PQ 1200 GOSUB 2310:K=T(I,J):
GOSUB 1510:GOTO 180
PR 1210 I=A-48:GOSUB 2380:IF
T(I,0)=0 THEN 180
PS 1220 GET #1,B:GOSUB 2390
PT 1230 ON C(B) GOTO 1370,12
50,170,440
PU 1240 GOSUB 2330:GOTO 180
PV 1250 J=T(I,0):X=T(I,J):G
OSUB 2400
PW 1260 X=T(I,J):GOSUB 2400
PX 1270 IF R=0 THEN NF=T(I,J
)+12:GOTO 1290
PY 1280 NF=T(I,J)-1
PZ 1290 N=0
P0 1300 N=N+1:IF N=5 THEN G
OSUB 2330:GOTO 180
P1 1310 IF F(N)<>NF THEN 130
0
P2 1320 F(N)=T(I,J):FC=FC+1:
T(I,0)=T(I,0)-1:BR=B
R+5
P3 1330 K=-1:GOSUB 1510:GOSU
B 2310
P4 1340 IF T(I,0)<>0 THEN J=
J-1:K=T(I,J):GOSUB 1
510
P5 1350 K=F(N):LX=FX+3*N:LY=
FY:GOSUB 1520:GOSUB
1630
P6 1360 GOTO 180
P7 1370 A=B-48:GOSUB 2390:X=
T(I,1):GOSUB 2400
P8 1380 IF R=12 THEN N1=T(I,
1)+1:GOTO 1400
P9 1390 N1=T(I,1)+14
P0 1400 IF N1>51 THEN N1=N1-
52
P1 1410 N2=N1+26:IF N2>51 TH
EN N2=N2-52
P2 1420 B=T(A,0):IF B=0 THEN
GOSUB 2330:GOTO 180
P3 1430 IF T(A,B)=N1 THEN 14
50
P4 1440 IF T(A,B)<>N2 THEN G
OSUB 2330:GOTO 180
P5 1450 FOR J=1 TO T(I,0):K=
-1:GOSUB 1510:NEXT J
P6 1460 FOR J=1 TO T(I,0):B=
T(A,0)+J:T(A,B)=T(I,
J)
P7 1470 K=T(A,B):LX=TX+A*3:L
Y=TY+B-1:GOSUB 1520:
GOSUB 2310:NEXT J
P8 1480 T(A,0)=T(A,0)+T(I,0)
:T(I,0)=0:GOTO 180
P9 1490 GOTO 180
P0 1500 REM I,J CALCULATED S
HOWCARD
P1 1510 LX=TX+I*3:LY=J+TY-1

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PE 1520 IF K<>-1 THEN 1550
PK 1530 POSITION LX,LY:?"
":POSITION LX,LY+1:?"
"
PL 1540 GOTO 1600
PM 1550 SUIT=INT(K/13):R=K-(
13*SUIT):COL=0
PN 1560 IF SUIT=1 THEN COL=2
PO 1570 IF SUIT=3 THEN COL=2
PP 1580 POSITION LX,LY:?" R*(
R+1,R+1);S*(SUIT+1,S
UIT+1)
PQ 1590 POSITION LX,LY+1:?" S
*(SUIT+1,SUIT+1);R*(
R+1,R+1)
PR 1600 RETURN
PS 1610 POSITION PX,PY:?" CHR
$(160);CHR$(160):POS
ITION PX,PY+1:?" CHR$
(160);CHR$(160):RETU
RN
PT 1620 K=-1:LX=NX:LY=NY:GOS
UB 1520:GOTO 2360
PU 1630 POSITION 3,18:PRINT
"(5 SPACES)"
PV 1640 POSITION 3,18:PRINT
BR
PW 1650 RETURN
PX 1660 IF BR>49 THEN 1750
PY 1670 PRINT CHR$(125)
PZ 1680 POSITION 11,9:PRINT
"YOU HAVE ONLY $";BR
;":FOR I=1 TO 200:
NEXT I
P0 1690 POSITION 12,15:PRINT
"TOO BAD!!"
P1 1700 POSITION 22,22:PRINT
"PLAY AGAIN(Y/N)?"
P2 1710 GET #1,A
P3 1720 IF A=89 THEN BR=500:
GOTO 160
P4 1730 IF A=78 THEN BR=0:G
OTO 450
P5 1740 GOTO 1710
P6 1750 F(2)=-1:F(3)=-1:F(4)
=-1:TN=-1:FC=0:TC=0
P7 1760 K=-1:LY=FY:FOR I=1 T
O 4:LX=FX+I*3:GOSUB
1520:NEXT I
P8 1770 FOR I=1 TO 4:J=0
P9 1780 J=J+1:IF J=13 THEN 1
810
P0 1790 T(I,J)=-1:GOTO 1800
P1 1800 K=T(I,J):GOSUB 1510:
GOTO 1780
P2 1810 NEXT I
P3 1820 LX=PX:LY=PY:GOSUB 15
20:LX=NX:LY=NY:GOSUB
1520
P4 1830 BR=BR-50:GOSUB 1630:
FOR I=1 TO 17:NEXT I
:GOSUB 2390
P5 1840 FOR I=52 TO 1 STEP -
1:C=INT(I*RND(1))+1:
P(53-I)=D(C):D(C)=D(
I):NEXT I
P6 1850 FOR I=1 TO 52:D(I)=P
(I):NEXT I
P7 1860 FOR I=1 TO 13:S(I)=P
(I):NEXT I:SC=13
P8 1870 F(1)=P(14):F(0)=1:FC
=1:FF=F(1)-13*INT(F(
1)/13):PC=34
P9 1880 FOR I=1 TO 4:T(I,0)=
1:T(I,1)=P(14+I):FOR
J=2 TO 12:T(I,J)=-1
:NEXT J:NEXT I
P0 1890 FOR I=1 TO PC:P(I)=P
(I+52-PC):NEXT I:P(
PC+1)=-1
P1 1900 K=S(1):LX=SX:LY=SY:G
OSUB 2310:GOSUB 1520
P2 1910 K=F(1):LX=FX+3:LY=FY
:GOSUB 1520:BR=BR+5:
GOSUB 1630

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HD 1920 FOR I=1 TO 4:K=T(I,1
):LX=TX+3*I:LY=TY:GO
SUB 2310:GOSUB 1520:
NEXT I
BF 1930 GOSUB 1610
NL 1940 X=S(1):GOSUB 2400:IF
R<>FF THEN 1990
BP 1950 N=F(0)+1:F(0)=N:F(N)
=S(1):FC=FC+1:SC=SC-
1:BR=BR+5
IF 1960 FOR J=1 TO SC:S(J)=S
(J+1):NEXT J:S(SC+1)
=-1
DO 1970 K=S(1):LX=SX:LY=SY:G
OSUB 1520
NA 1980 K=F(N):LX=FX+3*N:LY=
FY:GOSUB 1520:GOSUB
1630:GOTO 1940
IJ 1990 I=0
BI 2000 I=I+1:IF I=5 THEN 20
60
DF 2010 X=T(I,1):GOSUB 2400:
IF R<>FF THEN 2000
IJ 2020 N=F(0)+1:F(0)=N:F(N)
=T(I,1):FC=FC+1:BR=B
R+5
AF 2030 K=-1:LX=TX+3*I:LY=TY
:GOSUB 1520:K=F(N):L
X=FX+3*N:LY=FY:GOSUB
2310:GOSUB 1520:GOSUB
UB 1630
AF 2040 T(I,1)=S(1):T(I,0)=1
:SC=SC-1:FOR J=1 TO
SC:S(J)=S(J+1):NEXT
J:S(SC+1)=-1
BF 2050 K=S(1):LX=SX:LY=SY:G
OSUB 1520:K=T(I,1):L
X=TX+3*I:LY=TY:GOSUB
1520:GOTO 1940
KI 2060 RETURN
EL 2070 REM SCREEN LAYOUT
PD 2080 ? CHR$(125)
AI 2090 POSITION TX+3, TY-1: ?
" 1 2 3 4"
FK 2100 POSITION SX, SY-1: ? "
STOCK"
BC 2110 POSITION FX+3, FY-1: ?
"FOUNDATION"
NJ 2120 POSITION 2, 17: ? "BAN
K"
MP 2130 POSITION PX-1, PY-2: ?
"PACK TALON"
DB 2140 POSITION PX-1, PY+3: ?
"Q TO REDEAL":POSIT
ION PX-1, PY+4: ? "ESC
TO EXIT"
KI 2150 RETURN
ON 2160 DIM D(52), P(52), S(13
), T(4, 13), C(255), R*(
52), S*(52), T*(13), NM
*(13), F(4), F*(18)
PF 2170 FOR I=49 TO 52:C(I)=
1:NEXT I
BP 2180 C(ASC("F"))=2:C(ASC(
"Q"))=3:C(27)=4:C(AS
C("P"))=5:C(ASC("S"
))=6
JE 2190 C(ASC("S"))=6:C(ASC(
"T"))=7
EK 2200 T*="23456789TJQKA":F
OR I=1 TO 13:T*(I,1)
=CHR$(ASC(T*(I,1))+1
28):NEXT I
NG 2210 R*(1)=T*:R*(14)=T*:R
*(27)=T*:R*(40)=T*
PD 2220 S*(1)=CHR$(251):S*(2
)=CHR$(128):S*(3)=CH
R$(144):S*(4)=CHR$(2
24)
HM 2230 PRINT " ENTER PLAYER
'S NAME: ";:INPUT NM
$
IO 2240 IF NM$="" THEN 2240
MF 2250 F*(1)="D":F*(3)=NM$
:F*(LEN(F*))+1)=".BAN

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":GOSUB 2420
HE 2260 INPUT #2, BR:CLOSE #2
CE 2270 IF BR<50 THEN BR=500
JG 2280 FOR I=1 TO 52:D(I)=I
-1:NEXT I:POKE 752,1
LN 2290 FX=23:FY=4: SX=2:SY=6
:TX=7:TY=1:NX=33:NY=
16:PX=27:PY=16:CX=25
:CY=16
KF 2300 RETURN
PA 2310 SOUND 2, 240, 12, 12:FO
R T=1 TO 3:NEXT T:SO
UND 2, 0, 0, 0
KH 2320 RETURN
HP 2330 REM HONK SOUND, INVA
LID MOVE
OB 2340 SOUND 2, 55, 12, 12:FOR
I=1 TO 12:NEXT I:SO
UND 2, 0, 0, 0
KK 2350 RETURN
BP 2360 POSITION PX, PY-1:PRI
NT "(8 SPACES)":POSI
TION PX, PY-1:PRINT P
C-TC; "(4 SPACES)":TC
KN 2370 RETURN
OG 2380 POSITION CX, CY:PRINT
" ":POSITION CX, CY:
PRINT CHR$(A):RETURN
PA 2390 POSITION CX, CY+1:PRI
NT " ":POSITION CX, C
Y+1:PRINT CHR$(B):RE
TURN
HD 2400 REM SIMULATED RANK F
UNCTION R=
KK 2410 R=X-13*INT(X/13):RET
URN
MK 2420 TRAP 2450
KC 2430 OPEN #2, 4, 0, F*
KK 2440 RETURN
BC 2450 TRAP 40000:CLOSE #2:
OPEN #2, 8, 0, F*
BJ 2460 PRINT #2:0
MF 2470 CLOSE #2:OPEN #2, 4, 0
, F*:RETURN

```

Program 3: Apple II Canfield—ML

Version by Bill Chin, Editorial
Programmer

```

8000: 20 EC 80 80 72 20 00 82 FD
8008: 80 6D 20 5B 82 80 68 AD CB
8010: 26 83 F0 0F A9 7F 8D 2C A6
8018: 83 8D 2D 83 A9 07 8D 2E CE
8020: 83 D0 0F A9 2A 8D 2C 83 F6
8028: A9 55 8D 2D 83 A9 02 8D 2C
8030: 2E 83 A9 03 8D 1A 83 A9 14
8038: 02 8D 22 83 20 09 81 A9 EB
8040: 18 8D 1B 83 20 98 81 20 D2
8048: 5C 81 EE 1E 83 CE 1B 83 AB
8050: D0 F2 AD 26 83 F0 20 A0 4F
8058: 00 AD 27 83 20 88 80 A0 A6
8060: 04 AD 27 83 20 88 80 A0 B0
8068: 08 AD 26 83 20 88 80 A0 9A
8070: 0C AD 26 83 20 88 80 60 64
8078: 72 82 03 08 92 82 0A 08 EE
8080: AA 82 01 01 AA 82 0A 0F 2A
8088: 0A 8A 8D 2B 83 89 78 7E
8090: 80 85 FC 8B 89 78 80 85 95
8098: FD C8 AD 28 83 8D 20 83 19
80A0: 89 78 80 C8 1B 6D 29 83 85
80AB: C9 07 90 07 E9 07 EE 20 3C
80B0: 83 B0 F5 8D 21 83 B9 78 3A
80B8: 80 18 6D 2A 83 8D 1E 83 62
80C0: A9 01 8D 1A 83 89 07 8D 88
80C8: 22 83 A9 08 8D 1B 83 AC FD
80D0: 2B 83 B1 FC 8D 2C 83 20 92
80D8: 09 81 20 98 81 20 5C 81 13
80E0: EE 1E 83 EE 2B 83 CE 1B 60
80E8: 83 D0 E4 60 20 67 82 C9 EF
80F0: 35 90 01 60 A2 80 8E 27 30
80F8: 83 C9 0E 90 07 E9 0D EE E1
8100: 27 83 B0 F5 8D 26 83 1B 11
8108: 60 AD 1A 83 8D 1C 83 AB AE

```

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8110: A9 00 99 2C 83 AD 21 83 76
8118: 18 6D 22 83 C9 07 90 05 8F
8120: E9 07 EE 1C 83 8D 23 83 95
8128: AD 2C 83 09 7F 8D 1D 83 FD
8130: AC 21 83 F0 15 A2 00 0E 92
8138: 2C 83 BD 2C 83 0A 3E 2D 9A
8140: 83 EB EC 1C 83 D0 F3 88 6E
8148: D0 EB AC 1C 83 B9 2C 83 E4
8150: 09 80 2D 1D 83 99 2C 83 CD
8158: 88 10 F2 60 AC 23 83 B9 BA
8160: 8A 81 AC 1C 83 88 31 FE FF
8168: 19 2C 83 91 FE 88 30 0A 11
8170: F0 08 B9 2C 83 91 FE 08 D0
8178: D0 F8 AC 21 83 B9 91 81 71
8180: A0 00 31 FE 0D 2C 83 91 9B
8188: FE 60 7F 7E 7C 78 70 60 02
8190: 40 00 01 03 07 0F 1F 3F F5
8198: AD 1E 83 29 3F A8 B9 C0 CD
81A0: 81 05 E6 85 FF AD E1 83 51
81A8: 29 08 F0 02 A9 80 18 2C 2C
81B0: 1E 83 70 04 10 04 69 28 7D
81B8: 69 28 6D 20 83 85 FE 60 BA
81C0: 00 04 08 0C 10 14 18 1C A3
81C8: 00 04 08 0C 10 14 18 1C AB
81D0: 01 05 09 0D 11 15 19 1D B3
81D8: 01 05 09 0D 11 15 19 1D BB
81E0: 02 06 0A 0E 12 16 1A 1E C3
81E8: 02 06 0A 0E 12 16 1A 1E CB
81F0: 03 07 0B 0F 13 17 1B 1F D3
81F8: 03 07 0B 0F 13 17 1B 1F DB
8200: A9 00 8D 20 83 8D 21 83 A5
8208: 20 67 82 8D 1F 83 C0 01 A9
8210: 90 12 F0 01 60 C9 18 90 FA
8218: 01 60 A9 24 8D 20 83 A9 CA
8220: 04 8D 21 83 A9 00 8D 25 74
8228: 83 A9 E0 8D 24 83 AD 1F F7
8230: 83 CD 2A 83 90 04 ED 24 BB
8238: 83 38 2E 25 83 4E 24 83 46
8240: 90 EF 18 6D 21 83 8D 21 B6
8248: 83 8D 29 83 18 AD 25 83 15
8250: 6D 20 83 8D 20 83 8D 28 AF
8258: 83 18 6A 20 67 82 8D 1E B1
8260: 83 8D 2A 83 C9 C0 60 20 3A
8268: B1 00 20 05 E1 A5 A1 A4 28
8270: A0 60 7F 7F 5F 07 01 01 DF
8278: 0F 7F 7F 7F 77 55 55 07 DF
8280: 5F 7F 7F 7F 47 47 01 01 57
8288: 47 7F 7F 7F 5F 57 55 57 53
8290: 5F 7F 7F 7F 7F 7E 78 78 6C
8298: 7F 7F 7F 7F 7E 7A 7A 7E 74
82A0: 7F 7F 7F 7F 7F 7E 7E 7E A2
82A8: 7F 7F 7F 7F 7F 7E 7A 7E 9E
82B0: 7F 7F 63 1C 1C 10 00 1C F0
82B8: 1C 1C 63 1C 1F 1F 63 7C B9
82C0: 7C 00 63 1C 1F 63 1F 1F 16
82C8: 1C 63 4F 47 43 49 4C 00 EA
82D0: 4F 4F 00 7C 7C 60 1F 1F DB
82D8: 1C 63 43 79 7C 60 1C 1C 7E
82E0: 1C 63 00 1C 1F 4F 67 73 07
82E8: 73 73 63 1C 1C 63 1C 1C 75
82F0: 1C 63 63 1C 1C 1C 03 1F 81
82F8: 1C 63 01 67 67 67 67 67 BA
8300: 67 67 1F 1F 1F 1F 1F 1F 3D
8308: 1C 63 63 1C 1C 1C 1C 10 BD
8310: 44 13 1C 1C 1C 60 1C 1C F9
8318: 1C 1C 01 00 02 7F 1F 85 26
8320: 14 03 07 03 03 13 04 02 71
8328: 13 00 08 28 78 04 00 00 10
8330: 00 00 00 00 00 00 00 00 37
8338: 00 00 00 00 00 00 00 00 3F
8340: D8 78 85 45 86 46 84 47 74
8348: A6 07 0A 0A B0 04 10 3E 3A
8350: 30 04 10 01 E8 E8 0A 86 08
8358: 1B 18 65 06 85 1A 90 02 B7
8360: E6 1B A5 26 85 08 A5 29 99
8368: 29 03 05 E6 85 09 A2 08 71
8370: A0 00 B1 1A 24 32 30 02 EB
8378: 49 7F A4 24 91 08 E6 1A 6F
8380: D0 02 E6 1B A5 09 1B 69 E9
8388: 04 85 09 CA D0 E2 A5 45 63
8390: A6 46 A4 47 58 4C F0 FD 59
8398: 00 00 00 00 00 00 00 00 9F
83A0: 00 00 00 00 00 00 00 00 A7
83A8: 00 00 00 00 00 00 00 00 AF
83B0: 08 08 08 08 08 08 08 08 BF
83B8: 14 14 14 00 00 00 00 00 51
83C0: 14 14 3E 14 3E 14 14 00 4A

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83C8: 08 3C 0A 1C 28 1E 08 00 AF
83D0: 06 26 10 08 04 32 30 00 30
83D8: 04 0A 0A 04 2A 12 2C 00 D7
83E0: 08 08 08 00 00 00 00 00 EE
83E8: 08 04 02 02 02 04 08 00 85
83F0: 08 10 20 20 20 10 08 00 57
83F8: 08 2A 1C 08 1C 2A 08 00 2C
8400: 00 08 08 3E 08 08 00 00 50
8408: 00 00 00 00 08 08 04 00 79
8410: 00 00 00 3E 00 00 00 00 FC
8418: 00 00 00 00 00 00 08 00 31
8420: 00 20 10 08 04 02 00 00 DB
8428: 1C 22 32 2A 26 22 1C 00 A2
8430: 08 0C 08 08 08 08 1C 00 5A
8438: 1C 22 20 18 04 02 3E 00 02
8440: 3E 20 10 18 20 22 1C 00 85
8448: 10 18 14 12 3E 10 10 00 55
8450: 3E 02 1E 20 22 22 1C 00 80
8458: 38 04 02 1E 22 22 1C 00 72
8460: 3E 20 10 08 04 04 04 00 4B
8468: 1C 22 22 1C 22 22 1C 00 DF
8470: 1C 22 22 3C 20 10 0E 00 75
8478: 00 00 08 00 08 00 00 00 C2
8480: 00 00 08 00 08 08 04 00 F2
8488: 10 08 04 02 04 08 10 00 9C
8490: 00 00 3E 00 3E 00 00 00 53
8498: 04 08 10 20 10 08 04 00 52
84A0: 1C 22 10 08 08 08 08 00 13
84A8: 1C 22 2A 3A 1A 02 3C 00 82
84B0: 08 14 22 22 3E 22 22 00 E7
84B8: 1E 22 22 1E 22 22 1E 00 55
84C0: 1C 22 02 02 02 22 1C 00 91
84C8: 1E 22 22 22 22 22 1E 00 A5
84D0: 3E 02 02 1E 02 02 3E 00 30
84D8: 3E 02 02 1E 02 02 02 00 BF
84E0: 3C 02 02 02 32 22 3C 00 7B
84E8: 22 22 22 3E 22 22 22 00 91
84F0: 1C 08 08 08 08 08 1C 00 24
84F8: 20 20 20 20 20 22 1C 00 E1
8500: 22 12 0A 06 0A 12 22 00 1F
8508: 02 02 02 02 02 02 3F 00 89
8510: 22 36 2A 2A 22 22 22 00 7F
8518: 22 22 26 2A 32 22 22 00 82
8520: 1C 22 22 22 22 22 1C 00 F9
8528: 1E 22 22 1E 02 02 02 00 0D
8530: 1C 22 22 22 2A 12 2C 00 2A
8538: 1E 22 22 1E 0A 12 22 00 DD
8540: 1C 22 02 1C 20 22 1C 00 A5
8548: 3E 08 08 08 08 08 08 00 66
8550: 22 22 22 22 22 22 1C 00 2D
8558: 22 22 22 22 22 14 08 00 D4
8560: 22 22 22 2A 2A 36 22 00 5A
8568: 22 22 14 08 14 22 22 00 7D
8570: 22 22 14 08 08 08 08 00 88
8578: 3E 20 10 08 04 02 3E 00 D1
8580: 3E 06 06 06 06 06 3E 00 12
8588: 00 02 04 08 10 20 00 00 16
8590: 3E 30 30 30 30 30 3E 00 8E
8598: 00 00 08 14 22 00 00 00 F6
85A0: 00 00 00 00 00 00 00 7F 2B
85A8: 04 08 10 00 00 00 00 00 B9
85B0: 00 00 1C 20 3C 22 3C 00 24
85B8: 02 02 1E 22 22 22 1E 00 01
85C0: 00 00 3C 02 02 02 3C 00 04
85C8: 20 20 3C 22 22 22 3C 00 A7
85D0: 00 00 1C 22 3E 02 3C 00 F3
85D8: 18 24 04 1E 04 04 04 00 93
85E0: 00 00 1C 22 22 3C 20 1C EF
85E8: 02 02 1E 22 22 22 22 00 39
85F0: 08 00 0C 08 08 08 1C 00 9A
85F8: 10 00 18 10 10 10 12 00 01
8600: 02 02 22 12 0E 12 22 00 F0
8608: 0C 08 08 08 08 08 1C 00 37
8610: 00 00 36 2A 2A 2A 22 00 C4
8618: 00 00 1E 22 22 22 22 00 EB
8620: 00 00 1C 22 22 22 1C 00 A4
8628: 00 00 1E 22 22 1E 02 02 AA
8630: 00 00 3C 22 22 3C 20 20 49
8638: 00 00 3A 06 02 02 02 00 09
8640: 00 00 3C 02 1C 20 1E 00 92
8648: 04 04 1E 04 04 24 18 00 3D
8650: 00 00 22 22 22 32 2C 00 F5
8658: 00 00 22 22 22 14 08 00 3D
8660: 00 00 22 22 2A 2A 36 00 3A
8668: 00 00 22 14 08 14 22 00 CF
8670: 00 00 22 22 22 3C 20 1C 42
8678: 00 00 3E 10 08 04 3E 00 1B

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8680: 38 0C 0C 06 0C 0C 38 00 BF
8688: 08 08 08 08 08 08 08 00 95
8690: 0E 18 18 30 18 18 0E 00 ED
8698: 2C 1A 00 00 00 00 00 00 42
86A0: 00 2A 14 2A 14 2A 00 00 A6

```

Program 4: Apple II Canfield—BASIC

Version by Bill Chin, Editorial
Programmer

```

A5 10 REM COPYRIGHT 1988 COMPUTE
! PUBLICATIONS, INC. ALL R
IGHTS RESERVED
C8 20 TEXT : HOME : PRINT "COPYR
IGHT 1988 COMPUTE! PUBLICA
TIONS": HTAB 9: PRINT "ALL
RIGHTS RESERVED"
68 30 VTAB 8: HTAB 8: PRINT "SPA
CE BAR TO CONTINUE": VTAB
16
9B 32 K = PEEK (49152): IF K < >
160 THEN K = RND (1): GOT
O 32
9D 34 GOTO 2520
BF 40 POKE 40196,189: POKE 40197
,158
C8 70 PRINT CHR$(4);"BLOAD CANF
IELD.ML,A#8000"
9A 80 POKE 6,168: POKE 7,131
91 90 IF PEEK (48896) = 76 THEN
PRINT CHR$(4)"PR#A#8340":
GOTO 110
AD 100 POKE 54,64: POKE 55,131:
CALL 1002
C8 110 GOSUB 2400
E7 120 GOSUB 1950
46 130 A$ = " ": GOSUB 1725:Q =
FRE (0): IF FC < > 52 THE
N 250
91 135 REM WINNER
F3 140 FOR I = 1 TO 1000: NEXT
68 160 VTAB 9: HTAB 12: PRINT "C
ONGRATULATIONS!"
87 170 HTAB 7: PRINT "YOU HAVE B
EATEN THE ODDS!!"
48 190 VTAB 12: HTAB 3: PRINT "Y
OU HAVE A TOTAL BANKROLL
OF $";BR
8A 200 VTAB 22: HTAB 2: PRINT "C
ONTINUE PLAYING? (Y/N)"
D8 210 GET A$
61 215 IF A$ = "y" THEN GOSUB 26
40: GOTO 120
8F 220 IF A$ = "Y" THEN GOSUB 26
40: GOTO 120
88 225 IF A$ = "n" THEN GOTO 410
C3 230 IF A$ < > "N" THEN 210
16 240 GOTO 410
18 250 IF SC = 0 THEN 270
66 260 R = FN R(S(1)): IF R = FF
THEN N = F(0) + 1:F(0) =
N: GOSUB 840: GOTO 130
BF 270 IF TC = 0 THEN 290
3B 280 R = FN R(P(TC)): IF R = F
F THEN N = F(0) + 1:F(0)
= N: GOTO 1160
49 290 E = 0: FOR I = 4 TO 1 STE
P - 1: IF T(I,0) = 0 THEN
E = I
FA 300 NEXT
67 310 IF E = 0 THEN 370
36 320 IF SC = 0 THEN 370
C6 330 T(E,1) = S(1):T(E,0) = 1:
SC = SC - 1
5D 340 FOR I = 1 TO SC:S(I) = S(
I + 1): NEXT :S(SC + 1) =
- 1
D7 350 K = S(1):LX = SX:LY = SY:
GOSUB 1740
88 360 K = T(E,1):LX = TX + 3 *
E:LY = TY: GOSUB 1740: GO
SUB 2920: GOTO 130
DD 370 GET A$

```

```

CA 390 ON CX(ASC(A*)) GOTO 510
,395,1010,560,120,690,400
93 395 GOSUB 2940: GOTO 130
IF 400 IF BR < 50 THEN BR = 0
11 410 HOME : TEXT
35 420 VTAB 9: HTAB 7: PRINT "TH
ANKS FOR PLAYING,";NM$
3E 430 VTAB 11: HTAB 3: PRINT "Y
OU HAVE A TOTAL BANKROLL
OF $";BR
8F 432 PRINT CHR$(4)"OPEN "F$
9C 434 PRINT CHR$(4)"WRITE "F$
6F 436 N$ = STR$(BR): PRINT N$:
PRINT CHR$(4)"CLOSE "F$
34 450 VTAB 13: HTAB 9: PRINT "C
OME BACK AGAIN SOON!"
A2 460 FOR I = 1 TO 4000: NEXT :
TEXT : HOME : END
92 510 I = VAL (A*): GOSUB 2900:
GOTO 1370
9E 560 IF PC = 0 THEN 130
81 570 IF PC = TC THEN ZX = NX *
7:ZY = NY * 8: GOSUB 185
0:LX = PX:LY = PY:K = - 1
: GOSUB 1740
41 580 IF P(TC + 1) = - 1 THEN T
C = 0
65 590 IF P(TC + 2) = - 1 THEN T
C = TC + 1: GOTO 620
5A 600 IF P(TC + 3) = - 1 THEN T
C = TC + 2: GOTO 620
A1 610 TC = TC + 3
C8 620 IF PC = TC THEN ZX = PX *
7:ZY = PY * 8: GOSUB 185
0
EA 630 GOSUB 1902
92 660 IF P(TC + 1) = - 1 THEN Z
X = NX * 7:ZY = NY * 8: G
OSUB 1740
2F 670 K = P(TC):LX = NX:LY = NY
: GOSUB 2920: GOSUB 1740:
GOTO 130
A2 680 GOTO 130
EA 690 GOSUB 1725: GOSUB 2900: I
F SC = 0 THEN 130
94 700 R = FN R(S(1))
D9 710 GET B$: ON CX(ASC(B*))
GOTO 880,780,770,770,120,
770,400
7F 770 GOSUB 2940: GOTO 130
2A 780 GOSUB 1728
A1 790 IF R = 0 THEN NF = S(1) +
12: GOTO 810
8A 800 NF = S(1) - 1
47 810 N = 0
88 820 N = N + 1: IF N = 5 THEN
GOSUB 2940: GOTO 130
49 830 IF F(N) < > NF THEN 820
D2 840 F(N) = S(1):FC = FC + 1:S
C = SC - 1:BR = BR + 5
C5 850 FOR J = 1 TO SC:S(J) = S(
J + 1): NEXT :S(SC + 1) =
- 1
9C 860 K = S(1):LX = SX:LY = SY:
GOSUB 1740: GOSUB 2920
A7 870 K = F(N):LX = FX + 3 * N:
LY = FY: GOSUB 1740: GOSU
B 1930: GOTO 130
78 880 I = VAL (B*): GOSUB 1728
3C 890 IF T(I,0) = 0 THEN J = 0:
GOTO 970
7F 900 IF R = 12 THEN N1 = S(1)
+ 1: GOTO 920
FE 910 N1 = S(1) + 14
F8 920 IF N1 > 51 THEN N1 = N1 -
52
43 930 N2 = N1 + 26: IF N2 > 51
THEN N2 = N2 - 52
76 940 J = T(I,0)
F2 950 IF T(I,J) = N1 THEN 970
IF 960 IF T(I,J) < > N2 THEN BOS
UB 2940: GOTO 130
38 970 J = J + 1:T(I,J) = S(1):T
(I,0) = T(I,0) + 1:SC = S
C - 1

