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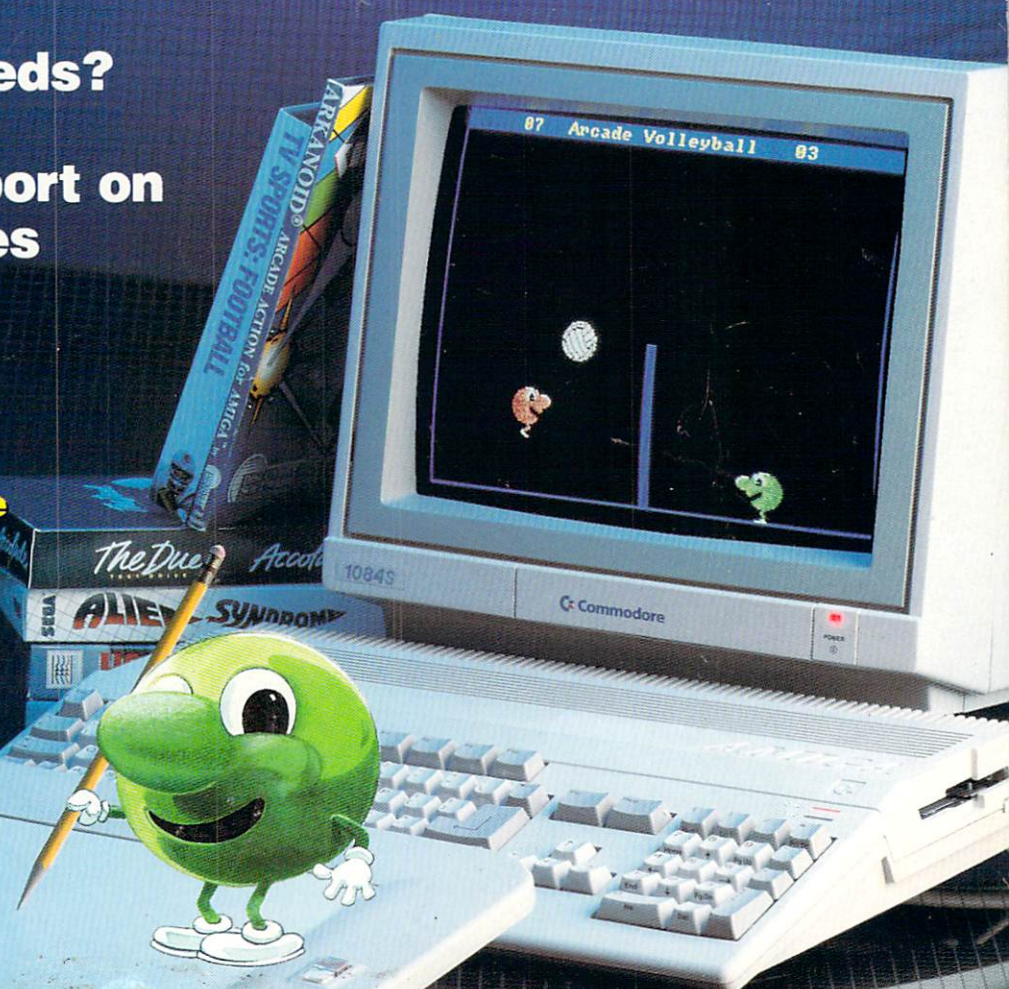
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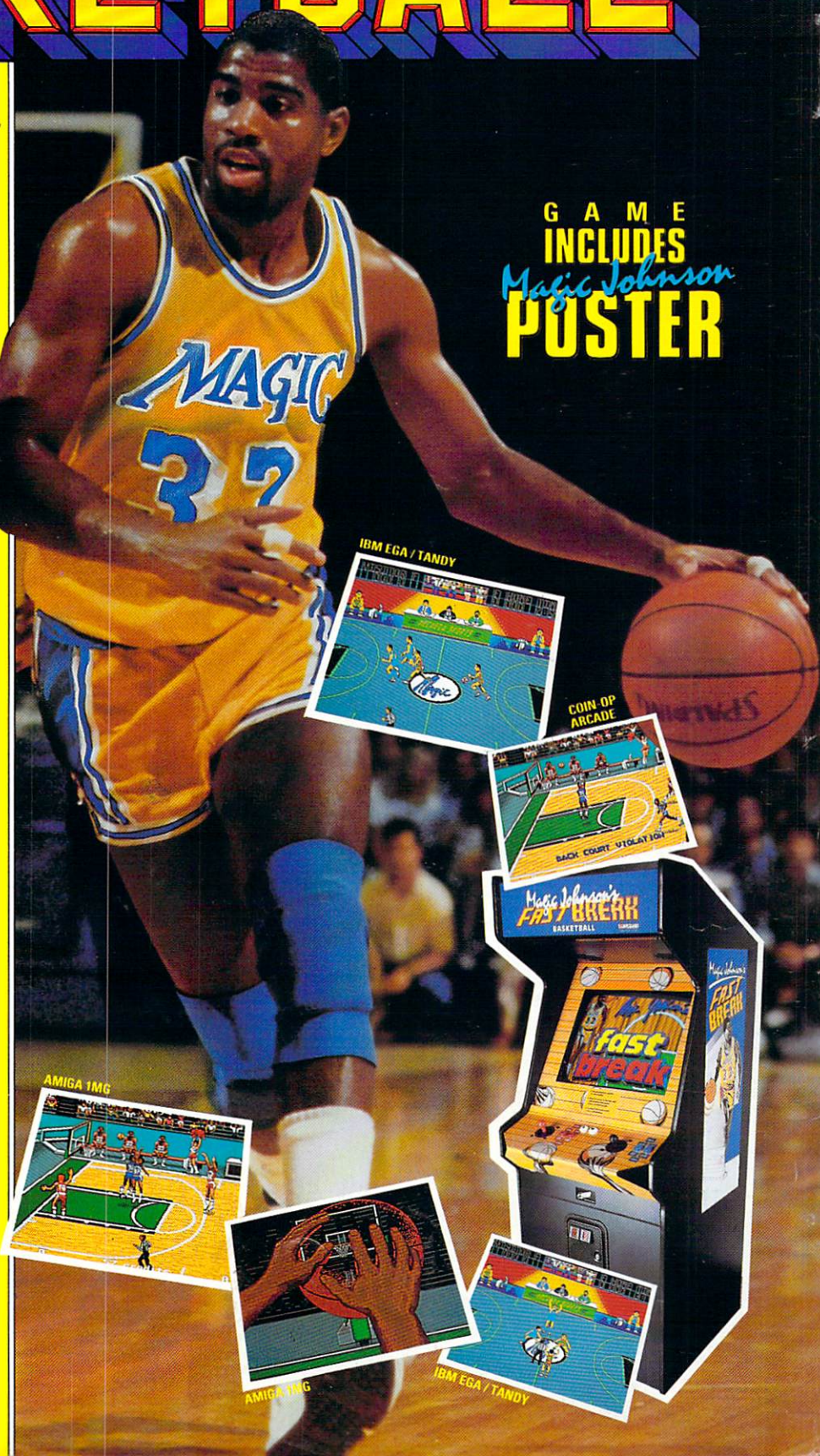


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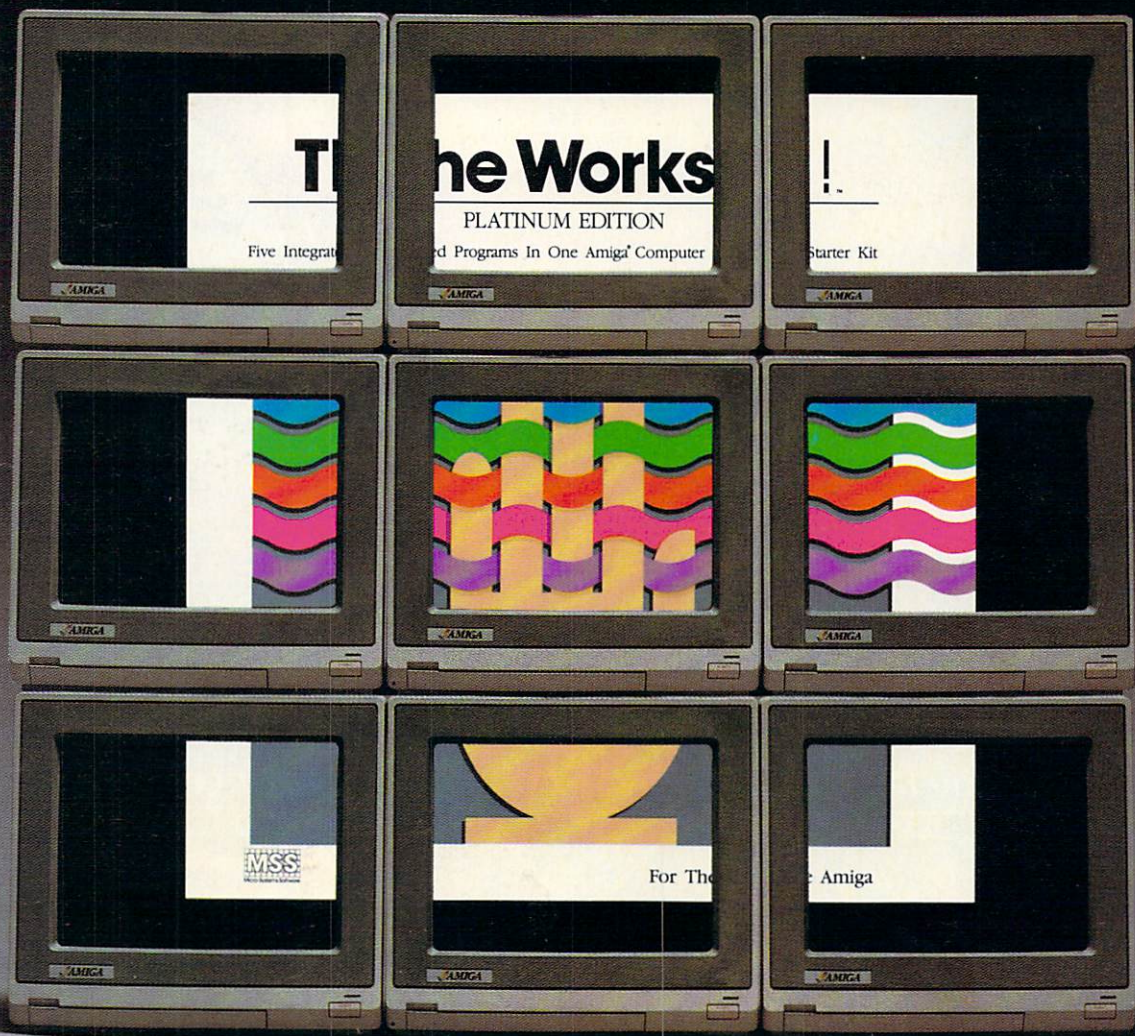
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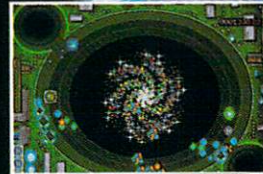
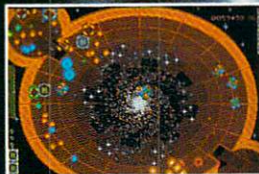
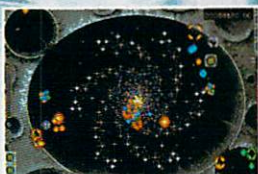


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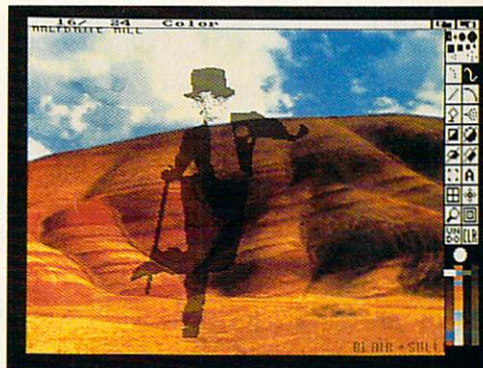
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COMPUTE!'s Amiga Resource (ISSN #1043-0792) is published by COMPUTE! Publications, Inc., ABC Consumer Magazines, Inc., Chilton Company, one of the ABC Publishing Companies, a part of Capital Cities/ABC, Inc., 825 Seventh Ave., New York, NY 10019 USA. Phone (212) 265-8360. Editorial offices are located at 324 West Wendover Ave., Greensboro, NC 27408. Domestic subscriptions: 6 issues, \$15.00; 6 issues, magazine and companion disk, \$59.95. POSTMASTER: Send Form 3579 to COMPUTE!'s Amiga Resource, P.O. Box 3253, Harlan, IA 51537. The design and contents are fully protected by copyright and must not be reproduced in any manner. Copyright ©1989 by COMPUTE! Publications, Inc. All rights reserved. Amiga is a registered trademark of Commodore-Amiga, Inc. AmigaDOS, Kickstart, Intuition, and Workbench are trademarks of Commodore-Amiga, Inc.

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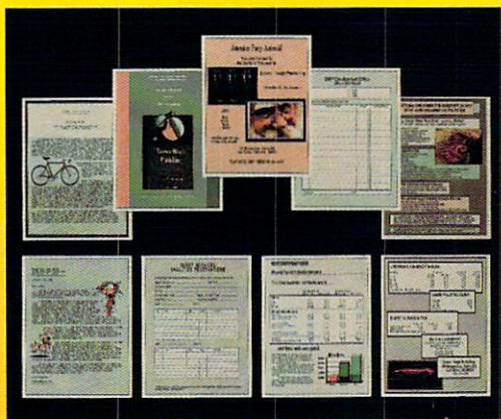
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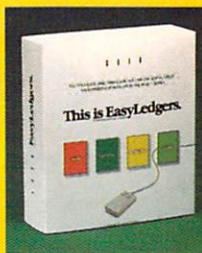
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Perspectives from the Editors

At noon on March 3, a crowd of eager attendees hit the exhibition hall of what was to be the largest Amiga-specific computer show to date: the 1989 New York AmiExpo.

We were there, but our magazines weren't. We had our *Amiga Resource* disks, but our computer monitor, which was to be used to show the disk, was damaged in transit.

So there we were, several well-dressed people standing behind a booth with nothing to offer except free luggage tags—the most original freebie at the show—for your paid subscription to a magazine that hadn't arrived.

Things worked out, however. Seeing as 47th Street Photo was located down the street on 42nd (there's logic in there somewhere, I'm sure), we dashed over and blew \$310 on a brand-new Commodore 1084 stereo monitor. And buyer's guide coordinator Caroline Hanlon—without whom we would all be lost—was quickly reaching her boiling point. The shipping company, in fear of their personal and professional safety, had no alternative but to produce the missing periodicals. The goods arrived at approximately 3:30. Things went pretty much downhill from there.

Our location on the show floor was ideal: at the end of the hall, about as far from the entrance as you can get. Just to the left of us, WordPerfect was running some kind of comedy routine in which show attendees were encouraged to emit animal noises in return for a package of M & M candies. Heckler Dr. Oxide from the neighboring Comp-U-Save booth was only too willing to oblige and often stole the show with his vocal talents.

As is common with trade shows, we had the opportunity to talk to and trade products with the editors of other magazines—*Info*, *Amigo Times*, *Amiga World*, *Robo City News*, *Amiga Plus*, *Y.A.A.M.*, *Amiga Transactor*, and so on. The camaraderie between “competing” publications is encouraging. Oddly, the people at the *Amazing Computing* booth refused to swap magazines and suggested that we purchase their latest issue for \$3.95.

Being in the Big Apple was interesting in itself. COMPUTE!'s dubious choice of lodging placed us in a hotel more than ten blocks away from the Marriott that hosted the convention. As a result, we saw much of the city simply by walking to and from the show. One morning, on the way to the convention hall, associate editor Rhett Anderson engaged in a test of logic with one of the finer sidewalk watch vendors: *How much are the watches? Thirty-five dollars. All of them? Yep. How about this one? That's twenty-five dollars. And this one? That's twenty-five dollars, too. I've only got twenty to spend. OK, twenty. I'll take two.*

The biggest surprise at the show was the return of *Resource* sales rep Susan Annexstein's purse. She had left it sitting on a table, in the convention hall, in New York. “The fact that it came back with all its contents intact is probably due to the fact that most of the show's attendees are from out of town,” speculated noted computer expert and weekend sociologist Sheldon Leemon.

Despite its turbulent beginnings, the show was a success for us. Our magazine was a hit, and we made several new friends in the Amiga community. Even shrewd bargain hunter Rhett Anderson won out in the end—as it turns out, one of his fake Guccis actually keeps time.

—Randy Thompson

Looking ahead...

Animation: It's what the Amiga does better than any other home computer. To drive the point home, we're compiling our most comprehensive buyer's guide yet to animation software.

As usual, our next disk will be chock-full of ready-to-run utilities and games, along with our popular “Art Gallery” images. “On Disk” programs will include “Mosaic,” a strategy game with smooth-scrolling animation; “Macro Keys,” a utility for customizing your function keys; and a high-flying arcade game tentatively titled “Joe Barn Stormer.”

Features editor Keith Ferrell will have a sneak preview of a soon-to-hit-the-states eco-simulation game from England. We'll also be reviewing all the new versions of BASIC available for the Amiga. And, being a resource, we'll have many more mini reviews to keep you up-to-date on the latest software.

Stay tuned—there's a lot to look forward to.

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READERS FEEDBACK

Send questions or comments to Amiga Feedback, *COMPUTE!'s Amiga Resource*, P.O. Box 5406, Greensboro, North Carolina 27403. We regret that, due to the volume of mail received, we cannot respond individually to questions. We reserve the right to edit letters for clarity and length.

Let's Hear It for the 500

Having scanned through the buyer's guides in your new magazine, I was pleasantly surprised by the number of expansion devices available for the Amiga 500. The Amiga 2000 is generally considered to be the most expandable Amiga (and I tend to agree), but the Amiga 500 has more hardware options for two reasons. First, there are many third-party hardware devices designed specifically for it. Second, the expansion chassis that are being produced by Pacific Peripherals and Phoenix allow most 2000 cards (excluding processor and video cards) to be used with the 500.

With a beefier power supply and ample desk space, the 500 can rival any high-end personal computer, and at a bargain price.

Paul Hamm
Brooklyn, NY

There's no doubt about it—the Amiga 500 has come into its own as an expandable computer. If you missed it, be sure to check out Arlan Levitan's feature, "Expanding the 500," in our Summer 1989 issue.

Cornered by a Sprite

I feel ridiculously stupid. I have programmed in assembly language for years on the Commodore 64 using sprites. I now own an Amiga 500 and do most of my programming in assembly language. My problem is that I just can't seem to turn on the sprites.

I have all the ROM Kernel reference manuals, programming guides, and so on. One manual makes note of two system macros—ON-SPRITE and

OFF-SPRITE. These macros are supposedly used to control sprite DMA. I have spent hours trying to access these macros (I can't even find them), with no success. I have also tried writing directly to the DMA register (\$DFF060), also with no success.

Could you shed some light on the subject?

D. Gibbs
Colorado Springs, CO

As many programmers have discovered, programming the Amiga is very different from programming the 64. Don't be discouraged—after a while, you'll find that the Amiga is an excellent machine on which to program.

Without seeing your code, we can't say exactly what the trouble is, but you probably don't need the macros you discussed. If you're programming the Amiga "by the book" (that is, you haven't thrown out the operating system), sprite DMA should already be on; the operating system leaves the sprites on all the time because the mouse pointer is a sprite. Read up on the SimpleSprite structure and the GetSprite, ChangeSprite, MoveSprite, and FreeSprite library calls. Sheldon Leemon's Inside Amiga Graphics, from COMPUTE! Books, has two demonstration programs that use simple sprites—one in C and one in BASIC.

If you're working at the hardware level, you'll need to build a copper list that includes the appropriate commands to turn on sprites. See the hardware manual for details. It's also helpful to examine an Intuition screen in memory to see just how sprites and colors are handled.

Stunt Flying

I have just picked up your first issue. All in all, it's a very fine effort on your part. I have been subscribing to your magazines for the last five years. I was very glad to see you expanding into the Amiga line of computers. I have subscribed to six issues—magazines and disks.

The only fault I could find with your magazine is that you must have something against aircraft simulations. I own both of these programs and it was obvious to me that the photos were upside down.

Thanks in advance for your time and effort. I hope *COMPUTE!'s Amiga Resource* grows as your other publications have.

William Kennedy
Greenwood, NS, Canada

It wasn't just aircraft simulations that we sabotaged—we flipped a few other photos in our spring issue as well. Normally, we get to take a look at the blue lines (quick copies of the film used to print the magazine) to make sure that the photos are in the right places and in the correct orientation. Unfortunately, we ran right up against the deadline when we put that one together. We'll do our best to make sure it doesn't happen again.

More Video Choices

I just picked up your premiere issue and it looks pretty good, but you made a few mistakes. First, your answer to Mike Ross in "Readers Feedback" was only partly correct. You told him that he couldn't get color without an RGB monitor. Actually, there are two products on the market which will let you get color without an RGB monitor.

For \$49.95, you can buy Commodore's 520 Video Adapter, which will give you both color composite output and an RF signal usable with color televisions. For the same price, C-Ltd. sells C-View, which produces color video output which is quite good. True, it is an extra cost, but it's a far cry from the cost of an RGB monitor.

John D. Larkin
Milford, CT

Thanks for the information. While we haven't seen either of the products that you mention, we still believe that any composite output generated by the Amiga will be disappointing when

READERS FEEDBACK

compared to an RGB screen. But for budget-conscious buyers, these products are good news indeed.

A Difference of Opinion

It's about time that you decided to address Amiga users with a magazine, but you're too late if you expect me to subscribe; there are already around a dozen excellent Amiga magazines. I'll have to evaluate each of your issues as it comes out. The first issue passes, but you'd better get your information more up-to-date.

In responding to David Huntz about card trouble, you incorrectly gave the impression that inserting cards was difficult and voided the warranty, and that Commodore has poor quality control. None of this is true. The truth is that like all computers that take cards, proper contact cannot be ensured with the initial insertion because of flux residues. A card should be reinserted three or four times before the user decides that something is wrong. If a card is exceptionally tight, service departments use a special contact lubricant, but there is no reason why an ordinary user shouldn't try it first as long as minimal force is used.

Also, on page 22, under the title "Where to Next?," the fifth paragraph starts, "Compared to the IBM PC and the Apple Macintosh, the Amiga is sorely lacking in productivity and business software. . . ." This is absurdly out-of-date. In the business and productivity area, the Amiga surpassed IBM and the Mac years ago. *Lotus*, *dBase*, *Excel*, *Word*, *Ventura*, or *Page-Maker* can't hold a candle to *Superbase*, *Microfiche Filer*, *Excellence*, *Maxiplan*, or *Professional Page*.

I can't complain too much since this was your first issue, and I am looking forward to buying the disk issue with "Advanced Laser Chess" on it, but please try to keep current.

