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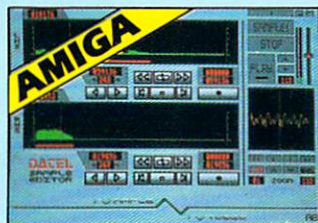
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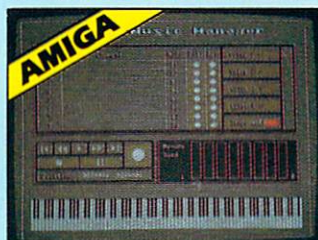
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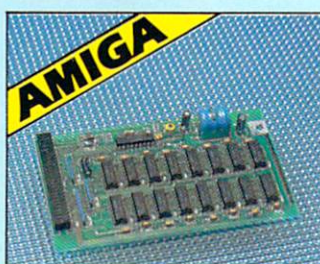


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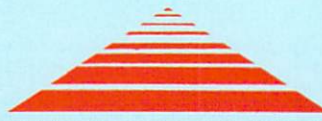


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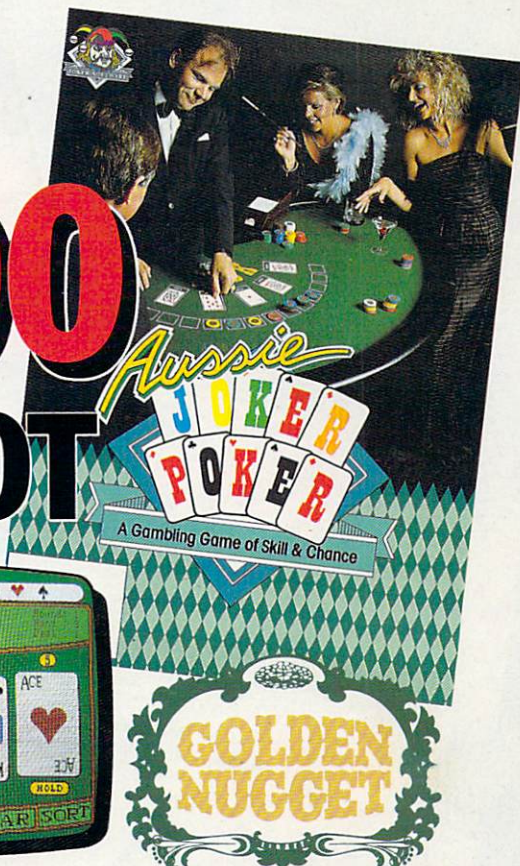
If ordering by telephone add \$3 shipping & handling and check that your PC meets the minimum hardware requirements as no cash refunds apply. Warranty is limited to free replacement of faulty products returned by prepaid post.



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### Aussie JOKER POKER Contest Rules

1. No purchase necessary to enter.
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3. To enter, simply complete and return the the official entry form.
4. Limit five entries per family or household. Five free entry forms and full contest rules are included with "Aussie Joker Poker" or may be obtained by sending a stamped self-addressed envelope larger than 5 1/2" x 7 1/2" with a hand written request to: Aussie Joker Poker Contest Entry Forms, P.O. Box 22381, Gilroy, CA 95021-2381. Mail-in requests limited to one per name, household or family and must be received no later than 3/31/89. WA & VT residents need not include return postage. Full rules also available from participating Mindscape retailers.
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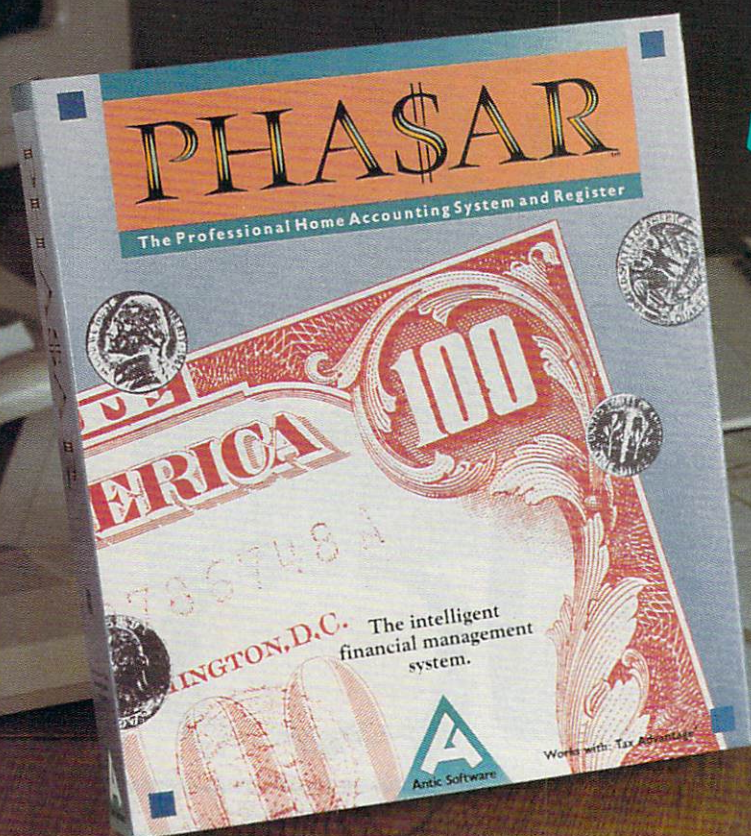
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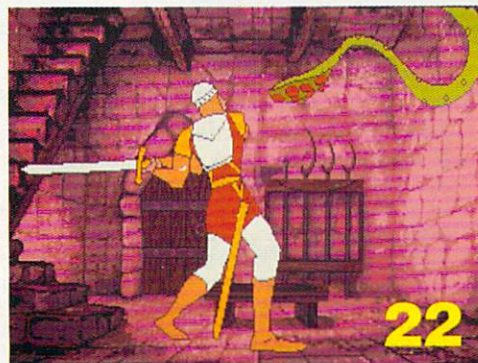
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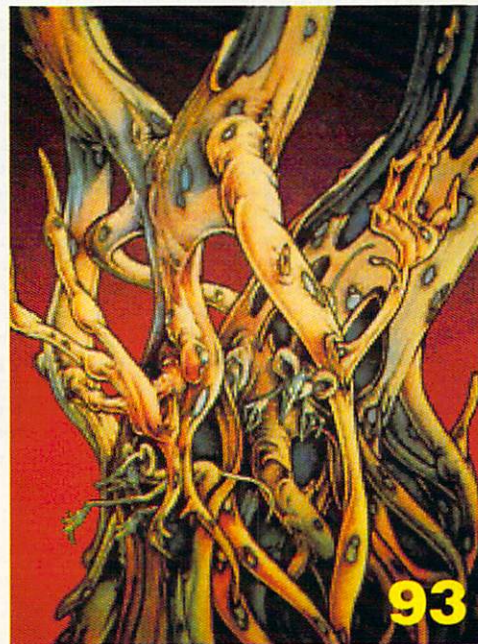
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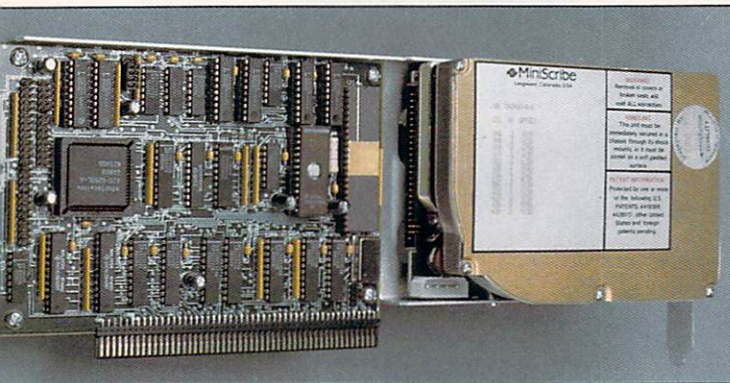


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## HardFrame/2000

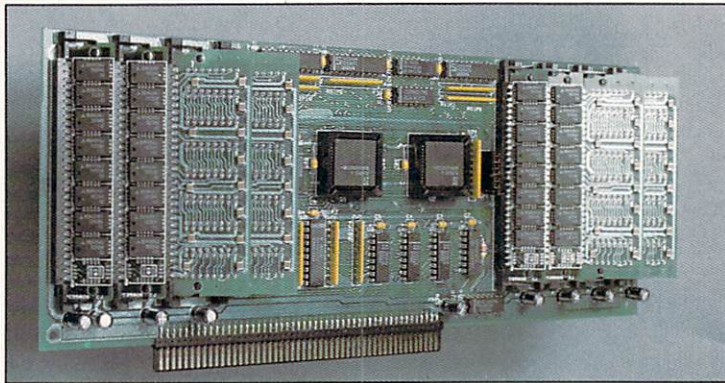
The Super-speed, DMA, SCSI Hard Disk Interface with 1.3 Autobooting



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The **HardFrame/2000** photo shows the product with a MiniScribe 20 megabyte hard disk installed. Hard disks are not included in the purchase price of **HardFrame**. Note that if placed in the first slot, **HardFrame** uses only one slot.

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The **8-UP!** photo shows the card half populated with conventional SIMM modules and half with MicroBotics *PopSIMM's*. *PopSIMM's* (without DRAM installed) are available as separate purchase items.



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Editorial inquiries should be addressed to The Editor, COMPUTE!, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408.

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## Perspectives from the Editors

Welcome to the premiere issue of *COMPUTE!'s Amiga Resource*—and get ready for an even bigger and better *Resource* next time.

This time we have an array of features and reviews, as well as the best columnists in the business: Jim Butterfield on the Command Line Interface, Shay Adams on entertainment, and our own Randy Thompson and Rhett Anderson taking sides on various Amiga topics. They'll be here every issue.

What do have we planned for *COMPUTE!'s Amiga Resource*? On the technical side, we'll be looking at both programming and hardware tips and techniques aimed at getting the best possible performance out of your computer. We'll offer a full range of reviews, buyer's guides, and new-product information. There'll be features both diverting and informative. The Amiga community—believe us!—is filled with strong opinions, and our columnists will both present and respond to those opinions. We're hoping for a lively letters page as well, so let us hear from you.

Perhaps more important than the news and opinions we can share is the window on Amiga creativity that we offer. This magazine is the showplace where your creativity can shine.

Already, we're putting together the first *COMPUTE!'s Amiga Resource Disk*, and we're confident that you'll be hard pressed to find a more creative, diverting package. There's "Advanced Laser Chess," the superb sequel to one of the most popular programs we've ever published. Strategy of another kind is shown to good effect in "Power Poker." We'll have some useful and exciting utilities on disk. Our "Amiga Art Gallery" will appear both on paper and on disk.

Where do we find these programs? How do we come by the art for our gallery? Most of the software and virtually all of the art come from our readers. We look closely at each submission we receive, and we pay for the privilege of publishing the best of it. If you're doing good work on the Amiga, think about showing it to us.

We've enjoyed your response to our special *Amiga User's Guide* series, and that response has helped set the direction for this new magazine. We hope you'll agree with us that *COMPUTE!'s Amiga Resource* is a different kind of Amiga publication—one that addresses topics and delivers information that you'll find nowhere else. Think of this as a transitional issue, midway between our user's guides and the full-fledged, disk-included *Resource*. Next time, with the addition of the disk, we'll be bringing you the most complete Amiga publication available. In other words, we'll be your resource.

Welcome to our first issue. We look forward to your response and to seeing you here for every issue and disk to come.

—Keith Ferrell

## Looking ahead...

The next issue of *COMPUTE!'s Amiga Resource* marks the debut of our disk, with software including "Advanced Laser Chess," an all-new and enhanced version of our award-winning strategy game.

Also on disk is "Power Poker," a hypnotic card game, as well as utilities and our exclusive "Amiga Art Gallery."

In the magazine, you'll find reading material galore, including the debut of some new columnists. Among them is Rob Peck, who'll be here every issue to answer your Amiga questions.

Dozens of reviews will bring you up-to-date on the latest Amiga products. We've got features that are sure to entertain and enlighten. And there's plenty of programming and technical advice.

A special charter subscriber offer can be found on page 92.

See you next time.



# READERS FEEDBACK

Do you have a question or a problem? Have you discovered something that could help other Amiga users? We want to hear from you. Write to Amiga Feedback, COMPUTE!'s Amiga Resource, P.O. Box 5406, Greensboro, NC 27403. We regret that, due to the volume of mail received, we cannot respond individually to programming questions.

## See Your Dealer

I've owned my Amiga 2000 for two months now. I installed an A2052 RAM card and it didn't work. I've been having a hard time getting it repaired under warranty. They say I voided it by installing the card. Nothing warns you of this. Could you find out about this and print something about it in your magazine?

David Huntz  
Pearl City, HI

Since your card would be worthless if you couldn't plug it into your Amiga 2000, we found it hard to believe that you could void your warranty by installing a card—especially the A2052 RAM card, which is made by Commodore, comes with user installation instructions, and is presumably up to Commodore's hardware specifications. So we called a Commodore Amiga dealer for more information. One comment he made was that he had heard that some people were installing Bridgeboards into their Amiga 2000s with such fervor that they sheared off a small row of capacitors near the base of the card. The dealer, in turn, directed us to one of Commodore's four regional service centers.

We had the privilege of getting in touch with Todd Butson, Commodore's Midwest Technical Advisor, based in Chicago. Mr. Butson said that although the card comes with user installation instructions, the user is ultimately responsible for any damage he or she causes while installing a card. The moral of the story is to have a qualified Commodore service repre-

sentative install any cards that you may purchase for your Amiga.

Mr. Butson also said that replacement chips, like the Kickstart 1.3 ROMs for the Amiga 500 and 2000 and the upcoming enhanced chip set for those same computers, or the replacement Denise chip for the Amiga 1000, should also be installed by your dealer.

According to Mr. Butson, Commodore's policy on this matter is similar to the policies of Apple and IBM.

We'd be interested in hearing from readers with similar experiences.

## Perfect Painting

I am planning to purchase an Amiga. I know it's a great machine for graphics, but I'm having trouble finding the right paint program. I'm definitely not a professional artist, but nevertheless, I'm interested in a product that takes full advantage of the Amiga's potential.

The paint programs I've seen have either been too technical, expensive, and overloaded with extra, difficult-to-use features, or have been oversimplified so as not to utilize the full power of the Amiga. Could you help me in picking an Amiga paint program that's complete, not aimed solely at professional users, and reasonably priced?

Wilson Lee  
Canton, MI

Needless to say, there are many, many Amiga programs. That's good, but it does complicate the process of choosing. Current paint programs can be divided (rather arbitrarily, we admit) into those that support the HAM (Hold And Modify) mode and those that don't. Because HAM paint programs support so many colors, they are well suited to manipulating digitized images. They also are good for painterly effects. With a good HAM paint program, you can simulate watercolors, pastels, or oils. In general, HAM paint programs are slower than their counterparts.

The king of the non-HAM paint programs is Deluxe Paint II (a new

version, Deluxe Paint III, is nearing completion), from Electronic Arts. It has the smoothest feel of any Amiga paint program. It's a good choice whether you're a beginner or an advanced user.

For HAM paint programs, Photon Paint, from MicroIllusions, is a good choice. It has most of the features of Deluxe Paint, plus some new ones.

A new program, Deluxe PhotoLab, from Electronic Arts, lets you draw in any Amiga mode. It's a good way to have the best of both worlds.

All the programs mentioned here are packed with features. You'll find that it won't take too long to accustom yourself to the tools you need most. Eventually, you'll probably find a use for each and every feature (and maybe even want more).

We'll tell you more about these and other Amiga paint programs in an upcoming issue of COMPUTE!'s Amiga Resource.

## TV, Amiga-Style

Could I buy just an Amiga 500 computer and play games on it on a regular color TV without having to buy any other hardware for it?

Mike Ross  
Browns Mills, NJ

Yes and no. The Amiga 500 has two video sources—an RGB connector and a monochrome composite output. The composite output is useful if you have a monochrome monitor, but nearly all Amiga users use an RGB color monitor like the Commodore 1084S.

If your television is fairly new, it may support direct composite input from your computer. Otherwise, you'll need a video modulator, which can be purchased at any Radio Shack store and most video stores. With the composite output, however, you'll get a picture that is black-and-white only (not good news for game players like you). To obtain color, you need an RGB monitor. We realize it will set you back some money, but there's really no stand-in for a good RGB monitor. ▲



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# TAKING SIDES

Rhett Anderson and Randy Thompson

## Disk Copiers—Pirate's Weapon or User's Tool?

**WEAPON!** Software companies might not be happy that I'm actually coming out and saying it, but I haven't found a *single program* that is safe from even the greenest of Amiga personal computer users. Disk copiers like *Marauder II* (discontinued once its producer started making copy-protected games), *Project D*, and *Raw Copy* are insidious programs that can make pirates out of us all.

Think about the stereotyped image of the pirate—a technically sophisticated hacker with too much time on his hands. On the Amiga, a pirate is someone who has enough money to buy a disk copier and not enough sense to know that pirating hurts the Amiga and all Amiga users.

We've heard the excuse for disk copiers: "Users have a right to make backup copies of their software." I don't argue with that. After all, suppose that you're a businessperson on a schedule. If your word processing program breaks down and you don't have a backup, you're in bad shape, right? Right, but what word processor is copy-

protected? *WordPerfect*? Nope. *ProWrite*? Nope. *KindWords*? Nope. Copy-protected productivity software is a rare bird indeed.

On the Amiga, it's the games that are copy-protected. Do you really need a backup of *Marble Madness*? Is it the process of legitimate backup that sells all these disk copiers? And we're not just talking backup here, folks. Some of these copiers actually re-

move the passwords that the manufacturers put in to keep from having to protect the disks.

How do these copiers hurt Amiga users? In the vain attempt to keep their games from being spread around like butter, game producers try out new and nastier copy protection. It works for a little while—sometimes even for the shelf life of the game.

A case in point: My all-time favorite computer game is *Time Bandits*. I could get an ulcer listening to the kachunk-kachunk-thoop-thoop-thoop of the game loading. Why don't the software companies just give up copy protection? Some have tried, only to find that their games got passed around faster than everyone else's.

Looking over at Mr. Thompson's side, we see the tired defenses we've all seen before. Luckily, he wakes us up with this amazing statement: "When you purchase something, you have the right to do whatever you need to make that product last as long as possible." I've never heard that bit of law before. Is this some forgotten amendment to the Constitution, Mr. Thompson?

**TOOL!** Maybe I've been twisted by some traumatic childhood experience. Perhaps I'm just immoral (my cohort Mr. Anderson calls me compulsive—among other things). But the first thing I do when I buy a new program is boot a disk copier and make a backup. I'm not talking about dragging a Workbench disk icon on top of DF1:BAD or executing DISKCOPY from the CLI. No, I use one of those evil, borderline-legal programs that are the tools of treacherous underground technology pirates; I use a copy program that can duplicate copy-protected software.

When you purchase something, you have the right to do whatever you need to make that product last as long as possible. With tape decks, that means cleaning the heads. With software, that means backing up your disks. And with copy-protection so common, backing up software *requires* the use of disk nibblers, crackers, parameters copiers, and so on. If anything, it's copy protection that should be stopped, not disk copiers.

When VCRs first came out, the television and movie industries tried to halt their production. They claimed that people would steal their services by handing out copies of movies and television shows to friends. Software manufacturers have the same concern. But just because a product can be abused doesn't mean that it should be abolished. You can kill someone with an ice pick, but banning sharp kitchen utensils is not the answer.

I don't condone software piracy, but copy programs serve a vital function. I wouldn't own a computer without one. They back up disks faster than Workbench could ever hope to and they back up programs that are otherwise uncopyable.

Looking over at Mr. Anderson's side, I'm humored by his holier-than-thou attitude. Climb down off your pedestal and confess, Mr. Anderson. I hear *Marauder's* sledgehammer pan pipe emanating from your office cubicle. You may not be pirating software, but *you are* using the software you so adamantly preach against.

Sure, it's games that are affected the most by copy protection. But I have the right to back up games, too. Games make up 75 percent of all Amiga software. For many Amiga owners, games are the reason they bought their computer. They don't want to shell out 40 bucks for the latest arcade challenge just to have their only copy go bad.

Save your breath, Mr. Anderson. As long as there's copy protection, copiers will remain useful and vital tools. ▲





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# JUST FOR FUN

Shay Addams

## Amiga: The Nintendo of the Nineties?

**THE PREMIER GAME MACHINE!** You won't be seeing that in a Commodore Amiga ad, but most game designers agree it's what the Amiga does best—and does better than any other computer. To find out why, I asked Brian Fargo (whose Interplay Productions recently shifted from developing software for Electronic Arts and other companies to manufacturing and marketing its own programs), Happy Keller (an Electronic Arts producer whose most recent Amiga effort was *Earl Weaver Baseball*), and Bob Jacob (president of Cinemaware, the biggest manufacturer of games for the Amiga). I also got some comments on the "dark side" of the Amiga from a freelance programmer who requested anonymity.

### Brian Fargo

**Addams:** Why did Interplay release *Battle Chess* on the Amiga first?

**Fargo:** We chose the Amiga because we wanted to make a splash. Since we're really like a new company, we wanted to do a product that was graphically stunning, something that people would remember us by, that would really stick out in a crowd. The Amiga has the best graphics capabilities of any computer out there, and it also has the stereo sound, again, to capture everyone's attention. And we've always been fond of the Amiga. It was the first machine out there to really do these types of graphics and sounds, so we've always had a place for it in our hearts.

**Addams:** From a game designer's perspective, what's so special about the Amiga's graphics?

**Fargo:** It's got the most colors you can put on the screen per se, in a normal mode. And it also has hardware support for the graphics, so we can do a lot more with the graphics because the hardware is handling it for us. And it's also 68000-based, so it's easier to write for than some of the other machines—say, the 6502. And the disks have plenty of storage—800K. The Amiga is definitely the best machine for graphics, sound, and processor power, no doubt about it.

**Addams:** How does it compare to the Apple IIGS and Atari ST as a gaming machine?

**Fargo:** The Apple IIGS does not have better graphics than

the Amiga. The sound is questionably better—you have more ranges, but it doesn't sound as full and is kind of tinny, though it's a great machine. You also have to program in 65816, which is just a superset of 6502, so it's not the greatest language. There's no hardware support for the graphics, and C runs slow on the GS. That makes the Amiga a clear standout.

Then the ST, which has a 68000 and runs C quite well, has a problem with its disk drives that hold only 380K–400K—which meant we'd have had to split *Battle Chess* into two disks, and we didn't want people to have to swap disks in the middle of a game. The sounds are nothing compared to the Amiga, and it has fewer colors. Plus, software sales of ST games are less than half of those for the Amiga.

**Addams:** How many people do you have working full-time on the Amiga?

**Fargo:** At least two of our seven programmers.

**Addams:** Would you call it a fun machine to program on?

**Fargo:** Fun? Programming fun? Well, it has so much power that it's fun. There are quirks with the system that make you want to throw it out the window sometimes. But overall it's fun to work on.

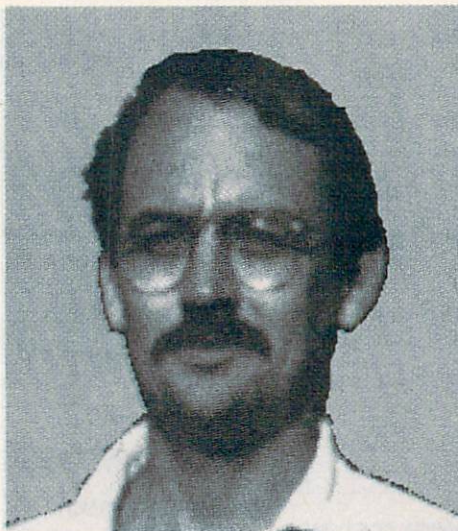
**Addams:** Are you planning more Amiga-first games?

**Fargo:** Yeah, we are. We like the idea of doing the Amiga version first—doing a program that is graphically stunning and state-of-the-art, that runs fast and sounds

good and looks good—and then taking it from there and going down [when converting it for other machines]. When you start at the top, your designs can be more ambitious, because you know you can do more; then you try and figure, *how am I going to get this one on the IBM?* But that's good, too, because it makes you push harder when you port down.

We got away with doing *Bard's Tale* first for the Apple and then going to the Amiga, but we redesigned the thing from scratch, as far as how it would look and feel, and it would have been easier if we'd started at the top and gone down. >

Guru meditation  
error—I never know  
when it's going to  
pop up.





## Happy Keller

**Addams:** Why do you like to program for the Amiga?

**Keller:** Doing an Amiga version of a game is a real good showcase for the product. And there are certain games that just really belong on the Amiga—that don't fit well on other computers. And you get super versions of existing games [when they're converted for the Amiga]. I really enjoy the digitized sounds we can produce on the Amiga because of its excellent sound capabilities. It's just the best blend of sound and graphics out there at a reasonable price. There are also more people who will purchase the product than if it were released on any other 68000-based machine.

**Addams:** What sort of games are best suited for the Amiga?

**Keller:** Well, *Interceptor*, with all its cinematography: all the different angles that you can fly from; looking at your plane from behind, underneath, or on top; turning your head all around. There are a lot of movie-type special effects that we could execute because there's enough horsepower in the machine.

**Addams:** What makes it particularly well-suited for that kind of game?

**Keller:** More colors and four-channel stereo sound. We've got a blitter and sprites and bobs, which our artists are able to manipulate to produce some special effects that just haven't been seen—or can't be seen—on other computers.

**Addams:** Do you think of the Amiga primarily as an entertainment machine now?

**Keller:** I do personally, because I'm in the entertainment studio. But we have an entire division that makes creativity products for the Amiga, and they're continually updating and improving those. For them, it's a creativity tool and a way of making presentations.

**Addams:** Electronic Arts supported the Amiga with a big ad campaign when it was first released. What was the reaction when the Amiga initially bombed?

**Keller:** In spite of the hardware sales not matching our expectations, we did quite well. And we're going to do more Amiga titles, and so are our affiliated titles.

**Addams:** Have you noticed a difference since the 500 has been out?

**Keller:** Some. Anytime there are more machines out there, sales will be up. Still, a true mega-hit title on the Amiga will only do about 25,000 units, which is a real small number compared to a mega-hit in the IBM market, which can do 150,000 or more. But it still makes good business sense, if doing a new game or port for a 68000 machine, to do it for the Amiga—because more people are willing to purchase it than copy it. For me personally, not being a representative of Electronic Arts, I find it amusing that the ST was put out as a kind of cheap Amiga, and it looks like the people who bought it for that reason have managed to kill it (because of

their piracy of ST software).

## Bob Jacob

**Addams:** Do you view the Amiga as a game machine more than anything else?

**Jacob:** That's the most obvious thing in the world. And whether Commodore chooses to recognize it as a game machine is almost irrelevant. The fact is, the people recognize it as a game machine. It's certainly not a very good business machine, for two reasons: Hard disk support is minimal and the 640 × 400 mode is just not very pleasing on the eye for word processing and database management. Yet with all the great music and sound-and-graphics capability, I think you have to recognize the Amiga for what it is—the world's greatest game machine. There's no question about it. We support the Apple IIGS and IBM. But the fact is, neither of them has a blitter; the PS/2 has only minimal sound support; the GS has great sound support—but the animation capabilities are very limited. Certainly, the PS/2 can put lots of colors on the screen, but how do you move them? And if you move them, how do you get nice sound effects to accompany them? You can't. The Amiga is the one box in the marketplace that offers no compromises in terms of being able to put out a really entertaining experience.

**Addams:** Why did you choose the Amiga for your first games, such as *Defender of the Crown*?

**Jacob:** Two reasons. One, as a new company we felt it would be easier to gain recognition in the marketplace by jumping on a new bandwagon and running with it. Being a new machine with amazing capabilities,

the Amiga gave us an opportunity to do something spectacular. We saw it was capable of much better graphics and sound, and it made us rethink what a game could be on this machine. *Defender of the Crown's* success (it has sold over 50,000 units) proves we struck a nerve somewhere. The other reason we wanted to support the Amiga was because technically it is the best machine.

If you compare our Amiga products with ports of 64 games going up to the Amiga, you'll see that it's easier to go down than to come up. It's very tempting not to redo the graphics from the 64 version when you go up to the Amiga, but it's very easy in some cases to start from the Amiga and work your way down. After all, the Amiga, Atari ST, and IBM all share the same graphics resolution, 320 × 200, and we've developed methods of doing graphics on the Amiga and porting them over to these other, less capable machines, including the Commodore 64. The fact is, we make a lot more on the 64 and the IBM than we do on the Amiga. But I think we end up with a better 64 and IBM product by porting down to them from an original Amiga version.

The Amiga is also a labor of love for a lot of people. It's certainly not the largest machine population in the world. Obviously, in North America, the IBM market is approximately 40 times larger than the Amiga market. Yet

The games we'll see  
over the next couple  
of years will just be  
quantum leaps over  
anything we've seen  
so far.



people who program for it do love it, and I think a lot of publishers who were taking a wait-and-see attitude are starting to jump on the bandwagon. You're going to see a tremendous increase in the number of Amiga titles in the entertainment field.

**Addams:** Cinemaware's first few titles incorporated many elements of the adventure game, but the most recent ones, such as *Rocket Ranger* and *The Three Stooges*, have emphasized arcade action. Is this a trend?

**Jacob:** That's just a coincidence. It does not indicate a specific trend toward eye-hand coordination tests. In fact, if you don't personally fall in love with *Lords of the Rising Sun*, I'll be amazed, because it has the kind of depth that an SSI game has, in terms of being a war game, and it has the best graphics we've ever done—better than *Defender of the Crown*. It should be out in January. Although there are five arcade elements in it, you don't have to play them if you don't want to.

But the best software for the Amiga has yet to be written. It wasn't until about four years after the Apple II was released that really decent games started to appear. And in the case of the Commodore 64, just in the last year there's been a tremendous improvement in quality, because programmers are figuring out all these technical tricks that allow the machine to do more than it's designed to do. In the case of the Amiga, with its capabilities, I think the games we'll see over the next couple of years—at least by 1991—will just be quantum leaps over anything we've

seen so far, at least by 1991.

### Unknown Programmer

Not all Amiga programmers love the machine. With bag over head (and, possibly, tongue in cheek), one programmer shares his views on the dark side of Amiga programming.

**Unknown:** Guru meditation error—I never know when it's going to pop up. It seems it's almost random, but there are bugs with the system that cause it to crash. If you don't double-click the mouse on the Amiga 500 fast enough or you do it too fast (I'm not sure which), the system gets locked up, so you have to eject the disk and put it back in again. Also, the operating system does things behind your back that will drive you nuts. And the failure rate on the drives is bad. But all the Kickstart problems have been worked out. None of these is a big deal in itself, but these little things start to add up.

Some of my colleagues have very nasty names for AmigaDOS—AmigaDOG, for one. Others are often commenting, "Boy, don't you think it'll be nice when the Amiga finally gets an operating system?" Because the first thing I do when starting an Amiga program is disable as much of the Amiga's operating system as possible and do it myself, since I can do it more memory-efficiently and much better. And it would be nice if Commodore would stop selling it as just a creativity box: They've got the best entertainment machine out there, and they don't advertise it as a game machine. ▲

## Beginners

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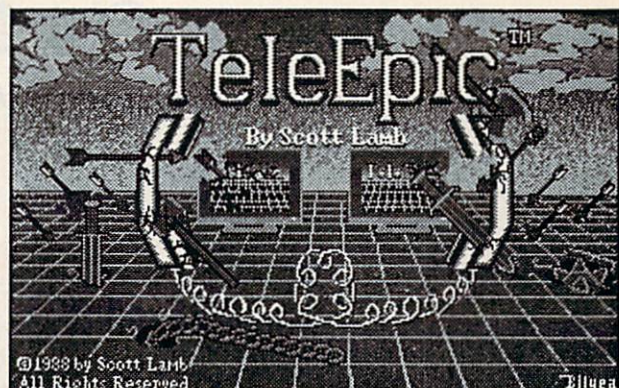
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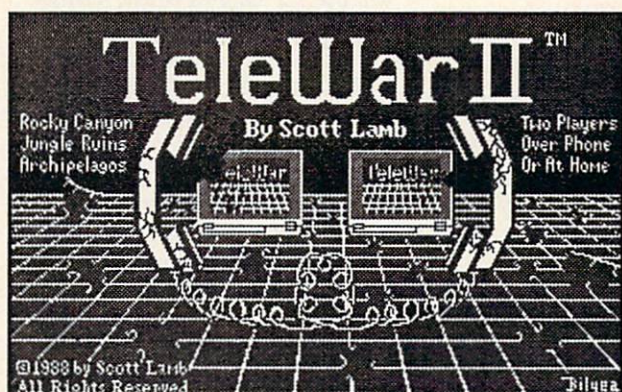
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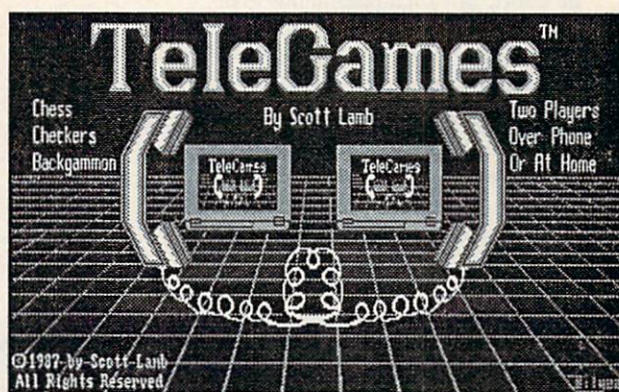
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# CLI CLIPS

Jim Butterfield

## Introducing the CLI—the Command Line Interface.

When most people first meet the Amiga, they meet icons—little pictures on the screen. Move the mouse so that the pointer is positioned over an icon, click (press the left mouse button), and that icon is selected. In this Workbench mode of operation, there's no need to type in commands or to remember special formats.

After a while, the Workbench seems limiting. This is especially true for those who have used other, less powerful computers. Learning to type commands such as `LOAD`, `RUN`, or `DIRECTORY` takes a little effort. But such commands give you more options and freedom than seem to be available with icons.

Enter the CLI, or Command Line Interface. Using the CLI, you'll be able to type commands rather than just select options from a menu. Soon, you'll be able to see information and do things that would not be possible with the Workbench alone.

Some users will be happy to stay with the Workbench. They will click on the desired icon, put the Amiga to work, and have all the computer ability they need. Others will want to look deeper within their machines, to examine, adjust, and fine-tune their programs and disks. To do this, they will need to use the CLI.

Early Amigas hid the CLI from users. Perhaps the designers feared confusing our brains by putting too much power in our hands. On early Workbench systems, users needed to select Preferences and then click on a box marked CLI ON. When they returned to their Workbench display, an icon marked CLI would then be visible. On current systems, the CLI icon (marked *CLI* or *Shell*) can be found on the Workbench disk. Click twice on the box and a CLI window will spring into operation, ready for your commands.

There are other ways to make a CLI window available. One that's popular but not problem-free involves pressing a combination of keys as the Amiga is executing its startup sequence. As the Amiga starts up and the first message appears on the screen, you can hold down the CTRL key and tap the D key. The Amiga abandons what it's doing and waits for you to type a command. This technique works, but since the Amiga has not finished its startup work, the system may not be as neatly organized as you

might want.

If you plan to use the CLI a great deal, you'll want to set up a Workbench disk that will leave a CLI window on the screen when all the initial work has been completed. That's not hard to do; it involves a simple change to a file called `s:startup-sequence`. I'll show you how to do that later.

Workbench 1.3 is now available. If you don't have it yet, get the Enhancer package as soon as possible. It's more convenient, it's more efficient, and it will keep you up-to-date. In this and following articles, I will use 1.3 features whenever they are useful, and that will be often.

The 1.3 system adds many new CLI commands and expands most existing ones. The CLI window itself (called the *console*) has been made more sophisticated by means of a shell. This is a new type of console (called *newcon*) that allows you to recall previously entered lines in order to correct, modify, or repeat them (or even just to read what you've done). It's much like the screen-editing feature of earlier Commodore machines such as the 64. There are many other attractive new features in 1.3; we'll meet them as we discuss the CLI.

Do get the Enhancer rather than picking up an unauthorized version of 1.3. The manual alone is worth the price. You get well over a hundred pages of detailed documentation on the new commands, including many new CLI features.

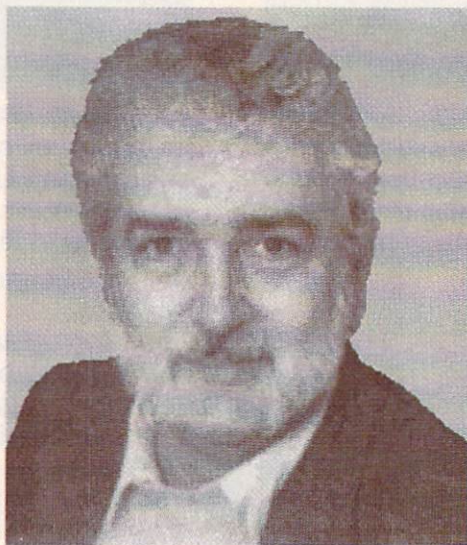
Before you do anything else, make a copy of your original Workbench disk. Then put the original disk away as an archive disk, which you won't use unless you need to go back to the source. Remember that

most of the Amiga's logic is on this disk; lose its contents and you'll lose the power of the Amiga, at least until you get a replacement.

We'll assume that you would like to have this disk give you a CLI window as soon as it has powered up (or *booted*). To do this, we'll need to change the script file `s:startup-sequence`.

A script file contains a series of CLI commands that will be performed when the file is executed. These commands are written in normal ASCII characters, so you can read them if you like. For example, type the command `TYPE s:startup-sequence` and this file will be typed out to

Early Amigas hid  
the CLI. Perhaps  
the designers feared  
confusing our  
brains.







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the screen for you to see.

The file contains all the things that are done when the Amiga boots. At the moment, we don't need to know what all of these commands mean. But we do want to add something new to the file to make it leave a CLI window open when it's finished.

To change any text file, you may use an editor. The easiest one to use is called *ED*, although you might prefer one of the many other editors that are available. Typing *ED s:startup-sequence* causes the edit window to appear and the file to be displayed. (Note that when you give commands within the CLI, the case of the characters is insignificant—you could type *Ed S:StartUp-SequenceE* with equal success.)