```



```

52 980 FOR N = 1 TO SC:S(N) = S(
N + 1): NEXT :S(SC + 1) =
- 1
A3 990 K = S(1):LX = SX:LY = SY:
GOSUB 1740: GOSUB 2920
13 1000 K = T(I,J): GOSUB 1732:
GOTO 130
62 1010 GOSUB 2900: GOSUB 1725:
IF TC = 0 THEN 130
13 1020 R = FN R(P(TC))
98 1030 GET B$: ON CX( ASC (B$))
GOTO 1220,1100,1090,109
0,120,1090,400
AA 1090 GOSUB 2940: GOTO 130
09 1100 GOSUB 1728
31 1110 IF R = 0 THEN NF = P(TC)
+ 12: GOTO 1130
C2 1120 NF = P(TC) - 1
3A 1130 N = 0
C1 1140 N = N + 1: IF N = 5 THEN
GOSUB 2940: GOTO 130
70 1150 IF F(N) < > NF THEN 1140
88 1160 F(N) = P(TC):FC = FC + 1
:PC = PC - 1:TC = TC - 1
72 1170 FOR I = (TC + 1) TO PC:P
(I) = P(I + 1): NEXT :P(
PC + 1) = - 1
FC 1180 IF TC = 0 THEN GOSUB 190
2:ZX = NX * 7:ZY = NY *
8: GOSUB 1850: GOTO 1200
88 1190 K = P(TC):LX = NX:LY = N
Y: GOSUB 1740
83 1200 VTAB NY - 2: HTAB NX: PR
INT " "; HTAB NX: PRIN
T TC
18 1210 GOSUB 2920:K = F(N):LX =
FX + 3 * N:LY = FY: GOS
UB 1740:BR = BR + 5: GOS
UB 1930: GOTO 130
84 1220 I = VAL (B$): GOSUB 1728
E8 1230 IF T(I,0) = 0 THEN J = 0
: GOTO 1310
E5 1240 IF R = 12 THEN N1 = P(TC
) + 1: GOTO 1260
38 1250 N1 = P(TC) + 14
A5 1260 IF N1 > 51 THEN N1 = N1
- 52
3A 1270 N2 = N1 + 26: IF N2 > 51
THEN N2 = N2 - 52
A8 1280 J = T(I,0)
63 1290 IF T(I,J) = N1 THEN 1310
C8 1300 IF T(I,J) < > N2 THEN GO
SUB 2940: GOTO 130
17 1310 J = J + 1:T(I,J) = P(TC)
:T(I,0) = T(I,0) + 1:PC
= PC - 1:TC = TC - 1
4E 1320 FOR N = (TC + 1) TO PC:P
(N) = P(N + 1): NEXT :P(
PC + 1) = - 1
07 1330 IF TC = 0 THEN GOSUB 191
0: GOTO 1360
A8 1340 K = P(TC):LX = NX:LY = N
Y: GOSUB 1740
89 1350 GOSUB 1902
85 1360 GOSUB 2920:K = T(I,J): G
OSUB 1732: GOTO 130
63 1370 GOSUB 1725: IF T(I,0) =
0 THEN 130
83 1380 GET B$: ON CX( ASC (B$))
GOTO 1570,1450,1440,144
0,120,1440,400
9E 1440 GOSUB 2940: GOTO 130
6F 1450 GOSUB 1728:J = T(I,0):R
= FN R(T(I,J))
37 1460 X = T(I,J):R = FN R(X)
02 1470 IF R = 0 THEN NF = T(I,J
) + 12: GOTO 1490
25 1480 NF = T(I,J) - 1
58 1490 N = 0
89 1500 N = N + 1: IF N = 5 THEN
GOSUB 2940: GOTO 130
48 1510 IF F(N) < > NF THEN 1500
93 1520 F(N) = T(I,J):FC = FC +
1:T(I,0) = T(I,0) - 1:BR
= BR + 5

```

```

57 1530 K = - 1: GOSUB 1732: GOS
UB 2920
AD 1540 IF T(I,0) < > 0 THEN J =
J - 1:K = T(I,J): GOSUB
1732
C8 1550 K = F(N):LX = FX + 3 * N
:LY = FY: GOSUB 1740: GO
SUB 1930
EC 1560 GOTO 130
F8 1570 A = VAL (B$): GOSUB 1728
:R = FN R(T(I,1))
81 1580 IF R = 12 THEN N1 = T(I,
1) + 1: GOTO 1600
09 1590 N1 = T(I,1) + 14
95 1600 IF N1 > 51 THEN N1 = N1
- 52
2A 1610 N2 = N1 + 26: IF N2 > 51
THEN N2 = N2 - 52
98 1620 B = T(A,0): IF B = 0 THE
N GOSUB 2940: GOTO 130
DD 1630 IF T(A,B) = N1 THEN 1650
B9 1640 IF T(A,B) < > N2 THEN GO
SUB 2940: GOTO 130
0C 1650 FOR J = 1 TO T(I,0):K =
- 1: GOSUB 1732: NEXT
26 1660 FOR J = 1 TO T(I,0):B =
T(A,0) + J:T(A,B) = T(I,
J)
3C 1670 K = T(A,B):ZX = 21 * A +
TX * 7:ZY = TY * 8 + B
* 14 - 14: GOSUB 1750: G
OSUB 2900: NEXT
E6 1680 T(A,0) = T(A,0) + T(I,0)
:T(I,0) = 0: GOTO 130
21 1690 FOR I = 1 TO 4:
58 1700 IF T(I,0) = 0 THEN 1720
55 1710 J = T(I,0):K = T(I,J): G
OSUB 1732
07 1720 NEXT
F7 1722 RETURN
84 1725 VTAB CY: HTAB CX: PRINT
" ": HTAB CX: PRINT " "
88 1727 VTAB CY: HTAB CX: PRINT
A$: RETURN
18 1728 VTAB CY + 1: HTAB CX: PR
INT B$: RETURN
85 1732 ZX = 21 * I + TX * 7:ZY
= TY * 8 + J * 14 - 14:
GOTO 1750
C8 1740 ZX = LX * 7:ZY = LY * 8
88 1750 IF K > - 1 THEN 1780
26 1760 IF ZX / 2 < > INT (ZX /
2) THEN ZX = ZX - 1
DA 1770 CALL 32768,0,ZX,ZY:ZX =
ZX + 2: CALL 32768,0,ZX,
ZY: RETURN
84 1780 SUIT = INT (K / 13):R =
K - (13 * SUIT):COL = 0
81 1790 IF SUIT = 1 OR SUIT = 2
THEN COL = 2
DE 1820 IF ZX / 2 = INT (ZX / 2)
THEN ZX = ZX + 1
F6 1830 CALL 32768,K + 1,ZX,ZY
F1 1840 RETURN
9D 1850 HCOLOR= 0: FOR I = 0 TO
23:T = ZY + I:T1 = ZX +
20: HPL0T ZX,T TO T1,T:
NEXT : HCOLOR= 3: RETURN
D6 1902 VTAB PY - 2: HTAB PX: PR
INT " "; HTAB PX: PRI
NT PC - TC
FD 1904 VTAB NY - 2: HTAB NX: PR
INT " "; HTAB NX: PRIN
T TC: RETURN
4F 1910 ZX = NX * 7:ZY = NY * 8:
GOSUB 1850: GOTO 1902
C8 1930 VTAB 18: HTAB 2: PRINT "
": HTAB 2: PRINT "*"
"BR
F3 1940 RETURN
F7 1950 IF BR > 49 THEN 2050
62 1960 HOME
BC 1980 VTAB 9: HTAB 11: PRINT "
YOU HAVE ONLY $":BR:"":

```

```

FOR I = 1 TO 3000: NEXT
A3 1990 VTAB 12: HTAB 15: PRINT
"TOO BAD!": FOR I = 1 T
O 2000: NEXT
89 2000 VTAB 22: HTAB 22: PRINT
"PLAY AGAIN? (Y/N)"
2B 2010 GET A$: IF A$ = "" THEN
2010
C3 2020 IF A$ = "Y" THEN BR = 50
0: GOSUB 2640: GOTO 2050
A8 2030 IF A$ = "N" THEN BR = 0:
GOTO 410
68 2040 GOTO 2010
36 2050 F(2) = - 1:F(3) = - 1:F(
4) = - 1:TN = - 1:FC = 0
:TC = 0
57 2060 K = - 1:LY = FY: FOR I =
1 TO 4:LX = FX + I * 3:
GOSUB 1740: NEXT
FF 2070 K = - 1:LX = PX:LY = PY:
GOSUB 1740:ZX = NX * 7:
ZY = NY * 8: GOSUB 1850
58 2090 FOR I = 1 TO 4:J = 0
15 2100 J = J + 1: IF J = 13 THE
N 2130
48 2110 IF T(I,J) = - 1 THEN 213
0
A9 2120 GOSUB 1732: GOTO 2100
88 2130 NEXT
89 2140 LX = PX:LY = PY: GOSUB 1
740
DD 2150 BR = BR - 50: FOR I = 1
TO 17: GOSUB 2920: NEXT
: GOSUB 1930
5F 2160 FOR I = 52 TO 1 STEP - 1
:C = INT (I * RND (1)) +
1:P(53 - I) = D(C):D(C)
= D(I): NEXT
E0 2170 FOR I = 1 TO 52:D(I) = P
(I): NEXT
77 2180 FOR I = 1 TO 13:S(I) = P
(I): NEXT :SC = 13
78 2190 F(1) = P(14):F(0) = 1:FC
= 1:FF = F(1) - 13 * IN
T (F(1) / 13):PC = 34
7E 2200 FOR I = 1 TO 4:T(I,0) =
1:T(I,1) = P(14 + I): FO
R J = 2 TO 12:T(I,J) = -
1: NEXT : NEXT
9C 2210 FOR I = 1 TO PC:P(I) = P
(I + 52 - PC): NEXT :P(P
C + 1) = - 1
68 2220 K = S(1):LX = SX:LY = SY
: GOSUB 2920: GOSUB 1740
85 2230 K = F(1):LX = FX + 3:LY
= FY: GOSUB 2920: GOSUB
1740:BR = BR + 5: GOSUB
1930
7A 2240 FOR I = 1 TO 4:K = T(I,1
):LX = TX + 3 * I:LY = T
Y: GOSUB 2920: GOSUB 174
0: NEXT
A8 2250 VTAB PY - 2: HTAB PX: GO
SUB 1902
73 2260 R = FN R(S(1)): IF R < >
FF THEN 2310
88 2270 N = F(0) + 1:F(0) = N:F(
N) = S(1):FC = FC + 1:SC
= SC - 1:BR = BR + 5
3E 2280 FOR J = 1 TO SC:S(J) = S
(J + 1): NEXT :S(SC + 1)
= - 1
EB 2290 K = S(1):LX = SX:LY = SY
: GOSUB 1740: GOSUB 2920
C8 2300 K = F(N):LX = FX + 3 * N
:LY = FY: GOSUB 1740: GO
SUB 1930: GOTO 2260
E6 2310 I = 0
58 2320 I = I + 1: IF I = 5 THEN
2380
EC 2330 R = FN R(T(I,1)): IF R <
> FF THEN 2320
42 2340 N = F(0) + 1:F(0) = N:F(
N) = T(I,1):FC = FC + 1:
BR = BR + 5

```

```

00 2350 K = - 1:LX = TX + 3 * I:
LY = TY: GOSUB 1740:K =
F(N):LX = FX + 3 * N:LY
= FY: GOSUB 2920: GOSUB
1740: GOSUB 1930
CF 2360 T(I,1) = S(1):T(I,0) = 1
:SC = SC - 1: FOR J = 1
TO SC:R(J) = S(J + 1): N
EXT :S(SC + 1) = - 1
09 2370 K = S(1):LX = SX:LY = SY
: GOSUB 1740:K = T(I,1):
LX = TX + 3 * I:LY = TY:
GOSUB 1740: GOTO 2260
F8 2380 RETURN
74 2400 HGR2 : HOME : POKE 28,42
: CALL 62454
A7 2402 FOR I = PY - 2 TO PY + 7
: VTAB I: HTAB PX - 2: P
RINT " " " : NE
XT
42 2410 HOME : HTAB 11: PRINT "1
2 3 4 "
6A 2420 VTAB 5: HTAB 2: PRINT "S
TOCK"
52 2422 VTAB 3: HTAB 28: PRINT "
FOUNDATION"
73 2424 VTAB 17: HTAB 2: PRINT "
BANK"
E0 2428 VTAB 16: HTAB 27: PRINT
"PACK TALON"
03 2450 VTAB 22: HTAB 27: PRINT
"<RET> REDEAL": HTAB 27:
PRINT "CTRL E EXIT"
DC 2500 RETURN
0F 2520 DIM D(52),P(52),S(13),T(
4,12),CX(255)
7F 2522 I = 2
15 2524 READ A: CX(A) = I: I = I +
1: IF A < > 5 THEN 2524
21 2530 FOR I = 65 TO 97: CX(I +
32) = CX(I): NEXT
69 2540 FOR I = 49 TO 52: CX(I) =
1: NEXT
60 2545 ONERR GOTO 2585
6A 2550 INPUT " ENTER PLAYER'S N
AME: ";NM0
08 2560 IF NM0 = "" THEN 2550
70 2565 F$ = NM0 + ".CAN":F$ = L
EFT$(F$,12)
34 2570 PRINT CHR$(4)"OPEN "F$
73 2575 PRINT CHR$(4)"READ "F$
30 2580 INPUT N$:BR = VAL(N$ +
" ")
E9 2585 PRINT CHR$(4)"CLOSE "F$
0B 2590 IF BR < 50 THEN BR = 500
25 2595 POKE 216,0
6F 2600 FOR I = 1 TO 52:D(I) = I
- 1: NEXT
C2 2610 FX = 23:FY = 4: SX = 2: SY
= 6: TX = 7: TY = 1: NX =
33: NY = 16: PX = 28: PY =
16: CX = 27: CY = 18
27 2620 DEF FN R(X) = X - 13 * I
NT(X / 13)
3A 2890 GOTO 40
08 2900 PRINT "(0)";
E0 2910 RETURN
C2 2920 T = PEEK(-16336)
F0 2930 RETURN
53 2940 FOR I = 0 TO 29:T = PEEK
(-16336): NEXT
F8 2950 RETURN
49 3030 DATA 70,84,80,13,83,5

```

Program 5: IBM PC/PCjr Canfield

Version by George Miller, Editorial
Programmer

```

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```

80 30 KEY OFF:DEF SEG=0:DEFINT A
-Z:POKE 1047,PEEK(1047) OR
64:RANDOMIZE TIMER
DL 40 FOR X=0 TO 13:C=C+CHR$(2
20):D=D+CHR$(223):NEXT:F
OR X=0 TO 9:E=E+CHR$(196
):NEXT
CI 50 DIM CD$(52),M(52),ST$(13),
FD$(4,13),TB$(4,25),PK$(34
),V$(13)
E6 60 SCREEN 0,1:WIDTH 40:COLOR
15,10:CLS:GOSUB 320
IJ 70 COLOR 15,2,0:CLS:COLOR 14:
LOCATE 3,25:PRINT C$:FOR I
= 0 TO 5:LOCATE 4+I,25:PRI
NT CHR$(221)+""
"+CHR$(222):NEXT:LOCATE 9,
25:PRINT D$:LOCATE 12,25:C
OLOR 14:LOCATE 9,25:PRINT
D$
PP 80 LOCATE 12,25:COLOR 4:PRINT
C$:LOCATE 13,25:PRINT CHR
$(221);:COLOR 14:PRINT CHR
$(218);:PRINT E$:PRINT CH
R$(191);:COLOR 4:PRINT CHR
$(222):LOCATE 14,26:COLOR
14:PRINT CHR$(179)+"" CANFI
ELD "+CHR$(179)
JH 90 LOCATE 15,25:COLOR 4:PRINT
CHR$(221);:COLOR 14:PRINT
CHR$(192);:PRINT E$:PRIN
T CHR$(217);:COLOR 4:PRINT
CHR$(222):LOCATE 16,25:PR
INT D$:LOCATE 21,25:COLOR
14:PRINT C$
AF 100 FOR I=0 TO 1:LOCATE 22+I,
25:PRINT CHR$(221)+""
"+CHR$(222);:NEXT:
LOCATE 24,25:PRINT D$:CO
LOR 14:LOCATE 21,2:PRINT
LEFT$(C$,9)
LI 110 FOR I=0 TO 1:LOCATE 22+I,
2:PRINT CHR$(221)+""
"+CHR$(222);:NEXT:LOCATE
24,2:PRINT LEFT$(D$,9);
LC 120 COLOR 15:LOCATE 5,27:PRIN
T"F1 Quit":LOCATE 7,27:P
RINT"F10 Concede"
PH 130 LOCATE 1,9:PRINT "oundati
on":LOCATE 5,9:PRINT"1
2 3 4":LOCATE 9,2:PRI
NT"TOCK":LOCATE 22,28:PRI
NT"Bankroll"
FF 140 BANK=BANK-50:COLOR 14,2:L
OCATE 23,29:PRINT"$";BANK
:COLOR 15:LOCATE 22,3:PRI
NT"From:":LOCATE 23,5:PRI
NT"To:":LOCATE 23,13:PRIN
T"ack":LOCATE 23,18:PRINT
"alon"
JK 150 COLOR 15,4:LOCATE 1,8:PRI
NT"F":LOCATE 9,1:PRINT"S"
:LOCATE 23,12:PRINT"P":LO
CATE 23,17:PRINT"T":COLOR
15,2:GOSUB 390
FD 160 COLOR 2,2:LOCATE 22,9:PRI
NT" ":LOCATE 23,9:PRINT"
":COLOR 15,4:GOSUB 250
GA 170 A$=INKEY$:IF A$="" THEN 1
70
JP 180 IF A$="." THEN 1010
HP 190 IF A$="/" THEN GOSUB 290:
GOTO 70
JD 200 LOCATE 22,9:PRINT A$
HC 210 IF A$="P" THEN GOSUB 610:
GOTO 160
DK 220 IF A$="T" THEN GOSUB 750:
GOTO 160
HP 230 IF A$>="1" AND A$<="4" TH
EN GOSUB 1170:GOTO 160
LD 240 IF A$="S" THEN GOSUB 1040
:GOTO 160 ELSE 160
RL 250 TOTAL=0:FOR Y=1 TO SU :TO
TAL=TOTAL+F(Y):NEXT:IF TO
TAL<52 THEN RETURN

```

```

H6 260 CLS:COLOR 14,1:LOCATE 8,8
:PRINT"Congratulations, "
PLAYER$":LOCATE 10,7:PR
INT"You've beaten the odd
s!"
6P 270 LOCATE 12,10:PRINT"Play a
gain (Y/N)?"
BC 280 A$=INKEY$:IF A$="Y" THEN
70 ELSE IF A$="N" THEN 10
10 ELSE 280
KC 290 IF BANK>50 THEN RETURN
FB 300 CLS:COLOR 1,15:LOCATE 10,
20:PRINT"Sorry, you only
have $";BANK;" remaining.
":LOCATE 12,20:PRINT"Woul
d you like to play again?
(y/n)"
PK 310 A$=INKEY$:IF A$="Y" THEN
BANK=500:GOTO 70 ELSE IF
A$="N" THEN CLS:END ELSE
310
EJ 320 CLS:LOCATE 5,14,0:COLOR 1
5:PRINT C$:LOCATE 6,14:PR
INT CHR$(221);:COLOR 14:P
RINT CHR$(218);:PRINT E$;
:PRINT CHR$(191);:COLOR 1
5:PRINT CHR$(222):LOCATE
7,15:COLOR 14:PRINT CHR$(
179)+"" CANFIELD "+CHR$(17
9)
BB 330 LOCATE 8,14:COLOR 15:PRIN
T CHR$(221);:COLOR 14:PRIN
T CHR$(192);:PRINT E$;:P
RINT CHR$(217);:COLOR 15:
PRINT CHR$(222):LOCATE 9,
14:PRINT D$
KF 340 COLOR 12:LOCATE 14,4:PRIN
T"Copyright 1988 COMPUTE!
Pub., Inc.":LOCATE 15,11
:PRINT"All Rights Reserve
d":COLOR 14:LOCATE 17,4:I
NPUT "Enter Player's NAME
":PLAYER$
FO 350 ON ERROR GOTO 370
ND 360 OPEN "I",#1,PLAYER$+".DAT
":INPUT#1,BANK:CLOSE #1
IG 370 IF BANK<=0 THEN BANK=500
KP 380 FOR X=0 TO 3:FOR T=1 TO 1
3:READ CD$(X*13+T):CD$(X*
13+T)=CD$(X*13+T)+CHR$(X+
3):NEXT:RESTORE 1530:NEXT
:RESTORE 1530:FOR T=13 TO
1 STEP-1:READ V$(T):NEXT
:KEY 1, ".":KEY 10, "/":RET
URN
DB 390 LOCATE 15,5:COLOR 1:PRINT
"Shuffling Deck...":FOR I
=1 TO 52:M(I)=I:NEXT:FOR
I=1 TO 52:X=INT(52*RDND)+1
:TP=M(I):M(I)=M(X):M(X)=T
P:NEXT
HE 400 LOCATE 15,5:COLOR 7:PRINT
" " " :PK=34
:TN=0
PI 410 FOR X=1 TO 13:ST$(X)=CD$(
M(X)):NEXT:TP$=ST$(13):GO
SUB 580:XL=10:YL=2:GOSUB
850:ST=13:ST$(0)=" "
PH 420 FD$(1,1)=CD$(M(14)):TP$=F
D$(1,1):GOSUB 580:XL=2:YL
=7:GOSUB 850:F=7:SU=1:GOS
UB 860:FOR X=15 TO 18:TB$
(X-14,1)=CD$(M(X)):NEXT
JD 430 FOR X=19 TO 52:PK$(X-18)=
CD$(M(X)):NEXT:PK$(0)="
"
EB 440 COLOR 0,10:LOCATE 20,11:P
RINT PK
DJ 450 COLOR 7,6:XL=21:YL=12:TP$
=" " :GOSUB 850:COLOR 0,1
0
ND 460 XL=6:FOR Q=1 TO 4 :TP$=TB
$(Q,1):T(Q)=1:F(Q)=0:GOSU
B 580:YL=5+(4*Q):GOSUB 85
0:NEXT:F(1)=1

```



```

AB 470 IF LEFT$(ST$(ST),1)<>LEFT
$(FD$(1,1),1) THEN 510
AM 480 GOSUB 840:SU=SU+1:FD$(SU,
1)=ST$(ST):GOSUB 1480
AJ 490 GOSUB 840:I=SU:F=F+4:TP$=
ST$(ST):GOSUB 580:XL=2:YL
=F:GOSUB 850:GOSUB 860:ST
=ST-1
AE 500 TP$=ST$(ST):XL=10:YL=2:GO
SUB 580:GOSUB 850:GOTO 47
0
AJ 510 T=0
AF 520 T=T+1:TP$=TB$(T,1):IF LEF
T$(TP$,1)=LEFT$(FD$(1,1),
1) THEN 540
AI 530 IF T<4 THEN 520 ELSE RETU
RN
AK 540 I=T:GOSUB 840:GOSUB 560:G
OSUB 580:GOSUB 850:GOSUB
860:GOSUB 570:TP$="" :GOS
SUB 850
AH 550 IF ST<>0 THEN TP$=ST$(ST)
:GOSUB 570:GOSUB 580:GOSU
B 850:ST=ST-1:TB$(T,1)=TP
$:TP$=ST$(ST):XL=10:YL=2:
GOSUB 580:GOSUB 850:GOTO
470
AM 560 SU=SU+1:FD$(SU,1)=TP$:LOC
ATE 20,18:COLOR 0,2:PRINT
TN:GOSUB 1480:F=F+4:XL=2
:YL=F:RETURN
AP 570 XL=6:YL=5+(T*4):RETURN
AQ 580 IF TP$="" THEN COLOR 0,
2:RETURN
AA 590 IF RIGHT$(TP$,1)=CHR$(3)
OR RIGHT$(TP$,1)=CHR$(4)
THEN COLOR 4,7 ELSE COLOR
0,7
AA 600 RETURN
AA 610 IF PK=0 THEN PK=TN:TN=0
AA 620 IF PK<3 THEN TN=TN+PK:PK=
0 ELSE PK=PK-3:TN=TN+3
AA 630 IF PK=0 THEN COLOR 2,2 EL
SE COLOR 7,6
AA 640 XL=21:YL=12:COLOR 7,6:TP$
="" :GOSUB 850:COLOR 0,2
:LOCATE 20,11:IF PK<>0 TH
EN PRINT PK ELSE PRINT "
"
AA 650 XL=21:YL=19:TP$=PK$(TN):G
OSUB 580:GOSUB 850:LOCATE
20,18:COLOR 0,2:PRINT TN
AA 660 IF LEFT$(TP$,1)<>LEFT$(FD
$(1,1),1) THEN RETURN
AA 670 TN=TN-1:IF TN<>0 THEN GOS
UB 710
AA 680 IF TN=0 THEN XL=20:YL=18:
COLOR 0,2:TP$="" :PRINT
TP$:XL=21:YL=19:GOSUB 850
AA 690 IF PK=0 THEN XL=20:YL=15:
COLOR 0,2:TP$="" :GOSUB
850
AA 700 GOTO 640
AA 710 SU=SU+1:FD$(SU,1)=TP$:LOC
ATE 20,18:COLOR 0,2:PRINT
TN:GOSUB 1480:GOSUB 840
AA 720 GOSUB 580:F=F+4:XL=2:YL=F
:GOSUB 850:GOSUB 860
AA 730 IF TN>0 THEN TP$=PK$(TN):
GOSUB 580:XL=21:YL=19:GOS
UB 850
AA 740 FOR I=TN+1 TO 33:T=I+1:PK
$(I)=PK$(T):NEXT:RETURN
AA 750 A$=INKEY$:IF A$="" THEN G
OTO 750
AA 760 A=VAL(A$):LOCATE 23,9:PRI
NT A$:TP$=PK$(TN)
AA 770 IF A>=1 AND A<=4 AND T(A)
=0 THEN TB$(A,1)=TP$:GOTO
820
AA 780 IF A$="F" THEN GOSUB 870:
IF HIT=1 THEN GOSUB 930:H
IT=0
AA 790 IF A=0 THEN RETURN

```

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AL 800 R=A:Y=T(A):IF A$>="1" OR
A$<="4" THEN GOSUB 940:IF
HIT=1 THEN GOSUB 1000
AM 810 RETURN
AJ 820 XL=6:YL=5+(4*VAL(A$)):T(V
AL(A$))=1:GOSUB 1000:IF T
N=0 THEN GOSUB 830 ELSE R
ETURN
AA 830 TP$="" :XL=21:YL=19:GOSU
B 580:GOSUB 850:RETURN
AL 840 FOR DELAY=0 TO 1500:NEXT:
RETURN
AA 850 LOCATE XL,YL:PRINT TP$:LO
CATE XL+1,YL:PRINT RIGHT$(
TP$,1):PRINT LEFT$(TP$,
1):RETURN
AM 860 BANK=BANK+5:COLOR 14,2:LO
CATE 23,29:PRINT " " :
LOCATE 23,30:PRINT "$"BANK
:RETURN
AA 870 FOR Q=1 TO SU:IF RIGHT$(F
D$(Q,F(Q)),1)=RIGHT$(TP$,
1) THEN F$=FD$(Q,F(Q)):S=
Q
AL 880 NEXT:IF S<>0 THEN 890 ELS
E RETURN
AL 890 IF LEFT$(F$,1)="A" THEN V
=1:GOSUB 1500 :GOTO 910
AA 900 GOSUB 1490:GOSUB 1500
AA 910 IF V+1<>C THEN RETURN
AA 920 F(S)=F(S)+1:FD$(S,F(S))=T
P$:XL=2:YL=3+(4*S):HIT=1:
GOSUB 580:GOSUB 850:GOSUB
860:RETURN
AA 930 XL=21:YL=19:TN=TN-1:GOSUB
740:GOTO 640
AA 940 IF ASC(RIGHT$(TP$,1))<5 A
ND ASC(RIGHT$(TB$(R,Y),1)
)<5 THEN RETURN
AA 950 IF ASC(RIGHT$(TP$,1))>4 A
ND ASC(RIGHT$(TB$(R,Y),1)
)>4 THEN RETURN
AA 960 F$=TB$(R,Y):IF LEFT$(TP$,
1)="A" THEN C=1:GOSUB 149
0 ELSE GOSUB 1490:GOSUB 1
500
AA 970 IF V-1<>C THEN RETURN
AA 980 T(R)=T(R)+1:XL=6+(T(R)-1)
:YL=5+(4*R)
AA 990 TB$(R,Y+1)=TP$:HIT=1:RETU
RN
AA 1000 GOSUB 580:GOSUB 850:TN=T
N-1:TP$=PK$(TN):XL=21:YL
=19:GOSUB 580:GOSUB 850:
GOSUB 740:HIT=0:GOTO 640
AA 1010 CLS:LOCATE 10,10:COLOR 2
,4,0:PRINT"You have $"BA
NK" remaining."
AA 1020 LOCATE 12,7:PRINT"Thank
you for playing ";COLOR
14:PRINT"CANFIELD"
AA 1030 OPEN "O",#1,PLAYER$+".DA
T":PRINT#1,BANK:CLOSE#1:
END
AA 1040 IF ST=0 THEN RETURN
AA 1050 TP$=ST$(ST)
AA 1060 A$=INKEY$:IF A$="" THEN
1060
AA 1070 IF A$="F" THEN GOSUB 870
:GOSUB 1100:RETURN
AA 1080 IF A$>="1" AND A$<="4" T
HEN R=VAL(A$):Y=T(R):GOS
UB 940:GOSUB 1100:RETURN
AA 1090 RETURN
AA 1100 IF HIT=0 THEN RETURN
AA 1110 GOSUB 580:GOSUB 850:ST=S
T-1:TP$=ST$(ST):XL=10:YL
=2:GOSUB 580:GOSUB 850:H
IT=0
AA 1120 IF ST=0 THEN COLOR 0,2:G
OSUB 850:RETURN
AA 1130 IF LEFT$(ST$(ST),1)<>LEF
T$(FD$(1,1),1) THEN RETU
RN
AA 1140 GOSUB 840:SU=SU+1:FD$(SU

```

```

,1)=ST$(ST):GOSUB 1480
AL 1150 GOSUB 840:I=SU:F=F+4:TP$
=ST$(ST):GOSUB 580:XL=2:
YL=F:GOSUB 850:GOSUB 860
:ST=ST-1
AJ 1160 TP$=ST$(ST):XL=10:YL=2:G
OSUB 580:GOSUB 850:GOTO
1130
AA 1170 B$=INKEY$:IF B$="" THEN
1170
AL 1180 LOCATE 23,9:PRINT B$:A=V
AL(A$):T=T(A):S=A
AA 1190 IF A>=1 AND A<=4 THEN TP
$=TB$(A,T)
AA 1200 IF B$<>"F" THEN 1300
AA 1210 IF LEFT$(TP$,1)<>LEFT$(F
D$(1,1),1) THEN 1240
AA 1220 IF SU<4 THEN SU=SU+1 ELS
E 1240
AA 1230 F(SU)=1:FD$(SU,1)=TP$
AA 1240 GOSUB 870
AA 1250 IF HIT<>1 THEN RETURN
AA 1260 HIT=0
AA 1270 IF A$>="1" AND A$<="4" T
HEN A=VAL(A$):T(A)=T(A)-
1:IF T(A)=0 THEN 1290
AA 1280 TP$="" :XL=6+T(A):YL=5+
(A*4):GOSUB 850:TP$=TB$(
A,T(A)):GOSUB 580:XL=6+(
T(A)-1):GOSUB 850:RETURN
TP$="" :XL=6+T(A):YL=5+
(A*4):GOSUB 850:IF ST<>0
THEN T=A:GOSUB 550:T(A)
=1:RETURN
AA 1300 IF A$=B$ THEN RETURN
AA 1310 IF B$>="1" AND B$<="4" T
HEN B=VAL(B$):F$=TB$(B,T
(B)):GOTO 1330
AA 1320 RETURN
AA 1330 IF A$>="1" AND A$<="4" T
HEN A=VAL(A$):TP$=TB$(A,
1)
AA 1340 IF ASC(RIGHT$(TP$,1))<5
AND ASC(RIGHT$(F$,1))<5
THEN RETURN
AA 1350 IF ASC(RIGHT$(TP$,1))>4
AND ASC(RIGHT$(F$,1))>4
THEN RETURN
AA 1360 IF LEFT$(TP$,1)="A" THEN
C=1:GOSUB 1490:GOTO 138
0
AA 1370 GOSUB 1500:GOSUB 1490
AA 1380 IF V-1<>C THEN RETURN
AA 1390 IF A$>="1" AND A$<="4" T
HEN A=VAL(A$):YL=5+A*4:T
(A)=0
AA 1400 COLOR 7,2:TP$="" "
AA 1410 FOR Y=T TO 0 STEP-1:XL=7
+(Y-1):GOSUB 850:NEXT
AA 1420 IF B$>="1" AND B$<="4" T
HEN B=VAL(B$):YL=5+(B*4)
:TA=B:SB=T(B)
AA 1430 FOR Y=1 TO T:TB$(TA,SB+Y
)=TB$(S,Y)
AA 1440 IF B$>="1" AND B$<="4" T
HEN B=VAL(B$):T(B)=T(B)+
1
AA 1450 TP$=TB$(S,Y):XL=5+(SB+Y)
:GOSUB 580:GOSUB 850:NEX
T
AA 1460 IF T(A)=0 AND ST<>0 THEN
GOTO 1290
AA 1470 RETURN
AA 1480 F(SU)=1:RETURN
AA 1490 G$=F$:GOSUB 1510:V=6:RET
URN
AA 1500 G$=TP$:GOSUB 1510:C=6:RE
TURN
AA 1510 FOR I=13 TO 1 STEP-1:IF
LEFT$(G$,1)=V$(I) THEN G
=I+1
AA 1520 NEXT:RETURN
AA 1530 DATA A,K,Q,J,T,9,8,7,6,5
,4,3,2

```

Program 6: Amiga Canfield

Version by George Miller, Editorial Programmer