Kirk L. Augustin
Tigard, OR

We didn't mean to scare users off from installing their own cards. In fact, we

install cards regularly (into all kinds of computers) here at COMPUTE!. But that's likely to be of little consolation to Mr. Huntz, who is having trouble getting his computer repaired. The information we gave was correct and up-to-date. Any damage you might cause installing your own cards is your responsibility. If Commodore tells us differently, we'll pass that information along to our readers. If you're willing to take the risk (albeit minimal) of installing your own cards, go right ahead. But if you're squeamish at all, let your dealer take the responsibility.

And as for the note about business and productivity software, we respectfully disagree. Although productivity software has improved, we still think it's far below the level (in quality and power) of PC and Mac software.

Just Games?

I noticed in your spring issue of *COMPUTE!'s Amiga Resource* that you focused a lot on games. I agree—it's an excellent gaming computer, but that's just a small piece of the pie. Being mainly into computer graphics, I was disappointed that you talked about the Amiga being a game machine or a programmer's dream. I'm 14 years old and I only have one game, and I use my Amiga every day. I hope to see more on 3-D graphics in your magazine, since I am subscribing.

Another note: I've been putting together a magazine on the Amiga for a school project. It just so turns out that before I even knew your magazine existed, I decided to call my letters column "Feedback" and my section on art from well-known Amiga artists "Art Gallery." So much for originality.

David Prothero
Chehalis, WA

We agree: The Amiga isn't just for games. As our magazine grows, you'll see us cover every significant application of Amiga computers, including the graphics applications that you're interested in.

"Feedback" by the way, is a name we've been using since the early days of *COMPUTE!* magazine. And "Art Gallery" just happens to be a straightforward (if rather uninspired) name for an art gallery. ▲

Where to Write

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For programming questions

Programmer's Page

For programming tips

Submissions Reviewer

For "On Disk" program submissions

Amiga Art Gallery

For art and animation submissions

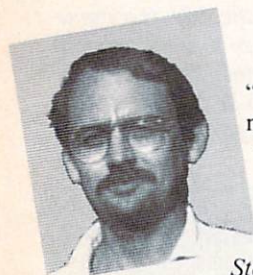
User Group Update

To be included in our regular listing

JUST FOR FUN

Shay Addams

Crash and Burn



"Crash and Burn" Addams, they still call me at flight simulator school—but don't think it was easy earning such a nickname. First I had to crash several thousand Cessnas in *Flight Simulator*, run a fleet of submarines aground in *Red Storm Rising*, and crack up a few dozen

Ferraris in *Formula One*. And just when I thought I'd completely burned out on simulators—that I couldn't possibly crash and burn another one without crashing and burning my monitor by tossing it out the window—along came a pair that captured my attention as effectively as the Afghan rebels did Kabul earlier this year. One reason is that the interfaces of *4 × 4* and *Starglider II* make them far easier to start having fun with right away than is possible with many other simulators (you know, the kind with the 147-page manuals). Both call for only 512K.

In an arcade-style racing game with strategic considerations, *4 × 4* simulates those grueling, off-road truck races that unwind in places like the Baja desert. The basic setup reminds me of the classic *Space Invaders* design: Objects (rocks, logs, and other vehicles rather than enemy spaceships) move from the top of the screen toward your vehicle (a *4 × 4* truck instead of a heavily armed spacecraft) while you move left or right to dodge them. A colorful first-person view of the horizon and scenery rolls toward you, but you don't see this through your truck's windshield; instead, you watch your truck heading straight for the horizon, a perspective that paves the way for some entertaining animated effects. There are up to 16 opponents to pass, including the Doomboogey, whose maniacal driver tries to run you off the road.

The "serious" side of the simulation comes into play after you've advanced beyond the Beginner level. Until then, your hardest choice is picking which of four courses you'll race on and which of four types of truck you want to drive. At Amateur, Semi-Pro, and Pro levels, however, you must also equip your truck by purchasing items such as extra gas and oil, a mechanic, spare parts, and other racing gear (including a six-pack of beer, so authentic is this

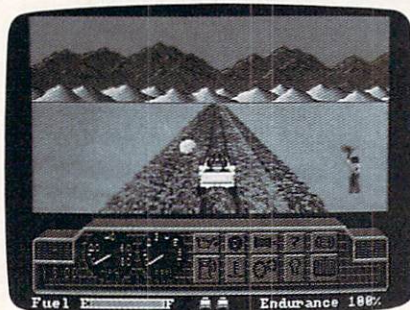
simulation) before entering the race. Some of these may prove vital if you break down in the desert, miles from a garage. The weight and volume of items added to your truck determine its actual speed and effectiveness in various types of terrain, so strategy plays as crucial a part as eye/hand coordination does at the higher levels. Besides prerace decisions, you'll also have to make more on-the-spot calls during the race, such as whether you have time to pour in that last can of gas or make repairs.

Damage is cumulative, so you might hit dozens of boulders before being forced to stop for repairs. An icon on the instrument panel lights up to indicate which part (radiator, transmission, and so on) is damaged. If repairs are necessary, the program tells which parts are required and a parts box shows which parts you're carrying; you simply click on the appropriate parts to make the repairs. Without the parts, you can still perform make-shift fixes, but that takes longer.

Whether racing through the Baja desert or Georgia mud, you'll witness a truckload of rollicking animated effects. Hit a log, and your truck careens to one side at a 45-degree angle and starts ripping along on two wheels; passing another truck while I was on two wheels was a real thrill. When you hit a big rock, the truck might roll sideways or flip front over end as it flies through the air. I passed one truck by hitting a rock and actually flipping over the truck. Once I hit a rock that sent my truck sailing over the upcoming river. (And I was startled when another driver honked at me while passing—the

first time this had ever happened to me in a racing game.) If you hit a road sign, your truck explodes. The steering wheel and other pieces fly through the air; then you see the body of a little man and a dog at the side of the road, all animated.

Some of this sport's most unique elements add to the game's authenticity. If stuck in a bog or other rugged terrain, for example, you can pull your truck free with a winch; without one, you have to take more time to rock yourself free by punching the gas. This is realistic, but other aspects are less than authentic. My most successful runs were achieved by continually swerving back and forth



Whether you're racing your *4 × 4* through the Baja desert or the Georgia mud, you'll witness a truckload of rollicking animated effects.

across the road, a tactic that wouldn't work on a real dirt or mud track. Another thing that bothered me is that the dashboard instrument panel is identical in all trucks. Perhaps it's unfair to criticize the game this minutely, however, since Epyx doesn't market it as a simulator. And while it's not a pure simulator in the sense of SubLOGIC's *Flight Simulator*, 4×4 is the kind of simulator I prefer—one whose designer knows when to leave reality behind in favor of fun. I'm hoping to see a sequel, if only because it will be called $4 \times 4 II$.

It took me a bit longer to master the controls of my spaceship in *Starglider II* than to take charge of 4×4 's occasionally gymnastic all-terrain vehicles. But I enjoyed this British import from Rainbird almost as much as 4×4 because it addresses the main reason I've never liked many flight simulators: choppy, slow graphics that make "playing" more tedious than sitting on a real airplane that's flying from point A to point B (two of my favorite vacation destinations). The program spans two disks, but it can be played on a one-drive system.

Starglider II delivers an unusual experience: It realistically simulates flying an imaginary vehicle. And graphically, it outdistances most flight simulators that are based on real planes and jets. While you're cruising near a planet's surface, the buildings are depicted with 3-D models whose surfaces are painted with bright, bold colors (almost as if they've been washed with new and improved Cheer). Bank left and spin around a tall tower and you'll see a geometrically accurate perspective of the building. These graphics struck me as some of the fastest, most fluid and flicker-free animations I've seen in a flight simulator. Then you leave the blue skies of Apogee (one of the four other planets in this solar system) for the blackness of space. There you'll find that things happen equally fast, as an assortment of space pirates' gunships dart in and out while blasting their lasers at your ship. Knock one out and it may jettison some cargo, which you can retrieve with a tractor beam for sale or trade at a supply depot.

Thunder rolls across the sky as lightning crackles from the clouds, and you'll even watch the sun rise if you're up that early. Another animated effect that contributed to the fun was the way my ship exploded into dozens of pieces when I smashed it up or got blasted by aliens. This made me feel that even when I crashed, I was getting some extra entertainment from the game. By accessing a special feature, artistically minded gamers can rotate, paint, and resize all the shapes in the game. You can even modify each shape's animated sequence.

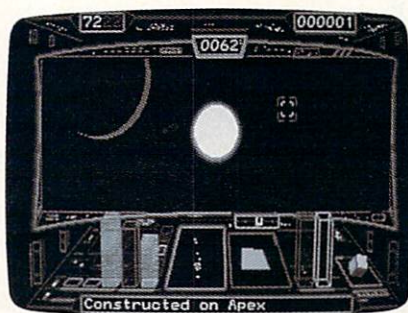
The interface uses animation effectively and uniquely. Instead of a word or simple illustration to indicate which weapon is currently selected, you see an animated picture of an energy bomb exploding, a blue missile sailing through space, or laser fire ripping holes in space. Rather than show your speed and fuel supply with numbers, the interface represents these and other factors with 3-D bar graphics that rise and fall. The artificial horizon indicator is a rotating, 3-D rectangle that shifts to reflect your ship's relation to the surface of the planet or moon below.

Keyboard controls facilitate performing actions unrelated to flying and shooting. You punch the I key to identify an object that's in your sights, and you hit the cursor keys to rotate an object held in the tractor beam. There are enough such commands to make this more than just a shoot-'em-up space game, but not so many that you'll suffer a brain hemorrhage trying to remember which key to hit in an emergency. *Starglider II* supports mouse, joystick, and keyboard controls; the docs recommend using a mouse, but I realized more control by using a joystick for flying and hitting the space bar to fire weapons.

Like an adventure game, *Starglider II* has a real plot, whose long-range goal will sound familiar to anyone who's seen *Star Wars III*: To prevent aliens from blasting the planet Novenia with their heavily armed space station, you've got to knock out the beam transmitters that are protecting the station. Along the way, you must keep your Icarus spaceship supplied with fuel,

gear, and other supplies (by defeating pirates and grabbing their goods), explore the system of tunnels that riddle one planet's interior, and investigate the various moons and the asteroid belt that complete this fantastic solar system. You can save a game in progress, and there's even a high-score board—both thoughtful features. I also appreciated the humor revealed in the ratings you get for varying degrees of success and failure. The first time out, my rating was *Dead So Soon?* But I rapidly improved to *Try the Fire Button*.

Starglider II is a real winner on two counts: as a simulator with highly polished animation and as an arcade game with considerably more depth than most. Exploring its many worlds—let alone completing your missions—could keep you busy for months. But so could taking first place at the Pro level in the four race courses included with 4×4 , which is an even more offbeat but equally stimulating simulation. Your choice here is best determined by whether you're a laser-happy space cowboy or a fool on four wheels. ▲

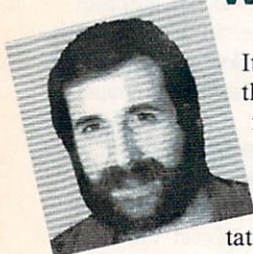


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ABSTRACTIONS

Arlan Levitan

Wrestling Commodore's A590 Hard Drive



It's late Sunday night and the editors of the *Resource* would undoubtedly be relieved to know that I've passed on spending the bulk of the evening viewing WrestleMania V. While I was being verbally pummeled by the exhortative promos for the WWF melodrama, I began to get the unsettling feeling that the editorial tag team of "Hammerlock" Thompson and "Boom Boom" Anderson might show up at my office to execute a half-dozen or so motivational body slams if I got much further behind deadline.

Randy and Rhett aren't the only ones after me. COMPUTE!'s book division has been hounding me for the last two months about finishing my half of the 1.3 update to Leemon and Levitan's *AmigaDOS Reference Guide*. I admittedly wasn't in any particular rush. The thought of another prolonged bout with dueling diskettes under the control of AmigaSLOTH...er, DOS... appealed to me as much as attending a Commodore cold-eggs-and-greasy-Danish press breakfast after an all-night party crawl at COMDEX. Sheldon Leemon finished his half of the book long ago. I would have, too, I rationalized, if I'd been using an Amiga 2000 running flat-out with a Quantum hard drive and a Commodore 68020 accelerator card. Enough was enough. After finishing last issue's "Expanding the 500" article, I figured I might as well put my money where my mouth is.

As luck would have it, my local dealer received a couple of Commodore A590 Hard Drive Pluses. Suggested retail price for the drive is \$799. Being typically short of folding green, I mentally rummaged through the inventory of Honest Arlan's Used Computer Corral. After 15 minutes of fast talking, I left the Slipped Disk with an A590 under my arm and a 1.3 Kickstart ROM in my pocket, leaving proprietor Jeff Moskow with a verbal IOU for one old Zenith laptop, a Migent pocket modem, and assorted software.

It may not be a power user's dream in terms of capacity and speed, but I like my A590 a lot. So will most 500 owners; Commodore may have a real winner on its hands, once the company prunes some thorns (which we'll discuss after a few kudos).

No other add-on drive for the 500 matches the computer's styling and takes up so little additional desktop real estate. There's no pass-through for the expansion bus, but

since the A590 also includes a memory expansion board, I don't view that limitation as a real problem.

You don't have to fully populate the chip sockets to add RAM to the A590, as some competitive hard disk/ram card combinations for the 500 require. The A590 is happy with 0K, 512K, one megabyte, or a full two megs of chips on board. Another convenience is that while the A590 has its own power supply, it turns on and off automatically with the 500.

First item on the agenda was installing the 1.3 Kickstart ROM in my 500 so I could boot directly from the hard drive. This was done in less than 15 minutes, interrupted only once by a call from someone who sounded a lot like Max Toy, reminding me that I shouldn't be messing around inside my machine without a note from the Almighty.

The manual supplied with the A590 I got was typical of a product developed during a printers' strike: It consisted of a sheaf of $8\frac{1}{2} \times 11$ photocopied sheets, with *Preliminary Copy* stamped in bold red letters on the cover sheet and full of numerous hand-penciled corrections. Since I was feeling somewhat perverse, I decided to actually read the installation instructions for a change.

At first blush, hookup appeared to be as simple as a Dan Quayle stump speech. The one puzzling item consisted of references to a grounding clip that must be installed at the bottom edge of the 500's bus connector before the 500 and A590 can be mated. Since I didn't recall seeing anything that remotely resembled the pictured clip, I fearlessly slapped the A590 and 500 together, plugged in the A590's separate power-supply brick, and turned on the 500. The system refused to power up at all. Instead I was treated to a high-pitched whine, emanating from the A590 power brick, that sent all of the neighborhood dogs bolting in terror.

Obviously the missing ground clip was required to make the thing work. I spent the better part of an hour fabricating the missing part, and then installed it. Still nothing. I wasted another hour jockeying the clip's position in a vain attempt to set things right. Nothing worked.

In a moment of frustration, I punched the whole mess back against the wall. As the cables in back of the A590 hit the wall, the drive powered on for a moment and just as quickly powered back down. After a bit of experimentation, I found that if I bent the power cable just so, the A590 was happy. The power cable or connector was almost

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certainly at fault.

I rebooted the system and everything came up like a champ, even without my kludged ground clip, which, I would guess, had only been required for preproduction units. I suppose I might have lived with the cable situation if the A590's drive-access light hadn't stopped working. That was enough to prompt a request for an exchange for another A590, which hasn't given me a whit of trouble. The speed of the drive that came in my A590 isn't blindingly fast, but it cut my boot-up time in half and beats doing the diskette shuffle any day.

The first wave of A590s that Commodore shipped are using 20-megabyte hard drives from Epson. It may have managed to nail down a dominant share of the U.S. printer market, but Epson has a long-standing tradition of producing laptop computers that are doomed to failure.

Epson's first foray into the market was the trend-setting HX-8, a diminutive notebook-sized machine with a proprietary operating system. The only thing dimmer than my memory of the machine was its 2-line \times 20-character liquid crystal display. Next came the Epson Geneva PX-8, a beautifully packaged but somewhat quirky machine that still shows up occasionally in mail-order liquidator catalogs.

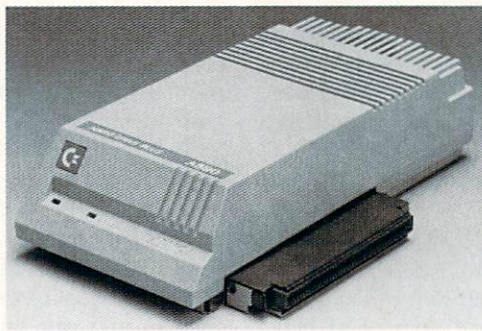
The PX-8 used the same cartridges used by microcassette recorders for data storage and markedly improved on its predecessor with an 8-line \times 80-column LCD window that was almost legible under most lighting conditions. I actually owned a PX-8 for a couple of days when it first shipped but was forced to return it for aesthetic reasons.

The Geneva PX-8 came with a variety of applications in ROM, and I came to the conclusion that owning *Word-Star* housed in a media that wouldn't allow me to erase that godforsaken program from hell was too much to bear. The PX-8 was a CP/M-based machine, and its life was cut mercifully short by the introduction of heavier, more expensive MS-DOS-compatible laptops. Epson lay low, licking its wounds and sizing up the laptop market as it grew.

One might think that after waiting two years to enter the PC laptop market, the Epson folks might have had a shot at getting things right. Unfortunately, Epson's Equity LT fared little better than its distant cousins. The Equity was afflicted with screen-reliability problems and was heavy enough to spark conjecture that Epson had used focus groups comprised of bricklayers in the product-design phase. Rumor has it that last year Epson was stuck with a warehouse full of low-power hard drives with integrated controller circuitry that were intended for

use in Equity LTs, and that Commodore bought the lot for about \$100 per drive.

Commodore's bean counters may be pleased with the purchase from Epson, but I'll admit to being a little miffed over the same. The A590 was designed to handle either PC XT-type or SCSI hard drives. I'm sure the Epson is a fine unit, but there's no denying that using a SCSI drive instead would have augmented the performance of the A590 by markedly improving the transfer rate of the drive.



The use of the Epson drive in the A590 is mitigated somewhat by the provision of an external SCSI port on the back of the A590, which makes adding external drives easy and cost-effective. Amiga owners can indirectly benefit from the growing popularity of high-capacity SCSI drives in the Macintosh world. I've seen complete 20-meg external MAC SCSI drives going for less than \$250 on the used market as of late.

Commodore may have been trying to kill two birds with one stone with its big hard drive buy. Widespread conjecture has it that the Epson drives might be incorporated into the Amiga Arrow, a rumored laptop scheduled for 1991 that will be equipped with a backlit color LCD screen by Hitachi and a small trackball in lieu of a mouse.

A couple of final caveats are in order for prospective purchasers of the A590. Besides doing without a typeset manual, early owners will also have to do without any diagnostic programs for finding bad memory chips installed in the A590. The programs were not finished in time to go out with the first

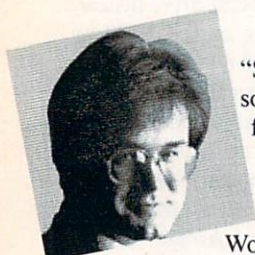
A590s. Installing RAM in the A590 is not difficult, but it's definitely not for the inept or faint of heart: It requires complete disassembly of the A590 since the chip sockets are located underneath the hard drive.

Don't plan on using common 1 \times 1024K one-megabit memory chips for RAM expansion. The A590 requires that you use the slightly more expensive 4 \times 256K one-megabit chips. Fortunately, the price of memory is getting to the point that you don't have to take out a second mortgage to add a couple of megs to your machine.

Last summer, the wholesale price of a meg of RAM peaked out at a little over 400 smackers. Judging from the last quote I got from a couple of friendly mail-order chip merchants, those who are confident enough to risk the wrath of Commodore and void their 90-day warranty by installing RAM themselves can pick up memory today for about \$120-\$150 per megabyte. Remember, handling static-sensitive RAM chips is not everyone's cup of tea, but I've never had any problems, probably due to the fact that I was grounded throughout most of high school. ▲

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The Workbench



"Spotlight" helps you get more from the software and hardware you already have for your Amiga—and if you have an Amiga, you have the Workbench. This month, I'll discuss some common problems that you might have with the Workbench, along with some hints and public domain programs to help you use it more effectively.

The Amiga operating system has two faces—the Workbench and the CLI. You control everything on the Workbench by using the mouse and clicking on icons and gadgets. Theoretically, the Workbench does everything needed to control every aspect of the Amiga, such as starting programs, customizing programs, and managing files and disks. Pointing and clicking is easier than using the CLI. Unfortunately, not all programs work well with the Workbench, and a few things don't work from the CLI.

With the CLI, everything is entered through the keyboard in short bursts called *command lines*. (CLI stands for *Command Line Interface*.) To use the CLI properly, you must dedicate yourself to memorizing the syntax of each command. The CLI gives finer control once you've learned to use it.

A good guide to the Workbench is the Introduction to the Commodore Amiga book that comes in the box with your Amiga. It discusses the basic concepts of point-and-click and the details of using programs such as Notepad.

Both the CLI and the Workbench depend on files. Files hold collections of data on disk—letters, programs, and spreadsheets are all stored in files. For an icon to appear on the Workbench, there must be two files present on the disk. If we have a spreadsheet data file named Taxes, then a second file named Taxes.info must exist on the disk. Called an *info file*, this second file stores the actual image of the icon that is displayed, along with information about its location on the screen. When you drop the Taxes icon into a drawer called 1989, for example, the Workbench moves both files into the drawer. Drawers rely on info files as well. If a drawer does not have a corresponding info file, you can't manipulate it from the Workbench, because you can't see it.

Not having an icon for each file leads to a common problem. Disks that appear empty can give a *Disk Full* error when you try to save to them. If you depend on icons

to indicate the presence of files stored on a disk, you will be misled. Look at the disk using a file requester (such as the one in *Deluxe Paint*) and you'll find the files that take up space. Most file requesters show every file on the disk. On a fresh Workbench disk, there are many files and drawers that do not have icons.

You can remove these files in two ways. First, learn to use a few CLI commands, such as *cd*, *dir*, and *delete*. You don't need to know any other CLI commands to remove unused files from a disk. Every file and drawer can be managed from the CLI. The CLI does not depend on info files. Or, use a program such as *CLImate*, which presents a file requester with buttons that permit you to delete files. (*CLImate* allows you to copy and move files and perform other disk-related tasks as well.) There are dozens of public

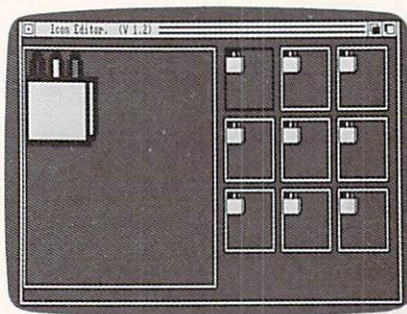
domain utilities that do the same job, all known by the generic name DirUtil. See this month's "Best of the Boards" for two such programs, *ClickDOS* and *Browser*.