*ED* is a screen editor. If we change the text appearing on the screen and then give the Exit command, the revised file will be saved. If you somehow botch things up, use the Quit command to terminate editing and leave the original file unchanged. This last command is performed by pressing the following keys in order: ESC, Q (for Quit), RETURN. You may be asked if you really want to abandon the editing work that you have done; press Y to signal Yes.

With the *ED* display of the startup-sequence file on the screen, press ESC followed by B (for Bottom) and then RETURN. This takes you to the bottom of the file. The last command is almost always *ENDCLI*, which means *Terminate this CLI window*. On systems earlier than 1.3, all you need to do is to remove this line. You do this by pressing ESC, D (for Delete), and RETURN. The revised file will be saved with ESC, X (for Exit), RETURN.

After you've made the change, the system will boot from this disk in a slightly different way: It will leave a CLI screen on the window after it has completed its work.

If you have a 1.3 system, it's better to take another approach. The CLI window is nice, but a more advanced Shell window is nicer. So instead of removing the *ENDCLI* line, add a new line just before it. Move the cursor to the start of the *ENDCLI* line and press RETURN; this will create a blank line just above. Position to this blank line and enter *NEWSHELL*. You may now save the revised file with ESC, X (for Exit), RETURN. Later, when you boot this disk (start up using the disk), it will complete its initial work by presenting you with a shell window in which you can type CLI commands.

Keep in mind that you don't need to set up your disks to generate a CLI this way. You can always just double-click on the CLI or Shell icon. There are even special utilities (such as *POPCLI*, by John Toebes) that will give you a CLI window any time you press a certain combination of keys.

There are 64 commands in the C (command) directory, and additional commands elsewhere. You won't use all of these. In fact, about a dozen commands will become your favorites. The others you will look up as you need them.

Here are some of the commands I use frequently:

**CD** Set the current directory. The current directory may be thought of as your working directory pointer. Whenever you don't say explicitly which disk or drawer to use, the system will use your current directory. If you haven't changed the CD, it will usually point to the disk in drive 0 (DF0:). If you'd like to see what your current directory is, type the CD command followed by RETURN.

**DIR** and **LIST** Take a directory listing of the contents of the disk. DIR is more compact and presents the files in alphabetic order. LIST gives more detail on each directory item.

**COPY** Make a copy of a file. This is more flexible than you might think at first. For example, *COPY FILE PRT:* delivers the copy to the printer; in other words, it causes a text file to be listed. *COPY FILE \** would cause the file to be delivered to the CLI window (designated with an asterisk).

**ECHO** Output a string. At first, this command seems useful only within a script file; but with redirection, it can be very handy. For example, I could jot a quick note on the printer by commanding *ECHO >PRT: "Quick Note"*, or I could write a short file on a ramdisk by typing *ECHO >RAM:TEST "Hello World"*.

**RENAME** Change the name of a file. Since the file's path is part of its name, this command is useful for moving a file in or out of a directory (or drawer). Thus, to put a file called TAX into a drawer whose name is BUSINESS, you might command *RENAME TAX BUSINESS/TAX*.

**DELETE** Get rid of a file you

don't need.

**NEWCLI** This is a good way to start multitasking. If you want the computer to do more than one job at a time, you can open an extra CLI window using the command *NEWCLI*. In the new window, type the command to start a job. Then click back to the old CLI window and go to work on the other job. The two jobs will run independently, providing they don't both try to work on a single resource (such as the printer) at the same time. Even then, they'll work—but you won't like the results.

**RUN** A quicker way to multitask. If the job you want to start does not need to use the CLI window, you can start it up as a separate task by prefixing the word *RUN* to the command. For example, if you were to type *AMIGABASIC*, the CLI would go to work and set up Amiga Basic as requested. But in this case, you could not use the CLI for anything else until Amiga Basic had been terminated. In contrast, you could type *RUN AMIGABASIC* to cause Amiga Basic to be set up as a separate task. This would leave the CLI free to do other jobs as you wished.

The CLI sits close to the heart of the Amiga. As you learn more about its workings, you'll also learn ways to make your computer more efficient and effective. And that's what we'll be doing in this column. ▲

#### Editing the Startup-Sequence File

##### A 1.2 Startup Sequence

```
BindDrivers
echo "A500/A2000 Workbench 1.2 ..."
...
LoadWB
...
endcli > nil: [[delete this line]]
```

##### A 1.3 Startup Sequence

```
Addbuffers df0: 10
c:SetPatch >NIL: ;patch system functions
cd c:
echo "A500/A2000 Workbench disk. Release 1.3 ..."
...
LoadWB delay ;wait for inhibit to end before continuing
NewShell [[add this line]]
endcli >NIL:
```





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## SupraDrive for Amiga

Supra has announced the release of the SupraDrive for the Amiga 2000. The hard disk system provides users with autobooting and fast access time.

SupraDrive has complete DMA access and an external SCSI port, allowing the connection of additional SCSI devices to the system. The system is compatible with RAM boards, digitizers, and the Amiga Bridgeboard (the system supports MS-DOS when a Bridgeboard is used).

Both internal and external SupraDrives are available in 20-, 30-, and 60-megabyte capacities. Each drive is packaged with formatting and utilities software, allowing the disk to be divided into as many as five partitions. *CLImate* is also included with each

drive, along with an operator's manual.

A special Supra Interface Kit, containing everything but the hard disk, is available for those who already have a hard disk that will be mounted internally.

The 20-, 30-, and 60-megabyte drives retail for \$699.00, \$799.00, and \$995.00, respectively. With a controller, the interface kit sells for \$399.95; without, it retails for \$249.95.

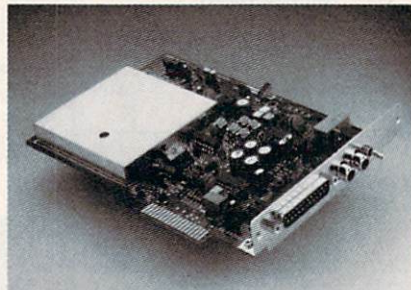
Supra, 1133 Commercial Way, Albany, OR 97321

Circle Reader Service Number 201.

## Genlock 2000

The Commodore A2300 Genlock Board has been introduced by Commodore Business Machines for use with the Amiga 2000. The A2300 permits Amiga-generated graphics and text to be synchronized and combined with output from standard National Television Standards Committee (NTSC) external video sources such as a videocassette recorder, video camera, or laser disc player.

The board, which can be installed into the CPU internal video expansion slot, allows users to add titles, color graphics, and three-dimensional animation to professional and home video productions. With the use of a graphics or video software program, text and graphics can be developed on



With the Commodore A2300 Genlock, users can integrate text and graphics into a video.

the Amiga and then integrated into the video.

The A2300 Genlock Board is available in both PAL and NTSC modes and carries a suggested retail price of \$399.00.

Commodore Business Machines, 1200 Wilson Dr., West Chester, PA 19380

Circle Reader Service Number 202.

## Ancient Quest

Players of Microdeal's *Tetra Quest* find themselves involved in the first Galactic Games, where athletes from different worlds have assembled. The games cannot go on because the six Phoenix Tablets have been stolen by the Tetroids, who were not invited to participate in the games.

Phoebus, the sun god, challenges the player to find the tablets. The Tetroids have split them into 64 pieces and have hidden them in the six provinces of their world. Their world contains 384 sections, where players encounter Spitters, Aliens, acid and oil slicks, mutating deflectors, and joysticks.

The Tetroids, having a sense of sportsmanship, have devised obstacles that can be twisted into advantages for the player.

The suggested retail price for *Tetra Quest* is \$39.95.

Microdeal, 576 S. Telegraph, Pontiac, MI 48053

Circle Reader Service Number 203.

## Sounds Good

Precision Incorporated has released *Pro\*Sound Designer, Gold Edition* for Amiga 500, 1000, and 2000 computers. This sound-digitizing, -processing, and -playback system has a specially designed hardware adapter that uses second-generation sound-digitizing technology.

The adapter has a full 1-32 kHz frequency response range with a high signal-to-noise ratio. Features include automatic gain control and the ability to record, edit, and manipulate up to four sound samples at the same time. Users can cut, paste, and overlay

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# N E W PRODUCTS

while changing frequencies and octaves. The user interface provides a graphic display of sound samples.

The package includes an extra disk containing *MIDI-Plus* software, which permits samples recorded with *Pro\*Sound Designer* to be played back as instrument voices on either a MIDI keyboard or an Amiga. The *MIDI-Plus* module permits up to ten samples in memory at once, giving the user full playback control over all or part of a given sound sample.

The *Pro\*Sound Designer* and *MIDI-Plus* system retails for \$159.95.

Precision has announced that all *Superbase* products are no longer marketed by Progressive Peripherals.

*Precision Incorporated*, 8404 Sterling St., Suite A, Irving, TX 75063  
Circle Reader Service Number 204.

## A Big Bad Cat

Players had better watch out for *Street Cat*, the toughest cat in the city and the latest release from the U.S. Gold line of games from Epyx.

The game features four events that test the cat's athletic ability and knowledge of the streets. In the city park sprint, cats must make their way through an obstacle course. The cats then hop on their motorcycles, where they must run over roadside disks without being caught for speeding.

The next event, set in a swimming pool, requires the cats to float on platforms and knock geometric shapes off a diving board. If they can stay dry, they can then move on to the cat-walk event in the sewer system, where rats, a mad dog, slimy pipes, and slippery barrels and ladders must be avoided. Should the cat slip, it could wind up in the city cesspool.

The final event is bowling against a bulldog, but there are no pins. The cat and the dog try to bowl each other over and into the gutter. Whoever gets bowled over has to drink a milkshake, and, after downing a few, will find it difficult to move around.

*Street Cat* can be played individually or against an opponent or the computer. The suggested retail price is \$24.95.

Epyx, 600 Galveston Dr., P.O. Box 8020, Redwood City, CA 94063  
Circle Reader Service Number 205.

## See the Amiga Through 3-D Glasses

Haitex Resources has introduced X-Specs 3-D glasses, which provide stereoscopic three-dimensional viewing of images on the Amiga screen. The glasses control what each eye sees independently by closing and opening an optical shutter at 60 frames per second, tricking the brain into seeing the images with depth.

*SpaceSpuds*, an arcade space battle designed especially for X-Specs, is packaged with the glasses. Haitex reports that over 40 independent software-development firms are working on X-Specs 3-D-compatible Amiga software.

The complete system includes one pair of glasses, an interface that supports up to two pairs of glasses, a disk of three-dimensional images, and the *SpaceSpuds* game. The interface plugs into the second joystick port and requires no additional power supply. The suggested retail price is \$124.95.

*Haitex Resources*, 208 Carrollton Park, Suite 1207, Carrollton, TX 75006

Circle Reader Service Number 206.

## Sea Battlers

Players of Titus Software's *Off Shore Warriors* battle in a sport in which participants pilot powerboats and battle against rocks and waves in addition to competing against each other.

The battles take place on large



Powerboaters battle to the death in Titus's *Off Shore Warriors*.

lakes, where crowds cheer on the competitors. Players are armed with a boat equipped with missiles and must battle to the end to determine the winner and ultimate survivor.

*Off Shore Warriors* has a suggested retail price of \$39.95.

*Titus Software*, 20432 Corisco St., Chatsworth, CA 91311

Circle Reader Service Number 207.

## Move Up with Your Modem

Trans Com has made it possible for Commodore 64 and 128 users who are moving up to an Amiga to continue using their 1670 modem with their new computer. With the IF-1670 Modem Interface and cable, users can plug their 1670 modem into their Amiga serial port.

The interface is designed to be used with Commodore model 1670 300-/1200-baud modems and an Amiga or other computer with an RS-232 port.

The complete package consists of the interface module, a three-foot cable with a DB-25 connector, and a wall-mount power supply for powering the IF-1670 and the 1670 modem.

Once installed, the 1670 modem works with all terminal software for the Amiga.

The IF-1670 has a suggested retail price of \$43.95.

*Trans Com*, P.O. Box 88566, Carol Stream, IL 60188

Circle Reader Service Number 208.

## Go to the Head of the CLAS

MicroEd has released the *Computerized Lesson Authoring System (CLAS)*, designed for users who want to create their own interactive teaching lessons but lack programming skills.

*CLAS* makes it possible for the Amiga to write the program for the user. The created programs can utilize digitized picture screens, voice, and music.

The program carries a suggested retail price of \$99.00.

*MicroEd*, P.O. Box 24750, Edina, MN 55424



# One Good Book deserves Another and another, and another, and a...

## Amiga C for Beginners

-an introduction to learning the popular C language. Explains the language elements using examples specifically geared to the Amiga. Describes C library routines, how the compiler works and more.

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## Amiga Disk Drives-Inside & Out

-is the most in-depth reference available covering the Amiga's disk drives. Learn how to speed up data transfer, how copy protection works, computer viruses, Workbench and the CLI DOS functions, loading, saving sequential, relative file organization, more.

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## AmigaBASIC Inside and Out

-THE definitive step-by-step guide to programming the Amiga in BASIC. Every AmigaBASIC command is fully described and detailed. Topics include charts, windows, pull down menus, files, mouse and speech commands.

**Best Seller**

**\$24.95**

Includes Workbench 1.3

## AmigaDOS Inside and Out

-covers the insides of AmigaDOS from the internal design up to practical applications. Includes detailed reference section, tasks and handling, DOS editors ED and EDIT, how to create and use batch files, multitasking, and much more.

**New**

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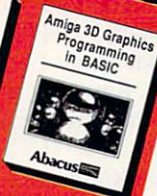


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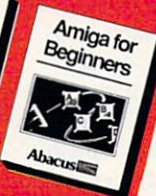


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The Amiga's been around for almost four years. During that time, it's been one of the most exciting computers to watch grow. The creativity that fueled that growth isn't dying out. Instead, it's exploding. The Amiga's strong hardware and flexible software are being used to create new and unique products, and the old standbys—games and graphics programs—are for the first time approaching the limits of the machine.

At three recent trade shows we attended, we saw many products and talked to many people. The products coming out now (and the ones that will be coming out soon) provide clues to the products and applications in the future of Amiga computing.

The Los Angeles Ami-EXPO, although much smaller than the other shows, was exciting because it was geared exclusively toward the Amiga. Dozens of exhibitors showed their wares. Among the exciting products first shown at AmiEXPO was ASDG's SpectraScan scanner and Antic Software's *Pioneer Plague*—

the first game to use the Amiga's exclusive HAM (Hold And Modify) graphics mode.

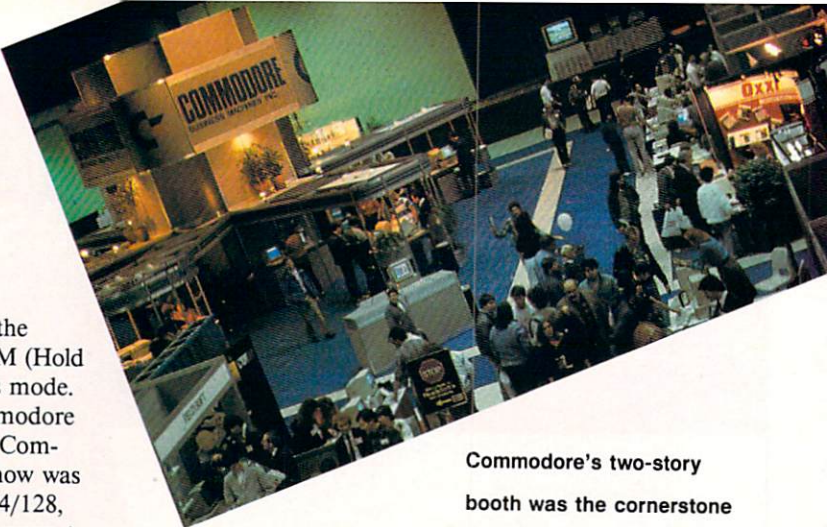
The World of Commodore show featured a huge Commodore booth. The show was to cover the Amiga, 64/128, and Commodore PC computers, but the Amiga easily captured the lion's share of the attention. Exciting software like *Movie Setter* from Gold Disk and ReadySoft's *Dragon's Lair* made their first appearances. ReadySoft's Macintosh emulator, *Max*, was also a hit.

COMDEX (Computer Dealers Exposition) is a show for computer dealers and distributors. The Amiga didn't play a big part in the proceedings, but Commodore did make a bit of a splash with its announcement of two new Amigas—the 2000HD and the 2500—and supporting hardware.

While these shows were going on, Commodore quietly began shipping version 1.3 of its operating system. If you haven't updated yet, contact your dealer. The 1.3 Enhancer package (consisting of three disks and a manual) is worth the \$29.95 price.

## The Amiga, Now

By attending shows, reviewing software, reading and rereading press releases of cryptic hardware, and just plain messing around with the Amiga (it's a tough job), we've collected a sampling of what's happening in the Amiga market today. Take a look and see what you think. We're betting that you'll be as excited about the Amiga's future as we are.



Commodore's two-story booth was the cornerstone of the World of Commodore show.

## Where to Next?

Where's the Amiga going? With all the recent shows and new-product announcements, it's hard to find a linear path. We all know that the Amiga is an everything machine, but Commodore's marketing crew has to decide just which niches to hit.

John DiLillo and the rest of the crew in the Education Division of Commodore would say that education is the future of the Amiga. With its low price and high performance, the Amiga is well suited to the classroom. Student-created videos, captured and edited on the Amiga; simulation programs that present painless animal dissections performed with a mouse-controlled scalpel (no more dead frogs); or spectacular views of the night sky, where students can learn about the names and locations of key constellations—these applications just scratch the surface of the possibilities of the Amiga in the classroom.

On the hardware side of the issue, Commodore International has been showing off some stunning prerelease products. Amiga boards in the works include a Transputer, an 80286 board, a 68020 board, and two eye-popping graphics boards.

Although not a new phenomenon, games will always be important to the Amiga's future. The latest breakthrough games incorporate more realism and detail than ever. New technologies such as CD-I promise to revolutionize the way we interact with games. Even today, we see adventure programs evolving into complex, interactive novels. Look at some of Cinemaware's Amiga products and you'll find software that has more in common with a movie than with any traditional computer game.

Compared to the IBM PC and Apple Macintosh, the Amiga is sorely lacking in productivity and business software, but this is changing. Databases, spreadsheets, and specialized accounting programs are slowly appearing. Tomorrow's productivity programs for the Amiga will not be translations of MS-DOS software, however. They'll be unique in their use of graphics and sound—spreadsheets with a wide variety of graphing features, databases that can cross-reference digitized sounds and animation files as well as names and numbers, and inventory software that uses bar-code readers to record and delete items, complete with digitized pictures to represent them.



# The Latest in Graphics

**T**he Amiga excels in graphics applications. There are many companies pushing it into professional applications. For instance, ASDG has introduced Spectra-Scan, a hardware system that leaves common digitizers out in the cold. It's based on the Sharp JX-450 color scanner. You lay your artwork or photo on the scanner, and the image shows up on your Amiga in brilliant color. You can then adjust such parameters as intensity and saturation. The software maintains a 24-bit representation of your image in RAM for a palette of 16 million colors.

If you're using the Amiga for desktop publishing or word processing, you'll appreciate a larger screen with higher resolution. The Viking I, from Moniterm, is a monochrome monitor that displays four shades of gray. The monitor is big and sharp as a tack.

Animation buffs will love *Movie Setter*, a program from Gold Disk that lets you make cartoons on your Amiga without learning to program. Just use the built-in paint program to draw a few frames of animation. Then use the mouse to click your characters across the screen.



*Movie Setter* brings point-and-click animation to the Amiga.

## New-Age Power Tools

*Superbase*, Precision Software's popular database program, is multiplying faster than rabbits. Precision seems to introduce a new version every chance it gets: There's *Superbase Personal*, *Superbase Personal 2*, *Superbase Professional*, *Superbase Professional 3*, and, for the IBM PC, *Superbase 4* as well as *Superbase 4 x 4* (not that you're interested in the IBM PC).

No matter which version of *Superbase* your pocket-book allows, *Superbase* is an excellent database program. It's both powerful and easy to use. You can store all kinds of Amiga media—text, graphics, sounds—and access them with a simple VCR-type control panel. It takes a while to get up to full speed on the program's many features, but it's worth the trouble.

Good Amiga word processors were hard to find when the computer was young. Today we see a whole new genre of text editors. These word processors don't just handle text; they manipulate graphics, check spelling, and even correct grammar. *Excellence*, from MicroSystems Software,

## Two New Amigas

Commodore announced two new Amiga computers at the recent COMDEX show in Las Vegas: the 2000HD and the 2500. The Amiga 2000HD has everything a 2000 has, plus an A2090A hard disk controller, a 40MB hard disk, KickStart 1.3 in ROM, and a new nameplate that touts the computer's lengthier name. The hard disk comes initialized with Workbench 1.3, Amiga Basic, and various utilities already installed. With 1.3 in ROM, the 2000HD automatically boots from the hard disk. The Amiga 2000HD carries a suggested retail price of \$2,999.

With a 68020 microprocessor, a 68881 math coprocessor, and 2MB of 32-bit

The current top-of-the-line computer from Commodore is the Amiga 2500.

RAM (a total of 3MB of RAM), the Amiga 2500 is Commodore's top-of-the-line Amiga. Like the 2000HD, the 2500 also has a 40MB hard disk and KickStart 1.3 in ROM. The 2500's strong point, however, is speed. At 14.23 MHz, the 2500 operates at twice the processor speed of a normal Amiga. Commodore claims that performance increases can go as high as 400 percent. The Amiga 2500 has a suggested retail price of \$4,699.

is the newest word processor to hit the market. It supports IFF graphics, color text, multiple columns, proportional text, and math functions within documents. As a result, *Excellence* is not as fast as some word processors; it is, however, the Amiga's most capable word processor.

On the other end of the word processor spectrum are text editors—programs designed to edit plain lines of text, and nothing more. These word processors don't need word-wrap, multiple fonts, spelling checkers, graphics support, or even the ability to print. Text editors are the tools of programmers, who use them to write source code. ASDG's text editor,

*CygnusEd*, offers the speed and versatility that programmers require. *CygnusEd* performs text searches at 100,000 characters per second, incorporates blitter-based scrolling for maximum speed, and can have up to ten files open at one time.

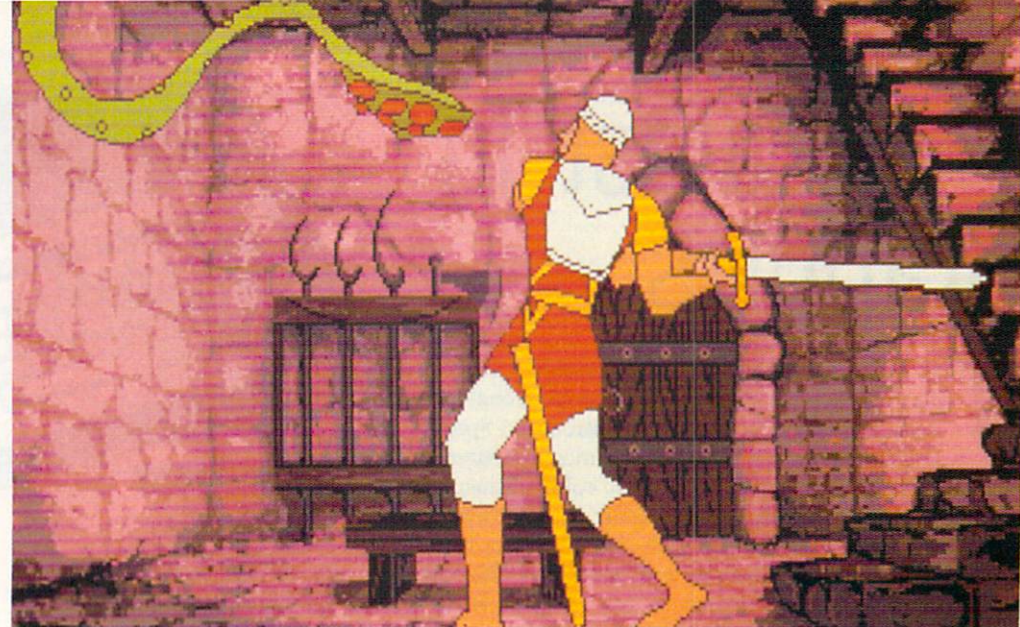
You won't need *CygnusEd* if you use Lattice's new C compiler to write your programs; *Lattice C 5.0* has its own integrated text editor, which flags lines that cause compiler errors. *Lattice C 5.0* also compiles faster, generates more efficient code than previous versions, and has an integrated debugger that allows you to step through your code and interrogate program variables and structures. ▶



# Games That Push the Limits

Take a look at some of the new Amiga games and I guarantee you'll be impressed. Programmers are slowly but surely realizing the computer's full potential as a game machine. Soon, Amiga games will be pushing the limits of the Amiga, not just reaching them.

Want to impress your friends? Show them Antic Software's *Pioneer Plague*, the first commercial game to use HAM (Hold And Modify) mode. HAM mode allows you to display up to 4096 different colors on the screen at a time. Everything in the program, from the explosions to the scrolling backgrounds, is dazzling. It's a wonder that



The Amiga struts its stuff when it runs ReadySoft's *Dragon's Lair*.

game developers have ignored HAM mode for so long. After all, it's the variety of colors, not high resolution, that makes television images look so good.

*Pioneer Plague's* programming magic was performed by Bill Hawes, the author of the first Amiga game, *Mind Walker*.

If you're into animation, check out *Dragon's Lair*, from ReadySoft. This game is unbelievable. The color animation is so fast and so clean that it rivals Saturday

morning cartoons. The original arcade version of *Dragon's Lair* uses a video laser disc to achieve its picture-perfect animation; the Amiga version relies on the raw horsepower supplied by the computer's advanced video subsystem. To the casual observer, the two versions are identical.

The creative genius behind *Dragon's Lair* is Don Bluth, a former Disney artist and the director of the full-length animated movie *The Secret of NIMH*. Bluth and

his team put a lot of work into *Dragon's Lair*—the game encompasses six Amiga disks. If you have the chance, stop by your Commodore dealer's and ask to see the *Dragon's Lair* demonstration program. You'll be amazed. As one COMPUTE! editor put it, "*Dragon's Lair* represents the future in games."

## Tomorrow's Hardware from Commodore

As far as technology goes, the Amiga was a computer was born out in front of the pack, with its powerful 68000 microprocessor and its amazing custom chips. Recently, the competition has begun to creep up. Not to fear—Commodore Technology, a division of Commodore International, is finally beginning to talk about some of its upcoming projects. It's hard to say when these products will be released, but it's good to know that they're in the pipeline.

Envious of the 256 (out of 16 million) colors available in VGA and Macintosh II systems? Don't be. The Commodore Amiga High Resolution Color Graphics Card will be hard to beat. It features

programmable resolutions ranging to 1024 × 1024, with as many as 259 (that's right, 259) colors on the screen simultaneously. The background screen is formed with 256 of the colors, while 3 more colors overlay the background. This will make it easy to scroll text and simulate sprites without disturbing the picture-perfect background. The board features the Texas Instruments TMS34010 graphics processor, which executes graphics commands at up to 6 million instructions per second (and you thought that the blitter was fast). You choose your 259 colors from a palette of 16 million. The chip uses high-speed DMA to move images and commands from your Amiga to its 1.5 megabytes of

memory. You'll need an Amiga 2000 and a multisync monitor.

There's another graphics board coming from Commodore. It's the Professional Video Adapter, a combination genlock, frame grabber, and digitizer. A professional paint program is being written to take advantage of the features of the board. The PVA requires an Amiga 2000.

If one processor isn't enough for you, you'll be anxious for the Amiga Transputer Parallel Processing Workstation, a number-crunching demon that will process your Amiga's socks off. You can connect as many as 17 Transputers to your Amiga for heavy-duty math and science applications. It will work great in conjunction with the graphics

boards described above. With the Transputer, you can run your Amiga at hundreds of millions of instructions per second.

Two other slightly more conservative coprocessor boards are in the works. First, there's the A2620 68020 board for the 2000. It runs the fast Motorola chip at 14.3 MHz. Included are the 68881 math coprocessor and the 68851 memory-management unit. The board comes standard with two megabytes of 32-bit RAM. With this card, you can expect to run your off-the-shelf Amiga applications with a performance increase of approximately 400 percent. The other board is the new A2286 Bridgeboard. With the new Bridgeboard, you can run your IBM PC applications at IBM AT speed. ▲



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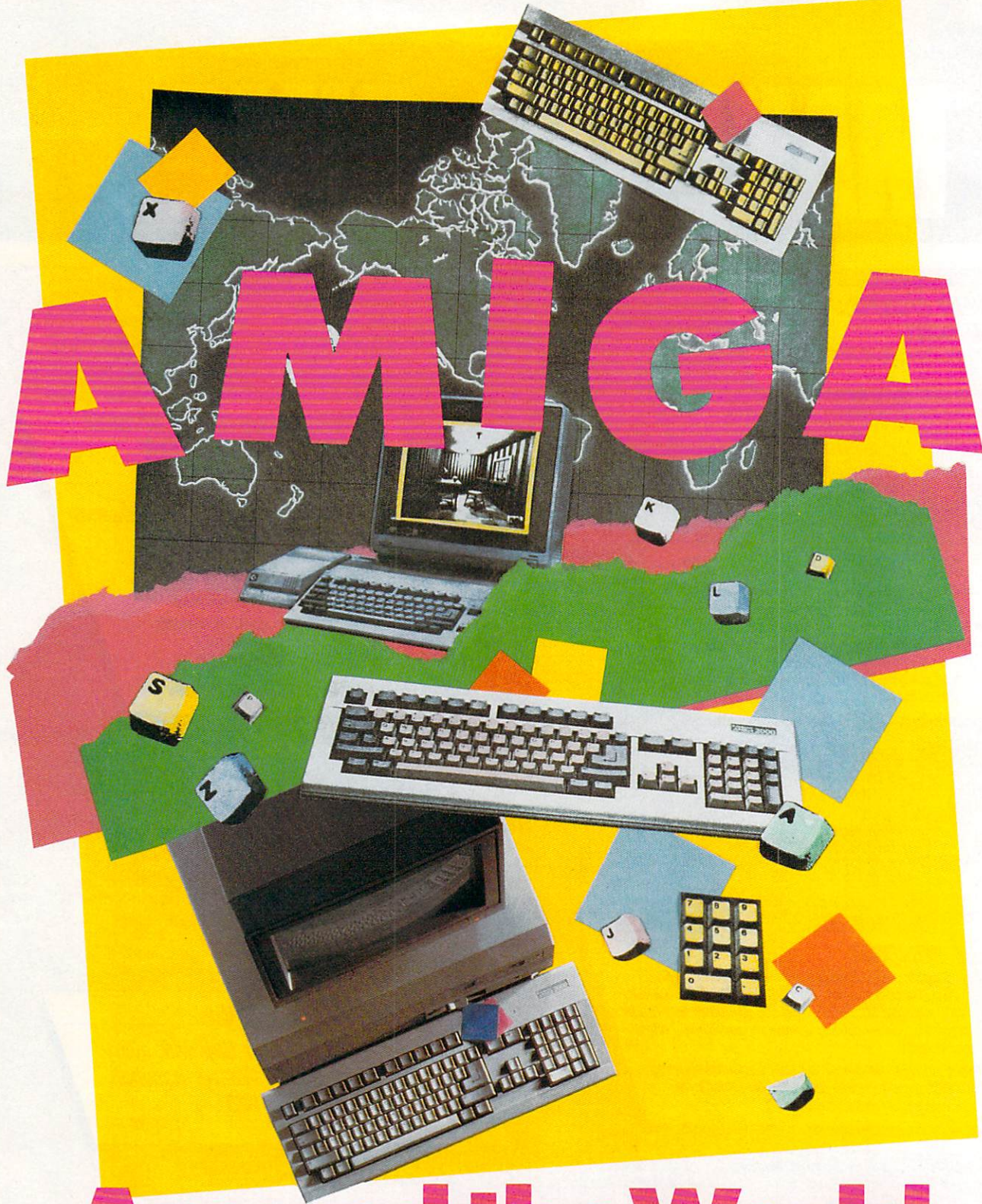
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# Around the World

*You're familiar with the Amiga in the States.*

*Join us for a guided tour of how the rest of  
the world uses the machine . . . .*





# The Conquest of Europe: Amiga Comes On Strong

**L**et's not beat about the bush. There's just one question to be asked about the Amiga in Britain: Can it survive?

It may come as something of a shock to U.S. readers to know that only a few months ago, the considered answer to this question was an emphatic negative. The Atari ST was sweeping the market in the U.K. on a surge of software support and aggressive marketing, while the Amiga was sitting on the shelves. Things are changing now, but it's still an uphill struggle. What went wrong?

To understand the difficulties faced by the Amiga in Britain, you have to come to grips with the curious attitude of the English toward computing.

## Cost-Consciousness

It's no coincidence that the first mass-selling computer in Britain was Clive Sinclair's ZX-80. The fact that it had only 1K of RAM and a 16K add-on pack that wobbled so badly it frequently dumped your data was of no importance whatsoever; at less than \$170 (a bargain for the

*In the United Kingdom and  
on the continent, the  
amazing Amiga is winning  
more converts every day.  
It's easy to understand  
why, considering the  
amount of software and  
industry attention Europe  
is directing at the Amiga.*

Steve Cooke

late seventies), the machine would have sold without any memory at all. Since then, it's been an accepted fact that although Britain has Europe's largest computer user base, it's a user base traditionally driven by price, not power.

British home-computer users have become accustomed to paying around \$250 for the major 8-bit machines. They also expect to use their existing color TV with their computer so they won't have to fork out for a monitor. Finally, although they like the idea of disk drives, they still expect not to have to pay for them—the vast majority of entertainment software (which drives the home computer business in Europe) sells on cassette.

In such an environment, Commodore even had a struggle persuading consumers that they should pay for the C64's dedicated tape unit. Almost unbelievably, several companies made money from selling little gadgets to let impecunious Britishers connect their 64s to their \$20 cassette players. The fact that anyone should consider going to all that inconvenience just to save per-





## *After a shaky start, the Amiga is capturing the attention of enlightened computer users throughout Europe. But is the current Amiga enthusiasm another case of too little, too late?*

haps another \$20 is typically British.

When it comes to software, the pricing situation is even more acute. The last few years have seen enormous drops in software prices in the U.K. Games topping the U.K. charts now regularly retail in the so-called "budget" category, at around \$3.40 each. Prices like these don't leave an awful lot in the bank for software development, much of which is carried out in Britain by teenagers or programmers in their early twenties.

The amount of money available in Britain and the way people are prepared to spend it is therefore the single most important factor influencing hardware sales. Peo-

ple may believe that 16-bit is twice as good as 8-bit, but they certainly aren't prepared to pay twice as much. Launched at £499 [approximately \$900] and later reduced by £100 [\$175], the Amiga was priced way out of the mass British market, at a retail cost higher than any yet seen on a machine in this sector.

### **Branded?**

Buying preferences and brand loyalty also tended to hurt early sales of the Commodore machine. The Sinclair Spectrum has been by far the most popular computer in Britain, closely followed by the Commodore 64 and, in third place, the Amstrad range of Z80 machines.

While the 8-bit market ruled, each of these machines created certain preconceptions about what a home computer should be.

First, the Sinclair was not only cheap, but also, in internal hardware/firmware design, very easy to program. Sinclair owners wanting to upgrade looked forward to another cheap, clean machine in which the CPU did most of the work and any necessary support chips were easy to set up and program. And, of course, they wanted a modulator so they could use their TV. Naturally, they chose the Atari ST—available before the Amiga and (at launch) £200 [approximately \$350] cheaper.

The Commodore 64 was noted for its hardware sprite facilities and its sound chip, but renowned for a poor BASIC. Commodore owners looked forward to more of the same, but without having to POKE every time they wanted to peep. However, they'd paid more for their machine in the first place and weren't quite so penny-pinching.

This market sector should have provided most of the Amiga's sales in Britain, but Commodore's perverse marketing policy in the early days of the Amiga in Britain aimed itself primarily at business applications. At this stage, the average 64 owner lost interest and sought comfort from the ST—or possibly a Sega or



Nintendo games console.

Finally, the Amstrad machines came with everything—built-in tape or disk drive, monitor, excellent BASIC, and good color facilities, but rather slow screen handling. Amstrad owners wanted something more powerful, but it had to be in a single package. The marketing of the ST and that of the Amstrad range have a number of similarities—not the least of which being the parallels between Alan Sugar and Jack Tramiel—and many Amstrad users joined the ST queue.

The sad truth is that in the struggle against Atari, its only true competitor in the 16-bit European market, Commodore not only launched second, but also mistargeted, overpriced, and underpromoted its product. As a result, the initial success

While we're delighted to bring you this in-depth portrait of the European Amiga scene, we must admit that volatile currency exchange rates can render information obsolete as soon as it's printed.

Conversion rates used at press time (for what they're worth) were

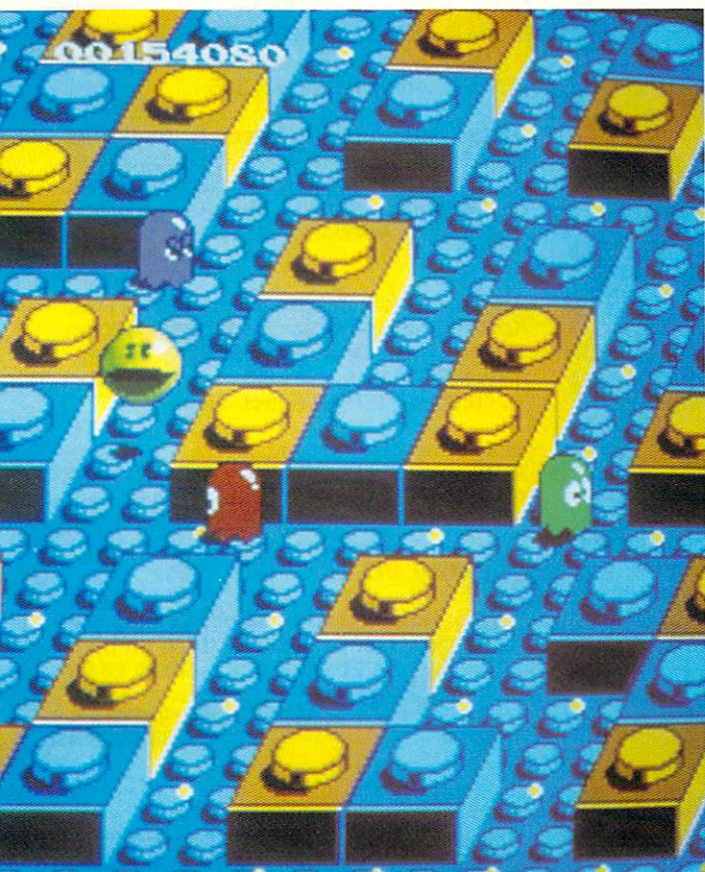
£1 = \$1.79

1DM = \$1.75

For the sake of readability we rounded off the figures. Historical amounts we simply converted to the U.S. equivalents.