```

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DEFINT a-Z:DEFSNG r,g,b:RANDOMIZE TIMER
DIM sb(36,3),CD$(52),M(52),ST$(13),FD$(4,13),TB$(4,25),pk$(34),v$(13)
t$=" "
INPUT "What is your name";NAM$
yorn:
PRINT "Do you have an account?";INPUT yorn$
IF UCASE$(LEFT$(yorn$,1))="Y" THEN
OPEN NAM$ FOR INPUT AS #1
INPUT #1,bank
CLOSE 1
ELSE
IF UCASE$(LEFT$(yorn$,1))<>"N" THEN yorn
END IF
GOSUB DoScreen
GOSUB Initialize
GOSUB GameScreen
CheckKey:
GOSUB CheckTotal:GOSUB GetKey
IF key=129 THEN endgame
IF key=138 THEN GOSUB Busted:GOSUB GameScreen:GO
TO CheckKey
COLOR 2,15:LOCATE 22,9:PRINT a$
IF a$="P" THEN GOSUB PacK:GOTO CheckKey
IF a$="T" THEN GOSUB DoTalon:GOTO CheckKey
IF a$>="1" AND a$<="4" THEN GOSUB TtoTA:GOTO Che
cKey
IF a$="5" THEN GOSUB StackPlay:GOTO CheckKey ELSE
CheckKey
GameScreen:
COLOR 2,10:CLS:WIDTH 40
FOR c=0 TO 2:FOR x=0 TO 3:LINE (200+x*2,20+(70*c
)+x*2)-(305-x*2,70+(60*c)-x*2),12+x,bf:NEXT x,c
COLOR 2,15:LOCATE 5,27:PRINT "F1 Quit":LOCATE 7,
27:PRINT "F10 Concede"
LOCATE 14,28:COLOR 12,15:PRINT "Canfield"
COLOR 2,10:LOCATE 1,9:PRINT "oundation":LOCATE 5
,9
PRINT "1 2 3 4":LOCATE 9,2:PRINT "tock":LOCA
TE 22,28
COLOR 2,15:PRINT "Bankroll"
bank=bank-50:LOCATE 23,29:PRINT "$";bank
FOR x=0 TO 3:LINE (9+x*2,160+x*2)-(77-x*2,191-x*
2),12+x,bf:NEXT x
LOCATE 22,3:PRINT "From:":LOCATE 23,5:PRINT "To:"
COLOR 2,10:LOCATE 23,13:PRINT "ack";LOCATE 23,18
:PRINT "alon";
COLOR 3,10:LOCATE 1,8:PRINT "F":LOCATE 9,1:PRINT "
S":LOCATE 23,12:PRINT "P"
LOCATE 23,17:PRINT "T":COLOR 2,10
GOSUB ShuffleDeck
RETURN
CheckTotal:
COLOR 2,15:LOCATE 22,9:PRINT " ":LOCATE 23,9:PRIN
T " ";
TOTAL=0:FOR y=1 TO SU :TOTAL=TOTAL+F(y):NEXT:IF
TOTAL<52 THEN RETURN
CLS:COLOR 14,1:LOCATE 8,10:PRINT "Congratulations
, "player$!"
LOCATE 10,7:PRINT "You've beaten the odds!"
LOCATE 12,10:PRINT "Play again (Y/N)?"
GOSUB GetKey:
rs:
IF a$="Y" THEN
GOSUB GameScreen:GOTO CheckKey
ELSEIF a$="N" THEN
endgame
ELSE
GOTO rs
END IF
Busted:
IF bank>50 THEN RETURN
CLS:COLOR 1,15:LOCATE 10,20:PRINT "Sorry, you onl
y have $";bank;" remaining.":LOCATE 12,20:PRINT "
Would you like to play again? (y/n)"
Brs:
GOSUB GetKey:IF a$="Y" THEN
bank=500:GOTO GameScreen:GOTO CheckKey
ELSEIF a$="N" THEN
GOTO endgame
ELSE
GOTO Brs
END IF
Initialize:
WIDTH 40:COLOR 2,10:CLS
FOR x=0 TO 3:LINE (100+x*2,40+x*2)-(205-x*2,63-x
*2),12+x,bf:NEXT x
COLOR 2,15:LOCATE 7,16:PRINT "Canfield"
COLOR 2,10:LOCATE 14,4:PRINT "Copyright 1988 COMP
UTE! Pub., Inc."
LOCATE 15,11:PRINT "All Rights Reserved":
SetBank:
IF bank<=0 THEN bank=500
RESTORE cards
FOR x=0 TO 3:FOR t=1 TO 13
READ CD$(x*13+t):CD$(x*13+t)=CD$(x*13+t)+CHR$(x+
65):NEXT
RESTORE cards:NEXT
FOR t=13 TO 1 STEP -1:READ v$(t):NEXT:
GOSUB InitShapes
RETURN
cards:
DATA A,K,Q,J,T,9,8,7,6,5,4,3,2
ShuffleDeck:
LOCATE 15,5:COLOR 2,10:PRINT "Shuffling Deck...";
FOR i=1 TO 52:M(i)=i:NEXT:FOR i=1 TO 52:x=INT(52
*RAND)+1:tp=M(i):M(i)=M(x):M(x)=tp:NEXT
LOCATE 15,5:PRINT " ":pk=34:TN=0
FOR x=1 TO 13:ST$(x)=CD$(M(x)):NEXT:tp$=ST$(13)
xL=10:yL=2:GOSUB ShowCard:ST=13:ST$(0)=" "
FD$(1,1)=CD$(M(14)):tp$=FD$(1,1):xL=2:yL=7
GOSUB ShowCard:F=7:SU=1:GOSUB VBank:FOR x=15 TO
18
TB$(x-14,1)=CD$(M(x)):NEXT
FOR x=19 TO 52:pk$(x-18)=CD$(M(x)):NEXT:pk$(0)="
"
GOSUB ShowDeck
xL=6:FOR Q=1 TO 4 :tp$=TB$(Q,1):t(Q)=1:F(Q)=0
yL=5+(4*Q):GOSUB ShowCard:NEXT:F(1)=14
STtoFD:
IF LEFT$(ST$(ST),1)<>LEFT$(FD$(1,1),1) THEN SetT
GOSUB DeLaY:SU=SU+1:FD$(SU,1)=ST$(ST):GOSUB News
uit
GOSUB DeLaY:i=SU:F=F+4:tp$=ST$(ST):xL=2:yL=F
GOSUB ShowCard:GOSUB VBank:ST=ST-1
tp$=ST$(ST):xL=10:yL=2:GOSUB ShowCard:GOTO STtoF
D
SetT:
t=0
TltF:
t=t+1:tp$=TB$(t,1):IF LEFT$(tp$,1)=LEFT$(FD$(1,1
),1) THEN SetI
IF t<4 THEN TltF ELSE RETURN
SetI:
i=t:GOSUB DeLaY:GOSUB AddSuit:GOSUB ShowCard
GOSUB VBank:GOSUB YcalC:tp$=" ":GOSUB ShowCard
STK:
IF ST<>0 THEN
tp$=ST$(ST):GOSUB YcalC:GOSUB ShowCard
ST=ST-1:TB$(t,1)=tp$:tp$=ST$(ST):xL=10:yL=2
GOSUB ShowCard:GOTO STtoFD
END IF
AddSuit:
SU=SU+1:FD$(SU,1)=tp$:LOCATE 20,18:COLOR 2,10:PR
INT TN
GOSUB NewSuit:F=F+4:xL=2:yL=F:RETURN
YcalC:
xL=6:yL=5+(t*4):RETURN
PacK:
IF pk=0 THEN pk=TN:TN=0
```



```

IF pk<3 THEN TN=TN+pk:pk=0 ELSE pk=pk-3:TN=TN+3:
GOSUB ShowDeck:GOTO PTLon4
PBLank:4
xL=21:yL=12:COLOR 7,6:tp$=" ":GOSUB ShowCard4
COLOR 2,0:LOCATE 20,11:IF pk<>0 THEN PRINT pk EL
SE PRINT " "4
GOSUB ShowDeck4
PTLon:4
xL=21:yL=19:tp$=pk$(TN):GOSUB ShowCard4
LOCATE 20,18:COLOR 2,0:PRINT TN4
IF LEFT$(tp$,1)<>LEFT$(FDS(1,1),1) THEN RETURN4
TN=TN-1:IF TN<>0 THEN GOSUB ISuit4
IF TN=0 THEN xL=20:yL=18:COLOR 0,2:tp$=" ":PRIN
T tp$:xL=21:yL=19:GOSUB ShowCard4
IF pk=0 THEN xL=20:yL=15:COLOR 0,2:tp$=" ":GOSU
B ShowCard4
GOTO PBLank4
ISuit:4
SU=SU+1:FDS(SU,1)=tp$:LOCATE 20,18:COLOR 2,0:PRI
NT TN:GOSUB NewSuit:GOSUB DeLaY4
F=F+4:xL=2:yL=F:GOSUB ShowCard:GOSUB VBank4
IF TN=0 THEN tp$=pk$(TN):xL=21:yL=19:GOSUB ShowC
ard:GOSUB ShowDeck4
DPack:4
FOR i=TN+1 TO 33:t=i+1:pk$(i)=pk$(t):NEXT:RETURN
DoTalon:4
GOSUB GetKey4
a=VAL(a$):COLOR 2,15:LOCATE 23,9:PRINT a$:tp$=pk
$(TN)4
IF a=1 AND a<=4 AND t(a)=0 THEN TB$(a,1)=tp$:GO
TO NewCard4
IF a$="F" THEN GOSUB ChkFDTP:IF HIT=1 THEN GOSUB
LTalon:HIT=04
IF a=0 THEN RETURN4
r=a:y=t(a):IF a>1 OR a<=4 THEN GOSUB ChkTable:IF
HIT=1 THEN GOSUB TnMin4
GOSUB ShowDeck4
RETURN4
NewCard:4
xL=6:yL=5+(4*a):t(a)=1:GOSUB TnMin:IF TN=0 THEN
GOSUB NCard ELSE RETURN4
NCard:4
tp$=" ":xL=21:yL=19:GOSUB ShowCard4
IF pk<>0 THEN GOSUB ShowDeck4
RETURN4
DeLaY:4
FOR DeLaY=0 TO VaLc:NEXT:RETURN4
ShowCard:4
COLOR 10,10:LOCATE xL,yL:PRINT t$:GOSUB CheckCoL
or4
IF tp$=" " THEN4
GOTO Space4
END IF4
LOCATE xL,yL:PRINT LEFT$(tp$,1)4
x=yL*8:y=xL*8-8:j=ASC(RIGHT$(tp$,1))-654
PUT (x,y),sb(0,j),PSET4
PUT (x-8,y+8),sb(0,j),PSET4
LOCATE xL+1,yL+1:PRINT LEFT$(tp$,1):RETURN4
Space:4
COLOR 10,10:LOCATE xL,yL:PRINT tp$:LOCATE xL+1,y
L:PRINT tp$:RETURN4
CheckCoLor:4
IF tp$=" " THEN COLOR 5,6:RETURN4
IF RIGHT$(tp$,1)=CHR$(65) OR RIGHT$(tp$,1)=CHR$(
66) THEN4
COLOR 12,24
ELSE4
COLOR 5,24
END IF4
RETURN4
VBank: bank=bank+5:COLOR 2,15:LOCATE 23,29:PRINT
LOCATE 23,30:PRINT "$"bank:RETURN4
ChkFDTP:4
FOR Q=1 TO SU4

```

```

IF RIGHT$(FDS(Q,F(Q)),1)=RIGHT$(tp$,1) THEN F$=F
D$(Q,F(Q)):s=Q4
NEXT:IF s<>0 THEN IsAce ELSE RETURN4
IsAce:4
IF LEFT$(F$,1)="A" THEN v=1:GOSUB VaLc:GOTO VC4
GOSUB VaLg:GOSUB VaLc4
VC:4
IF v+1<>c THEN RETURN4
F(s)=F(s)+1:FDS(s,F(s))=tp$:xL=2:yL=3+(4*s):HIT=
14
GOSUB ShowCard:GOSUB VBank:RETURN4
LTalon:4
xL=21:yL=19:TN=TN-1:GOSUB DPack:GOTO PBLank4
ChkTable:4
IF ASC(RIGHT$(tp$,1))<=66 AND ASC(RIGHT$(TB$(r,y
),1))<=66 THEN RETURN4
IF ASC(RIGHT$(tp$,1))>=67 AND ASC(RIGHT$(TB$(r,y
),1))>=67 THEN RETURN4
F$=TB$(r,y)4
IF LEFT$(tp$,1)="A" THEN c=1:GOSUB VaLg ELSE GOS
UB VaLg:GOSUB VaLc4
IF v-1<>c THEN RETURN4
t(r)=t(r)+1:xL=6+(t(r)-1):yL=5+(4*r)4
TB$(r,y+1)=tp$:HIT=1:RETURN4
TnMin:4
GOSUB ShowCard:TN=TN-1:tp$=pk$(TN)4
xL=21:yL=19:GOSUB ShowCard:GOSUB DPack:HIT=0:GOT
O PBLank4
endgame:4
CLS:LOCATE 10,8:PRINT"You have $"bank" remaining
LOCATE 12,5:PRINT"Thank you for playing ";:COLOR
6:PRINT"CANFIELD"4
OPEN NAM$ FOR OUTPUT AS #14
PRINT#1,bank4
CLOSE 14
WINDOW CLOSE 3:SCREEN CLOSE 1:END4
StackPlay:4
IF ST=0 THEN RETURN4
tp$=ST$(ST)4
GOSUB GetKey4
IF a$="F" THEN GOSUB ChkFDTP:GOSUB NewStock:RETU
RN4
IF a$>="1" AND a$<="4" THEN r=VAL(a$):y=t(r):GOS
UB ChkTable:GOSUB NewStock:RETURN4
RETURN4
NewStock:4
IF HIT=0 THEN RETURN4
GOSUB ShowCard:ST=ST-1:tp$=ST$(ST)4
xL=10:yL=2:GOSUB ShowCard:HIT=04
IF ST=0 THEN COLOR 0,2:GOSUB ShowCard:RETURN4
ReChk:4
IF LEFT$(ST$(ST),1)<>LEFT$(FDS(1,1),1) THEN RETU
RN4
GOSUB DeLaY:SU=SU+1:FDS(SU,1)=ST$(ST):GOSUB News
uit4
GOSUB DeLaY:i=SU:F=F+4:tp$=ST$(ST)4
xL=2:yL=F:GOSUB ShowCard:GOSUB VBank:ST=ST-14
tp$=ST$(ST):xL=10:yL=2:GOSUB ShowCard:GOTO ReChk
TtoTA:4
a=VAL(a$):GOSUB GetKey:b$=a$:b=VAL(a$)4
LOCATE 23,9:PRINT b$:t=t(a):s=a4
IF a>=1 AND a<=4 THEN tp$=TB$(a,t)4
IF b$<>"F" THEN AeB4
IF LEFT$(tp$,1)<>LEFT$(FDS(1,1),1) THEN Nom4
IF SU<4 THEN SU=SU+1 ELSE Nom4
F(SU)=1:FDS(SU,1)=tp$4
Nom:4
GOSUB ChkFDTP4
IF HIT<>1 THEN RETURN4
HIT=04
IF a>=1 AND a<=4 THEN t(a)=t(a)-1:IF t(a)=0 THEN
NoTA4
tp$=" ":xL=6+t(a):yL=5+(a*4):GOSUB ShowCard4
tp$=TB$(a,t(a)):xL=6+(t(a)-1):GOSUB ShowCard:RET
URN4
NoTA:4
tp$=" ":xL=6+t(a):yL=5+(a*4):GOSUB ShowCard4
IF ST<>0 THEN t=a:GOSUB STK:t(a)=1:RETURN4
AeB:4
IF a=b THEN RETURN4
IF b>=1 AND b<=4 THEN F$=TB$(b,t(b)):GOTO PLYTab
Le4

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RETURN<
PLYTable:<
IF a>=1 AND a<=4 THEN tp$=TB$(a,1)<
IF t(b)=0 THEN v=1:c=0:GOTO cv<
IF ASC(RIGHT$(tp$,1))<=66 AND ASC(RIGHT$(F$,1))<
=66 THEN RETURN<
IF ASC(RIGHT$(tp$,1))>=67 AND ASC(RIGHT$(F$,1))=
>67 THEN RETURN<
IF LEFT$(tp$,1)="A" THEN c=1:GOSUB ValG:GOTO cv<
GOSUB ValC:GOSUB ValG<
cv:<
IF v-1<c THEN RETURN<
IF a>=1 AND a<=4 THEN yL=5+a*4:t(a)=0<
tp$=" "<
FOR y=t TO 0 STEP-1:xL=7+(y-1):GOSUB ShowCard:NE
XT<
yL=5+(b*4):TA=b:sb=t(b)<
<
FOR ty=1 TO t<
TB$(TA,sb+ty)=TB$(s,ty):t(b)=t(b)+1<
tp$=TB$(s,ty):xL=5+(sb+ty)<
GOSUB ShowCard<
NEXT ty<
<
IF t(a)=0 AND ST<>0 THEN NOTA<
RETURN<
<
NewSuit:<
F(SU)=1:RETURN<
ValG:<
g$=F$:GOSUB Vcards:v=g:RETURN<
ValC:<
g$=tp$:GOSUB Vcards:c=g:RETURN<
Vcards:<
FOR i=13 TO 1 STEP-1:IF LEFT$(g$,1)=v$(i) THEN g
=i+1<
1520 NEXT:RETURN<
'<
InitShapes:<
RESTORE InitShapes<
FOR j=0 TO 3:FOR i=0 TO 36:<
READ a$:sb(i,j)=VAL("&H"+a$):NEXT i,j<
RETURN<
'<
'heart<
DATA 8,8,4,FF00,FF00,FF00,FF00,FF00<
DATA FF00,FF00,FF00,FF00,9900,8100,8100,8100<
DATA C300,E700,FF00,FF00,9900,8100,8100,8100<
DATA C300,E700,FF00,0,6600,7E00,7E00,7E00<
DATA 3C00,1800,0,0,0<
'<
'diamond<
DATA 8,8,4,FF00,FF00,FF00,FF00,FF00<
DATA FF00,FF00,FF00,FF00,E700,C300,8100,8100<
DATA C300,E700,FF00,FF00,E700,C300,8100,8100<
DATA C300,E700,FF00,0,1800,3C00,7E00,7E00<
DATA 3C00,1800,0,0,0<
'<
'club<
DATA 8,8,4,FF00,E700,E700,9900,9900<
DATA E700,C300,FF00,FF00,E700,E700,9900,9900<
DATA E700,C300,FF00,FF00,E700,E700,9900,9900<
DATA E700,C300,FF00,0,1800,1800,6600,6600<
DATA 1800,3C00,0,0,0<
'<
'spade<
DATA 8,8,4,FF00,E700,C300,8100,8100<
DATA 8100,E700,FF00,FF00,E700,C300,8100,8100<
DATA 8100,E700,FF00,FF00,E700,C300,8100,8100<
DATA 8100,E700,FF00,0,1800,3C00,7E00,7E00<
DATA 7E00,1800,0,0,0<
'<
GetKey:<
a$=INKEY$<
IF a$<>" " THEN<
a$=UCASE$(a$)<
key=ASC(a$)<
ELSE<
GOTO GetKey<
END IF<
RETURN<
'<
ShowDeck:<
LOCATE 20,11:COLOR 2,10:PRINT pk<
IF pk=0 THEN<

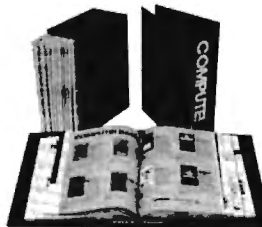
```

```

COLOR 10,10<
ELSE<
COLOR 15,15<
END IF<
tp$=" ":LOCATE 21,12:PRINT tp$<
LOCATE 22,12:PRINT tp$<
RETURN<
'<
DoScreen:<
SCREEN 1,320,200,4,1:WINDOW 3,"", (0,0)-(311,186)
,16,1:<
WINDOW OUTPUT 3:COLOR 3,0:WIDTH 40:RESTORE PaLet
teData:FOR i=0 TO 15<
READ r,g,b:PALETTE i,r,g,b:NEXT<
RETURN<
'<
PaLetteData:<
DATA 0,.7,0<
DATA 0,0,0<
DATA 1,1,1<
DATA 1,0,0<
DATA 1,1,1<
DATA 0,0,0<
DATA 1,0,0<
DATA 1,1,1<
DATA 0,0,0<
DATA 1,0,0<
DATA 1,1,1<
DATA 0,0,0<
DATA 1,0,0<
DATA 1,1,1<
DATA 0,0,0<
DATA 1,0,0<
DATA 1,0,0<
DATA 1,.5,.1<
DATA 1,.7,.1<
DATA 1,.6,.1<

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The World Inside the Computer

Fred D'Ignazio, Associate Editor

Treat Your Kids To Some K-Mail

Our day is probably a lot like yours. My wife Janet is up like a shot at 5:15 a.m. Ten minutes later she plays reveille over the walkie-talkie we have rigged between our first-floor bedroom and our son's distant second-floor bedroom. "Get up, sleepy bags," she warbles. I grunt and roll out of bed.

Then it's hurry, hurry, hurry. Wake the kids. Feed the cat. Make the lunches. Wake the kids again. Make breakfasts. Sign homework papers. Search for lunch money. Find shoes. Tie shoes. Find kids. Rush them out the door.

Janet is like an invisible "wake-up" elf in the morning. No one ever actually sees her. She rushes around saying cheery things, whipping up scrambled eggs for Eric, putting on makeup, and then, *zip!* she's out the door as we stumble into the kitchen. "Who was that?" Catie usually asks. "Mommy," says Eric, "I think."

Your Hair Looks Great!

All the members of my family, including Mowie the cat, go in different directions. We're together as a group only 10 or 20 minutes a day. But, like any family, we need to communicate. There are all the formal things like doctors' appointments, birthday parties, shopping expeditions, haircuts, and the like. And there are the little things that are just as important. Things like: "How was your day?" "Your hair looks great," and "That was a neat 20-foot python made out of spiral binder rings that you brought home from school yesterday."

But we never see each other—except in passing. So how do we stay in touch and keep all those little cracks and crevices in our lives from growing bigger?

I used to try to communicate by magic marker and bulletin board. But there were so many mes-

sages that the board became messy and impossible to read. Next I tried yellow sticky tabs. But sticky tabs are like gerbils: They multiply. Soon we had wallpapered our entire kitchen in sticky tabs; there were layers of new sticky tabs on top of old ones, like geological eras of mud, dust, and sludge. Janet got so fed up with the darn things she held a sticky tab bonfire on top of the kitchen stove, risking burning down the whole house just because my domestic message system had gotten a little out of control.

Now we're in a new home, and we need to communicate more than ever. I don't dare smuggle in another sticky tab (not if I want to stay married). So I've turned to Old Faithful: the computer.

Starting A K-Board

The best thing about our K-Board (Kitchen electronic bulletin board) is that the K-Mail and the K-Messages we send to each other don't accumulate the way sticky tabs used to. We have a board that's as deep as the ocean and as high as the fins on my mom's old Edsel. It's a *virtual* board with unlimited space. No matter how many messages we "tack" on our board, there's always room for more.

And it's cheap! No line charges. No service or system charges because all the messages are stored inside a single computer sitting on our kitchen counter. We happen to be using *Thinktank* on a very old Compaq computer, but you could use any outline processor, word processor, or database.

I have five categories on the computer: Messages, Tasks, Calendar, Phone Book, and Library. I fire it up when I stumble into the kitchen each morning. And I don't shut it down until the kids are in bed.

The K-Board just sits there, smack in the middle of the kitchen,

quietly and invitingly waiting for people to sit down and type in messages. And you know, it works.

I still don't see Janet in the morning, but when I've had my first cup of coffee, I sit down at the K-Board, and there's a message from her. I usually reply; then I grow ambitious and type messages to Catie, Eric, and, on my good days, Mowie. Catie has just begun the seventh grade, and she's taking French, so we've put a stack of French-English dictionaries next to the K-Board, and we cleverly slip French words into our messages—especially the messages to Mowie. (Mowie's code name is *la chatte noire la plus grande du monde.*)

Catie and Eric love the board. Before its arrival, they always rushed home from school and asked me if they had received mail that day. (I never understood why they asked, since neither ever writes anyone.) I had the disagreeable task of telling them no. But those days are past. Now when they come home from school, messages are always waiting—from Mommy, from Daddy, from Mowie, and from any other creature my imagination can dream up. Both children gobble the messages up like candy and then they sit down at the K-Board and dutifully reply to each one. When I stand behind Eric's shoulder and watch him, I am overcome by emotion. He absolutely refuses to read the Dick and Jane texts his school assigns him. But he sails through his messages on the K-Board and slowly but surely pecks a heartfelt reply.

Sending and receiving K-Mail makes it possible for the members of my family to stay in better touch with each other despite their busy schedules. It gets my kids to practice their keyboard and word processing skills. And it just might help my son get through the third grade. ©



Hot Line To The Denver Broncos

Last year I wrote a column knocking desktop utilities in general and telephone-directory/autodialing software in particular. I reflected on people too lazy to dial a telephone number and said I preferred a good ol' Rolodex and a touch-tone phone to a computer and a modem. Now a product has come along that causes me to eat those words. *Hot Line* version 2.0 from General Information is a show stopper of a directory/dialer.

Hot Line works as a memory-resident program taking about 85K of memory or as a stand-alone program executed directly from DOS. In memory-resident mode, the program is popped onto the screen by the Alt-F10 keys, although provision is made to change that combination. Either way, a menu bar is superimposed on the screen showing seven choices: *Dialer*, *Phonebook*, *Log*, *Keys*, *Methods*, *Settings*, and *Help*.

Selection from the menu is made by the point-and-shoot method or by typing the first letter of the choice. When *Hot Line* is running in resident mode, you don't even have to fool with the menu bar for often-used commands but can execute them directly with function keys: F1 brings up a national directory, F2 is a personal directory, F3 activates the city look-up function, and F8 brings up a selection of the ten numbers you most frequently dial.

The *Dialer* command is used to enter and dial numbers directly from the PC's numeric keypad. It can also extract and dial a number from information on the screen. Suppose you have a list of names and telephone numbers someone has sent to you on disk—perhaps it's your turn to call the computer club. Instead of entering all the numbers in your directory, you simply use a word processor or text editor to display the data on the

screen, put the cursor by the first number, and invoke *Hot Line's* *Dialer* command. It'll do everything but the talking.

Super Phonebook

The *Phonebook* command is the heart of *Hot Line*. You can select either your personal telephone book or a national telephone directory supplied by General Information. The national directory has 10,000 numbers—many of them toll free—for every type of entry you can imagine. Both directories are stored on disk, not in memory, and access with a floppy-based computer is correspondingly slow. A hard disk is recommended, but General Information supplies a smaller version of the national directory for floppy users.

Want to call NBC and get information about a television program? Type *National* and you'll get a screen full of listings starting with the word *National*, one of which is the National Broadcasting Company. If you want to call Yale University, type *Yale* and you'll see listings for both the campus switchboard and the law journal—as well as for Yamaichi International and the Yellow Cab Company of Tulsa, Oklahoma. *Nabisco* brings up the food conglomerate; *Denver* pops up numbers for the city, the Broncos, the Nuggets, and the Zephyrs; and *Compute* shows *Compute! Publications, Inc.*

Although the directory is remarkably complete, *Hot Line* allows you to add new listings as well as supplement the national directory with a personal directory. Your personal listings can be built with *Hot Line*, imported as an ASCII text file, or imported as a *dBase III* file.

The *Phonebook* command has two more goodies on its menu: *Cities* and *Area Codes*. *Cities* lets you enter a place name and it looks up

the area code. *Area Codes* does the reverse: You enter an area code, and it gives you the state and a major city.

International Hot Line

Hot Line can dial international numbers and Centrex numbers as easily as local numbers. Indeed, it can dial anything up to 30 digits and automatically affix a 22-digit dialing code for any of the long-distance carriers. I found the way the software distinguishes between a local number and a toll number in the same area code especially interesting. As part of the installation process, you must edit a list of all possible exchange prefixes, telling *Hot Line* which are within your local calling area. The program then knows to precede the remaining numbers with 1 to activate long distance.

The *Log* command allows you to record and time telephone calls, perhaps for client billing. *Keys*, *Methods*, and *Settings* are *Hot Line* utility commands to configure, customize, and alter the program's many parameters. The *Help* command provides online assistance.

Hot Line is so easy and convenient to use that I confess I am now in the legion of the lazy, although I justify its \$75 cost as a prudent expenditure: Long-distance directory service costs 60 cents a shot, so after I've used just 120 numbers from the national directory, I figure I'll be saving money.

Hot Line version 2.0 requires DOS 2.0 or later, a Hayes or Hayes-compatible modem, one disk drive, and 256K of memory. It's available from General Information, 401 Park Pl., Kirkland, WA, 98033. ©



Beyond BASIC

In my last column, I promised that this month would mark the beginning of a discussion of computer languages. In particular, I want to take a look at the strengths and weaknesses of various languages. So this month, I'll open the mini-series by looking at data types.

If BASIC is your only programming language, then you probably have not run across this topic before. Yet, more than likely, you have already used various data types. In BASIC, the two underlying data types are numbers and strings. Typically, you might write program lines such as these, where the first line demonstrates numeric data types and the second shows strings:

```
TOTAL = 3.7 * SUBTOTAL
FILES = "D3:TEST.DAT"
```

Because BASIC has only these two types, the language has a very simple scheme for distinguishing them: String variables have a dollar sign on the end of their names, and string literals have quotation marks around their contents. Other data items are assumed to be numeric—simple and clean. Yet even in BASIC there are actually several *implied* data types that are not specially declared.

For example, consider the address that you PEEK or POKE to. It must be a number between 0 and 65535. The actual value at that address must be a number between 0 and 255. File numbers must be between 0 and 7. The list could go on. You object? You say these are all simply restricted ranges of the basic numeric data type? In BASIC, that is true. But in other languages. . .