There is another common misunderstanding about full disks. Dragging an icon into the Trashcan does not remove a file from the disk; it simply moves it to the Trashcan drawer. The space it uses on the disk is not reclaimed for other purposes until the icon is actually deleted. This lets you remove a file from the Trashcan if you've thrown it away accidentally.

On the Workbench screen itself, there are several menus. The second menu is called Disk, and it has a menu item called Empty Trash. This option deletes all files in the Trashcan drawer. To delete a file immediately to reclaim its space, select the icon (by single-clicking) and select the Discard menu option from the Project menu. In one step, the file's size is added to the free space on the disk.

While moving files and drawers, you may notice an uncommon bug in the Workbench. Sometimes, when you're dragging an icon or groups of icons, they disappear when you release the mouse button. They haven't really disappeared; they've been moved to a drawer to the left of the place where you dropped them. If you open that drawer, you'll find the missing icons. No harm has been done. Move them back to where you want them, one at a time, and freeze them in place with the Snapshot item on the Workbench's Special menu.

If all a file needs is an icon for it to be visible from the Workbench, how can you make icons for files? The Extras disk includes a program called IconEd that can be used to create and edit icons. There are a few complications. Icons



IconEd is a program that you'll find on your Extras disk. Use it to make or modify Workbench icons for your files.

come in several types. To make a new icon, you should clone it from another icon of the same type. Programs need Tool icons, while data files use Project icons. Disk, drawer, and Trashcan icons are distinct types as well. To make an icon for a file, load an icon of the right type, draw the image, and then save it using the name of that file. Note that Disk icons must be named Disk with a capital D; lowercase *d* doesn't work. IconEd automatically adds the .info suffix for you.

IconEd doesn't have a wide selection of painting features. With the right tools, you can make icons with any paint program. Keep in mind that the Workbench is a 640 × 400 resolution screen with only four colors. Public domain programs to the rescue. Fred Fish disk 85 has a good set of tools for this. One converts a brush to an icon, one converts an icon to a brush, and yet another will reduce any full-size IFF picture to a smaller size with four colors. Fred Fish disk 55 has a screen-grabbing program for saving any Workbench screen as an IFF file so that you can import it into the paint program to get your custom Workbench colors. Note that you'll need to use the CLI to navigate a Fish disk and to run these programs.

Making an icon for a program does not guarantee that it will work from the Workbench. Many programs are CLI-based and depend on text input and output. There are public domain programs to launch CLI programs from the Workbench, but these may not work with all programs.

The Info item on the Project menu of the Workbench gives vital statistics about an icon and its corresponding file. Select a file, then choose Info, and a window appears. In the upper left, you see the icon type, such as Project or Disk, and the file size. Below this, the Comment gadget lets you enter a short comment about the file. The Tool Types gadget shows extra information passed to the program when it starts.

If the icon type is Project or Disk, there is a Default Tool field. This area shows the full name of the program that made this file. When you double-click a Project icon, the Default Tool is the name of the program that is run. For example, the icon for a picture made with *Deluxe Paint* has a Default Tool of *DPaint:DPaint*. Your double-click starts it searching for *DPaint* on a disk of the same name.

Duplicating files leads to a problem related to the Default Tool gadget. When an icon is duplicated, the new copy gets the words *copy of* added to the old filename. If you leave this copy of the program on the disk and delete the original program, suddenly the Project icons stop working. They can't find the parent program when you double-click on them. If you've left a file called *copy of DPaint* on the disk, the Project icons for pictures made with *Deluxe Paint* have a Default Tool of *DPaint:DPaint*, instead of *DPaint:copy of DPaint*. After using Duplicate, be sure to remove the *copy of* prefix from the filename, using the Workbench Project Rename menu item.

Note that this can happen to disk names, too, if disks are copied using Workbench's Duplicate function. A perfectly integrated Workbench application won't have these problems, but most programs aren't perfect. If you prefer using the Workbench exclusively and aren't satisfied with programs that don't work properly with the Workbench, write a letter to the manufacturer of the software. Amiga companies are still small and wise enough to listen to well-thought-out customer feedback.

You might want to try this trick to add an extra menu to the Workbench screen. From the CLI, enter the line *LOADWB -debug* (the debug option must be typed in lowercase) and press Return. The Workbench redraws itself, and a new menu appears under the text of the memory meter. The menu has two items: *debug* and *Flushlibs*.

Do not select debug unless you have a second Amiga connected to the serial port. The Amiga will lock up, the mouse won't move, and there is no choice but to reboot. This item invokes a built-in programmer's debugging tool on the serial port at 9600 baud. To use this, you need a computer or terminal on the serial port.

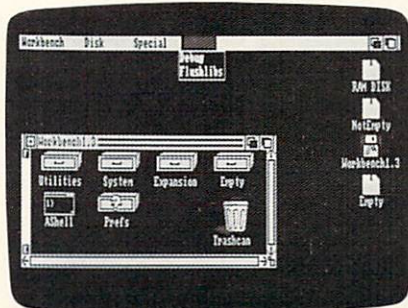
The second item, *Flushlibs*, is more useful. If you keep a watchful eye on the Workbench memory meter before and after you run a program, you'll see that all the memory used by the program isn't returned. When a program runs, it can load fonts or libraries of sub-routines into memory. These can remain in memory after you leave the program. The *Flushlibs* option lets you reclaim this memory. With large fonts, it can add up to a significant amount. For best results, choose this item several times in

succession to get around a minor bug in the operating system. Again, imperfect programs will not return all the memory. Eventually, running this kind of program over and over might lead to a visit from the Guru.

This past summer, Commodore released Enhancer 1.3, a new version of the operating system. Your Amiga dealer sells it for about \$30. It includes a slim manual that explains the many options of all the CLI commands, including several new ones. Frankly, even as a minor Amiga Guru, I found the documentation daunting. The majority of the manual is dry detail about CLI commands.

The Workbench didn't even make the index, but 1.3 does bring at least one new thing that should appeal to Workbench users. A program called *IconMerge* aids in the creation of double-image icons. These are the icons whose images change when you select them, such as the Trashcan icon, where the lid pops open when the icon is selected. *IconMerge* lets you split an existing double-image icon into two icons and merge two icons into one double-image icon.

Enhancer 1.3 includes other features, such as a ram-disk that survives rebooting, easier methods of moving printer drivers and Preferences settings to new disks under Workbench control, and above all, a faster disk-access system for hard disk users.

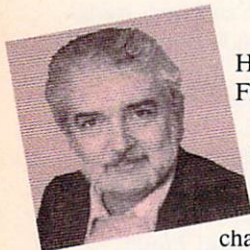


The hidden Workbench Debug menu has two options. Use the *Flushlibs* option to reclaim memory.

CLI CLIPS

Jim Butterfield

Notes, Fonts, Templates, and More



Here are a few quick tips for the CLI. First, you may clear a cluttered screen by pressing the ESC key and then C. (If you're using the Shell, you'll have to press RETURN.) This also clears any special modes, such as the alternate character set which is enabled when you press CTRL-N in a CLI (not a Shell) window.

If you want to leave a temporary note for yourself in the CLI window, press the semicolon key (;) and then type the note. If you don't want your note to scroll away, create a new window by typing NEWCLI or NEWSHELL. Click into the new window, size it if you wish, and type your note there (don't forget to use the semicolon key). Click back into your main CLI window, and the note will stay until you return to the window and type ENDCLI or ENDSHELL.

A somewhat more permanent note could be created with the short command COPY * TO RAM:NOTE. The asterisk signifies the current window, where the command was typed. Type your message, using as many lines as you like. When you've finished, press CTRL-BACKSLASH (\) to end the message, and your CLI prompt returns. To see the note, just type TYPE RAM:NOTE.

To use your Amiga as a typewriter, type COPY * TO PRT: and then type your message, ending with CTRL-BACKSLASH.

If you wish to run an Amiga Basic program, you can type AMIGABASIC and then load the selected program when BASIC comes up. But it's quicker to follow the CLI command with the program name. Thus, to start up an Amiga Basic program called Graphs, you would type AMIGABASIC GRAPHS.

The above technique is especially useful for preparing custom boot disks. Add a command similar to the one shown above to the file s:startup-sequence, and the selected BASIC program runs when you boot your system.

By the way, Amiga Basic programs can vanish from the screen when they've finished; all you need is the command SYSTEM at the end of your program.

Redirection. A command such as COPY asks you to name the input and output; there is no default, since you must give the name. Other commands or programs may have defaults: the output, in particular, may be set to go to the current window. This is the case with such commands as *Dir*, *List*, and *Type*; the result goes to the screen unless you redirect it.

To redirect the output of a command or a program, use the greater-than symbol followed by the file or device to which you want the output to go. Suppose you wish to type the directory of drive df1: to the printer. Type DIR >PRT: DF1:. You may put a space after the greater-than symbol if you wish, but remember that a redirection such as >PRT:, with or without a space, must immediately follow the command's name.

Why is position important? Sometimes there is more than one command, generating more than one output. Let's take the DIR command example we have just given. You might decide to multitask this command with RUN; that way, as the directory is printing, you can continue to use the CLI. Let's look at this command before redirection: RUN DIR DF1:. RUN generates a message like [CLI 2].

DIR outputs the directory. Which of these two outputs do we wish to redirect? The DIR output, of course. So we type RUN DIR >PRT: DF1: and our multitasked directory listing is under way. If we were to mistakenly command RUN >PRT: DIR DF1:, we'd get [CLI 2] on the printer, and the directory would go off into never-never land. (The new task created by the RUN command doesn't have a default window.)

You can use multiple redirection with multiple commands. Suppose you don't like the [CLI 2] message that RUN generates, and you don't want to see it. Let's con-

sign it to nowhere, to the NIL: device.

RUN >NIL: DIR >PRT: DF1: tells the computer to set up an extra CLI process (RUN), to throw away the [CLI] message (>NIL:), and to have this new process perform a directory command (DIR), which sends the directory results to the printer (>PRT:).

Input redirection is part of the system, but you won't use it much with AmigaDOS commands. Few commands use the CLI screen as a default input. The only command I know of that does this would be DIR using option I (Interactive). If we follow the command name with a space and a question mark, the system will usually type a prompt (called a *template*) and then ask for input from the screen. In that case, we could redirect this input. It seems impractical, but it allows us to demonstrate the feature.

Let's show input redirection working. First, create an argument file by typing ECHO >RAM:ARGS "DF0:S QUICK". This generates a one-line file using output redirection; we'll use it in a moment. This file contains our response to a prompt message that we will receive. Type

Templates are used internally by CLI commands. They're not just for your viewing.

LIST <RAM:ARGS ?. The system sees the question mark and types the prompt template for LIST. Now it wants to receive an input; since we have redirected the input stream to the file ram:Args, that's where the computer looks for the response. Watch this curious input redirection take place. The system types the LIST prompt and then takes its input from file ram:Args. The result is the same as if we had typed LIST DF0:S QUICK.

Templates. Type a CLI command followed by a question mark and in most cases you'll be prompted by a template that shows the information the command will accept. These templates seem cryptic at first. Once you understand them, though, they are very useful indeed.

The interesting part is that the template is used internally by the command itself. It's not just an informative line for your viewing.

The keywords within a template may carry special designators to indicate how they are used. There are three such items, and I remember them as follows: /A—this means Always. You must *always* provide this piece of information. /K—this means Keyword. If you wish to supply this information, you must type the *keyword*. /S—this means Switch. Using this keyword *switches* a feature on or off.

For example, typing PROTECT ? on a 1.3 system yields the template FILE/A,FLAGS,ADD/S,SUB/S. This means that you must always supply a filename, you may enter flags, and you may type keywords ADD or SUB—either of which will set a “switch” within the command. The template tells you that you are allowed to enter only a filename, if you wish.

By using the keywords, you may change the order in which you enter data. I don't recommend this, as it often leads to mistakes, but you could, for example, copy file ALPHA to BETA by typing COPY TO BETA FROM ALPHA instead of the more usual COPY ALPHA BETA. More useful are templates, which are used internally by the commands and allow you to put keywords wherever they are convenient. You may say LIST DF0: QUICK or LIST QUICK DF0:—the system will know what you mean.

The JOIN command has an unusual template that starts with 15 commas; these are blanks that allow you to input up to 15 “from” filenames. The last field shows as AS=TO/K, which we read as “keyword AS, alternatively TO, must be used to identify this field.” The keyword causes the command to skip over any unused “from” fields, so that JOIN GIN VERMOUTH AS MARTINI uses two input files rather than the 15 that are allowed.

Script Files. Whenever there is a series of commands that you need to give many times, you will profit by writing a script file containing these commands. Type EXECUTE followed by the name of your script file, and its commands will be executed.

On the 1.3 system, you won't need to use the EXECUTE command. Once you've set the script bit, when you

type the file's name you will automatically trigger an execute operation.

The simplest script file contains commands that never vary, such as a series of instructions like MAKEDIR RAM:WORK and CD RAM:WORK.

Script files can be made more creative by the use of arguments. A simple example will illustrate this. Suppose we have three text files, Huey, Dewey, and Louie, and we want to rename these files HueyText, DeweyText, and LouieText. Let's set up a script file to do the job.

Using your favorite text editor, create a file called AddText containing the three lines given below.

```
.key filename/a
Rename <filename> <filename>Text
Echo "<filename>Text NAMED."
```

The first line says: “The item that follows AddText will be referred to as filename.” The /a means that it must always be there or the script will refuse to run.

The second line gives the Rename command. Wherever <filename> appears, the supplied item will be substituted. Note that there is a space before and after the first <filename>, but that the suffix Text has no space ahead of it. The third line just confirms that the job has been done.

If this is a 1.3 system, we set the Script flag by typing PROTECT ADDTEXT +S. Now we may convert the three files by typing ADDTEXT HUEY, ADDTEXT DEWEY, and ADDTEXT LOUIE.

If you haven't upgraded to Work-

bench 1.3, type the word EXECUTE before each AddText.

Let's try a more complex example. Suppose you have a disk with some interesting fonts mounted on df1: and you wish to copy some of these fonts to your system disk. To transfer a font called CRAZY, you would need to give the following commands:

```
COPY df1:CRAZY.font font:
MAKEDIR font:CRAZY
COPY df1:CRAZY.font:CRAZY
```

Note that the font name has to be typed in correctly four times. If you have several fonts to move, you might find the following script file, called FontMove, to be a big help:

```
.key fontname/a
COPY df1:<fontname>.font font:
MAKEDIR font:<fontname>
COPY df1:<fontname>.font:<fontname>
ECHO "<fontname> Transferred."
```

Once your script file is in place, you can move many fonts easily by typing such lines as FONTMOVE CRAZY, FONTMOVE WILD, or FONTMOVE RADICAL. ▲

• • •

With 1.3, you can set
the file's script bit,
and the execute
command will be
called automatically.

• • •

ASK ROB PECK

Rob Peck

Programs That Run Programs



I am trying to write a menu-driven utility similar to the public domain program DirUtil, and I need to know how it launches other programs. As a side question, I am also curious about why the CLI window won't go away when I run programs from the startup sequence—even after an ENDCLI.

David Florance
Greensboro, NC

Both of these questions are closely related to the way AmigaDOS launches programs and the way Amiga programs are constructed.

Each command in your startup sequence takes control of the CLI window. It's only when the current command finishes that the CLI regains control and reads the next instruction found in your startup script.

If your startup sequence contains a line that begins with a RUN command, something interesting happens—the CLI starts an *independent process* to run the program. This leaves the current CLI free to read and perform the next line in the startup script (RUN is just one way you can get the Amiga to multitask). However, the CLI also gives the program a *lock on a handle* to the startup CLI, just in case the program needs to output some information or receive input from the user. Basically, a handle gives the program access to the CLI window for printing characters and for reading information entered via the keyboard.

This activity (giving the program a lock on the handle) prevents the CLI window from closing until all of that CLI's programs have finished running. That's why your startup CLI hangs around even after you've entered ENDCLI—some of the programs executed in your startup sequence are still active. Although the latest versions of both *Lattice C* and *Manx C* can produce programs that release their lock before they've finished running, it's likely that some of your favorite utilities do not have this ability.

Handles play an important role when you run a program, especially if you run one program from within another.

The main vehicle for launching programs from within other programs is the AmigaDOS `Execute()` function. `Execute()` has the following syntax: `Execute(commandString, input, output)`. The `commandString` parameter specifies the CLI command (program name) and arguments that you wish to execute. The command string may also include I/O redirection—that is, a less-than symbol or FROM arrow (<) to show where the standard input is to come from, and a greater-than symbol or TO arrow (>) indicating where the standard output is to be directed. The second parameter is a redirection file handle that should be

RunBackground.c

```
/* Compiled with Lattice 4.0:
   lc1 runbackground.c
   lc2 -v runbackground.c
   BLINK lib:c.o,runbackground.o TO RUNBACKGROUND
   LIB lib:lc.lib+lib:amiga.lib
*/

/* runbackground.c */

#include "exec/types.h"
#include "libraries/dosextens.h"

void main(argc, argv)
int argc;
char *argv[];
{
    LONG success;
    UBYTE commandstring[255];
    struct FileHandle *nilfh, *Open();

    nilfh = Open("NIL:",MODE_OLDFILE); /* This always succeeds. */
    strcpy(&commandstring[0],"RUN >NIL: <NIL: ");

    /* (Your version should add error checking on argv[1]
       to make sure there is a command to do.) */

    strcat(&commandstring[0],argv[1]);
    strcat(&commandstring[0]," >NIL: <NIL: ");

    /* Now commandstring reads:
     *
     * "RUN >NIL: <NIL: COMMAND >NIL: <NIL:"
     *
     * This disconnects RUN and COMMAND from the CLI, and
     * finally passes a file handle to NIL: (nilfh).
     * This prevents Execute() from passing the incoming
     * CLI's file handle down the line to its children.
     */

    /* Users can add the rest of their command args to the end
     * of this string by using argc and argv,
     * appending each of the remaining args, plus a blank
     * space, to the end of the command string.
     */

    success = Execute(&commandstring[0],nilfh,nilfh);
}
```

used if there is no FROM redirection specified in the command string. It tells the Amiga how to redirect the standard input. The third parameter is a redirection file handle for the standard output.

A value of 0 for either *input* or *output* causes AmigaDOS to assume that the standard input/output for the program being run is the same as for the program that runs it. Thus, a simple command such as DIR will print its output directly to the CLI window if the program that executes it is started from a CLI.

`Execute()` has two restrictions. First, the RUN command must be present in the directory that you ASSIGN to C:, or you must have RUN available somewhere in the command path. Second, the command that you execute must be either in the current directory or in the C: directory. As an alternative, you may specify the complete pathname, such as MYDISK:COMMANDS/MYPROGRAM in `Execute()`'s command-string parameter.

Here's a sample program using the `Execute` function:

```
/* execute.demo.c */

#include <libraries/dosextens.h>

main()
{
    int success;

    success = Execute("dir >ram:dir.file",0,0);
    if (success==0) printf("I/O error %ld",IoErr());
}
```


This program puts a listing of the current directory into a file named dir.file in the ramdisk. To see the results of this program, enter the command TYPE RAM:DIR.FILE from the CLI.

If you use the instruction Execute("RUN something",0,0), you might think the CLI window could close, but unfortunately the RUN command inherits the handle to the CLI window and passes it on to the "something" that you RUN.

To run something as a background process, you need a command that disconnects the program from the CLI. That's where RUNBACKGROUND comes in. I created RUNBACKGROUND because I wanted to run the Workbench clock program from my startup sequence and still have the CLI window go away. The source code for RUNBACKGROUND is shown here as RunBackground.c. You may also find the source code on this issue's *Amiga Resource* disk in the Source/AskRobPeck directory. RUNBACKGROUND's executable file is found in the disk's C directory.

To try this program, open a new CLI or Shell and enter the following (you may have to copy RUNBACKGROUND to your own Workbench disk, as we do not always have enough free disk space to provide a CLI on the *Resource Disk*):

RUNBACKGROUND Workbench1.3:
Utilities/CLOCK
ENDCLI >NIL:

The command string cannot include input or output redirection. For example, you cannot say RUNBACKGROUND TEST >myfile. Also, the command string must explicitly specify the complete path to the command. A new version of this program, RUNBACK (found on Fred Fish disk #152), handles path searching for commands.

If you have a program that can be launched only from the Workbench, you can use a program written by John Toebes called WBRUN (also found on the *Amiga Resource Disk*). Like RUNBACKGROUND, WBRUN executes programs from the CLI and still allows the CLI to close.

Finally, there are a few considerations you must take into account when you're using RUNBACKGROUND and programs like it. The program that

you run must not depend on any form of interactive input from a CLI because it becomes totally disconnected from the CLI window. Also, RUNBACKGROUND does not close the file handle obtained by opening NIL:. This ties up a small block of memory somewhere in the system. This is not considered "nice" under Amiga system programming guidelines, but it's a small price to

pay for the functionality the program provides. ▲

If you have a programming question or problem that you'd like answered, write to Ask Rob Peck, COMPUTE!'s Amiga Resource, P.O. Box 5406, Greensboro, NC 27403. We regret that, due to the volume of mail received, we cannot respond to every question.

The Power of AMIGA with the Stroke of a Pen

Inkwell Systems introduces the NEW 184-A Light Pen with Amiga Light Pen Driver which provides an easy-to-use, natural alternative to the mouse for data entry on the most popular Amiga software programs.

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Pilot a Gunship

Take the controls of the U.S. Army's AH-64A Apache attack helicopter in *Gunship*, from MicroProse. Armed with Hell-fire and Side-winder missiles, and folded-fin aerial rockets, your helicopter sports a 30mm cannon capable of firing 625 rounds per minute.

A variety of levels, mission types, and mission objectives are available. Do your best and you may

earn commendations, medals, and promotions during gameplay.

Gunship pilots must fly missions in Southeast Asia, Central America, the Middle East, and Western Europe. A training scenario is conducted in the U.S.

The Amiga version is hard disk-installable, utilizes key-disk copy protection, and can be controlled by a joystick. The suggested retail price is \$54.95.

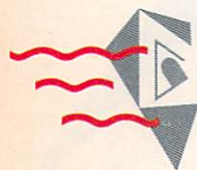
MicroProse, 180 Lakefront Dr., Hunt Valley, MD 21030

Joe Blade to the Rescue

Six world leaders have been kidnapped, and there is only one man that can save them: Joe Blade. In this action-adventure from DigiTek Software, players must guide Joe as he tries to penetrate the fortress of the evil Crax Bloodfinger which consists of 127 rooms. Once inside, players must locate the keys, free the hostages, disarm and reset the bombs, and then escape. *Joe Blade* retails for \$29.95.

DigiTek Software, 8910 N. Dale Mabry Executive Center, Suite #37, Tampa, FL 33614

The Unkindest Copy



Where will it all end? Copy-protected programs have spawned a class of software dedicated to removing copy protection. To further confuse matters, some of these **copy programs are themselves copy-protected**, which has given rise to copy programs that

remove the protection from copy-protected copy programs. Have you got that straight so far? Well, it seems that while the author of one copy program was in the process of unprotecting a competing copy program, he noticed that large **hunks of the code had been lifted intact** from a third copy program. In fact, he claims that part of **the code isn't even used** by the program. And that, in his opinion, is taking copying a bit too far. —S.L.