Thanks for your indulgence—and if you have a better formula for predicting exchange-rate fluctuations between magazine preparation and on-sale date, give us a call. There are several weeks between the two, and we'd like to make some investments—Editor





*Pacmania*, licensed and converted for the Amiga by Grandslam. This and similar Amiga arcade conversions are playing an important part in winning the machine a larger market in Europe.

At this time, it really looked as if the Amiga was doomed. Anyone who suggested that a year later it might be outselling the ST and heading for the number 1 slot would have been sent for medical attention.

That, however, is precisely what happened.

### Turnaround

The first stage in the Amiga's recovery came, ironically, from the ST's success. Suddenly everyone was talking 16-bit. Software houses supporting the Atari machine began to increase their margins by doing Amiga versions as well. With increased software support, the machine became marginally more attractive.

At this stage, however, almost all Amiga software in the U.K. looked identical to the ST versions. There were a

few imports from the States that didn't fall into this category—notably Cinemaware's *Defender of the Crown*—but they tended to be criticized (with some justification) for hiding a lack of extended gameplay behind pretty graphics and sound. The ST was still the gamers' machine and therefore the one the dealers stocked.

The whole ball game went into reverse, however, after Atari's increase of the ST retail price from £299 [approximately \$535] to £399 [approximately \$715]. Commodore followed through rapidly with a new marketing team, a matching price of £399, and a new, entertainment-based marketing strategy. People began to look at the Amiga with greater favor, and the dealers, disappointed by Atari's distribution tactics and frequent product changes, began to switch loyalties as well. Suddenly, the Commodore machine was on all the shelves—and getting taken off them by the public, as well.

Finally, increasing awareness of the ST's failure in the States and elsewhere began to count heavily against it. On top of this, titles like *Interceptor* and Psygnosis' *Menace*

appeared for the Amiga, showing something of what the machine was capable of. Whatever that something was, the ST couldn't match it... and hasn't since, despite a drop back to the old £299 price level.

Which leaves everything in the garden rosy for Commodore. Or does it? Unfortunately not; the battle with the ST may be won, but other formidable opponents are now on the horizon. The most serious has to be the growing question of whether or not one should buy a 16-bit computer at all.

This question arises in Britain (and to a much lesser extent, if at all, in the rest of Europe) because of the nature of the market. Buyers remain price-conscious, and £399 for an Amiga or £299 for an ST is still a lot of money for a mass-market device in Europe.

*Martech's Phantom Fighter*—one of a new generation of British Amiga products due out this Christmas.



of the ST in Britain was so great that a survey conducted by the country's leading multiplatform magazine, *ACE*, in the summer of 1987 showed that 95 percent of the 8-bit owners planning to upgrade intended to get an Atari ST. The Amiga, which had only made it onto the market in any volume during February of that year, hardly figured at all.





Secondly, it's still primarily a games market. Although graphics applications are popular (and MIDI, where the ST is concerned, is especially attractive), what people really want to do is grab a joystick and start blasting. To do this, there's really no reason why a dedicated games console shouldn't suffice.

Until now, there hasn't really been a console available that delivers enough clout. Nintendo looked promising but has suffered distribution problems. However, the company is now planning a multimillion-dollar TV ad campaign for Christmas 1988 that could change its fortunes.

Even more significant, however, are the plans of U.K. firm Konix to produce a 16-bit "mega-console" for around £120 [approximately \$215]. Although it's been shrouded in secrecy, enough is known about the machine to get software houses clamoring for a development system. Activision/Mediagenic, U.S. Gold, Ocean, and a number of other major development houses already have one. The machine is due for unveiling early in 1989 and features cartridge and disk loading together with superlative graphics and sound performance.

Not quite *Roger Rabbit*, but still a clever mix of graphics and live action, this scene from the TV fantasy game "Nightmare" was produced using images generated on an Amiga system by the Travelling Matte Company.

A quick glance at this clipping from a popular Danish newspaper shows the enormous extent of Amiga software piracy in Denmark. At the time this paper appeared, many of these titles were yet to be released on the open market. Since 1 krone equalled about 15 cents at press time, you can see that these games were going for rather less than peanuts.

The company, previously known for its joysticks, is also supplying a number of control options, including the home user's very own sitting-room sit-in console.

Meanwhile, another U.K. company, Flare, has designed a Z80-driven engine with powerful custom chips that leaves most 16-bit machines, including the Amiga, stumbling at the starting block. Negotiations are currently underway to put the unit on the market for £199 [approximately \$250]. Its window/menu operating system is entirely joystick- or mouse-driven, so a keyboard is not required. The Flare

uses a DSP (digital signal processor) with a reduced instruction set to handle a 3000-vertex vector-graphics screen at 50 frames a second with 256 colors onscreen at once. You can also program it to emulate Casio PD or Yamaha FM synthesis on any of eight sound channels with full stereo positioning. Not bad for under £200.

Yet the Amiga is selling better than ever before. The question on everybody's lips, however, is whether it isn't

all too little, too late.

This holiday season will determine whether the Amiga ends up a Christmas present... or a turkey.

## And on the Software Side...

"It's so obviously superior." Ian Hetherington, British programming guru and project leader at 16-bit-software house Psygnosis, reckons that from the software developer's point of view, the Amiga has to succeed.

According to Hetherington, the trouble with the Amiga market has been the hardware: "It's tempted programmers to produce a glut of product which merely exploits the hardware features. They see the blitter and 500K of RAM and, *pow!*, they've filled the entire memory with graphics." As a result, the U.K. has been inundated with endless pretty shoot-'em-ups and graphics packages, but no really creative entertainment software.

This situation is chang-

08 Amiga, Infocom adventures, alle 30 på disk., m. manual disk, kr. 225,-.

06 21 24 72 Amiga, Pac. mania, Street S. Basketb., Star Goose, Turbostracks, Menace Mega T., Cyberoid, Summer OL, Spider Tronic, Netherworld, Nebulus, Bundesliga Man., Rocket R., Zynaps, 25,-/stk. incl. disk.

06 44 55 55 Amiga, Rocket Ranger, Summer OL, Virus, Katakis, Platoon, Major M, Whirligig, Down at the Trolls, BoB Moran. Ring for nyhedsliste. Garanti på spillene. Henv. efter kl. 18:00. Kr. 20,-/stk. incl. disk.

05 22 02 56 Amiga: nye spil, progr., kr. 25,-, incl. diskette.

06 43 39 30 Amiga: synops, major motion, rocket ranger, bomb jack, the three stooges, alien syndrom, volleyballsimulator, platoon, hoogieboy, incl. disk, kr. 25,-/stk.

07 52 32 47 Amiga: Bomb Jack, Minigolf, Zynaps, In-ter, Alien Syndrom, Attack on Lon-... kr. 20,-/stk.

08 25 68 69 Amiga: Rocket Ranger, Platoon, Major M...





ing now, however. Psygnosis' next product, *Menace 2*, attempts to branch out with a two-disk multiloading game (unusual so far for the Amiga in Britain) containing 500K of music data alone, as well as enhanced gameplay.

"Multiloading is common in the States," Hetherington observes, "but for different reasons. They have different problems over there, since most programmers go through the operating system. We clear it out completely, so that once the software has read the boot track, you could just as well jettison the ROMs—all our software works with the whole 500K. There seems to be a U.S. philosophy to obey OS rules in the belief that this aids upwards compatibility. If this is really the case, and I believe it not to be, then at the very least you pay a heavy penalty in processing time to achieve it."

This sums up one of the major differences in entertainment-software programming between the U.K. and the U.S. and touches on the reason why the Amiga was slow to catch on. Programming the ST wasn't too different from programming some of the earlier, clean 8-bit machines. The teenage prodigies responsible for much of the country's games software were wary of setting up the Amiga's sound and graphics chips. It all seemed a bit too much like hard work, whatever the results.

That initial resistance seems to be rapidly disappearing, however. Games like Martech's *Phantom Fighter* and conversions along the lines of Grand-slam's *Pacmania* are all part of a burgeoning Amiga software scene in Britain.

## Continental Questions

Although Britain remains the most active home computer



market in Europe, other countries are rapidly catching up. How is the Amiga doing on the continent?

With the exception of France, Commodore seems to be pulling in the prizes in almost every territory. The basic situation isn't that much different from the U.K.'s in that the ST, although initially popular, has been sliding everywhere. More importantly, however, the original predominance of the Commodore 64 in Europe (as opposed to the Sinclair Spectrum in Britain) has eased the introduction of Amiga technology.

## Great Danes

The most striking example of this is Denmark, where Commodore accounts for prac-

tically all the non-MS-DOS units sold. The company even has a firm hold in the PC market—an area it has failed to attack successfully elsewhere in Europe.

*Amiga-crazy* is about the best way to describe Denmark. The country is swarming with computer clubs, and every self-respecting home computer user has an Amiga 2000—quite a difference from the British market, where the less expensive Amiga 500 is preferred.

The only problem in Denmark is software. An unusually high level of piracy means that software titles, however successful, sell as few as 500 units each, which is hardly enough to pay for the packaging, let alone the costs of development. The

The staff of the Amiga Centre Scotland (Martin Lowe, foreground), the first company in Britain to wholeheartedly and exclusively back the Amiga.

only hope here is the increasing activity of Danish programmers on the international market: As they achieve success, perhaps they'll start to realize the penalties involved for indiscriminate piracy and so exert more influence on their colleagues.

## The German Market

Germany was the first country in Europe to really take to the ST, which in 1987 became the first computer in that territory ever to push IBM from the number 1 hardware-sales slot. The ST's never done that again, however, and now the Germans are espousing the Amiga. By the summer of 1988, it was generally reckoned that the Amiga's installed user base had overtaken the ST's by around 30,000 units, though figures for the total sales were unavailable.

One of the reasons for the success of the Amiga in Germany is price—unusual in this market, which normally puts price at the bottom of the list of considerations. However, the 520ST is not popular in Germany, and a 1040ST costs around 1200DM [approximately \$675], whereas an Amiga 500 comes in at 200DM [approximately \$115] less.

Throughout Europe, however, the real determining factor seems to be brand loyalty. Germany is traditionally





a Commodore 64 market and has gone for the Amiga. Denmark and Holland have followed the same pattern.

France and Spain, on the other hand, having previously been loyal to Spectrum and Amstrad, seem to be looking more to the ST. How long this is likely to continue, in the face of dwindling American sales, remains in doubt.

Assuming the continuation of a strong 16-bit-home computer market over the next few years (and it's really only in Britain that there is the slightest doubt on this point), the Amiga appears destined to be Europe's number 1 machine.

## The Business Sector

In common with its approach elsewhere, Commodore is making a big push in the U.K. toward vertical markets, targeting the Amiga at audio-visual applications, CAD, and desktop publishing.

The company's already meeting with considerable success. On the A.V. side, independent TV production company Triangle Television has adopted the Amiga standard in its graphics-design/animation department. A number of other companies have followed suit. Most conspicuous to date must be the infamous Travelling Matte group, which does TV and video postproduction work from the back of a van.

The Travelling Matte has already been responsible for a national TV show, "Knightmare," which featured Amiga-driven graphics sequences overlaid on live action to simulate a computer adventure/fantasy game in which the monsters actually appeared to threaten and chastise the players. The success of the show means that a sequel is bound to appear soon, giving the Amiga a growing prominence in the TV market.

Cadvision's X-CAD has also given the machine a big boost in the computer-aided-design arena, where it's currently rumored that the chairman of the Auto-CAD User Group runs an Amiga... using X-CAD. Commodore has been quick to press home this advantage by appearing at a number of CAD exhibitions—the first manufacturer with a product in this price range to do so.

Desktop publishing has been a much slower part of the market, however. Although the Amiga is widely used for this purpose in Denmark (some of the country's most popular Commodore magazines, from Microtech Publishing, are all produced on an Amiga 2000 using *PageMaker*) and in Germany to a lesser extent, the British market hasn't taken off yet.

According to Dean Barratt, Commodore's marketing manager, "This is simply because the right product hasn't appeared. *PageMaker* on the Amiga just isn't strong enough." It is, however, only a matter of time; the MS-DOS desktop publishing market has been very slow in Britain, and the only real alternative, the Apple Macintosh, suffers from a punitive pricing policy, making the machine almost twice as expensive in the U.K. as it is in the States. The appearance of an affordable, competent desktop publishing system that could handle color would be a major market breakthrough.

## What Lies Ahead?

Commodore has had a tough time in Britain ever since 1986, when the company shut down its vast Corby manufacturing plant. The high times of 1985, when Prime Minister Margaret Thatcher presented the millionth Commodore 64 to a lucky user, are long gone.



Since then, it's been uphill all the way. The Plus 4 and C16 were abysmal failures, despite the latter gaining reasonable sales following heavy discounting. And until recently, the Amiga looked as if it might follow the others into oblivion.

In the last couple of years there's been a big staff shakeup at Commodore U.K., ending up with a new management structure determined to make the Amiga succeed. A charismatic 24-year-old, Dean Barratt admits the company has made mistakes in the past, but points to a new initiative with the Amiga that he believes will pay handsome dividends. "We had a good Christmas last year," Barratt contends, "but we lacked investment from Commodore. Now we've got a £1 million TV campaign about to break, together with shop-window promotions in 300 sites across the country. We've had a tremendous response from everyone and the outlook is very encouraging."

Speaking from the other side of the fence is Martin Lowe, the man who's done as much as anyone to get the

Dean Barratt, Commodore's U.K. marketing manager, surrounded by images that suggest the Amiga will finally be targeted at game players and not at spreadsheet users.

Amiga a high profile in Britain. His Amiga Centre Scotland is the first and foremost Amiga specialist in the country and one of the few companies (if not the only one) in Britain to deal exclusively in Amiga products.

"Commodore has wasted a lot of the last three years," he remarks. "Other machines are now threatening to catch up, so the next six months are quite critical."

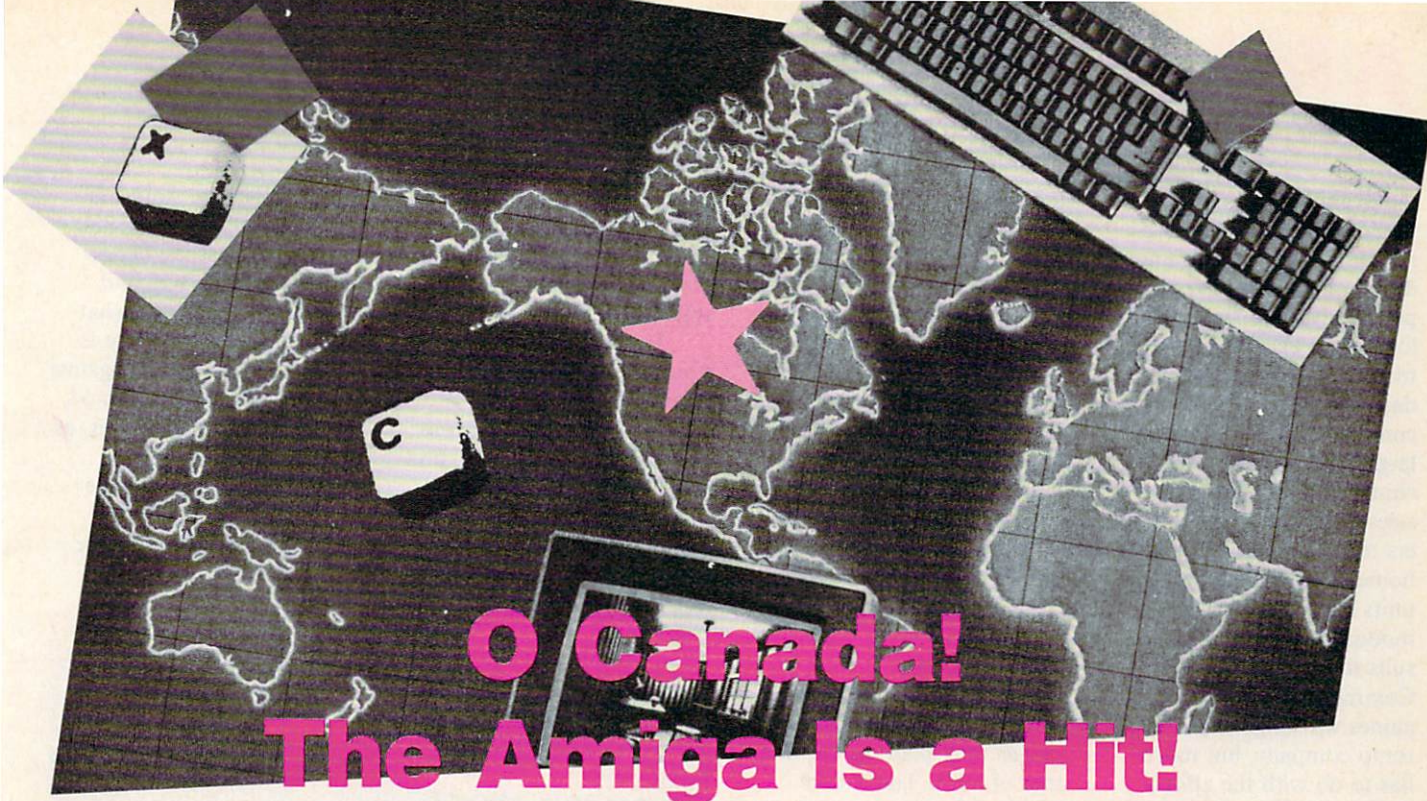
The main problem as Martin sees it is the machine's technical specifications. "There's a serious need to re-spec the hardware," he says. "The screen resolution and numbers of colors are just not good enough for the serious graphics market. Also," he concludes, "there may have been improvements in Commodore's operation, but the marketing has been nonexistent."

Probable causes for concern here are, first, the Acorn/Olivetti Archimedes—an extremely fast RISC-based machine, priced at £800, with 320 × 256 pixel resolution and 256 colors out of a palette of 4096—and, secondly, Amstrad's new range of VGA MS-DOS machines, which start at even lower prices.

It's too early to say which machine will prevail. The Amiga has a big start, but the computer business has a way of ignoring starting positions when it comes to awarding the medals. ▲

Steve Cooke is editor of the U.K. magazine *Your Amiga*.





## O Canada! The Amiga Is a Hit!

In Canada, the Amiga has always known where it was going.

From the time the machine appeared, near the end of 1985, there was no doubt in Commodore Canada's mind that the Amiga would be the machine to replace its best-selling 64. Advertising began immediately, with radio ads gracing, among other shows, Toronto Blue Jays broadcasts. The ads, demonstrating the Amiga's built-in speech capability, were impressive.

As with all computers in Canada, though, pricing was a barrier. The earliest Amiga 1000s, complete with second disk drive and an RGB monitor, sold for about 3,500 Canadian dollars. Compared to a Commodore 64, which with drive and color monitor was going for under \$1,000, the Amiga represented a major investment.

### Worlds to Conquer

But Commodore pushed the machine. The Toronto-based company hosts an annual Commodore-only trade show, the World of Commodore, and even in December 1985 the Amiga made a strong

*Thanks to an aggressive  
marketing campaign,  
not to mention unequalled  
name recognition,  
Commodore Canada has  
achieved substantial success  
with the Amiga. And now  
that Canadians have their  
machines, what are they  
doing with them? Plenty....*

Neil Randall

showing. By 1986 it easily filled half of the show. At the December 1987 World of Commodore, the Amiga was clearly the dominant machine. In many ways, of course, this progress reflected the Amiga advances shown in the United States, but, on the whole, the Canadian branch of the company seemed to give the new machine stronger support.

Commodore Canada, in fact, is entirely in charge of its own marketing. The director of marketing, Stan Pagonis, creates promotions for the Amiga, 64, 128, and the PC line. Among the more popular Amiga promotions are three Amiga 500s (with 1084 monitors) for the price of two (educational institutions only); software bundles at substantial discounts with system purchase (some bundles emphasizing applications, others demonstrating entertainment software); and a special price on the 2088 Bridgeboard when it's purchased with an Amiga 2000.

### Across the Boards

What must be realized to appreciate the relative success of the Amiga in Canada is





the overall success of Commodore International's Canadian subsidiary. Commodore Canada has never posted a year of financial losses, not even during Commodore International's worst days of 1986. Its IBM-compatible line is the second largest seller of MS-DOS machines in the country, and sales of Commodore computers represent half of Canada's home computer market (in units sold). Part of Commodore's popularity here results from the fact that Commodore Business Machines was originally a Toronto company, but much has to do with the affordability of the 64. Apples, IBMs, Macintoshes, and even early Ataris were expensive in Canada, much more so than in the United States.

Today, sales of the 64 account for just under 30 percent (in dollars) of Commodore's overall sales, and sales of the company's IBM compatibles are doing slightly better than that. The Amiga, by comparison, accounts for 42 percent, and it is the machine Commodore has chosen to give the strongest push. Buyers include those upgrading from the 64 and first-time buyers who have read the ads or have heard of the Amiga's capabilities from others. Promotions in Canada have concentrated on the Amiga, but specials for the IBM-compatible line are in the works.

The problem with the Amiga in Canada, says Pagonis, is consumer awareness. Businesses, universities, and even home users know about IBMs, Apple II's, the Macintosh, and the Commodore 64, but few think of the Amiga when they think of computers. To help promote awareness, Commodore has stepped up newspaper and magazine advertising (to the tune of \$2 million in the

third quarter of 1988), and a television campaign is to be launched before Christmas 1988. Furthermore, the company demonstrates the Amiga at business and education shows. Awareness is helped by the Amiga's distribution in nonspecialty stores such as K mart, Canadian Tire, and Eaton's, but this presence is somewhat dubious since mass-market distribution can hinder the appeal of the computer for businesses.

### School Days

One of the company's more interesting awareness campaigns took place in the summer of 1988. Thirty-four students from across Canada, all of them Amiga users, were flown to Toronto for training by Commodore. Each member of the Amiga Action Team, as it was called, then returned home and visited all Amiga dealers within an assigned area. Their task was to help local dealers display and promote the Amiga properly, to coordinate between Commodore and the dealer, and to participate in awareness-oriented Amiga Days. According to Roger Comens, of Neutron Computers (a Commodore retailer in Kitchener, Ontario), the experiment was aimed at the chain stores rather than the specialty dealers because the mass-market stores do not have the resources to maintain a computer-knowledgeable staff.

Comens states, as well, that Commodore Canada provides very good support for its dealers. He sees the measured growth of Amiga advertising as a strong signal of the competence of the company's marketing strategy, saying, "Advertising is something you develop over a period of time, not something you do all at once." He also feels that Commodore's modest advertising for the

Amiga in the early days was a good thing, because the machine's potential was far from realized by the available software.

Support for the Amiga in Canada, particularly the Amiga 500, is understandable. For the past five years, Commodore 64s—and more recently, 128s—have dominated the Canadian education market, much as computers in the Apple II se-

presentation, the Amiga is making slow but significant inroads against the better-established MS-DOS and Macintosh base. Somewhat predictably, Commodore is fighting in this market against the popularity of its own 64, because in research circles, as in business, the Amiga is prejudicially viewed as the descendant of the 64 and thus a more powerful game machine.



The Amiga enjoys centerstage status in Toronto.

ries have formed the basis of K-12 educational hardware in the United States. With the 64 already in place, Commodore was a known commodity in education, so upgrading to the 500 has been a natural step.

Of course, school boards are reluctant to replace one set of computers with a set of incompatibles, and inexpensive MS-DOS machines are cutting into Commodore's dominance of the K-12 market. To combat the incursion of the competition, Commodore Canada has assigned three regional education managers to ensure that the Amiga gets a fair trial.

One of these managers, Ray Prachun, sees the Amiga's K-12 base beginning to broaden, but he finds greater support at the postsecondary level. Especially in the area of audiovisual projects, and increasingly in desktop publishing and video

### User Groups

User-group support for the Amiga is very strong. Commodore Canada's "User Group News," a newsletter aimed at user groups, lists over 120 Commodore groups, most of which, according to Commodore's Donna Green, have a growing Amiga component. A few of the groups are exclusively Amiga, but many began several years ago, in support of the 64, the VIC-20, or even the PET.

The largest Commodore user group in Canada, in fact, retains a reminder of its PET origins in its name. The Toronto Pet Users Group, a.k.a. TPUG, offers a wealth of Amiga public domain software and programming and development assistance. TPUG has several chapters in the Toronto area, and meetings are both regular and frequent.

One group, Ottawa's Amici Amiga Users Group, launched the first annual



Amiga Community Friendship Day on October 1 and 2, 1988. Their initiative was to take some 500s, 1000s, 2000s, keyboards, video cameras, digitizers, printers, and genlocks into an Ottawa children's hospital and let the children create an Amiga environment. Amici contacted several other groups around the country and in the United States, and their challenge to organize similar community-based events in other cities received an extremely favorable response.

### Down to Business

Like all computer manufacturers, Commodore hopes to break the IBM—and to an increasing extent, Macintosh—hold on the business market. For a number of reasons, this is far from an easy task. First, where businesses use microcomputers rather than mainframes, *personal computer* (PC) has come to be synonymous with IBM. In addition, Apple has done a much better job of selling the Macintosh than Commodore has done selling the Amiga. Finally, the introduction of IBM's OS/2 and that of the Macintosh II have done much to convince businesses to upgrade the system they have rather than switching to a new system. If these three reasons haven't been enough to keep Canadian businesses away from the Amiga, the Amiga itself provides two reasons: its price and its company. Given the perception of many business professionals that you get what you pay for, only the Amiga 2000 is expensive enough for a business to consider it a "serious" computer. What's more, Commodore Business Machines, despite its longevity in the computer field, is not viewed as a completely reliable company.

Still, there is room for optimism in the Amiga's

chances of capturing a share of the business market. According to Pagonis, "There is considerable movement in business circles for the Amiga, especially where a powerful graphics tool is necessary. Art studios, advertising agencies, corporate departments that require four-color separation—these are the most common business applications at present." Furthermore, Pagonis says, interest is high in the area of video applications. Cable companies and production houses are using the Amiga for sets, animation, and titling; and it's seeing increasing use in Canadian television for weather telecasts. The Amiga has been seen on "Miami Vice" and in the movie *Three Men and a Baby*.

Despite this activity, Pagonis admits that the Amiga's business growth is slow. The company is aiming less at businesses currently using IBMs than at those now equipped with Macintoshes, because the Amiga's

*Earl Weaver Baseball* on the Amiga might well be the best-looking software designed for any microcomputer, but, in the world of word processing, spreadsheeting, and database managing, the existence of graphics-intensive games is a minus, not a plus. Certainly the introduction of *WordPerfect* for the Amiga eases part of this difficulty, but the machine still has no proven, respectable database manager or spreadsheet program. Like WordPerfect Corporation, Ashton-Tate (publishers of *dBase III*), Borland (publishers of a host of IBM software), and Microsoft (publishers of MS-DOS and *Word*) are names that speak volumes. Amiga software developers have not built anywhere near this level of corporate reliability.

### New Kid on the Desktop

Here too, though, is reason for optimism. *WordPerfect's* presence on the Amiga scene is very good news, but so is the commitment of Canadian

*Script* a few months later. Last year, Gold Disk introduced *Professional Page*, a professional-quality desktop publishing package clearly aimed to compete with Macintosh packages such as *PageMaker*. A recent upgrade to *Professional Page* includes a four-color-separation module on paper or on film (for later conversion by typesetting machines) and a wealth of other improvements to an already-impressive product.

From a business standpoint, the company's commitment could be a major plus. Like most professional products, *Professional Page* is offered at a strong discount to educational institutions, and a policy of upgrades is in full force for all owners. Recently Gold Disk released *Professional Draw*, designed to work hand in hand with *Professional Page*. *Professional Draw* offers the possibility of camera-ready color illustration, something a production house would find most appealing. These two products are typical of the kind that vaulted the major IBM and Macintosh publishers to the kind of respectability they now enjoy.

Such respectability is necessary. The Amiga is well established in Canada, but it still has a long way to go. It must either crack the business and education markets before too long or abandon the attempt in favor of its own unique markets, probably in broadcasting, production, and in the home. Certainly Commodore Canada seems committed to making the Amiga happen here, and it is willing to look at the machine's growth as a long-range strategy rather than a quick, shoot-the-works kind of approach. That alone is some guarantee of success. ▲

Neil Randall, a frequent contributor of features and reviews, is a professor at the University of Waterloo in Ontario.



Thousands of people attend the World of Commodore show.

advantages over the Mac—color, graphics handling, animation—are better understood by an organization already committed to a Motorola 68000-based machine.

One of the problems with cracking the IBM/Mac business market, of course, is the availability of professional-quality software.

publisher Gold Disk Incorporated, of Mississauga, Ontario (near Toronto). The company's first Amiga offering was *PageSetter*, a medium-complexity desktop publishing package. Gold Disk was among the first to offer *LaserScript* compatibility for its software, with the release of *PageSetter Laser-*





# Here, There, and Everywhere

**T**here may not be many Amigas in the Orient yet, but there is a lot of talk about the machine.

Considered estimates place the number of Japanese Amigas, for example, at fewer than 5000. In terms of awareness, though, the Amiga is close to universal. During a recent visit to Japan, we discovered that virtually everybody in the Japanese personal computer industry seems to know the Amiga, and despite language barriers, all are able to extol the machine's virtues.

Commodore itself is well aware of the potential for success in the Orient. "We want to see a larger number of Amigas in Japan and the Orient," says Max Toy, Commodore's president. "Although our largest marketing opportunity remains right here in the United States, there's no denying the business and vertical uses that Amigas can serve. That's as true in Japan as anywhere."

It's more likely, though, at least for the time being, that there will be more Japanese software flowing westward to the Amiga than

## *Amiga news, notes, and notions from around the globe*

Amigas migrating to the East. Several leading Japanese entertainment software publishers are already finding the Amiga to be a hospitable home for their products.

Entertainment software in Japan is an arcade-driven industry, and industry leaders, intent on carrying their programs to the world, have targeted the Amiga as the machine on which to display their products to their greatest advantage.

Taito spokesman S. Yasuda is enthusiastic about the machine. "Amiga offers [producers of entertainment software] a great opportunity.

Amiga has the combined graphics and sound capabilities that make it an excellent amusement machine." Already established in the Amiga market with games such as *Arkanoid*, Taito will be bringing other proven arcade performers to Amiga screens in 1989.

Konami is another Japanese arcade giant with ambitious plans for the Amiga. According to Kenji Kobayashi, supervisor of Konami's overseas department, the company will release 7-10 Amiga titles in 1989.

Because the Amiga is almost the only personal com-

puter capable of matching the quality of coin-operated games, there may be an even more interesting arcade development. Rumor has it that a major producer of coin-op games is looking into the possibility of using Amigas as engines for new-generation coin-operated arcade machines.

It would be ironic, wouldn't it, if those quarters that kids pop into slots delivered the same graphics and sound we already enjoy in our homes and offices?

### **Up from Down Under**

If Crocodile Dundee and koala bears can come out of Australia to conquer the world, then why not software?

That, at least, is the hope of Joker Software International. Peter Snow, CEO of the Australian company, is eager to let the world know the wonders of Australian software for the Amiga.

The first of those products to hit the States is *Aussie JOKER POKER*, a card game that has proved phenomenally popular in Australia and which will be making its American debut simulta-

Keith Ferrell



neously in all major personal computer formats.

It's clear from a few minutes with Snow that the Amiga may be nearest and dearest to his heart. For one thing, *Aussie JOKER POKER* was originally written for the Amiga using *True BASIC* as well as certain proprietary software tools. For another, the Amiga is hugely popular in Australia, where more than 10,000 copies of *Aussie JOKER POKER* have been sold.

"That's a terrific number of copies," Snow points out, "considering the size of Australia's population."

The game itself is simple enough, yet it can prove hypnotic. With your Amiga acting as both dealer and croupier, players (up to 90 of them!) work their way through hands dealt them—sorting, discarding, and drawing cards in hopes of tallying high scores. *Aussie JOKER POKER* is enough like familiar card games to be quickly accessible, yet it carries enough of the flavor of Australian casinos to be a little exotic.

Like all of Joker's products, the game is nonviolent, a point Snow stresses. "Our products are appropriate for the whole family," he says. Upcoming products from the Australian developer include a word game and a LOTTO generator.

If they're as well executed as *Aussie JOKER POKER*, we may be saying *G'day!* to quite a bit of Australian software in the near future.

### Smooch!

Whatever the nation, the market for personal computers is predominantly male. That's as true of the Amiga as it is of any other machine, and it's a situation Commodore intends to remedy.

In Europe, an advertising

campaign to win the hearts of the female market is sealed with a kiss. Literally.

*Kiss Me, Amiga!* is the tag line for a series of ads designed to increase female awareness of the Amiga in particular and of microcomputing in general. "Our audience is 85-percent male," notes Winfried Hoffmann, managing director of Commodore's European operations. "It's up to all of us to stress the importance of equal computing opportunities for members of both sexes."



The new campaign is designed to encourage young women to explore the educational benefits that can be derived from the Amiga. "It's the computer for the clever her, the clever him," the ads state.

While the campaign is primarily running in traditionally female-oriented publications, the tag line appears to have acquired a life of its own: *Kiss Me, Amiga!* has been spotted on clothes borne by both fans and athletes at recent soccer and track-and-field events in Germany.

### Behind the Curtain

Despite restrictions on passing technology to Eastern

bloc nations, Amigas are finding their way behind the Iron Curtain in larger and larger numbers.

"There are more Amigas in the East than anybody believes," states Commodore's Winfried Hoffmann. Perhaps as many as 20,000–30,000 Amigas are now in use in countries such as Hungary and East Germany, he says.

Hoffman says Hungary loves the Amiga and is one of the world's leading producers of entertainment software, although this fact is less than

Amiga community is doing. To that end, we'll need your help.

Let us hear from you. We want to know where Amigas are found and what they're being used for. We're interested in both professional and personal applications.

Likewise, if you're involved with, or know of, an Amiga user's group that isn't included in our "User Group Update," drop a line to Mickey McLean, user's group coordinator, in care of this

**An addictive card game, *Aussie JOKER POKER* is one of the first pieces of Amiga software to come up from down under.**

magazine. Let us know as well something of what your user group does, how many members you have, and so on.

Obviously, we're open to submissions from throughout the world. If you're an Amiga artist, consider our pages as the showplace for your creations; we pay for the art we publish. If you're a programmer, think about submitting your work for possible purchase and inclusion on *COMPUTE!'s Amiga Resource Disk*, which will make its debut next issue.

In an often fractious world, it's nice to find an area where people can come together for entertainment, discussion, and the sharing of information. Those are just some of the purposes we hope to serve with *COMPUTE!'s Amiga Resource*. There are a world of other possibilities, and we look forward to exploring some of them with you. ▲

Keith Ferrell is *COMPUTE!'s* features editor and our most well-traveled staffer.

### Where in the World Are You?

*COMPUTE!'s Amiga Resource* aims to serve Amiga users, and we believe that's a worldwide community.

Certainly our distribution plans embrace much of the planet. As this issue shows, we're already delivering worldwide Amiga information to our readers.

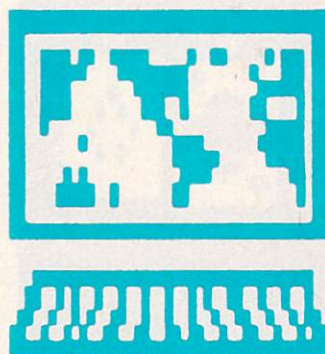
We want to do more. In addition to our regular features, columns, and reviews, we'd like to keep all of you posted on what the rest of the



## A M I G A

A  
Programmer's  
Dream

*It can be a business computer, game machine, graphics wizard, or almost anything you want.*



**A**migas are programmers' vehicles. No other machine shows off programming so well. Its powerful 68000 microprocessor makes it a business computer; its animation subsystem makes it a game machine; its multifont support makes it a capable desktop publishing system; its dedicated chips make it a graphics wizard and a music virtuoso.

In the sea of today's computers, the Amiga truly is an island unto itself. Secure in its proprietary operating system, it resists the ebb and flow of MS-DOS and Macintosh influences. While the Macintosh promotes desktop publishing, Amiga users

experiment with desktop video. While neatly aligned rows of blue-suited executives number-crunch through the latest MS-DOS spreadsheet, the diverse ranks of Amiga artists, musicians, and dabblers boot up *Deluxe PhotoLab*, *PIXMate*, or *Sonix*, or simply preview the latest killer demo.

How does this diversity of Amiga users affect Amiga programmers? They tend to be more freewheeling, daring, and innovative. Very few programmers consider the trial of porting their programs to another computer when they're designing an Amiga program. Freed from the limitations of other computers, they can design beyond the bounds of the lowest common denominator.

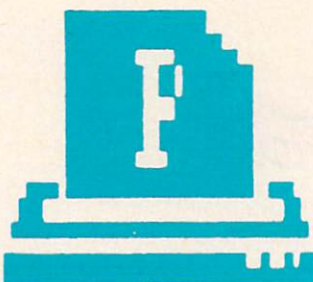
Programs do get ported the other way—that is from other systems to the Amiga. *WordPerfect* is a good example. Just about anything that can be done on another system

can be done on the Amiga. Many ports of UNIX programs are in the public domain. UNIX hackers love the Amiga because the UNIX kernel resembles EXEC (Amiga's multitasking kernel) and because the UNIX-spawned C language is the Amiga's official system programming language.