Just My Type

Consider the following fragment of a Pascal program. In Pascal, the keyword TYPE means that the following declarations are naming various *kinds* of data, not reserving actual data space. The keyword VAR

means that further declarations do indeed reserve space for variables.

```
TYPE
  Mem_Address = 0..65535;
  Mem_Data = 0..255;
  Channel = 0..7;
  Open_Mode = ( Rd,Wr,Up )
  Cust_Rec = RECORD
    Name : String[30];
    Addr : String[30];
    City : String[15];
    State: String[2];
    Zip : 0..99999;
    Credit: ( OK,Avg,Bad );
  END;
```

```
VAR
  Peeker : Mem_Address;
  Peeked : Mem_Data;
  Customer : Cust_Rec;
  Mail_List : ARRAY [1..100]
    OF Cust_Rec;
```

Do you see what we have done? Thanks to Pascal's very rich data-typing capability, we are able to explicitly say what *kinds* of things a given variable is expected to handle. Take a close look at the variable *Peeked*. Its declaration says that it is a memory data type. Most Pascals will not even let you *try* to do a statement such as this:

```
Peeked = 3.7 * Total;
```

You are trying to assign a number that probably has a fractional part to a variable that can only have integer values from 0 to 255. Pascal knows you are being naughty, and the compiler burps real quick! And, although the following statement might get through the compiler, it will probably get you a range error when you run the program (if the original value of *Peeked* is 2 or more):

```
Peeked = 243 * Peeked;
```

Wow! Safety first, right? Well, yes. But it is more than that. Code written with strong data typing is more likely to run correctly (I have had several Pascal programs that worked the first time, once they had successfully compiled). Most importantly, in a commercial environment, such code is *maintain-*

able—a programmer can look at the code months or even years later and figure out what it is doing.

So, without even really trying, I have shown you one reason to consider learning languages other than BASIC. And I did not mean to imply that Pascal is the only language that has advantages here. Although C is generally more forgiving (another way of saying you can shoot yourself in the foot more easily) than Pascal, you can build quite readable and properly declared data types and structures with it. And, in fact, the newer versions of C—ones which follow the proposed ANSI standard—offer an option of choosing all the close checking of Pascal.

Setting The Record Straight

Go back and look at those Pascal data type declarations again. In particular, look at the *Cust_Rec* type and the *Customer* and *Mail_List* variables. Just as Pascal allows more restrictive variables than BASIC, so does it allow more complex variables. Consider these legal Pascal statements (given the above declarations):

```
Customer.Name := 'Jones' ;
Customer.Zip := 77344 ;
Mail_List[ 7 ] := Customer ;
IF Customer.Credit = Bad
  THEN Write('No Credit!');
```

Those first two lines might find their way into a BASIC program looking something like this:

```
CUST$(1,30)="JONES"
CUST$(78,82)=STR$(77344)
```

Which is more readable? If you decided to change from 5-digit to 9-digit zip codes, which program do you think would be easier to modify? No contest, right? And how would you begin to do something as simply as those third and fourth statements in BASIC? ©

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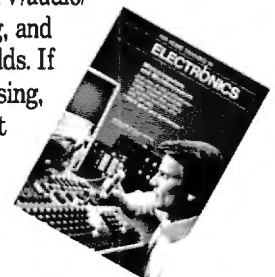
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The AmiExpo

I've just returned from AmiExpo, the first large computer show devoted exclusively to the Amiga, and it was quite an event. The list of attendees reads almost like a Who's Who of Amigadom. Members of the original Amiga design team gave speeches about the development of the Amiga. The current Commodore team responsible for the Amiga's future also turned out in force. Everyone from Irving Gould, chairman of CBM, and Richard McIntyre, senior vice-president of marketing, down to the Amiga technical support staff, engineers, and customer support people were there to get the public's reaction to their efforts. Many of the software developers who wrote the programs being shown in the exhibit hall were in attendance. A large contingent of prominent Amiga users showed up, people who are well known in the Amiga community for their public domain software or for their involvement with national Amiga users groups. And of course, there were plain old Amiga fans from all over the world. All in all, nearly 10,000 people attended the three-day event.

Although over 50 Amiga hardware and software companies were listed as exhibitors, there were dozens more who shared booth space or just wandered around the show, promoting their products. I'll quickly mention some of the new products shown and go into further detail in future columns. In the language department, *Lattice C* has come back strong with its version 4.0. This version was written by John Toebes of *Hack* fame, whose thorough familiarity with the deep voodoo of Amiga programming has allowed him to really customize the compiler for the Amiga. Jim Goodnow of Manx Software isn't sitting still either. He's upgraded the *Aztec C* compiler to version 3.6 and added

a slick source-level debugger.

Music And Video

On the music front, Roger Powell's *Texture* MIDI software has been adapted for the Amiga by Sound Quest, and is now available from Magnetic Music. New Wave Software, maker of *Dynamic Drums*, was showing off its new MIDI sequencer, *Dynamic Studio*. For video buffs, a couple of new genlock interfaces finally seem ready to hit dealer's shelves. The SuperGen interface costs \$750 and is said to deliver true broadcast-quality video as well as a number of special features. Mimetics' *ImaGen* costs only \$179 but looks like it will also deliver high-quality video. With such interfaces, the Amiga becomes one of the least-expensive and most-powerful video production machines available. At the show, Zuma announced that it's adding *TV*Show*, a companion program to *TV*Text*, to the growing library of Amiga video production software.

For months there have been rumors of a Commodore 64 emulator for the Amiga. Apparently, a lot of people believe in devolution, because at AmiExpo there were *two* 64 emulators on display. SIS's *GO-64* has been in the works for over a year, but ReadySoft's *64 Emulator* is a surprise entry that was developed in the last couple of months. These emulators come with hardware interfaces that allow the user to turn the Amiga serial port into a 1541 drive port. Neither emulator runs at full 64 speed, and both have trouble with turbo-load software. Time will tell which proves the more useful, if that's the right word.

Two new CAD programs showed up, one from Taurus, makers of *Acquisition*, and the other from Progressive Peripherals. Taurus's *CAD-X* is a high-powered program that needs at least two

megabytes of memory to run. The Progressive Peripherals program comes in two versions—*IntroCAD* for the beginner and *UltraCAD* for the more advanced user.

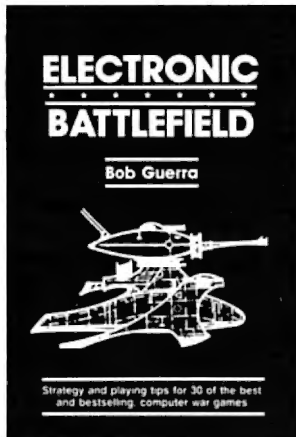
Video digitizers were bustin' out all over. Perfect Vision from SunRize is trying to give Digi-View a run for its money, but the preliminary version shown has a long way to go. Progressive Peripherals announced a frame-grabber product, but didn't show it. Last but not least, A-Squared was there with the Amiga Live! frame grabber. Despite my previous facetious innuendo to the contrary, it seems that they're moving ahead with plans to market it themselves. Unfortunately, Live! works with the 1000 only, and new models are not planned.

Several other hardware manufacturers were adapting their products to the new machines. Supra was showing SCSI hard drives for both the 500 and 2000, as well as a new 2400-bps modem for \$220. Memory expansion products for the 500 were in ample supply. Spirit Technology was selling 1.5-megabyte internal expansion memory cards for the 500, while Progressive Peripherals was talking about an 8-megabyte board for the littlest Amiga. Byte by Byte was showing an external 2-meg box. Anakin Research had new versions of their Easyl drawing pad for both the 500 and 2000.

Besides the software exposition, AmiExpo featured a large number of conferences, featuring a wide variety of knowledgeable speakers (myself, ahem, included). Many tantalizing hints were dropped about the future of the Amiga, so I'll end by passing on a few. How would you like to see Unix on the Amiga? How about a 640 X 400 noninterlaced display? There are lots of surprises on the horizon. By the way, Workbench 1.3 appears mighty interesting. ©

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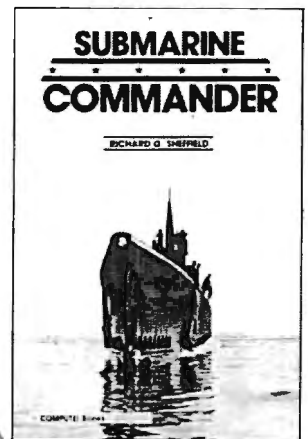
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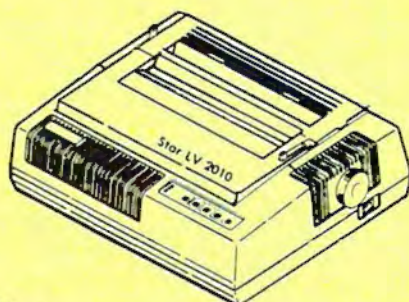
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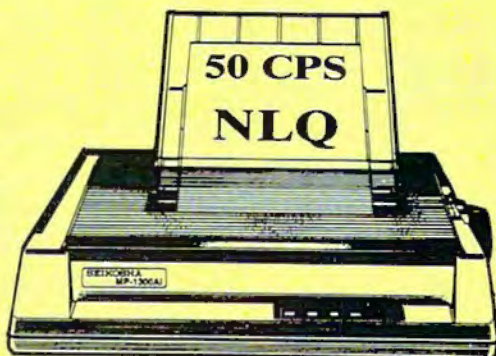
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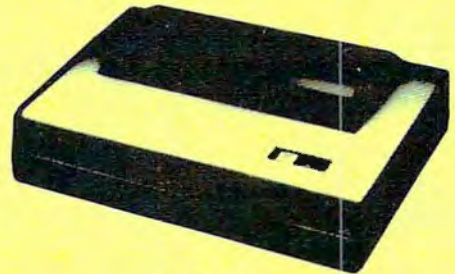
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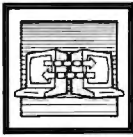
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Electronic Funnies

Late word from Washington has it that the Federal Communications Commission may reconsider the timing of its decision to impose local telephone system access charges on commercial information services in January 1988. Over the last few months, the FCC has been deluged with protests opposing the surcharges. According to Tymnet, a provider of packet-switching services, of the 3,964 letters filed by September 14, only 5 were in favor of the FCC ruling.

Even if such access charges are not eventually adopted, it appears that in the near future telephone lines may no longer be the venue of choice for information providers. The speed and cost limitations of the switched public network are hastening the introduction of alternative high-speed information delivery systems.

Electronic Newsletters

Anyone who has perused a local or national newspaper knows that news is big business. Online versions of newspapers and magazines have been available from many commercial information services for a number of years, but their popularity has been limited. The sheer bulk of data in most printed publications has required that the content of online editions be severely abbreviated by either condensing or deleting material. In shortened form, downloading the contents of a periodical is still an expensive proposition, due to the cost of connect time and the unsuitability of the information service's present delivery system for traditional advertising.

The most successful news-related communications venture to date has been the NewsNet information service, which has stayed afloat in spite of high connect-time rates by concentrating on carrying

electronic versions of pricey "insider" newsletters. NewsNet requires that its subscribers absorb both the cost of the regular subscription to the newsletters they wish to access, and the connect-time charges incurred in downloading the complete text. The system works, since the amount of time to electronically download a newsletter via modem is relatively short, and NewsNet subscribers place a high value on getting their information immediately upon release, rather than waiting several days for the U.S. Snail or paying for overnight delivery.

Text From The TV

So what about those of us whose financial well-being is not directly tied to the price of Brazilian coffee or hog bellies? In the near future, a system called Videotrax from Alpha Microsystems may allow most computer owners to receive newspapers, magazines, catalogs, and a veritable cornucopia of information via television. Videotrax allows data to be overlaid on regular television signals and sent at the rate of 82,000 bits per second, which works out to about two and a half pages of text per second.

The system was demonstrated live during a Public Broadcasting Systems science special last year. The PBS show was sponsored by the NASA Lewis Research Center and Michigan State University's Comm. Tech Lab and PBS-affiliate WKAR-TV. Entitled, "Science Fiction—Science Fact," the show was broadcast on October 22 and featured wide-ranging discussions by noted speculative fiction authors and scientific researchers.

A 15-page article, "Reflections on a Crystal Ball: Science Fiction vs. Science Fact," was sent to multiple Videotrax-equipped sites as part of the broadcast. During the six seconds it took to accomplish the task,

the visual patterns associated with the data were displayed on viewers' television screens.

Systems such as Videotrax may well bust the electronic distribution of news materials and other information wide open. Hardware developers are already talking about programmable Videotrax-like units that will act much like VCRs. Information will be broadcast on a regular basis, daily (or several times a day) for newspapers, and weekly or monthly for other periodicals. Users will program the unit for the information they desire, and the information will be downloaded when broadcast.

While such systems are essentially paperless, fans of the Sunday funnies need not despair, since both graphics and text can be transmitted. The recent emergence of computers with graphics abilities well-suited to displaying photographic material (like the Amiga, Mac II, and IBM PS/2s) will allow pictures to be included in electronic newspapers and will keep overall cost down by permitting traditional pictorial advertising.

Electronic newspapers do have their down side, however. Imagine thousands of bleary-eyed yuppies lugging their laptop computers to local pancake houses and delis for Sunday morning breakfast. You can't wrap fish in a computer monitor, and my parakeet, Babbage, will sorely miss the full text of White House press briefings. ©

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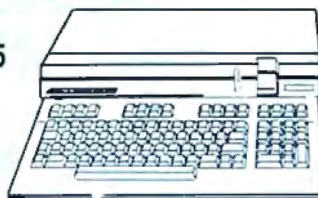
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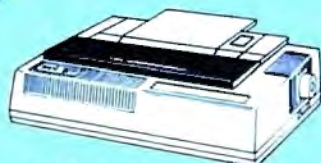
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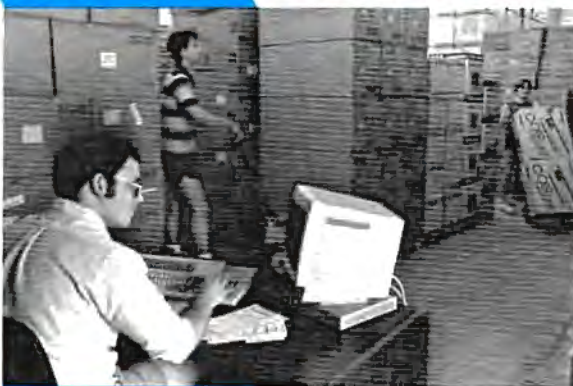
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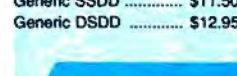
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Anatomy Of A Desk Accessory

We all know what a desk accessory is. It's one of those gadgety little programs that lives in the Desk menu in the upper left corner of the screen. Whether you're running a GEM application or just noodling around on the desktop, accessories are ready and waiting to be used. This feature is not the same as true multitasking, since an accessory completely freezes the main application while it's active, and you can't have more than six accessories in memory at once. But it's a workable, practical scheme; and as a result, nearly every ST owner has a collection of favorite desk accessories.

An accessory sounds like a flashy item, and it is, but you can create one with surprising ease. The program listing with this article contains C source code for a complete, fully functional desk accessory. It compiles exactly as listed with *Megamax C*. The code may require minor tweaking for other compilers, specifically in the function named *Assembly*, which contains two in-line assembly language instructions. Don't feel bashful about modifying the program or adding your own code. It's provided as a skeleton—a minimal working example that you can flesh out to create an accessory of your own.

GEM Messages

Apart from the fact that they're useful, accessories provide an occasion for investigating the shadowy domain of GEM messages. Like the contents of a diplomat's briefcase, GEM messages have great importance, although they seldom see the light of day.

Messages are important because GEM can never be sure which process may be running at a given moment. Right now you may be running a word processor, but two minutes later you might pull

down the Control Panel accessory to adjust the keyboard speed, and five minutes after that you might call the Install Printer accessory to prepare for printing a document.

Some form of interprocess communication is needed to keep processes from tangling one another and bringing down the whole system. The actual work of scheduling applications—deciding who gets to run and who doesn't—is done by GEM itself. But it's the job of each individual process to avoid tripping others.

An accessory's role is not unlike that of a minor actor in a play. You must be onstage and paying constant attention, ready to spring into life and speak your piece on cue. But you must never leap onto center stage at the wrong moment, just when the star of the production is about to begin a soliloquy.

Checking In

Fortunately, like the bit player in our fictional drama, a desk accessory has only a few cues to listen for. To learn what they are, let's take a brisk walk through the program listing.

The very first call in the program is to a function called *appl_init*. As its name suggests, *appl_init* initializes the application, saying, in effect, "Here I am, GEM." Until GEM knows that you exist, you can't create any graphics with VDI functions, or call any AES functions to create dialog boxes, menus, and similar GEM features.

The program next calls a function named *menu_register*, which, for a desk accessory, is the equivalent of registering at a hotel. After this call, your accessory has an official place in the Desk menu, including a unique menu ID number to distinguish it from other accessories in that menu. In plain English, *menu_register* says something like, "I want to be a desk accessory. Sign me up and give me a badge."

Don't Wake Me Unless. . .

Once checked in, every good accessory is expected to go to sleep until awakened. But like a weary hotel guest who expects an important call, the accessory first tells GEM what messages it considers important enough to rouse it from its slumber.

The next function call in the program has two purposes. It both informs GEM which messages we want to hear about, and allows us to slip into the background. The name of this function is *evnt_multi* and it allows an application to watch for as many as six distinct events, simultaneously.

This call is complex because *evnt_multi* allows for so many different possibilities. Our accessory, however, cares about only one of those possibilities—the opening of a desk accessory—so most of the *evnt_multi* items are filled with dummy values or addresses.

The first parameter we pass to *evnt_multi* is a manifest constant named *MU_MESAG*. To GEM, this value says, "Send me a message whenever somebody touches the Desk menu." If we had been interested in other events, such as keyboard clicks or mouse activity, the values representing those events would have been added to this parameter.

The other item of interest here is *Msg_Buffer*, a 16-byte array. By passing the address of *Msg_Buffer* to GEM, we establish a pigeonhole where GEM can deposit message data.

Dreaming

In terms of program flow, our code comes to a complete halt here. No more program statements are executed until GEM tells us the designated event has taken place. A typical accessory spends nearly all of its time in this peculiar, wakeful rest in which, as the doctor said of the sleepwalking Lady Macbeth, it can

"receive at once the benefit of sleep and do the effects of watching." In the meantime, you are using the computer for some other purpose.

Waking Up

Eventually, somebody chooses the accessory from the menu. Here's where `Msg_Buffer` becomes important. If someone selects an accessory—any accessory—from the Desk menu, then the value `AC_OPEN` appears in `Msg_Buffer[0]`, the first byte of the `Msg_Buffer` array. And if our accessory happens to be the one selected, GEM puts our menu ID value into `Msg_Buffer[4]`, the fifth byte.

The next three program statements (SWITCH, CASE, and IF) test

the two values in `Msg_Buffer`. We could have combined both tests into one large IF statement, but that would make the program less useful as a platform for further development. You might write an accessory that's interested in events other than `AC_OPEN`, or you might write one that registers more than one entry in the Desk menu. This general structure can accommodate both needs. (The `EMULATOR.ACC` accessory, by the way, is an example of an accessory that registers two entries in the Desk menu.)

Assuming we survive both tests, it's time to perform our appointed mission, whatever that is. This accessory is a demo, so it plays a brief, harmless joke and then goes

back to sleep.

When chosen, this accessory puts up a simple dialog with the `form_alert` function and waits for you to click OK. Then it calls the ROM routine that TOS normally uses to paint bombs on the screen after an operating system exception. The bombs *look* ominous, but they don't mean a thing. The computer works exactly as usual, and the shapes disappear as soon as you do something to refresh the screen area where they appear. If you're using this program as a skeleton, of course, you'll want to replace the bomb-painting code with something useful; delete the entire function named *Assembly* and the *Supexec* call that invokes it.

Magic Desk Accessory

```
#define AC_OPEN 40 /* Means an accessory was opened */
#define MU_MESAG 0x0010 /* Means menu message event */
#define BOMBS 0xfc0a70 /* Address of the bomb routine in ROM */
#include <osbind.h> /* GEMDOS, XBIOS, BIOS definitions */

extern int gl_apid;
extern long Assembly();
char Our_Name[] = " Magic Desk ";
char No_No[] = "[1][ I wish you l hadn't done that. ][ Bye ]";

main() {
    int Event, Dummy, Menu_ID, Msg_Buffer[8];
    int contrl[12],intin[128],ptsin[128],intout[128],ptsout[128];

    /* Tell GEM that we exist */
    appl_init();

    /* Check in at the front desk ... */
    Menu_ID = menu_register(gl_apid, Our_Name);

    /* Loop forever. Accessories never terminate. */
    while(1)
    {
        /* Go to sleep until an event of interest wakes us */
        Event = evt_multi(MU_MESAG, /* We want menu event messages... */
            1,1,1,0,0,0,0,0,0,0,0, /* Lotsa things we don't care about */
            Msg_Buffer, /* This is the address of our message pipe buffer */
            0,0,&Dummy,&Dummy,&Dummy,&Dummy,&Dummy,&Dummy); /* More chaff. */

        /* Check the contents of the message buffer */
        switch( Msg_Buffer[0] )
        {
            /* Did someone open an accessory ? */
            case AC_OPEN:
                /* Is the opened accessory OUR accessory ? */
                if( Msg_Buffer[4] == Menu_ID )
                {
                    /* Our accessory was opened. Do something. */
                    form_alert( 1, No_No );

                    /* Execute this routine in supervisor mode */
                    Supexec( Assembly );

                    /* All done. Go back to sleep until next time. */
                } /* close if */
            } /* close switch */
        } /* close while */
    } /* close main */

    /* This function calls a ROM routine to paint a */
    /* wide swath of harmless bombs on your screen. */
    extern long Assembly() {
        asm {
            move.l #39,D1
            jbr BOMBS
        }
    }
}
```

Immortality And Subversion

Before leaving this program, note one final singularity of desk accessories: They run forever. Just before the `evt_multi` call, is the statement `while(1)`, which puts the program into an endless loop. After the accessory wakes up and does its business, it immediately reenters the loop and makes another `evt_multi` call, which puts it back to sleep. Once installed, an accessory runs continuously until you press the reset button or turn off the computer.

This everlasting quality, combined with an accessory's ability to spring into the foreground at any time, calls for some extra caution in programming. An accessory should follow a strict good-neighbor policy, never hogging resources unnecessarily or making unanticipated, irrevocable changes in the environment. If it allocates memory when waking up, it should release all that memory before going back to sleep, and so on.

Perhaps the most novel of accessories is one that installs itself as usual *but never registers in the Desk menu*. This highly subversive concept may be best suited to practical jokes, but maybe you can think of a sensible use for it. Such an accessory won't have a menu ID, and it won't show up in the Desk menu, but it shares every other feature that we've described. ©



The Beginner's Page

C. Regena

Drawing Lines

Programming graphics on your computer can be a lot of fun. I enjoy writing graphics programs, but it's a difficult topic to cover in this column because graphics commands differ so greatly from one computer to another. However, this month I'm going to describe some of the point and line drawing commands available on the Amiga, Apple, eight-bit Atari, Atari ST, Commodore 128, and IBM PC/PCjr. Unfortunately, because of BASIC 2.0's lack of graphics commands, these examples do not work on the Commodore 64.

Plotting Points

Think of your computer's screen as a coordinate grid, with the origin (coordinate 0,0) in the upper-left corner. When specifying coordinates, the horizontal position (X) comes first, and the vertical position (Y), second. For example, to plot a point on the Amiga or IBM, you use the command PSET (10,50), where 10 and 50 are the X and Y coordinates, respectively.

The following programs demonstrate point plotting on each machine:

```
100 REM AMIGA VERSION
110 CLS
120 PSET (20,50):PSET (30,50):
  PSET (25,55)
130 FOR X=22 TO 28:PSET (X,58):
  NEXT
```

```
100 REM APPLE VERSION
110 HGR : HCOLOR= 3
120 HPLOT 20,50: HPLOT 30,50: H
  PLOT 25,55
130 FOR X = 22 TO 28: HPLOT X,6
  0: NEXT X
```

```
100 REM EIGHT-BIT ATARI
110 GRAPHICS 8:COLOR 3
120 PLOT 20,50:PLOT 30,50
  :PLOT 25,55
130 FOR X=22 TO 28:PLOT X
  ,58:NEXT X
```

```
100 REM ATARI ST - ST BASIC
110 FULLW 2: CLEARW 2
120 LINEF 20,50,20,50
130 LINEF 30,50,30,50
140 LINEF 25,55,25,55
```

```
150 FOR X=22 TO 28
160 LINEF X,58,X,58
170 NEXT X

100 REM 128 VERSION
110 GRAPHIC 1,1
120 DRAW 1,20,50: DRAW 1,30,50:
  DRAW 1,25,55
130 FOR X=22 TO 28: DRAW 1,X,58
  :NEXT X
```

```
100 REM IBM VERSION
110 SCREEN 1:CLS
120 PSET (20,50):PSET (30,50):P
  SET (25,55)
130 FOR X=22 TO 28:PSET (X,58):
  NEXT X
```

As you can see, each computer has a different method for plotting points: The Amiga and IBM use the PSET command; the Apple plots points with HPLOT; the eight-bit Atari uses PLOT; the Atari ST must plot points by drawing a line to and from the same point using LINEF; and the 128 makes use of a DRAW command whose first parameter specifies the color of the point. In each of these versions, line 110 sets up and clears the graphics screen for output.

Drawing Lines

In many early versions of BASIC, point-plotting commands were the only way to draw graphics on the screen. This could become quite tedious. Lines had to be drawn using FOR-NEXT loops or DATA statements specifying the points to set. Essentially, every point had to be specified.

Now, most computers have line and circle commands containing many options, so you can draw much more quickly. Here's a short example of the line-drawing commands for all six computers:

```
100 REM AMIGA VERSION
110 CLS
120 X1=20:Y1=50:X2=100:Y2=75
130 LINE (X1,Y1)-(X2,Y2)
140 X2=55:Y2=80
150 LINE -(X2,Y2)
```

```
100 REM APPLE VERSION
110 HGR : HCOLOR= 3
120 X1 = 20:Y1 = 50:X2 = 100:Y2
  = 75
130 HPLOT X1,Y1 TO X2,Y2
140 X2 = 55:Y2 = 80
150 HPLOT TO X2,Y2
```

```
100 REM EIGHT-BIT ATARI
110 GRAPHICS 8:COLOR 3
120 X1=20:Y1=50:X2=100:Y2
  =75
130 PLOT X1,Y1: DRAWTO X2,
  Y2
140 X2=55:Y2=80
150 DRAWTO X2,Y2
```

```
100 REM ATARI ST - ST BASIC
120 FULLW 2: CLEARW 2
130 X1=20:Y1=50:X2=100:Y2=
  75
140 LINEF X1,Y1,X2,Y2
150 X1=X2:Y1=Y2
160 X2=55:Y2=80
170 LINEF X1,Y1,X2,Y2
```

```
100 REM 128 VERSION
110 GRAPHIC 1,1
120 X1=20:Y1=50:X2=100:Y2=75
130 DRAW 1,X1,Y1 TO X2,Y2
150 X2=55:Y2=80
160 DRAW 1 TO X2,Y2
```

```
100 REM IBM VERSION
110 SCREEN 1:CLS
120 X1=20:Y1=50:X2=100:Y2=75
130 LINE (X1,Y1)-(X2,Y2)
140 X2=55:Y2=80
160 LINE -(X2,Y2)
```

In each case, X1 and Y1 specify the starting point of a line, while X2 and Y2 specify the end point. Notice line 160: Here we draw a line from the last point plotted (100,75) to coordinate X2,Y2.

If you have a lot of lines to draw, you may want to use a DATA statement system. For example, add the following lines to the program above, replacing lines where necessary:

```
120 READ N,X1,Y1,X2,Y2
135 FOR C=1 TO N
140 READ X2,Y2
170 NEXT C
180 DATA 22,38,118,42,122
190 DATA 46,116,35,36,38,
  28,42,26,45,30,44,40
200 DATA 36,54,20,75,17,8
  4,19,95,24,102,32,106
```

```

210 DATA 50,106,58,100,62
    ,94,61,86,58,80,52,76
220 DATA 40,76,32,82,30,8
    8,32,98

```

The first READ statement in Line 120 reads N for the number of points to be used in the loop, and then X1 and Y1 for the first point and X2 and Y2 for the second point. Lines 140-170 set up a FOR-NEXT loop that for N times reads two numbers for the coordinates of a point (X2,Y2) and draws a line to that point. I shortened the DATA statements so they would be easier for you to read, but you can put as many numbers as possible in your DATA statements and, thus, use fewer statements (and less memory). If you copy these data numbers correctly, you'll see a treble clef.

Besides points and lines, most computers offer box and circle commands as well. There are also commands that allow you to fill or paint the shapes that you have drawn. The best way to learn these commands is to sit down with your computer's manual and experiment. Who knows what you may come up with. ©



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COMPUTE!

The Hermit

The Commodore and Apple versions of this adventure game from the November issue need additional line modifications. The Commodore changes (Program 2, p. 55) should include a line 20 and a revised line 50, as follows:

```

20 FOR I=1 TO 25:PRINT:NEXT I:
  PRINT"[WHT]{2 SPACES}COPYRI
  GHT 1987 COMPUTE! PUBL., IN
  C."
50 GET A$:IF A$="" THEN 50

```

The Apple version (Program 4, p. 56) also requires a revision to line 50, as follows:

```
50 GET A$
```

For Tandy 1000 owners only, reader David Davis suggests that command line editing can be improved by changing line 5800 in the IBM version to read as follows:

```
5800 UL$=CHR$(95):CL$=CHR$(29):
  DL$=CHR$(8)
```

The article with this program neglected to mention that the Amiga version requires at least 512K of memory.

Getting Help

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Include a complete description of your difficulties; simply stating that the program doesn't work is not of much help to us. Be sure to mention any error messages that appear. It's often helpful to send a printout of the program as you have entered it. We request, however, that you not send disks or tapes; we cannot guarantee that these will be returned.

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Flexible Files

Jeff Klein

Arm yourself with all the information you need to make the IBM PC's BASICA random file commands even more powerful. Your file structures will be limited only by your imagination. For the PC with BASICA, compatibles with GW-BASIC, or the PCjr with Cartridge BASIC.

After working with BASICA's random access files, you're bound to run into problems which limit your file structure. If you use a large number of fields, program lines can become too large for the BASICA editor to handle. Difficulties can also arise if you want to allow the user to define the file structure, and using arrays as record names can be a laborious task. This article presents techniques that allow you to create a completely flexible file structure. Long and complex program lines no longer become necessary. Self-modifying file structures can be created. Structures required by a database—where different file structures are demanded for each application—are now possible, as well as structures which may require change over time. In fact, almost any imaginable file structure is possible.

Random Access Files

First, let's briefly review random access files. The random access file is a file in which a group of information, called a record, can be accessed by its position in the file. This position is called its record number. In contrast, a sequential file can be accessed only by starting at the first record and reading each record until the desired one is located.

Random access file structures are defined by the OPEN and FIELD statements. The OPEN statement has the following format:

```
OPEN "filename" AS #filename  
LEN=reclength
```

This opens a file named *filename* using *filename* as its reference num-

ber, with each record having a length of *reclength*. The format of the FIELD statement is as follows:

```
FIELD #filename, fldlength AS stgvar, ...
```

This statement defines the structure of the file with the reference number *filename*. Here the first field has a length *fldlength* which will be assigned to the string variable *stgvar*. A list of lengths and string variables, separated by commas, can continue to define the entire file structure. The file must be open before its fields can be defined, so the OPEN statement must be used before the FIELD statement.

A file is accessed with the GET and PUT statements:

```
PUT #filename, recnum  
GET #filename, recnum
```

PUT writes to a file, and GET reads from it. The record number *recnum* will be read or written to the file *filename*.

Before you can store a record, however, it must be moved into the file buffer. This is done with the LSET or RSET statements. The format for these statements is as follows:

```
LSET stgvar = stgdata  
RSET stgvar = stgdata
```

These commands move the data *stgdata*, which is a string, into the file buffer in the field defined by *stgvar*. LSET left-justifies the data, and RSET right-justifies it. Be sure to use the variable names represented by *stgvar* only in combination with the LSET and RSET statements while the file is open. Failure to do this stops any data from entering the file buffer for that field name.

Defining A Flexible File

The key to a flexible file structure lies in the FIELD statement. This fact is the key: *All FIELD statements executed for a file are operating simultaneously.* That is, FIELD statements do not cancel each other out.

This suggests that a record can be divided differently in separate FIELD statements. Thereafter, each time the record is read in, it is partitioned in the way it was divided by each FIELD statement.