Hot News and Insider Gossip
by Sheldon "The Ear" Leemon

New Products edited by Mickey McLean

Products That Echo



We've heard that Impulse is about to market a product called *Harmony*, an inexpensive (\$200) **pitch-recognition device**. You play a non-MIDI musical instrument into a microphone, or **even hum a tune**, and it translates the notes into a musical score. This score can be saved in IFF SMUS format and then be edited, translated into MIDI events, and even printed out by scoring software. This makes composing as easy as singing.

If this sounds strangely familiar, there's a good reason. **Almost four years ago**, a company called Cherry Lane Technologies advertised an item called the **Pitch Rider**, which was supposed to do much the same thing. Its release was **delayed for years**, and not many people ever got to see one. Another of Cherry Lane's products that never actually materialized was a program called (you guessed it) *Harmony*, which was supposed to listen to the music that you were playing into the Pitch Rider and then use artificial intelligence to play along with you. The **moral of this story** is that even though software and hardware sometime evaporate into vaporware, eventually the **vapor condenses back into real products**. —S.L.



Seek the Crown of Power

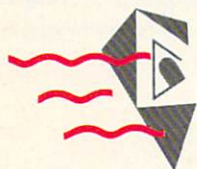
Players assume the role of a young Incan warrior chosen by his people to seek the Crown of Power in *The Last Inca*, a graphics/text adventure from Free Spirit Software.

Players must find the crown before the evil wizard Zulphosi does. Zulphosi, who was once held prisoner on Galapagos, wishes to use the crown to destroy the Incan people. During their journey, players encounter

many challenges and only the most skillful of warriors can survive the Sacred Mountain, home of the Great Condor. Players also discover traces of the forgotten civilization of the Megaterras and must seek out the Emerald of Xiahuxi possibly found in the Caves of Doom. *The Last Inca* has a suggested retail price of \$39.95.

Free Spirit Software,
P.O. Box 128, 58 Noble
St., Kutztown, PA 19530

Secret System



Last issue, we predicted that new **Amiga-based game machines** from both Commodore and Epyx would be shown at the January CES show. Though Commodore chose not to go mano a mano with the Nintendo steamroller, Epyx showed a new game machine **behind closed doors**. A number of people have seen the new machine, but security is still pretty tight. After signing a 15-page nondisclosure agreement,

most would only comment, **It's not what you'd expect**. Others said, **What you've been hearing is probably true**, which tends to confirm that it's definitely not what we'd expect.

That seems to rule out the possibility of Amiga-based technology, though the design philosophy is likely to be very similar, given that **David Morse**, former president of Amiga, now heads up Epyx and has former Amiga hardware engineer **Dave Needle** and software engineer **R. J. Mical** working for him. Another notion that can probably be dismissed as "what we'd expect" is some kind of **interactive video system** based on CDI, VDI, and

DVI technology.

The most plausible story we've heard is that the system is **some kind of hand-held game machine**. Unlike those goofy LCD games that have a resolution of about 30×30 pixels, this system would have a **full-resolution color CRT**. Given the success of portable electronics, a Watchman-sized portable videogame with graphics that rival Nintendo's may be popular enough to cause teachers to **scowl at the mention of the Epyx name**. Whatever Epyx's plan, challenging the ubiquitous Nintendo will probably turn out to be, in the words of one observer, **a 100-million-dollar crap shoot**. —S.L.

Attack Copter

The Sega arcade hit *Thunder Blade* has been released by Mindscape for the Amiga.

The game offers two different visual perspectives: from above and from behind the helicopter. The top-down view allows you to see the surrounding area in 3-D, while the view from the rear allows you to fly forward through the approaching landscape.

As a helicopter pilot, you must defeat the enemy while flying over skyscrapers, mountains, deserts, and the ocean.

Thunder Blade carries a suggested retail price of \$49.95.

In addition to *Thunder Blade*, Mindscape has released the Sega arcade games *Out Run*, *Space Harrier*, and *Alien Syndrome*. Future releases include *Shinobi*, *Action Fighter*, and *After Burner*.

Mindscape, 3444 Dundee Rd., Northbrook, IL 60062

Guide from a Guru

Sassenrath Research has published *Guru's Guide, Meditation #1*, the first volume in a series of technical books for the Amiga. Volume 1 was written by Carl Sassenrath, the author of Amiga's Multitasking Executive operating system. The book is designed for both novice and expert programmers, guiding them through Amiga's system software.

Meditation #1 covers the core of event-driven activities in the Amiga Exec—the interrupt system. The book is divided into three major sections. Chapter 1, "Introduction," provides background material and offers a starting point for understanding the system. In this chapter, the history of the Amiga and the major elements of the system are discussed. Chapter 2, "Principles," delves into the theoretical



Carl Sassenrath, author of *Guru's Guide, Meditation #1*.

design and strategic importance of interrupts. An in-depth view of interrupt operation from the hardware and software perspectives is provided. The third chapter, "Programming," provides a hands-on practical application of Sassenrath's knowledge of the Amiga's interrupt structure. Readers can obtain useful techniques and examples, including a guide to the

creation of well-behaved applications with the Amiga environment.

The book contains many useful diagrams, tables, and examples as well as a wealth of inside programming lore for Amiga users and developers. *Guru's Guide #1* is available in softcover and sells for \$14.95.

Sassenrath Research,
P.O. Box 1510, Ukiah, CA 95482

Sheldon "The Ear" Leemon Appears on Jeopardy

Amiga Resource contributing editor Sheldon Leemon won second place on the April 19 episode of Jeopardy. His prize is a trip for two to the Bahamas.



Sheldon: Computers for \$500.

Alex: The answer is: it's the slowest DOS for a 16-bit computer.



Sheldon: Aahhh... What's AmigaDOS?

Alex: That's right!

It's a Masterpiece

AROCK Computer Software has released *Masterpiece Professional Font Collection*.

The 20-disk set contains 110 different font styles, many in large sizes designed for video work. Ninety-five percent of the fonts are in 100-point or larger sizes. The fonts can also be resized smaller. All fonts are high resolution.

The collection also features 141 hi-res *Deluxe Paint* pages with thousands of objects and

examples. Other features include two disks full of color brushes, four disks of ColorFonts, and a 100-page manual that includes full-size font printouts.

Masterpiece Professional Font Collection has a suggested retail price of \$199. The disk set can be ordered direct from AROCK by calling (800) 288-AROK.

AROCK Computer Software, 1306 E. Sunshine, Springfield, MO 65804

Networking



One area in which the Amiga has yet to make much progress is in local area networks (LANs). Networking expands a computer's usefulness in a number of ways. At the lowest level, it **allows several machines to share expensive peripherals** like

laser printers and large hard disks. More sophisticated arrangements allow **transparent file transfers** from one Amiga to another, as well as electronic mail. The most sophisticated kind of network allows you to connect Amigas to other micros, minis, and mainframes.

Surprisingly, the Amiga has been able to perform the latter type of networking almost from the very beginning, thanks to **Ameristar's Ethernet adapter** and software. Although it's not cheap (about \$900 per Amiga), it's great if you're at a university or research center and want to **hook up your Amiga to a Sun workstation**.

The burden for providing networking is obviously on Commodore, and **it's starting to get the message**. We've heard rumors that the company is considering a number of different options. It has supposedly licensed AmeriStar's Arcnet board, for example, which might provide the hardware for a **cheap Amiga-to-Amiga connection**. Commodore is also rumored to have approached TOPS, a division of Sun Microsystems, which provides a popular network for connecting its workstations to Apple Macintoshes and IBM PCs. —S.L.

Internal Affairs

Supra has released the SupraModem 2400zi internal modem for the Amiga 2000 series of computers.

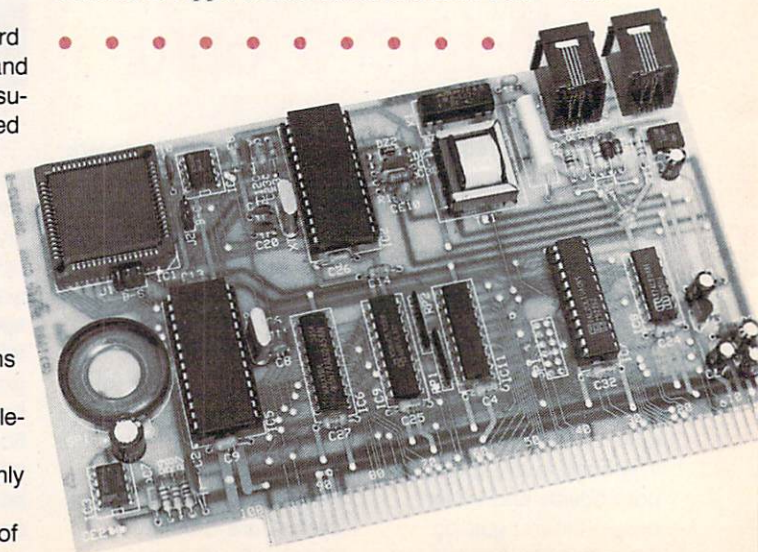
The Hayes-compatible modem is a half card that supports asynchronous operation at 2400, 1200, and 300 baud. Custom configurations can be created by issuing commands. These configurations can then be stored in the modem's nonvolatile memory and automatically loaded each time the modem is turned on or reset.

SupraModem fits in any Amiga bus slot and is compatible with all popular Amiga telecommunications software. Other features include autoanswer and autodial, two modular phone jacks for telephone line and phone, adjustable volume speaker for monitoring call progress, and software that allows multiple modems to connect to one computer.

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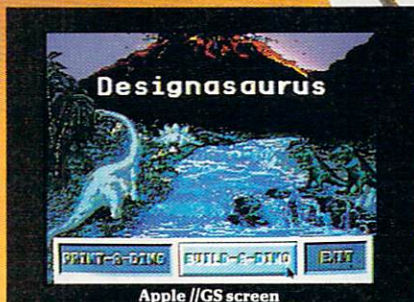
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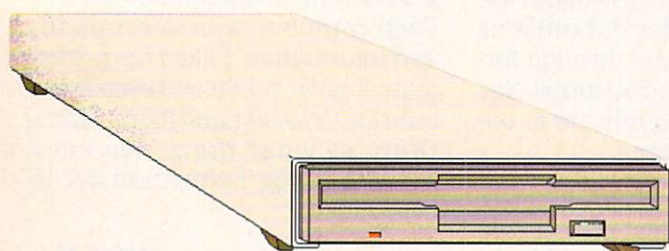
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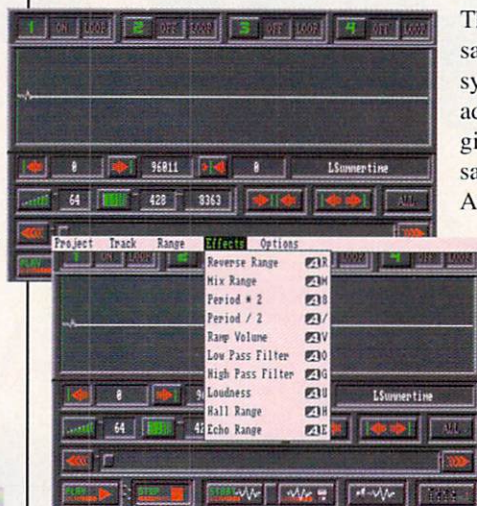
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Keith Ferrell

That's the general consensus when it comes to Amiga entertainment. Sure, it's a great game machine, but the greatest games still await development.

There are as many explanations for that—and opinions about Amiga entertainment—as there are developers and publishers supporting the machine.

To find out what makes the Amiga so great and what makes a great Amiga game, we talked with some of the leaders—and some relative newcomers—in Amiga entertainment software.

Discovery Software

Designing Interactive Symphonies

Rick Ross hears music when he thinks of Amiga entertainment. The president of Discovery Software, publishers of *Sword of Sodan* and *Arkanoid*, Ross sees interactive entertainment as a symphony, with the Amiga serving as orchestra, and designers and programmers acting as conductors.

"You have to control the central mechanisms of a game program the same way a conductor manages a symphony," he says. "You've got to call resources into use at the appropriate time, telling the computer how much is to be involved, when to take a break, and so on. In that sense, the programmer is the conductor of a

symphony of computing resources."

Unlike a musical orchestra, the programmer's instrument is in constant evolution. "Technology is a moving target that continues to advance—today's ideal is tomorrow's history."

Given that, how does the four-year-old Amiga measure up against new entertainment systems?

"When the Amiga was first conceived," Ross observes, "it was the ideal game machine at a certain level of technology. But the state of the art has moved forward to produce some fascinating second-generation, 16-bit game consoles." He draws a breath. "But even compared to the best of the consoles, the Amiga is a better machine."

Why?

Ross explains: "Easily controllable access to a large array of bitmap-manipulation features allows you to store, manage, and transfer data. And audio/visual entertain-

How do you make a great game? How do you make a great Amiga game? Entertainment takes many forms—and so do the answers to these questions. Those who would know gave us some of the answers.

ment is limited most by bandwidth, by the very question of how much data you can move how fast."

What new technologies will alter Amiga entertainment? "CD-ROM, multimedia, optical read/write devices—all of these will help artwork and sound improve. They'll affect our day-to-day decisions. Extra disk space means more computing resources, more storage . . . and that

means more to offer the player. More data moving through faster, increased bandwidth."

Games as information, information as games. You can listen to music the same way, too. "Bandwidth is much more restrictive than imagination. If technology continues to improve, there's no limit to what our imaginations can deliver." Ross grows reflective. "Someday we may see an ultimate game."

Cinemaware

Making Magic Movies

Bob Jacob wants to make movies you can star in, to tell stories that capture you as completely as a book can.

"Great interactive entertainment is an *experience*, not just a game," says Jacob, founder and president of Cinemaware, publishers of *Rocket Ranger*, *TV Sports Football*, and other games.

And the Amiga is the best platform for such experiences? "Absolutely! Amiga is the best pc on the market as far as graphics, sound, animation, memory, and disk space."

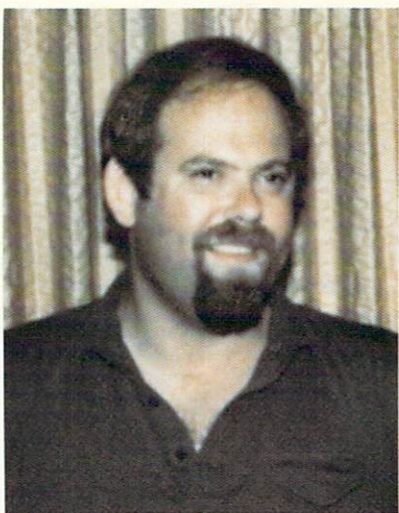
What does that combination of qualities mean when it comes to entertainment? "With Amiga, there are fewer constraints to the imagination than with any other pc."

What drawbacks does the Amiga bring? Says Jacob: "There's a fairly steep learning curve for programmers. The Amiga is not really a microcomputer, but rather, a mini-computer in disguise. As a result, a number of programmers run into real problems in terms of the best way to manage memory on the machine."

Have these difficulties held back Amiga entertainment? Not really. Jacob thinks it's more a matter of developers catching up with the computer's capabilities. "We've been working on the Amiga for three years, and only in the last year or so have we felt comfortable with the machine," he says.

But comfort doesn't mean complacency. "The next 12 months will see Amiga software that blows away anything previously done."

Jacob points out that this sort of evolution is natural. "The Commodore 64 had been out for five years before publishers really exploited its capabilities—'89 and '90



Bob Jacob

will be the big years for the Amiga."

With the machine poised to take off, what can we look for in entertainment software? Something new, according to Jacob. "Great entertainment will be more than just better graphics and sound. With such a powerful machine, we need to rethink what entertainment software can be. We need bigger concepts."

He has no doubts where the focus of such concepts lies: "*Storytelling!* Telling stories is the biggest subject being addressed right now.

We're looking for the best way of telling stories on a pc. Our goal has always been to create the excitement of buying a new best seller. We want to cause the player to lose any sense of time and reality."

And the biggest challenges?

Again, Jacob is emphatic. "Interfaces, without question. No matter how good the story, you can't overcome a cumbersome interface. But a simple interface is harder to do than a complicated one. And true simplicity requires a hell of a complicated program."

Can it be done?

Confidence could be Bob Jacob's middle name: "We're getting closer all the time."

Epyx

Searching for Substance

When it comes to Amiga entertainment, R. J. Mical knows whereof he speaks.

Mical developed the Workbench and Intuition for the original Amiga and now handles special projects for games-giant Epyx. He has strong opinions about the Amiga and the games being developed for it. ▶

Personal Favorites

Objectivity time.

We asked some leading Amiga publishers and developers—as well as some interested bystanders—to name their favorite game published by a company other than their own.

Cinemaware's **Bob Jacob** picked Rainbird's *Starglider II*: "It's a very involving experience," he explains, "a nice blend of story and techno wizardry."

R. J. Mical of Epyx is a man of many words—and many favorite games. With some effort we held him to his four faves:

"*Marble Madness*—without a doubt. It's hypnotic!"

"*Flight Simulator II*—switch airplanes at 30,000 feet.

"*Interceptor*—I still fly it a lot.

"*Sidewinder*—a game that's graphically and aurally superb."

Discovery's **Rick Ross** likes what he calls the "hypnotic elegance of *Shanghai*."

Shanghai likewise found favor with Visionary Design's **Randy Linden**, who

admires the fact that the entire package is so professionally polished. Another Linden pick is *Sword of Sodan*, which, as he says, "broke new ground for the Amiga."

Joe Hubbard of Free Spirit goes for a classic. "*Defender of the Crown* combines graphics, story, and playability. It's not a difficult game, but it is an entertaining and enjoyable one."

Scorpion's **Eli Tomlinson** says, "*TV Sports Football* is a great mix of strategy, arcade action, fantastic graphics, and a lot of nice little touches that add to the game."

Another *TV Sports Football* fan is IDG's **Manlio Allegra**. "Great gameplay, excellent graphics, a superb interface."

Amiga Resource's **Rhett Anderson** particularly admires *Time Bandit* for its variety of situations: "You never know what's going to happen."

Keith Ferrell, features editor for *Amiga Resource*, is especially fond of *Reel Fish'n*. "Like the real thing, you have good days and bad ones—and it's just as easy to brag about the software bass that got away."

"No one can equal the quality of visual and audio effects on any other machine," Mical says. "But only a few companies have really taken advantage of those capabilities."

Is it getting better? "On the whole, most developers are coming up to speed. But a lot are finding that the Amiga is just too complicated. Many are not yet sure of what it takes fully to exploit the Amiga's capabilities."

Why not? "The Amiga's more difficult to program than most micros. A lot of people have been doing it for several years and have gotten quite adept. The fact that there are so many Amigas out there means a wider and wider body of programmers willing to dedicate time and energy to programming the machine."

What makes it more difficult? The same things that make the Amiga so exciting. "The Amiga has the capabilities and features of a more powerful computer—and programming it requires that kind of knowledge," says Mical.

He notes that the differences impose new disciplines and requirements. "It's not like other micros. You can't just sit down like you could with the Apple II manual [the documentation accompanying the Apple II] and figure out how to program. The basic set of Amiga documentation is five inches thick, heavily complicated and detailed. The hump to overcome before you can write your first successful Amiga program is an enormous one. As a result, a whole class of programmer is excluded."

Exclusive abilities, though, don't mean those programmers aren't writing Amiga games. It just means they're not writing good ones.

"You've got a growing body of people [producing products] who don't know how to program the machine." Which results in less than spectacular games.

"A great Amiga game has got to perform flawlessly," he insists, the perfectionist in him showing. "You have to take advantage of the Amiga's graphics and audio capabilities, sure." But there's another, more essential ingredient. "It's got to be a fun game—if it's not fun, then forget it."

Those widely touted graphics and sounds may in fact be too seductive. "A lot of games have real flash and pizzazz, but they look gorgeous and play lousy. We can all name several famous games that fit that cate-

Doing It Yourself!

We're poised on the lip of a golden age of entertainment software. The industry has much of the appeal of movie-making in Hollywood's early days. But how do you break in?

Here's good and varied advice from people who are already there.

Epyx's **R. J. Mical** notes: "To write a good game, you have to really understand what good games are. Study hard. This involves learning how to program and understanding what makes games good—why certain games are enjoyable."

He advises serious play. "Play games until your ears fall off, until your fingers get numb from bashing the joystick—then play some more. And not just computer games. Play all manner of games, arcades and boards. Get into the zen of games. Only then, once you deeply understand gaming, can you really create a good game. Unless, of course, you are completely lucky. And a lot of people are."

Bob Jacob of Cinemaware offers encouragement: "This is not a hard business to break into. It depends on your ambition and aspirations. Art and programming are demonstrable skills—there's always a job available for someone willing to come in and learn. Look for your opportunity, and when you find

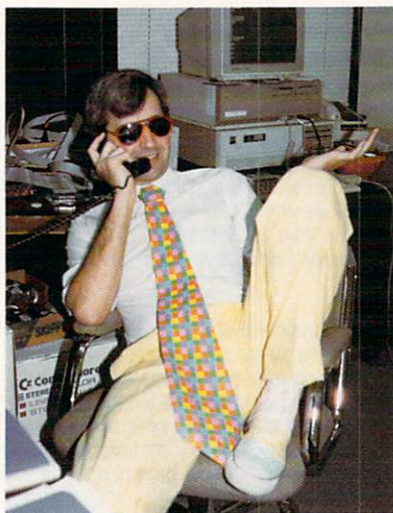
it, apply yourself. Be willing to work."

Scorpion's **Eli Tomlinson** says, "A lot of people are good programmers but don't fully think their ideas through. The game must come first."

Bob Maludzinski, president of Mindware International, makes an important point: "Start out with a system where you're constrained by resources. On a Commodore 64, for example, you have no room to be sloppy; you have to learn discipline."

Free Spirit's **Joe Hubbard** recommends this: "Once you've mastered the machine, contact a reputable publisher and show your stuff." He's encouraging. "This is a great time for Amiga programmers. There's a real shortage of people who can handle the machine."

Rick Ross of Discovery prefaces his advice with an old joke: "What's the difference between God and a programmer? God knows he's not a programmer." But the joke conceals serious advice: "No matter who you are," Ross says, "there's always somebody better. There's little you can do that hasn't been done before. Being able to work as a member of a team is the number 1 most critical element in success in this or any other field. Remember teamwork, and remember that business is a much broader activity than programming or game design."



R. J. Mical

gory." Like a lot of things, it's a problem not restricted to computer games.

"All flash and no substance," Mical says in the tone of a man who's seen it all. "There's too much of that."

IDG

Making SEGA Software

Manlio Allegra, one of the partners in International Development Group (which translates SEGA arcade games into disk-based products), takes a larger-than-normal perspective on Amiga entertainment.

"It's important that developers have a global view of the marketplace," Allegra says. "This is a worldwide business, and people who want to succeed should see it that way."