As with any computer, you must watch for certain things when programming the Amiga. Because it's a multitasking computer, you must be careful not to step on the feet of other programs that may be running at the same time. You must also follow several standards. Though they may take time to learn, they make for a consistent and easy-to-use user interface. The Amiga provides you as a programmer with many tools and devices that require careful study and experimentation. But again, mastering these tools makes programming simpler.

*Rhett Anderson and  
Randy Thompson*





Over the next several pages, you'll learn about the marvelous Amiga and the variety of Amiga programming languages. And while you may not find the perfect Amiga language, we're sure you'll want to try a few.

### In the Chips

Hidden within the Amiga's casing is a treasure of custom silicon. Designer Jay Miner gave the Amiga specialized integrated circuits for sound production, graphics manipulation, and disk I/O—chips so powerful that they are being put to use in stand-alone arcade machines. The Amiga's blitter, for example, is capable of moving large bitmapped images.

To take full advantage of the Amiga, programmers need to learn to use these chips to their potential. Words like *copper list* and *clipblit* permeate Amiga SIGs on CompuServe and BIX.

### Basic Concepts

Before you start programming the Amiga, you need to understand the meaning of several terms. Some of the most important are listed here.

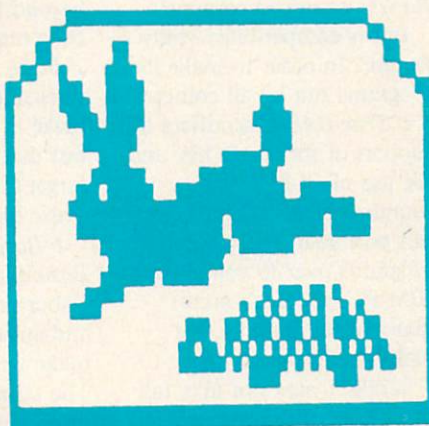
• **Workbench.** We're all familiar with the Amiga Workbench. Unless you've modified your startup sequence, the Workbench is the first thing you encounter when you boot your computer. Using this friendly, mouse-driven interface, we

control our computers, performing such operations as copying files, formatting disks, and, most importantly, running programs.

It's important for you, as a programmer, to make sure your software is Workbench-accessible. By not providing double-click access to your programs, you limit the usefulness of your work. To be considered a *true* Amiga application, a program should be accessible from both the Workbench and the CLI. Expecting a CLI user to load the Workbench just to run your program is almost as unforgivable as forcing a first-time user to wrestle with Amiga's MS-DOS-like, CLI interface.

• **CLI.** The CLI is the Amiga's Command Line Interface. It is similar to the MS-DOS A> prompt. Several programming languages require the use of the CLI, though the trend is to allow programmers to share the Workbench interface that Amiga users enjoy.

• **Intuition.** This is the core of the Amiga's multitasking operating system. *Intuition* provides access to screens,



windows, icons, pull-down menus, gadgets, requesters, graphics, and the all-important mouse.

To the programmer, *Intuition* is a powerful set of

programming tools, or, more accurately, a library of functions written in the C programming language but accessible from all programming languages. To the user, *Intuition* is a consistent and friendly means of interacting with the computer. Understanding *Intuition* is the key to designing easy-to-use and easy-to-program Amiga software.

• **Memory.** The Amiga has two different kinds of RAM. If your Amiga has 512K of RAM or less, all your memory is *chip memory*. It's not called chip memory because the RAM is on a chip; it's called chip memory because it can be read by and written to the Amiga's three custom chips: Agnus, Denise, and Paula (sometimes known as Agnes, Daphne, and Portia). These custom chips are responsible for the Amiga's video and audio magic. Among them, they hold the blitter (a high-speed data mover), the copper (in charge of displaying video data), and the four-channel stereo audio.

Expansion memory (memory above 512K RAM) is *fast RAM*. It cannot be accessed by the custom chips—only by the microprocessor. Because the custom chips aren't "running interference" on this RAM, programs in fast memory run slightly faster than programs in chip memory.

You may think that having two types of memory would be confusing, but it usually causes little trouble. The Amiga automatically loads programs into fast memory if there is any available. If there isn't any, the Amiga loads the programs into chip memory.

Programmers can specify the type of memory they want when they request memory from the system. It's important to request chip memory when you use memory to hold sound or graphics data.

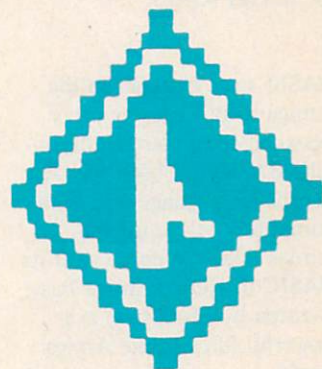
• **Structures.** To access ROM

Kernel routines, programmers need to learn about the system's data structures. In C, you access these system structures with C *structures*. In Modula-2, you use *records*. In assembly language, you have to simulate structures by defining the correct amount of space for each field.

Most Amiga programming languages have the data structures predefined as *include files* (known as *import modules* in Modula-2).

• **Include files.** With all the powerful routines built into the Amiga, there are many programming functions, constants, structures, and so on that must be defined somewhere within your source code. To use these elements, most Amiga programming languages require the use of include files. Include files provide these definitions for you, saving you the time of typing them in.

• **Libraries.** ROM Kernel routines are grouped into *li-*



*braries*. If you use these routines in a library, you must first open it (some languages open the necessary libraries automatically). Many libraries reside in ROM, but some must be loaded from disk.

• **Devices.** *Devices* (like the printer or the serial port) are treated as if they were libraries. To communicate with a device, you open the device and then perform calls to it for input/output. ▶

*continued on page 42*





# The Multilingual Amiga

In the following paragraphs, we summarize many of the most popular programming languages. Note that there are several specialized languages that we don't cover. Instead, we've elected to discuss only general-purpose ones. For those interested in special-purpose languages, check out *Director*, a powerful language designed for graphics and animation; *ADVSYS*, a language tailored to writing text adventures; and *ARexx*, a powerful batch language similar to CLI scripts.

## BASIC

BASIC is as popular on the Amiga as it is on any other personal computer. Traditionally, BASIC has been the *only* computer language sold with computers. Although the Amiga does not come with its BASIC in ROM, Amiga Basic (written by Microsoft) is a powerful force in the Amiga world.

For those who are looking for more speed or more power but who still want to stay with a language they know, there are several good alternatives to the BASIC that all buyers get free with their Amiga.

## Amiga Basic

Certainly the most accessible programming language available for the Amiga is Amiga Basic. Amiga Basic is found on the Extras disk that comes

with your computer. And even though it's free, it's one of the best versions of BASIC available for *any* computer.

Amiga Basic is an exceptionally capable programming language that provides easy access to almost all of the Amiga's features—screens, windows, sprites, sound, the mouse, and so on. It's also compatible with other versions of Microsoft BASIC, such as those for the IBM PC and the Apple Macintosh. BASIC programs written for these computers run on the Amiga with virtually no changes.

Amiga Basic is an interpreted language, however, so its programs are slower and require more memory than programs written in a compiled programming language. However, with a BASIC compiler, such as *AC/Basic*, Amiga Basic programs can be turbocharged for optimum performance.

If you're a casual programmer, Amiga Basic may be the only language you'll ever need.

## AC/Basic

If you get serious about Amiga Basic, you should consider *AC/Basic*, a compiler from Absoft. *AC/Basic* is virtually 100-percent compatible with Amiga Basic. If you've written a few programs and you want them to go much faster, *AC/Basic* will oblige.

Absoft also makes compilers for the Apple IIGS and the

Macintosh (the Mac version is sold by Microsoft). If you've written a program for any of these three machines, it's relatively easy to get the program to work on the other two.

## True BASIC

About 25 years ago, John Kemeny and Thomas Kurtz developed the BASIC programming language. Today, BASIC has become a language with a hundred different dialects, with each dialect virtually incompatible with the next. *True BASIC* is Kemeny and Kurtz's attempt to both modernize and standardize the BASIC language. In theory, a program written in *True BASIC* on one computer will run without modification on another *True BASIC*-equipped computer.

But is compatibility really a feature? In order to make its programs run on all computers, *True BASIC* sacrifices the support of sprites, BOBs, and the use of all four Amiga sound channels. Though you can port your *True BASIC* programs over to your friend's IBM PC, you can't access many of the features that make the Amiga unique.

While it may not take full advantage of the Amiga's advanced capabilities, *True BASIC* is a quality structured language. *True BASIC* provides DO-WHILE loops, DO-UNTIL loops, CASE statements, internal and external subroutines, and the

ability to call C and assembler routines.

*True BASIC* is both an interpreter and a compiler. This makes for a unique programming environment. For developing and debugging programs, use the interpreter. For the final product, select Compile—*True BASIC* will generate a self-contained machine language program that runs at lightning speed.

## F-Basic

*F-Basic* is a curious but powerful version of BASIC. It's not pure BASIC, however, but more a blend of BASIC, Pascal, FORTRAN, and SNOBOL. BASIC users will feel right at home with it, though.

*F-Basic* is a good transition language. If you want to move beyond BASIC, but C source code makes you nauseous, try *F-Basic*. Its RECORD structures and direct library calls make it powerful, and it's so fast that you may decide to forget C and stick with *F-Basic* instead.

*F-Basic* is written in *F-Basic* therefore, it contains elaborate pattern-matching and string commands that make writing compilers easy. The string handling is more impressive than any other language discussed here. (See the sidebar on exotic languages for a discussion of Icon, a programming language that has even better string-handling capabilities.)

Be forewarned: *F-Basic*





doesn't have a Workbench interface; you must use it from the CLI. It also doesn't have an integrated editor, which makes the process of correcting syntax errors quite a chore.

### GFA BASIC

*GFA BASIC* is the most popular programming language on the Atari ST. Although the Amiga version probably won't show up until spring, beta copies of the language are impressive. This version of BASIC has many specialized keywords for both sound and graphics control. It also makes it easy to get at the Amiga's library routines. The language is reentrant, which means that no matter how many *GFA BASIC* programs are running, only one copy of *GFA BASIC* need be present. *GFA BASIC*, currently being beta-tested, will be available from Michtron.

### SAM BASIC

Remember *Simon's BASIC* for the Commodore 64? It was a graphics- and sound-intensive superset of BASIC 2.0. The developer of *Simon's BASIC* has created *SAM BASIC* for the Amiga. It's a very powerful BASIC with more extensions than any other version. Although the language showed promise a year ago, this British program has been plagued by distribution problems in the U.S.

### C

C was the first programming language available for the Amiga. It is, so to speak, the Amiga's native tongue. Because much of the Amiga's operating system is written in C, most Amiga programming books focus almost entirely on this terse language.

C is not a language for

beginners. It's difficult to read—often cryptic—and extremely unforgiving when it comes to errors (C is a close friend of the Guru). But most of all, C is flexible and efficient. It's the perfect language for confident Amiga programmers who want to get the most out of their machines.

Currently, there are two C compilers available for the Amiga: *Lattice C* and *Aztec's Manx C*. Both are quality compilers. With more error checking, a built-in editor, and an integrated debugger, *Lattice C* is the leader in price and performance. Programs written for one compiler require little, if any, modification to run on the other.

### Pascal

Pascal is among the most popular of algorithmic languages. This language hasn't really caught on in the Amiga world, mostly because there haven't been any good implementations of Pascal.

Metacomco's new *MCC Pascal* Version 2 changes that. It's a full ISO-standard Pascal, with many Amiga-specific extensions. Although it's a bit more cumbersome than Modula-2, it performs almost as well. It's reasonably priced and has a better manual than any of the Modula-2s. Unfortunately, it can only be used from the CLI. It lacks an integrated editor. You'll find that it's almost impossible to find Amiga demos written in Pascal, but several demos are included on the disk. If you like Pascal, you'll love *MCC Pascal* Version 2.

### Modula-2

Pascal is a popular language, but it has trouble with low-level system access. That's the major reason C has be-

come so popular on microcomputers. Modula-2, Pascal's big brother, is a powerful and readable language that meshes almost perfectly with the Amiga. At first, Amiga Modula-2 programmers had a hard time deciphering the C code that makes up the bulk of programming examples found in Amiga programming books, but there are now many examples of Amiga Modula-2 code in the public domain.

All versions of Modula-2 currently available for the Amiga have editors that are well integrated into the system. When the compiler finds programming errors, just load the source file into the editor—you'll see where you've made your mistakes.

### TDI Modula-2

*TDI Modula-2* was the first version of Modula-2 available for the Amiga. Most demo programs are written in it. TDI has done a fair job of upgrading the compiler, but there are still a few bugs left. It's also the slowest of the three Modula-2 versions.

### Benchmark Modula-2

*Benchmark Modula-2* is a fast, single-pass compiler with an integrated editor. Many extra modules are available, including modules that support IFF graphics, simple windows, and C-style system calls.

### M2-Amiga

*M2-Amiga* is a speedy Modula-2 compiler. Although it's expensive, it has the best interface of all the languages discussed here.

### Machine Language

There are almost a dozen assemblers on the market, including a few good public

domain programs. A few have integrated editors and debuggers that make learning how to program in 68000 easier.

When you're programming in machine language, you're working at the computer's level. This makes for excellent control and speed.

If you've programmed in machine language on other computers, you'll find the Amiga's 68000 microprocessor surprisingly powerful. It can operate directly on data sizes of 8 bits, 16 bits, and 32 bits. It has built-in multiply and divide operations.

There are two schools of thought when it comes to Amiga machine language. One group claims that it is best to use the Amiga include files to reference data structures, library calls, and macros. This makes machine language programming more like a higher-level language. The opposing camp believes that programmers should declare the necessary structures and library vector offsets explicitly. This makes it much faster to assemble programs. The first process appeals to mainframe and minicomputer programmers; the second, to programmers who cut their teeth on computers like the Commodore 64.

### The Right Choice

The problem of choosing an Amiga programming language is like the problem of choosing a dessert in an expensive restaurant. When there are so many good selections, it's hard to decide what's the best choice.

If you'd like a taste of each language, download a few bits of source code from a bulletin board or visit your local user group for advice.





Software Failure. Press left mouse button to continue.

Guru Meditation #81000009.00203782

## A Taste of the Exotic

**T**ired of the humdrum world of everyone else's favorite language? If BASIC, Pascal, C, Modula-2, and machine language are the English, French, Russian, Latin, and Spanish of the computer languages, then what is the programming analog of Swahili? Hawaiian? Algonquian?

If you're ready for an adventure, try Draco, Icon, or XLISP. You might have to do a little searching, but you'll probably enjoy your destination. You might even like getting there.

### Draco

On a trip through CompuServe, we came across this beauty. Draco is a computer language that's a little bit of C, a little bit of Modula-2, and a pinch of a few other things.

Because of its family resemblance to other structured languages, Draco is an elegant language. Once you get the hang of it, it's fun to use. Its speed is good, but nothing to write home about (about on par with that of a bad C compiler). The author of the language, Chris Gray, a professional compiler writer, is certainly capable of optimizing the code. We'll see if he gets around to it.

The main drawback to Draco is that you're on your own. You probably won't be able to find many demo programs written in it. Draco exists only on CP/M machines and the Amiga. But if you have a stubborn side to you, or if you can't scrape up the bucks for a full-blown C or Modula-2, this language may be for you.

### Icon

Have you ever noticed that there's something familiar about BASIC, Modula-2, C, Pascal, and FORTRAN? Once you've learned one, the second isn't too hard to pick up. The third is even easier. These languages, although superficially very different, are all members of the computer language family known as *procedural languages*. In other words, a FOR loop is a FOR loop is a FOR loop.

If you've learned a few of these languages and you feel as if you're in a rut, take on a real challenge: Icon. Icon was designed by the designer of an earlier language, SNOBOL. While that language was based on a variety of string scanning and other text-based functions, Icon is a universal language, general enough to handle virtually any problem.

Icon is almost impossible to describe. There are things you can do in a single line in Icon that take 20 lines to accomplish in Pascal. Icon, like its predecessor, is popular in some universities. There's even a textbook that covers it—*The Icon Programming Language* (Ralph E. Griswold and Madge T. Griswold, Prentice-Hall). If you're intrigued, try it.

### XLISP

Another exotic language is XLISP. Written by David Betz, XLISP is an object-oriented version of LISP, the most popular of the languages used by artificial-intelligence researchers.

What does object-oriented mean? It means that instead of constructing procedures to do your work, you build objects. The objects pass messages back and forth. Objects can be based on other objects. The idea comes from *Smalltalk*, a language developed at Xerox PARC. You'll also find objects in C++, a new variant of C. (Lattice has just introduced a C++ compiler.)

Sure, it seems weird, but so do most new ways of looking at things. Give XLISP a try.

*continued from page 39*

• **ROM Kernel.** Hidden behind Intuition are a set of programming routines known as the *ROM Kernel*. These routines provide access to the Amiga's lower-level features.

The ROM Kernel is much like BIOS on the IBM PC, TOS on the Atari ST, or Kernel ROM on the Commodore 64 and Commodore 128. By using the ROM Kernel's built-in subroutines, programmers have access to the Amiga's I/O devices, low-level graphics routines, sound chip, and much more. On the Amiga 1000, most of the ROM Kernel is stored on the Kickstart disk. On the Amiga 500 and Amiga 2000, these routines are located permanently in the computer's ROM.

• **Exec.** Exec is the multi-tasking operating system of the Amiga. It handles task scheduling and such jobs as opening and closing libraries.

• **The Guru.** A visit from the *Guru* means that something has gone wrong. As any programmer knows, programs rarely run correctly the first time. If a program error is severe enough, the Guru steps in. Red flashing borders announce the Guru's arrival. Within these borders is the message *Guru Meditation #x*, where *x* provides the numeric representation of what went wrong. Most often, Guru visitations end with a system reboot, causing the computer to react as if you have pressed Control-Commodore-Amiga (or Control-Left Amiga-Right Amiga on the Amiga 1000).



# BUYER'S GUIDE

## ACTION GAMES

### Adventure

#### Autoduel

Origin Systems / joystick / 39.95

In the twenty-first century, the player is assigned to carry out a courier mission for the FBI. To complete the mission, the player must build the biggest, most heavily armored vehicle possible using a variety of weapons, ammunition, and armor. This game is an adaptation of the board game Car Wars. The package includes one disk, a road map, a driver's handbook, and a toolkit.

#### Battleship

Epix / 29.95

Based on the board game of the same name, *Battleship* pits navy against navy as players try to avoid detection of their fleet by the enemy. Shrapnel, fire, and holes in the broadside cripple the battleships until they finally sink. Using the Salvo Fire option, players can fire only four shots per remaining ship. Two or more players may also compete in the tournament play. *Battleship* contains digitized sound effects and color graphics.

#### Boomeraid

TSA Media / Distributed by American Software Distributors / 49.50

As a result of training by tribal elders deep in the Australian bush, the player decides to rely on his or her skill with spears and boomerangs to rid the city's parks of street gangs. While eliminating the menace, the player must also protect the elderly citizens who have been caught in the parks. Ratings are based on flight path, accuracy, and avoiding the grannies. The player begins with a spear and progresses to more advanced boomerangs, adjusting the flight path of the weapon according to the graphs

Exciting storylines combined with outstanding graphics and realistic sound bring adventure and challenge to your screen. Our buyer's guide lists the games that draw you into the action.

and equations at the bottom of the screen. A bushknife can be used as a last resort. In the seventh and final mission, the player must drive the gang members out of their junkyard fortress and defeat their leader, Top Dog. The package includes the program disk; a 50-page tutor that helps explain graph theory; and MathBench, a graphics workstation for manipulating the graphs used as flight paths.

#### Capone

Actionware / 512K / 39.95

Set in Chicago during the 1920s, *Capone* challenges the player to shoot down as many gangsters as possible without injuring any innocent bystanders. In addition to pedestrians, there are many obstacles such as a warehouse filled with crates of explosives. This action game features animation, color graphics, and sound effects. It is designed to be used with the Actionware Light Phaser Gun, which is available from Actionware for \$39.95. Mouse control is also accepted.

Caroline D. Hanlon

#### Contra

Konami / joystick optional / 39.95

As the ultimate guerrilla warrior, the player must fight against the Red Falcon to save the whole world. Weapons include rapid-fire machine guns, alien cannons, and high-tech lasers. The warfare takes place in 3-D mazes with underground security systems and tropical forests with giant waterfalls.

#### Cosmic Relief: Prof. Renegade to the Rescue

Datasoft / Distributed by Electronic Arts / 39.95

Professor K. K. Renegade is the only one who can save Earth from total obliteration by an approaching asteroid, but he can't be found. The player chooses one from a group of internationally famous adventurers to help in the search for the professor. During the quest, the adventurers are confronted by bizarre creatures and acid storms, and they must rely on objects such as vacuum cleaners, teacups, and unicyles. After finding the professor, the group must build an anti-asteroid deflector.

#### Dark Castle

Three-Sixty / 39.95

Play is set in medieval times, where the hero must fight his way through 14 different rooms of the castle. Each room becomes progressively harder as the player sends the hero up against rats, bats, and fire-breathing dragons. Dungeon torture and an evil wizard must also be overcome. The ultimate object of the game is to find and slay the Black Knight.

#### Defender of the Crown

Cinemaware / 49.95

In this adventure, the player takes the role of a swordsman and military leader in medieval England. The player must lead the Saxon knights against the Norman invaders to defend England and end the civil war. >



## **Deja Vu: A Nightmare Comes True**

Mindscape / 49.95

The player's head has a huge bump on it and his or her clothes are covered in blood. Nothing seems familiar in any of the rooms. There's been a murder, and the player is the suspect, yet the player is the only one that can solve the murder and absolve him- or herself of the charges.

## **Dungeon Master**

FTL Games / 39.95

*Dungeon Master* is a realtime game of monsters, weapons, magical spells, twisting corridors, flying projectiles, and other surrealistic aspects of a dungeon world. The game incorporates color artwork, animation, and digitized sound.

## **Dungeon Quest**

Image Tech / 512K / 49.95

*Dungeon Quest* is a graphic adventure game featuring 40 different graphics and digitized sound. The intuitive user interface can be used to move the characters or look for information. The game takes place in Medieval England where a young knight undertakes a quest to find a stolen article. The quest takes the knight through the countryside and to a castle with several levels of dungeons.

## **Faery Tale Adventure**

MicroIllusions / Distributed by Mediagenic / 49.95

Players travel through over 17,000 surface screens and another 2000 screens underground and on an astral plane in this graphics adventure. The object of the game is to join the quest of three brothers as they encounter dragons, wizards, and princesses. Features include music and sound effects.

## **First Expedition**

Interstel / Distributed by Electronic Arts / 49.95

Braun the Explorer ventures into the unknown ocean world of Yorland with a boat and a companion to recover three sun spheres and save his civilization. To survive, the characters must learn to manage their food and fuel resources and map their journey using a star chart, a star catalog, and ancient map fragments. Allies and enemies include pirates, traders, and natural elements.

## **Fright Night**

Microdeal / 39.95

This R-rated game is based on the *Fright Night* movie from Columbia Pictures. As the vampire neighbor Jerry Dandrige, the player has 12 dark and dangerous hours to turn everyone in the house into a vampire before they kill him in his own coffin.

## **Gnome Ranger**

Constellation Software / 19.95

This graphics adventure game features Ingrid, who must be guided through a three-part odyssey. A 48-page gnome diary is included with the package.

## **Gold Rush**

Sierra On-Line / 39.95

A historically accurate adventure game, *Gold Rush* follows one man's journey from New York City to the gold fields of California as he tries to strike it rich. There are three different games in the program, one for each of the three routes the prospector can choose. Each trail has its own set of obstacles and perils.

## **Guild of Thieves**

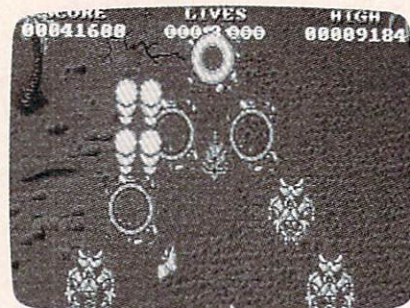
Rainbird / 29.95

*Guild of Thieves*, the sequel to *The Pawn*, is an illustrated adventure that takes place in the mythical kingdom of Kerovnia. The program combines dialogue, graphics, humor, and puzzles. Players are supplied with a 40-page novella, a Bank of Kerovnia credit card, an Indenture and Contract of Service Certificate, dice, and play guide.

## **Hybris**

Discovery Software / 39.95

In this action-adventure game, the player is commander of a missile cruiser flying over enemy territory. There are 11 cruisers to pilot, with up to 24 ships attacking at one time. The captain must determine which targets to strike and when to use rapid fire, extra missiles, or an invincible mode.



*Hybris by Discovery Software*

## **Impossible Mission II**

Epyx / 39.95

Elvin, the malicious mastermind, returns with a plot to take over the world in the twenty-fifth century. Elvin is based in a high-tech office complex filled with dark tunnels, surveillance cameras, human-seeking suicide robots, and time bombs. Players must collect secret code numbers to access the control room and defeat Elvin. There are eight towers to search, each with varying degrees of difficulty and an individual theme. Coded pieces of music and a pocket computer map can help guide the players through the fortress.

## **Karate Kid Part II**

Microdeal / 39.95

Players fight opponents in competition where there are no trophies, no points, no referees, and no rules. In this game based on the motion picture, players must guide young Daniel through fight after fight until he reaches the castle of King Shohashi

where he must do battle with the evil Chozen. There, the player must discover the secret of the drum or die. Players control Daniel with flying kicks, somersaults, punches, jumping, and ducking. Bonus points are awarded for catching flies with chopsticks and breaking ice with bare hands. Features include one- or two-player control and a choice of joystick or keyboard control.

## **King of Chicago**

Cinemaware / 49.95

The setting is the crime-ridden Chicago of the 1930s. The player must battle the Capone mob for control of Chicago. Weapons include violence, intimidation, bribery, treachery, and clout. Gameplay includes 3-D animated graphics.

## **Land of Legends**

MicroIllusions / Distributed by Mediagenic / 49.95

The first in the Quest Masters Series, this dungeon-style game places players in a fantasy world populated with bandits, monsters, brave warriors, wizards, rogues, and wise priests. Features include the combination of a 3-D viewing window with an on-screen mapping feature, and a combat mode for when the adventure requires action.

## **Leatherneck**

Microdeal / 39.95

The player becomes a Commando Warrior attempting to rescue captured comrades from the Evil Empire. Players must slash their way through the jungle and into the enemy command complex. An adapter is available that will allow up to four players to participate as commandos at the same time.

## **Lords of the Rising Sun**

Cinemaware / one megabyte / 49.95

As the leader of a twelfth-century Japanese family, the player must confront and defeat the Taira clan, rivals who have overthrown the emperor and dishonored the player's family. To become the shogun, the player must defend against armies of samurai warriors and ninja assassins, negotiate alliances with other clans, and survive hand-to-hand combat. The loser must commit *seppuku*, the ritual of disembowelment. Action takes place in realtime on a detailed, three-screen-wide map of medieval Japan complete with clouds and ocean waves.



*Lords of the Rising Sun by Cinemaware*



### Manhunter: New York

Sierra On-Line / 49.95

Aliens invaded New York City two years ago, and now the player must track and report human activities to the alien dictator-ship. Players can choose between good—a supporter of the human underground—and evil—a manhunter loyal to the aliens. Features of the program include a map of New York City, split screens, and advanced windowing capabilities.

### Mike the Magic Dragon

Anco Software / 24.95

Mike, the magic dragon, is trapped in a large castle from which he must escape. Each room is guarded by ghosts and robots, and the floors are mined or have energy barriers. Mike can use his magical powers to get past the physical blockades, but he must use cunning to decipher the security codes of each room before his captors find him.

### Murder on the Atlantic

Intracorp / 512K / 39.95

The player sets sail in the year 1938 on the luxury liner, S.S. Bourgogne for a restful cruise. However, a murder on board the ship turns 40 people into suspects and the player into a detective. The detective must search the ship's 600 salons and state-rooms, look for 22 clues, decode locks and messages, and interview the suspects in order to solve the mystery.

### Operation: Clean Streets

Broderbund / 39.95

Cleanup Harry is an undercover cop whose mission is to rid the city streets of thugs, punks, and hoodlums. Harry tracks the criminals to the worst parts of town, battles them in hand-to-hand and foot-to-head combat, and then confiscates their drugs. The game features five levels of play in which the criminals—and Harry—become more powerful and skillful.

### Rockford

Arcadia / Distributed by Electronic Arts / 34.99

Rockford, the world's greatest archaeologist, guides the players on five expeditions to places such as the Cavern of Craymar (to look for the pharaoh's gold pieces), the seas of Tiresius off the coast of Mexico, and the kitchens of Kyssandra (in search of the Apples of Eternal Youth). Strategy and speed are required to collect the treasures and avoid obstacles such as falling rocks, monkeys, fish, and poisonous snakes. There are four levels of difficulty.

### Rogue

Epyx / joystick / 39.95

One player is given the mission of descending into the dungeon of doom to recover the amulet of Yendor and make it back to level 1 with the enchanted sword. The maze monster, deadly darts, and trap doors confront the adventurer on 26 levels of play. Each game is different.

### Rush 'N Attack

Konami / joystick optional / 39.95

Ambushes, guerrillas, bazookas, flame-throwers, and a fleet of choppers try to stop the player from rescuing dozens of POWs hidden in an enemy camp. For one or two players.

### The Seven Temples of Cortez

Aegis Development / 512K / 49.95

Players must find the hidden treasures of Ce Acatl Quetzalcoatl, while avoiding Kisin, the god of death. The game is set 2000 years ago in Mexico where a rich civilization thrived until the Spanish took over in 1521.

### Shadowgate

Mindscape / 49.95

As the last of the line of kings, the player is the only one left with enough power to destroy the Warlock Lord. The player must find the Warlock Lord in a huge castle full of secret passageways, collapsing floors, and the Warlock Lord's evil, armed allies. *Shadowgate* is the third in Mindscape's line of graphic adventures.

### Sinbad and the Throne of the Falcon

Cinemaware / 49.95

As Sinbad the Sailor, the player undertakes a sea quest to help a princess. Along the way, the player encounters pirates, genies, romance, heartbreak, comedy, and tragedy, and his or her skills as swordsman, leader, and navigator are tested.

### Tanglewood

Microdeal / 39.95

The object of this graphic adventure is to help Uncle Arthur regain his mining rights to the planet of Tanglewood. The player has ten days to find stolen documents that will prove Arthur's rights to the Inter-Galactic Court. The quest takes the player through gardens, forests, rivers, swamps, underground mines, an earthquake zone, and into the Opposition Control Center. Players must gain the trust and support of the native Tanglians in order to uncover necessary clues to successfully penetrate the Opposition Center and recover the documents. The game is completely mouse-controlled, with no text entry, and contains more than 1200 locations and 700K of graphics.

### Temple of Apshai Trilogy

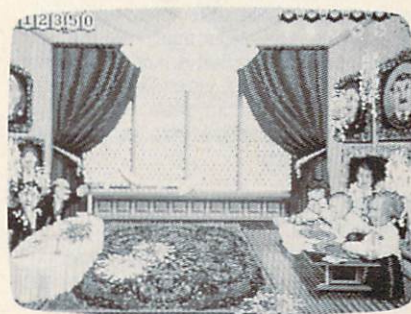
Epyx / 19.95

A trilogy, this adventure begins in the *Temple of Apshai* where the player must develop experience and strength to face future challenges. In the *Upper Reaches of Apshai*, the player meets mazes, monsters, and magic. The player then moves on to Egypt where he or she must face *The Curse of Ra*. There are almost 600 dungeons and dark places in the whole adventure.

### The Three Stooges

Cinemaware / 49.95

The Three Stooges try to save an orphanage from a banker who wants to foreclose. They must rescue the old lady that runs the orphanage and her three daughters. The program contains color graphics and animation, and the digitized voices and sound effects are from classic Stooges films.



*The Three Stooges by Cinemaware*

### Thunderboy

DigiTek / 512K / 34.95

Thunderboy searches for his girlfriend and the villains who have kidnapped her. Along the way he is confronted by deadly butterflies, half-man and half-ape creatures, and dragons.

### Time Bandit

Microdeal / 39.95

Players assume the role of the Bandit, traveling through space in search of treasure. The game includes 20 different playing maps with 16 levels in each one for a total of more than 3000 scrolling screens. Players can take part in the three built-in graphic/text adventures. They can pilot the starship *Excalibur* and find its missing crew, bring peace to a western ghost town, or play in a high-stakes card game in the dungeons of Castle Greymoon. The dual-player mode allows two users to play at the same time. The program is written in machine language and uses 350K.

### Uninvited

Mindscape / 49.95

In this graphics adventure, the player explores a demon-filled mansion. Using the mouse, the player chooses what action to take—examine, open, close, speak, operate, go, hit, or consume. The interactive text is accompanied by digitized sound and animation.

### Who Framed Roger Rabbit?

Buena Vista Software, Division of Walt Disney Corporation / joystick optional / 44.95

In this game based on the Walt Disney movie, Judge Doom tries to prevent Roger Rabbit from finding Marvin the Gag King's will and ultimately saving Toontown. The computer version is actually three games in one, each with multiple skill levels, music, digitized speech, and animated color graphics. >



## Arcade Games

### Aaargh

Arcadia / Distributed by Electronic Arts / 39.95

Based on Arcadia's coin-op arcade game, *Aaargh* features a monster that terrorizes towns and cities, eating people and demolishing villages, Chinese temples, and frontier outposts. The player must help the monster find an egg that is hidden beneath a building in each city, which leads to bonus rounds and higher point totals. Features include animated graphics, scrolling screens, and sound effects.

### Airball

Microdeal / 39.95

In this arcade game, an evil wizard has turned the main character into a rubber ball and left him in a mansion of over 300 rooms. The player must find the spell book with a magic incantation that will return him to human form. The wizard has given the ball a slow air leak, so the player must also locate air pumps throughout the mansion while avoiding sharp objects in each room. Points are scored by picking up objects along the way. Players can use the keyboard, a mouse, or a joystick to maneuver through the mansion.

### Amegas

DigiTek / 512K / 34.95

This arcade-style game contains 40 screens of bouncing, shooting, slamming, and juggling action.

### The Annals of Rome

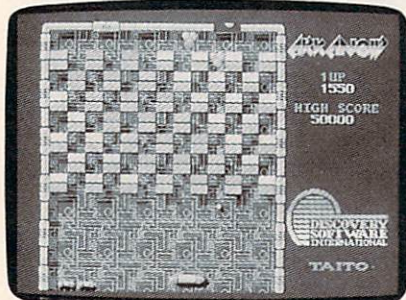
Datasoft / Distributed by Electronic Arts / 24.95

As the leader of the ruling party of the Senate in Rome in 273 B.C., the player is in control of the Roman armies both at home and on foreign soil. The player must deal with 13 foreign powers and command 21 Roman officers who vary in their abilities and degree of loyalty.

### Arkanoid

Discovery Software and Taito / 29.95

This arcade-action game is based on a video arcade game of the same name. *Arkanoid* features 66 levels of gameplay, with a



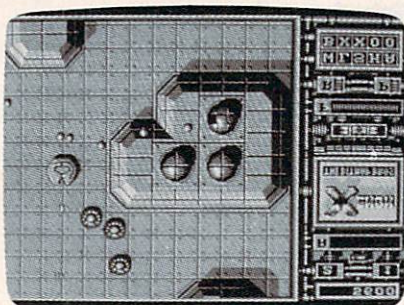
*Arkanoid* by Discovery Software and Taito

special mode that slows the action to a player's skill level. Each level has a configuration of bricks and hazards. The object is to hit a ball with a paddle against the breakable bricks, catch the powers contained in the broken capsules, and then advance to the next level. The game includes a 30-day money-back guarantee.

### Awesome Arcade Action Pack

Arcadia / Distributed by Electronic Arts / 49.99

*Awesome Arcade Action Pack* contains three arcade-style games. In *Sidewinder*, players pilot a spacecraft through 3-D, scrolling screens to reach the interior of the alien Star Killer and destroy it. Captain Zed guides the player through 16 levels of attack from vicious aliens in *Xenon*. The player must switch between a ground-based hovercraft and a jet fighter to penetrate the enemy defenses. *Blasta Ball* is the thirty-seventh century's version of hockey. Inertia controls the spaceships on a metal playing field, and homing missiles are used to move the puck. There are ten craft to control, and the player can play another person or the computer.



"Xenon" from *Awesome Arcade Action Pack* by Arcadia

### BattleDroidz

Datasoft / Distributed by Electronic Arts / joystick / 34.95

This action and strategy game places the player in an abandoned mining cavern of a faraway planet, where remote-controlled mine droids are used for sport. The object of the game is to select a hexagon in a mine grid and send a battle droid into battle with a resident alien. Four energy pods must be collected before escape is possible. The player, who wins after having completed a row of hexagons across the screen, will encounter many obstacles while racing against the clock. The game features 3-D scrolling graphics and 37 different landscapes to explore.

### Better Dead than Alien

Electra / Distributed by Discovery Software / 34.95

*Better Dead than Alien* is an arcade-style game in which the player hunts down aliens. According to the game, an alien is at its weakest when its eyes glow putrid green. The game features multilevel action, simultaneous dual-player mode, sound, and color graphics.

### Black Shadow

Scorpion Software / 34.95

Players attempt to destroy an asteroid by outgunning the aliens and bombing enemy installations. The game features two-player simultaneous action.

### Blockbuster

Mindscape / 512K / 39.95

While battling the bouncing ball to knock down a barrier, the player must also avoid yellow sun bombs dropped by aliens, catch falling tokens for extra points, and watch for lighting icons to buy special weapons. There are 80 levels of gameplay, and the player can design 48 more screens and barriers with a built-in designer.

### Bomb Busters

ReadySoft / 29.95

In *Bomb Busters*, the player is the leader of a bomb squad whose mission is to defuse bombs planted throughout famous buildings of the world. Robot guards that protect the bombs are programmed to kill anyone who interferes. There are 100 levels of play on two disks.

### Bubble Ghost

Accolade / 34.95

In this arcade-action game, the player must guide a bubble-blowing ghost through 36 chambers filled with hazards and monsters. Players have to steer the bubbles away from walls, burning candles, fans, and other bubble-popping paraphernalia.

### City Defense

Constellation Software / 19.95

Players must defend several cities from laser beams from outer space. Weapons include a limited number of missiles. One or two players can compete. The game can be controlled by mouse.