For example, Figure 1 demonstrates how to split a record into overlapping fields. The file is opened with a record length of 40 characters. The first FIELD statement divides the record into three fields; the second, into five. When the GET command is executed, record 5 is read, dividing the record two ways.

Notice the second FIELD statement. The undesired fields are assigned to DUM\$. DUM\$ absorbs the unwanted characters between the desired ones. Also notice that the first FIELD statement tells the computer to place the first eight characters into the variable DATE\$. The second FIELD statement further divides the same date by telling the computer to place the first two characters into the MONTH\$ variable, the backslash into DUM\$, the next two characters into DAY\$, and so on. Both FIELD statements divide the record simultaneously, but each divides it differently.

FIELD Definitions

The length of a program line no longer limits your FIELD definitions. Figure 2 demonstrates the way to define a large number of fields. Simply define several fields and then start another statement. The fields already defined in the previous statement are skipped by assigning them to the unused variable DUM\$. The new fields are then defined after this variable. This process can be carried onto as many lines as necessary, each time picking up the previously defined fields.

Remember, each time a variable is repeated in a set of FIELD statements, only the last one defined is assigned in this manner.

This means that in Figure 2, DUM\$ will contain the characters specified in the last FIELD statement when a record is read in.

Flexible Arrays

Arrays can be defined using this same technique. Again, a dummy variable DUM\$ absorbs the previously defined fields. The idea is to step through the record, assigning each array element its own FIELD statement. At each step, the unwanted or previously assigned fields are absorbed into the unused variable DUM\$. Figure 3 is an example of this technique that can be adapted directly into your own programs. Notice that the record length must be calculated to open the file.

Designing Your Own File

Completely nonstandard files can be created in much the same way, as shown in Figure 4. The format for the file is stored, in this case, in an array. Each element holds the length of a field. A separate variable contains the number of fields defined. These can be assigned from a file, read in from DATA statements, or input from the user.

Before the file can be opened, the record length must be calculated. Line 10 does this by adding the individual field lengths stored in the array. The file is then opened, and the fields are defined. This is done in a loop, using the same technique described earlier for arrays. This time, however, the length of fields must be summed manually to produce the number of characters to absorb the next time through the loop (see line 60). Again, these statements can be adapted into your own programs.

Please note: If you are planning to use a record length of more than 128 bytes (characters) you must initialize BASIC differently. The file buffer size is changed by adding parameters to the BASIC command when loading BASIC. The command with its relevant parameters is

```
BASICA /F:number-of-files /S:
buffer size
```

By default, the buffer size is 128 characters, and the maximum number of files is eight. The maxi-

mum buffer size is 32,767 characters. This means that your flexible file cannot have a record length larger than 32767. This should not be a problem, however. If you find yourself running out of memory with a large buffer size, limit the

maximum number of files (you probably won't be reading and writing to eight files simultaneously). Here is an example of initializing BASIC with two open files and a record length of 150 characters.

```
BASICA /F:2 /S:150
```

Figure 1

```
1st FIELD statement-->      DATE      DESCRIPTION PRICE
                             record 5 : "06/ 14/ 87 #356 Color Monitor 280.00" (sample)
2nd FIELD statement-->      M   D   Y   R           ITEM
                             O   A   E   E
                             N   Y   A   F
                             T           R
                             H
10 OPEN "example1.dat" AS #1 LEN=40
20 FIELD #1, 8 AS DATES, 25 AS DESCRIPTIONS, 7 AS PRICES
30 FIELD #1, 2 AS MONTHS, 1 AS DUMS, 2 AS DAYS, 1 AS DUMS
                2 AS YEARS, 1 AS DUMS, 3 AS REFS, 21 AS ITEMS
                7 AS DUMS
40 GET #1,5
```

Figure 2

```
record 14 : " 10 30 40 20 45 87 34 23 23 39 38 61" (sample)
                A   B   C   D                               (line 20)
                DUM$   E   F   G   H                       (line 30)
(final assignment of) DUM$                               I   J   K   L (line 40)
10 OPEN "example2.dat" AS #2 LEN=36
20 FIELD #2, 3 AS AS, 3 AS BS, 3 AS CS, 3 AS DS
30 FIELD #2, 12 AS DUMS, 3 AS ES, 3 AS FS, 3 AS GS, 3 AS HS
40 FIELD #2, 24 AS DUMS, 3 AS IS, 3 AS JS, 3 AS KS, 3 AS LS
50 GET #2,14
```

Figure 3

```
record 18, " 34 20 0 3 45 15 35" (sample)
                DUM$ AS(1) 1st pass (loop)
                DUM$ AS(2) 2nd pass
                DUM$ AS(3) 3rd
                DUM$ AS(4) 4th
                DUM$ AS(5) 5th
                DUM$ AS(6) 6th
                DUM$ AS(7) 7th (last)
(final assign of)DUM$
Note: In this example FIELDLEN = 3
                NUMARRAYS = 7
10 OPEN "example3.dat" AS #3 LEN=FIELDLEN*NUMARRAYS
20 FOR I=1 TO NUMARRAYS
30 FIELD #3,(I-1)*FIELDLEN AS DUMS, FIELDLEN AS A$(I)
40 NEXT I
50 GET #1,18
```

Figure 4

```
                1         2         3         4
                1234567890123456789012345678901234567890
record 34: "-----"
file structure :          want          assign
                    field of length 5  FIELDLEN(1) = 5
                    field of length 7  FIELDLEN(2) = 7
                    field of length 10 FIELDLEN(3) = 10
                    field of length 9  FIELDLEN(4) = 9
                    field of length 9  FIELDLEN(5) = 9
                    in this case FIELDNUM = 5
10 RECLen=0:FOR I=1 TO FIELDNUM:RECLen=RECLen+FIELDLEN(I) :NEXT I
20 OPEN "example4.dat" AS #4 LEN=RECLen
30 DUMLEN=0
40 FOR I=1 TO FIELDNUM
50 FIELD #4,DUMLEN AS DUMS, FIELDLEN(I) AS A$(I)
0 DUMLEN=DUMLEN+FIELDLEN(I)
70 NEXT I
80 GET #4,34
```


Sprite Grabber For The 64

Todd Wostrel

With this creative graphics utility, you can capture a part of any hi-res or text screen and convert it to a sprite for use in any other program.

Sprites are one of the Commodore 64's wonders. They can be moved around both hi-res and text screens without disturbing these screens. Collisions are easily detected, and these super-graphic blocks can be expanded in both the horizontal and vertical directions. On the negative side, sprites take a long time to read into memory—especially if your program contains many sprites—and there is no utility built into the 64's BASIC 2.0 to allow you to grab a part of a screen and place it in a sprite. "Sprite Grabber," the program accompanying this article, provides a solution to both of these problems, and does so without using a large amount of the 64's memory.

Because Sprite Grabber (Program 1) is written entirely in machine language, it must be entered using the "MLX" machine language entry program found frequently in COMPUTE!. Be sure to read the instructions for using MLX before you begin entering data. When you run MLX, you'll be asked for a starting and an ending address for the data you'll be entering. The correct values for Sprite

Grabber are as follows:

Starting address: C000
Ending address: C277

After you've entered all the data, be sure to save a copy before leaving MLX.

Grabbing Sprites

To enable Sprite Grabber, simply load it with

`LOAD"filename",8,1`

where *filename* is the name you used when you saved Sprite Grabber to disk. After the program is loaded, remember to type NEW and press RETURN to reset important memory pointers.

A new command is now available to you. The syntax of the command is

`SYS 49152, blk, sx, sy (sa) (ca)`

Blk refers to the block (the 64-byte area) where you want to store the sprite data. Legal numbers are 0-255. The sprite data is saved to the VIC video bank (0-3) where the screen resides. The usual restrictions for selecting sprite blocks apply. For example, if the screen currently resides in bank 0 (the default), then you must choose carefully to avoid overwriting important system information. In VIC bank 0, only block 11 (locations 704-767) is completely unused by any ROM routine. If tape is

not being used, blocks 13-15 (locations 832-1023) are also available. Blocks 32-255 lie in the normal BASIC program text area. When using these blocks, you should take steps to keep the BASIC program from corrupting the sprite data, and vice versa. Similar cautions apply to the other video banks.

Sx and *sy* are the x- and y-addresses, respectively, of the upper left corner of the screen area to be saved. *Sx* must be in the range of 0-319, and *sy* must be 0-199. Parts of the sprite may be off the screen if *sx* values greater than 296 or *sy* values greater than 176 are used.

The parameters in parentheses are optional. (Don't type the parentheses if you use these parameters.) Normally, Sprite Grabber will find which screen is being displayed and will take the data from that screen, but you can override this automatic operation with these two parameters. If the data is to come from a hi-res screen, only the first parameter—*sa*, the starting address of the screen—needs to be set. If the data is to come from a text screen, both this and the second parameter—*ca*, the starting address of the character set—must be specified. The legal range for each of these optional parameters is 0-65535.

The Sprite Grabber command can be used in direct as well as program mode. Parameters can be

numbers, variables, or any expression that produces a number in the 64's BASIC. Giving a parameter a value outside of the legal range will yield unpredictable results.

Practical Uses

Sprite Grabber can be used to display scrolling messages that are captured from text screens. To move a message, all that you need to do is adjust the sprite's x- and y-coordinates. Text can easily be moved anywhere. You can even have your own custom characters grabbed and placed in a sprite.

Sprite Grabber also makes it possible to use hi-res pictures for computer programs such as games just by taking the data from the hi-res picture. If you don't have a sprite editor, you can use a hi-res program to draw sprites and later capture them for your use. Sprite grabber also makes long groups of DATA statements almost unnecessary because all you need to do is print a picture on the screen and grab it—you don't have to wait for the sprite to be POKEd into the computer's memory.

A Demonstration

Demo (Program 2) is a BASIC program that shows how to use Sprite Grabber. Demo prints a message on the computer's screen and sets up eight sprites that capture the message and scroll it. The demonstration program uses sprite blocks 252-255, which lie far enough above the end of this short program and far enough below the start of the string variable pool that they can be used without problems in this particular example.

The sprites in Demo show all the possibilities of horizontal and vertical sprite expansion. First, the image is copied to one block of sprites and displayed, then it is copied to another block and displayed. This is done to prevent jitters when the sprite is being copied. When the sprites are being changed, the character set—specified by the *ca* parameter in Sprite Grabber's SYS command—is also changed, causing the letters to alternate between upper- and lowercase. Let's take a closer look at the program.

Lines 160-190 do some initial housekeeping. They set the text

screen and border colors (line 160), read in DATA statements that indicate the eight sprites' vertical and horizontal positions (line 170), set the vertical and horizontal expansion registers (line 180), and set the sprite's colors (line 190). The rest of the program is a loop that enables all the sprites (line 200), calls the Sprite Grabber routine to move a portion of the text screen into two sprite blocks (line 210), then stores these block numbers into the eight sprite pointers beginning at address 2040 (line 220). This process is repeated in lines 230-240 with a slightly different portion of the screen grabbed, and a different character set specified by the *ca* parameter in the SYS command. The program then returns to the FOR statement in line 190 and repeats the loop.

Program 1: Sprite Grabber

Please refer to the "MLX" article in this issue before entering the following listing.

```

C000:20 9B B7 8E 74 C2 A9 00 5A
C008:85 FE AD 74 C2 0A 26 FE 92
C010:0A 26 FE 0A 26 FE 0A 26 08
C018:FE 0A 26 FE 0A 26 FE 85 BC
C020:FD 20 0E E2 20 EB B7 8E 47
C028:73 C2 A6 14 8E 71 C2 A6 90
C030:15 8E 72 C2 C9 2C D0 1A 15
C038:20 0A C2 8E 77 C2 A0 00 95
C040:B1 7A C9 2C D0 09 20 0A 2A
C048:C2 8E 78 C2 4C 98 C0 4C 9C
C050:BE C0 AD 00 DD 29 03 49 F9
C058:03 0A 0A 0A 0A 0A 0A 8D D9
C060:77 C2 8D 78 C2 AD 11 D0 47
C068:29 20 F0 11 AD 18 D0 29 4E
C070:08 0A 0A 18 6D 77 C2 8D 97
C078:77 C2 4C BE C0 AD 18 D0 99
C080:AA 29 F0 4A 4A 18 6D 77 69
C088:C2 8D 77 C2 8A 29 0E 0A 09
C090:0A 18 6D 78 C2 8D 78 C2 52
C098:20 13 C2 A2 17 A0 14 8E 63
C0A0:75 C2 8C 76 C2 20 82 C1 E3
C0A8:F0 03 20 E7 C1 CE 75 C2 DC
C0B0:10 F3 A2 17 8E 75 C2 CE 9B
C0B8:76 C2 10 E9 30 24 20 13 2C
C0C0:C2 A2 17 A0 14 8E 75 C2 C1
C0C8:8C 76 C2 20 4C C1 F0 03 D6
C0D0:20 E7 C1 CE 75 C2 10 F3 4C
C0D8:A2 17 8E 75 C2 CE 76 C2 9B
C0E0:10 E9 A5 01 09 07 85 01 1A
C0E8:58 A9 81 8D 0D DC 60 A9 50
C0F0:00 8D 7A C2 AD 75 C2 18 32
C0F8:6D 71 C2 8D 79 C2 90 06 BC
C100:A9 01 8D 7A C2 18 AD 76 3A
C108:C2 6D 73 C2 8D 7B C2 A8 6B
C110:AD 77 C2 85 FC 98 60 8D 91
C118:7D C2 A2 00 8E 80 C2 0A 65
C120:2E 80 C2 0A 2E 80 C2 18 E4
C128:6D 7D C2 AA A9 00 6D 80 6D
C130:C2 8D 80 C2 8A 0A 2E 80 0E
C138:C2 0A 2E 80 C2 0A 2E 80 88
C140:C2 85 FB 18 AD 80 C2 65 E1
C148:FC 85 FC 60 20 EF C0 29 BC
C150:F8 20 17 C1 98 29 07 65 34
C158:FB 85 FB A9 00 65 FC 85 6A
C160:FC AD 79 C2 29 F8 65 FB 1D
C168:85 FB AD 7A C2 65 FC 85 36
C170:FC AD 79 C2 29 07 AA 20 14
C178:62 C2 A0 00 B1 FB 3D 69 53
C180:C2 60 20 EF C0 4A 4A 4A 8E

```

```

C188:20 17 C1 AD 79 C2 8D 7F 66
C190:C2 AD 7A C2 8D 80 C2 4E 9E
C198:80 C2 AD 7F C2 6A 4A 4A 59
C1A0:18 65 FB 85 FB A9 00 65 4D
C1A8:FC 85 FC 20 62 C2 A0 00 0D
C1B0:B1 FB AA A5 01 09 07 29 1F
C1B8:FB 85 01 A9 00 85 FC 8A F0
C1C0:0A 26 FC 0A 26 FC 0A 26 72
C1C8:FC 85 FB 18 AD 78 C2 65 67
C1D0:FC 85 FC AD 7B C2 29 07 EE
C1D8:A8 B1 FB AA AD 79 C2 29 49
C1E0:07 A8 8A 39 69 C2 60 AD BB
C1E8:76 C2 0A 6D 76 C2 8D 7C C6
C1F0:C2 AD 75 C2 4A 4A 4A 18 44
C1F8:6D 7C C2 A8 AD 75 C2 29 27
C200:07 AA BD 69 C2 11 FD 91 E9
C208:FD 60 20 83 AE 20 F7 B7 7E
C210:A6 15 60 AD 77 C2 29 C0 EE
C218:18 65 FE 85 FE A0 3E A9 DB
C220:00 91 FD 88 10 FB AD 18 36
C228:D0 29 0E C9 04 F0 04 C9 74
C230:06 D0 22 AD 00 DD 29 03 D8
C238:C9 03 D0 0C A9 C0 18 6D 2C
C240:78 C2 8D 78 C2 4C 55 C2 A0
C248:C9 01 D0 09 A9 00 18 6D 88
C250:78 C2 8D 78 C2 A9 7F 8D 45
C258:0D DC 78 A5 01 29 FA 85 2D
C260:01 60 A5 01 29 F8 85 01 7C
C268:60 80 40 20 10 08 04 02 F2
C270:01 00 00 00 00 00 00 76

```

Program 2: Demo

For instructions on entering the following program please refer to "COMPUTE!'s Guide to Typing in Programs" found elsewhere in this issue.

```

RQ 10 REM [2 SPACES] * SPRITE GR
      ABBER DEMO
SK 20 REM COPYRIGHT 1988 COMPU
      TEI PUBLICATIONS, INC.
      [2 SPACES] ALL RIGHTS RES
      ERVED.
JQ 100 PRINT "[CLR][RED]
      [10 SPACES][18 0]
BG 110 PRINT "[9 SPACES][EM]
      [RVS]* SPRITE GRABBER *
      [OFF][G]
FE 120 PRINT "[9 SPACES][EM]*
      [2 SPACES] FROM COMPUTE!
      *[G]
EK 130 PRINT "[10 SPACES][18 T]
PB 140 PRINT "[WHT][7][2 RIGHT]
      COPYRIGHT 1988 COMPUTE!
      PUBLICATIONS"
XP 150 PRINT "[10 RIGHT] ALL RIG
      HTS RESERVED."
DR 160 POKE53280,0:POKE53281,0
CG 170 FORX=0TO15:READA:POKE53
      248+X,A:NEXT
AS 180 POKE53277,51:POKE53271,
      15
SG 190 FORX=0TO7:POKE53287+X,X
      /2+1:NEXT
MH 200 FORX=31TO228STEP4:POKE5
      3269,255
FM 210 SYS49152,252,X,4,1024,4
      096:SYS49152,253,X+24,4
      ,1024,4096
GC 220 FORY=0TO3:POKE2040+2*Y,
      252:POKE2041+2*Y,253:NE
      XT
RA 230 SYS49152,254,X+2,4,1024
      ,6144:SYS49152,255,X+26
      ,4,1024,6144
EX 240 FORY=0TO3:POKE2040+2*Y,
      254:POKE2041+2*Y,255:NE
      XT
MB 250 NEXT
CM 300 DATA 120,100,168,100,144
      ,150,168,150
XP 310 DATA 120,200,168,200,144
      ,225,168,225

```


Softkey For Atari XL/XE

John Oakley And Earl R. Davidson

Take control of your computer keyboard with this impressive macro program—the best one we've published for the Atari. Included is a powerful macro editor. For the Atari XL/XE series of computers with a disk drive.

"Softkey" is a keyboard macro program for Atari XL and XE computers (except for the 1200XL) that's compatible with many programs, including Atari BASIC, *AtariWriter*, *SpeedScript 3.0*, DOS 2.5, and DOS XL from OSS. Softkey allows you to redefine keys any way you wish.

If you plan to use Softkey with BASIC, you can redefine keys to aid you in writing and debugging your programs. For instance, you might want to define Shift-Control-S as SAVE"D:. Then, whenever you want to save your program, just press Shift-Control-S and type the filename, then press RETURN.

Softkey can be even more useful with a word processor. Suppose you're writing an essay about *Wuthering Heights*, a novel by Emily Brontë. Define Control-W to be *Wuthering Heights*, Control-H to be Heathcliff, Control-C to be Catherine, and Control-B to be Brontë. One keystroke is all you need to get any of these names.

The best thing about Softkey is that you don't need to be a programmer to use it—a complete macro editor is included.

Typing It In

Softkey consists of two programs—the first is a BASIC program that creates a machine language program on disk. The second is the Softkey Editor, which is written in BASIC. Using "The Automatic

Proofreader" program, located elsewhere in this issue, type in both programs and save them to disk. When you save the programs, use the name SKCREATE for Program 1 and SKEDIT for Program 2. Program 2 has many special characters. Be sure you read and understand the typing instructions in the "COMPUTE!'s Guide to Typing In Programs" article elsewhere in this issue. In particular, the vertical line character (|) is obtained with the SHIFT-= key combination. Characters enclosed in braces, {}, are typed by holding down the CTRL key while typing the indicated keys.

Next, load Program 1 and run it. The program will ask you the name of the file you wish to create. Respond with the name AUTORUN.SYS. The machine language Softkey program will be written to disk. If your disk already has a file named AUTORUN.SYS on it, you probably don't want to overwrite that file with the Softkey program. Instead, format a new disk, write the DOS files to it (and the RAM-DISK.COM file, if you have a 130XE), copy SKEDIT to the disk, and finally run SKCREATE and specify AUTORUN.SYS.

Now, run SKEDIT (Program 2). You'll see the following list of commands:

Edit Key
Load
Save
Clear
Auto Key
View All

You can move up and down among the commands with the cursor keys. Press RETURN to select a command. Alternatively, commands can be selected by typing

the first letter of the command. To the left of the commands is the file selector box, which becomes active when you select the Load command. The box to the right of the commands (labeled Current File) is a status box, which keeps track of the number of keys defined, the amount of memory used, and which key (if any) is defined as the Auto Key.

Let's define a key. Select the Edit Key Option by pressing E. Now press the key combination that you wish to define. You can define Control and Shift-Control combinations, so Control-B and Shift-Control-B can perform different actions. We will define a shortcut for saving to disk. Press Shift-Control-S. Now type SAVE"D:. Press SELECT to store your macro. If you wish to define other keys, define them now. If you want one of your key definitions to execute automatically when you boot the disk, choose that key as the Auto Key with the Auto Key command.

When you're ready to save your key definitions, select the Save command. Enter the name DEFAULT.SOF. This is the name of the file which is loaded by the AUTORUN.SYS program. Reboot your computer by turning it off and back on. The Softkey program loads into memory. If you selected an Auto Key, it executes automatically. Try out your keyboard macro by typing Shift-Control-S. SAVE"D: should appear on the screen.

Softkey can be disconnected by typing Shift-Control-Escape. This should be done whenever you run SKEDIT to edit your macros. Pressing Shift-Control-Escape again reactivates Softkey.

Editor Features

Since the Caps key can be used as a macro key, press HELP and Shift-HELP to turn caps on and off. Press OPTION to delete the last key pressed (pressing delete won't work, since macros can be assigned to it). Press START to abort the editing of the current key. Press SELECT to enter a new definition.

You may want to keep a collection of macro files on a disk with descriptive filenames. Whenever you want to use one of the macro files, simply rename it to DEFAULT.SOF.

Key Redefinition

Softkey allows dynamic key redefinition. This means you can redefine any key without rebooting. As an example of this powerful feature, we'll redefine the Shift-Control-S key to print SOUND. Note that the new definition must have the same number, or less characters than the original definition.

Press Shift-Control-A to redefine a key. The border color should change to red. Now press the key you wish to redefine—in this case Shift-Control-S. The border should change to light purple, indicating that you've chosen a valid macro key. Now type SOUND. Press Shift-Control-A to end macro redefinition. You may wish to define several strings of spaces in the macro editor. These blank definitions can then be redefined whenever you need them. Note that there is no way to save the keys redefined by Softkey's redefinition mode.

Compatibility

Softkey is compatible with many programs. As an example, consider *SpeedScript 3.0*, COMPUTE!'s popular word processor. Format a new disk and copy the Atari DOS files onto it. Now, transfer a copy of *SpeedScript* to the disk and rename it SPSCRIPT.OBJ. Copy SKCREATE and SKEDIT to the disk. Run SKCREATE and answer AUTORUN.SYS when asked for a filename. Run SKEDIT and define any keys you like. Be sure to save your keys with the filename DEFAULT.SOF. Turn the computer off and back on. Softkey will load into memory. Type DOS to go to the DOS menu. Select L, press RETURN, and type SPSCRIPT.OBJ. *SpeedScript* will

start, and your key definitions will be ready.

About Softkey

The machine language Softkey program intercepts the keyboard interrupt and compares each keystroke to the defined macros. If the keystroke is not a macro, the key is passed on to the regular keyboard routines. If the key is a macro, each key of the macro is sent on to the built-in routines, one at a time. A keyboard buffer is built-in, allowing you to type ahead while Softkey is in control.

Softkey moves MEMLO up by 128 bytes and installs its own keyboard buffering and vertical blank routines. Most of the machine language routine and the 3K macro buffer are located in normally unused sections of memory. Softkey should be compatible with any program that uses standard keyboard calls, does not use the same memory locations as Softkey, and recognizes the new MEMLO setting.

For instructions on entering these programs, please refer to "COMPUTE!'s Guide to Typing In Programs" elsewhere in this issue.

Program 1: Softkey Creator

```
NO 0 REM COPYRIGHT 1988 COMP
UTE! PUBLICATIONS, INC.
ALL RIGHTS RESERVED.
FP 1 PRINT "{CLEAR}COPYRIGHT
1988":PRINT "COMPUTE!
PUBLICATIONS, INC.":PRI
NT "ALL RIGHTS RESERVED
."
LC 2 DIM TEMP$(20),FN$(22)
DA 5 PRINT :PRINT "SOFTKEY C
REATOR."
KE 6 PRINT "FILENAME:":;INPU
T #16;TEMP$:FN$="D":;FN
$(3)=TEMP$
IL 10 OPEN #1,0,0,FN$
GN 20 FOR H=1 TO 2126
LD 30 READ A:CK=CK+A:PUT #1,
A
DL 40 NEXT H
GM 50 IF CK<>210721 THEN PRI
NT "ERROR IN DATA STAT
EMENTS"
EI 1000 DATA 255,255,0,48,19
3,53,0,0
JA 1010 DATA 0,0,0,0,0,0,0,0
JB 1020 DATA 0,0,0,0,0,0,0,0
JC 1030 DATA 0,0,0,0,0,0,0,0
JJ 1040 DATA 0,32,0,0,162,0,
240,2
MC 1050 DATA 162,1,8,120,173
,1,211,72
MH 1060 DATA 41,254,141,1,21
1,32,11,196
MO 1070 DATA 104,141,1,211,4
0,96,138,72
KO 1080 DATA 173,9,210,205,2
42,2,208,5
EH 1090 DATA 174,241,2,208,4
5,201,159,208
BC 1100 DATA 10,173,255,2,73
```

```
,255,141,255
KN 1110 DATA 2,176,31,174,0,
48,232,224
EF 1120 DATA 24,208,2,162,0,
236,1,48
HP 1130 DATA 240,16,142,0,48
,157,3,48
KB 1140 DATA 141,242,2,169,3
,141,241,2
LF 1150 DATA 133,77,173,217,
2,141,2,48
PI 1160 DATA 104,170,104,64,
68,49,58,68
ND 1170 DATA 69,70,65,85,76,
84,46,83
HK 1180 DATA 79,70,155,0,0,0
,0,0
AF 1190 DATA 255,0,0,0,0,0,0
,0
JB 1200 DATA 0,0,0,0,0,0,0,0
JC 1210 DATA 0,0,0,0,0,0,0,0
JD 1220 DATA 0,0,0,0,0,0,0,0
JE 1230 DATA 0,0,0,0,0,0,0,0
JF 1240 DATA 0,0,0,0,0,0,0,0
JB 1250 DATA 0,0,0,0,0,0,0,0
JH 1260 DATA 0,0,0,0,0,0,0,0
JI 1270 DATA 0,0,0,0,0,0,0,0
JJ 1280 DATA 0,0,0,0,0,0,0,0
JK 1290 DATA 0,0,0,0,0,0,0,0
JC 1300 DATA 0,0,0,0,0,0,0,0
JD 1310 DATA 0,0,0,0,0,0,0,0
JE 1320 DATA 0,0,0,0,0,0,0,0
JF 1330 DATA 0,0,0,0,0,0,0,0
JG 1340 DATA 0,0,0,0,0,0,0,0
JH 1350 DATA 0,0,0,0,0,0,0,0
JI 1360 DATA 0,0,0,0,0,0,0,0
JJ 1370 DATA 0,0,0,0,0,0,0,0
JK 1380 DATA 0,0,0,0,0,0,0,0
JL 1390 DATA 0,0,0,0,0,0,0,0
JD 1400 DATA 0,0,0,0,0,0,0,0
JE 1410 DATA 0,0,0,0,0,0,0,0
JF 1420 DATA 0,0,0,0,0,0,0,0
JG 1430 DATA 0,0,0,0,0,0,0,0
JH 1440 DATA 0,0,0,0,0,0,0,0
JI 1450 DATA 0,0,0,0,0,0,0,0
JJ 1460 DATA 0,0,0,0,0,0,0,0
JK 1470 DATA 0,0,0,0,0,0,0,0
JL 1480 DATA 0,0,0,0,0,0,0,0
JH 1490 DATA 0,0,0,0,0,0,0,0
JE 1500 DATA 0,0,0,0,0,0,0,0
BE 1510 DATA 0,0,0,157,73,3,
152,157
CK 1520 DATA 72,3,169,7,157,
66,3,32
GE 1530 DATA 86,228,96,162,1
6,169,214,157
FP 1540 DATA 68,3,169,0,157,
69,3,160
FP 1550 DATA 4,169,0,32,149,
49,48,42
LB 1560 DATA 56,165,216,229,
214,133,212,165
ML 1570 DATA 217,229,215,133
,213,230,212,208
OB 1580 DATA 2,230,213,162,1
6,169,0,157
KA 1590 DATA 68,3,169,80,157
,69,3,164
OK 1600 DATA 212,165,213,32,
149,49,48,2
JB 1610 DATA 56,96,24,96,32,
182,52,32
LJ 1620 DATA 165,49,176,0,16
9,0,141,14
OD 1630 DATA 212,8,120,165,1
2,141,28,48
ON 1640 DATA 165,13,141,29,4
8,169,0,133
EN 1650 DATA 216,169,80,133,
217,173,1,211
BA 1660 DATA 72,41,254,141,1
,211,165,212
```