The course of creating an arcade hit and translating it from coin-op to Amiga may see the code travel from Japan to Europe to Canada or the United States. Along the way, some things stay the same.

"Playability—above all else," Allegra says, making clear that the player's experience is foremost in his mind. "With a great arcade game, you must hit what I call the *adrenaline factor*—the game has to trigger the player's adrenaline." ▶

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To do that, Allegra's designers and programmers use every skill in the book. "Fast action, sound effects and music (which are very important keys to total involvement in a game), graphics—all of it works together to put the player right into the game."

Without naming names, Allegra is critical of some current Amiga arcade efforts. "Amiga is the best machine on the market for sound," he points out, "but very few people have truly leveraged this strength. Also, too many games are basically ports from the Atari ST, an inferior machine."

Playability, sound, action—some things stay the same from one nation to another, from one operating environment to the next. But in the course of moving a game from coin operation to Amiga disk, some aspects do change.

"Occasionally we have to make alterations in the way that characters are designed," Allegra says. "We've redefined characters from some Japanese games. Also, some Japanese games don't work in the United States because they're just too cutesy."

But when it does work, when it all comes together in an adrenaline-boosting entertainment package, *arcade* comes close to being a universal language.

"At its best," says Allegra, "a great arcade game is a work of art."

Free Spirit

Toward More Adult Entertainment

Joseph Hubbard, president of Free Spirit Software, feels that it's time for more adult entertainment programs. Not pornography, mind you—just good fun with a measure of erotica mixed in. His big hit, *Sex Vixens from Outer Space*, typifies his approach.

Whether for adults or younger players, though, Amiga entertainment imposes certain requirements. "You've got to have good graphics, sound effects, entertainment value—but especially the graphics. The Amiga is noted for its graphics, and you've got to deliver that."

Is it more important to have a great game, or a great *Amiga* game? For once, Hubbard feels, you've got to have it both ways. "If you want to have a great game, you've got to de-



Manlio Allegra

liver a good game experience, and a good *Amiga* game experience." That means taking advantage of the machine.

Not everyone takes that advantage. "Some Amiga games get by just on graphics alone," Hubbard points out with some dissatisfaction. It may be that the Amiga tempts developers in that direction, in ways that other micros do not. "Obviously," he says, with a wry chuckle, "you can't get away with graphics-only games on an IBM."

Having achieved success with *Vixens*, Hubbard has a healthy attitude toward the importance of occasional bawdiness in entertainment. He's also aware of the social concerns about such programs.

At what point do we cross the line between adult entertainment and pornography? Hubbard feels that's a

Photo/Tom Netsel



Joe Hubbard

matter of individual taste.

"When we did *Sex Vixens*, we did it to have fun with that sort of game. We kept in mind a movie spoof called *Flesh Gordon*. That was the vein we were after—good-humored sexiness."

How does he respond to charges that software erotica is more dangerous than other forms of entertainment because of the interactivity the computer makes possible? Hubbard thinks such charges are out of line.

"Everyone has fantasies, and there's nothing wrong with that. At the computer, nobody gets hurt." He grows more adamant. "I'd rather see people playing erotic games on the computer, in fact, than shoot-'em-ups. You can sit at your computer and kill hundreds of people. Is that healthier for you than sex?"

Visionary Design Technologies

Sweating the Details

Randy Linden thinks it's the little things that make the difference between a game and a great game.

Director of product development for Visionary Design Technologies, publishers of *Vortex*, Linden feels that the final, detail-oriented polish of a game is perhaps the most crucial phase of development.

The big picture is important, too. Requirements for successful Amiga entertainment? "Very smooth animation, high-quality graphics, and very clean sound," Linden says without hesitation; then he lingers for a moment, thinking about game sound and the failure of some publishers to fully exploit this aspect of the Amiga.

"A lot of sound effects in Amiga games sound digitized, he complains, "rather than sounding like a professional product."

That's a shame, Linden feels, because it's so avoidable. "The Amiga has the potential to put out sound and graphics like no other home computer can. A lot of companies are rushing products to the market without giving the final polish and attention to detail that are needed."

Are Amiga games inherently different from other computer games? "I think so. Because the Amiga is such a fast computer, more games are reflex-oriented. For example, most recent games have fast action and colorful characters—just like

City Desk 2.0 Desktop Publishing Software Debuts At the First Houston Amiga Expo

Kan Yeung, the President of MicroSearch, is proud to announce the release of City Desk 2.0. The program was introduced at the First Houston Amiga Expo which was held at MicroSearch on April 15. The Expo, which was a huge success, was attended by nearly a thousand visitors and vendors. With vendors offering great discounts, our retail division reported record sales of over \$52,000. Jay Miner charmed everyone with his keynote address at the luncheon, which was held in his honor.

Thanks to everyone who attended for making the Expo a success. Special thanks to C'LTD, Microbotics, RGB Creations, WordPerfect, SunRise Industries, Spirit Technologies, TSR Hutchinson, Haitex, New Horizons, Precision, Bridge Foundation, CLAUG, CHUG-AMUG and Club Amiga.

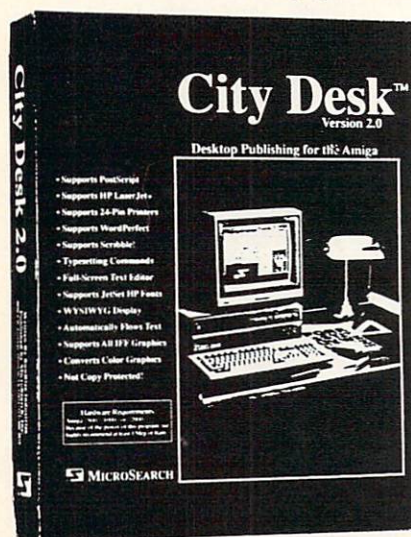
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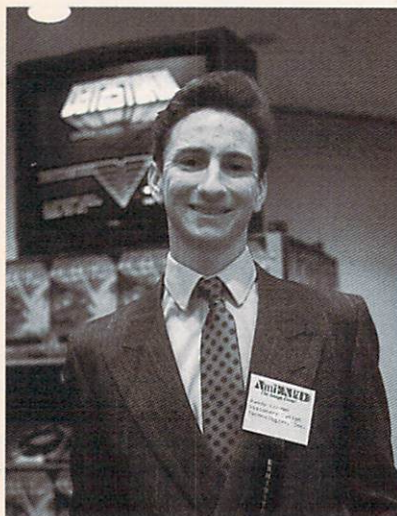
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entertainment arcade. The Amiga is an entertainment arcade machine in that sense—and as such is very different from entertainment IBM."

Linden is confident that we're entering a golden age of Amiga entertainment. The best developers are beginning to stretch the Amiga's capabilities. "New games like *Dragon's Lair* and *Sword of Sodan* are starting to hoist the Amiga to a new level. We're being catapulted toward the next level of Amiga games."

Will that next level involve new technologies? How likely are we to see CD-ROM on the Amiga, for example?

"Unfortunately," Linden says, "we're headed for two classes of



Randy Linden

Amiga users—the 500 users and the 2000 users. CDs allow incredible amounts of data storage and phenomenal retrieval—but I think it's going to be restricted to the high-end 2000 users."

However the technology develops, Linden sees Amiga entertainment getting better all the time. "The next round of games is going to be very creative, based on brand-new ideas. The Amiga is maturing to the point where games require more depth. Like books, games are getting to the point where the farther you get into the game, the more you get out of it."

What can you get out of a great game? "As much as possible. People want more out of their games. They don't want to just sit around and hit the fire button. They want games that entertain them. Games that let them think, discover, and learn." ▲

Over Here, Over There



More than 200 years after the Revolution, there are still differences between the Royalists and the Colonials. Two experts take two different looks at the differences between American and British entertainment software.

Eli Tomlinson

The View from Here

Eli Tomlinson, president of Scorpion Software, imports quite a bit of British entertainment for the Amiga. In his opinion, the differences between America and England, in terms of software, run more to variances of taste than to quality.

"The actual quality of the programming is equal," Tomlinson says. "In fact, the British have a lot of great programmers."

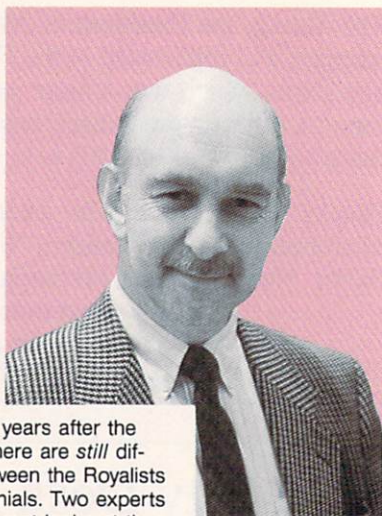
That quality yields different results, though. "American and British tastes tend to be very different when it comes to software. Americans are attracted to thinking games, role-playing games, fantasy games, war games," Tomlinson feels.

And overseas? "The British are a lot more enthusiastic about straightforward shoot-'em-ups and arcade games."

There are marketing differences as well. "America is a much more closed market than England. Anybody can get started in England and be in all the outlets."

In the States, Tomlinson feels, it's tougher. "Here, we have to deal with a number of distributors. Some of them want to keep limits on the number of products they'll handle. Sometimes that seems like as few products as possible. Naturally, the major publishers get the first shot at the shelf space. So it's harder getting into the stores."

Conversely, in England, shelf space is available, but shelf life is brief. "It's like two weeks—unless you have a real superhit, initial orders are about all you get in England."



Antony Jacobson

The View from There

Magazine publisher Antony Jacobson is very British and very committed to the Amiga. The combination results in some strong opinions about the virtues of European software and the nature of American software.

Are the two similar? Jacobson thinks not. "There is a definite difference. The games that are produced in the U.S. are, I think, simpler. Americans like very basic shoot-'em-ups. Very good, very fast," he points out. "But basically, they're still shoot-'em-ups."

It's different overseas. "In Europe they tend to produce more complex games—games like *Captain Blood* and *Starglider*. Those [types of] games are being demanded in Europe and are of substantial complexity because the people who have bought the Amiga there are not necessarily the same group who've bought it here. They are probably people who have had ten years of game-playing experience. They know all the tricks, they've seen all the sprites, and they want to be challenged. You cannot at this moment produce an Amiga game for Europe which is not a demanding game, and make it work."

What American games does Jacobson admire? "I like *Sword of Sodan*. That went a long way. *Arkanoid* is very good."

Jacobson is hopeful of renewed creative energy in American Amiga entertainment. "I think there was a dropping off of the amount of intellectual input that went into games here."

Among American publishers, Jacobson has special appreciation for Cinemaware. "They are the pacesetters."

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BRIDGING THE GAP

A Hands-On Look at Commodore's Bridgeboard

Neil Randall

The Amiga 1000 made its debut in 1985 when the IBM PC was the only business computer to be taken seriously. The Macintosh, itself only a year old, was still regarded as a toy by the business crowd, and the Apple II and Commodore 64 had never made it to the big time. Small wonder, then, that one of Commodore's major goals with the Amiga was IBM compatibility. And since the IBM family and its growing legion of clones were run by Microsoft's MS-DOS, that meant the Amiga, too, had to become an MS-DOS clone.

At first, Commodore thought to solve the problem with software. In 1986 the company released *Transformer*, which, along with a 5¼-inch disk drive—the Commodore 1020—did in fact lend MS-DOS capabilities to the Amiga. But three problems quickly emerged. First, *Transformer* ran the monster MS-DOS packages like *WordPerfect*, *WordStar*, *dBase II*, and *Lotus 1-2-3*, but it had trouble with several

other packages, especially those with any kind of graphics orientation (a great irony, considering the Amiga's vastly superior graphics capabilities). Second, *Transformer* was slow, running well below the 4.77 MHz attained by even the most unadorned PC. Finally, MS-DOS users were quickly becoming accustomed to hard disks, and the Amiga market was not yet large enough to sustain them.

The *Transformer* software is still available, and public domain programs that speed it up are as well. But real MS-DOS compatibility is achieved by hardware, not software, because the Amiga and PC machines use not only different microprocessors, but also microprocessors manufactured by entirely different companies. The Amiga (like the Macintosh and the Atari ST) runs on Motorola's

68000 chip, while PCs use Intel's 8086 or 8088. Marrying the two is far from an easy task.

Eventually, Commodore developed the Sidecar, an Amiga 1000 hardware add-on that was, in effect, an IBM PC XT in a small box. When the company decided to stop developing the 1000 in favor of the 500 and 2000, it abandoned the Sidecar as well. In its place Commodore introduced the A2088 Bridgeboard, a plug-in card for the Amiga 2000.

How Does It Work?

The A2088 Bridgeboard is a full-sized hardware card that fits into one of two special slots residing inside the 2000. Because it physically fits across both the PC and Amiga slots, it acts precisely as the bridge its name suggests. In an impressive achievement of hardware engineering, Commodore managed to bridge two entirely different computing worlds.

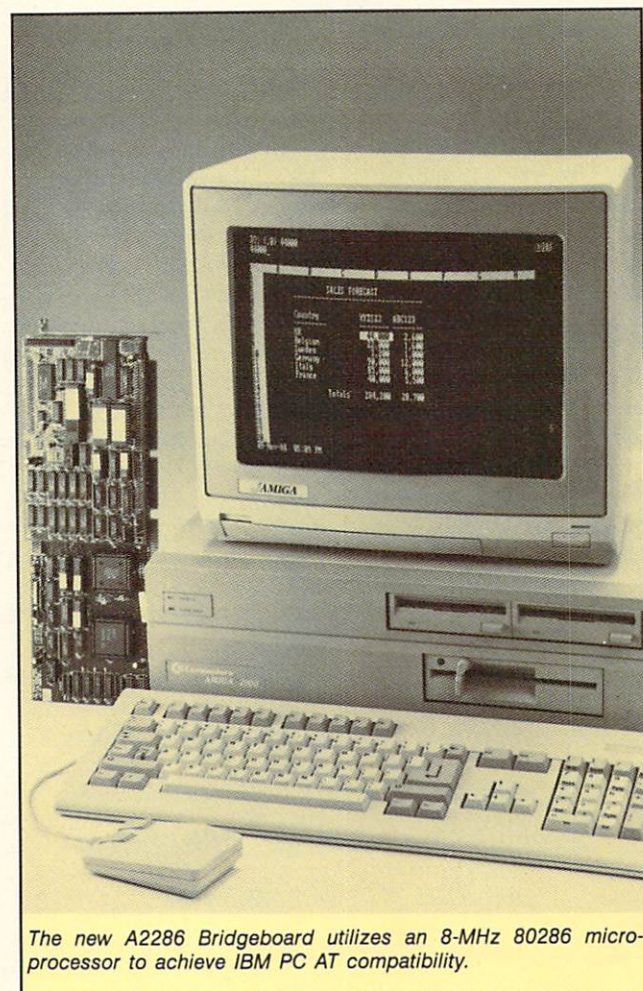
What the Bridgeboard has to do is allow an MS-

*Curious about the Bridgeboard?
Veteran Amiga user Neil Randall
provides a hands-on evaluation of
Commodore's best-selling
Amiga 2000 peripheral,
describing what it is, how it works,
and how you can use it.*

DOS machine to work simultaneously with—and as part of—an Amiga. To that end, the Bridgeboard contains both a separate computer and circuitry that allows two computers to share a system. This means, functionally, that the Bridgeboard's Intel 8088 processor, the heart of IBM PC XT clones, must work hand in hand with a Motorola 68000, the central processing unit in the Amiga.

Getting the 8088 itself to work is not the problem. Commodore has had a PC-compatible line of computers for a couple of years now, so the technology was already in place. The Bridgeboard's PC works as a stripped-down XT, with a 4.77-MHz 8088, a socket for an 8087 math coprocessor, 512K of RAM, a 16K BIOS designed by Phoenix Technologies, and a 5¼-inch floppy disk drive (with controller on-board) designed to fit into the 2000's lower opening. The Bridgeboard has the Amiga's keyboard emulate a standard XT keyboard, while the Amiga's parallel (printer) port can be assigned to the PC side. While all this is going on, the Amiga monitor is emulating either monochrome or IBM color mode.

Slots and ports take care of the rest of the PC emulation. The Bridgeboard itself contains a Centronics parallel port, into which you can plug an external disk drive. Either the Commodore 1020, a 5¼-inch Amiga drive, or the standard Amiga 1010, an external 3½-inch drive, can be placed here, with the 3½-inch drive able to format double-sided disks with 720K capacity. As long as you put the Bridgeboard in the rightmost bridging slot inside the 2000, you have three full-sized PC slots available for such peripherals as video adapters,



The new A2286 Bridgeboard utilizes an 8-MHz 80286 microprocessor to achieve IBM PC AT compatibility.

hard cards, music cards, speed-up cards, and even AT-emulation cards.

Separate as the PC and Amiga sides are, they nonetheless share a very valuable 128K known as dual-port RAM. Through the dual-port RAM, which is subdivided into three sections, the Amiga is able to interact with and control the PC XT that resides on the Bridgeboard. Combined with two large custom chips on the Bridgeboard, which contain the Amiga's control configuration and the Janus software interface, the dual-port RAM lets the Amiga display and control the PC XT as if it were merely another Amiga window.

Getting It to Work

1. Some Assembly Required.

Learning to use the Bridgeboard is anything but a snap. A safe prediction is that anyone who buys an Amiga 2000 without having used one before and adds a Bridgeboard without having used MS-DOS before will simply not be able to get started. Those who know one system but not the other will have a somewhat easier time. The ideal, however, is to know both AmigaDOS and MS-DOS or to get someone who does to set up the system for you.

To load MS-DOS on the Amiga, you must first install the Bridgeboard. The best scenario here is to have your

dealer install it for you, especially since opening the 2000's chassis can cancel your warranty. Installing the Bridgeboard, though, is quite easy: Just open up the 2000 and follow the instructions in the Bridgeboard manual. All in all, the procedure takes about half an hour.

2. Monochrome or Color, and Who Gets the Printer?

When the Amiga is back together, you slip the MS-DOS system disk (included with the Bridgeboard) into the 5¼-inch disk drive (which you installed with the Bridgeboard) and then power up the Amiga. When the Amiga asks for the Workbench disk, you insert the PC-Workbench disk, also included in the 2088 package. This disk contains a modified startup sequence which boots MS-DOS after it has booted Workbench. After that, you need only open an MS-DOS window.

To open an MS-DOS window, you double-click the PC drawer found on the PC-Workbench disk. Up comes a window with programs named PC Mono, PC Color, PCDisk, LPT1, and PCPrefs. PC Mono opens an MS-DOS monochrome display, while PC Color gives a PC color display. Clicking on LPT1 assigns the Amiga's printer port to the PC side. PCDisk runs the software necessary for transferring files between MS-DOS and AmigaDOS and for using Amiga disk drives as virtual disks (more on this below). PCPrefs gives you the option of disabling the Amiga display (used if you buy a separate monitor for the PC side) and allows you to set the amount of memory your system will use for the Amiga/Bridgeboard interface.

One example of the difficulty in using the Bridge-

board software is the effort required to open a PC color display. The Bridgeboard defaults to a monochrome display when it boots, so you must specifically request a color display. To do this, you double-click the PC Mono icon; then you type MODE CO80 on the MS-DOS screen and hit RETURN. Then you must close the PC Mono window (by clicking the close gadget) and double-click the PC Color icon from the PC-Workbench window. Now you can change the default for a color display, but the point is that for first-time users this is both bewildering and unnecessary. Surely all that was needed was a requester asking whether you want monochrome or color on boot-up.

3. Looking Through the PC Window.

Keeping in mind that the PC Window is just another Amiga window, it's not surprising that it contains Amiga-like pull-down menus. Primarily, you use these menus to configure your PC window as you like. You can choose Hide Borders to get rid of the window borders (this makes it look most like a PC display), or choose Small-Size Window to shrink the window into a corner (for access to the Workbench). Window Freeze lets you hold the contents of a PC window in place (usually so you can work on another PC window simultaneously), while Set Cursor Blink Rate allows you, not surprisingly, to alter the rate at which the cursor flashes. Then, too, you can open a second and third PC window (they multitask), or you can set the number of text colors (4 maximum with monochrome display, 16 maximum with color display). Unlike a real PC, the

Amiga's PC can choose its colors from the host machine's 4096 available.

Also included is a rudimentary cut-and-paste function. This lets you transfer text between the PC window and other Amiga applications. Unfortunately, you will run into problems if your Amiga application doesn't use the Amiga's clipboard (*WordPerfect* is the prime nonuser here). This is not the fault of the Bridgeboard, however; such offending programs cannot cut, copy, or paste to *anything* but themselves.

- Buy an external 3½-inch disk drive and plug it into the Bridgeboard's port. If you already own a Commodore 1010 (the normal Amiga external drive), this will work. In fact, you can then switch it from the Bridgeboard's port to the Amiga's external port as need demands.

Note, however, that the Bridgeboard will format disks in this drive with only 360K of storage space unless you change the CONFIG.SYS file on your MS-DOS system disk. To do this, load CONFIG.SYS into a good word processor (don't use the

drive (see the final option in this list).

- Buy an MS-DOS hard drive with controller. The Amiga side will be able to share this drive by using the Janus software supplied with the Bridgeboard. These drives are called *Janus drives*.

Note that the choice between option 3 and option 4 depends on which system you use most frequently. An Amiga hard drive will let the Amiga autoboot when you power it up (you don't need the Workbench disk) and will give faster disk access to the Amiga side than to the MS-DOS side. By manipulating the Amiga's startup sequence, you can also autoboot MS-DOS using this drive. The only benefits to buying an MS-DOS hard drive are increased speed on the MS-DOS side and a greatly reduced price. Count on over \$800 for a 40-megabyte Amiga drive—\$400 for an MS-DOS drive with the same storage.

- Use your Amiga drives as MS-DOS virtual drives. The combination of the PCDisk icon on the PC-Workbench disk and the JDISK program on the supplied MS-DOS disk lets you use existing Amiga disk drives as if they were MS-DOS drives. This means that you can use the 2000's internal drives (df0: or df1:), the Amiga's external drive (df2:), or the Amiga's hard drive for the MS-DOS side of the system. Setting up virtual drives isn't especially difficult, but the Bridgeboard manual, which is otherwise pretty good, goes a long way to making the process thoroughly confusing.

What you're doing in creating a virtual drive is telling the Amiga drive to set aside some space on the disk for MS-DOS storage. Tech-

The Bridgeboard, unlike a real PC, can choose its screen colors from the Amiga's 4096 different hues. Every second Amiga 2000 buyer purchases a Bridgeboard.

4. Virtual or Real? Only Janus Knows for Sure.

The Bridgeboard comes with one 5¼-inch disk drive that you install inside the Amiga 2000. It formats double-sided disks with 360K of storage space. The problem is that many PC programs require two drives, and an increasing number are ineffective without a hard drive. In the PC world, you see, hard drives are cheap.