### Combat Zone

Keypunch Software / joystick / 19.99

Players can become arcade ballistic experts in this combat action game. The action includes tank battles and helicopter air strikes.

### Cosmic Bouncer

ReadySoft / 29.95

A freak computer mishap has turned a simple yellow tennis ball into a living object. Now that ball bounces its way through more than 20 levels of play to earn the player the title of *Cosmic Bouncer*.



### Crystal Hammer

Constellation Software / 19.95

This *Breakout*-type arcade game has 30 levels of play for one or two players.



Crystal Hammer by Constellation Software

### CubeMaster

ASDG / 512K, Kickstart 1.2 or later, joystick optional / 24.95

In this arcade-style shoot-'em-up game, the player is the cubemaster, a combination sports celebrity and NASA astronaut. The cubemaster is strapped into a manned mobility unit with forward, retro, and attitudinal rockets and a rapid-fire particle cannon that the player uses to shoot down the cube-drones. However, the cubedrones have both positive and negative side effects which must be anticipated if the player is to progress to the level of cubelord.

### The Cyber Complex

DigiTek / 512K / 44.95

As troubleshooter for the Computer, the player tries to stop evil men from the subterranean city as they seek to destroy the Computer.

### Diablo

Classic Image / 29.95

The object of this mazelike game is to arrange a track to keep the advancing ball on a continuous course. After the ball has crossed a section of track, that section is removed, so the player has less and less track to work with. The game includes 240 sections of track, with two tracks on each of 120 movable panels.

### Double Dragon

Arcadia / Distributed by Electronic Arts / 34.95

Players follow the story of twin brothers, Billy and Jimmy Lee, who have learned how to fight tough in the city. Billy's girlfriend has been kidnapped by a street gang headed up by the mysterious Shadow Boss. Players must help the brothers rescue the girl using their street smarts and martial arts skills. Weapons such as knives, bats, rocks, and oil drums are available to help fight the gang. For one or two players.

### Ebonstar

Microlussions / Distributed by Mediagenic / 34.95

Players face off on the battlefield of *Ebonstar* in this futuristic space-battle arcade game.

### Emerald Mine

Constellation Software / 19.95

This arcade adventure features over 100 levels of play. Players must collect diamonds and emeralds within each field while working against the clock and avoiding objects. For one or two players.

### Enlightenment

Rainbird Software / 24.95

In this arcade-style game, Hasrinaxx the Druid must free the lands of Belorn from the evil wizard Acamantor and his legion of the undead. Magical powers aid Hasrinaxx in his fight through the ten lands of Belorn and a five-level dungeon. The game includes 15 levels of increasing difficulty, 32 spells, and five different characters to control.

### Final Mission

DigiTek / 512K / 34.95

As the final mission of training, the player must work his or her way through the labyrinth of terror, the last stage of insanity. There are more than 20 levels of play.

### Fire Power

Microlussions / Distributed by Mediagenic / 24.95

This tank battle game is the first in the One on One Arcade Game Series. One player can compete against the computer or two players can clash in split-screen action or battle via modem. Player options include tanks, tank characteristics, and battle scenarios.

### FootMan

Top Down Development / 29.95

Players control *FootMan* as he munches dots and gobbles ghosts while traveling through 50 different mazes. A maze editor allows players to create their own levels of difficulty. Features include stereo sound, an 80-person high-score table, and one- and two-player options.

### Fortress Underground

Constellation Software / 19.95

Players fly a battle helicopter as they search out and destroy a hostile power station in an underground cavern. The game features over 640 screens.

### Foundation's Waste

Scorpion Software / 34.95

The player tries to escape a hostile planet in a stolen spacecraft by defeating his or her captors.

### Galactic Invasion

Microlussions / Distributed by Mediagenic / 24.95

This second game of Microlussions' One on One Series takes place on a realtime star field of the Milky Way and an adjoining galaxy. One player can compete against the computer, or two players can battle against each other either side-by-side or via modem.

### Ganymed

ReadySoft / joystick / 29.95

Ganymed, the frozen moon of Jupiter, has been under the rule of the oppressive Tyrans for centuries. As leader of the outlawed star warriors, the player must defeat the giant deathbots and free the planet.

### Gauntlet

Mindscape / joystick / 49.95

There are over 100 mazes in this arcade-style game for one or two players. Each player chooses a character to search through the mazes for food, treasures, door keys, magic potions, and the exit to the next maze. Throughout the mazes the heroes—Thor, Thyra, Merlin, and Questor—must battle a variety of monsters, ghosts, demons, and sorcerers to survive.

### GoldRunner

Microdeal / 39.95

Players of *GoldRunner* must lead an expedition to find a new life-supporting planet. To reach this new world, the travelers must pass through the Ring Worlds of Triton, which is a hostile section of the universe guarded by a merciless and omnipotent race of beings. Players must engage in open-space aerial combat or strafe the planet's landscape in search of the power source that will destroy the planet. An on-board computer shouts warnings and encouragement to the player. An original music score accompanies the action.

### GoldRunner II

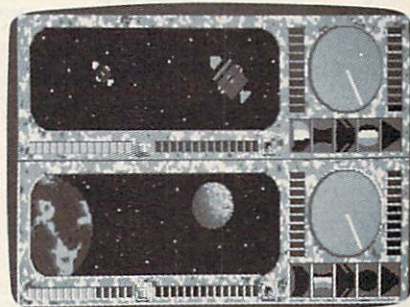
Microdeal / 39.95

Fifty years ago, earth died and all living things migrated to the Ring Worlds of Triton. However, a band of hostile pirates remained and are now seeking revenge. In this sequel to *GoldRunner*, the player must defeat the pirates and recover all the hostage defense robots. Additional scenery disks are also available for \$14.95 per disk.

### Gun Shoot

DigiTek / 512K / 34.95

Players try to shoot 12 different opponents, including bank robbers, without hitting any innocent bystanders. The game includes a two-player mode and digitized sound. >



Galactic Invasion by Microlussions





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## Insanity Fight

Microdeal/39.95

Players are given five fighters with which to begin this space-battle game. Once launched into space, players must survive the battle to eventually face the evil death ship. The fighter's display panel provides the player with information on radar, speed, time, and fuel level. The game offers several play options.

## Jackal

Konami/joystick optional/39.95

The player attempts to rescue his or her comrades from behind enemy lines using the army's all-terrain attack jeep. The jeep is equipped with guided missiles and incendiary grenades. For two players or one player against the computer.

## Karate King

Constellation Software/19.95

This karate combat game features nine different screens. Each opponent becomes more difficult as the game progresses. One or two players can fight it out.

## Kill or Be Killed

Teknoware/512K/49.95

In this multilevel, arcade-style game, the player attempts to rescue a POW from behind enemy lines. This two-disk game features graphics, sound, and animation.

## Larrie & the Robbery of the Ardies

Constellation Software/19.95

Players must help Larrie avoid fast-moving Ardies while collecting objects for points. The game features several levels and scrolling backgrounds. One or two players can participate.

## Major Motion

Microdeal/39.95

*Major Motion* is an arcade-style driving game that pits the player against armored cars, spiked cars that slash tires, and an enemy assault helicopter with an arsenal of bombs. The player tries to rid the land of the evil Draconian League and make the roads safe for civilians.

## Maniax

Anco/24.95

A thick, swirling smoke protects a part-dragon, part-serpent creature from destruction. Only Maniax, an alien from another planet, has any chance of destroying the evil intruder, but he needs the players' help to rid the city of the smoky menace.

## Marble Madness

Electronic Arts/joystick/49.95

One or two players race against the clock or each other to get their marbles through the raceways and over the goal line. Obstacles include humming hovers, marble munchers, and a steelie. There are six raceways—such as the silly level and the aerial race—to provide varying degrees of challenge. This arcade-style game features 3-D graphics and the musical score and sound

effects from the original Atari coin-op version.

## Master Ninja: Shadow Warrior of Death

Paragon Software/Distributed by Electronic Arts/39.95

Players assume the identity of a ninja warrior sent on a quest to recover a magic sword stolen by an evil Japanese warlord. The ninja must fight his way through more than 25 chambers of the warlord's castle, confronting evil ninjas, samurai guards, mystic ninja priests, curses, and deadly tigers. The player uses the ninja's martial-arts skills and weapons to kill his opponents, recapture the sword, and kill the warlord.

## Mega Pinball

Starvision/Distributed by Apache Technologies/39.95

Four different 640 X 384 graphic screens feature eight-direction scrolling, flippers, bumpers, jumpers, tunnels, bonus sections, and other arcade-style pinball-machine action. The angle of the onscreen machine can be set to affect the speed of the ball. A four-player mode is available.

## Mission Elevator

Constellation Software/19.95

In this mystery arcade game, the player must collect 16 clues to diffuse a bomb planted on the 62nd floor of a hotel. Enemy secret agents try to stop the success of the player's mission.

## Persecutors

Constellation Software/19.95

Players must navigate a ship through unknown waters while avoiding force fields and alien attackers. The game features over 65 levels of competition.

## Phantasm

Scorpion Software/34.95

A destitute wanderer is transported to a distant moon and given the opportunity to save the Earth. For each section of the Earth saved, the player must destroy eight reconstitution installations and then redock. The player can choose which sections to rescue first.

## Pinball Master

Anco/24.95

*Pinball Master* simulates the arcade classic. It offers realistic ball control, graphics, and sound effects.

## Pinball Wizard

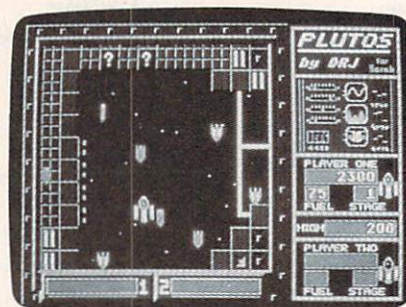
Accolade/34.95

*Pinball Wizard* brings arcade-style pinball action to the computer screen. Several pinball tables are provided, with an assortment of obstacles and targets, and players can assign the bonus values. The game will penalize the players when they try to tilt, and the stroboscope feature causes the ball to vanish occasionally. Using the built-in construction set, players can build their own tables with customized designs and colors.

## Plutos

Mindscape/joystick/29.95

Stationed in outer space, the player must defend against attacks by spinners, bouncing disks, alien armadas, sentinels, and an immense mother ship. The arcade-style action is displayed in high-resolution graphics with background sound effects.



Plutos by Mindscape

## Power Stix

DigiTek/512K/34.95

Joystick pros can work their way through 15 levels of obstacles.

## Robbeary

Anco/24.95

Bertie Bear sets out to rob a 24-floor building of its fruit and gems, but he needs help from the player to outsmart the guards. This game was previously released in Europe.

## Skyblaster

DigiTek/512K/34.95

One or two players can battle it out in this air-to-air and air-to-ground 3-D combat simulation. There are 20 degrees of difficulty, with 80 levels of play.

## Space Battle

Constellation Software/19.95

One or two players can battle in space while traveling through an asteroid belt.

## SpaceCutter

Rainbird/29.95

Players pilot a powerful spaceship in search of the Stargates, a passageway to the free world. Alien spacecraft, asteroid belts, and enemy missiles try to stop the hijacked SpaceCutter. The game requires problem-solving skills as well as arcade-game strategies. It features 3-D shaded graphics, shadow effects, and sideways scrolling.

## Spaceport

Constellation Software/19.95

As the pilot of a prototype spacecopter, the player must navigate the interior of an asteroid to rescue the spaceport and destroy the enemy.

## Spinworld

DigiTek/512K/34.95

Players must battle the inhabitants of Spinworld, a large object spinning toward the solar system.



## Street Cat

U.S. Gold / Distributed by Epyx / 24.95

Players must complete competitive events to determine who is the top cat. The cats must crawl, jump, somersault, and run through the park; spring off and land on floating platforms in the pool; cross through the sewers; and bowl against the bulldog.

## Thexder

Sierra On-Line / 34.95

In *Thexder*, based on the arcade game, players control a robot that has the ability to transform from an android to a fighter jet and back again. Players must battle more than 20 types of aliens and explore caves and battlefields. The program features a musical score that choreographs itself to reflect the action.

## Turbo

Microlusions / Distributed by Mediagenic / 24.95

A part of Microlusions' One on One Series, this auto-racing action/arcade-style game allows one player to compete against the computer and two players to race side by side or via modem. Game features include oil slicks, spiked wheels, different road courses, a choice of cars, and police chases.

## Twin Ranger

Starvision International / Distributed by Apache Technologies / 39.95

In this shoot-'em-up arcade game, the Twin Ranger is the last surviving warrior in a world where computers have taken over. The Twin Ranger uses his energy-absorbing weapons to attack the master control computers (MCC) and return the world to its precomputer state. *Twin Rangers*, which is three games in one, features 3-D effects, scrolling techniques, sound, and music.

## Viper Patrol

Keypunch Software / joystick / 19.95

Players blast off into space in this arcade-action game. Waves of enemy vipers must be destroyed as they attack the player's spacecraft head-on.

## Virus

Rainbird / 29.95

A seeder slowly and silently spreads the spores of a poisonous virus that is infecting the Earth. Piloting a hoverplane, the player seeks out the virus, ready to destroy it with scanners, laser cannons, and homing missiles. There are eight aliens to contend with, and play becomes more difficult as gravity increases. Features include scrolling screens, multidirectional movement, contoured landscapes, projected shadow effects, and a sensitive control system.

## Vyper

Top Down Development / 29.95

This space-adventure and battle game features 100 levels of competition with 25 different opponents and stereo sound. One or two people can play.

## Way of the Little Dragon

Constellation Software / 19.95

*Way of the Little Dragon* is a karate adventure game with eight levels of play and four different challengers. For one or two players.

## Zoom!

Discovery Software / 29.95

*Zoom!* is a nonviolent arcade-style game featuring Zoomer. Zoomer is chased by a gang of reckless enemies through an outer-space land, Zoomland, as he tries to collect territories and points. However, Zoomer must watch out for the "oops" factor when he tries to advance to the next level. There are 50 levels of play. The game includes a 30-day money-back guarantee.

# Simulations

## Arcticfox

Dynamix / Distributed by Electronic Arts / 49.95

A new, high-tech snow tank that accelerates from 0 to 100 in four seconds is Earth's only defense against the aliens who have invaded the South Pole. The player controls the Arcticfox as it travels across mountains, crevasses, ice fields, and tundra, and through electrical storms and blizzards. Landscapes are displayed in 3-D. The tank uses lasers, cannons, mines, heavy armor, and guided missiles to ward off attacks from nine alien craft. This game offers real-time tank movement, first-person cockpit and missile views, and instrumentation such as zoom, radar, clock, and compass.

## Balance of Power

Mindscape / 49.95

The player takes the part of either the President of the U.S. or General Secretary of the U.S.S.R. in this strategic simulation. As head of the nation, the player has eight years to manage overt and covert actions, surrections, political deceptions, divisions of troops, and diplomatic relations. During the course of play, each nation's prestige will rise or fall.

## Crazy Cars

Titus / 39.95

*Crazy Cars* lets computer drivers experience the speed of some of the world's fastest cars as they race through six courses—Arizona, space shuttle, Florida, mountain, Malibu, and New York. Players start out in a Mercedes 560 SEC, and, after successfully completing all six races, they can move up to a Porsche 911 Turbo, Lamborghini Countach, and, finally, a Ferrari GTO. Speeds in the cars can reach up to 189 mph. There are 72 levels of play accentuated by sound effects and color graphics.

## Destroyer

Epyx / joystick / 39.95

The captain of this Fletcher Class U.S. Naval Destroyer is responsible for the total operation of the ship—radar and sonar readings, depth charges, antiaircraft guns, torpedoes, onboard computer, and repair. The ship must be repaired constantly for all controls to function properly. The captain also has to avoid U-boats, Kamikaze pilots, and Zero fighters. There are seven missions and three levels of difficulty from which to choose. An instruction manual is included; the game is joystick controlled.

## Echelon

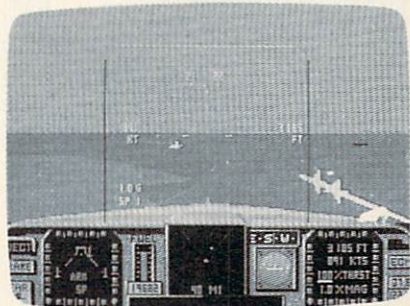
Access / 44.95

Echelon is a top-secret military facility of the twenty-first century where pilots learn to fly the Lockheed C-104 Tomahawk, a space combat and exploration vehicle. The player is assigned to patrol a new zone and find the solution to several strange events which have occurred there. The game features four weapons systems, a bidirectional teleprinter unit, two 3-D screens, infrared graphics, and the LipStik, a voice-activated control headset to give commands to the spacecraft.

## F/A-18 Interceptor

Electronic Arts / 512K, one megabyte recommended / 49.95

Amiga flyers can take control of the F/A-18 Interceptor and lead combat missions to shoot down enemy aircraft and defend Air Force One. This flight simulation contains six combat missions, free flight, and a training mission, all set in the San Francisco area. In free-flight mode, pilots can try to fly under the Golden Gate Bridge, bomb the Transamerica Pyramid, or glide over Alca-



F/A-18 Interceptor by Electronic Arts

traz. In combat and training missions, players can land the F/A-18 on the USS *Enterprise* aircraft carrier or fly the land-based F-16 Falcon. By enrolling in the flight school, players can qualify for additional missions. Weapons include Sidewinder missiles, a 20mm Vulcan cannon, and Sparrow missiles. Game features include 3-D graphics, a realtime digital map, a 360-degree first-person perspective, a zoom function, an ejection seat, and sound effects such as explosions, cannon fire, landing screeches, and the jet engine. ▶



### Flight Path 737

Anco Software / 24.95

Computer pilots learn to fly the commercial 737 jet in this flight simulator. Players start with solo flight and gradually work their way up to international license. The flights take off from an airfield surrounded by mountains, and the pilots must navigate the aircraft to a landing in a valley on the other side.

### Gato

Spectrum HoloByte / 49.95

Players are in the captain's seat of a World War II Gato class submarine. Wartime mission assignments are beeped out in Morse code and translated into text on the console while approaching objects are viewed in 3-D. Players have control of depth, speed, periscope, radar, torpedoes, and other submarine functions. The records of enemy vessels sunk and missions completed are kept in the captain's log, which can be saved for future games. The enemy is programmed to think strategically and to avoid being sunk.

### GeeBee Air Rally

Activision / 39.95

An arcade-style racing game that features over 250 levels of difficulty. GeeBee Air Rally offers players the choice of 16 different air-race courses with 3-D scrolling graphics. Players must fly over, under, and around the competition. Flying too close may cause a collision, forcing the pilot to bail out.



GeeBee Air Rally by Activision

### Gunship

MicroProse / 49.95

Players take control of an AH-64 Apache helicopter to carry out seven rescue, search-and-destroy, and covert missions. The Apache is loaded with 11 guided missiles, four guns, Hellfire laser missiles, a zoom-TV gunsight, and the integrated helmet targeting system (IHTS). The missions take place around the world from Southeast Asia to Central America. This flight simulation program uses 3-D graphics and a joystick flying system and varies in difficulty from training to expert levels.

### Harrier Combat Simulator

Mindscape / 512K / 49.95

Developed in conjunction with the British Aerospace, this game simulates air-to-air and air-to-ground combat flight of the Harrier

er aircraft. Players can maneuver the jet through vertical takeoffs, barrel-roll attacks, air and ground combat, and firing heat-seeking Sidewinder missiles and 30 mm cannons. The mission is to destroy the enemy's headquarters 500 miles away without being detected and shot down by a supersonic MiG-2323. Onscreen instruments, aircraft response, and visual feedback help guide the player. There's a practice mode for developing flight and combat skills, and the player can choose pilot, commander, or ace level for the combat mode.

### Harrier Mission

Anco Software / 24.95

As a beginning pilot of the Harrier fighter, the player must learn to land on the carrier, hover, and evade incoming missiles. In the combat missions, the pilot can use sweep radar to find the enemy and then launch heat-seeking missiles or use gunnery skills to shoot him down. Releasing chaff can help the pilot avoid being shot down, but he or she must also keep a close eye on fuel levels to make it back to the carrier. Water swells and cross winds could make the landing treacherous.

### Highway Hawks

Anco / 34.95

Highway Hawks is a two-disk racing simulation. Players can race against each other or trade their cars.

### Jet

SubLOGIC / 512K, mouse, color or monochrome monitor; joystick optional / 49.95

Players can take the pilot's seat of an F-16 Fighting Falcon or F-18 Hornet jet fighter to track and shoot down MiG-21 and MiG-23 fighters. This fighter-jet simulation features full-screen heads-up display, search radar, an automatic target-tracking computer, an ejection seat, multiple 3-D windows, a missile's-eye-view of targets, and a multiplayer option. There's a free-flight mode for non-combat maneuvers as well as various other options for aerial dogfights or target strikes. Scenery includes clouds, 3-D ground targets, enemy aircraft, and an aircraft ground shadow.

### Scenery Disk #7

SubLOGIC / flight simulation software / 24.95

One in a series of disks that provide additional scenery and flying environment when used with *Flight Simulator*, *Flight Simulator II*, *Jet*, or other SubLOGIC flight simulators. This disk includes airports, radio-nav aids, cities, highways, rivers, and lakes; and it covers parts of the East Coast—Washington D.C., Charlotte, Jacksonville, and Miami. This disk can be used for both visual flight and VFR or IFR cross-country flight.

### Scenery Disk #11

SubLOGIC / flight simulation software / 24.95

One in a series of disks that provide additional scenery and flying environment when used with *Flight Simulator*, *Flight Simulator II*, *Jet*, and other flight simulation programs. This disk includes airports, radio-nav aids,

cities, highways, rivers, lakes, and a hot-air balloon for the Central Great Lakes area. There are views of Detroit, Pittsburgh, and Niagara Falls.

### Silent Service

MicroProse / 39.95

The player commands a World War II submarine in the South Pacific in this submarine simulation that includes five different battle-station screens and a map of the South Pacific. There are six historical missions requiring surface attacks with 5-inch guns, careful tracking, and torpedo attacks on enemy troopships. To survive, the player must also avoid depth charges, destroyer detection, and shallow water. Graphics include the bridge, conning tower, torpedo room, and periscope. More than 32 colors are used to depict sunsets, burning ships, oil slicks, and battle stations as seen from the submarine. Digitized sounds represent actual submarine and sonar sounds. Onscreen icons are used for game control. Skill levels range from gunnery to patrolling the Pacific.

### SkyChase

Maxis / joystick /

Pilots can choose to fly any of a number of planes: FA-18 Hornet, F-14 Eagle, F-15 Tomcat, F-16 Falcon, MiG-31 Foxhound, MiG-27 Flogger, and even a paper airplane. Players fly against the computer or another player using handicaps and the ace mode. Targets can be locked using the heads-up display (HUD). The game includes stereo sound. All planes are in 3-D wire-frame format.

### Sub Battle Simulator

Epyx / 39.95

As commander of a World War II submarine, the player can choose from 24 American and 36 German missions, including seek and destroy, rendezvous, lifeguarding, and patrol. There are six classes of U.S. Navy submarines and German Kriegsmarine U-boats, each individually outfitted with equipment characteristic of the 1939-45 era. The missions are based on historical data, and there are three modes of command: target practice, single mission in a combat setting, and wartime command for the duration of the war. Weapons include anti-aircraft guns, torpedoes, mines, and deck guns. The player also has to be on the lookout for destroyers, depth charges, aircraft, and inclement weather. A manual and quick-reference command card are included.

### Super Huey

Cosmi / 19.95

This helicopter flight simulator takes advantage of the graphics and sound capabilities of the Amiga. Players can choose from four scenarios. In Solo Flight, players are trained in flight techniques and become familiar with the helicopter's instruments. The Rescue mission requires players to find and pick up stranded military personnel. The Explore mission provides players with the opportunity to fly unexplored territory and map the



terrain. In the Combat mission, players defend a secret desert installation from unknown hostile forces. The helicopter is equipped with rockets and machine guns.

### Test Drive

Accolade / 44.95

In this driving simulation game, players can test-drive a variety of high-performance cars, including the Ferrari Testarossa, Lamborghini Countach, Lotus Esprit Turbo, and Porsche 911 Turbo. The interior of the car and road are displayed as seen by a driver. The player must drive a section of highway within a certain time frame. Obstacles include traffic, falling rocks, and patrol officers.

## Space and Science Fiction

### Alien Fires

Paragon Software / Distributed by Electronic Arts / 512K, Kickstart v. 1.2 / 39.95

Players assume the role of a time lord who can transcend the barriers of time. Custom characters can be created by defining strengths and weaknesses in such areas as fighting, diplomacy, dexterity, and quickness. The game begins with the character being sent into the distant future to Galaxy's End, a small planet at the edge of the universe. The object is to find a mysteriously vanished man known as Samuel Kurtz, creator of a time transportation device that must be destroyed. The game features a digitized rock soundtrack, scrolling 3-D graphics, and speech synthesis.



Alien Fires by Paragon Software

### Andromeda Mission

Demonware / Nationwide distribution through retail stores only / 39.95

In *Andromeda Mission*, the player sets out to save the race from an evil worse than aliens.

### Captain Blood

Mindscape / 49.95

Fractal and vector graphic techniques are used to create the screens in this space game. Captain Blood must search for and destroy the Captain Blood clones scattered

around the galaxy before they drain his energy.

### Carrier Command

Rainbird / 44.95

The time is June 2166, and the mission is to populate a series of volcanic islands in the Southern Ocean before the STANZA takes control. The player controls the aircraft carrier and its on-board weapons, a squadron of remote fighters, and an amphibious assault division. Arcade-style action takes place in 3-D graphics. The package includes an illustrated mission briefing and operations guide, an audio-cassette soundtrack, and a sticker.

### Charon 5

Mindware International / 512K / 34.95

Strategy and arcade action are combined in this space game in which the player battles against the intergalactic Charon 5. The game offers more than 5400 full-color screens with 11 levels of play and stereo sound and music.



Charon 5 by Mindware International

### Empire

Interstel / Distributed by Electronic Arts / 49.95

This space strategy game combines combat, exploration, and artificial intelligence. Players must send forces to distant planets to build armies and navies, form nations, and gather resources. The object of the game is to gain influence and control of the galaxy. The game features over 30 commands.

### Extensor

DigiTek / 512K / 34.95

In this space-based game, players compete in a 3-D motorcycle contest on the deserts of Mars. There are 24 levels of difficulty.

### Fire and Forget

Titus Software / 39.95

The Inter-Galactic Liberation Organization is threatening to destroy Earth, and it is up to the player to save the planet. As commander of Thunder Master, the world's ultimate fighting machine, the player is at the controls of a V-16 triple-turbo engine with four-wheel drive and tetranuclear-propulsion missiles. A second player can command the magnetic levitation unit, Thunder Cloud. There are three levels and six conflicts ranging from guerrilla warfare to global war.

### Hitchhiker's Guide to the Galaxy

Infocom / 14.95

Arthur Dent's house is going to be bulldozed to make way for a highway bypass. This same fate awaits the planet Earth. The player takes part in a series of intergalactic adventures while trying to salvage his or her home.

### Obliterator

Psygnosis / Distributed by CSS / 512K / 39.95

Drak, Last of the Obliterators, is a genetically enhanced fighting machine, and he has been summoned by the Federation council to protect Earth. His mission is to infiltrate an alien cruiser using a prototype matter transporter and then to destroy the craft.

### Off Shore Warriors

Titus Software / 39.95

A new sport has evolved on Earth after extraterrestrial pacifists' takeover of the planet. Powerful boats race against each other and the elements in international competition on some of the world's largest lakes. Each boat is armed with only two missiles and one captain. The winner is the one that finishes the game alive.

### Pioneer Plague

Antic Publishing / 512K, joystick recommended / 39.95

In this science-fiction game, the player must prevent an out-of-control robotic spaceship from entering the atmosphere. The Pioneer Probe Mark IV was designed to find suitable planets and make them habitable for humans. However, the probe has gone haywire and is destroying everything in its path. Choosing from four monitors in the LifeStar control room, the player can travel to the airship, take the LifeStar to another planet, open the drone programming simulator, or save and load drone patterns. Drones and photon missiles can be used to stop the probe from reaching any other planet. Status instruments help monitor the progress. The game features HAM-mode graphics, 4096 onscreen colors, and multilevel game design.

### Quizam!

Interstel / Distributed by Electronic Arts / 34.95

For one to eight players, *Quizam!* features eight game boards, eight levels of difficulty, and over 2000 multiple-choice questions. The players must decipher and answer questions in order to access eight satellites that are orbiting the Earth. Questions come from two main categories—Fun Facts, which includes sports, games, culture, television, and potpourri; and School Days, with questions from vocabulary, history, art, and other studies. The package also includes "Quizzer!," a program which allows players to design their own questions and answers. ▸



## Reach for the Stars, Third Edition

Strategic Studies Group / Distributed by Electronic Arts / 39.95

One to four players compete to colonize and rule empires in space. Empires can be built and maintained by improving the industry and environment and by building warships. There are four classes of warships, transports, and explorers. Game options include novae, natural disasters, solar debris, and xenophobes. A tutorial is included.

## Roadwar 2000

Strategic Simulations / 512K / 39.95

It's the year 2000, and the United States is on the verge of destruction from bacteriological warfare. The player is assigned the task of locating eight scientists and taking them to a secret underground lab, where they must develop a life-saving serum. The search is made harder and more dangerous by the hordes of mutant beings and rival road gangs the adventurer meets on the journey.

## Roadwar Europa

Strategic Simulations / 512K / 44.95

In this sequel to *Roadwar 2000*, terrorists threaten to detonate five nuclear devices in twenty-first-century Europe. Commissioned by the United Nations, the player leads a gang against the terrorists to find and disarm the bombs and then destroy the terrorist leaders. Mutants, cannibals, and rival road gangs attempt to stop the rescue group, which is armed with guns, crossbows, and rams. The crew and vehicles from *Roadwar 2000* can be transferred to this version, or the player can design new ones.

## Roadwars

Arcadia / Distributed by Electronic Arts / 34.99

In the twenty-fifth century, the Galactic Federation rules, and computers and robots do all the work. Moons are connected by roadways controlled by computers. When one of those computers malfunctions, the player, commander of a battlesphere tank, is sent in to repair the roadway and clear the debris. A laser cannon helps blast barricades as well as aliens.

## Rocket Ranger

Cinemaware / 49.95

Scientists of the twenty-first century travel back to 1940 to alert the hero that the Nazis will win World War II. They supply a rocket suit, a ray gun, and a secret decoder wheel so the player can thwart the Nazis, change history, and save humanity. This interactive game is modeled after Saturday-morning serials and includes arcade sequences, a nonlinear plot, music, and sound.

## Rubicon Alliance

Datasoft / joystick / 19.95

A ninth planet, Nono, attempts to destroy the Rubicon Alliance created among the eight planets in the Hyturan Star System. The player takes the role of Hawkins, a Starfox space fighter, who undertakes a

mission in eight stages to find and defeat Nono and save the Alliance.

## Scary Mutant Space Aliens from Mars

ReadySoft / 39.95

*Scary Mutant Space Aliens from Mars* is a multitasking text-adventure game that features digitized graphics and sound. Using animated sequences and instant maps, the player must learn to operate a Dryfon 3 Zapometer, dismantle the Ion-Beam Dooomsday device, and find a way through the Maze of Neptune.

## Silicon Dreams

Rainbird / 29.95

Three smaller games are combined in this space adventure. The player is a colonizer of the planet Eden in the twenty-third century. In the first game, *Snowball*, the player awakens from hibernation on a transport ship on its way to Eden. In *Return to Eden*, the crew of the *Snowball* travels to the city of Enoch on Eden. Finally, in *Worm of Paradise*, the adventurer must find a way to solve the problem in Enoch.

## Skyfox II: The Cygnus Conflict

Electronic Arts / 512K / 39.95

In this sequel to *Skyfox*, players again use the warp-speed space fighter, *Skyfox*, to fight for the Federation in the Cygnus Constellation. The *Skyfox* is equipped with neutron disrupters, photon pulse bombs, antimatter mines, and other weapons and can travel at a speed of 9000 kilometers per second. There are ten battle scenarios covering an area of over 50 star bases. At the end of each mission, the player's performance is evaluated by a Mission Summary Screen. Action takes place in 3-D graphics at a fast-frame rate.

## Slaygon

Microdeal / 39.95

*Slaygon* is a sophisticated military robot that cannot be stopped by conventional weapons. The robot is sent to the Cybordynamics Laboratory to destroy the main computer, blow up the facility, and thwart plans of world domination. A cloaking device makes the robot invisible, and a short-range scanner alerts the robot to danger. Shields help absorb destructive energy, while a storage room allows the robot to pick up objects for future use. An information panel provides an energy-level indicator, a directional indicator, and an overhead-map view of the player's movements.

## Space Quest I: The Sarien Encounter

Sierra On-Line / 49.95

Roger Wilco, sanitation engineer, crash-lands on an alien planet and faces a multitude of adventures—alien brew at the Keronian Rock Palace, cruising the galaxy in a used spaceship, and finding new life forms. The game also contains arcade sequences.

## Space Quest II: Vohaul's Revenge

Sierra On-Line / 49.95

*Vohaul's Revenge* is the sequel to Sierra's *Space Quest: The Sarien Encounter*. In this adventure, Roger Wilco, a sanitation engineer and space hero, tries to defeat the evil scientist Sludge Vohaul. The game contains animated, cartoonlike graphics.

## Space Quest III: The Pirates of Pestulon

Sierra On-Line / 49.95

Roger Wilco battles Pestulon pirates to save two software authors, The Two Guys from Andromeda, from a future of writing lifeless arcade games. The player must infiltrate the Scumsoft Software Empire to free the authors. This game is the third in the *Space Quest* series.

## Space Racer

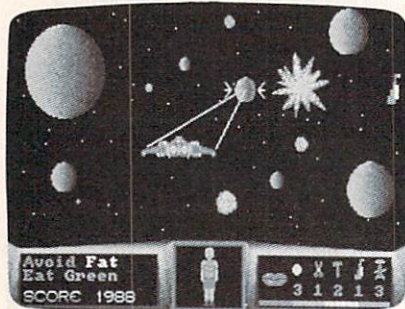
Broderbund / 19.95

The player represents Earth at the space races, a contest among various planets held every three years in the twenty-fifth century. The player must race for his or her life through three alien worlds, dodge other racers, force them into speed traps, or blast them out of the universe. The game features 3-D animation and graphics.

## SpaceSpuds

Haitex Resources / Distributed by Apache Technologies / 512K minimum / 124.95

*SpaceSpuds* is a space-based arcade game designed to be played with Haitex's X-Specs 3-D Stereoscopic Vision System. In the game, the player is in the middle of an intergalactic junk-food-freighter crash and must destroy as much fat debris as possible.



## SpaceSpuds by Haitex Resources

In any collision with debris, the player adds calories and weight until he or she explodes. With X-Specs 3-D glasses, all the action is viewed in 3-D graphics with accompanying stereo sound. The LCD shutter-glasses plug into the interface, which fits into the Amiga's second joystick port. Custom images can also be created to view with the X-Specs system. The *SpaceSpuds* package includes the game; the X-Specs 3-D glasses; *Molecule3D*, a stereoscopic molecular model display program; *D3D*, which displays static 3D images; and *Cubes3D*, a game in which animated 3-D cubes dance across and out of the screen.



## Star Fleet I

Interstel/55.00

FLEET members begin as cadets in the academy and compete to advance to Admiral Emeritus, where they can control 36 galactic cruisers, 13 ship systems, and 500 crew members in an attempt to eliminate evil from the galaxy. Communication is conducted through the Star Fleet Headquarters BBS. Features of this space strategy game include phasers, torpedoes, shields, transporters, mines, computers, navigation, color animation, sound effects, and music. The package includes a 70-page academy training manual, a 100-page officers' manual, and a quick-reference command card.

## Star Wars

Broderbund/39.95

Based on the George Lucas movie of the same name, this arcade-style game pits Luke Skywalker in an X-Wing Fighter against the Empire's Death Star.

## Starglider

Rainbird/44.95

The player is commander of an airborne ground-attack vehicle challenging the almost invincible starship, Starglider. To defeat the ship requires quick reflexes, skill, and a few tricks. Maneuvers occur in 3-D animation. The package includes a flight-training manual, a color poster, a key guide, and a novella, which sets up the story.

## Starglider II

Rainbird/44.95

Aliens from a multitude of planets attack colonists in this space-based game. It is up to the players to defend the colonists and destroy the aliens and their Egron patrol craft. The game features a 3-D instrument panel, weapons systems, sound effects, digitized speech, multiple controls, game options, and animation. A novella written by James Follet and a quick-start card are included.

## Stellar Conflict

PAR Software/512K/39.95

As emperor of the planet, the player must use the starships to mine other planets and conquer the galaxy. The game features randomly generated galaxy maps, multiple windows, timed turns, rebellions, multiple classes of planets, color graphics, and sound. Players can send each other messages and display income or battle information during their turns. The sound can be toggled on and off. One to four players can compete on three levels of play.

## Stellaryx

Laser Gamesmanship/512K; one megabyte recommended if using the Help feature/39.95

*Stellaryx* is an arcade-style space action game. The player can use photons, lasers, guided missiles, tractor beams, and stasis grenades to defeat alien space invaders. With one megabyte of memory, players can also dock the ship at the space base and access the help screens.

## Tera Quest

Microdeal/39.95

The six Phoenix Tablets needed to start the first Galactic Games have been stolen by the Tetroids, a vengeful race excluded from the games. The Tetroids have split each tablet into 64 pieces and hidden them in the six provinces of their world. Phoebus, the sun god, issues the challenge that whoever becomes the Tetraquestrian and recovers the tablets will inherit all the powers of the sun god. But first, the warrior must survive the 384 sections of the Tetroids' world, acid and oil slicks, spitters, and the mutating deflectors.

## Terrorpods

Psygnosis Limited/Distributed by CSS/39.95

A scrolling 3-D playing field provides the background for this arcade-style space adventure. The player is a Federation agent who must uncover the secret of the Empire's war machine, Terrorpod. The agent travels undercover to the asteroid Colian with a defense strategy vehicle (DSV), a trading allowance, and an incomplete map of the main crater. However, before long, the Empire discovers the intruder, and con-



*Terrorpods* by Psygnosis Ltd.

sequently, the player must find a way to survive—by mastering the trading style of Terrorpods. The game can be played in a variety of European languages, British English, or American English.