DA 1670	DATA 5,213,240,31,16 0,0,177,216	OP 2090	DATA 169,23,141,1,48 ,162,32,169	MC 2500	DATA 70,65,85,76,84, 46,83,79
HD 1680	DATA 145,214,230,214 ,208,2,230,215	MA 2100	DATA 12,157,66,3,76, 86,228,162	BF 2510	DATA 70,33,155,155,1 69,0,133,212
HO 1690	DATA 230,216,208,2,2 30,217,198,212	PN 2110	DATA 32,169,147,157, 68,3,169,48	EK 2520	DATA 169,80,133,213, 169,0,133,214
HK 1700	DATA 165,212,201,255 ,208,2,198,213	FA 2120	DATA 157,69,3,160,2, 169,0,32	BC 2530	DATA 169,224,133,215 ,162,3,160,0
DO 1710	DATA 56,176,219,169, 0,141,13,53	IN 2130	DATA 149,49,16,3,76, 60,52,172	OB 2540	DATA 177,214,145,212 ,136,208,249,230
DH 1720	DATA 173,13,53,10,17 0,189,14,53	BC 2140	DATA 148,48,240,23,1 69,149,157,68	DJ 2550	DATA 215,230,213,202 ,16,240,8,120
IH 1730	DATA 133,216,189,15, 53,133,217,189	GE 2150	DATA 3,169,48,157,69 ,3,169,0	NL 2560	DATA 169,0,141,14,21 2,173,1,211
CI 1740	DATA 74,53,133,214,1 89,75,53,133	FL 2160	DATA 32,149,49,16,3, 76,60,52	OI 2570	DATA 72,41,254,141,1 ,211,169,80
OD 1750	DATA 215,160,0,174,1 3,53,24,173	IK 2170	DATA 32,166,51,96,8, 120,169,0	HN 2580	DATA 133,213,169,224 ,133,215,162,3
EK 1760	DATA 231,2,125,134,5 3,145,216,173	MH 2180	DATA 141,14,212,173, 1,211,72,41	HO 2590	DATA 160,0,177,212,1 45,214,136,208
EP 1770	DATA 232,2,125,164,5 3,145,214,238	BD 2190	DATA 254,141,1,211,1 73,143,48,13	JO 2600	DATA 249,230,213,230 ,215,202,16,240
OB 1780	DATA 13,53,173,13,53 ,201,30,208	EI 2200	DATA 144,48,240,23,1 73,143,48,133	DO 2610	DATA 104,141,1,211,1 69,192,141,14
JC 1790	DATA 199,169,126,133 ,216,169,0,133	EE 2210	DATA 214,173,144,48, 133,215,160,4	BF 2620	DATA 212,40,96,0,86, 48,96,48
HC 1800	DATA 217,173,231,2,1 33,212,173,232	KB 2220	DATA 173,141,48,145, 214,200,173,142	BO 2630	DATA 101,48,104,48,1 20,48,189,50
BF 1810	DATA 2,133,213,169,0 ,133,214,169	HL 2230	DATA 48,145,214,173, 141,48,133,212	DH 2640	DATA 199,50,218,50,3 5,196,49,196
EO 1820	DATA 48,133,215,165, 216,5,217,240	ED 2240	DATA 173,142,48,133, 213,160,0,173	EC 2650	DATA 54,196,62,196,6 8,196,71,196
DP 1830	DATA 31,160,0,177,21 4,145,212,230	EO 2250	DATA 147,48,145,212, 160,1,173,148	HI 2660	DATA 83,196,88,196,9 1,196,205,196
BP 1840	DATA 214,208,2,230,2 15,230,212,208	EC 2260	DATA 48,145,212,160, 2,145,212,160	NL 2670	DATA 208,196,220,196 ,223,196,52,198
HN 1850	DATA 2,230,213,198,2 16,165,216,201	LC 2270	DATA 3,169,0,145,212 ,160,6,145	EI 2680	DATA 60,198,70,198,8 9,198,40,198
GB 1860	DATA 255,208,2,198,2 17,56,176,219	BK 2280	DATA 212,200,145,212 ,160,4,145,212	AH 2690	DATA 46,198,49,198,9 6,51,101,51
HF 1870	DATA 165,212,141,231 ,2,165,213,141	BB 2290	DATA 200,145,212,160 ,8,162,0,189	HP 2700	DATA 87,48,97,48,102 ,48,105,48
JD 1880	DATA 232,2,169,56,14 1,8,2,169	KK 2300	DATA 149,48,145,212, 232,200,206,148	BB 2710	DATA 121,48,194,50,2 04,50,222,50
IO 1890	DATA 48,141,9,2,169, 34,141,40	HP 2310	DATA 48,208,244,173, 141,48,141,143	OK 2720	DATA 36,196,50,196,5 5,196,63,196
EN 1900	DATA 2,169,48,141,41 ,2,162,0	FC 2320	DATA 48,173,142,48,1 41,144,48,152	EP 2730	DATA 69,196,72,196,8 4,196,89,196
LD 1910	DATA 142,27,2,232,14 2,26,2,169	EL 2330	DATA 24,109,141,48,1 41,141,48,173	NO 2740	DATA 92,196,206,196, 209,196,221,196
CE 1920	DATA 27,133,12,169,4 8,133,13,169	AO 2340	DATA 142,48,105,0,14 1,142,48,104	HM 2750	DATA 224,196,56,198, 65,198,75,198
AA 1930	DATA 99,141,2,196,16 9,198,141,3	DP 2350	DATA 141,1,211,169,1 92,141,14,212	EH 2760	DATA 94,198,41,198,4 7,198,50,198
HO 1940	DATA 196,104,141,1,2 11,169,192,141	BE 2360	DATA 40,96,132,212,1 69,0,133,213	LB 2770	DATA 97,51,102,51,0, 1,0,3
PD 1950	DATA 14,212,40,32,24 9,50,96,169	BF 2370	DATA 32,170,217,32,2 30,216,162,8	FE 2780	DATA 2,56,34,27,2,2, 2,2
JH 1960	DATA 99,141,141,48,1 69,198,141,142	OO 2380	DATA 160,0,177,243,8 ,41,127,157	KH 2790	DATA 0,1,1,3,0,1,0,1
CE 1970	DATA 48,169,0,141,14 3,48,141,144	DO 2390	DATA 140,52,232,200, 40,16,243,162	LD 2800	DATA 3,27,56,34,126, 3,0,1
JJ 1980	DATA 48,162,32,169,3 ,157,66,3	IL 2400	DATA 32,169,12,157,6 6,3,32,86	JM 2810	DATA 3,1,0,0,0,0,0,0
LI 1990	DATA 24,173,1,3,105, 48,141,127	LI 2410	DATA 228,162,0,169,1 1,157,66,3	JK 2820	DATA 0,0,0,0,0,0,0,0
PP 2000	DATA 48,169,126,157, 68,3,169,48	MC 2420	DATA 169,42,157,72,3 ,169,0,157	JL 2830	DATA 0,0,0,0,0,0,0,0
FP 2010	DATA 157,69,3,169,4, 157,74,3	MH 2430	DATA 73,3,169,140,15 7,68,3,169	JM 2840	DATA 0,0,0,0,0,0,0,0
FF 2020	DATA 32,86,228,16,3, 76,60,52	MG 2440	DATA 52,157,69,3,32, 86,228,162	II 2850	DATA 226,2,227,2,230 ,49,0,196
CJ 2030	DATA 162,32,169,145, 157,68,3,169	AM 2450	DATA 0,160,0,136,208 ,253,202,208	HI 2860	DATA 116,198,0,0,0,0, 0,0
FI 2040	DATA 48,157,69,3,160 ,2,169,0	IF 2460	DATA 248,96,253,69,1 14,114,111,114	BO 2870	DATA 0,0,0,0,0,224,1 ,240
FJ 2050	DATA 32,149,49,16,3, 76,60,52	EE 2470	DATA 32,35,120,120,1 20,155,155,67	BE 2880	DATA 3,76,238,197,16 5,212,72,165
OG 2060	DATA 173,145,48,240, 9,32,113,51	EA 2480	DATA 97,110,110,111, 116,32,76,111	MC 2890	DATA 213,72,169,3,14 1,43,2,169
IN 2070	DATA 206,145,48,56,1 76,242,173,146	KI 2490	DATA 97,100,32,68,49 ,58,68,69	EJ 2900	DATA 1,141,26,2,173, 2,48,240
LG 2080	DATA 48,201,255,240, 8,141,3,48			HM 2910	DATA 54,173,15,210,4 1,4,240,7

```

FK 2940 DATA 2,48,173,9,210,
174,0,48
OO 2950 DATA 236,1,48,208,18
,232,224,24
IC 2960 DATA 208,2,162,0,236
,1,48,240
GA 2970 DATA 6,157,3,48,142,
0,48,173
OL 2980 DATA 252,2,201,255,2
40,2,208,95
DH 2990 DATA 173,10,196,208,
97,173,4,196
MA 3000 DATA 13,5,196,240,89
,173,4,196
MC 3010 DATA 133,212,173,5,1
96,133,213,160
AN 3020 DATA 1,177,212,160,3
,209,212,208
OD 3030 DATA 22,169,0,145,21
2,160,6,177
HA 3040 DATA 212,141,4,196,2
00,177,212,141
EH 3050 DATA 5,196,24,144,20
3,176,201,160
NK 3060 DATA 3,24,177,212,10
5,1,145,212
CE 3070 DATA 105,7,168,177,2
12,141,6,196
GH 3080 DATA 32,175,197,176,
179,173,6,196
OB 3090 DATA 170,41,63,201,1
7,208,5,142
JI 3100 DATA 220,2,240,3,142
,252,2,104
DN 3110 DATA 133,213,104,133
,212,96,174,1
BD 3120 DATA 48,236,0,48,240
,241,232,224
EE 3130 DATA 24,208,2,162,0,
142,1,48
OK 3140 DATA 189,3,48,141,6,
196,201,220
CB 3150 DATA 208,8,173,10,19
6,73,255,141
IE 3160 DATA 10,196,173,10,1
96,208,190,173
OJ 3170 DATA 6,196,201,255,2
40,10,173,9
GG 3180 DATA 196,208,5,56,17
6,170,176,149
BO 3190 DATA 173,0,196,133,2
12,173,1,196
HG 3200 DATA 133,213,173,6,1
96,201,255,240
NO 3210 DATA 102,173,9,196,2
01,1,208,41
EJ 3220 DATA 32,175,197,144,
126,173,200,2
AP 3230 DATA 73,68,141,200,2
,165,212,141
BN 3240 DATA 0,196,165,213,1
41,1,196,238
LK 3250 DATA 9,196,160,3,169
,0,145,212
PH 3260 DATA 141,4,196,141,5
,196,76,197
BH 3270 DATA 196,160,2,177,2
12,160,3,209
BD 3280 DATA 212,240,66,24,1
77,212,105,1
FB 3290 DATA 145,212,169,7,2
4,113,212,168
FH 3300 DATA 173,6,196,145,2
12,32,175,197
CG 3310 DATA 176,156,173,6,1
96,170,41,63
ND 3320 DATA 201,17,208,5,14
2,220,2,240
PD 3330 DATA 3,142,252,2,56,
176,199,173
AE 3340 DATA 9,196,208,17,23
8,9,196,173

```

```

LC 3350 DATA 200,2,141,8,196
,73,34,141
OP 3360 DATA 200,2,56,176,17
7,160,3,177
HK 3370 DATA 212,170,169,0,1
45,212,138,160
LL 3380 DATA 1,145,212,169,0
,141,9,196
PD 3390 DATA 173,8,196,141,2
00,2,56,176
BK 3400 DATA 149,173,2,196,1
33,212,173,3
BL 3410 DATA 196,133,213,160
,0,173,6,196
OE 3420 DATA 209,212,208,25,
160,6,173,4
ID 3430 DATA 196,145,212,200
,173,5,196,145
HL 3440 DATA 212,165,212,141
,4,196,165,213
MJ 3450 DATA 141,5,196,56,96
,160,4,177
KB 3460 DATA 212,72,200,177,
212,133,213,104
BJ 3470 DATA 133,212,5,213,2
08,205,24,96
NC 3480 DATA 169,0,141,4,196
,141,5,196
CF 3490 DATA 173,2,196,133,2
12,173,3,196
EA 3500 DATA 133,213,165,212
,5,213,240,29
KN 3510 DATA 160,3,169,0,145
,212,160,6
MC 3520 DATA 145,212,200,145
,212,160,4,177
JP 3530 DATA 212,72,200,177,
212,133,213,104
IC 3540 DATA 133,212,56,176,
221,162,23,169
KP 3550 DATA 0,157,3,48,202,
16,250,141
IL 3560 DATA 0,48,141,1,48,1
69,27,133
CI 3570 DATA 12,169,48,133,1
3,169,56,141
DF 3580 DATA 8,2,169,48,141,
9,2,169
LJ 3590 DATA 34,141,40,2,169
,48,141,41
HC 3600 DATA 2,162,0,142,27,
2,232,142
OJ 3610 DATA 26,2,169,126,14
1,231,2,169
EP 3620 DATA 48,141,232,2,96
,255,0,0
JK 3630 DATA 0,0,0,0,0,0,0,0
AD 3640 DATA 0,0,0,0,0,0,0,2
24
CJ 3650 DATA 2,225,2,248,50,
32

```

Program 2: Softkey Editor

```

AP 10 REM COPYRIGHT 1988 COM
PUTE! PUBLICATIONS, IN
C. ALL RIGHTS RESERVE
D.
JA 20 PRINT "{CLEAR}COPYRIGH
T 1988":PRINT "COMPUTE
! PUBLICATIONS, INC.":
PRINT "ALL RIGHTS RESE
RVED."
OK 30 FOR TT=1 TO 1500:NEXT
TT
NN 80 DIM SCREEN$(1):SCREEN$
="":GOSUB 1940:GOTO 29
0
EN 90 REM
OC 100 REM READ KEYBOARD
HG 110 REM
GO 120 FLASH=0
OL 130 FLASH=FLASH+1:IF FLAS

```

```

H>20 THEN FLASH=1
HJ 140 IF FLASH=1 THEN A=USR
(ADR(INVERT$),SCRMEM+
OFFSET,L)
KK 150 IF FLASH=10 THEN A=US
R(ADR(INVERT$),SCRMEM
+OFFSET,L)
BN 160 IF PEEK(764)<>255 THE
N 190
BH 170 IF CONSOLE THEN CONS=
PEEK(53279):IF CONS=3
OR CONS=5 OR CONS=6
THEN 240
GG 180 GOTO 130
HD 190 CODE=PEEK(764):RESTOR
E CODE+3000:READ CODE
$,TYPE
PN 200 IF PEEK(732)=81 AND T
YPE=1 THEN CODE=CODE+
64:RESTORE CODE+3000:
READ CODE$,TYPE
DB 210 IF CODE=220 THEN CODE
=255
AB 220 IF CFLAG THEN GET #1,
KEY:GOTO 240
KF 230 POKE 764,255:SOUND 0,
6,10,12:SOUND 0,0,0,0
KJ 240 IF FLASH<10 THEN A=US
R(ADR(INVERT$),SCRMEM
+OFFSET,L)
HN 250 RETURN
HM 260 REM
NG 270 REM MAIN COMMAND MENU
HD 280 REM
GG 290 SCREEN$=SCR$:POKE 93,
PEEK(PEEK(94)+PEEK(95
)*256):? DN$:UP$:
C=0:CONSOLE=0:POSITIO
N 25,4:? FN$(1,LEN(FN
$)-4):POSITION 37-(MA
CNUM>99)-(MACNUM>9),5
:? MACNUM
JE 310 POSITION 37-(LEN(FIL$
)>999)-(LEN(FIL$)>99)
-(LEN(FIL$)>9),6:? LE
N(FIL$)
BL 320 POSITION 25,8:RESTORE
AUTO+3000:READ CODE$
:IF LEN(CODE$)>14 THE
N CODE$(10)=CODE$(12)
:CODE$(4)=CODE$(6)
LP 330 POSITION 23,8:? CODE$
:;OFFSET=132:L=10
KK 340 GOSUB 120
LG 350 IF CODE=15 OR CODE=69
THEN OFFSET=OFFSET+4
0-240*(OFFSET>292)
LB 360 IF CODE=14 OR CODE=78
THEN OFFSET=OFFSET-4
0+240*(OFFSET<172)
GH 370 IF CODE=42 OR CODE=10
6 OR OFFSET=132 AND C
ODE=12 OR OFFSET=132
AND CODE=76 THEN GOSU
B 480:GOTO 290
JG 380 IF CODE=62 OR CODE=12
6 OR OFFSET=212 AND C
ODE=12 OR OFFSET=212
AND CODE=76 THEN GOSU
B 1110:GOTO 290
DH 390 IF CODE=0 OR CODE=64
OR OFFSET=172 AND COD
E=12 OR OFFSET=172 AN
D CODE=76 THEN GOSUB
1300:OFFSET=172:L=10:
GOTO 290
GG 400 IF CODE=18 OR CODE=82
OR OFFSET=252 AND CO
DE=12 OR OFFSET=252 A
ND CODE=76 THEN GOSUB
1750:OFFSET=252:L=10
:GOTO 290
KD 410 IF CODE=63 OR CODE=12

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7 OR OFFSET=292 AND C
ODE=12 OR OFFSET=292
AND CODE=76 THEN GOSU
B 1040:OFFSET=292:L=1
0:GOTO 290
HD 420 IF CODE=16 OR CODE=80
OR OFFSET=332 AND CO
DE=12 OR OFFSET=332 A
ND CODE=76 THEN GOSUB
1790:GOTO 290
EH 430 IF CODE=47 OR CODE=11
1 THEN POKE 752,0:POS
ITION 0,21:END
BI 440 GOTO 340
HM 450 REM
IN 460 REM EDIT KEY
HP 470 REM
BO 480 CONSOLE=1:TEMP$="":MA
C1$="":MAC2$="":MAC3$
="":SCREEN$(401,441)=
"|(9, )@ress(, )+ey
(, )to(, )$efine(10 , )|
"
OB 490 OFFSET=409:L=21:GOSUB
120:MACKEY=CODE:MACK
EY$=CHR$(MACKEY):IF C
ODE=255 THEN 480
DC 500 SCREEN$(401,481)="|se
fning(, )+ey(Z){25 , )
|I|Z|X|(, )<DOWN>(, )$el
(, )key(2 , )$3|(, )
<DOWN>(, )$one(2 , )$E2
(, )<DOWN>(, )!bort1"
CJ 510 POSITION 15,10:? CODE
$;:OFFSET=520:L=1:POS
ITION 0,13
LG 520 GOSUB 780
OF 530 GOSUB 120:IF CONS<7 T
HEN 570
AO 540 IF OFFSET+LEN(CODE$)>
959 THEN ? CHR$(253);
:GOTO 530
PP 550 OFFSET=OFFSET+LEN(COD
E$)
BP 560 ? CODE$;:MAC1$(LEN(MA
C1$)+1)=CODE$:MAC2$(L
EN(MAC2$)+1)=CHR$(COD
E):POKE 764,255:GOTO
530
JI 570 IF CONS=5 THEN 720
JP 580 IF CONS=6 THEN 860
NJ 590 IF CONS>3 THEN 490
HK 600 REM
BB 610 REM DELETE LAST KEY P
RESSED
HM 620 REM
LD 630 IF LEN(MAC2$)=0 THEN
530
JB 640 SOUND 0,20,10,6:RESTO
RE ASC(MAC2$(LEN(MAC2
$),LEN(MAC2$))+3000
EJ 650 READ CODE$:FOR I=1 TO
LEN(CODE$):OFFSET=OF
FSET-1:POKE SCRMEM+OF
FSET,0:MAC1$(LEN(MAC1
$))=""
NF 660 IF PEEK(85)>0 THEN PO
KE 85,PEEK(85)-1:GOTO
680
BC 670 POKE 85,39:POKE 84,PE
EK(84)-1
MC 680 NEXT I:MAC2$(LEN(MAC2
$))="" :SOUND 0,0,0,0:
GOTO 530
ID 690 REM
CH 700 REM SELECT - STOPS ED
IT
HM 710 REM
LG 720 IF LEN(MAC2$)=0 THEN
740
IH 730 FIL$(LEN(FIL$)+1)=CHR
$(MACKEY):FIL$(LEN(FI

```

```

L$)+1)=CHR$(LEN(MAC2$
)):FIL$(LEN(FIL$)+1)=
MAC2$:MACNUM=MACNUM+1
HL 740 RETURN
IA 750 REM
JK 760 REM KEY ALREADY DEFIN
ED?
IC 770 REM
IK 780 CHPOS=1
CI 790 IF CHPOS>LEN(FIL$) TH
EN RETURN
GC 800 SKIP=ASC(FIL$(CHPOS+1
,CHPOS+1))
IO 810 IF FIL$(CHPOS,CHPOS)=
MACKEY THEN 920
KD 820 CHPOS=CHPOS+SKIP+2:GO
TO 790
HP 830 REM
GI 840 REM ABORT - NO CHANGE
IB 850 REM
NB 860 IF LEN(MAC3$)=0 THEN
880
IO 870 FIL$(LEN(FIL$)+1)=CHR
$(MACKEY):FIL$(LEN(FI
L$)+1)=CHR$(LEN(MAC3$
)):FIL$(LEN(FIL$)+1)=
MAC3$:MACNUM=MACNUM+1
IA 880 RETURN
IF 890 REM
HH 900 REM PREVIOUSLY DEFINE
D KEY
HO 910 REM
FB 920 MAC2$=FIL$(CHPOS+2,CH
POS+1+SKIP):MAC3$=MAC
2$
AH 930 FOR I=1 TO LEN(MAC2$)
:RESTORE ASC(MAC2$(I
, I))+3000:READ CODE$:?
CODE$;:MAC1$(LEN(MAC
1$)+1)=CODE$:NEXT I
BL 940 OFFSET=OFFSET+LEN(MAC
1$):IF CHPOS=1 THEN 9
60
LN 950 TEMP$=FIL$(1,CHPOS-1)
OE 960 IF CHPOS+2+SKIP>LEN(
FIL$) THEN 980
FF 970 TEMP$(LEN(TEMP$)+1)=F
IL$(CHPOS+2+SKIP,LEN(
FIL$))
IO 980 FIL$=TEMP$:MACNUM=MAC
NUM-1
HF 990 IF OFFSET>960 THEN OF
FSET=OFFSET-40:GOTO 9
90
KB 1000 RETURN
KB 1010 REM
NJ 1020 REM AUTO KEY
KI 1030 REM
DB 1040 SCREEN$(401,481)="|
(9, )@ress(, )+ey(, )t
o(, )!utorun(9 , )|I
(, )@ress(, )<UP>3hif t
<LEFT>(UP)#tr1<LEFT>
<UP>%sc<LEFT>(, )for
(, )no(, )auto(, )|"
NL 1050 OFFSET=409:L=22:GOSU
B 120
FI 1060 AUTO=CODE
KI 1070 RETURN
KW 1080 REM
PN 1090 REM SAVE FILE
KG 1100 REM
PD 1110 SCREEN$(401,480)="|&
ile(, )name(Z){12 , )
<UP>%3#<LEFT>(, )to
(, )%xit(3 , )|I(38 , )
|"
DL 1120 POSITION 1,11:? FN$;
:L=1:CH=LEN(FN$)-7:0
FFSET=444+CH:CFLAG=1
GOSUB 120:IF NOT TY
PE THEN ? CHR$(253);
:GOTO 1130
KB 1130

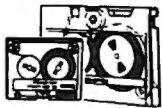
```

```

EH 1140 IF KEY=155 THEN CFLA
0=0:GOTO .220
OH 1150 IF KEY=27 THEN CFLAG
=0:GOTO 290
ND 1160 IF KEY=126 AND CH=0
THEN 1200
IP 1170 IF KEY=126 THEN SCRE
EN$(OFFSET,OFFSET+4)
="(N)3/&(, )":CH=CH-(
CH)0:OFFSET=OFFSET-
(CH)-1:GOTO 1200
KK 1180 POSITION 4+CH,11:? C
HR$(KEY);UP$;
JI 1190 IF CH<8 THEN OFFSET=
OFFSET+1:CH=CH+1
IE 1200 SCREEN$(OFFSET+1,OFF
SET+4)="(N)3/&"
NC 1210 GOTO 1130
II 1220 POSITION 0,11:POKE 8
42,13:INPUT FN$:POKE
842,12:POSITION 0,1
1:? "I";
I=LEN(FN$)
BC 1240 IF FN$(I,I)="" THEN
I=I-1:FN$=FN$(I,I):
GOTO 1240
KL 1250 OPEN #2,8,0,FN$:PUT
#2,MACNUM:PUT #2,AUT
O:FOR I=1 TO LEN(FIL
$):PUT #2,ASC(FIL$(I
,I)):NEXT I
KO 1260 CLOSE #2:RETURN
KO 1270 REM
IA 1280 REM READ DIRECTORY
LA 1290 REM
DR 1300 DR$="":SCREEN$(401,4
80)="|(38 , )|I(38 , )
|"
DI 1310 OPEN #2,6,0,"D:*.SOF
"
FA 1320 INPUT #2;F$
MF 1330 IF F$(5,8)="FREE" TH
EN DR$(LEN(DR$)+1)=F
$(1,16):GOTO 1350
AK 1340 DR$(LEN(DR$)+1)=F$(3
,10):GOTO 1320
JE 1350 CLOSE #2
ND 1360 DRL=LEN(DR$)
MF 1370 FOR I=1 TO DRL:DR$(I
,I)=CHR$(ASC(DR$(I,I
))-32):NEXT I
IO 1380 IF LEN(DR$)<17 THEN
POSITION 1,4:? "NO
FILE$";CHR$(253):FO
R I=1 TO 350:NEXT I:
GOTO 1530
PL 1390 SCREEN$(412,428)=DR$
(DRL-16,DRL):DRL=DRL
-16:DR$(DRL+1)="" :DR
E=DRL/8-1
CC 1400 SCREEN$(441,480)="|
(, )\J(F){UP}2%452.
<LEFT>(, )to(, )$elect
<2 , )<UP>%3#<LEFT>
(, )to(, )%xit(, )|"
NO 1410 FOR I=0 TO 5:IF (I#8
)+1>LEN(DR$) THEN PO
P :GOTO 1440
IH 1420 SCREEN$(123+(I#40),1
23+7+(I#40))=DR$(1+(
I#8),8+(I#8))
FA 1430 NEXT I
AF 1440 OFFSET=121:L=10:DRC=
0
PC 1450 SFLAG=1:GOSUB 120
NH 1460 IF CODE=15 OR CODE=6
9 THEN IF OFFSET=321
AND DRC<DRE THEN DR
C=DRC+1:GOSUB 1660:G
OTO 1520
EC 1470 IF CODE=15 OR CODE=6
9 THEN OFFSET=OFFSET
+40*(OFFSET<321 AND

```


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COD



IB 3055 DATA >,0
KL 3056 DATA f,1
KD 3057 DATA h,1
KL 3058 DATA d,1
DA 3060 DATA <CAPS>,0
KI 3061 DATA g,1
LF 3062 DATA s,1
KE 3063 DATA a,1
JB 3064 DATA L,2
JA 3065 DATA J,2
IB 3066 DATA :,2
JF 3069 DATA K,2
JH 3070 DATA \,0
JP 3071 DATA ^,0
JB 3072 DATA O,2
JD 3074 DATA P,2
JH 3075 DATA U,2
PL 3076 DATA <RETN>,2
JC 3077 DATA I,2
KH 3078 DATA -,0
HF 3079 DATA I,0
JJ 3080 DATA V,2
II 3082 DATA C,2
IK 3085 DATA B,2
KB 3086 DATA X,2
KE 3087 DATA Z,2
BN 3088 DATA \$,0
BF 3090 DATA #,0
BJ 3091 DATA &,0
BK 3093 DATA %,0
GI 3094 DATA ",0
BI 3095 DATA !,0
GD 3096 DATA [,0
KH 3098 DATA],0
JL 3099 DATA N,2
IK 3101 DATA M,2
HL 3102 DATA ?,0
PI 3103 DATA <SHFT><INVR>,0
JC 3104 DATA R,2
IH 3106 DATA E,2
JH 3107 DATA Y,2
JJ 3109 DATA T,2
JE 3110 DATA W,2
IP 3111 DATA Q,2
GF 3112 DATA (,0
GI 3114 DATA),0
GH 3115 DATA ',0
OF 3116 DATA <DEL-LINE>,0
IC 3117 DATA @,0
CE 3118 DATA <CLEAR>,0
PH 3119 DATA <INS-LINE>,0
IE 3120 DATA F,2
IH 3121 DATA H,2
IE 3122 DATA D,2
JA 3124 DATA <SHFT><CAPS>,0
IK 3125 DATA G,2
JH 3126 DATA S,2
IB 3127 DATA A,2
DP 3128 DATA <CTRL>L,0
DO 3129 DATA <CTRL>J,0
CH 3130 DATA <CTRL>;,0
DK 3133 DATA <CTRL>K,0
JF 3134 DATA <CTRL><LEFT>,0
OJ 3135 DATA <CTRL><RIGHT>,0
EE 3136 DATA <CTRL>O,0
EE 3138 DATA <CTRL>P,0
EK 3139 DATA <CTRL>U,0
KA 3140 DATA <CTRL><RETN>,0
DH 3141 DATA <CTRL>I,0
AD 3142 DATA <CTRL><UP>,0
KC 3143 DATA <CTRL><DOWN>,0
EH 3144 DATA <CTRL>V,0
DB 3146 DATA <CTRL>C,0
DI 3149 DATA <CTRL>B,0
EB 3150 DATA <CTRL>X,0
EJ 3151 DATA <CTRL>Z,0
CE 3152 DATA <CTRL>4,0
CF 3154 DATA <CTRL>3,0
CJ 3155 DATA <CTRL>6,0
EJ 3156 DATA <CTRL><ESC>,0
CK 3157 DATA <CTRL>5,0
CI 3158 DATA <CTRL>2,0

NG 3160 DATA <CTRL><COMMA>,0
NB 3161 DATA <CTRL><SPACE>,0
BP 3162 DATA <CTRL>.,0
EA 3163 DATA <CTRL>N,0
EB 3165 DATA <CTRL>M,0
CE 3166 DATA <CTRL>/,0
AC 3167 DATA <CTRL><INVR>,0
EJ 3168 DATA <CTRL>R,0
DF 3170 DATA <CTRL>E,0
EK 3171 DATA <CTRL>Y,0
ED 3172 DATA <CTRL><TAB>,0
EH 3173 DATA <CTRL>T,0
EL 3174 DATA <CTRL>W,0
EB 3175 DATA <CTRL>Q,0
CP 3176 DATA <CTRL>9,0
CI 3178 DATA <CTRL>0,0
DA 3179 DATA <CTRL>7,0
IL 3180 DATA <CTRL><DEL-CHAR>,0
CK 3181 DATA <CTRL>B,0
CP 3182 DATA <CTRL><,0
KD 3183 DATA <CTRL><INS-CHAR>,0
DL 3184 DATA <CTRL>F,0
DO 3185 DATA <CTRL>H,0
DL 3186 DATA <CTRL>D,0
JK 3188 DATA <CTRL><CAPS>,0
EB 3189 DATA <CTRL>G,0
EF 3190 DATA <CTRL>S,0
DE 3191 DATA <CTRL>A,0
DI 3200 DATA <SHFT><CTRL>O,0
DL 3202 DATA <SHFT><CTRL>P,0
PB 3203 DATA <SHFT><CTRL>U,0
FA 3204 DATA <SHFT><CTRL><RETN>,0
DH 3205 DATA <SHFT><CTRL>I,0
MH 3206 DATA <SHFT><CTRL>-,0
NH 3207 DATA <SHFT><CTRL>=,0
NE 3216 DATA <SHFT><CTRL>4,0
NF 3218 DATA <SHFT><CTRL>3,0
NJ 3219 DATA <SHFT><CTRL>6,0
PA 3220 DATA <SHFT><CTRL><ESC>,0
NB 3221 DATA <SHFT><CTRL>5,0
NP 3222 DATA <SHFT><CTRL>2,0
MP 3223 DATA <SHFT><CTRL>1,0
IG 3224 DATA <SHFT><CTRL><COMMA>,0
IG 3225 DATA <SHFT><CTRL><SPACE>,0
HP 3226 DATA <SHFT><CTRL>.,0
PA 3227 DATA <SHFT><CTRL>N,0
PB 3229 DATA <SHFT><CTRL>M,0
HL 3230 DATA <SHFT><CTRL>/,0
KJ 3231 DATA <SHFT><CTRL><INVR>,0
PA 3232 DATA <SHFT><CTRL>R,0
OF 3234 DATA <SHFT><CTRL>E,0
PK 3235 DATA <SHFT><CTRL>Y,0
PD 3236 DATA <SHFT><CTRL><TAB>,0
PH 3237 DATA <SHFT><CTRL>T,0
PL 3238 DATA <SHFT><CTRL>W,0
PG 3239 DATA <SHFT><CTRL>Q,0
NG 3240 DATA <SHFT><CTRL>9,0
HP 3242 DATA <SHFT><CTRL>0,0
NH 3243 DATA <SHFT><CTRL>7,0
JI 3244 DATA <SHFT><CTRL><BACKSPACE>,0
NK 3245 DATA <SHFT><CTRL>B,0
NP 3246 DATA <SHFT><CTRL><,0
OC 3247 DATA <SHFT><CTRL>>,0
OL 3248 DATA <SHFT><CTRL>F,0
OO 3249 DATA <SHFT><CTRL>H,0
OC 3250 DATA <SHFT><CTRL>D,0
EB 3252 DATA <SHFT><CTRL><CAPS>,0
OI 3253 DATA <SHFT><CTRL>G,0
PF 3254 DATA <SHFT><CTRL>S,0
HP 3255 DATA -NONE-,0

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Time Stamp For IBM

Lawrence H. Bannister

Have you ever found yourself knee-deep in printouts, unsure which was the latest version? Or have you ever wanted to check the execution time of a program and had to look for a stopwatch? If so, the program accompanying this article is just what you need. With it, you can stamp the system time on any screen. DOS 2.0 or higher is required, along with BASICA for the PC, GW-BASIC for compatibles, or Cartridge BASIC for the PC Jr.

One of the nicest things about the PC is the PrtSc key, which allows you to print the current screen. This makes it easy to get quick printouts of portions of program listings, spreadsheets, databases, or word processor text. The only problem with using the PrtSc key is that you have no way of knowing when a particular screen was printed. If you've been working for several hours and have numerous versions of the same screen, it's difficult to tell which is the most recent.