There are five ways to attach an extra drive to a Bridgeboard:

- Buy an external 5¼-inch disk drive and plug it into the drive port supplied on the Bridgeboard. The Commodore 1020 is fine for this, but a lot of other drives are available.

hopelessly unfriendly EDLIN program supplied with MS-DOS); then add the line
DRIVPARM=/D:01 /F:2 /H:2 /S:9 /T:80

to the file, making sure you include all the spaces, and save it in ASCII (text) format. Next, reboot MS-DOS by pressing the CTRL, ALT, and DEL keys at the same time. You can now format 3½-inch disks with 720K of storage space.

- Buy an Amiga hard drive with controller. The Commodore 2090A controller is the standard here (don't get the 2090, because you can't autoboot with it), and there are a number of hard drives on the market. The MS-DOS side will be able to share this drive by using it as a virtual

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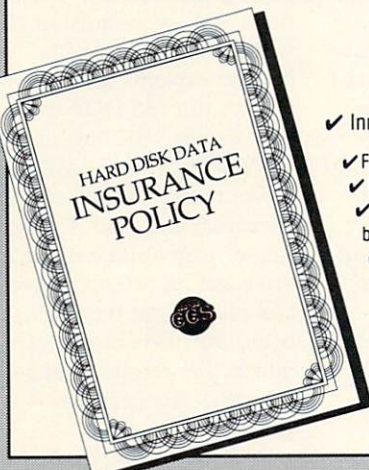
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Mac-2-Dos will also be available without the Macintosh drive. This option DOES NOT include the ability to use the Mac drive to read/write Amiga diskettes.

DOS 2

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nically, this space is just an AmigaDOS file that the Amiga can't read, but from the user's standpoint it is, for all intents and purposes, an MS-DOS disk. The problem is that the JLINK software is far from easy to implement.

Proceed with Caution

The procedure below tells you exactly what to do to set up an MS-DOS virtual drive on the 2000's internal drive df1:. There are several options available, but you should explore these only after you have the procedure down pat.

- Your CONFIG.SYS file must contain the line `DEVICE=JDISK.SYS`. If it doesn't, use your favorite word processor to add this line and then reboot MS-DOS by pressing CTRL-ALT-DEL.
- Open the PC-Workbench and double-click on PCDisk. (Note: You *must* do this or you can't use a virtual drive.)
- Open an MS-DOS window by double-clicking on the PC Mono icon.
- Answer the time and date prompts and get to the A> prompt.
- Put an Amiga-formatted disk (preferably blank) into df2:.
- Change to drive a: and type `JLINK D: DF2:VIRTUAL /C:160`
- Now use your MS-DOS software. Whenever you wish to use the virtual drive for loading, saving, copying, and so on, tell the program to use drive d:.
- When you have finished using MS-DOS, don't just close the window or turn off the machine. Instead, unlink the virtual drive by typing `JLINK D: /U` (if you don't do this, you can damage the

file you've created).

- When you want to use that virtual drive again, boot up MS-DOS, put the same disk in df2: and type `JLINK D: DF2:VIRTUAL`
- Once again, you can load and save files to df2: via d:.

A bit of explanation: You don't have to call your virtual drive d:. JLINK allows c:, d:, e:, or f:. In fact, you can have four virtual drives going at the same time. Also, you can specify any Amiga drive as the location of your virtual drive; just make sure you have a formatted disk in it. For

Bridgeboard is an IBM PC XT clone.

I have run several MS-DOS programs on the Bridgeboard, and all have operated flawlessly. Some graphics-intensive games will not run, I have heard, but those that I have tried—*Starflight*, *Star Commander*, *Flight Simulator II*, *Nobunaga's Ambition*, *Civil War*, *Pete Rose Baseball*, *Heroes of the Lance*—have all run without problems. Similarly, I have successfully worked with *WordPerfect*, *Microsoft Word*, *Microsoft Works*, *Lotus 1-2-3*, and other applications software. AdLib's Music Syn-

had the guts to try.

If you opt for the Bridgeboard, buy a hard drive as well. If your budget is a bit tight, get an MS-DOS hard drive and partition it for use with the Amiga side (the manual explains how). If you plan to run MS-DOS software extensively, buy an extra MS-DOS drive—virtual drives remain far too clumsy for casual use. And if you absolutely can't afford a hard drive, get an external drive and plug it into the Bridgeboard slot. Do *not* expect satisfactory results from a one-drive Bridgeboard system.

Commodore managed to bridge two entirely different computing worlds, an impressive achievement of hardware engineering.

example, `JLINK C: DH0:VIRTUAL` will put a virtual drive named c: on the Amiga hard drive, thereby emulating the normal MS-DOS hard drive system. You can also put virtual drives into the Amiga's ramdisk (`JLINK E: RAM:VIRTUAL`), the new RAD disk, or df0: or df1:.

Finally, the size you give the virtual drive (`/C:160`) doesn't really matter because, like the Amiga's RAM drive, the virtual drive will grow as more data is stored on it. That's why I recommended using a blank disk as a virtual disk—you don't want your virtual drive fighting for disk space with Amiga files.

Does It Really Work?

Yes, it really works. Properly installed and configured, the

thesizer card worked perfectly in a PC slot, and I have talked with people who have successfully used VGA cards and hard disk cards. The Bridgeboard manual claims full compatibility with cards such as the AST Six Pak Plus, the ATI EGA Wonder, the Intel Above Board 2MB expansion card, a Hayes Smartmodem 1200 internal modem, a Mountain 20MB Drive Card, a Plus Hardcard, and a Taurus LAN card.

At 4.77 MHz, however, the Bridgeboard is slow. Most PC XT clones now come with turbo or double-speed processors, and users of these will notice the difference. One technician suggested—off the record—that I replace the Bridgeboard's 8088 processor with the faster 8088-2, but I haven't as yet

The Future

In December 1988, Commodore announced the A2286D Bridgeboard. This board replaces the 2088 and gives the Amiga full IBM AT compatibility. The A2286D contains an Intel 80286 processor (on which ATs are based), and a 1.2MB 5¼-inch disk drive. This version of the Bridgeboard runs at 8 MHz, much faster than the 2088, but still well short of the 10–12 MHz standard of stand-alone AT clones.

Commodore estimates that every second Amiga 2000 buyer purchases a Bridgeboard. Whether or not this trend will continue with the more expensive A2286D board is impossible to predict. What can be predicted, though, is a further upgrading to the 80386 and beyond, because the Bridgeboard/Amiga combination is a strong one. The interface software must be improved dramatically to build the system to its potential, but having two computers in one case is a very good idea. For those who want an Amiga but also need access to MS-DOS, the Bridgeboard is a nearly ideal solution. ▲

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Rodent Roundup

A Close-Up Look at Input Devices



Tethered to each and every Amiga is a Commodore Amiga mouse.

While you can run your Amiga mouseless in a pinch (via the Amiga keys and the cursor keys), it's not much fun at all. Now there are two alternative mice: the My-T Mouse, from Southern Technologies, and the Boing! Mouse, from Centaur Software. This article takes a close look at those mice as well as two alternatives: the Easy! drawing tablet and the Inkwell Light Pen.

While the latter two devices appeal mainly to artists, the mice are another matter. Why would you buy a mouse when one comes free with your Amiga? There are two possible reasons: if your Amiga mouse starts misbehaving (or flat out dies) or if you'd like to take advantage of software that supports the middle (third) button sported by both of

these challengers.

Currently that second reason may be moot (as little if any software yet supports the middle mouse button), but since the Amiga software supports that middle button, don't be surprised to see three-button support in applications software soon.

I feel especially qualified to comment on the first reason, though, since my first Amiga mouse died after only a few months of service (soon after the death of my first power supply, in fact). My second Amiga mouse is still workable, but despite my careful attention and a routine schedule of maintenance, it is beginning to slack off on such operations as dropping the menus and moving in certain directions. I'm not picking on Commodore's mouse (after all, it seems to hold up well for everyone else here at COMPUTE!), but I must admit

that I was relieved to see some competition for the small beast.

While the three mice mentioned here plug right into the Amiga's mouse port, the other two peripherals, the touch tablet and the light pen, plug into other ports and depend on the custom software included in the packages.

The light pen plugs into port 2 (the joystick port). The Amiga 500 version of the touch tablet plugs into the expansion connector on the left side of the machine and provides a pass-through for such devices as hard drives and RAM expanders.

The Commodore Amiga Mouse

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The Commodore Amiga mouse is the standard against which every Amiga

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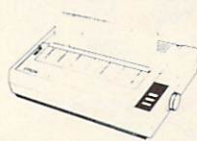
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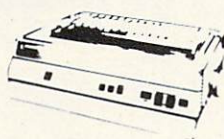
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input device is measured. It feels good in the hand and rolls across most surfaces smoothly and quietly. The cable is almost four feet long—long enough for virtually any desk arrangement.

But the mouse is not without its problems. It must be cleaned regularly or it begins to squeak. Also, the microswitches under the mouse buttons may fail eventually.

The Boing! Mouse

\$114.00

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4435 Redondo Beach Blvd.
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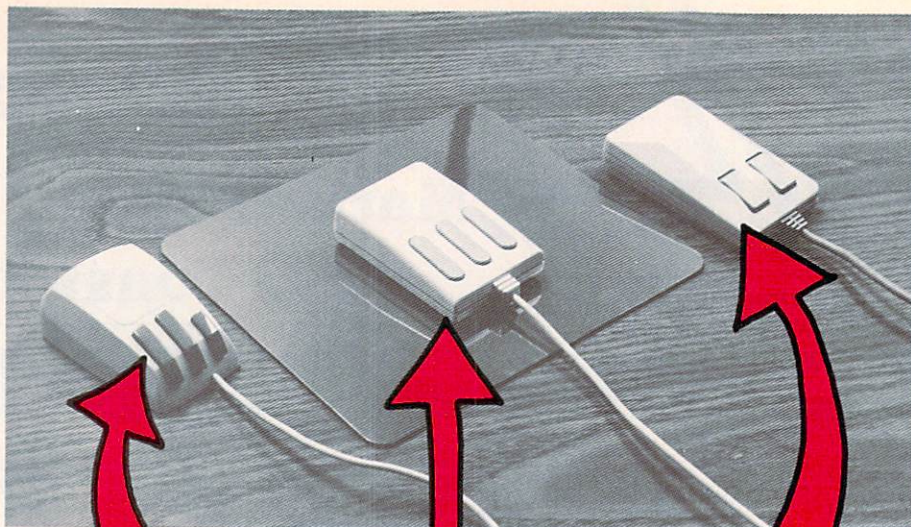
The Boing! Mouse is the first optical mouse for the Amiga. It has an excellent feel.

Unlike the standard Amiga mouse, the Boing! mouse contains no moving parts, so it's maintenance-free. It's smooth and quiet.

The Boing! Mouse works by tracking the reflection of a light beam off of the special mouse pad provided in the package. Unfortunately, this system doesn't seem very accurate. The mouse pointer jitters when you move it quickly across the screen.

The Boing! Mouse has three buttons. The middle button goes unused with most Amiga software. However, there is some software in the works which uses the button—most notably, the X-Windows interface for UNIX-equipped Amigas coming from GfxBase, a company started by Dale Luck, who wrote much of the Amiga's graphics library.

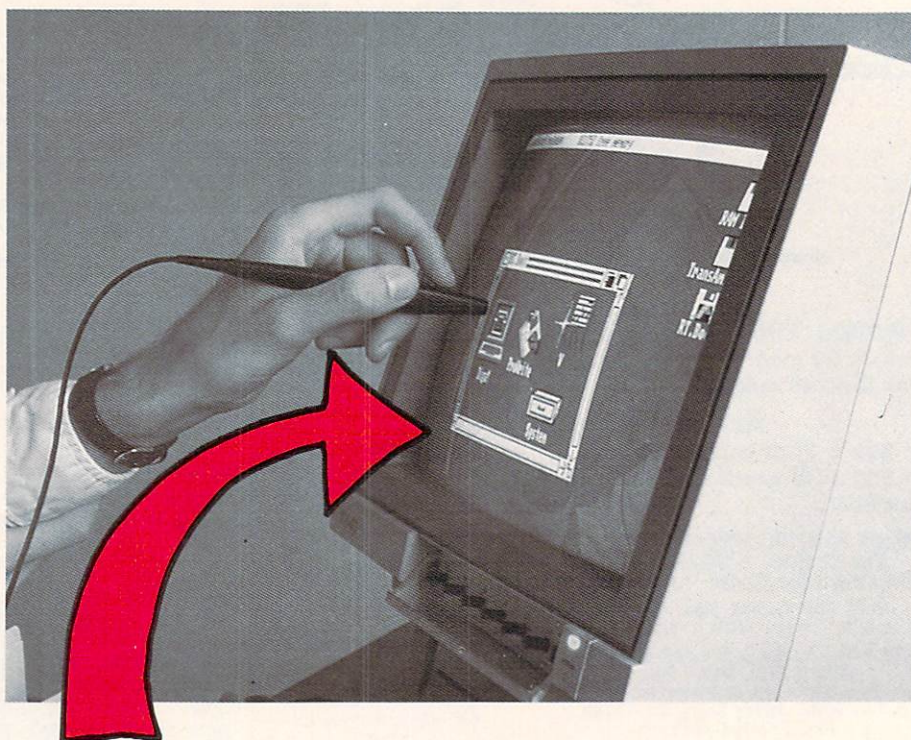
If you have the money and you don't want to worry about mouse maintenance, you'll be pleased with the Boing! Mouse. ▸



The My-T Mouse

The Commodore AMIGA Mouse

The Boing! Mouse
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The My-T Mouse

\$59.95

Southern Technologies
2009 McKenzie
Suite 110
Dallas, Texas 75006

This mouse, although it has a bit of a cheap feel to it, is a good replacement mouse for the Amiga. It is accurate. In use, the My-T Mouse emits a sound not unlike the hollow roaring you hear when you press your ear to a conch shell. Some may find this sound annoying, but it doesn't bother me.

Like the Boing! Mouse, the My-T Mouse features a third mouse button. The My-T Mouse feels good in the hand, but the mouse buttons are a bit too thin.

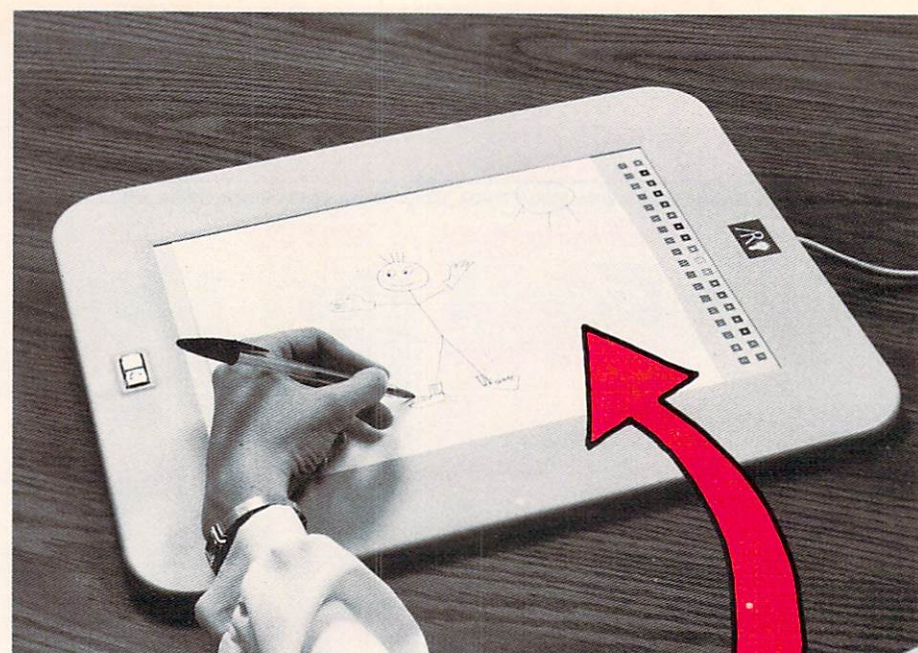
Overall, the My-T Mouse is a good replacement mouse.

Inkwell Light Pen

\$129.95

Inkwell Systems
1050-R Pioneer Way
El Cajon, CA 92020
I had some classic moments of frustration with the Inkwell Light Pen. The first problem I had was that the pen couldn't see my screen very well because I prefer a black background. Since the light pen tracks the light emitted from the video tube of your monitor, it must sense a signal strong enough to register. *Strong* means bright—you might even want to wear sunglasses when you use this light pen.

After I'd loaded *DeluxePaint III* (the pen does *not* work with *DeluxePaint II*), I switched the background color to white. The Light Pen had no problem tracking the beam. It took me awhile to get used to using a light pen, and I never did become proficient at it (others might). The best I could manage was a cartoon style.



With the Easyl, Artists can draw just the way they're used to — with pencil and paper.

The most difficult task in trying to use a light pen is to figure out just where to put your elbow. I had to move my computer to the left to clear a space below the monitor. Still, after a few minutes, my arm grew tired.

The Light Pen isn't accurate if you press the tip against the screen. You have to back away at least two inches.

The Light Pen requires special driver software. After you've run the software, you can use the mouse and Light Pen together.

The Light Pen might work best as a input device for custom programs. For instance, you might develop a program which allows menu entries to be made from the pen.

The manual shipped with the Light Pen is good. For a light pen, the Inkwell works well, but I fail to see the advantage the device has over a mouse.

The Easyl

\$399.00

Anakin Research
110 Westmore Dr.
Unit 11C
Rexdale, Ont.
Canada M9V 5C3

Artists will love the Easyl—especially artists who are used to drawing on paper. It feels much more natural to draw on a tablet than to draw with a mouse. To use the Easyl, just drop a piece of paper onto the pad, boot your favorite paint program, and start drawing with a pencil or pen. With the Easyl, it's easy to trace artwork (as long as you don't mind drawing on the original).

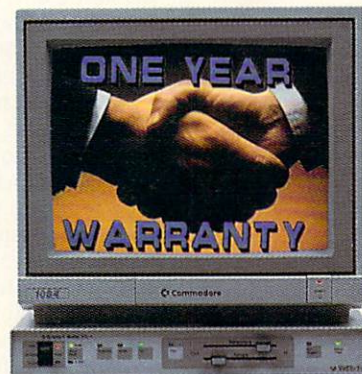
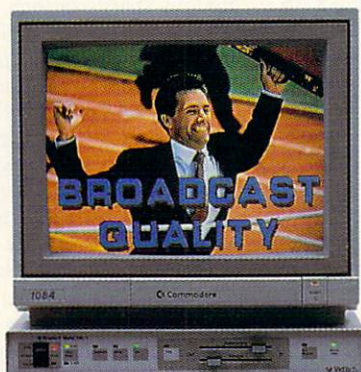
To install the Easyl, you must insert its interface into the expansion port of the Amiga. It was a tight fit on COMPUTE!'s Amiga 500. In fact, when we first forced the interface onto the 500, it refused to boot, showing us only a green screen and a blinking power light.

Fortunately, associate editor Randy Thompson had read that you could reseat certain chips by pressing the 500 down onto your knee. Amazingly, this fixed the computer.

The Easyl comes with a paint program called Easyl, but using this program is an unpleasant experience. Instead, we used *DeluxePaint III*. The mouse is active at the same time the Easyl is.

Driver software is provided for both left-handers and right-handers. The normal drivers use the pad buttons the same way mouse buttons do, while the drivers preceded by the letter R reverse the logic of the left mouse button. The effect of this is that you don't need to hold down the mouse button while drawing—only while you wish to move the pen without drawing.

For those willing to pay the price for their art, the Easyl is an excellent choice. ▲



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10 HOT NEW GAMES FROM EUROPE

Marshal M. Rosenthal

Years ago, few American game players considered buying programs from "across the pond." After all, there was plenty of great stuff right here—and in English. • Times have changed. A vast number of games are being developed in England and Europe. And since Commodore's presence overseas is very strong, much of this activity revolves about the Amiga. So much good stuff is available that U.S. retailers are beginning to take notice. • So what's hot over there? (There usually means England—where the bulk of the Amiga software is being developed.) Looking ahead at new releases, here are ten games that should keep you rocking.



Afterburner

Activision U.K.'s *Afterburner* is exactly what you'd expect. Pilot a deadly F-14 through level after level of nonstop action. Enemy planes menace you from above as target opportunities present themselves below. Beware of incoming missiles, especially from behind, and be prepared to roll your craft to avoid being blown to bits.

The mouse does it all, so keep your eyes glued to the screen and monitor the warning lights. Of course, you can kick in the afterburners and shift to high speed, but watch the fuel gauge. Fortunately, there are locations where you can refuel and load new missiles. Great sound, fancy graphics, and lots of action really do it to you here.

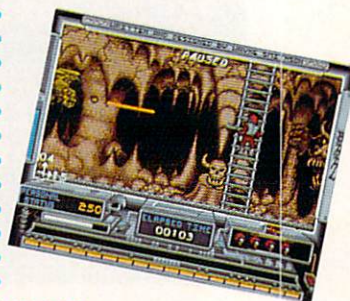
Real Ghostbusters

We all know who to call by now, right? So Activision's *Real Ghostbusters*, based on the animated TV series, comes just in time. You and a companion (if desired) must fight to rid the city of a host of ugly-wuggies in 12 levels of zapping electron beams, mad marauding monks, and walking mummies. Sheesh—this seems more like work than fun.

Each level ends with a guardian ghost that has to be whacked off before you can proceed to the next. Good thing the invincible Slimer is willing to lend a hand. The charm of *Real Ghostbusters* is its cartoonlike feeling. Animation moves quickly, the characters are funny, and the soundtrack is entertaining.

Vindicators

Another red-hot conversion is Domark's *Vindicators*. Enter your SR-88 Battle Tank and take on the evil Tangent Empire. Smash through their hideous space stations, destroying automated defense turrets and mobile armored tanks. Pick up extra fuel canisters, as well as Battle Stars, which allow you to purchase weapons and superpowers. Demolish the main control center; then warp out to the next station. There are 14 in all. The 3-D multidirectional scrolling keeps the challenge alive, and you start leaning into the screen to catch the enemy before he sees you.



BAAL

BAAL (Psygnosis) is one of those games that keeps you coming back, even when you swear that you've had it. The main heavy, Mr. B., is about as bad as they come. He's waiting for you down in the depths of the earth—should you live so long.

Your onscreen soldier has a laser weapon that can kill most of the evil things found in the pits, but mostly you have to keep moving. You can somersault over obstacles, but you can't go up if there's nothing to climb. There are tools and powers to acquire that will help you along the way.

Horizontal scrolling, up and down ladders, and lots of animated characters add up to a great challenge (and plenty of frustration). This is one tough game.



Dragonscape

Let's back up a bit with Software Horizons' *Dragonscape* and try a little strategy. There are monsters, but there's less wanton violence.

Garvin, your pet Dragon, flies you around the depressing landscape of Tuvania, a land bent beneath the curse of the King of Kaos. Avoid or destroy the evil aliens sent by the king as you search for hidden artifacts that can help you save your beloved land. Each level is huge, consisting of many screens that scroll in all directions. Of course, there's a time to think and a time to fight: *Dragonscape* provides you with both.