## Torch 2081

Digital Concepts/Distributed by Apache Technologies/joystick/29.95

Flaming debris from an interplanetary nuclear war threatens the inhabitants of a twenty-first-century planet. The player must use a Surface Defense Glider to deflect the fireballs and defend the population while avoiding obstacles. There are more than 90 levels of play.

## Tracers

Microllusions/Distributed by Mediagenic/34.95

Thieves, thugs, and terrorists have invaded the interiors of all the computers, and as a member of the Integrated Human Operations Police, Techopolis Precinct, the player must find a way to stop them. The program includes music and sound effects and accepts keyboard or joystick controls.

## The Twilight Zone

First Row Software Publishing/39.95

At first, the several stories in this program may seem unrelated, but as play progresses they merge into one plot with a twist ending. Modeled after the television series, the program includes the "Twilight Zone" music and soundtrack as well as the characteristic prose style of Rod Serling.

## Zero Gravity

EAS Software/Distributed by Microdeal/joystick/29.95

*Zero Gravity* is an intergalactic version of volleyball played in a weightless environment. The ball sometimes careens off the bulkheads at wild angles to create unreturnable shots, and extra points can be added or subtracted by hitting the panels along the sides. Two players can play each other using a split screen, or one person can play the computer. There are three levels of play—novice, advanced, and expert.

# War Games

## Blitzkrieg at the Ardennes

Command Simulations/one megabyte/59.95

The one-megabyte version of *Blitzkrieg at the Ardennes* is an enhanced version of this war-strategy game which depicts the World War II Battle of the Bulge. New features include hidden movement by units under specified conditions, a modified attack rule in which units in cover do not have to attack adjacent enemies, aerial reconnaissance, and the ability to have reinforcements arrive late, early, or damaged according to historical accounts. Additional sound and graphics have been added. The one-megabyte version is available only from Command Simulations. An upgrade from the 512K version is available for \$10.

## Breach

Omnitrend Software/512K/39.95

This one-player tactical-squad combat game includes intelligent opponents, multilevel combat areas, many pieces of equipment, and several combat scenarios. A scenario builder allows players to design their own battle campaigns.

## Dive Bomber

U.S. Gold/Distributed by Epyx/39.95

Players are put into the pilot's seat of a World War II torpedo bomber, where they must fly missions against Germany. Based on the aircraft carrier *HMS Ark Royal*, the torpedo bomber must carry out a mission to sink the German battleship *Bismarck*. Players must take off and land on the carrier, fight enemy combat aircraft, battle U-Boats, and dive-bomb E-Boats and mine fields. ▶



## Firezone

Datasoft/Distributed by Electronic Arts/24.95

This war game takes place in the twenty-first century between the European Combine and the Pacific League. One or two players can control high-powered, mobile armored vehicles. There are nine scenarios, and additional ones can be designed.

## Gettysburg: The Turning Point

Strategic Simulations/512K/59.95

The three days of fighting at Gettysburg, Pennsylvania, in 1863 are reenacted in 42 turns with this war game. The game features a command-control system to show the effects of the commanders, ammunition points, fatigue rules, and variable reinforcement. Three versions—basic to advanced—are available. The computer can play either side. For one to two players.

## The Hunt for Red October

DataSoft/49.95

Players assume the role of a Soviet submarine captain First Rank, who wants to defect to the United States and turn over his Red October submarine in the process. The captain must not let his 113-man crew become aware his plan. He must also keep the secret from the Russians and defect to the U.S. at the best possible time. The game begins off the coast of Iceland, where the



The Hunt for Red October by DataSoft

player will encounter Russian, U.S., and NATO forces. The captain has all of the sub's weaponry and special features at his disposal. The longer the mission, the greater the chance of Soviet detection, and the Soviets have been instructed to destroy the sub should a defection be found out. The game's options are icon-driven, and a mouse or a joystick can be used to issue orders.

## Into the Eagle's Nest

Mindscape/39.95

The goal is to rescue three Allied saboteurs from a Nazi fortress, salvage the great art treasures of Europe from the Nazis, and destroy the fortress. There are four missions which take place on four floors connected by elevators. The view of the game is from the top looking down. The arcade-style game features four-way scrolling animation, graphics, and sound.

## Kampfgruppe

Strategic Simulations/512K/59.95

This World War II game takes place on the Eastern Front of 1941–1945. The player commands either the German or Russian forces and their respective arsenals of tanks, tank destroyers, self-propelled artillery, assault guns, mortars, and flame-throwers. The headquarters-control option determines how fast a unit will respond to orders, and the computer calculates damage and combat down to the individual weapons and soldiers. There are four historical scenarios, and scenarios can be created. For one to two players.

## Ogre

Origin Systems/Distributed by Brøderbund/39.95

In this war strategy game, a Cybertank, the Ogre, battles against heavy tanks, missile tanks, Howitzers, and the infantry in a fight to the death. The Ogre is armed with missiles, main cannons, minor cannons, and antipersonnel guns. For one to two players.

## S.D.I.

Cinemaware/49.95

Two young lovers—a general with the United States' Strategic Defense Initiative and a Russian commander—are the only ones who can protect the human race from destruction. As the general, the player must defend the U.S. against a sneak KGB missile attack and battle KGB rocket fighters in a 3-D flight simulator.



S.D.I. by Cinemaware

## The Serayachi Campaign

Omnitrend Software/Breach/24.95

This combat scenario disk works with the Breach combat game. The disk contains 16 battle scenarios.

## Shiloh: Grant's Trial in the West

Strategic Simulations/Distributed by Electronic Arts/512K/44.95

In April 1862, General Grant's Union forces were caught in a surprise attack at Pittsburgh Landing on the Tennessee River by General Johnston's Confederate Army of the Mississippi. This program recreates those two days of battle in 15 turns. The terrain of Shiloh is displayed on a 30 × 30 square grid battlefield, and all the brigades and artillery are included. Play can be switched between strategic and tactical dis-

play, and a morale option is included for the untired troops. The program consists of three games—introductory, intermediate, and advanced.

## TeleWar

Software Terminal/512K, modem/39.95

Two players at separate locations can play war games by connecting their computers via modem and this tele-game program. The program accepts baud rates from 300 bps to 9600 bps, and a file folder option can store each opponent's name, phone number, and baud rate for easy access. The game features three super-bitmaps and 12 scenarios of battlefields, digitized sound effects, and color graphics. Each player must position his or her artillery, vehicles, and other weapons while defending against the other player's offensive moves. The object of the game is to capture the opponent's headquarters. The save-game option allows players to stop the game and resume at a later date. Players can also "chat" while they are making their moves. With the no-modem setting, two players can play on the same computer without using modems. Additional map disks are available.

## The Universal Military Simulator

Rainbird/49.95

Five historical battles—Gettysburg, Arbella, Hastings, Marston Moor, and Waterloo—can be reenacted with this game. The locale, geographical features, troops, and armaments are historically accurate. With the built-in editor, new maps, order of battles, objectives, and what-if scenarios can be designed to vary the historical battles or create new ones. Battles take place on a 3-D grid system so the player can view the field from any angle or zoom in to an area. Digitized sound accompanies the play.

# Sports Games

## California Games

Epyx/39.95

Up to eight players can take part in this survey of California-style recreation. Games include surfing, throwing flying discs, skateboarding, rollerskating, and riding BMX bicycles.

## CFL

Beta Software/Gridiron/14.95 each

More than 450 fictional Computer Football League players are available on each CFL disk. These disks can be used with Gridiron, from Bethesda Softworks, to create 2–20 teams, each with a budget of \$8 million. Players' names, speed and strength ratings, salaries, and years of experience are listed for the season specified. However, players' attributes may change on subsequent disks, and all players eventually retire. Disks for years 1 and 2 are currently available at \$14.95 each.



## Championship Baseball

Activision/39.95

In this baseball simulation the user controls the action—hitting, pitching, catching, running the bases, and sliding. Split-screen graphics allow players to view the plate and the whole field at the same time. The game offers a four-division, 24-team league.

## Championship Golf: The Great Courses of the World, Volume 1

Gamestar/Distributed by Mediagenic/39.95

In this first volume of *The Great Courses of the World*, the player can tee off at Pebble Beach. The program recreates that famous golf course, including distances, par, and sand traps.

## Commissioner's Disk

Electronic Arts/Earl Weaver Baseball/19.95

*Commissioner's Disk* contains the tools needed to manage a baseball team or enhance *Earl Weaver Baseball* and *Earl Weaver Baseball Data Disks*. The disk can be used to create league drafts and schedules, edit and accumulate player stats, print stat cards and schedules, and customize ball parks with the park editor.

## Downhill Challenge

Broderbund/29.95

In this interactive ski-racing simulation, the players compete in downhill, slalom, giant slalom, and jumping. There are separate runs for beginning, intermediate, and advanced skiers. Action appears in 3-D animation.

## Earl Weaver Baseball

Electronic Arts/49.95

Earl Weaver and Eddie Dombrower co-authored this baseball simulation, which allows users to experience many aspects of the game, from playing ball to building a stadium. The arcade-like play mode uses hires graphics and sound to pit two teams against each other, including some of the All-Star teams from 1901 to 1975. Users can also take the role of manager, consulting with Earl Weaver to set lineups, trade and draft team members, or relieve pitchers. Managers can also build their own All-Star teams and keep statistics using the built-in compiler; there are 90 statistical measurements. Game players can play one of the 26 major league parks or design their own ball park. Instant replay (in three speeds), slow motion, and freeze frame are added to simulate actual TV coverage. The Amiga version features digitized sounds such as the crack of the bat, the roar of the crowd, the announcer's voice, and the umpire's calls.

## Earl Weaver Baseball Data Disk

Electronic Arts/Earl Weaver Baseball/12.95

This data disk contains all the names, statistics, and ratings to recreate the 1986 major league teams. The disk is designed to be used with *Earl Weaver Baseball*.

## Famous Course Disk, Volume II

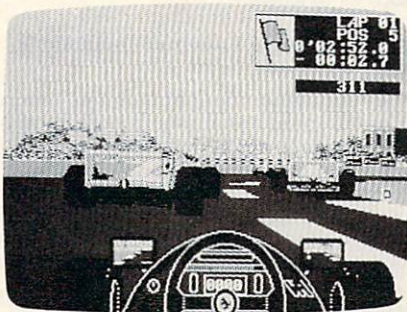
Accolade/Mean 18/19.95

This disk offers three additional golf courses that can be played using *Mean 18*. Turnberry, Scotland; Inverness Club, Ohio; and Harbour Town, South Carolina are all included on the disk.

## Ferrari Formula One Grand Prix Racing Simulation

Electronic Arts/49.95

Car buffs can race their own Ferrari F1/86 on the international Grand Prix circuit, competing against seven of the world's best drivers on 16 racetracks. Between races, the driver can test and fine-tune the car in the dyno room, in the wind tunnel, or on the Fiorano test track. Plus, there are practice, warm-up, and qualifying heats. This simulator includes a first-person view of the cockpit with oil pressure, water temp, and fuel gauges; turbo boost control; moving stick shift, steering wheel, and mirrors; understeer, oversteer, cornering, and straight-away speeds. In the garage, the player supervises all engine and suspension work.



*Ferrari Formula One Grand Prix Racing Simulation by Electronic Arts*

## Final Assault

Epyx/39.95

Thrill seekers can practice climbing some of the world's most treacherous peaks with this mountain-climbing game. Mountain climber Eric Escoffier provided design assistance for the rock faces, glaciers, crevasses, and chasms found along the trails. Players must choose which supplies to backpack from over 50 items. Onscreen variables include temperature, time, altitude, and physical state of the climber. There is a training course before the climb, and a safety guide is provided.

## 4th & Inches

Accolade/joystick/44.95

*4th & Inches* features three screens—a scrolling football field, a statistical screen that shows the players' performance and personal records, and a play menu from which to choose offensive and defensive plays. The game includes 22 players, the football, and the ball's shadow. The view of the field is from the press box, and action follows the player with the ball. A 30-second clock can be implemented for more realistic play. Players' energy levels decline as the game progresses. For one or two players.

## GBA Championship Basketball Two-on-Two

Gamestar/Distributed by Mediagenic/44.95

Each player can control two men in basketball competition—two against two, one on one, or one or two players against the computer. The teams play in 23-team leagues, and the players are based on real pro-basketball players. There are several practice games, including practice shooting, horse, one-on-one, and around the world. Crowd noises provide background sound effects, and a sample sports page is updated with the results of each game.

## GFL Championship Football

Activision/44.95

This football simulation is played using an on-the-field perspective. The action takes place on the field, where the user is actually running plays and taking hits.

## Grand Slam

Infinity Software/512K/49.95

Players can compete in the Big Four of the world Grand Prix tennis circuit in this action sports game. The competition starts on the clay courts of Paris and the French Open and then moves on to the grass of Wimbledon. After Great Britain, it's on to New York and the U.S. Open, followed by the Australian Open down under. Players choose a wood, metal, or graphite racquet, with corresponding stringing tension for different levels of play. Each opponent has unique playing styles and characteristics. Players can even confront the umpire to protest questionable line calls. The game provides players with a championship draw to chart progress in Grand Slam events. Other features include digitized sound and 3-D graphics.

## Gridiron

Bethesda Softworks/Distributed by Electronic Arts/59.95

Players take the part of the football coach—calling plays, sending in replacements, checking out the defense, and controlling the ball carrier. There's a playbook with 40 preprogrammed plays, or gamers can create their own plays. With the player-draft option, each player's speed and strength can be set. Digitized sounds include crowds, the ref's whistle, the quarterback's calls, and action at the scrimmage line. There are five levels of play for one or two players.

## Grid Start

Anco Software/24.95

In this racing game, the player drives a six-gear Formula 1 race car over six circuits, competing against 23 other cars. The player must learn to master rapid gear shifts, braking, and acceleration just to stay on the course. The power-boost option is reserved for extra speed during crucial maneuvers. The game contains three categories—novice, amateur, and professional—and each has its own championship table. >



## Hardball

Accolade / 44.95

A baseball simulation, *Hardball* offers a 3-D perspective of each field angle. Different screens provide the strategy selections for the managers. There are six pitches that can be thrown by left- or right-handed pitchers, and players appear in large-sized graphics.

## Head Coach

MicroSearch / 49.95

Players assume the role of head coach in this pro football-simulation strategy game. Players choose the strategy, call the play, and then watch it unfold on the field. The success of the play is determined by the probability of the play working against the defensive formation. The yardage gained or lost is based on statistical results from a professional football game. Other features include instant replay with slow motion, and the option to create a team complete with player names, jersey colors, and playbooks.

## Hole-in-One Miniature Golf

DigiTek / 512K / 39.95

Golf enthusiasts can practice their putting with this computer version of miniature golf. The two-disk set includes four courses for a total of 72 holes, with obstacles ranging from a windmill to the inside of a pinball machine. The mouse interface is used to point and click shots. Up to four players can play at one time.

## Indoor Sports

Mindscape / 49.95

This sports package contains four different indoor games to play—air hockey, table tennis, bowling, and darts. Players can compete against each other or the computer. The program includes 3-D graphics and animation.

## International Soccer

Microdeal / 39.95

Team colors, wind, rain, and a night-play option add to the realism of this computer soccer game. Onscreen referees decide the plays, and an electronic scoreboard keeps the score. For one or two players.

## Karting Grand Prix

Anco Software / 24.95

In this go-cart racing game, players must choose their tires and sprocket size to suit the track conditions—dry, wet, or slippery. As players race around curves and bends, they have to keep an eye on their opponents as well as on the wear and tear on the tires.

## Leader Board

Access / joystick / 39.95

One to four players can simulate an actual game of golf on one of these 18-hole courses. Players choose their clubs, distance, and type of shot. There are three levels of difficulty, and the computer calculates the handicaps and scores. The package includes *Tournament Disk 1*, which contains four Access-designed courses.

## Mean 18

Accolade / 49.95

One to four players can play famous golf courses such as Pebble Beach, St. Andrews, and Augusta with this golf game. The courses include a driving range and a putting green. Using the Golf Course Architect Set, players can even design their own courses, complete with sand traps, water hazards, and trees. Players can compete against other computer golfers in online tournaments by using *Mean 18* on the Computer Sports Network. Additional course disks are also available.

## Mini-Putt

Accolade / joystick / 44.95

One to four players can play on their choice of courses, with each course representing a theme such as a famous movie, a sport, or a country. Players can view the action from either the golfer's-view window, the over-view window, or the play-screen window. Three types of obstacles are found on the course: paths, such as bridges; setbacks, consisting of pop-up barricades; and timing, such as windmills.

## 1987 College Football Data Disk

Beta Software / Gridiron! / 14.95

The *1987 College Football Data Disk* contains the speed and strength ratings for all 1987 Big Eight and 12 top-20 college football teams to use with *Gridiron!*, from Bethesda Softworks. Teams include OU-Miami, USC, UCLA, Texas A & M, Michigan State, Florida State, Auburn, Notre Dame, and others.

## Street Sports Basketball

Epyx / 39.95

One or two players compete in this neighborhood-style basketball game. The court is set up in the schoolyard, alleyways, or a park, and three players for each team are chosen from ten neighborhood dribblers. Much of the strategy involves how well each player has put together his or her team and how well the hoop shooters can avoid local obstacles such as oil slicks and fences.

## Superstar Ice Hockey

Mindscape / 512K / 49.95

One or two players can face off against each other or the computer in *Superstar Ice Hockey*. In this multilevel game, the player can be the owner and general manager, trading and recruiting players or sending the team to a training camp. As head coach, the player can set and change the lines and plan the strategies. Or the player can act as goalie or center and play on the team. This simulation allows for two-on-two, four-on-four, or six-on-six games. A team can compete against 19 other teams in four divisions for up to nine seasons.

## The Games: Summer Edition

Epyx / 49.95

*The Games: Summer Edition* is set in Seoul, South Korea, site of the 1988 Summer Olympic Games. Players participate in the

opening ceremonies, where competitors parade before the stands and the Olympic flame is lit. Competition includes springboard diving, gymnastics, pole vaulting, velodrome sprint cycling, the hammer throw, hurdles, archery, and the rings. Winners are saluted with awards ceremonies following events. The game also features a closing ceremony.

## TV Sports Football

Cinemaware / 512K / 49.95

*TV Sports Football* offers more than 28 football teams and a 16-game schedule with postseason playoffs. It also contains pre-game warm-up shows, broadcasters, cheerleaders, fans in the stands, and a halftime show with a marching band. The computer player can call the shots as the coach or play on the field as a quarterback, running back, or wide receiver. The player sets up the offense and the defense based on individual and team statistical records. *TV Sports Football* includes arcade action on the field, color graphics, and animation. The game is designed for one or two players against each other, for players against the computer, or for computer against computer.

## Winter Games

Epyx / 39.95

This game lets players take part in seven of the Winter Olympic Games, including figure skating, bobsledding, and the biathlon. The game includes the opening ceremonies and national anthems. For one to eight players.

## World Class Leaderboard

Access / 44.95

Three famous 18-hole golf courses are reproduced in this golf game that includes distance, traps, trees, rough, and water hazards. Players can tee off at St. Andrews, Doral, and Cypress Creek. A fourth course, the Gauntlet Country Club, was designed for this program. The program also offers a printout of the scorecard, an editor to rearrange the holes, a top view of each hole, a practice putting green, and driving ranges.

## World Games

Epyx / 39.95

Players take the part of athletes representing 18 countries as they compete in some not-so-common athletic events. There's cliff diving in Mexico, sumo wrestling in Japan, weightlifting in Russia, bull riding, barrel jumping, log rolling, the caber toss, and the giant slalom. A history and travelog are included, as well as seven options of practice and competition. For one to eight players.

## World Tour Golf

Electronic Arts / 39.95

This version of *World Tour Golf* is designed to take advantage of the Amiga's graphics capabilities. Players can choose from over 20 well-known golf courses, or they have the option to design their own course with the golf course-construction set. Up to four human or computer opponents can play, or the player can model a golfer after his or her favorite pro.



# Memory Expansion Buyer's Guide

Name	Manufacturer	500	1000	2000	Internal or External	Memory Capacity	Power Supply	Warranty	Price*	Comments
Algebra 2MB	Access Associates		■		E	512K-2MB		90 d	249	Unpopulated price.
Alpha Board	Alphanetics			■	I	2MB	N	90 d	700	Call to verify current price.
Alpha Board	Alphanetics	■	■		E	2MB	N	90 d	700	Call to verify current price.
ASDG 2M	ASDG		■		E	0K, 512K, 1MB, 2MB	N	18 m	399	Unpopulated price.
ASDG 2MI	ASDG			■	I	0K, 512K, 1MB, 2MB	N	18 m	399	Unpopulated price.
aMEGA	C Ltd.	■	■		E	1MB		1 yr	550	Pass-through design.
A2052	Commodore Business Machines			■	I	2MB		90 d	799	Being replaced by the A2058.
A2058	Commodore Business Machines			■	I	2MB-8MB		90 d	799	Replaces A2052 RAM expander; includes 2MB RAM.
A501	Commodore Business Machines	■			I	512K		90 d	200	
AX1000	Comspec		■		E	1MB	N	1 yr	775	Includes nonvolatile ramdisk.
AX2000	Comspec		■		E	2MB	N	1 yr	1239	Includes nonvolatile ramdisk.
RE2000	Comspec			■	I	2MB	N	1 yr	199	Unpopulated; \$999 populated. Consumes 1/6 power of other boards.
512K RAM Extension Card	Datel Computers	■			I	512K		90 d	70	Unpopulated; includes battery-backed clock/calendar.
Impact A500-HD/RAM Controller	Great Valley Products	■			E	2MB	Y	1 yr	795	Includes hard disk drive (20MB, 30MB, or 45MB), SCSI connector for 7 devices, and software driver. Price does not include RAM.
Impact A2000-SCSI/RAM(2/0) Controller	Great Valley Products			■	I	2MB	N	1 yr	360	Board includes SCSI hard disk controller, external SCSI connector for 7 devices, and 50-pin ribbon cable.
Grand Slam	Interactive Video System			■	I	256K-2MB; 1MB-8MB	N	1 yr	450	Includes parallel and serial ports and SCSI disk controller; RAM chips available in 256K increments to 2MB or in 1MB increments to 8MB.
Lightning 5	M.A.S.T.			■	I	512K-4MB	N	1 yr	349	Unpopulated price.
Minimegs	M.A.S.T.	■	■		E	512K-2MB	N	1 yr	199	Unpopulated price.
Insider for A1000	Michigan Software		■		I	1MB	N	0K, 90 days; 1MB, 1 year	150	Unpopulated price.
Starboard2/500	MicroBotics	■			E	512K-2MB	Y	120 d	339	Unpopulated price.
Starboard2/SB2000 (Adapted)	MicroBotics			■	I	512K-2MB	N	120 d	339	Unpopulated price.
8-UP!	MicroBotics			■	I	512K-2MB	N	120 d	199	Unpopulated price.
Starboard2	MicroBotics		■		E	512K-2MB		120 d	339	Unpopulated price.
PPI 1000	Palomar Peripherals		■		E	2MB, 4MB, 8MB	Y	6 m	930	Includes interface for two disk drives with up to 40MB and a battery-backed clock. Price is for board with no drives or memory.
Phoenix 2510, 2110	Phoenix Electronics	■	■		E		N	1 yr	180	Expansion chassis with two 100-pin slots to run 2000 cards



Name	Manufacturer	500	1000	2000	Internal or External	Memory Capacity	Power Supply	Warranty	Price*	Comments
Phoenix 2520, 2120	Phoenix Electronics	■	■		E		Y	1 yr	254	Expansion chassis with two 100-pin slots to run 2000 cards.
Exp-512	Progressive Peripherals and Software	■			I	512K	N	90 d	80	Battery-backed clock/calendar; price does not include memory.
Exp-1000	Progressive Peripherals and Software	■			I	1MB	N	90 d	300	Price does not include memory.
Exp-8000	Progressive Peripherals and Software	■			I	8MB	N	90 d		Requires additional power supply; call for price.
ProRAM 2000	Progressive Peripherals and Software			■	I	2MB, 4MB, 6MB, 8MB	N	90 d	300	Price does not include memory.
Hurricane H1000	Ronin		■		I	1MB-4MB	adapter harness	1 yr	600	For use with Hurricane H1000 accelerator board.
Hurricane H2000	Ronin			■	I	1MB-4MB	adapter harness	1 yr	600	For use with the Hurricane H2000 accelerator board.
IN-500	Spirit Technology	■			I	0K, 0.5MB, 1MB, 1.5MB	N	90 d	149	Installs under radiation shield.
IN-1000	Spirit Technology		■		I	0K, 0.5MB, 1MB, 1.5MB	N	90 d	239	Includes battery-backed clock/calendar and installation disk; installs under radiation shield; populated boards available.
SIN 500-2	Spirit Technology	■			I	0K, 0.5MB, 1MB, 2MB	Optional external	90 d	299	Unpopulated price; populated boards available.
SupraRAM 512K	Supra	■			I	512K	N	90 d		Battery-backed realtime clock; call for current price.
SupraRAM 2MB	Supra	■			I	2MB		90 d	180	Installs in SupraDrive SCSI interface OK.
SupraRAM 8MB	Supra			■	I	8MB		90 d	199	OK
2MB RAM Expansion	Synergy	■			I	0.5MB-2MB	N	1 yr	300	Plugs into the Synergy hard disk controller; unpopulated price.
*Rounded off with no decimal.										
*Prices may vary due to fluctuating costs of RAM chips.										

### Names and Addresses

Access Associates  
491 Aldo Ave.  
Santa Clara, CA 95054-2303  
(408) 727-8520

Alphanetics  
P.O. Box 339  
Forestville, CA 95436  
(707) 887-7237

ASDG  
925 Stewart St.  
Madison, WI 53713  
(608) 273-6585

C Ltd.  
723 E. Skinner  
Wichita, KS 67211  
(316) 267-3807

Commodore Business Machines  
1200 Wilson Dr.  
West Chester, PA 19380  
(215) 431-9100

Comspec Communications  
74 Wingold Ave.  
Toronto, Ontario M6B 1P5  
Canada  
(416) 785-3553

Datel Computers  
3430 E. Tropicana Ave. #67  
Las Vegas, NV 89121  
(800) 782-9110  
(702) 454-7700

Great Valley Products  
225 Plank Rd.  
Paoli, PA 19301  
(215) 889-9411

Interactive Video Systems  
15201 Santa Gertrudes Ave.  
Suite Y102  
La Mirada, CA 90638  
(714) 994-4443

M.A.S.T.  
Memory and Storage Technology  
3881 Benatar Way  
Chico, CA 95928  
(916) 342-6278

Michigan Software  
43345 Grand River  
Novi, MI 48050  
(313) 348-4477

MicroBotics  
811 Alpha Dr.  
Suite 335  
Richardson, TX 75081  
(214) 437-5330

Palomar Peripherals  
14580 High Pine St.  
Poway, CA 92064  
(619) 748-1202

Phoenix Electronics  
P.O. Box 156  
314 Court St.  
Clay Center, KS 67432  
(913) 632-2159

Progressive Peripherals  
and Software  
464 Kalamath St.  
Denver, CO 80204  
(303) 825-4144

Ronin  
1150 Ballena Blvd.  
Suite 201  
Alameda, CA 94501  
(415) 769-9325

Spirit Technology  
220 W. 2950 S.  
Salt Lake City, UT 84115  
(800) 433-7572  
(801) 485-4233

Supra  
1133 Commercial Way  
Albany, OR 97321  
(503) 967-9075

Synergy  
5638 Allen Ave.  
Suite 3  
San Jose, CA 95123  
(408) 972-2434



# Buyer's Guide to Disk Drives

Floppy Drives

Name	Manufacturer	500	1000	2000	**Type of Drive	No. of Drives	Size of Disk	Internal or External	Capacity	Transfer Rate	SCSI Interface	Size of Drive	Warranty	Price*	Comments
Alphanetics for A500/1000	Alphanetics	■	■	■	H			E	30-60MB	5MB/sec	■	half-height	1 yr	600	Includes power supply; call for current prices of boards with memory.
Alphanetics for A2000	Alphanetics			■	H			I	30-60MB	5MB/sec	■	half-height	1 yr	600	Call for current prices of boards with memory.
CA-880	California Access	■	■	■	F	1	3 1/2	E		250K/sec		half-height	1 yr	230	Includes connector for attaching an additional disk drive.
A1010	Commodore Business Machines	■	■	■	F	1	3 1/2	E					90 d	300	
A1020	Commodore Business Machines	■	■	■	F	2	5 1/4	E					90 d	300	Includes transformer; reads MS-DOS disks.
A2010	Commodore Business Machines			■	F	1	3 1/2	I	880K				90 d	200	
Comspec Bernoulli	Comspec Communications	■	■	■	H			E	20MB	290K/sec	■	5" x 7" x 13"	1 yr	1399	Uses removable cartridges; price does not include cartridges; three-pack cartridges, \$280.
Comspec Hard Drives	Comspec Communications	■	■	■	H			I/E	20-332MB	290K/sec	■		1 yr	1350	Price is for 20MB external drive with SCSI interface.
CSA 20MB	CSA			■	H			I	20MB				90 d	895	Requires SCSI interface card.
CSA 40MB	CSA			■	H			I	40MB				90 d	1595	Requires SCSI interface card.
CSA 80MB	CSA			■	H			I	80MB				90 d	2495	Requires SCSI interface card.
Datel Disk Drive—Dual	Datel Computers	■	■	■	F	2	3 1/2	E	1MB			6" L	90 d	300	
Datel Disk Drive—Single	Datel Computers	■	■	■	F	1	3 1/2	E	1MB			6" L	90 d	170	
E1-3-32	Expansion Technologies		■		H			E	32MB		■			700	3 1/2-inch drive.
E1-3-49	Expansion Technologies		■		H			E	49MB		■			850	3 1/2-inch drive.
E1-5-63	Expansion Technologies		■		H			E	63MB		■			900	5 1/4-inch drive.
E5-3-32	Expansion Technologies	■			H			E	32MB		■			700	3 1/2-inch drive.
E5-3-49	Expansion Technologies	■			H			E	49MB		■			850	3 1/2-inch drive.



# Buyer's Guide to Disk Drives

E5-5-63	Expansion Technologies	■			H		E	63MB		■		900	5 1/4-inch drive.
Escort I	Expansion Technologies	■	■	■	F	I	3 1/2	E				180	Includes long cable, gray faceplate, and expansion port for additional drives.
FData-10	Flexible Data Systems	■	■	■	F	I	3 1/2	E			1.2" H × 4" W × 7" D	150	Two-year warranty can be purchased for \$24.95.
FData-20	Flexible Data Systems	■	■	■	F	2	3 1/2	E				300	Power supply included.
FS-80A	Future Systems	■	■	■	F	I	3 1/2	E			half-height	199	
Data Cell 20	Giga Cell Systems	■	■	■	H			E		■	2.5" H × 2.75" W × 8" D	945	Price includes host adapter and software.
Data Cell 40	Giga Cell Systems	■	■	■	H			E		■	2.5" H × 2.75" W × 8" D	1290	Price includes host adapter and software.
Data Cell 60	Giga Cell Systems	■	■	■	H			E		■	2.5" H × 2.75" W × 8" D	1440	Price includes host adapter and software.
Impact A500-20HD/RAM Subsystem	Great Valley Products	■			H			E			6" × 10"	795	0 RAM.
Impact A500-30HD/RAM Subsystem	Great Valley Products	■			H			E			6" × 10"	895	0 RAM.
Impact A500-40Q/RAM Subsystem	Great Valley Products	■			H			E			6" × 10"	1195	Turbo hard drive from Quantum; 0 RAM.
Impact A500-45HD/RAM Subsystem	Great Valley Products	■			H			E			6" × 10"	1095	0 RAM.
Impact A500-80Q/RAM Subsystem	Great Valley Products	■			H			E			6" × 10"	1650	Turbo drive from Quantum; 0 RAM.
Imp.A2000-HC/40Q	Great Valley Products	■	■	■	H			I		■		999	Quantum drive.
Imp.A2000-HC/80Q	Great Valley Products	■	■	■	H			I		■		1450	Quantum drive.
Imp.A2000-HC/100	Great Valley Products	■	■	■	H			I		■		1950	Conner or Rodime drive.
Impact A2000-HC/20	Great Valley Products	■	■	■	H			I		■		675	Seagate drive.
Impact A2000-HC/30	Great Valley Products	■	■	■	H			I		■		775	Seagate drive.
Impact A2000-HC/45	Great Valley Products	■	■	■	H			I		■		950	Seagate drive.



# Buyer's Guide to Disk Drives

IOmega Bernoulli Drive	Inner Connection	■	■	C	1	3 1/2	E	20MB to infinite	■ (CLtd., CSA)	1 yr	1695	Uses 20MB cartridges; designed to prevent head crashes; includes on-board diagnostics software.
IOmega Bernoulli Drive 2000	Inner Connection	■	■	C			I	20MB to infinite	■ (CLtd., CSA)	fits 5 1/4-inch slot	1595	Uses 20MB cartridges; designed to prevent head crashes; on-board diagnostics.
IOmega Bernoulli Dual Drive	Inner Connection	■	■	C	2	3 1/2	E	20MB to infinite	■ (CLtd., CSA)	1 yr	2595	Uses 20MB cartridges; designed to prevent head crashes; includes on-board diagnostics software.
Tiny Tiger	MAST	■	■	H			E	20-180MB	■	half-height	269	Price includes case, controller card, and power supply; call for price of drives.
Twindrive	MAST	■	■	F	2	3 1/2	E	880K		2" H	299	Optional external power supply for \$9.95.
Unidrive	MAST	■	■	F	1	3 1/2	E	880K		1" H	169	Upgrade to Twindrive for \$130; optional external power supply for \$9.95.
Air Drive External	Megatronics	■	■	F	1	3 1/2	E	880K		half-height	199	30-inch cable included.
Air Drive Internal	Megatronics	■	■	F	1	3 1/2	I	880K		half-height	159	30-inch cable included.
1578-15	Micropolis	■	■	H			I	382MB	■	full-height	2820	
1674-7	Micropolis	■	■	H			I	182MB	■	half-height	1445	
OverDrive with Konica Floppy Drive	Pacific Peripherals	■	■	F	1	5 1/4	I	10MBB	■		999	DMA card installed in slot; drive mounts in drive space; drive uses high-density floppy disks.
OverDrive with 30MB	Pacific Peripherals	■	■	H			I	30MB	■		699	DMA hard card with 3 1/2-inch hard drive mounted on it.
OverDrive with 50MB	Pacific Peripherals	■	■	H			I	50MB	■		849	DMA hard card with 3 1/2-inch hard drive mounted on it.
OverDrive with 62MB	Pacific Peripherals	■	■	H			I	62MB	■		799	DMA hard card installed in slot; drive mounts in 5 1/4-inch drive space.
SubSystem 500	Pacific Peripherals	■	■	F	1	3 1/2	E			1.5" H × 18.5" W × 13" D	399	Exp. box includes floppy drive and 54-watt power supply; supports two A2000 cards; fits under the A500.



# Buyer's Guide to Disk Drives

Model	Manufacturer	■	■	■	H	1	2	3 1/2	E	Capacity	4MB/sec	■	2.6" H x 4.4" W x 10" D	1 yr	Call for current prices.
PDH-85, 120, 180	Phoenix Electronics	■	■	■	H				E	85, 120, or 180MB		■	2.6" H x 4.4" W x 10" D	1 yr	Call for current prices.
PFD 135	Phoenix Electronics	■	■	■	F	1	3 1/2		E	880K			1 1/4" H x 4 1/4" W x 10 3/4" D	1 yr	30-inch cable included.
PFD 135I	Phoenix Electronics	■	■	■	F	1	3 1/2		I	880K				1 yr	163
PFD 235	Phoenix Electronics	■	■	■	F	2	3 1/2		E	880K				1 yr	325
PHD-22	Phoenix Electronics	■	■	■	H				E	22MB	4MB/sec	■	2.6" H x 4.4" W x 10" D	1 yr	86-pin pass-through capabilities.
PHD-32	Phoenix Electronics	■	■	■	H				E	32MB	4MB/sec	■	2.6" H x 4.4" W x 10" D	1 yr	86-pin pass-through capabilities.
PHD-48	Phoenix Electronics	■	■	■	H				E	48MB	4MB/sec	■	2.6" H x 4.4" W x 10" D	1 yr	86-pin pass-through capabilities.
Pioneer Dual Floppy Drive	Pioneer Computing	■	■	■	F	2	3 1/2		E					90 d	330
Pioneer Hard Drives	Pioneer Computing	■	■	■	H				E	20MB		■	full- or half-height	1 yr	660
Pioneer Single Floppy Drive	Pioneer Computing	■	■	■	F	1	3 1/2		E					90 d	160
PRD-44	Pioneer Computing	■	■	■	C				E	44MB	1.25MB/sec	■	5 1/4-inch half-height		1280
ProDrive 2000	Progressive Peripherals and Software	■	■	■	F	1	3 1/2		I	880K			3 1/2-inch, like 2010	90 d	175
FD-10	Supra	■	■	■	F	1	5 1/4		I	10MB/disk	1.25MB/sec	■	3" H x 6 1/2" W x 14" D	90 d	995
SupraDrive	Supra	■	■	■	H				E	20, 30, 45, 60, 120, 250MB		■	3" H x 5 1/4" W x 11 1/2" D	90 d	799
SupraDrive	Supra	■	■	■	H				E	20, 30, 45, 60, 120, 250MB		■	3" H x 5 1/4" W x 11 1/2" D	90 d	799
SupraDrive	Supra	■	■	■	H				I/E	20, 30, and 60MB Internal; 120 and 250MB external		■		90 d	699



# Buyer's Guide to Disk Drives

Master 3A	Surfside Components International (SCI)	F	I	3 1/2	E					1 3/4" H X 4 1/4" W X 9" D	1 yr	159	2 1/2-inch cable included.
Hard Disk Plus 20	Synergy	H			E						1 yr	750	Includes interface box, host adapter, one-meter cable, and expansion box for two drives; 2MB RAM optional.
Hard Disk Plus 30	Synergy	H			E						1 yr	900	Includes interface box, host adapter, one-meter cable, and expansion box for two drives; 2MB.
S-520	Xetec	H			E					2.5" H X 14" W X 12" D	9 mo/1 yr	699	Includes SA-5 host adapter, manual, software, and cables.
S-540	Xetec	H			E					2.5" H X 14" W X 12" D	9 mo/1 yr	899	Includes SA-5 host adapter, manual, software, and cables.
S-1020	Xetec	H			E					2.5" H X 14" W X 12" D	9 mo/1 yr	749	Includes SA-10 host adapter, software, manual, and cables.
S-1040	Xetec	H			E					2.5" H X 14" W X 12" D	9 mo/1 yr	949	Includes SA-10 host adapter, software, manual, and cables.