"Time Stamp," the program accompanying this article, solves this problem by allowing you to display the current system time in either the upper right-hand corner of the screen or on the command line.

Getting Started

Time Stamp is a BASIC loader. Type in the program, save a copy to a disk, and then run it. It will create the executable program called SHOWTIME.COM on the same disk. (After you've used the loader to create SHOWTIME.COM, you won't need it again.) You can rename SHOWTIME.COM any legal

filename you'd like, as long as it has an extension of .COM. To run Time Stamp, simply type SHOWTIME (or whatever name you used for the file) on the command line at the DOS prompt. Your PC will respond with

Resident code loaded at nnnn

where nnnn is Time Stamp's address in the memory of your particular machine.

Time Stamp is a resident utility, so after loading it into your PC or compatible, you will always have the two Time Stamp functions available. The key combination Alt-1 (holding down the Alt key while pressing the number 1 key on the top row of the keyboard), will display the current system time in the upper-right corner of the screen. The key combination Alt-2 also displays the current system time, but this combination places the time stamp at the end of the line the cursor is on. (If you don't have a battery-operated clock on your PC, be sure to set the correct time when you boot the system.)

Using The Program

The first of Time Stamp's two functions—placing a time stamp at the top-right corner of the screen—is particularly useful when you're writing a document with a word processor or writing a program, and you use Shift-PrtSc frequently to keep a record of your work. Each piece of paper will be stamped with the time at which it was printed, so there never will be any doubt about which is the latest version.

Using Time Stamp is simple. All you need to do to place the time stamp on your screen is press the Alt-1 combination. Then press Shift-PrtSc to print your screen.

Please note, however, that some applications may either use the Alt-1 combination for a command themselves or treat pressing it as an error. In either of these situations, Time Stamp may not work properly.

The second function, which places a time stamp at the end of the line on which the cursor is currently located, provides a convenient way to check the running time of a program or a long loop in a program. Simply press Alt-2 immediately before Enter to start your program, and press Alt-2 again when it ends. The starting time will stay with your command line as your program outputs to the screen and the screen scrolls up. You can also press Alt-2 while your program is running to place a time stamp at the end of any intermediate output line.

Using Time Stamp With BASIC

In a few cases, you may have to modify your command procedure slightly if you want to use Alt-2 to place a time mark at the end of a command line before you execute it.

For example, if you use Alt-2 and then press function key F2 to run a BASICA program, BASIC will think that the time mark is intended to be a line number and will report an error.

This minor problem is easily solved. Don't use the F2 key. Instead, type RUN followed by a single apostrophe to denote a comment, then press Alt-2 to place the time mark on the command line. Finally, press Enter to execute the command.

Deleting Time Stamp

If Time Stamp has been installed and you want to delete it—to free

the memory space—simply run it again. You'll receive the message

Resident code deleted

If you need Time Stamp back, just run it again, and it will load itself into memory exactly the way it did the first time.

Time Stamp

For instructions on entering this program, please refer to "COMPUTE!'s Guide to Typing in Programs" elsewhere in this issue.

```

BN 10 *Copyright 1988 COMPUTE! P
      ublications, Inc. - All Ri
      ghts Reserved
NB 20 *SHOWTIME.BAS Used once t
      o create SHOWTIME.COM
DP 30 GOTO 860
ND 40 DATA E9,56,01,9C,9A,00
LC 50 DATA 00,00,00,1E,50,53
PN 60 DATA 88,40,00,8E,08,8B
PH 70 DATA 1C,00,8B,07,48,48
AB 80 DATA 3B,C3,75,03,8B,3C
KL 90 DATA 00,8B,08,8B,07,3D
DI 100 DATA 00,78,74,09,3D,00
LL 110 DATA 79,74,04,5B,58,1F
PI 120 DATA CF,C7,07,00,81,8C
JG 130 DATA CB,8E,08,07,14,02
BP 140 DATA FB,51,52,57,56,B4
DI 150 DATA 00,CD,1A,8B,C1,D1
ND 160 DATA E1,D1,E1,D1,E1,2B
ID 170 DATA CB,2B,D1,73,01,48
KB 180 DATA B1,04,D3,E0,F6,C4
LC 190 DATA 01,74,03,05,60,00
JL 200 DATA 3C,A0,72,03,55,60
ND 210 DATA 00,D2,EB,05,30,30
BD 220 DATA 88,26,16,02,A2,17
ND 230 DATA 02,D1,EA,8B,CA,D1
  
```

```

LK 240 DATA EA,03,D1,B4,06,8A
NA 250 DATA C6,D1,E0,D1,E0,D1
LA 260 DATA E0,81,E2,FF,1F,88
DA 270 DATA 26,19,02,8B,CA,D1
IN 280 DATA E1,D1,E1,03,D1,B4
ND 290 DATA 03,8A,C6,D1,E0,D1
BN 300 DATA E0,D1,E0,D1,E0,81
BN 310 DATA E2,FF,0F,88,26,1A
PL 320 DATA 02,8B,CA,D1,EA,03
PC 330 DATA D1,D1,EA,D1,EA,80
NA 340 DATA C6,30,8B,36,1C,02
IE 350 DATA 32,F6,D1,E2,8B,CA
DO 360 DATA D1,E1,D1,E1,03,D1
OH 370 DATA 80,C6,30,8B,36,1D
DD 380 DATA 02,84,0F,CD,10,50
ND 390 DATA B4,03,CD,10,58,52
IJ 400 DATA 8B,0E,14,02,81,F9
LN 410 DATA 00,79,74,02,86,00
IK 420 DATA 8A,D4,80,EA,08,B4
PD 430 DATA 02,CD,10,BE,16,02
KI 440 DATA B9,01,00,8A,04,3C
LB 450 DATA 24,74,0F,56,B4,0A
BP 460 DATA CD,10,FE,C2,B4,02
BF 470 DATA CD,10,5E,46,EB,EB
DJ 480 DATA 5A,B4,02,CD,10,5E
NC 490 DATA 5F,5A,59,E9,19,FF
LE 500 DATA 00,00,00,00,3A,00
EL 510 DATA 00,3A,00,00,24,52
FB 520 DATA 65,73,69,64,65,6E
DC 530 DATA 74,20,63,6F,64,65
BP 540 DATA 20,69,6E,73,74,61
LN 550 DATA 6C,6C,65,64,20,61
GC 560 DATA 74,20,24,52,65,73
BB 570 DATA 69,64,65,6E,74,20
IO 580 DATA 63,6F,64,65,20,64
EH 590 DATA 65,6C,65,74,65,64
DJ 600 DATA 0D,0A,24,30,0D,0A
FL 610 DATA 24,00,00,B4,35,80
DH 620 DATA 09,CD,21,8C,06,07
NB 630 DATA 01,89,1E,05,01,BF
CB 640 DATA 09,01,8B,F7,B9,14
ED 650 DATA 02,2B,CE,FC,F3,A6
  
```

```

EN 660 DATA 75,29,BA,3B,02,84
NK 670 DATA 09,CD,21,B4,35,80
BD 680 DATA 09,CD,21,8D,5F,02
AD 690 DATA 26,8B,17,8D,5F,02
GO 700 DATA 26,8E,1F,B4,25,80
NG 710 DATA 09,CD,21,8B,00,49
FL 720 DATA CD,21,8B,00,4C,CD
HK 730 DATA 21,BA,1F,02,84,09
BO 740 DATA CD,21,8C,CB,89,04
CO 750 DATA 04,8B,D3,D3,C2,8B
FD 760 DATA DA,80,E2,0F,80,CA
KF 770 DATA 30,80,FA,3A,72,03
JO 780 DATA 80,C2,07,B4,02,CD
HF 790 DATA 21,FE,CD,75,E4,8A
DP 800 DATA 53,02,B4,09,CD,21
NK 810 DATA BA,1F,02,B1,04,D3
LB 820 DATA EA,42,89,16,57,02
KF 830 DATA BA,03,01,B4,25,80
HM 840 DATA 09,CD,21,8B,16,57
HP 850 DATA 02,8B,00,31,CD,21
NJ 860 WIDTH 80:CLS:PRINT TAB(8)
      "Copyright 1988 COMPUTE!
      Publications, Inc. - All
      Rights Reserved":PRINT:PR
      INT
E1 870 CHKSUM=0
HB 880 OPEN "O", #1, "SHOWTIME.C
      OM":FOR IX = 1 TO 492
LB 890 READ A$
KC 900 J% = VAL("&H"+A$)
BP 910 CHKSUM = CHKSUM + J%
JK 920 PRINT #1, CHR$(J%);
HN 930 NEXT IX
PG 940 CLOSE
CP 950 IF CHKSUM = 52556! THEN P
      RINT "SHOWTIME.COM create
      d" : END
HK 960 PRINT "ERROR : Checksum i
      ncorrect : Review all dat
      a statements"
DP 970 KILL "SHOWTIME.COM" : END
      ©
  
```

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Quick Check

Phone Number And Address Filer For The ProDOS Ramdisk

Ronald G. Jones

Beginning Apple users can put their ramdisk to good use with this BASIC phone number and address filer. By keeping the program and its data in RAM, you have instant access to the names and phone numbers of friends and associates. There's also an option for displaying emergency numbers. The program runs on an Apple IIe with 128K of memory, IIc, and IIGS. ProDOS is required.

"Quick Check" uses ProDOS's incredibly fast ramdisk to store up to 250 names, phone numbers, and addresses. In addition, Quick Check holds six emergency numbers which can be brought quickly to the screen. All entries may be searched and edited. So that you won't lose any information, the program reminds you to save your data to a floppy disk whenever an entry has been changed.

Getting Started

To use Quick Check, type in Programs 1-3 using the "Automatic Proofreader" found elsewhere in this issue. Program 1 creates a data file and an exec file (explained later), Program 2 transfers your phone/address file from floppy disk to RAM, and Program 3 is the Quick Check program itself.

After typing them in, save each program on the same disk—preferably a ProDOS system disk (one you can boot with). Save Program 1 as DATA.GEN, Program 2 as

TRANS.SYD01, and Program 3 as QUICK.CHECK.

Load and run Program 1. This creates two files on your disk: SYD01, and INSTALL.QUICK. (You only need to run this program once to create these two files.) The SYD01 file is Quick Check's data file. Initially, SYD01 starts out empty.

INSTALL.QUICK is an exec file. To use Quick Check, you should execute this file using Applesoft's EXEC command every time you boot your computer. This transfers the Quick Check program and its data file from floppy disk to RAM. If you saved Quick Check's programs on a ProDOS system disk, you may add the following line to the end of your STARTUP file:

```
10000 PRINT CHR$(4);"EXEC  
INSTALL.QUICK"
```

Otherwise, simply enter EXEC INSTALL.QUICK directly from the keyboard, after booting with ProDOS. Be sure the disk that contains Quick Check's files is in the disk drive.

After Quick Check has been transferred to the ramdisk, it can be loaded and run instantaneously. As with a normal disk, however, loading programs from the ramdisk erases anything located in the BASIC workspace. So, if you are working on a BASIC program and wish to run Quick Check, save your current program to disk first.

To activate Quick Check, enter the following:

```
~/RAM/PH
```

With amazing speed, Quick Check is loaded and run.

Using The Program

When run, Quick Check offers these five options:

1. DISPLAY EMERGENCY NUMBERS
2. LOOK UP INFORMATION
3. EDIT AN ENTRY
4. ADD AN ENTRY
5. END PROGRAM

To make a selection, highlight the desired option by using the up-arrow and down-arrow keys, or press the corresponding number key. Press Return to make your selection final.

Display Emergency Numbers

When you select Display Emergency Numbers, all six emergency numbers are displayed on the screen. Press any key other than C to return to the main menu.

If you wish to change one of the entries, press C while the emergency numbers are displayed on the screen. One by one, the computer lists each name and number to the screen, asking if you wish to make a change. If you say yes, you can choose to edit either the name or number part of the entry. After editing an entry, the program asks if your changes are correct. If you answer no, you are given the chance to edit the entry's name or number again. Once the program has brought you through all six emergency numbers, you return to the main menu.

Look Up Information

Upon selecting this option, the program asks "What am I to look for?" Just type in the name—not the number—of the entry you wish to view, and press Return. (This option does not search emergency numbers, but rather, the 250 numbers you enter using the Add An Entry option described below.)

If you have entries for Jane Doe and John Doe, for example, you may search for Doe and the program will display both entries. If you wish to view all the entries in the directory, simply press Return without giving a name to search for. After you have searched for entries, you can return to the main menu by pressing Return.

Edit An Entry

As with the previous option, the computer asks what you're looking for. Type in the name, in part or in full, of the entry that you are searching for. If you're not sure which entry you wish to edit, enter a U and Quick Check will go through each entry in your file. Entering an A aborts this option.

For each entry that Quick Check finds, the program asks if you wish to change anything. Answer by pressing Y if you do, N if you don't. For each entry, you can change the name, number, street address, city/state, and zip code. When editing address entries, don't use a comma between the city and state.

Add An Entry

Here's where you add names and numbers to the program. When selected, you are asked to enter the name, number, street address, city/state, and zip code of an entry, in that order. Remember to use a space rather than a comma between the city and state entries. After entering all five lines, Quick Check displays your entry, asking if it is correct. If it's not, press N and reenter the information for that entry. (You must reenter the entire entry, not just the incorrect line.) If it's correct, press Y and you're brought back to the main menu.

End Program

To exit Quick Check, select this option. If any changes have been made to your file, the program asks

you to insert your Quick Check disk (the one with all the Quick Check files on it) into the drive and press C to continue. Your updated data will be saved to disk. This is important because any information stored in the ramdisk is destroyed when you turn off your computer. If you do not want to save your data just yet, press A and you'll return to the main menu.

If you haven't modified any of the entries, Quick Check simply clears the screen and ends. Both the program and its data file are still on ramdisk if you need them again.

For instructions on entering these programs, please refer to "COMPUTE!'s Guide to Typing in Programs" elsewhere in this issue.

Program 1: Quick Check—Data/Exec File Creator

```
80 100 REM COPYRIGHT 1988 COMPUTE! PUBLICATIONS - ALL RIGHTS RESERVED
3E 110 HOME : PRINT " COPYRIGHT 1988 COMPUTE! PUBL., INC ."; PRINT TAB( 11);"ALL RIGHTS RESERVED": VTAB 12: PRINT " CREATING EXEC AND DATA FILES."
3F 120 D$ = CHR$( 4):FF$ = "/RAM/PH":FI$ = "TRANS.SYD01":FH$ = "INSTALL.QUICK"
4F 130 PRINT : PRINT D$;"OPEN SYD01": PRINT D$;"WRITE SYD01"
FE 140 FOR X = 1 TO 6: READ A$: PRINT A$: PRINT "*****": NEXT : PRINT "0"
13 150 PRINT : PRINT D$;"CLOSE SYD01"
7B 160 PRINT : PRINT D$;"OPEN ";FH$: PRINT D$;"WRITE";FH$
E1 170 PRINT "HOME:PRINT ";CHR$(34);"TRANSFERRING QUICK CHECK TO RAM DISK.": PRINT "LOAD QUICK.CHECK": PRINT "SAVE ";FF$: PRINT "LOAD ";FI$: PRINT "RUN": PRINT "NEW": PRINT "HOME"
34 180 PRINT : PRINT D$;"CLOSE";FH$
AF 190 PRINT "DONE."
2A 200 DATA POLICE, DOCTOR, AMBULANCE, FIRE DEPARTMENT, POISON CONTROL, EXTRA
```

Program 2: Quick Check—Data File Transfer

```
80 100 REM COPYRIGHT 1988 COMPUTE! PUBLICATIONS - ALL RIGHTS RESERVED
7A 110 D$ = CHR$( 4): DIM EM$(6, 1),PH$(250, 4)
8B 120 PRINT : PRINT D$;"OPEN SYD01": PRINT D$;"READ SYD01"
84 130 FOR X = 1 TO 6: FOR Y = 0 TO 1: INPUT EM$(X,Y): NEXT Y,X
1B 140 INPUT PH: IF PH = 0 THEN 160
```

```
7C 150 FOR X = 1 TO PH: FOR Y = 0 TO 4: INPUT PH$(X,Y): NEXT Y,X
15 160 PRINT : PRINT D$;"CLOSE SYD01"
2B 170 PRINT D$;"CREATE /RAM/SYD01,TTXT"
AA 180 PRINT D$;"OPEN /RAM/SYD01"
EE 190 PRINT D$;"WRITE /RAM/SYD01"
77 200 FOR X = 1 TO 6: FOR Y = 0 TO 1: PRINT EM$(X,Y)
AA 210 NEXT Y,X: PRINT PH: IF PH = 0 THEN 230
32 220 FOR X = 1 TO PH: FOR Y = 0 TO 4: PRINT PH$(X,Y): NEXT Y,X
24 230 PRINT : PRINT D$;"CLOSE /RAM/SYD01"
```

Program 3: Quick Check—Main Program

```
75 6 REM COPYRIGHT 1988 COMPUTE! PUBLICATIONS, INC. ALL RIGHTS RESERVED.
84 7 HOME : TEXT : VTAB 10: HTAB 13: PRINT "COPYRIGHT 1988": HTAB 7: PRINT "COMPUTE! PUBLICATIONS, INC.": HTAB 10: PRINT "ALL RIGHTS RESERVED."
54 8 FOR I = 1 TO 2500: NEXT
39 10 HOME : TEXT : POKE 34,4:D$ = CHR$( 4):OM = 0
81 20 DIM EM$(6, 1),PH$(250, 4)
0F 30 RESTORE : FOR X = 1 TO 5: READ MI$(X): NEXT
79 40 PRINT : PRINT D$;"OPEN /RAM/SYD01": PRINT D$;"READ /RAM/SYD01": FOR X = 1 TO 6: FOR Y = 0 TO 1: INPUT EM$(X,Y): NEXT Y,X
29 50 INPUT PH: IF PH = 0 THEN 70
66 60 FOR X = 1 TO PH: FOR Y = 0 TO 4: INPUT PH$(X,Y): NEXT Y,X
8C 70 PRINT : PRINT D$;"CLOSE /RAM/SYD01"
96 80 HOME : VTAB 4: HTAB 4: PRINT "QUICK CHECK PHONE & ADDRESS FILE"
DE 90 V = 5:H = 6
74 100 FOR X = 1 TO 5: GOSUB 1000: NEXT :X = 1
FA 110 INVERSE : GOSUB 1000
9A 120 VTAB 23: HTAB 20: GET AN$:AN = ASC (AN$): IF AN = 13 THEN 180
C3 130 GOSUB 1000
E7 140 IF X > 1 AND AN = 11 OR AN = 8 AND X > 1 THEN X = X - 1: GOTO 110
62 150 IF X < 5 AND AN = 21 OR AN = 10 AND X < 5 THEN X = X + 1: GOTO 110
9E 160 AN = VAL (AN$): IF AN < 1 OR AN > 5 THEN 110
86 170 X = AN: GOTO 110
2F 180 ON X GOTO 200,300,400,500,600
8F 200 POKE 34,0: HOME : VTAB 4: HTAB 11: INVERSE : PRINT "EMERGENCY NUMBERS": NOR MAL
E9 210 VTAB 7: PRINT : FOR X = 1 TO 6 STEP 2: FOR Y = 0 TO 1:K$ = EM$(X,Y): GOSUB 1020: HTAB (11 - H): PRIN
```



```

T EM$(X,Y);
93 220 K$ = EM$(X + 1,Y): GOSUB
1020: HTAB (20 - H): PRIN
T EM$(X + 1,Y): NEXT Y: P
RINT : PRINT : NEXT X
E4 230 VTAB 21: HTAB 7: PRINT "P
RESS 'C' TO MAKE CHANGES"
: VTAB 23: HTAB 1: PRINT
"ANYTHING ELSE TO RETURN
TO MAIN MENU"
4B 240 VTAB 23: HTAB 39: GET AN$
: IF AN$ = "C" OR AN$ = "
c" THEN 250
54 245 HOME : POKE 34,4: GOTO 80
4C 250 HOME : VTAB 4: HTAB 8: PR
INT "CHANGE EMERGENCY NUM
BERS": POKE 34,4
4D 260 FOR X = 1 TO 6: HOME : VT
AB 10: PRINT : FOR Y = 0
TO 1:K$ = EM$(X,Y): GOSUB
1020: HTAB (20 - H): PRI
NT EM$(X,Y): PRINT : NEXT
Y
C3 270 VTAB 16: HTAB 3: PRINT "D
O YOU WISH TO CHANGE THIS
ENTRY ?"
F3 280 VTAB 19: HTAB 20: GET AN$
: IF AN$ = "Y" OR AN$ = "
y" THEN 700
2F 285 IF AN$ < > "N" AND AN$ <
> "n" THEN 280
83 290 NEXT : POKE 34,0: HOME :
POKE 34,4
D3 295 GOTO 80
3E 300 HOME : VTAB 5: HTAB 10: P
RINT "LOOK UP INFORMATION
": IF PH = 0 THEN 1030
E1 310 VTAB 10: HTAB 8: PRINT "W
HAT SHALL I LOOK FOR?":Q
Q = 0: VTAB 12: HTAB 10:
INPUT "":AN$:AN = LEN (AN
$):LN = 5:KK = 0
17 320 FOR X = 1 TO PH:Y = 0: FO
R Z = 1 TO LEN (PH$(X,Y))
: IF AN$ = MID$(PH$(X,Y)
,Z,AN) THEN GOSUB 360:Z =
LEN (PH$(X,Y))
9C 330 NEXT Z: IF KK = 1 THEN VT
AB 24: HTAB 7: PRINT "PRE
SS ANY KEY TO CONTINUE":
GET BN$: HOME :KK = 0
6F 340 NEXT X
93 345 IF QQ = 0 THEN 355
61 350 GOTO 1040
6E 355 HOME : VTAB 12: HTAB 7: P
RINT "I FIND NO MATCHING
ENTRIES": GOTO 1040
7F 360 PRINT : FOR W = 0 TO 4:K$
= PH$(X,W): GOSUB 1020:
HTAB (20 - H): PRINT PH$(
X,W): NEXT W:QQ = QQ + 1
4E 365 LN = LN + 6: IF LN > 22 T
HEN KK = 1:LN = 5
21 370 RETURN
A3 400 HOME : VTAB 5: HTAB 13: P
RINT "EDIT AN ENTRY:": IF
PH = 0 THEN 1030
9E 410 VTAB 10: HTAB 2: PRINT "P
LEASE ENTER NAME OF ENTRY
TO EDIT": VTAB 12: HTAB
10: PRINT "ENTER 'U' IF U
NKOWN": VTAB 14: HTAB 16
: PRINT "'A' TO ABORT"
FB 420 VTAB 16: HTAB 20:AN$ = ""
: INPUT "":AN$:AN = LEN (
AN$)
1C 423 IF AN$ = "" THEN 80
CE 425 IF AN$ = "A" OR AN$ = "a"
THEN 80
61 428 IF AN$ = "U" OR AN$ = "u"
THEN 460
F9 430 LN = 5:KK = 0: HOME
67 435 Y = 0: FOR X = 1 TO PH: F
OR Z = 1 TO LEN (PH$(X,Y)
): IF KK < > 0 THEN 445
C8 440 IF AN$ = MID$(PH$(X,Y),Z
,AN) THEN GOSUB 840
12 445 NEXT Z,X: IF LN = 5 THEN
355
89 450 GOTO 80
C1 455 HOME : VTAB 12: HTAB 7: P
RINT "THERE ARE NO MORE E
NTRIES": GOTO 1040
9D 460 X = 0
C8 465 KK = 0:X = X + 1: IF X >
PH THEN 455
A9 470 GOSUB 840: IF KK = 0 THEN
465
D1 475 GOTO 80
7F 500 HOME : VTAB 5: HTAB 14: P
RINT "ADD AN ENTRY:": IF
PH = 250 THEN 1050
C3 510 VTAB 10: HTAB 7: PRINT "P
LEASE ENTER NAME TO ADD -
": HTAB 20: INPUT "":PH$(
PH + 1,0)
C3 515 PRINT : HTAB 10: PRINT "E
NTER PHONE NUMBER -": HTA
B 20: INPUT "":PH$(PH + 1
,1)
E7 520 PRINT : HTAB 9: PRINT "EN
TER STREET ADDRESS -": HT
AB 20: INPUT "":PH$(PH +
1,2)
23 525 PRINT : HTAB 11: PRINT "E
NTER CITY & STATE -": HTA
B 20: INPUT "":PH$(PH + 1
,3)
C3 530 PRINT : HTAB 13: PRINT "E
NTER ZIP CODE -": HTAB 20
: INPUT "":PH$(PH + 1,4)
88 540 FOR S = 0 TO 4: IF PH$(PH
+ 1,S) = "" THEN PH$(PH
+ 1,S) = "###"
83 545 NEXT S
A5 550 HOME : VTAB 6: PRINT : FO
R S = 0 TO 4:K$ = PH$(PH
+ 1,S): GOSUB 1020: HTAB
(20 - H): PRINT PH$(PH +
1,S): PRINT : NEXT S: PRI
NT : PRINT : PRINT
E1 555 HTAB 11: PRINT "IS THIS C
ORRECT ?"
68 560 VTAB 23: HTAB 20: GET AN$
: IF AN$ = "N" OR AN$ = "
n" THEN 580
39 565 IF AN$ < > "Y" AND AN$ <
> "y" THEN 560
55 570 HOME : VTAB 12: HTAB 10:
PRINT "ENTRY IS NOW ON FI
LE":PH = PH + 1:OM = OM +
1: GOTO 1040
57 580 HOME : VTAB 12: HTAB 5: P
RINT "WOULD YOU LIKE TO T
RY AGAIN ?"
85 585 VTAB 14: HTAB 20: GET AN$
: IF AN$ = "N" OR AN$ = "
n" THEN 80
AC 590 IF AN$ < > "Y" AND AN$ <
> "y" THEN 585
8A 595 GOTO 500
9C 600 IF OM < > 0 THEN GOSUB 61
0
3F 605 POKE 34,0: HOME : TEXT :
END
DD 610 HOME:VTAB 8:HTAB 10:PRINT
"I MUST SAVE CHANGES":VT
AB 10:HTAB 3:PRINT "PLEAS
E MAKE SURE YOUR PHONE #
DISK"
2D 615 VTAB 12: HTAB 13: PRINT "
IS IN DRIVE 1"
C8 620 VTAB 14: HTAB 9: PRINT "P
RESS 'C' TO CONTINUE": VT
AB 16: HTAB 15: PRINT "'A
' TO ABORT"
88 625 VTAB 17: HTAB 20: GET AN$
: IF AN$ = "A" OR AN$ = "
a" THEN POP : GOTO 80
BA 630 IF AN$ < > "C" AND AN$ <
> "c" THEN 625
CE 640 GOSUB 1010
64 645 FF$ = "SYD01": GOSUB 660
51 650 FF$ = "/RAM/SYD01": GOSUB
660
34 655 RETURN
5D 660 PRINT : PRINT D$:"OPEN "
: FF$
FD 665 PRINT D$:"WRITE " :FF$
EE 670 FOR X = 1 TO 6: FOR Y = 0
TO 1: PRINT EM$(X,Y): NE
XT Y,X
83 675 PRINT PH: IF PH = 0 THEN
685
42 680 FOR X = 1 TO PH: FOR Y =
0 TO 4: PRINT PH$(X,Y): N
EXT Y,X
45 685 PRINT : PRINT D$:"CLOSE "
:FF$
28 690 RETURN
2C 700 HOME : VTAB 8: HTAB 3: PR
INT "CHANGE:"
F1 710 FOR Z = 0 TO 1: PRINT : H
TAB 5: PRINT Z + 1:". " :E
M$(X,Z): NEXT
88 720 VTAB 11: HTAB 3: PRINT "O
R"
51 730 VTAB 15: HTAB 20: GET AN$
:AN = VAL (AN$): IF AN <
1 OR AN > 2 THEN 730
E8 740 HOME :Z = AN - 1:K$ = EM$
(X,Z)
88 750 GOSUB 1020: VTAB 10: HTAB
(20 - H): PRINT EM$(X,Z)
C8 760 VTAB 12: HTAB 9: PRINT "P
LEASE INPUT NEW ENTRY"
6E 770 VTAB 14: HTAB 18: INPUT "
":EM$(X,Z)
98 780 HOME : VTAB 8: PRINT
76 790 FOR Z = 0 TO 1:K$ = EM$(X
,Z): GOSUB 1020: HTAB (20
- H): PRINT EM$(X,Z): NE
XT
E2 795 VTAB 16: HTAB 6: PRINT "I
S THIS ENTRY NOW CORRECT
?"
38 800 VTAB 18: HTAB 20: GET AN$
DC 810 IF AN$ = "N" OR AN$ = "n"
THEN 700
8F 820 IF AN$ < > "Y" AND AN$ <
> "y" THEN 800
89 830 OM = OM + 1: GOTO 290
96 840 HOME : VTAB 6: HTAB 2: PR
INT "IS THIS THE ENTRY YO
U WISH TO EDIT?": PRINT
: PRINT : PRINT
C8 850 FOR Q = 0 TO 4:K$ = PH$(X
,Q): GOSUB 1020: HTAB (20
- H): PRINT PH$(X,Q): NE
XT Q
F7 860 VTAB 23: HTAB 20: GET A$:
IF A$ = "N" OR A$ = "n"
THEN 370
88 870 IF A$ < > "Y" AND A$ < >
"y" THEN 860
7A 880 LN = 4:KW = 0
F6 890 FOR Q = 0 TO 4: HOME :K$
= PH$(X,Q): GOSUB 1020: V
TAB 12: HTAB (20 - H): PR
INT PH$(X,Q)
82 895 IF KW = 99 THEN 940
38 900 VTAB 15: HTAB 3: PRINT "D
O YOU WISH TO CHANGE THIS
LINE ?"
72 910 VTAB 17: HTAB 20: GET A$:
IF A$ = "N" OR A$ = "n"
THEN 940
83 920 IF A$ < > "Y" AND A$ < >
"y" THEN 910
A1 930 GOTO 950