Scorpion

Scorpion, from Digital Magic, is fun. Fight your way through a magical land filled with danger. Numerous hostile creatures bar your way, but your animated character knows what to do. Collect weapons and increase your skills as you go through five scrolling levels. No surprises here, but smooth scrolling and over 100 aliens to chomp keep you more than just awake.

Robocop

Robocop is another conversion from the coins to look for, courtesy of Ocean Software. Play the big metal guy as he takes on the worst scum imaginable on the city streets. Your rapid-fire gun makes mincemeat of these baddies, but beware the relentless ED-209 Robot; he's one mean dude.

Be sure to follow your directives and protect the

innocent—in other words, don't shoot the good guys. Make it to level 9 for the final confrontation with evil mastermind Dick Jones.



Barbarian II

Now that you're in a violent mood, it's time for *Barbarian II*, from Palace Software.

Once more the mighty barbarian warrior comes forth in full-color animation to battle the dreaded Wizard Draz. If you prefer, choose to put the lovely princess through her paces instead.

Run, jump, hack, punch, and kick your way through large levels featuring plenty of blood 'n' computer guts. Digitized sound effects enhance this product that places strategy on the back burner. Sword-and-sorcery lovers will find this game the one to grab.

Slip Stream

Microdeal sends you reeling with *Slip Stream*. Fly through an alien landscape, destroying everything possible. That also means taking out the various spacecraft that appear.

It's paramount that you reach the end of the stream and destroy the crystal that powers all your foes. Each stream (nine in all) is different, with arches and tunnels leading you toward the eventual destruction of this evil alien race. And then there's the changing weather; it never changes for the better, though. Fast, solid 3-D scrolling keeps you busy, especially as the screens change each time you play. Stereo sound effects are fun, too.



Seuck

Let's close with something a bit different: *Seuck*. No, I'm not clearing my throat. This is the name (acronym, actually) of the Shoot Em Up Construction Kit from Outlaw Productions. Powerful editing tools eliminate the need to know advanced programming techniques. Instead, these tools accent the power of your imagination in creating full-featured games.

Once your idea is ready, use the sprite designer to create a fighter, aliens, and other visual effects. Then go to the background editor to make a playing field for the action. Specify how all the objects behave in the game, how they'll move, and how they'll sound when hit. There's no keyboard input; everything is mouse-driven. Finally, combine all the elements and try it out.

Seuck isn't hard to master, but it does require time to get all the elements together. The results will be well worth it.

Now when will these games show up in a store near you? That's a hard one, because it depends on importers, dealers, arrangements—all that kind of transatlantic jazz. But you can bet that most of these games will become available, especially if the demand is great enough. If you're interested, let your dealers know you want them. ▲

Marshal M. Rosenthal has been involved as a photographer and writer in the overseas market since the early days of the "dreaded" Atari 2600. He maintains a studio in New York, where he specializes in photographing

children for print advertising. His features and pictorials can be found in major computer- and entertainment-related publications throughout England, France, Germany, Sweden, Mexico, and the U.S.

Who's Got 'Em

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England RG2 0JN

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Slip Stream
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England PL25 4YB

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5NS

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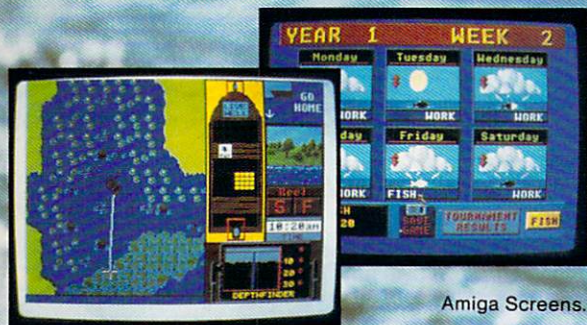
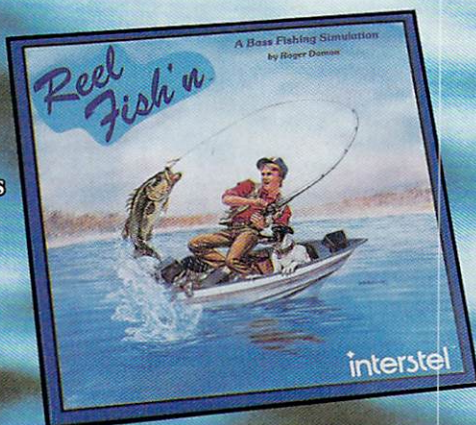
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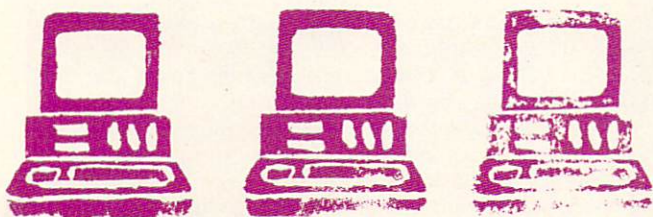
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CUSTOMIZING YOUR AMIGA



**Rhett Anderson
and Randy Thompson**

The Amiga's user interface is unique. You can operate the computer graphically from the Workbench or textually from the CLI—or even use both at once. No matter which way you go, you can always customize your work environment. This hands-on tutorial takes you step by step through the process of making your work environment just right for you.

The Amiga's user interface is under construction. When the Amiga 1000 first appeared, it sported version 1.0 of Kickstart and Workbench. Version 1.1 has since come and gone. Those early versions suffered from annoying bugs and almost comical sluggishness. Version 1.2 was a great improvement. In fact, that version was the first deemed stable enough to be put into ROM. Many things changed from version 1.0 to 1.2, but the user interface of the Amiga remained the same.

The deepest level of the Amiga's user interface is called Intuition. Intuition controls the objects that Amiga users must commonly deal with. Even if you don't realize it, you've probably encountered most of the elements of the interface: the screen and its gadgets (the drag bar and front and back gadgets), the window and its gadgets (the drag bar, close box, sizing box, and front and back gadgets), and the menus and submenus.

Two working environments are built on top of Intuition—the Workbench and the CLI (Command Line Interface). The first is the Macintosh-like graphics interface of the Amiga. The second is the MS-DOS-like text interface. Either can be used independently. And since the Amiga multitasks, you can even use the Workbench and CLI at the same time. In fact, you can use several CLIs at

once. (However, the Amiga limits you to one Workbench.)

Commodore is now up to version 1.3 of its operating system. This latest version allows autobooting from devices other than floppy drives. It also greatly improves the CLI. Version 1.4 (which could appear as early as this fall) is expected to bring a much-needed facelift to the Workbench.

But it's not just Commodore that's hard at work improving the user interface. Commercial developers and hackers alike have concocted utilities that redefine the Amiga.

Workbench Facelift

Most Workbench modifications are cosmetic. Using Preferences, you can change the screen colors, the width of the text (60 or 80 columns), and the shape of the pointer. With Workbench 1.3's FF (*FastFonts*) CLI command, you can change the Amiga's system font from Topaz to any other monospaced 8-bit font. (*FastFonts*, by Charlie Heath, is also available commercially as part of Microsmiths' *TexEd* package.) Double-click the ClockPtr icon found in the Utilities directory on the Workbench 1.3 disk, and your pointer turns into a digital clock that updates itself to keep you abreast of the time. These are just some of the graphic elements that you can change.

Disk, directory, application, and file icons can all be modified through use of the IconEd and IconMerge programs found in the System drawer on your 1.2 Workbench disk or in the Tools drawer on your 1.3 Extras disk. IconEd is a crude paint program designed specifically for editing icon images. IconMerge takes two separate icon shapes and links them together to create an animated icon—one image for the icon's deselected state and

CUSTOMIZING YOUR AMIGA

one for its selected, or "high-lighted," state.

IconEd can be frustrating, however. The best way to design icons is with a commercial-quality paint program. (See "Designing Icons.") *Express Paint 3.0*, from Brown-Wagh Publishing, is well suited for this purpose. It has the unique ability to load and save icons (.info

files) just as easily as it loads and saves picture files. If you use a program such as *Deluxe Paint*, you'll need a conversion utility to translate IFF files into icons. The public domain program *Brush2Icon* (available on AMICUS disk 25), for example, converts the IFF brush files created by paint programs into the necessary .info files. We're work-

ing on such a program for an upcoming issue of *COM-PUTE!'s Amiga Resource*.

While designing custom icons, you may feel constrained by the Workbench's four-color limit. Documented in the Summer issue of *Amiga Resource*, and found in the C directory of both that issue's and this issue's disks, is a program that breaks

the four-color barrier. This program, titled "Colorbench," adds four extra colors to the Workbench screen, allowing you to create detailed, eight-color icons.

If you're tired of the bland, monocolored Workbench background, there are several public domain and shareware programs designed to liven things up. *Rain-*

Designing Icons

You've worked many hours on that arcade game and it's finally done. You can't wait to show it to your friends. The only thing left to do now is copy the program to another disk and steal a Workbench icon—maybe the clock icon this time. Rename it and you're ready for the big presentation. Does this sound familiar? Why use a Workbench icon when you can design your own custom icon or even an animated icon? It's not that hard once you've learned all the tricks.

You'll need a couple of tools to get started. The first thing on order is a good paint program. I use *Deluxe Paint III*, but you can use whatever you like as long as it saves brushes in standard IFF format. Next, you need an IFF-to-icon conversion program. This program converts your IFF brush data into icon image data. If you don't have one, you can probably find one on your local BBS or use "IFF to Icon," published in the November 1987 issue of *COM-PUTE!* magazine, or *Brush2Icon* from Amicus disk 25. If you want to create animated icons, you'll need *Iconmerge*, a program found in the System drawer on your 1.2 Workbench disk or in the Tools drawer on your 1.3 Extras disk.

The first step in designing an icon is to create an image that best describes your program, disk, drawer, or whatever. You can use text or graphics to create just about anything you can imagine—just try to keep the images reasonably small so they load quickly from disk. Be sure to change your palette to match the colors of the Workbench screen. Since your images will be displayed on the Workbench screen, design them in 640 × 200 mode and use only the first four colors in the palette. If you don't, you'll wind up with strange-looking icons.

After drawing the images, save them to disk as brushes. Keep in mind that the icon text will be placed directly below your image; to keep the text from being jammed up too close, pick up a few extra pixels at the base of the image.

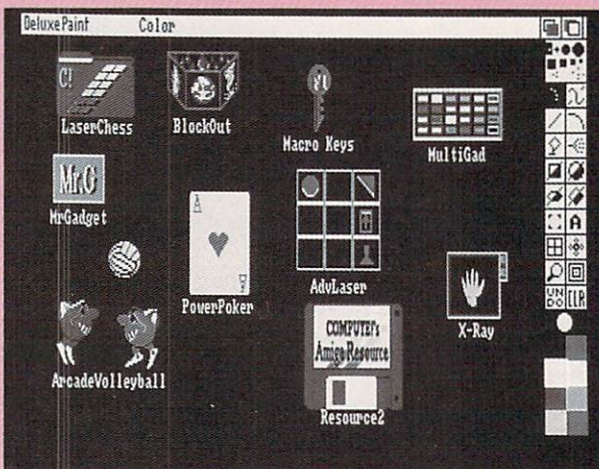
If you're creating an animated icon, you must perform one more very important step. Both brushes involved in an animated icon must be exactly the same size. This doesn't mean that your images have to be the same size, but what you pick up does. For example, suppose you're designing an animated book icon. In frame 1 the book is closed, and in frame 2 the book is open. The second frame will more than likely be a larger image. So, to compensate, you must leave space at the left of the image in frame 1. If you don't, the icon will jerk or move when you click on it.

You can use two equal-sized boxes as guides to help you pick up your images. First, draw a box that will hold the largest image. Then, pick up the box and stamp it down

around both images, making certain that the images are in the same place in both boxes. Now, use the brush tool to pick up everything in each box. By using the guide, you should have two equally sized brushes.

Now you're ready to convert the IFF data to icon data. Before running your conversion program, you need to duplicate a couple of .info files. Most data-conversion programs write directly into the icon file, changing only the image data. So if your image is for a drawer, you need to duplicate a .info file from a drawer. If your image is for a program, then you need to duplicate a .info file from a program. To make sure you have the correct type, highlight the icon in question and then select INFO from the Workbench menu. Information about the program and the icon will be displayed. The TYPE field will show *Tool* for programs, *Project* for data, *Drawer* for drawers, or *Disk* for disk icons.

After you've run the conversion program, your icon design should be finished. If you are designing an animated icon, you'll have two separate icons at this point. To bring



the two together, run *IconMerge*. When the program prompts you, enter *M* for *merge*; then enter the filename of the first icon, the filename of the second icon, and finally, the name you wish to give your new, animated icon. (Do not include the .info extension when entering filenames.) *IconMerge* will combine the two icons and exit. You will need to close and then reopen your disk's window to try out the new icon. You can read more about *IconMerge* in your 1.2 or 1.3 Enhancer Software manual.

—Troy Tucker

Bench, from Fred Fish disk 90, cycles the screen's background colors, creating a cascade of rainbow hues. You can place patterns and even IFF images in the background with the shareware program *DropCloth* (Fred Fish 128). For other effects, *WaveBench* (Fred Fish 112) creates Workbench tsunamis, while *DropShadow* (Fred Fish 112) adds an extra dimension with shadows for each window. Public domain programs are a great source of colorful and innovative screen hacks aimed at customizing the look of your Amiga.

The Changing CLI

Despite the attractions of the graphically oriented Workbench, the CLI is used (at least part-time) by a great many Amiga owners. Because of its nature as a command-driven interface, the CLI is an environment in flux. You can use the `RENAME` command to change the name of commands, delete commands, add new or improved ones, and perform many more exotic tricks.

Although you can't do

much to the appearance of a CLI window, you can change its size and name by editing the file `s:CLI-Startup`. For example, you can type `WINDOW=CON:0/10/640/100/MyCLI` to open a CLI window named `MyCLI` near the top of the screen.

Version 1.3 brings a replacement CLI called the `SHELL`. The `SHELL` looks quite a bit like the CLI, but it offers a wealth of new features. With the `SHELL`, you can edit the commands you type, recall previous commands, and even search for commands that begin with a certain sequence of characters. In addition, the `SHELL` allows you to make commands resident so that they don't have to be loaded from disk with each invocation. You can change the size and name of the `SHELL` by editing the `s:SHELL-Startup` file. Adding the statement `WINDOW=NewCON:0/10/640/100/MyShell` will set up a 640 x 91 pixel `SHELL` window named `MyShell`.

The `SHELL` also allows you to customize your environment with the alias command, which can be used

to abbreviate common commands. For instance, the command `ALIAS D1 "DIR DF1:"` lets you type `D1` to get a directory of drive `df1:`. Although you can type alias commands from the command line, it makes more sense to enter them into the `SHELL-Startup` file.

The `SHELL` also allows you to make commands resident. This makes commands operate as if they were built into the system. This speeds up operations dramatically, since the commands no longer need to be loaded from disk.

Normally, you have to click on an icon to open a CLI or `SHELL`. However, if you delete the `EndCLI` command in your startup-sequence file, you can keep the CLI window on the screen. Alternatively, you can use `PopCLI` (available on Fred Fish 84) to bring up a CLI with a keypress (Left Amiga-Esc). By default, `PopCLI` brings up a CLI window, but you can make it bring up a `SHELL` window instead by changing the installation command to read `POPCLI 180 SYS:C/NEWSHELL>`

`NIL:NEWCON:0/12/640/188/MyShell`.

The CLI or `SHELL` displays the CLI number as a prompt. You can change this prompt with the prompt command. For instance, `PROMPT "WHAT NOW?"` gives your computer a more human character. By including the parameter `%N`, you can display the CLI number. The parameter `%S` displays the current directory path. For example, try `PROMPT "CLI %N, PATH %S>"`.

Browser

Although there are other alternative environments being developed, *Browser* is the first one we've seen. *Browser* operates much like the Workbench except that filenames are manipulated instead of icons. This allows you to work with all files whether or not they have accompanying .info files. In addition, *Browser* allows you to place common applications into a pull-down menu so you can run them without digging through a nest of drawers. For more information on using *Browser*, see this month's "Best of the Boards" column. ▲

ARP: The AmigaDOS Replacement Project

AmigaDOS has had some longstanding problems. To solve them, several Amiga programmers (led by Charlie Heath) banded together to rewrite the bulk of the AmigaDOS CLI commands. The result is ARP—AmigaDOS Replacement Project.

To make the individual commands as small and reliable as possible, the ARP authors wrote an Amiga shared library called `arp.library`. This library has several commands designed to extend the Amiga's `dos.library` (good news for programmers). The functions contained within the ARP library can be accessed by any program. All that's required is that the `arp.library` file be located in the `libs` directory of your Workbench disk.

One of the ARP library's most useful features is its file requester—a window that allows you to select files from disk, for loading, saving, deleting, or whatever—a feature that should have been built into the operating system of the Amiga. Since the Amiga has never had a standard file requester of its own, programmers have always had to write their own. That's why different programs have different-looking (and different-functioning) file selectors. The ARP group hopes to change that.

For the average user, ARP means smaller, faster, and more versatile CLI commands. ARP commands tend to

handle wildcards better than AmigaDOS commands do (in fact, ARP commands support `*` as a wildcard equivalent to the AmigaDOS `?`). Here are a few size comparisons (in bytes) for the latest AmigaDOS commands (1.3) and the latest ARP commands (the Beta 8 version of ARP 1.3):

Command	AmigaDOS	ARP
Addbuffers	876	492
Assign	3008	1264
Avail	1964	692
CD	1756	580
Copy	9848	2772
Delete	6124	932
Dir	8772	2188

In each case, the ARP command is smaller than its AmigaDOS counterpart. For the ARP commands to work, you must have `arp.library` (16,996 bytes) on your boot disk in the `libs` directory.

The AmigaDOS Replacement Project has remained a step ahead of AmigaDOS. However, Commodore is promising major changes for AmigaDOS 1.4. Expect an expanded DOS library and smaller, more powerful commands. Also, don't be surprised if you finally see a standard Amiga file requester built into the system. It may be awhile before we finally see AmigaDOS 1.4. Until then, ARP is a logical alternative.

—Rhett Anderson

▶ BUYER'S GUIDE

BEYOND GAMES

Caroline D. Hanlon

Games are great, but there's much more to the Amiga. With the advent of desktop video, the Amiga is quickly gaining recognition beyond the entertainment community. The versatile Amiga is cropping up in video production, in recording studios, and even in universities as a teaching assistant. And as the popularity of the Amiga increases, more and more software is released, creating a virtual maze of disks and documentation. To help point the way, we've listed the business, creativity, and applications software that you should soon see on the software shelves. We've also provided some clues about the kinds of software we—and other industry watchers—think you'll be seeing in the near future.

▶ Desktop Publishing

Once declared the domain of the Macintosh, desktop publishing is gaining popularity on the Amiga because of the machine's ease of use and inexpensive price. Look for more professional-quality applications—such as support of 24-bit color—in upcoming software as developers realize the potential for integrating Amiga publishing not only in the business environment but also in professional applications such as magazine production.

Font-Works

ACS Software
\$99.95

With this font generator and editor, you can create color fonts using built-in drawing tools, or you can grab and modify letters from any IFF picture. Each font can accept up to 16 colors. Features include resize and scale, color cycling, pattern fills, gradient fills, shape and line tools, stencils, and special effects—accessed through macros—such as drop shadows, 3-D, neon, stencil, and outline.

Media Line Clip Art Collection

Free Spirit
\$34.95

This disk contains more than 200 clip-art pictures and a show utility to add to desktop publishing programs that support IFF graphics. Themes include holidays, parties, sports, computers, and scenery.

Media Line Font Disk 1 and 2

Free Spirit
\$34.95 each

Media Line Font Disks provide accessory fonts to use in video, graphics, and desktop publishing. *Font Disk 1* contains nine bit-mapped fonts while *Font Disk 2* offers structured fonts to use in 3-D programs.

PageStream

Soft-Logik Publishing
\$199.95

PageStream offers advanced desktop publishing features such as typographical control through leading, kerning, justification, and tracking; text placement in multicolumn formats complete with text flow, search and replace, and a tag feature for describing text; spelling correction; automatic and manual hyphenation; ten fonts; page-layout commands; paste-up tools; and support of line and color graphics.



Selected fonts from *ProFonts II: Decorative* by New Horizons

ProFonts, Volumes I and II

New Horizons
\$34.95 each

Compatible with programs that use Amiga fonts, these font packages are designed for word processing and desktop publishing on a dot-matrix printer. *ProFonts I: Professional* contains ten font families to use in business publications. *ProFonts II: Decorative* includes 40 display fonts for creative pieces and headlines.

Desktop Video and Animation

Desktop video is the preeminent innovation in the Amiga market. Often compared to the introduction of desktop publishing on the Macintosh, most industry experts agree that this new technology is ushering the Amiga into the non-Commodore community as well as creating a whole new publishing/broadcast genre. You might say that desktop video allows the Amiga to get a foot in the door of the business community—whether in producing music videos, in designing album covers, in new-product marketing, or in directing customers to aisle number 3. The Amiga's popularity is growing, thanks to the machine's wide range of capabilities, its user-friendliness, and its cost-efficient approach to art production. Many operations use the Amiga as an inexpensive workhorse to produce and edit pieces before sending them on to higher-end, broadcast-quality output. Producer, director, and animator Steve Gillmor refers to the Amiga as the "personal interface between artist and environment." The many applications of desktop video are just now being recognized, and we can expect to see new, diverse products with a variety of features and uses.

ANIMagic

Aegis Development
\$99.95

ANIMagic is an animation editor and special-effects generator to use with *VideoScape 3D*, *VideoTitrer*, *DeluxePaint*, and other programs that create IFF or ANIM files. You can design your own effects using spins, page turns, Venetian blinds, confettis, strobes, coloring, and titling effects. Animations can be edited, enhanced, and spliced together with the ANIM editor.

Elan Performer

Elan Design
\$59.00

Elan Performer gives you fingertip control of imagery and animation in any paint or animation program using RIFF and ANIM formats. You assign imagery and steps of animation to individual keys and then call them to the screen with just one keystroke. The program uses requesters in file areas.

LightBox

R & DL Productions
\$189.00

You can animate cartoons using the controls found in a light box and peg system and the tools of a paint program with *LightBox*. Drawings can be flipped at a rate of 1/30 second at any time. Requires one megabyte of RAM and Kickstart 1.2 or 1.3.

Media Line Animation Backgrounds Disk

Free Spirit
\$39.95

Animation packages such as *The Animator*, *Animate 3-D*, and *DeluxeVideo* can incorporate the 30 different color animation backgrounds on these two disks. The backgrounds are available in either NTSC or PAL versions.

MovieSetter

Gold Disk
\$99.95

You can create professional-quality animation sequences with *MovieSetter* and its special features such as color cycling, 60-frame-per-second playback, linear and elliptical guides, full stereo sound, full video overscan, and a WYSIWYG display. Commands are executed by clicking on onscreen symbols. The program includes a file of professionally drawn characters, but you can also design your own characters or import figures from paint programs. Requires one megabyte.