\*Rounded off with no decimal.

\*\*Prices may vary due to fluctuating costs of RAM chips.

\*\*H = hard drive

F = floppy drive

C = chassis

## Names and Addresses

Alphanetics  
P.O. Box 339  
Forestville, CA 95436  
(707) 887-7237

California Access  
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Design Works  
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San Jose, CA 95131  
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Commodore Business  
Machines  
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West Chester, PA 19380  
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Comspec Communications  
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Toronto, Ontario M6B 1P5  
Canada  
(416) 785-3553

CSA  
Computer System Associates  
7564 Trade St.  
San Diego, CA 92121  
(619) 566-3911

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Las Vegas, NV 89121  
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(702) 454-7700

Expansion Technologies  
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Fremont, CA 94538  
(415) 656-2890

Flexible Data Systems  
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Giga Cell Systems  
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Santa Clara, CA 95054  
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Paoli, PA 19301  
(215) 889-9411

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California, MD 20619  
(301) 863-5708

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Clay Center, KS 67432  
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## Major Motion

**T**hings are getting hot on the western frontier. The Draconian League controls all major roads and highways. The government has appointed you to infiltrate the Draconian stronghold and make the highways safe for civilian passage. Your code name: Major Motion.

Your job isn't easy. You face an onslaught of deadly machines: Armored vehicles try to run you off the road, cars with spikes try to slash your tires, and relentless assault helicopters constantly bomb your path. There's even a mad machine gunner in a stretch limo whose sole purpose is to turn you into Swiss cheese. And to make matters worse, intelligence reports show that even deadlier foes lurk ahead.

You begin your mission in a top-secret spy vehicle armed with the latest high-tech gizmos and weaponry. The car is initially equipped with machine guns but can later be fitted with missiles, turbo speed, repulser beams, oil slicks, and smoke screens.

A heavily armored weapons truck supplies your car with new weapons along the way. Since the roadside isn't very safe, you'll have to drive your car into the back of the moving truck. The truck signals you with a horn blast and then lowers ramps from the rear of the trailer. Of course, the enemy vehicles will do their best to keep you from boarding the truck. Once you're inside, a high-tech crew quickly fits your car with a new weapon and then lowers you back onto the road. Who said James Bond has all the fun?

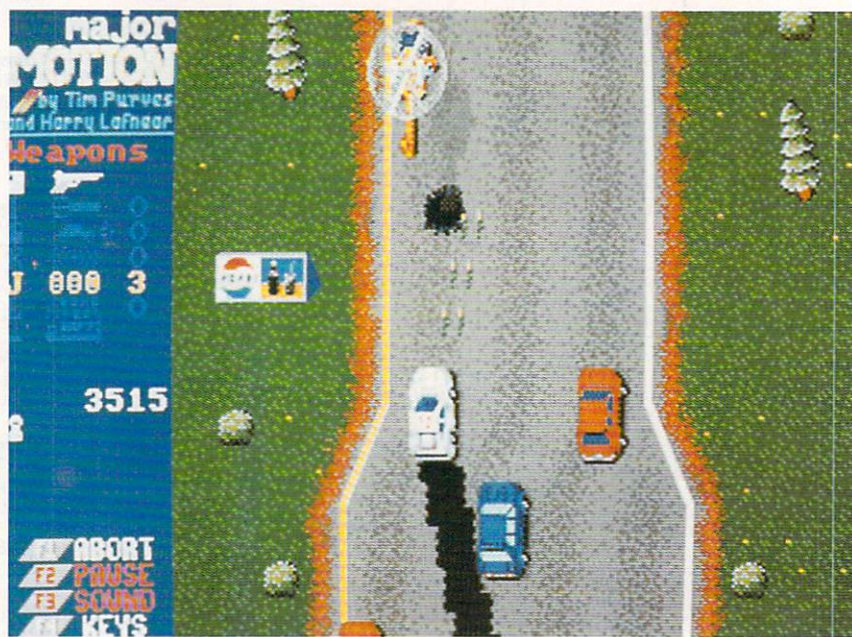
Your car's weapon status is displayed in the upper left corner of the screen. The display contains six small icons representing each type of weapon. Beside each icon, a display reveals the number of units available and the keyboard character that activates the weapon. When you pick up a new weapon, its corresponding icon is highlighted in white.

To activate a weapon, you must press its corresponding keyboard character. The game defaults to the right mouse button for turbo speed, I for missiles, J for oil slicks, K for repulsers, and L for smoke screens. This method feels very awkward at first, but you'll get used to it after a few games. If you want to change the default keys, there is an option to reprogram them to whatever you like. Get comfortable with the controls: You'll need fast reflexes on the road.

The most abundant of the enemy vehicles are the light blue bumper cars. These cars have no special weapons; they just try to run you off the

Dark blue spike cars are seen less often but are very deadly. Each wheel contains a retractable blade that can easily shred your tires. Spike cars have a red hourglass shape on the hood, but they can be mistaken for bumper cars because of their similar color. They have weak armor and can be destroyed with machine-gun fire. Shoot first: I don't advise trying to run these vehicles off the road.

The most powerful enemy vehicle is the assault helicopter. When you hear it coming, you'd better watch out! The chopper can match your speed, and it carries a huge payload of bombs. If it can't hit you, it will blow



The government has appointed you to infiltrate the Draconian stronghold and make the highways safe for civilian passage. Your code name: Major Motion.

road. They are heavily armored and can't be destroyed by machine-gun fire. They are especially dangerous when encountered in groups of three or more.

Dark gray station wagons also appear frequently. They are easy to identify because of the devilish insignia on the roof. They don't carry weapons, and they have weak armor. You can destroy them with machine-gun fire.

the road right out from under you. Missiles are your only defense against the copter. Luckily, you have to tangle with only one assault helicopter at a time.

Special cars appear as the game progresses. They are not affected by any of your weapons. Some chase you, while others just make one deadly pass. The first is a stretch limo with a machine gunner inside. The second is



an evil twin car, which is an early prototype of your car. It is fast and heavily armored but doesn't carry weapons. Both are pretty tough customers.

Different types of terrain will test your driving skills. You begin on pavement, but you'll see icy roads, dirt roads, and gravel roads before you're through. Each affects your car's performance differently. For example, icy roads prevent your car from accelerating quickly, but they allow you to bump your enemies off the road easier. The roads occasionally divide, narrow, curve, and zigzag, too. Since changes are usually abrupt, you'll have to rely on reflexes to stay alive.

*When you hear the helicopter coming, you'd better watch out!*

It isn't over when you reach the end of the road, either. You'll have to ditch your wheels for a speedboat and enter a long treacherous river. Like the highways, it's full of nasty hazards. You must dodge islands, logs, rocks, and enemy boats. It's a whole new ball game.

*Major Motion* is a clone of the popular arcade hit *Spy Hunter*. It has minor differences, but it's still one solid, action-packed arcade game. You'll find all of the necessary ingredients to keep you coming back for more. Smooth-scrolling roads are the highlight of the game. Trees and billboards fly by in dazzling colors. Digitized sound effects add plenty of realism, too. You'll hear screeching tires, exploding cars, air horns, and many other sounds.

Excellent design and playability make this game stand out. Strategically placed obstacles challenge you to get a little further each time you play. In other words, it's addictive. If you're looking for a truly entertaining arcade game with a lot of variety and action, you won't find one better than *Major Motion*.

—Troy Tucker

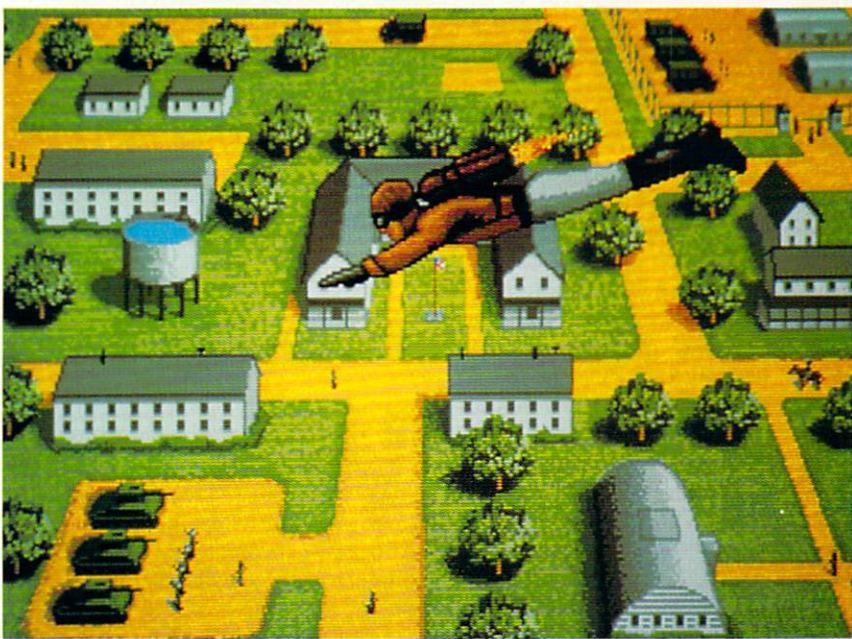
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## Rocket Ranger

**B**y day, I'm a mild-mannered reporter in the exciting world of computer journalism. At night, I grab a bite, sit down at my computer, take off my glasses, strap on a rocket pack, and become a Rocket Ranger.

Usually I have to put my glasses back on. After all, I don't want to miss the lush graphics and smooth animation of Cinemaware's latest and greatest game—*Rocket Ranger*.

*Rocket Ranger* is like an old movie in a new suit. There's a real balance here. Cinemaware tastefully balances black-and-white with color, reality with romance, and 1940s art with 1980s computer graphics.



*Rocket Ranger* is a beautiful blend of movie, adventure, and arcade sequences.

Here's what happens when you start a game of *Rocket Ranger*. You begin in the middle of World War II. Hitler is up to his usual tricks. You even see him in the cinematic introduction, shaking his fists and urging his troops forward. Who could stop a madman like that? Only the good old U.S.A. and Rocket Ranger, it seems.

You begin the game as a physicist, pondering some obscure theorem. Poof! A full rocket suit appears on your desk along with a manual, a pistol, a note, and a Dick Tracy-style

wristwatch. A note says that these futuristic implements are (surprise!) from the future—a future dominated by the totalitarian world government resulting from Hitler's victory. Here's your instructions: *We know that the Germans had several key bases in different parts of the world. Your mission is to find these bases, use the rocket pack and radium pistol to penetrate their defenses, and destroy their sources of power.* Indeed, that's exactly what the game is all about. You fly from country to country, uncovering secret Nazi factories and forces.

When you enter the game, you're at Fort Dix. This is your base of operations. From Dix, you can go to the War Room, the Fuel Depot, or the Rocket Lab.

In the War Room, you control al-

lied spies and start resistance movements. In the fuel depot, you transfer that magical substance—lunarium—to and from your rocket pack. In the Rocket Lab, you'll see how the stolen Nazi rocket parts are being put together to make a rocket. If you manage to build a rocket, you'll have to load it with lunarium and go to the moon.

If only it was as simple as you against the Nazis. The Germans have Zeppelined into the U.S. and kidnapped a famous rocket scientist and his beautiful daughter. If you have the



aeronautical skill and the eagle eye of the sharpshooter, you may be able to fly to the airship, but be careful. The Nazis have all kinds of cruel and unusual torture weapons up their sleeves, so you'd better pay attention and fly right.

In fact, you must be careful at every stage of this rich game. Built around arcade sequences, *Rocket Ranger* is also built around a mystery that functions on several levels. You have to fly right, but you also have to think straight to work your way successfully to the conclusion. In the arcade sequences, you'll fly against enemy fighters, duke it out with Nazi guards, and tackle other challenges. Even getting yourself airborne takes some skill.

*Cinemaware tastefully balances reality with romance.*

*Rocket Ranger* is a blend of movie, adventure, and arcade sequences. As a movie, it's intense and entertaining. As an adventure, it's intriguing. The arcade sequences are beautiful graphically; however, on the playability side, they range from the excellent (the air battles) to the dull (the fist-fights). The game isn't perfect, but it's good.

I do have a few gripes. First, there's the fact that I always lose. I don't know if that's Cinemaware's fault, though. I'm pretty sure that if I were to win the game tomorrow, I'd probably never play the game again—the arcade sequences are too few and far between to make the game interesting after the puzzle has been solved. But remember that this is a movie with an old-time hero and an old-time enemy. You expect the hero to win. It's disappointing when he doesn't.

Second, there's the copy protection. It consists of a Secret Decoder Wheel that tells you how much lunarium to place into your rocket pack to get from one country to another. I've lost the game twice by misreading the dial (I fell into the ocean, lunarium-less). True, it was my own carelessness, but still not a fun experience.

Third, I hate waiting for disk drives. In any Cinemaware game,

you'll find that you spend half your time staring into space, waiting for a screen or a sound or an animation to be loaded. Cinemaware tries to get around the problem with its own, faster DOS. This means that you can't install the game in a ramdisk or on a hard drive. All I can suggest to Cinemaware is to keep trying.

Fourth, and most annoying to me, every box and every ad for the game has the phrase: *Only YOU can stop the Interplanetary Spread of Jet-Propelled NAZI FACISM*. Unless *facism* is some sort of rule-by-faces that I don't know about, the word is *fascism*.

Overall, Cinemaware has created the best incarnation of its idea of software in *Rocket Ranger*. I've had a lot of fun playing. It's a solid game with clever and touching graphics and an excellent soundtrack. It even has heat haze over the city skylines.

— Rhett Anderson

Cinemaware  
4165 Thousand Oaks Blvd.  
Westlake Village, CA 91362  
\$49.95

## Battle Chess

**W**hat the world of computers probably needs least is another chess program. Admittedly, options for Amiga owners aren't nearly equal in number to those available to MS-DOS or Apple II owners, but with *Chessmate* and, especially, *Chessmaster 2000*, surely the needs of most chess players have been met. *Chessmaster 2000*, after all, is one of the most highly regarded chess packages of all, and it even has a fake spreadsheet to keep the boss off your back if you play it at the office.

So why would Interplay Productions bother creating one of its own? There are a couple of reasons. First, the fact that excellent chess packages already exist means little to the avid buyer of chess programs—no more than having unfinished adventure games lying about stops an adventure buff from buying the next one in the series. Second, Interplay had some-

thing different to offer. That something, it turns out, was full animation.

Most chess games are animated to a marginal degree. Move a knight, and the piece moves from one square to the next on the screen. In the case of *Chessmaster 2000*, this is accomplished against the background of a very attractive 3-D board. One chess-like game, Electronic Arts' superb *Archon*, took the idea of animation to heart, allowing for a battle between pieces contesting a square. It wasn't chess, though, and that's where *Battle Chess* comes in.

*It's the animated combat sequence that is so appealing.*

*Battle Chess* is nothing more than standard chess with animated pieces. There is no tactical subgame, as in *Archon*; all that's different from normal chess is that the pieces walk or glide to their appointed squares and then defeat the enemy piece in animated combat. The regular rules of chess are the only rules available: When a pawn moves into a square with an enemy bishop, the pawn defeats the bishop. Combat skill or differential is not an issue here.

Yet it is precisely the animated combat sequence that makes the game so appealing. The difference between computer chess and face-to-face chess has always been the ability of a human player to play against the computer, but besides that, the game suffers as a result of computerization. Gone is the physical feel of the pieces, the pure three-dimensionality of the board, the variety of available pieces, and, of course, the human interaction. Even in programs like *Chessmaster 2000*, which takes into account three-dimensionality and different perspectives on the board, the real chess-playing experience is partially lost.

*Battle Chess* adds a new dimension, albeit a purely aesthetic one. Because its pieces fight each other in an animated sequence, *Battle Chess* does something that simply can't be done with a standard chess set. In other words, the game takes advantage of the fact that it exists on a graphics-oriented computer, offering an addi-



tion to—rather than a slavish recreation of—the game of chess.

Considerable thought has gone into the programming of the combat sequences. Two pawns will fight each other in the same fashion each time, but a pawn defeats a bishop, and a bishop defeats a pawn, in entirely different ways. Rooks, which animate by becoming lumbering stone monsters, crush pawns, eat queens, and turn kings into pancakes. Queens fight with

monial to *Battle Chess*'s design was watching it enthrall my daughters and their friends. None of these people had ever played chess, nor had they ever shown any interest in learning. One look at *Battle Chess*, though, and they wanted to see how the pieces fought one another. I left them alone, told them that all the pieces move differently and explained how the game is won, and they quickly learned how the pieces move in order to get them to

demonstration software. Some of its combat sequences are gruesome, perhaps even objectionable, but their graphic excellence is unquestionable. Knight-vs.-knight combat, stolen from *Monty Python and the Holy Grail*, should bring laughs, and watching a king eliminate a queen is especially entertaining. Furthermore, the grunts and groans of dying pieces are disturbingly realistic. In other words, even if you don't particularly like chess, you might want this program for the graphics it offers.

—Neil Randall

Interplay Productions  
Distributed by Mediagenic  
3885 Bohannon Dr.  
Menlo Park, CA 94025  
\$39.95



Because its pieces fight each other in an animated sequence, *Battle Chess* does something that simply can't be done with a standard chess set.

magic, and they destroy each piece in a unique way. Much of *Battle Chess*'s fun, in fact, comes from wondering how one piece will destroy another. To find out, I spent the early games sacrificing everything from knight to queen just to see the battle sequences. Even so, I still have no idea how a pawn might destroy a king.

Games can be saved, and game situations can be set up. You can force the computer to make a move, take back a particularly disastrous move, or have the computer suggest a move. You can play with a two-dimensional board—somewhat faster, but with no animated combat—and you can choose from ten levels of play. The computer will play either or both sides, or you can play a human opponent. Finally, the game can be played via modem.

For me, the most revealing testi-

fight. To be sure, this resulted in a series of kamikaze chess matches, but by the end of a couple of hours, the girls knew the basic rules of chess. *Battle Chess* had taught them almost effortlessly.

As far as play goes, *Battle Chess* gives me a good battle at even its lowest levels (which, admittedly, isn't a major feat). It is somewhat more forgiving than *Chessmaster 2000*, to the degree that I can actually win, even at the second level. The manual teaches the rules of chess and it explains chess notation. It also gives notation for 20 historical matches. Amiga owners will be delighted to learn that the master disk is not only unprotected, but it also includes a separate program to use in installing it on a hard disk.

Finally, *Battle Chess* is worth owning if only as a piece of Amiga

## Inboard 500

The Inboard 500 from Spirit Technology is a RAM-expansion device for the Amiga 500. Like the Amiga 1000 and 2000, the Amiga 500 can directly access up to nine megabytes of RAM. Amiga users quickly learn, however, that those amazing Amiga graphics and sound programs are memory hungry. The 500 comes with 512K of memory and can easily be expanded to one megabyte with the A501 internal RAM expansion from Commodore, but expansion beyond one megabyte is more difficult and expensive. The 500's single expansion bus is designed for external devices with separate power supplies, which use more desk space and cause higher expansion costs. Other expansion devices, such as hard drives, also vie for use of the 500's expansion bus. The Inboard answers these concerns by expanding RAM internally without tying up the expansion bus.

The straightforward layout and high-quality assembly make it clear that Spirit Technology has put a lot of thought and effort into the Inboard. The device is a four-layer low-noise circuit board, designed to be installed on the Amiga's motherboard. The board has a socket for the 68000 CPU chip, an optional clock/calendar, and



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## AMIGA 500

The 500 includes 512K bytes internally and is expandable to 8 MB, two joystick ports, a serial port, a parallel port, an external disk drive port, and a built-in 3.5" disk drive. It even includes a 2-button mouse!  
Amiga 500

73729 \$CALL

## AMIGA 2000

The 2000 has multitasking abilities, sprites, a graphic coprocessor and built-in speech. With keyboard, mouse, joystick, RS232 and Centronics ports, the 2000 is a powerful computer. It has a built-in 3.5" disk drive, mounting locations for two external Amiga floppy disk drives and has an internal option for IBM PC/XT compatibility. Standard RAM is a full MB and is expandable to 9 MB.  
Amiga 2000

77617 \$CALL

## AMIGA Accessories

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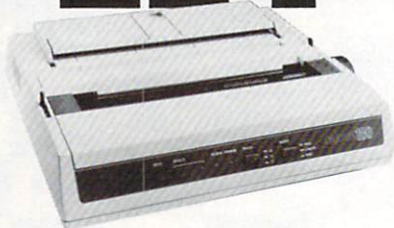
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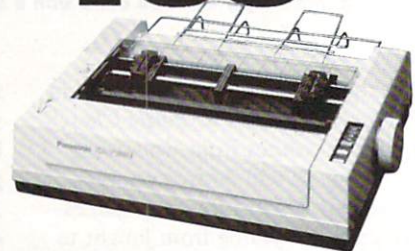


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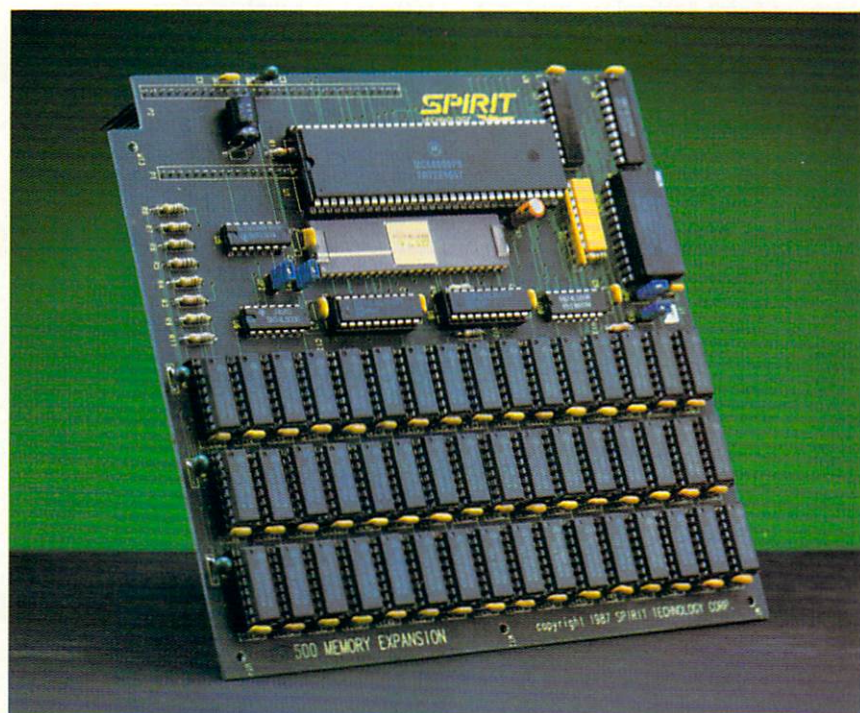
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**Affordable expansion is a hallmark of Spirit Technology's Inboard 500, a peripheral that delivers plenty of RAM for graphics—and sound-hungry programs.**

three banks of sockets for RAM chips. The user can configure the board to be used with 0K, 512K, 1 megabyte, or 1.5 megabytes of RAM. The Inboard uses 256K DRAM chips, rated at either 120 or 150 nanoseconds. These chips, commonly used for computer RAM expansions, have become considerably more expensive in the past few months.

Installation of the Inboard is not for the faint of heart or for those of us with two left thumbs. While most users can install the board themselves, it requires delicate and deliberate action. First of all, open the Amiga (this voids the warranty). Next, remove the metal RF shield covering the motherboard and then remove the 68000 chip from the motherboard. Place the 68000 chip in the Inboard. Then install the Inboard over the motherboard in the CPU's socket. Finally, clip one jumper to a pin on the Gary custom chip on the Amiga's motherboard.

Spirit Technology provides detailed step-by-step instructions and several diagrams, showing various stages of the installation procedure. Both the documentation and diagrams are contained on disk, but the diagrams are also provided in hardcopy form. Frankly, the documentation

should be provided in hardcopy as well. Anxious users who tear their Amigas apart to install the board will find it impossible to read the installation instructions unless they print them prior to disassembly. Users without printers are out of luck and must memorize the installation instructions.

I found the instructions to be thorough, and I had no real problems until I tried to plug the Inboard into the motherboard. I could not get it to seat properly. As the instructions

warned, there were several capacitors on the motherboard that I had to bend to make room for the Inboard. I performed this action with sweaty palms, but even after bending the capacitors, the board did not want to seat firmly in the 68000 socket. However, after stubborn but cautious persistence, I finally seated the board and secured it with a retaining clip supplied by Spirit Technology. The whole process took approximately 2½ hours, but I deliberately worked at a snail's pace.

I have had no problems with the board unseating or with the jumper clip running to the Gary chip. I recommend, however, that any user who feels uneasy about opening the 500 and installing the board should have a qualified technician perform the installation.

The Inboard must be configured to your system. As previously indicated, the Inboard is designed to add up to 1.5 megabytes to your system, in increments of 512K. The Inboard uses the same memory address (C00000) as the A501 0.5-meg expansion unit from Commodore. At this memory address, version 1.2 of the Amiga operating system will automatically configure expansion RAM to the system, which means the computer will automatically recognize the added RAM and add it to available memory. However, because that area of memory is only 1.5 megabytes in size, users who own the A501 expansion will not be able to auto-config expansion RAM on the Inboard for more than 1 megabyte. Therefore, users owning the A501 and

**Table 1**

Auto-Config	Inboard Configuration	Total RAM
Yes	1.5 meg, no A501	1,689,664
Yes	1.0 meg, no A501	1,427,752
Yes	0.5 meg, no A501	903,464
Yes	1.0 meg, with A501	1,689,896
Yes	0.5 meg, with A501	1,427,728
No	1.5 meg, with A501	2,474,232
No	1.0 meg, with A501	1,949,944
No	0.5 meg, with A501	1,425,656

**Table 2**

**Amiga 500 Power Usage**

Motherboard	1.69 amps (max.)
A501 Expansion	0.40 amps (max.)
A1010 Disk Drive	0.50 amps (max.)
Inboard with 1.5 meg	0.65 amps (max.)
	3.24 amps (max.)



an Inboard with 1.5 megabytes on board will have to use the *addmen* command for the system to recognize the expansion RAM on the Inboard. The *addmen* command directs the computer to find the Inboard's RAM and add it to available memory.

Spirit Technology provides programs on the disk accompanying the Inboard to help users configure the board to their systems. Configuration involves the switching of five jumpers on the Inboard and a choice of pins on the Gary chip to hook the jumper clip. Table 1 shows the various configurations and the total system RAM resulting from the configuration.

You'll notice that configuring Inboard RAM to auto-config under the Amiga operating system results in some loss of memory in two situations. With the A501 and a 1-megabyte-equipped Inboard, or with a 1.5-megabyte Inboard alone, you should get at least 1,949,944 bytes of available RAM. The reasons for the memory loss are not readily apparent, but tech-

nicians at Spirit Technology believe it is due to ROM overflow under the Amiga operating system. The solution to this memory loss, however, is to use the *addmen* command. As Table 1

*I highly recommend the Inboard 500 to Amiga 500 users looking to expand their system RAM.*

reveals, *addmen* allows full use of all memory added by the Inboard. While not as convenient as auto-config, the *addmen* command is relatively painless to use. By adding the *addmen* command to the startup sequence, the system recognizes the RAM at bootup. Spirit Technology helps users configure their system with *addmen* by providing support through documentation and utility programs on disk.

When using internal expansion devices on the 500, you must always be concerned with power drain. The

500's power supply is marginal compared to the 1000's or 2000's. In fact, Commodore does not recommend using devices other than the A501 and the A1010 3 1/2-inch disk drives that draw on the computer's power supply. However, the Inboard consumes very little power. Table 2 shows a breakdown of the power usage by the computer and common peripherals. Since the 500 power supply provides 4.3 amps, using a fully populated Inboard with an A501 and A1010 still leaves more than 1 amp in reserve. My concerns about the Amiga power unit forced me to purchase a third-party power supply before installing the Inboard. Amiga users, however, should be able to safely use the Inboard with the original 500 power supply.

Overheating is another concern whenever internal devices are added to any computer. Any internal temperature rise in the Amiga, however, should be negligible since the Inboard is located in the ventilation exhaust flow. In the two months I have had

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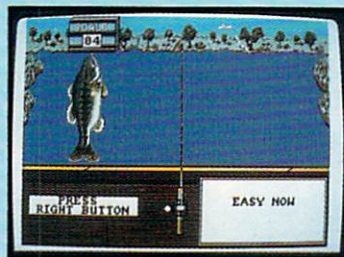
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the Inboard installed, I have experienced no overheating problems. In fact, I have noticed no appreciable difference in the heat generated by the 500 with the Inboard installed.

The Inboard 500 is a welcomed and needed third-party expansion device for the Amiga 500. In my opinion, the advantages of the Inboard's internal RAM expansion of the A500 greatly outweigh any concerns. The Inboard not only saves the Amiga user valuable desk space and having to transport an additional device when moving the computer, it saves the user money by avoiding separate power supplies and housings required by external expansion units. I highly recommend the Inboard 500 to Amiga 500 users looking to expand their system RAM. And believe me, sooner or later you'll need to expand!

—Scott Thomas

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## Empire

**E**mpire has been around for a while on mainframes, and in 1984 it became available on the IBM PC. Last year, Interstel added *Empire* to its series of games on the growing Star Fleet mythos and began porting it to different machines. The Atari ST version hit first; now the Amiga edition is here. It requires 512K of RAM.

Only loosely related to the Star Fleet series, *Empire* places you in the role of strategic commander of an Allied landing fleet. The Krellan Empire has subjugated several planets, and you have been ordered to invade one of them and reunite the cities. In practical terms, this means capturing all the cities on the planet, with the number of cities depending on the planet you invade.

You begin the game with control of one city, which appears white on

the screen. The rest of the world is black. Your first chore is to have the city produce armies, fighters, transports, destroyers, submarines, cruisers, battleships, or aircraft carriers. Then you must move your army out and discover the world in the squares around you.

Every time you move a square, adjoining squares become visible. Each square is one type of terrain: land, water, or city. Armies can march across land, but they can't cross water without transports. Since the enemy has a navy, your transports will need escort ships as well. The most suitable escorts are destroyers, but as naval commander you will want cruisers, battleships, submarines, and carriers to fight sea battles and prepare shorelines for invasion. Then, too, you will want fighters for exploration duties and for battling enemy armies, ships, and other fighters.

In other words, *Empire* demands an understanding of combined operations. It is not possible to win the



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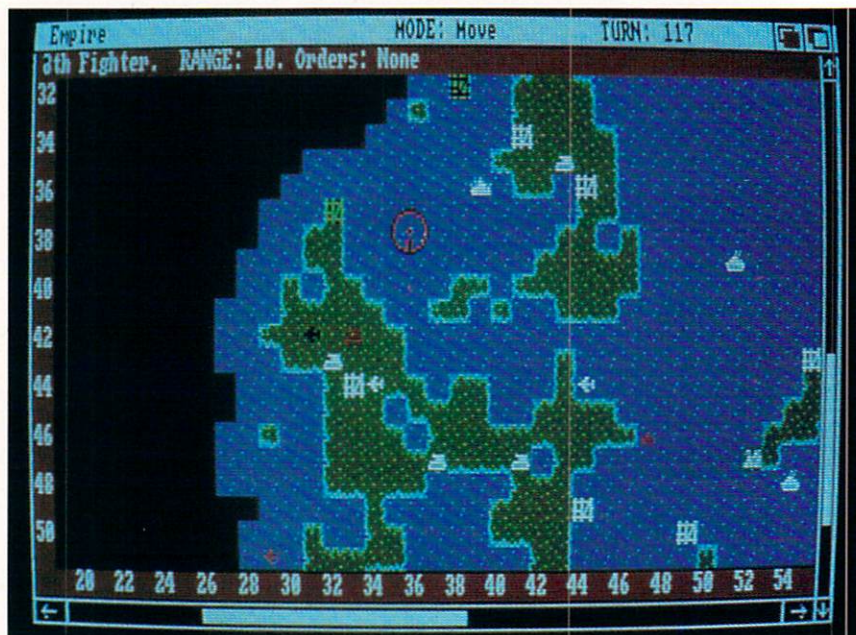
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game with armies only, because none of the worlds consists solely of land masses. Large-scale continental invasion demands the effective use of all possible weaponry. Your opponent, you must remember, is waiting for you to commit your forces. Then he will invade your country and see how well you've defended.

*Empire* sports a superb user interface. A scrolling map lets you see each unit. Move the units by keyboard commands, menu selection, or with the mouse. Creative use is made of the requester boxes, with responses such as "Yes, sir!" replacing the usual "Accept" or "OK." A box appears each time a unit is produced, asking whether you want the city to continue producing that type or to switch production to another unit. Other automatic boxes let you name the ships you produce (armies and fighters are automatically numbered).

Special orders are available through keyboard or menu commands. You can command ships to escort other ships (which means you don't have to give them orders every turn), and you can set flight paths for



*Empire* gives you the chance to be global commander—on a totally unexplored globe!

fighters. You can place units on sentry or patrol duty, again to minimize the number of decisions you have to make during each turn. Transports can be ordered to load all units that come ad-

jacent to them, and you can place several units under the same order. All these are designed to relieve you of making turn-by-turn decisions for dozens of units.

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Several reports are available to you each turn, and, unlike those offered by many war games, they're actually useful. The Combat report replays any battles that have occurred since your last turn, important when you're playing against a live opponent (as opposed to the computer). The Production Map shows which cities are producing which units. The Status screen displays how many cities you've captured, how many exist, what percentage of the world you've explored, and how many of each unit are under construction or in combat, and how many have been destroyed. Finally, the Ship report lists your ships, their locations, and their damage status.

*Empire* begins with a decision to load a map from disk or create one at random. The package includes a world-creation system, in which you can guide the world's construction to whatever degree you wish. You can build it square by square (a lengthy process), or you can create land masses and then sprinkle cities throughout automatically. Each map can be saved to disk, and you can ex-

change worlds with other owners of the game.

Of course, creating your own world and then playing it destroys the suspense (and enjoyment) of exploring a new world, but the random-creation feature keeps the game fresh.

There's more. The game can be played against one or two opponents, in any combination of human and computer. A Play-by-Mail option saves the program at the end of every turn, at which time you mail the disk or send it by modem to your opponent. Impressively, Amiga and Atari ST files are compatible, so if your friend has an ST and a modem, you can still play the game by telephone.

Further evidence of user friendliness exists in *Empire's* copy protection. The disk is unprotected, but to play you must find a specific word in the manual. For many games, this is tedious; for *Empire*, the process requires looking only for page and line numbers, since all words are the first ones on the line. If you make three mistakes, the program assumes you are working from a pirated copy, and, even here, user friendliness surfaces.

In a requester box titled "Such a Deal," the program asks if you wish to play 50 turns of the game and then decide if you want to order your own copy. For a hobbyist tired of being penalized for actually buying products, this is a welcome variation of attitude.

Finally, the game comes with a warning: "This program is highly addictive. Considerable, otherwise productive, time might be lost. Play only during vacations." By now, of course, I'm used to box hype claiming addictiveness, but this one is fairly accurate. I have never played a game in which making just one more move is so utterly compelling. Turns go so quickly and the interface is so well designed that hours can pass before you realize it. So take the warning to heart, but don't pass up *Empire* because of it. This is an excellent strategic game, one of the few that should be in everyone's software library.

—Neil Randall

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## Cosmic Relief: Prof. Renegade to the Rescue

**"P**rofessor Renegade, I presume?" I presume I'll be able to say that someday. Well, at least

I hope so. You see, Professor Renegade is missing, and word has it that he's a hard man to find.

*Cosmic Relief: Prof. Renegade to the Rescue* places you in the shoes of Fortisque Smythe, British explorer. Or Henri Beaucoup, explorer extraordinaire. Or Herr Hrushe, Wu Pong, or Big John Caine. No matter which hat you choose to wear, the story is about the same: Your job is to locate the mysterious Professor Renegade, the inventor of the Swiss Army Farm Animal (a combination cow, goat, and chicken) and frustrated doomsayer.

Here's the scoop. Forty years ago, the distinguished professor predicted that an asteroid was rocketing toward



The hunt is on. Will anyone find Professor Renegade in time?

Earth. Only prompt action would prevent a catastrophe. Needless to say, this didn't go well with the public or the professor's colleagues, who promptly laughed him into hiding.

Well, it turns out that the old pro-

fessor was absolutely right. Forty years later, the asteroid has been spotted, and only the professor knows how to save the world. The hunt is on. Will anyone find Professor Renegade in time?

The professor is thought to be in Tibet. In case you haven't heard, Tibet is a dangerous land, full of stone snakes, flying reptiles, and rainstorms capable of drowning a mere mortal.

Tibet isn't all bad, though. There seem to be just enough magical items scattered about to help you negotiate your way. You'll have to use your noggin, though, to figure out what to do with what.

*Cosmic Relief* is refreshingly unique. It's a delightful world where you can be an old-time adventurer in this day of the final frontier. The game has something that seems to be a rare commodity in recent computer games—atmosphere. It's a story you can really get into. It's a bit bizarre, true, but charmingly so.

It's not easy to design an Amiga computer game. Amiga users expect high-quality graphics and sound. While *Cosmic Relief* doesn't push the limits of the Amiga, its graphics, sound, and music succeed at their most important job—complementing the game. *Cosmic Relief* is chock-full of interesting animation and audio effects. In sum, there's nothing to complain about in the audio-visual

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category—no flicker or audible clicks to detract from the game.