```

```

09 940 NEXT
06 942 OM = OM + 1:KK = KK + 1:
RETURN
02 950 HTAB 9: PRINT "PLEASE ENT
ER NEW LINE": IF Q = 0 TH
EN HTAB 7: PRINT "ENTER '
*' TO DELETE ENTRY"
25 955 PRINT : HTAB 20: INPUT ""
;NA$: IF NA$ = "*" AND Q
= 0 THEN 970
58 960 PH$(X,Q) = NA$
0A 965 GOTO 940
32 970 FOR S = X TO PH - 1: FOR
G = 0 TO 4:PH$(S,G) = PH$
(S + 1,G): NEXT G,S:PH =
PH - 1:KW = 99: GOTO 940
0A 1000 VTAB (V + X * 2): HTAB H
: PRINT X;". ";MI$(X): N
ORMAL : RETURN
04 1010 HOME : VTAB 12: HTAB 11:
PRINT "ONE MOMENT PLEAS
E": RETURN
23 1020 K = LEN (K$):H = INT (K
/ 2): RETURN
0C 1030 VTAB 12: HTAB 6: PRINT "
THERE ARE NO ENTRIES ON
FILE"
5F 1040 VTAB 24: HTAB 13: PRINT
"PRESS ANY KEY";: GET AN
$: GOTO 80
09 1050 VTAB 12: HTAB 8: PRINT "
I'M SORRY, FILE IS FULL"
: GOTO 1040
0A 2000 DATA "DISPLAY EMERGENCY
NUMBERS", "LOOK UP INFORM
ATION ", "EDIT AN EN
TRY ", "ADD AN
ENTRY ", "EN
D PROGRAM "

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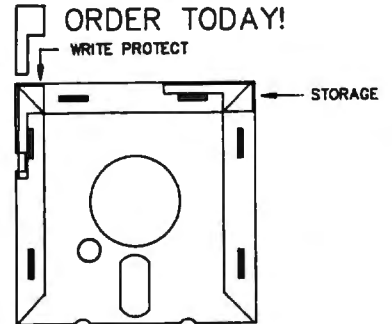
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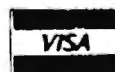
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The Elementary Amiga

Part 2

Jim Butterfield

The Amiga Workbench is fine for most applications. It gives you friendly access to most programs and files on disk. But it doesn't show you everything. To probe deeper, and to exercise greater control, you must activate the Command Line Interface (CLI). In this installment, we'll learn to use the CLI.

In many ways, the CLI is a traditional computer interface: You type in commands and receive responses in the form of text (sorry, no icons here). To use the CLI, you must first switch it on.

There are two ways to activate the CLI: an official method, and a quick-and-easy method. You're likely to use both at one time or another. Before using any of these methods, make a backup of your original Workbench disk and use the copy only. This way, your original disk is still available in case any problems occur.

First, we'll go over the official method of activating the CLI. Boot your system with Workbench and run Preferences. On the Preferences display, you'll see an area marked CLI with two boxes labeled OFF and ON. Click the ON box and then click the SAVE box at the lower right corner of the display. Close everything on the Workbench.

Now, when you reopen the Workbench disk, a new icon marked CLI appears in the System drawer. Double click this drawer and then on the CLI icon. A CLI window opens up.

Here's the unofficial method: Start the computer from a power-off condition or reboot by holding down the CTRL, Commodore, and Amiga keys at the same time. (On the Amiga 1000, these keys are designated CTRL, left-Amiga, and right-Amiga.) As the system is reading in the Workbench disk, hold down the CTRL and D keys simultaneously. Wait. The system stops with a BREAK message on the screen. When it does, release the keys. You're now in CLI.

Making A CLI Disk

The next step is to modify a Workbench disk so that the computer comes up in CLI every time. Here's how to do it: Boot with the Workbench disk to be modified and enter the CLI using one of the methods described above. From CLI, type ED S/STARTUP-SEQUENCE and press RETURN.

After a little disk activity, the screen changes to a new text display containing a series of CLI commands. Press the ESC key—this causes an asterisk to appear at the bottom of the screen—and then type B. This combination of key-

presses moves the cursor to the bottom of the text file.

At this point, the cursor should be on a line which reads ENDCLI >NIL: or something similar. Press the ESC key—there's the asterisk again—and then type D, for delete. The last line vanishes. If you prefer, you could just type a semicolon (;), inserting that character before the ENDCLI command. The semicolon acts like BASIC's REM statement, keeping the ENDCLI command from being executed. That's effectively the same as deleting the line.

If everything has gone as expected, press ESC one more time and then press the X key. The edited file is written to disk, replacing the original startup file. If by any chance you made a mistake—you pushed the wrong key, perhaps—press ESC and then Q, for quit. The computer asks if you really want to quit. Answer by pressing Y, and start over again from the ED S/STARTUP-SEQUENCE command.

From now on, this disk gives you the CLI every time you boot. To exit the CLI, just type ENDCLI and press RETURN (from now on, assume that all CLI commands are followed by the RETURN key). The CLI window disappears, leaving you with the Workbench screen. Most users leave the CLI active, however. It's easier to shrink the CLI window using the sizing gad-

get in the lower right-hand corner, and then click the back gadget to put it behind other windows on the Workbench screen. This way, the CLI sits there, waiting for you. Any time you need it, simply bring it to the front and click inside of it.

How It Works

The above procedure may seem puzzling at first, but it makes more sense as you learn more about your Amiga. We'll give a little background on the workings of the Amiga as it starts up, and then explain the modifications that we've made.

When the computer boots with the Workbench disk, it begins with a CLI window. This is where you see the copyright notices and release version number. During startup, the CLI doesn't wait for you to enter commands from the keyboard. Instead, it takes its instructions from a file called STARTUP-SEQUENCE.

A file containing CLI commands, such as STARTUP-SEQUENCE, has many names. Users with an MS-DOS background may use the term batch file. Another name, script file, comes from the idea that you can read the file (it's stored as text) and that the file contains a list of instructions. More accurately, however, I like to call it an *execute* file, since you can activate these files using the CLI command EXECUTE.

The computer doesn't care what you call it; it just searches the disk for a file called STARTUP-SEQUENCE. If it doesn't find it on the main part of the disk, it looks in the drawer called S, for Sequence. When it finds the file, it executes the commands it finds there. Some of these instructions put information on the screen (ECHO). Some of these commands adjust the way you access the disk (PATH). An important instruction, LoadWB, loads in the Workbench. The last instruction found in the standard startup file tells the CLI to self-destruct. That's the ENDCLI command.

Although the startup sequence begins automatically, we can stop it by holding down the CTRL and D keys. When pressed simultaneously, these two keys tell the computer, "if you're executing instructions

from a file, stop doing so." This is what happens when you use the unofficial method of accessing the CLI. Because the CLI aborts the startup sequence, it never gets to the ENDCLI instruction. Chances are, however, that the CLI never got to the LoadWB instruction either. If this is the case, the Workbench was never loaded and entering the ENDCLI command will lock up your computer, forcing you to reboot—no CLI, no Workbench, no computer.

To create a Workbench disk that boots up with the CLI active, we used a screen editor that comes on the Workbench disk called ED. There are other editors available—some of them quite marvelous—but everyone has good old ED, and it does the job just fine. By entering the command ED S/STARTUP-SEQUENCE, we ask the program ED to start, and to look in drawer S for a file called STARTUP-SEQUENCE. If found, the file is displayed on the screen where we can edit it.

When ED is running, the ESC key triggers what are called *extended commands*. All extended commands are prompted by an asterisk that appears on the bottom line of the screen. We used the extended commands: B, for go to bottom line; D, for delete the current line; and X, for exit the editor with file update. Extended command Q, if we needed it, caused the editor to quit without changing the file.

What did we do with STARTUP-SEQUENCE? We just eliminated the ENDCLI command at the end of the file. All the other commands in the startup sequence were left untouched. After editing the startup sequence, the Amiga boots as usual, except that the CLI remains on the screen. We could use the command ENDCLI and close the CLI window, but it's better to just move it out of the way when it's not in use.

First CLI Commands

The official CLI reference is *The AmigaDOS Manual*, published by Bantam Books. Be sure you get the revised edition—new CLI commands have been added since the book was first published. Here, I'll show a few commands that you can

experiment with.

If you have an Amiga 1000 or an unexpanded Amiga 500, you have to set the date and time every time you turn on your computer. Normally, we set the time using Preferences, but that requires a lot of mouse clicking. With the CLI's DATE command, it's a snap. For example, type DATE 25-Dec-87 11:20, and the job is done (assuming it's December 25, 1987, at 11:20 a.m.). Any time you want to know what the current date and time are, just enter DATE by itself and the computer responds obligingly.

Type DIR to get a directory listing of the current drive (drive 0). You can get the same listing by specifying drive 0 with the command DIR DF0:. If you have a second drive, you might like to put a disk in there and type the command DIR DF1: to see its contents.

If you have a printer, try making a hard copy of the directory. It's easy by using a feature called *I/O redirection*. The command DIR >PRT: DF0: sends the DIR command's output to the PRT: device (your printer). You could just as easily send the directory listing to a disk file. For example, the phrase >DLIST following a DIR sends everything to a file called DLIST. Pictorially, the greater-than sign (>) looks like an arrow, or a funnel. Think of redirection as a command to "pour" output to the given destination. Keep in mind that the redirection phrase must come immediately after a command.

You may notice that your disk has many drawers, or as the CLI calls them, directories. If you want to look inside a directory called Utilities, you give the command DIR UTILITIES (or DIR DF0:UTILITIES) and see what's in there. Or you could command DIR DF0: OPT A and see everything on the disk. OPT A, by the way, stands for Option All.

Icons And Info Files

In a disk directory listing, you'll see a number of files whose names end with *.info*. You might think these files contain information or documentation on the associated program. Not so. These files hold Workbench display information: the shape of the file's icon, location

of the icon in the disk's file window, and some of the other things seen when we use the Info option from the Workbench menu.

Most files have info files associated with them. Thus, if you have a program named DONKEY, you probably have a DONKEY.INFO file as well. This allows DONKEY to appear as an item on the Workbench. If you were to delete DONKEY.INFO, the program DONKEY would no longer appear in the Workbench display, but it would still exist and could be used from CLI.

Similarly, if we had a file called MONKEY which has no info file, we could make one by using the command COPY DONKEY.INFO TO MONKEY.INFO. The file MONKEY would then appear on the Workbench, but with one surprising result: The icons for both DONKEY and MONKEY would be located in exactly the same place, one on top of the other. To produce a sensible display, you would need to drag one of the icons to a new area and "log in" its new position with the Workbench's Snapshot option.

Don't assume that the CLI and Workbench are interchangeable. Many programs designed to work from the CLI do not work from the Workbench. That's usually because the CLI provides a ready-made screen area for input and output; a program running from the CLI may use what's already there. Workbench, in contrast, has no ready-made text window, and a program running under Workbench must know how to create such a window if needed.

DIR And LIST

We've used DIR to look at the contents of a disk. We may also use LIST to obtain a directory. Try LIST DF0: and see the difference. List not only displays the filenames, but the file size, protection status, date of creation, and any comment associated with a file.

The options for LIST are quite different from those of DIR. You can't use OPT A, for example. All commands may use redirection—that's part of the system's workings, not the command itself.

If you're not familiar with a command's syntax, type the com-

mand name followed by a space and a question mark. You'll be prompted by a description of the command's parameters (from now on referred to as a template). Thus, if you type DIR ? you see the template: DIR,OPT/K.

We read this as follows: The system needs the name of a DIRectory path (DF0: will do), followed, possibly, by OPTions. The K means that if you use options, you must precede them with the OPT keyword. (If the K were not there, it would mean you could omit the OPT keyword, and just supply the optional information.)

If we type LIST ? we see a much longer template. Again, DIR indicates that we may supply the name of a directory path, but then we see a long list of available options. I'll mention only a few here.

P = PAT/K is for filename pattern matching. P = PAT means that we may use either keyword P or PAT to activate pattern matching. The /K implies that if we use this option, we must enter either P or PAT. Space doesn't allow an in-depth discussion of pattern matching here, but here's a brief example that lists all files whose filename ends with .INFO: LIST P #?.INFO.

QUICK/S is an option that allows you to get a short or "quick" directory. (A quick LIST displays the names of the files and directories only.) The /S indicates that the keyword QUICK is a switch. By using the QUICK option, you switch on this feature.

For a third example of a command template, type COPY ? and you'll see FROM,TO/A,ALL/S, QUIET/S.

The FROM and TO parameters are flagged with /A, signifying that we must supply both the source and destination filenames—you must copy from somewhere to somewhere else. Anytime you're not sure about a command, type the question mark and examine the template.

Looking Ahead

There are a large number of commands available in CLI. You can see a list of these by typing DIR C:, or if you prefer, LIST C:. You don't need them all, by any means. We'll take a look at some of the more useful ones in the next few months. ©

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COMPUTE!'s Guide To Typing In Programs

Computers are precise—type the program *exactly* as listed, including necessary punctuation and symbols, except for special characters noted below. We have provided a special listing convention as well as a set of programs to check your typing—"The Automatic Proofreader."

Programs for the IBM and those in ST BASIC for Atari ST models should be typed exactly as listed; no special characters are used. Programs for Commodore, Apple, and Atari 400/800/XL/XE computers may contain some hard-to-read special characters, so we have a listing system that indicates these control characters. You will find these characters in curly braces; *do not type the braces*. For example, {CLEAR} or {CLR} instructs you to type the character which clears the screen on the Atari or Commodore machines. A complete list of these symbols is shown in the tables below. For Commodore, Apple, and Atari, a single symbol by itself within curly braces is a control key or graphics key. If you see {A}, hold down the CONTROL key and press A. This will produce a reverse video character on the Commodore (in quote mode), a graphics character on the Atari, and an invisible control character on the Apple.

For Commodore computers, graphics characters entered with the Commodore logo key are enclosed in a special bracket: [<A>]. In this case, you would hold down the Commodore logo key as you type A. Our Commodore listings are in uppercase, so shifted symbols are underlined>. A graphics heart symbol (SHIFT-S) would be listed as S. One exception is {SHIFT-SPACE}. When you see this, hold down SHIFT and press the space bar. If a number precedes a symbol, repeat the character the indicated number of times. For example, {5 RIGHT}, {6 S}, and [<8 Q>], mean, respectively, that you should enter five cursor rights, six shifted S's, and eight Commodore-Q's. On the Atari, inverse characters (white on black) should be entered with the inverse vid-

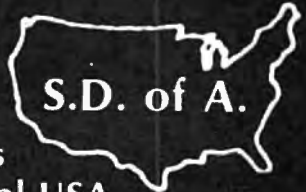
Atari 400/800/XL/XE

When you see	Type	See
{CLEAR}	ESC SHIFT <	⌘ Clear Screen
{UP}	ESC CTRL -	↑ Cursor Up
{DOWN}	ESC CTRL =	↓ Cursor Down
{LEFT}	ESC CTRL +	← Cursor Left
{RIGHT}	ESC CTRL *	→ Cursor Right
{BACK S}	ESC DELETE	⌫ Backspace
{DELETE}	ESC CTRL DELETE	⌫ Delete character
{INSERT}	ESC CTRL INSERT	⌫ Insert character
{DEL LINE}	ESC SHIFT DELETE	⌫ Delete line
{INS LINE}	ESC SHIFT INSERT	⌫ Insert line
{TAB}	ESC TAB	⌫ TAB key
{CLR TAB}	ESC CTRL TAB	⌫ Clear tab
{SET TAB}	ESC SHIFT TAB	⌫ Set tab stop
{BELL}	ESC CTRL 2	⌫ Ring buzzer
{ESC}	ESC ESC	⌫ ESCape key

Commodore PET/CBM/VIC/64/128/16/+4

When You Read:	Press:	See:	When You Read:	Press:	See:
{CLR}	SHIFT CLR/HOME	⌫	[1]	COMMODORE 1	⌘
{HOME}	CLR/HOME	⌘	[2]	COMMODORE 2	⌘
{UP}	SHIFT ↑ CRSR ↓	⌫	[3]	COMMODORE 3	⌘
{DOWN}	↑ CRSR ↓	⌫	[4]	COMMODORE 4	⌘
{LEFT}	SHIFT ← CRSR →	⌫	[5]	COMMODORE 5	⌘
{RIGHT}	← CRSR →	⌫	[6]	COMMODORE 6	⌘
{RVS}	CTRL 9	⌘	[7]	COMMODORE 7	⌘
{OFF}	CTRL 0	⌘	[8]	COMMODORE 8	⌘
{BLK}	CTRL 1	⌘	{ F1 }	f1	⌘
{WHT}	CTRL 2	⌘	{ F2 }	SHIFT f1	⌘
{RED}	CTRL 3	⌘	{ F3 }	f3	⌘
{CYN}	CTRL 4	⌘	{ F4 }	SHIFT f3	⌘
{PUR}	CTRL 5	⌘	{ F5 }	f5	⌘
{GRN}	CTRL 6	⌘	{ F6 }	SHIFT f5	⌘
{BLU}	CTRL 7	⌘	{ F7 }	f7	⌘
{YEL}	CTRL 8	⌘	{ F8 }	SHIFT f7	⌘
				←	⌘

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eo key (Atari logo key on 400/800 models).

Whenever more than two spaces appear in a row, they are listed in a special format. For example, {6 SPACES} means press the space bar six times. Our Commodore listings never leave a single space at the end of a line, instead moving it to the next printed line as {SPACE}.

Amiga program listings and Atari ST program listings in GFA BASIC contain only one special character, the left arrow (\leftarrow) symbol. This character marks the end of each program line. Wherever you see a left arrow, press RETURN to enter that line into memory. (For the Amiga, you can also enter the line simply by moving the cursor off the line.) Don't try to type in the left arrow symbol; it's there only as a marker to indicate where each program line ends.

The Automatic Proofreader

Type in the appropriate program listed below, then save it for future use. The Commodore Proofreader works on the Commodore 128, 64, Plus/4, 16, and VIC-20. Don't omit any lines, even if they contain unfamiliar commands or you think they don't apply to your computer. When you run the program, it installs a machine language program in memory and erases its BASIC portion automatically (so be sure to save several copies before running the program for the first time). If you're using a Commodore 128, Plus/4 or 16, do not use any GRAPHIC commands while the Proofreader is active. You should disable the Commodore Proofreader before running any other program. To do this, either turn the computer off and on or enter SYS 64738 (for the 64), SYS 65341 (128), SYS 64802 (VIC-20), or SYS 65526 (Plus/4 or 16). To reenoble the Proofreader, reload the program and run it as usual. Unlike the original VIC/64 Proofreader, this version works the same with disk or tape.

The IBM Proofreader is a BASIC program that simulates the IBM BASIC line editor, letting you enter, edit, list, save, and load programs that you type. Type RUN to activate. Be sure to leave Caps Lock on, except when typing lowercase characters.

On the Atari, run the Proofreader to activate it (the Proofreader remains active in memory as a machine language program); you must then enter NEW to erase the BASIC loader. Pressing SYSTEM RESET deactivates the Atari Proofreader; enter PRINT USR (1536) to reenoble it.

The Apple Proofreader erases the BASIC portion of itself after you run it, leaving only the machine language portion in memory. It works with either

DOS 3.3 or ProDOS. Disable the Apple Proofreader by pressing CTRL-RESET before running another BASIC program.

Once the Proofreader is active, try typing in a line. As soon as you press RETURN, either a hexadecimal number (on the Apple) or a pair of letters (on the Commodore, Atari, or IBM) appears. The number or pair of letters is called a *checksum*.

Compare the value displayed on the screen by the Proofreader with the checksum printed in the program listing in the magazine. The checksum is given to the left of each line number. Just type in the program a line at a time (without the printed checksum), press RETURN or Enter, and compare the checksums. If they match, go on to the next line. If not, check your typing; you've made a mistake. Because of the checksum method used, do not type abbreviations, such as ? for PRINT. On the Atari and Apple Proofreaders, spaces are not counted as part of the checksum, so be sure you type the right number of spaces between quote marks. The Atari Proofreader does not check to see that you've typed the characters in the right order, so if characters are transposed, the checksum still matches the listing. The Commodore Proofreader catches transposition errors and ignores spaces unless they're enclosed in quotation marks. The IBM Proofreader detects errors in spacing and transposition.

IBM Proofreader Commands

Since the IBM Proofreader replaces the computer's normal BASIC line editor, it has to include many of the direct-mode IBM BASIC commands. The syntax is identical to IBM BASIC. Commands simulated are LIST, LLIST, NEW, FILES, SAVE, and LOAD. When listing your program, press any key (except Ctrl-Break) to stop the listing. If you enter NEW, the Proofreader prompts you to press Y to be especially sure you mean yes.

Two new commands are BASIC and CHECK. BASIC exits the Proofreader back to IBM BASIC, leaving the Proofreader in memory. CHECK works just like LIST, but shows the checksums along with the listing. After you have typed in a program, save it to disk. Then exit the Proofreader with the BASIC command, and load the program as usual (this replaces the Proofreader in memory). You can now run the program, but you may want to re-save it to disk. This will shorten it on disk and make it load faster, but it can no longer be edited with the Proofreader. If you want to convert an existing BASIC program to Proofreader format, save it to disk with SAVE "filename",A.

Program 1: Atari Proofreader

By Charles Brannon

```
100 GRAPHICS 0
110 FOR I=1536 TO 1700:RE
AD A:POKE I,A:CK=CK+A
: NEXT I
120 IF CK<>19072 THEN ? "
Error in DATA Stateme
nts. Check Typing.":
END
130 A=USR(1536)
140 ? :? "Automatic Proof
reader Now Activated.
"
150 END
160 DATA 104,160,0,185,26
,3,201,69,240,7
170 DATA 200,200,192,34,2
08,243,96,200,169,74
180 DATA 153,26,3,200,169
,6,153,26,3,162
190 DATA 0,189,0,228,157,
74,6,232,224,16
200 DATA 208,245,169,93,1
41,78,6,169,6,141
210 DATA 79,6,24,173,4,22
8,105,1,141,95
220 DATA 6,173,5,228,105,
0,141,96,6,169
230 DATA 0,133,203,96,247
,238,125,241,93,6
240 DATA 244,241,115,241,
124,241,76,205,238
250 DATA 0,0,0,0,0,32,62,
246,8,201
260 DATA 155,240,13,201,3
2,240,7,72,24,101
270 DATA 203,133,203,104,
40,96,72,152,72,138
280 DATA 72,160,0,169,128
,145,88,200,192,40
290 DATA 208,249,165,203,
74,74,74,74,24,105
300 DATA 161,160,3,145,88
,165,203,41,15,24
310 DATA 105,161,200,145,
88,169,0,133,203,104
320 DATA 170,104,168,104,
40,96
```

Program 2: Commodore Proofreader

By Philip Nelson

```
10 VEC=PEEK(772)+256*PEEK(773)
:LO=43:HI=44
20 PRINT "AUTOMATIC PROOFREADE
R FOR ";:IF VEC=42364 THEN
[SPACE]PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VI
C-20"
40 IF VEC=35158 THEN GRAPHIC C
LR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=
46:GRAPHIC CLR:PRINT"128"
60 SA=(PEEK(LO)+256*PEEK(HI))+
6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POK
E ADR,BYT:ADR=ADR+1:CHK=CHK
+BYT:NEXT
80 IF CHK<>20570 THEN PRINT "**
ERROR* CHECK TYPING IN DATA
STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:
RS=SA+RF:HB=INT(RS/256):LB=
RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+L
F,LB:POKE SA+HF,HB:NEXT
```



```

110 IF CHK<>22054 THEN PRINT *
*ERROR* RELOAD PROGRAM AND
[SPACE]CHECK FINAL LINE":EN
D
120 POKE SA+149,PEEK(772):POKE
SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+
14,22:POKE SA+18,23:POKESA+
29,224:POKESA+139,224
140 PRINT CHR$(147):CHR$(17):"
PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (P
EEK(LO)+256*PEEK(HI))-1,0:N
EW
160 DATA 120,169,73,141,4,3,16
9,3,141,5,3
170 DATA 88,96,165,20,133,167,
165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
1,199,157,227,3
190 DATA 202,16,248,169,19,32,
210,255,169,18,32
200 DATA 210,255,160,0,132,180
,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
1,34,208,8,72
220 DATA 165,176,73,255,133,17
6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
3,167,165,168,105
250 DATA 0,133,168,202,208,239
,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
211,3,32,210,255
270 DATA 104,74,74,74,168,1
85,211,3,32,210
280 DATA 255,162,31,189,227,3,
149,199,202,16,248
290 DATA 169,146,32,210,255,76
,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
116,117,151,128,129,167,136
,137

```

Program 3: IBM Proofreader By Charles Brannon

```

10 *Automatic Proofreader Ver
sion 3.0 (Lines 205,206 ad
ded/190 deleted/470,490 ch
anged from V2.0)
100 DIM L$(500),LNUM(500):COL
OR 0,7,7:KEY OFF:CLS:MAX=
0:LNUM(0)=65536!
110 ON ERROR GOTO 120:KEY 15,
CHR$(4)+CHR$(70):ON KEY(1
5) GOSUB 640:KEY (15) ON:
GOTO 130
120 RESUME 130
130 DEF SEG=&H40:W=PEEK(&H4A)
140 ON ERROR GOTO 650:PRINT:P
RINT"Proofreader Ready."
150 LINE INPUT L$:Y=CSRLIN-IN
T(LEN(L$)/W)-1:LOCATE Y,1
160 DEF SEG=0:POKE 1050,30:PO
KE 1052,34:POKE 1054,0:PO
KE 1055,79:POKE 1056,13:P
OKE 1057,28:LINE INPUT L$
:DEF SEG:IF L$="" THEN 15
0
170 IF LEFT$(L$,1)=" " THEN L
$=MID$(L$,2):GOTO 170
180 IF VAL(LEFT$(L$,2))=0 AND
MID$(L$,3,1)=" " THEN L$
=MID$(L$,4)
200 IF ASC(L$)>57 THEN 260 'n
o line number, therefore
command

```

```

205 BL=INSTR(L$," "):IF BL=0
THEN BL=L$:GOTO 206 ELSE
BL$=LEFT$(L$,BL-1)
206 LNUM=VAL(BL$):TEXT$=MID$(
L$,LEN(STR$(LNUM))+1)
210 IF TEXT$="" THEN GOSUB 54
0:IF LNUM=LNUM(P) THEN 60
SUB 560:GOTO 150 ELSE 150
220 CKSUM=0:FOR I=1 TO LEN(L$
):CKSUM=(CKSUM+ASC(MID$(L
$,I)))$I AND 255:NEXT:LOC
ATE Y,1:PRINT CHR$(65+CKS
UM/16)+CHR$(65+(CKSUM AND
15))+" "+L$
230 GOSUB 540:IF LNUM(P)=LNUM
THEN L$(P)=TEXT$:GOTO 15
0 'replace line
240 GOSUB 580:GOTO 150 'inser
t the line
260 TEXT$="":FOR I=1 TO LEN(L
$):A=ASC(MID$(L$,I)):TEXT
$=TEXT$+CHR$(A+32*(A>96 A
ND A<123)):NEXT
270 DELIMITER=INSTR(TEXT$," "
):COMMAND$=TEXT$:ARG$="":
IF DELIMITER THEN COMMAND
$=LEFT$(TEXT$,DELIMITER-1
):ARG$=MID$(TEXT$,DELIMIT
ER+1) ELSE DELIMITER=INSTR
R(TEXT$,CHR$(34)):IF DELI
MITER THEN COMMAND$=LEFT$(
TEXT$,DELIMITER-1):ARG$=
MID$(TEXT$,DELIMITER)
280 IF COMMAND$<>"LIST" THEN
410
290 OPEN "scrn:" FOR OUTPUT A
S #1
300 IF ARG$="" THEN FIRST=0:P
=MAX-1:GOTO 340
310 DELIMITER=INSTR(ARG$,"-")
:IF DELIMITER=0 THEN LNUM
=VAL(ARG$):GOSUB 540:FIRS
T=P:GOTO 340
320 FIRST=VAL(LEFT$(ARG$,DELI
MITER)):LAST=VAL(MID$(ARG
$,DELIMITER+1))
330 LNUM=FIRST:GOSUB 540:FIRS
T=P:LNUM=LAST:GOSUB 540:IF
P=0 THEN P=MAX-1
340 FOR X=FIRST TO P:N$=MID$(
STR$(LNUM(X)),2)+" "
350 IF CKFLAG=0 THEN A$=""$0
TO 370
360 CKSUM=0:A$=N$+L$(X):FOR I
=1 TO LEN(A$):CKSUM=(CKSU
M+ASC(MID$(A$,I)))$I AND
255:NEXT:A$=CHR$(65+CKSUM
/16)+CHR$(65+(CKSUM AND 1
5))+" "
370 PRINT #1,A$+N$+L$(X)
380 IF INKEY$<>" " THEN X=P
390 NEXT :CLOSE #1:CKFLAG=0
400 GOTO 130
410 IF COMMAND$="LLIST" THEN
OPEN "lpt1:" FOR OUTPUT A
S #1:GOTO 300
420 IF COMMAND$="CHECK" THEN
CKFLAG=1:GOTO 290
430 IF COMMAND$<>"SAVE" THEN
450
440 GOSUB 600:OPEN ARG$ FOR O
UTPUT AS #1:ARG$=""$0:GOTO
300
450 IF COMMAND$<>"LOAD" THEN
490
460 GOSUB 600:OPEN ARG$ FOR I
NPUT AS #1:MAX=0:P=0
470 WHILE NOT EOF(1):LINE INP
UT #1,L$:BL=INSTR(L$," "
):BL$=LEFT$(L$,BL-1):LNUM(
P)=VAL(BL$):L$(P)=MID$(L$

```

```

,LEN(STR$(VAL(BL$)))+1):P
=P+1:WEND
480 MAX=P:CLOSE #1:GOTO 130
490 IF COMMAND$="NEW" THEN IN
PUT "Erase program - Are
you sure";L$:IF LEFT$(L$,
1)="y" OR LEFT$(L$,1)="Y"
THEN MAX=0:LNUM(0)=65536
!$0:GOTO 130:ELSE 130
500 IF COMMAND$="BASIC" THEN
COLOR 7,0,0:ON ERROR GOTO
0:CLS:END
510 IF COMMAND$<>"FILES" THEN
520
515 IF ARG$="" THEN ARG$="A:"
ELSE SEL=1:GOSUB 600
517 FILES ARG$:GOTO 130
520 PRINT"Syntax error":GOTO
130
540 P=0:WHILE LNUM>LNUM(P) AN
D P<MAX:P=P+1:WEND:RETURN
560 MAX=MAX-1:FOR X=P TO MAX:
LNUM(X)=LNUM(X+1):L$(X)=L
$(X+1):NEXT:RETURN
580 MAX=MAX+1:FOR X=MAX TO P+
1 STEP -1:LNUM(X)=LNUM(X-
1):L$(X)=L$(X-1):NEXT:L$(
P)=TEXT$:LNUM(P)=LNUM:RET
URN
600 IF LEFT$(ARG$,1)<>CHR$(34
) THEN 520 ELSE ARG$=MID$(
ARG$,2)
610 IF RIGHT$(ARG$,1)=CHR$(34
) THEN ARG$=LEFT$(ARG$,LE
N(ARG$)-1)
620 IF SEL=0 AND INSTR(ARG$,"
.")=0 THEN ARG$=ARG$+".BA
S"
630 SEL=0:RETURN
640 CLOSE #1:CKFLAG=0:PRINT"S
topped.":RETURN 150
650 PRINT "Error #";ERR:RESUM
E 150

```

Program 4: Apple Proofreader

By Tim Victor, Editorial
Programmer

```

10 C = 0: FOR I = 768 TO 768
+ 68: READ A:C = C + A:PO
KE I,A: NEXT
20 IF C < > 7258 THEN PRINT "
ERROR IN PROOFREADER DATA
STATEMENTS": END
30 IF PEEK (190 * 256) < > 76
THEN POKE 56,0: POKE 57,3
: CALL 1002: GOTO 50
40 PRINT CHR$(4):"IN#A$300"
50 POKE 34,0: HOME : POKE 34,
1: VTAB 2: PRINT "PROOFREA
DER INSTALLED"
60 NEW
100 DATA 216,32,27,253,201,14
1
110 DATA 208,60,138,72,169,0
120 DATA 72,189,255,1,201,160
130 DATA 240,8,104,10,125,253
140 DATA 1,105,0,72,202,208
150 DATA 238,104,170,41,15,9
160 DATA 40,201,58,144,2,233
170 DATA 57,141,1,4,138,74
180 DATA 74,74,74,41,15,9
190 DATA 48,201,58,144,2,233
200 DATA 57,141,0,4,104,170
210 DATA 169,141,96

```

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107 Amstrad	2-3
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109 Berkeley Softworks	1
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111 The Computer Book	49
112 Computer Direct	68-69
113 Computer Mail Order	40-41
114 Covox Inc.	97
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117 Indus-Tool	79
118 Lyco Computer	72-75
119 MECA	13
120 MicroProse Simulation Software	4
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123 Montgomery Grant	101
124 Near Future Computers	97
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129 Precision Images	97
130 Sir-tech Software, Inc.	16
131 Software Discounters of America	103
132 Strategic Simulations, Inc.	15
133 subLOGIC Corp.	9
134 subLOGIC Corp.	BC
135 Video Technology, Inc.	45

Classified Ads	108
COMPUTE! Books' Commodore Warehouse Clearance Sale	23
COMPUTE! Books' Electronic Battlefield and Submarine Commander	71
COMPUTE! Books for the Amiga	107
COMPUTE! Books' Warehouse Clearance Sale	21
COMPUTE!'s Sweepstakes	93
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118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134
135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151
152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185
186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202
203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219
220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236
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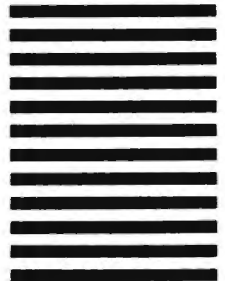
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