As for playability, I have mixed feelings. There are some things I applaud. For instance, there's no mad arcade-rush feel to the game. You can stand still (in most places, that is) and think about what you're going to do and not get clobbered. After a few games, you know which places are dangerous.

*The asteroid has been spotted. Only the professor can save the world.*

The game is played in colorful and exciting terrain. There are pits to avoid, clouds to investigate, caves to explore. The map for the game is quite large—easily over a dozen screen's worth.

But Tibet is too capricious a place for me. I know where the dangerous places are, but that doesn't help me much. Here's an example: I stand in front of a rock that I know (from previous experience) houses a rock snake. Periodically, the snake leaps out to do away with any unfortunate passerby. Its actions seem totally random. Even if I wait for the snake to leap out and back before I move, it still can (and often does) catch me as I try to run by. Sure, rock snakes can't be counted on to be predictable, but don't these things ever sleep?

When I play over and over without making any mistakes, but still die four times each game without making any progress, I tend to get frustrated. Because of its many good points, however, I rate *Cosmic Relief* as Good Plus. It could have been Great.

—Rhett Anderson

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## Carrier Command

**T**he good news: The documentation writers at Rainbird have decided not to include an introductory novelette with this game. The bad news: You may wish you'd spent your money on a few good paperback thrillers.

It's not that *Carrier Command* is a bad game; it's actually a pretty good one. It's just that the authors have thrown in so much, making the story so complex that you may tire of the game long before you've mastered it.

Rainbird has replaced the usual documentation novelette with eight pages of text and an audio cassette. In brief, a newly formed group of islands in the Southern Ocean holds the key to solving the world's energy crisis. To exploit this potential, two aircraft car-

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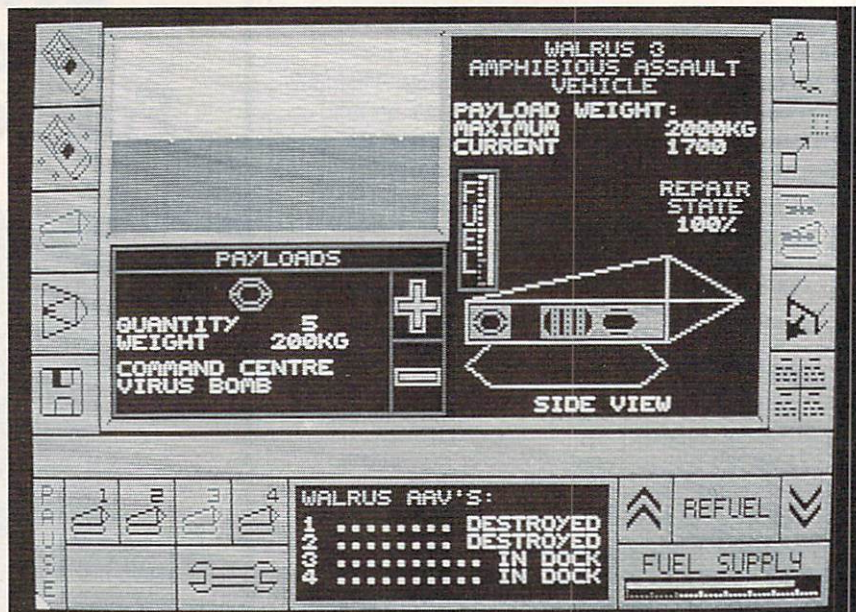


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On Resource Islands, the Automatic Centre Builders mine raw materials and build fuel dumps; on Factory Islands, they refine fuel and construct warehouses; on Defence Islands, they construct defensive stations; and on Stockpile Islands, they store weapons, fuel, and other materiel. (That's right, *centre* and *materiel*—British games use British spellings.)

The fly in the ointment? A terrorist group has subverted one of the aircraft carriers. And now you find yourself in a race to see who'll gain control of the islands.

If the strategy of placing Command Centre Builders reminds you of the board game Risk, you're not alone. Take away the fancy weapons and pretentious prose and you have a game in which you try to occupy more of the board than your opponent does. There's nothing wrong with this; it's an ancient and honorable computer-game tradition. *Carrier Command*



Commanding a carrier isn't easy; you've got to master strategy as well as tactics.

may even be easier to understand because of it.

As you may have guessed, you'll have to plan carefully before you place your Command Centres on the differ-

ent islands. You'll need to balance the various functions in order to create a productive system, and you'll have to devote a certain number of islands to nonproductive defense. Since the game

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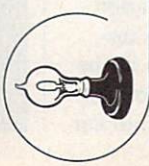
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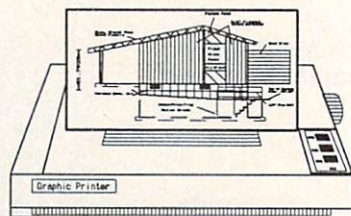
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requires decisions similar to those made by political and economic leaders in the real world, you'll find plenty of thought-provoking challenges.

(With the islands producing and stockpiling only what's necessary to keep the aircraft carriers going, it would seem you could just scrap the carriers and declare peace. But then there would be no need for the game.)

The game breaks down when it attempts to match the physical challenges of geopolitics—at least for me. The carrier you command carries drone aircraft, amphibious assault vehicles, and manned aircraft, and it's armed with a powerful laser cannon. You can simultaneously control up to four each of the amphibious and air vehicles, but you'll have your hands full with only one or two.

In keeping with the Amiga interface, icons crowd both sides of the play screen as well as the bottom. With 50 percent of the screen devoted to control and selection, *Carrier Command* quickly becomes unwieldy. Sometimes a selection leads to another

screen with a whole new set of icons and commands. With so many commands, even a quick-reference card would be of little help.

For example, before launching, an aircraft must first be selected, armed, fueled, and elevated to the flight deck. At the launch, you'll need to switch from mouse to joystick control—but while you're using the joystick, you can no longer access the icons. If you want to do anything else, you'll have to switch control modes again.

*Ever play the board game Risk? Then you've got a clue about Carrier Command's strategy.*

With just one vehicle, the controls aren't too confusing and may even add a note of realism to the game. But when they're multiplied by four aircraft, four amphibious vehicles, several drones, and the carrier itself, I have to wonder who will care enough to bother.

I also wonder about the science-fiction aspect of these kinds of games. I think too many programmers take the easy way out. Rather than program the actual characteristics of a laser-guided bomb, they give you a laser cannon and make up characteristics as they go along. Rather than simulate real aircraft, they give you something called the Manta of *Carrier Command*, tell you it's a terrific futuristic fighter aircraft, and hope you accept it. Rather than work with real geopolitical adventures, they find it easier to invent stories such as *Carrier Command*. Taking all the easy paths results in something nonpurists call science fiction; to me it seems to be a cop-out.

There's certainly room in the computer world for a game based on the command of an aircraft carrier. It could cut corners to make the controls easier to use without sacrificing gameplay, realism, or strategy. And considering that the target of my criticism is Rainbird of Britain, I wonder whether the programmers considered setting *Carrier Command* in the Falkland Is-

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lands conflict rather than in a fictional world.

It's also hard to care about saving a world whose only connection to your own is the energy crisis. Good science fiction is built on many subtle links between our own experience and an imagined world. Not having these links, *Carrier Command* doesn't pull us into its world or make us care about its survival.

Now that that's out of my system, I'll repeat that *Carrier Command* is not a bad game. It's a complex game, the graphics are 3-D solids, the sound is good, and the frame rate is fast. I suppose my main complaint is that it's a shame to waste this talent on a *so what?* scenario—rather like hiring Michelangelo to paint your kitchen.

*Carrier Command* for the Amiga requires 512K, a single disk drive, and a joystick.

In closing, I'll simply mention that the best strategy for defeating the game's bad guys involves dropping Remote Programming Pods on enemy Command Centres. These pods hold a

computer virus that can modify the Command Centre's operating system—a timely scenario that I hope won't worry virus-conscious Amiga users too much.

—Ervin Bobo

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## TV Sports: Football

If you're a Sunday afternoon football nut, you'll love *TV Sports: Football*. This game has bone-crunching tackles, diving catches, and cheering fans, just like pro games do. You'll be treated to a halftime show, cheerleaders, a marching band, and a sports commentator. In fact, you may

like this better than real TV football—and not just because it's free of commercial interruptions.

Cinemaware set out to duplicate on disk every possible aspect of professional football, and, to an impressive extent, the company achieved its goal.

To begin with, the game uses a league structure similar to the NFL's. The Cinemaware Football League (CWFL) consists of 28 professional football teams. Each may be owned and operated by a human or by the computer. Even the computer-owned teams exhibit personality, with some teams stronger in running, others possessing solid passing skills, and so on.

At the beginning of each season, owners select and edit their teams. You can change the team name, owner, player names, and player ratings. When you get your team built the way you want it, you can save it to disk. The large number of teams the game is able to manage means that you're able to play against as many as 27 of your friends. This is another indica-

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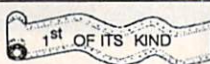
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tion that software entertainment is becoming a group activity, a development that's long overdue.

Actually you can have more than 28 people involved. A Teammates option lets two people play together on the same team. One takes the role of defensive captain, while the other is the offensive captain. The quarterback can target either a teammate or a computer-controlled receiver for a pass. Teamwork is another innovation for which Cinemaware should be commended.

Once the management details are settled, play begins. Play takes several forms, each of which is an option you can choose. *TV Sports: Football* allows you to play exhibition games, play CWFL games, or just practice with your team. Exhibition games are practice or preseason games and can be played without going through the team-manager phase. Select the team you want to control and the team you want to play against. This type of game is ideal if you just want to play a quick scrimmage or get revenge on a

team that slaughtered you earlier in the season. Exhibition games aren't real, so the scores and stats will not be saved to disk.

League games require that you play teams according to a fixed schedule. You'll play 16 regular-season games. If you're lucky, you may make it to the playoffs or even the championship. Scores and team statistics for each game are recorded in the CWFL statistics.

A practice mode is provided to help you increase your team's skills—and your own. Your team is placed on the field, facing a defensive line. Your quarterback doesn't have to worry about pass coverage or blitzing. You're free to call any of your offensive plays. This mode is especially good for learning your receivers' pass routes, warming up before games, or becoming familiar with the passing interface.

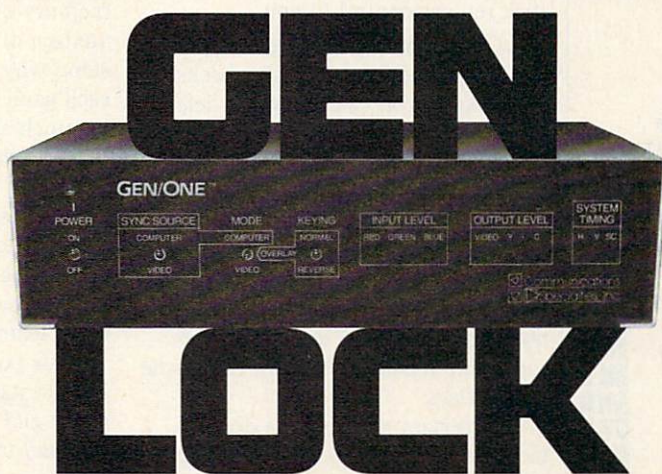
The passing interface for this game is the best of any football game on the market. In fact, you don't really have to learn it because it's so simple and instinctive. After the snap, you're

free to move the quarterback anywhere you choose. Pull back on the stick to drop back into the pocket. When the quarterback is stationary, he can be directed to throw a pass. By moving the joystick left and right, you can line up the quarterback to face any direction. Press and hold the fire button to set up the pass. A small *x* travels across field in the direction the quarterback is facing. To pass, just release the button when the *x* is near a receiver. Once the ball is in the air, you'll control the receiver nearest the ball. If the quarterback makes a bad pass, you can direct your receiver to dive for the ball.

It's nice to be able to send any type of pass you want to any receiver who's available or might become free. For once, a software designer has gone after the feel of the real game rather than simply letting players designate a single receiver and then letting fly.

This sort of attention to detail is evident throughout the game. The game begins with a strikingly animated coin toss. The visiting team makes

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the initial call of heads or tails, and the team that wins the toss chooses to kick or to receive. After the receiving team returns the ball, the play-calling screen appears. You have 24 offensive and defensive plays to choose from. Selections are made with the joystick.

On offense, you control an 11-player team. At the start of each play, you control the quarterback. Before the snap, you must decide if you're going to pass or run the ball. Running plays require that you press the button for the snap, while passing plays require that you pull back on the joystick.

When executing running plays, you initially control the quarterback. After the pitchout or handoff, you take control of the running back. On some plays, the offensive line will create holes for you in the defense. The running back doesn't have to follow the play that was called; you can make the player run anywhere on the field.

An interesting touch is what I call the computerized option. After the snap on a running play, you can opt to let the computer finish the play. Or you can let the machine manage only to a certain point: A touch of the joystick returns control to you.

On defense, the player may control any of the four defensive backs or linebackers. You can move the defense around and decide which player, if any, will blitz the quarterback. You'll have to learn to read the offensive formations, too. You must know when to blitz and when to cover the pass plays. Timing is an important part of the defense also. When blitzing, you must not cross the line of scrimmage too soon. The refs love to throw their little yellow flags.

In certain situations, a diving tackle is necessary to catch a speedy running back or receiver. A press of the button will make your defensive back go airborne to nab the ball carrier. The only disadvantage to this is that it takes time to get back on your feet when you miss.

Thoughtfulness of design and ease of gameplay are more than fully matched by animation, color, and sound. Cinemaware has pushed the Amiga this time. The use of TV in the game's title is no accident: This looks like television sports, from the vivid green of the field to the color of the players' uniforms to the refs' yellow

flags. You can see the coaches' faces, get a closeup of network color commentators, and almost feel the crispness in the air. It's a realistically noisy game, too, with audible grunts and moans of the players.

*TV Sports: Football* includes a lot of extras, too. There's a halftime show complete with cheerleaders and a marching band. Keep your eyes peeled for celebrity guests, some of whom you may recognize from other Cinemaware products or from the world of real sports. Coaches and commentators, too, bear more than a passing resemblance to well-known figures.

Cinemaware has missed only a few tricks. An instant-replay option would be a valuable feature, and one that could be added easily. Player injuries would add another level of realism to this already realistic game. While asking for onscreen fights is probably too much, I'd like to see pass interference and a wider array of penalties.

Another feature that's missing is an awareness of expanded Amigas. Every time you score, you have to swap disks. Players with expanded memory ought to be able to take advantage of it. Also, it's hard to understand why you have to reboot after each game; a play-again option would be much appreciated.

But that's about all that's missing. This is an exceptionally rich package. During league play, for example, the other 26 teams are "playing" even as your game unfolds. Since it's TV sports, you're kept informed of the other teams' results and standings at various points during your game. League standings and stats are shown at the end of the game; *TV Sports: Football* tracks not only team standings, but also stats for every player in the CWFL.

This is the finest sports software I've ever seen. Totally playable as a straightforward, arcade-style football game, it also functions beautifully as a statistical program. Cinemaware has, in one stroke, set the standard by which I'll measure sports games from now on.

—Troy Tucker

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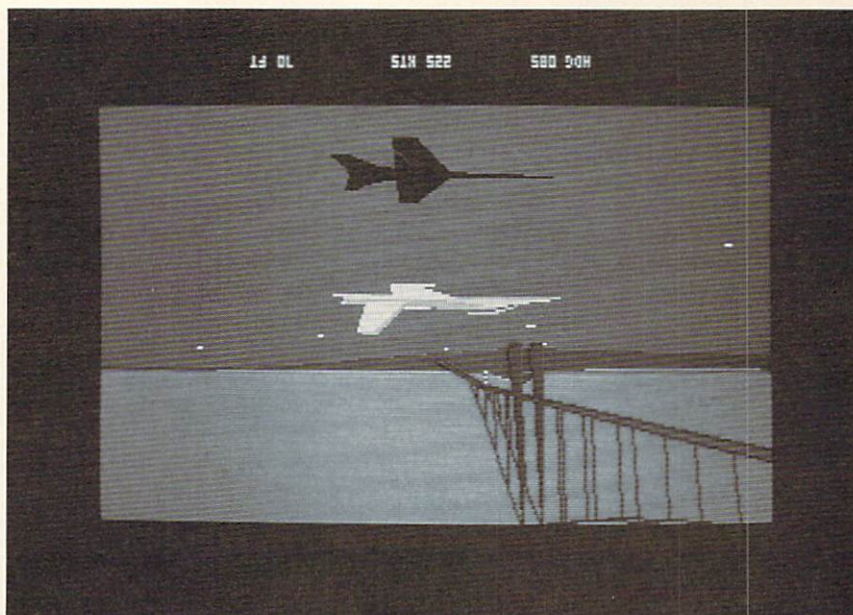


## F/A-18 Interceptor

**A**ccording to *F/A-18 Interceptor* documentation, designer Robert Dinnerman set out to create the home computer equivalent of an Evans-Sutherland flight simulator, the kind used by the Department of Defense. My guess is that he has come as close as anyone will in the near future, and he has created what is probably the best combat flight simulator ever.

It's important to note that building an accurate simulator is not enough. Assuming you design an accurate control panel and have a frame rate fast enough to give the sensation of speed, there are still missions and the overall approach to the action to consider.

Case in point: *Falcon* for the IBM PC and Macintosh computers recently won several honors from the Software



Interceptor is ready for you to kick the tires and light the fires—then hang on!

Publishers Association and deserved them all. While I have high praise for the authenticity of the control-panel display and the fast frame rate—among other features—I must admit I

found it unexciting because I never once found a hostile aircraft.

Likewise, *Jet* for the Amiga gets high praise. It has cockpit authenticity if not accuracy, missions against air

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and ground targets, a fast frame rate, and the challenge of landing on an aircraft carrier. (Any fool can launch from a carrier.) Yet the missions are somewhat existential: Launch from the carrier, fly a heading of 00, and soon three enemy aircraft will come in from your left. Shoot them down—if you can—and that's the end of the story.

*Jet* provides the fun that's missing

from *Falcon* and is a terrific experience. My most frightening moment at a computer came when I started to land at what I thought was a friendly airfield only to see two MiGs leaving the runway to come after me.

But, to be really good, a combat flight simulator must combine a proper mix of authenticity, movement, convincing graphics, and what might

be called the *gaming experience*. In its approach, I think *F/A-18 Interceptor* accomplishes this better than anything else I've ever seen.

To better appreciate how it works, we'll go step by step through a typical mission as played on an Amiga with one or more megabytes of RAM.

Your first view is of a map of the San Francisco Bay area, and there may be aircraft indicated on it—white for friendlies, red for hostiles. A message overlays the map and informs you of the war situation as of September 1, 1994, requests a security clearance code, and then gives the details of your mission.

Now the viewpoint changes. The grid lines disappear from the map, and you're looking at the Bay area from what might be a swiftly descending helicopter. This movie technique quickly sets *Interceptor* apart from anything else I've seen. The camera's focus sharpens, a black speck appears and then gradually assumes the shape of an aircraft carrier. Closer still, we see an F/A-18 Hornet waiting on the catapult and hear the lonely sound of the sea wind.

The camera rests at aircraft level, then pans until the craft is in profile and the pilot's white helmet is visible in the cockpit.

A quick cut and you find yourself in the cockpit, looking down the deck of the carrier. Before you is an instrument panel with the usual readouts of fuel, weaponry, radar, and the like. Superimposed on the wind screen is a heads-up display (HUD) showing speed, altitude, and compass heading.

When cleared for takeoff, punch F9 to bring your engines to 90 percent power; in a few seconds, you begin moving down the deck with the whine of the engines building to a pulsing roar. At about 140 knots, you're at the end of the deck—time to pull back on the joystick to get your nose in the air. At this point, the Hornet feels sluggish, but after you raise your landing gear, you'll see an immediate increase in speed and responsiveness.

In this mission, Air Force One has been hit by a missile, and it's limping toward San Francisco International airport. Its escort aircraft have been destroyed, and MiGs are still in the area. Your mission is to find and terminate the MiGs. The radar screen

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in the center of your console shows several blips. On the color radar, friendlies are blue, hostiles are red, and unknowns are white.

Turn on your targeting device, and a circle appears on the HUD. Targets close enough for identification are identified below the radar screen. A blip goes from white to red, and the legend, which supplies course, altitude, and speed, identifies it as a MiG-29. Although it is within the *cone of vulnerability* indicated on the radar, it is not dead ahead, so you must move to bring it in line. Punch F10 to bring yourself up to full power; then punch it again to kick in the afterburner.

At 700 knots, you get a great surprise. The nose of your craft jerks slightly, and you hear the faraway sound of a sonic boom. You've gone supersonic. *Interceptor* is the first simulator to let you know it in a convincing way.

Closer to the MiG, you throttle back and arm your weapons. Now you see the MiG as a black dot racing through the sky. Your targeting HUD

suddenly comes alive, and a square outline fixes on the MiG while a smaller diamond moves into the square. When the devices are aligned, press the fire button and watch an Aim-9 missile leap from your wing. Its fiery exhaust shows clearly as it heads for the MiG. A harsh tone warns you that a missile has been fired at you, so you release a flare and radar chaff and then try to break quickly away. If your lock-on was good, you'll hear an explosion even though you may already be turned away to chase the other bogey.

Even if you've cleared the skies of MiGs, your mission isn't over until you suddenly see a new screen showing an airliner and the message that Air Force One has safely landed at SFI.

And, although successful, your mission isn't complete until you land as directed—in most cases on the aircraft carrier. Line up as best as you can, keeping the control tower on the right. Throttle back to 175 knots and then lower your landing gear and deploy the arrestor hook. You'll have to

touch down in advance of the four restraining cables in order to be arrested safely. If you feel like you're missing, press F10, lift off, and make another pass.

When you've completed a mission by accomplishing a safe landing, you'll be informed by superimposed type on the screen, and the mission statistics will be written to a log on the disk. Statistics include number of missions flown and number completed, AMRAMMs fired and AMRAMMs hitting a target, Sidewinders fired/hitting, cannon rounds fired/hitting, total flight time, number of crashes, and number of missile hits you've taken.

Through it all, the landscape and seascape outside your windscreen has changed with a fluidity so real that you may well feel exhausted by the time you touch down.

That isn't all. There are other missions that require varying degrees of skill, such as trying to force down two F-16s stolen by terrorists and being escorted by two MiG-29s, shooting down a cruise missile while trying to

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avoid MiGs in the area, identifying unknowns in the area, and performing a search-and-rescue mission.

Before you can fly any of these missions, you must first qualify by taking off from and landing on the aircraft carrier. If you're one of those who has trouble lining up for an approach on such a tiny target, try it my way.

Launch from the carrier and, when you're up to speed, begin an inside loop. Instead of completing the loop, however, stop when you are inverted in a slight nose-up attitude. Continue to fly in this manner until you reach 14,000 feet and you can see the carrier well behind you. Now complete the loop, which costs you altitude, and—if you've kept your joystick steady—you'll need only tweak it a little to be perfectly aligned. The remainder of the approach is up to you.



To earn your qualifying wings, you'll want to watch the demo and then go to the training mode. In training mode, you follow a leader aircraft through some basic aircraft maneuvers.

When you feel you have these down pat, you can go to advanced training. Here, it's possible to toggle smoke on and off for the leader plane to make it easier to follow his maneuvers. You'll learn aileron rolls, Immelmans, the split-S, and other combat techniques that may keep you alive a bit longer.

There is also a free-flight mode that allows you to cruise the skies of San Francisco without engaging in combat. You'll probably find this mode useful for practice. In this, as in the first mission, you'll have the option of flying an F-16 Falcon from a land base. I suppose this routine is here to help build confidence before attempting a carrier landing. The F-16 is not used in combat missions, unless you decide to take out the Golden Gate Bridge with a Sidewinder missile.

To be complete and to meet the high standards SubLogic set long ago for flight simulators of all kinds, *Interceptor* also features multiple views out the wind screen and multiple views from outside the aircraft. It's interesting to note that the sound of your engines changes when you're on the outside looking in, just as it would be in real life. It's this attention to detail that makes *Interceptor* the standout program that it is.

Details are sparser in the 3-D scenery, though there is still enough to give you some extra excitement. In choosing San Francisco as the combat theatre, Sub Logic has made you privy to the challenge of flying beneath the Golden Gate and Oakland Bay bridges, as well as making tight, buzzing turns around the Transamerica building.

All such graphics, whether in the air or on the ground, are solid block objects as opposed to wire-frame, and perhaps the real wonder is that the frame rate can be kept so high. The same effects appear in SubLogic's *Jet*, of course, so I credit the Amiga for making possible the best flight simulators ever.

My one quarrel with *Interceptor* is with the protection code. The disk itself may be copied, but included with

the documentation is what used to be called a circular computer. When asked for a security code at the beginning of a mission, you spin the circular dials to align three numbers and punch the resulting fourth number into the computer. Nothing is wrong with this, and I applaud a protection routine that allows me to make a copy of the disk for myself and one for my son so we can keep separate logs. You must enter such a code each time you begin a new mission, but I think once per session would have been enough. On the other hand, the designers may feel the procedure adds to the sense of urgency conveyed with each mission. It's really only a minor annoyance.

Although the graphics and sound are among the best I've ever seen, there is a certain blockiness that keeps the lines of the F/A-18 from being as sleek as in real life. Yet it looks as good as anything in any other simulator and better than most.

While the program will run on a 512K Amiga, certain unspecified sounds will not be heard. Watching the Workbench free-RAM line as the simulation loads on my expanded Amiga shows over 700K being loaded. There is never a pause for disk access, and perhaps the lack of certain sounds is what makes the program RAM-resident on a 512K machine.

Documentation is slight, as it should be for those who like to kick the tires and light the fires. Control is through both keyboard and joystick, and some pains have been taken to make the keyboard commands easy to learn. Quick-reference cards usually aren't quick when you're in combat. The solution here was to use initial letters—*M* for map, *F* for flare, *C* for chaff, *T* for targetting device, and so on. You should find it almost instinctive to use.

Memory requirements begin at 512K, but I recommend one megabyte or more. I'd strongly suggest you invest a few dollars in a small stereo amplifier (mine was about \$50.00 at Radio Shack) and a set of stereo headphones.

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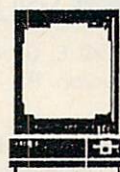
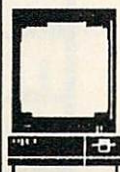
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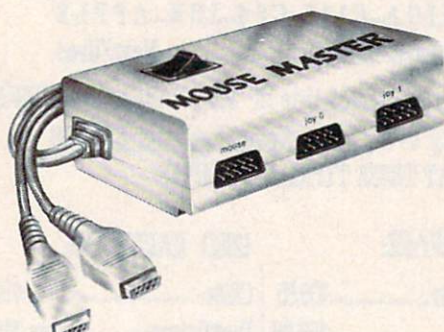
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## Don't Be a Computer Bozo

A few years back, when *hypertext* still referred to a test paper you'd written after drinking too many cups of coffee, a lot of people were concerned about something called *computer literacy*. They were concerned because they'd heard that there was a computer revolution coming, and they didn't want to get stuck on the wrong side of the barricades. Although they weren't sure just what computer literacy was, they figured that a passing familiarity with computers might help them keep their jobs if PCs started showing up around the office.

They also had vague anxieties about their children having to learn about computers in order to survive in the coming Computer Age. Commodore capitalized on these fears by running a TV commercial which suggested that you could save your child the embarrassment of flunking out of college by buying him or her a Commodore 64 (true enough, I imagine, if the curriculum included courses on *Championship Lode Runner*).

Now that the first wave of the computer revolution has come and gone, however, we've had a chance to form some conclusions about what computer literacy really is, and it seems that the really important part is learning the jargon associated with personal computers. It isn't necessary to actually learn how to use PCs—nobody is likely to sit you down at a cocktail party and ask you to set up a spreadsheet. You should, however, learn how to discuss computer matters without making any of the common mistakes which indicate that you don't have the faintest idea what you're talking about. In other words, you needn't be another Einstein just as long as you make sure that you're not a computer Bozo.

At its most basic, avoiding the computer Bozo syndrome means refraining from making comments that show a complete lack of understanding of how computers work. For example, one of the surest ways to tip someone off to your computer naiveté is to refer to software on ROM cartridges or floppy disks as "tapes." This instantly brands you as a consumer who is used to getting entertainment via video- or audio cassettes. One way to cure yourself of this problem is to take apart the medium in question and verify that there is no hidden magnetic tape inside. Or just

remember the word *media*—a fancy term that covers all kinds of storage devices.

Another common mistake is failing to make the distinction between memory capacity and storage capacity. You'll often hear first-time computer shoppers ask questions like "How many K's does it have?," and "How much to add a 20-meg memory?" Having heard people talk about 512K memory and 880K disk drives, they figure that K's are K's. They don't realize that asking how many K's a

computer has is like asking how many quarts a car uses—do you mean quarts of oil, quarts of coolant, quarts of brake fluid, quarts of gasoline, or quarts of windshield-washer fluid? On the Amiga, it's easy to distinguish between memory and disk storage. With memory, you lose your information when the cat pulls the power cord out of the wall socket. With disk storage, you lose your information when you pull the disk out of the drive before the red light goes off.

A large portion of computer jargon is comprised of acronyms and initials, and it's important to learn to pronounce them correctly. For example, the letters *OS* stand for *Operating System*, and are pronounced *oh ess*. But the letters *DOS*, which stand for *Disk Operating System*, are pronounced *doss* (rhymes with *boss*). It's considered only a minor gaffe to pronounce this word *dee oh ess*. It is a major blunder, however, to mispronounce the word and use phrases like *Amiga-dose* or *PC-doze* (the latter purportedly uttered by Loretta Swit in one of IBM's less memorable PS/2 commercials).

It can be just as bad to use an acronym when everybody else uses the initials. For example, only a real novice calls the Amiga's Command Line Interpreter the *kly* or *sly* or *klee*, instead of the *see ell eye*. Using an acronym instead of the initials in this case can lead to blunders such as referring to the product *CLImate* as *climate* or even *slime-ate*.

Of course, you aren't always safe committing one way or the other. Take, for example, the case of Electrical Erasable Programmable Read Only Memory, which is known as *ee-ee-prom*, or the portion of MS-DOS known as the *BDOS* (*bee-doss*). Trying to figure out how to pronounce an acronym by yourself can be a tricky and danger-

"For a short while, Apple tried to get people to say sexy instead of scuzzy."





ous business. I know one confused fellow who took a look at the letters *II* on the end of ASCII (American Standard Code for Information Interchange) and concluded that it was pronounced *askey 2* instead of just *askey*. He had probably had a traumatic experience with an Apple II in elementary school which left him scarred for life.

As you may have figured out by now, there's not a whole lot of logic behind the pronunciation of computer acronyms. The correct way to pronounce a computer term is determined strictly on the basis of how everyone else says it. For example, when the Small Computer System Interface standard was first established, it was used mostly by hardware hackers who were putting together their own computer systems, and was universally referred to as the *scuzzy* bus. Years later, when Apple adopted the SCSI standard for the Macintosh, some marketing types within the company were appalled by the thought of having to refer to a part of their computer as *scuzzy*. For a short while, they tried to get people to say *sexy* instead of *scuzzy*, an attempt that met with some derision on the part of those who knew a male connector from a female one. About the best Apple could do was to use the initials, *ess see ess eye*.

Although it's not always necessary to know exactly what an acronym stands for, it can help you to avoid mistakes in usage. For example, the word *WYSIWYG* (pronounced *wizzy-wig*) is often used, and misused, in connection with word processors and publishing programs. But how many know where this term originated? It

was back in the late sixties, when the popular catch phrases all came from a TV show called "Laugh-In" instead of the computer industry. On that show, a young black comedian named Flip Wilson used to put on a dress and a wig, and utter the immortal words, "What you see is what you get, honey." Although Flip probably wasn't thinking of *Page-Maker* at the time, the computer industry has adopted the phrase to describe a word processor or page-layout program which shows the formatting, type styles, and graphics onscreen just as they will appear when printed out on paper. In fact, the term has become so popular that many people seem to have forgotten what it stands for. I've seen it spelled *WYSIWIG* (What You See Is What I Get?) and even *WISIWYG* (What I Sell Is What You Get?).

There is at least one mistake that Amiga owners are less likely to make than anyone else. You probably won't hear somebody who has just bought a 500 refer to the *Omega* computer, as some IBM and Apple owners do. If you run across one of these unfortunate souls, who obviously can't tell the difference between a watch and a computer, treat them gently. After all, we all make mistakes. And with a little coaching, they too may master some of the more advanced computer topics, such as multitasking.

Sheldon Leemon is a prolific Amiga author, with several books and dozens of articles to his credit. Look for him on an upcoming episode of the popular TV game show "Jeopardy."

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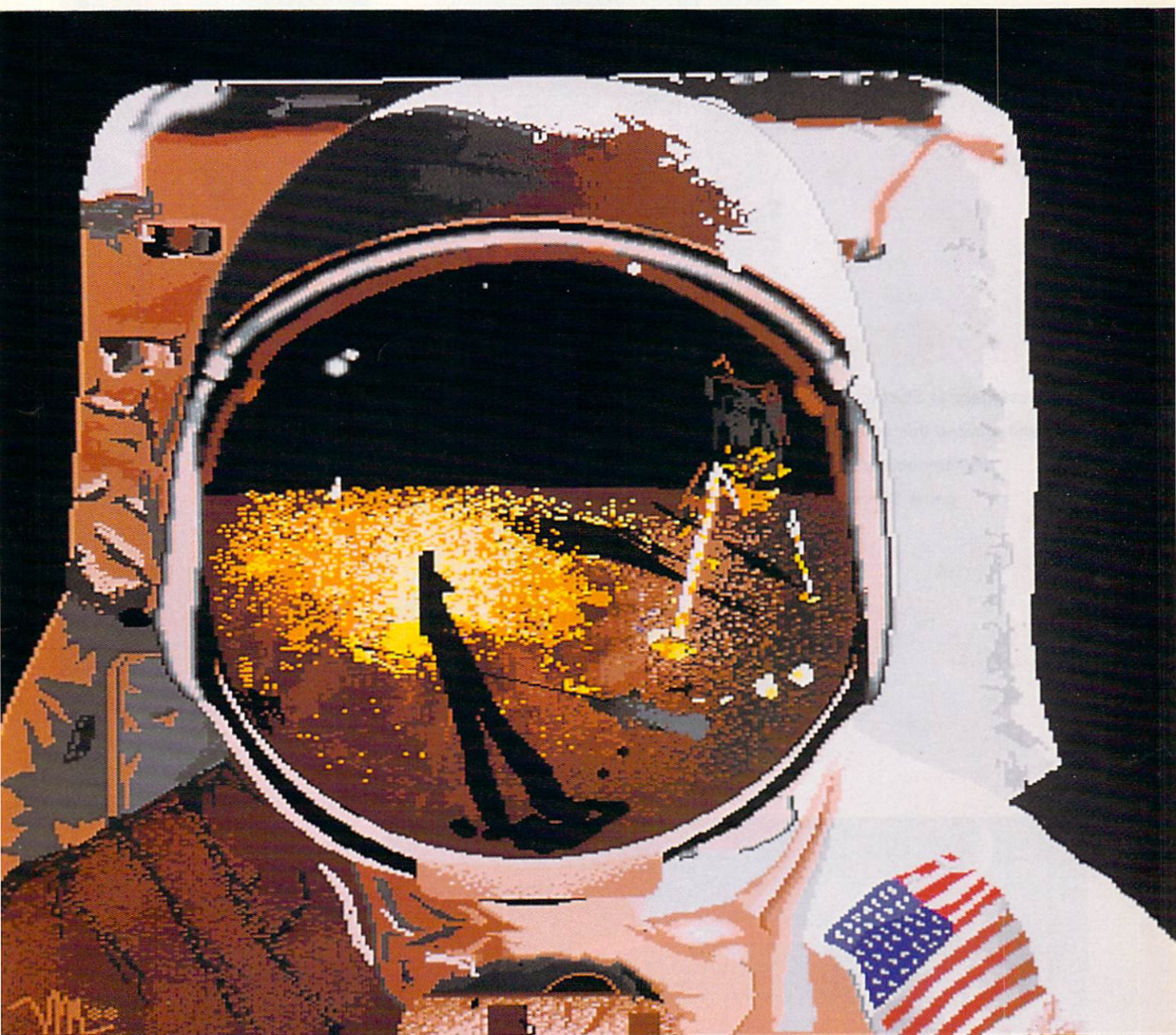
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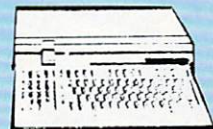
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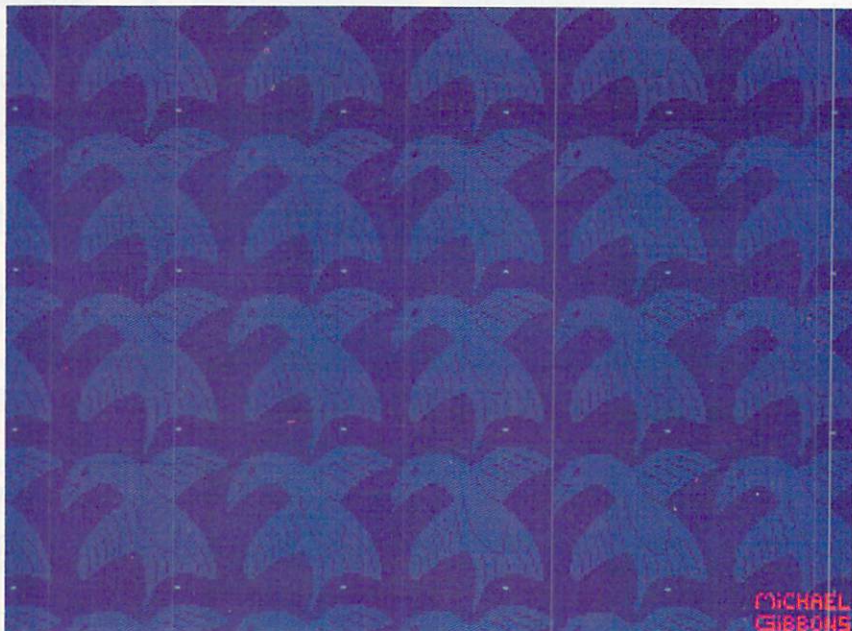


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