Turbo Silver

Impulse
\$199.95

With *Turbo Silver*, you can create 3-D, ray-traced animations with up to 512 frames per animation. The program can play back 6–60 frames per second and can ray-trace whole screens in four minutes. It supports genlock and overscan. Requires an external disk drive or a hard drive and Kickstart 1.2 or higher.



MovieSetter from Gold Disk

VIVA

MichTron
\$199.95

VIVA, the visual interfaced video-authoring system, lets you create, manage, and display text, graphics, video, sound, and animation. It also lets you control video recorders, laser-videodisc players, and other video devices to create a stand-alone interactive environment for sales promotions, training, or testing. The icon-driven program includes an editor, graphics libraries, fonts, and a speech module.

Business Applications and Telecommunications

Traditionally, Big Blue has led the business computing market, but with its advanced graphics and affordability, the Amiga is beginning to infiltrate that market. Some publishers believe the key to success in the business world for the Amiga is networking—tying computers together via telephone lines, BBSs, and netmail systems. Others see the Amiga used as a presentation tool for sales meetings, annual reports, and other promotions that integrate color, sound, and animation. As the following list shows, new releases in business software are currently targeted at the home and small-business user. As more developers and corporate buyers realize the opportunities available on the Amiga, we should see the Amiga gradually surfacing as a less-expensive, more flexible alternative to the Macintosh and IBM PCs.

Atredes 1.1

Incognito
\$149.00

Version 1.1 of this telecommunications package features point-and-click on the gadgets, Z-Modem, an online interaction program, and fully compliant and chainable menus. Requires one megabyte of memory.

Designer Database Series

Software Visions
\$39.00 for Home I
\$59.00 for Business I

Volumes in the Designer Database series contain databases and macro keys to use with *Microfiche Filer* and *Microfiche Filer Plus*. The home disk offers ten databases

covering videotapes, audio recordings, stamp collections, recipe catalogs, a personal inventory, and a home budget. The business disk includes seven databases such as calendar, mail merge, expense report, invoicing, inventory, and more; plus it has macro keys.

EasyLedgers

Brown-Wagh
\$295.00

EasyLedgers organizes your accounting data into four ledger-type books for general ledger, accounts receivable and payable, and inventory control. You can page through the books and accounts or place the data by clicking the mouse. The manual includes instructions on bookkeeping and sample files. Requires one megabyte of memory.

FreD

Gamma Software
\$49.95

FreD can store names, telephone numbers, and a brief remark for nearly one million of your friends, and it automatically dials the number for you. Information is stored in three fields with up to 256 characters in each field. Added features include wildcard searches, quick access to the Notepad text editor, and support for ASCII files and ARexx. A modem is recommended but not required. ►


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- Optional automatic text flow around contour of IFF pictures
- Full page view with the ability to edit graphic objects while at full page.



Pen Pal's database manager includes:

- Reports with sub-totals, final totals, and page breaks
- Sort multiple database fields - Specify search criteria
- Perform calculations

Pen Pal's graphic object drawing manager lets you:

- Define lines, shapes, and borders as objects
- Objects may be edited independently of each other
- Mix objects freely with IFF pictures and text
- Objects are layered and may be positioned behind or in front of other objects

Use this unique program to create professional appearing documents. From letters and memos, to reports, labels, flyers, newsletters, and special forms, this program lets you process information - not just words. With easy-to-use page layout features normally found in programs costing three times as much, this program frees you to transform normal writing into effective communication! Call (408) 355-3838 for more information.

This graphic is an imported IFF picture that was copied and cropped to suit. All graphics objects on this page were created in Pen Pal. This document was printed on an HP DeskJet printer. The program requires 1 Megabyte of RAM. All rights reserved.

Advertisement created with *Pen Pal* from Brown-Wagh



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
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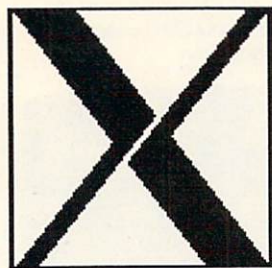
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The X Connection

What is the X Window System?

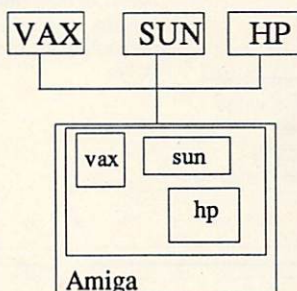


The X Window System(tm) from GfxBase brings workstation capabilities to your Amiga computer. You can now tap into the power of the computers on your network by accessing those X11 programs from your Amiga. All applications look alike under the X Window System. No need to relearn the programs when you use them from different computers. X11 (X Window System Version 11) is an industry standard graphics library, developed at MIT, network, hardware, and operating system independent, and available on workstations such as Suns, Vaxes, HP's, Crays, IBMs, and now Amigas. X11 presents a client-server model of distributed processing so that the application may run on the computer that will best run that application. The server runs on the machine that controls the display, keyboard, and mouse. The client or application may run on a different computer or it may run on the same computer as the server. If the program requires large amounts of cpu power it may run on a remote VAX, yet open

windows and provide menus on the graphics computer on your desk. Even though the program may be running on a super computer far away, it appears to be running on the computer in front of you. X11 supports simultaneous connections to several computers. You can have a window into a Sun running Frame, another window into a VAX running a CAD program, and another window into a Cray doing ray tracing, all on the same display. The X Window System provides a portable standard environment that programmers may write applications on and know that their program will be able to run on a large number of completely different computers with no extra effort.

The Amiga X Connection

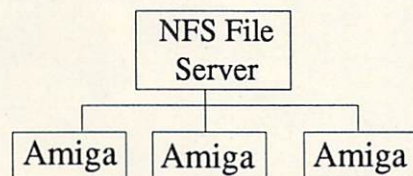
- X Window System Version 11 Release 2
- X11 Server and clients- xcalc, xclock, bitmap, uwm, etc.
- Xpr for the Amiga supports all Amiga printers
- X11 standard fonts and bitmap images
- Coexists with native Amigados window system
- Connections: tcp/ip ethernet, local socket
- Displays: 704x484 standard amiga monitor
- Viking 1 Monitor 1008x800
- Optional 3 button mouse



The Ethernet Connection

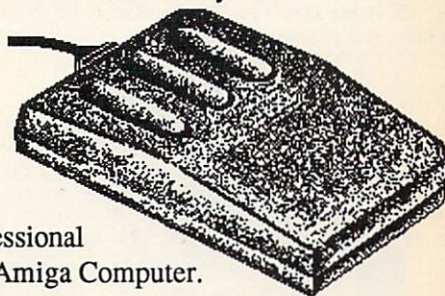
The Ameristar Internet Package available from GfxBase provides ethernet connections for your Amiga. The support of industry standard network protocols on the Amiga makes it a very low cost networked workstation. Hence, the Amiga can now interoperate with other ethernet networks that consist of either ICP based or Unix(tm) hosts.

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- Sun Compatible NFS (Network File System)
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- Telnet with vt100 emulation
- Remote login (rlogin)/ remote shell (rsh)
- TCP/IP/UDP protocols



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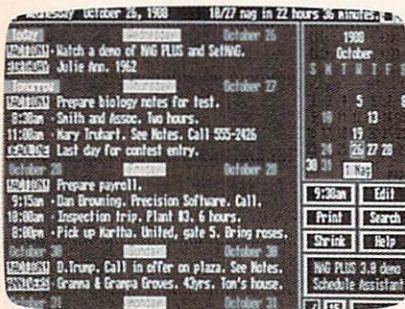
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The X Window System is a trademark of MIT, Amiga is a registered trademark of Commodore-Amiga, NFS is a trademark of Sun Microsystems, Ethernet is trademark of Xerox Corp., Unix is a trademark of AT&T

NagPlus 3.0

Gramma Software
\$79.95

Just what every busy person needs—a personal nag. This schedule assistant can visually or verbally remind you of up to 99 appointments, anniversaries, birthdays, or any other events per day. *Nag Plus 3.0* can also dial the phone for you and print out a list of that day's activities.



NagPlus 3.0 from Gramma Software

Nimbus 1.3

Oxxi
\$159.00

This latest version of Oxxi's accounting package for small businesses includes new features such as invoice and customer-statement printing on plain or preprinted forms, decimal quantities, new end-of-month

processing, and an updated manual. The program tracks customers and vendors by name and is designed to be up and running within an hour of opening the package.

Pen Pal

Brown-Wagh
\$149.95

Pen Pal is a word processor, database, and forms generator for people who produce one- to ten-page letters and reports. It supports 4096-color output and IFF pictures and includes a 100,000-word spelling dictionary, search and replace, mail merge, built-in database manager, graphics object-drawing manager, forms generation, and document statistics. Requires one megabyte of memory.

Project Master

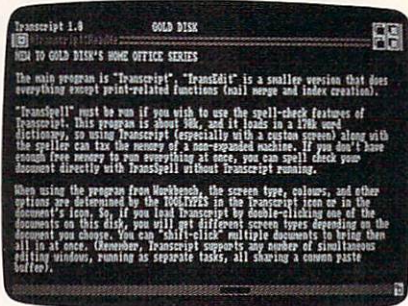
Brown-Wagh
\$195.00

You can plan, track, and control projects using the six modules of *Project Master*: Plan, Input, Statistics, Resources, Costs, and Time. This intuitive project manager provides charts in IFF and DrawPlus format, input in ASCII format, what-if situations, an onscreen toolbox for graphs, statistical calculations, and automatic readjusting of start and end dates.

ProText

MichTron
\$199.95

ProText is the latest word processor from MichTron. It includes all standard word processing features plus a spelling checker and a command line interpreter.



Transcript from Gold Disk

Transcript

Gold Disk
\$69.95

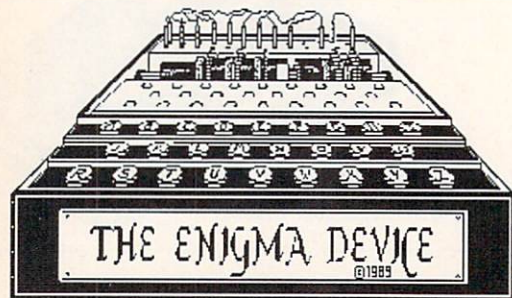
Transcript is a compact word processor consisting of the main program; TransEdit, a smaller version that performs all but the output functions of the main program; and TransSpell, a 90,000-word, stand-alone spelling checker. The program automatically creates indexes and mail merges. Keyboard shortcuts are listed in pull-down menus.

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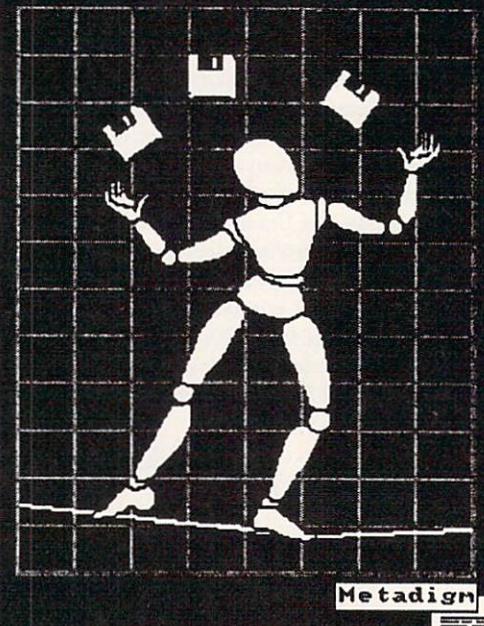
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Music

Professional musicians regard the Amiga as the premier computer for music because of its versatility, clarity of sound, and support for MIDI devices. And the variety of music programs available for the Amiga provides artists with a template for creating original compositions. You can count on more music programs being released for the Amiga and look for graphics integration that not only displays notes and signatures but also shows music in motion.

A.M.A.S.

MicroDeal
\$159.95

Advanced MIDI Amiga Sampler (A.M.A.S.) is a hardware and software combination for loading, saving, and editing sound samples. The program offers left, right, and stereo sampling with realtime spectrum analyzing and editing features in both mono and stereo modes. The 8-bit stereo audio digitizer includes a MIDI interface.

Dynamic Drums II

New Wave Software
\$79.95

This new release of *Dynamic Drums* combines a new user interface with enhanced musical features such as full-screen pattern editing and advanced MIDI support. On-screen graphics can be created with IFF brushes and backgrounds, geometric

shapes, and color cycling. A MIDI interface and a MIDI keyboard are optional.

Dynamic Studio 3.0

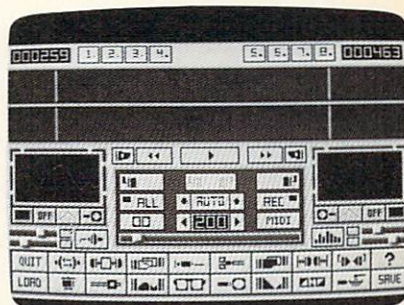
New Wave Software
\$199.95

Version 3.0 of New Wave's *Dynamic Studio* is an improved version of the original program. It offers a more effective user interface, SMPTE synchronization, better editing facilities, and a graphics editor for visualizing the notes. Requires one megabyte of RAM, a MIDI interface, and a MIDI keyboard.

EZ-CZ

New Wave Software
\$69.95

All the CZ parameters are displayed on one screen with this multitasking patch editor. Individual patches and banks of patches can be saved to disk. Requires a MIDI interface and a Casio CZ-series keyboard.



A.M.A.S. from MicroDeal

Master Editor/Librarian

Sound Quest
\$165.00-\$190.00

Sound Quest has introduced four new editors/librarians for the M1, K1, D10/20/110, and the DX11/TX802. Each editor/librarian features eight specific bank-editing functions, global editing, simultaneous editing of multiple synthesizers, and help screens. The M1 and DX11/TX802 editors are \$190 each, and the K1 and D10/20/110 editors are \$165 each.

Sound oasis

\$99⁹⁵

The internal sound capabilities of the Amiga are better than that of any other personal computer. These capabilities mean nothing though, without quality digital sounds, which up till now have been scarce. Sound Oasis gives Amiga owners access to a large library of studio-tested digital samples, by using the Amiga's built in disk drive to read disks made for the Mirage Digital Sampling Keyboard. Sounds can then be played from a MIDI keyboard, the computer keyboard, or saved as an IFF standard file. Mirage is a trademark of Ensoniq Inc.

dynamic drums

\$79⁹⁵

Transform your Amiga into a professional-quality drum machine with this software package. Easier to use than hardware-based drum machines because everything is displayed graphically on screen. Enter drum patterns quickly and easily in real time with visual feedback and editing. Create realistic drum tracks with any of the 100 drum and percussion samples that are included or use your own unique IFF one-shot samples. Dynamic Drums also has full MIDI implementation and even becomes velocity sensitive when triggered from a MIDI keyboard.

DYNAMIC STUDIO

\$199⁹⁵

A powerful MIDI sequencer that takes full advantage of the Amiga's sound, graphics, and sophisticated user-interface. Dynamic Studio is perfect for professional applications due to its sophisticated editing capabilities and SMPTE support. It is also ideal for home studios, because in addition to sequencing MIDI instruments, Dynamic Studio has a built-in drum machine, and the ability to playback instruments translated with Sound Oasis.

new wave
SOFTWARE

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PageSync

Mindware International
\$100.00

A module for use with *PageFlipper Plus F/X*, *PageSync* allows the synchronization of an external MIDI device with animation created with *PageFlipper Plus F/X*.

Quest II: Texture

Sound Quest
\$250.00

The second version of this music sequencer offers incremental recording, animated edit display with a sound option, three options for quantizing, arpeggiation, a linearizing function, chord flipping, multiple MIDI channels per track, and a panic button that sends an all-notes-off command and a controller-reset command.

Sonix SoundTrax Volumes One & Two

Aegis Development
\$19.95 each

Jon Rami wrote and performed the songs on the *SoundTrax* volumes, which interact with *Aegis Sonix*. Each volume contains two disks of songs created with sampled instruments.

Graphics

What has made the Amiga stand out since its inception? Graphics—first in games and now in desktop publishing, video, and even music. Graphics packages are becoming more sophisticated to take advantage of the Amiga's advanced capabilities, plus we now see Amiga graphics being used in professional productions. What used to take hours and hundreds of dollars can now be created quickly and easily on an Amiga and then recreated in a broadcast-quality format. Graphics programs will continue to be available for desktop publishing, illustrations, and entertainment, but we will see more products that allow you to use your creations in commercial productions.

ASDG-RESEP

ASDG
\$59.95

A utility designed to be used with Scanlab Professional, *ASDG-RESEP* allows you to take HAM images created with *Professional Page* and insert 24-bit images for full 16-million-color output.

DeluxePaint III

Electronic Arts
\$149.00

Basically an enhancement to *DeluxePaint II*, the latest version of this paint program offers three new features: support of Extra Half-Brite and 64-color modes, overscan mode, and animation. The font menu is replaced by a font selector, and the package includes two



DeluxePaint III from Electronic Arts

disks of artwork and animbrushes. A player program is included so animations can be played without loading *DeluxePaint III*. One megabyte of memory is recommended.

✓✓✓✓ UEDIT ✓✓✓✓

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- B) \$44.00, *Uedit* with user reference manual on disk.
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Uedit has quietly become the editor of choice for bright programmers and professionals in the USA and more than a dozen countries. Recently it won the Gold Medal in *Commodore* magazine.

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Design-3D

Gold Disk
\$99.95

Gold Disk's new modeling program can create models in wire frames with six line types and 16 colors plus dithering. It offers fast flat shading, axial extrusion, and four views of the object including perspective with four light sources. *Design-3D* also supports 3-D text and includes fonts and a font editor.

Digi-Paint 3

NewTek
\$99.95

An enhancement of the original *Digi-Paint*, version 3 features antialiased fonts, user-controllable 3-D texture mapping, colorizing, more drawing tools, image-processing software, superbitmaps, and overscan support. NewTek is also offering a 4096 Prize Jackpot contest. Upgrades are available for \$29.95.

Icon Magic

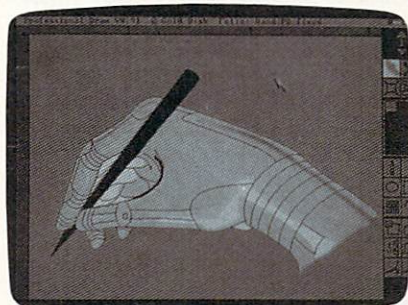
Glacier Technologies
\$79.95

This full-featured icon paint program includes basic paint features and an icon editor so you can design your own icons. After creating icons, the program generates the BASIC source or Assembler C code for the bobs, sprites, and gadgets. Icon Magic also incorporates the new ARexx-like *SmartLink* technology that lets you exchange data between programs.

Optiks

Incognito Software
\$199.99

The major feature of this ray-tracing program is its 16-million color, 24-bit Targa-file compatibility. It also offers color spotlights, multiple spotlights, and picture and surface mapping. Requires 512K.



Professional Draw from Gold Disk

Professional Draw

Gold Disk
\$199.95

Professional Draw is a structured drawing program for color illustrations and designs. Features include a wide variety of drawing tools such as polygons, bezier curves, and user-definable line weights; a nearly unlimited range of color; built-in clip art and text-

character macros; transformation features such as mouse-controlled rotation, scaling, shearing, and distortion; high-resolution to dot-matrix devices and laser printers; and a built-in color separator. The program is compatible with *Professional Page* 1.2.

Spritz

Glacier Technologies
\$79.95

This paint program is directed at the first-time user. It contains many of the features found in more expensive programs plus has a built-in grab screen, an award-making kit, 64-color support, and a load-drawer feature that allows you to load a set of brushes or clip art at one time instead of piece by piece. *Spritz* also incorporates the new ARexx-like *SmartLink* technology that lets you exchange data between programs.

3D Options

Rainbows Edge Productions
\$49.95

You can convert your IFF bitmapped pictures to two- and three-dimensional objects with *3-D Options*. Program controls include auto-tracing, color reduction, and edge detection. A demo disk is available for \$4.95.

X-Shell

Grafix Computing
\$199.00

X-Shell is a shell that provides custom graphics menus to replace the text menus of *X-CAD*. Requires *X-CAD*.

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► Programming and Utilities

The Amiga remains a favorite for programmers. Its speed, support of languages, user interface, and memory-expansion capabilities give the Amiga unlimited programming potential. New utilities, timesaving devices, and updates to popular packages make this a stable and continually growing area of Amiga software.

Aztec C Express 5.0, Developer Version

Manx Software Systems
To be released in July 1989
Price unavailable at press time

The Developer Version will contain all the features of the Professional Version plus Z editor, a text editor; VMake, for building large applications; an assembler; UniTools utilities such as diff and grep; and the complete debugger, SDB. Anyone purchasing version 3.6 before 5.0 is available will be given a free upgrade.

Aztec C Express 5.0, Professional Version

Manx Software Systems
To be released in July 1989
Price unavailable at press time

Version 5.0 of Aztec C will be a new, turbo-like environment featuring a quick compiler that moves directly to the assembly phase. The professional format will also include a

mouse-based editor, project manager, linker, utilities, and SDB Jr., a basic source-level debugger. Anyone purchasing version 3.6 before 5.0 is available will be given a free upgrade.

C.A.P.E. 68K Version 2.0

Inovatronics
\$89.95

Inovatronics' new release of C.A.P.E. features an integrated editor and assembler environment with precompiled include files, an ARexx interface, and optimizations.

Devpac Amiga Version 2.0

MichTron
\$99.95

An assembler for the Amiga, *Devpac* can assemble source files at a speed of up to 70,000 lines per minute. The editor runs under Intuition and accepts both menu and keyboard control. Requires Kickstart 1.2 or later.

ExpressCopy

Express-Way Software
\$44.95

ExpressCopy can back up hard drives or copy files from a hard disk to a floppy disk at about one megabyte per minute or 600K per minute with verify. Up to four backup disks can be created at a time. The program is multitasking and works from both the CLI and the Workbench.

GFA-BASIC 3.0

Antic Software
\$139.95

Already available in Europe, this BASIC language offers a high-speed interpreter, more than 300 commands with submenus and file requesters, in-line C and assembler commands, a built-in text editor, a runtime interpreter, and access to online libraries.

HiSoft BASIC

MichTron
\$159.95

A superset of PowerBASIC, *HiSoft BASIC* lets you write desk accessories (if you understand GEM), debug assembly language routines with the Symbolic debugger, and profile your programs. It compiles Amiga Basic and is compatible with Quick BASIC 3.

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Education

Education is the domain of Apple and, increasingly, MS-DOS. And with the abundance of education software and the low cost of those machines, they will probably remain the preferred computers in school systems. The Amiga, however, is appearing at the university level as an artificial intelligence and interactive expert system. The education community will probably develop the Amiga into a substitute teacher—a talking, animated machine with which students can interact.

Mypaint

Centaur Software
\$49.95

An educational paint program and coloring book, *Mypaint* includes 28 drawings for children to color. Kids can also draw their own pictures using the icon menus. No reading skills are required to use the program.

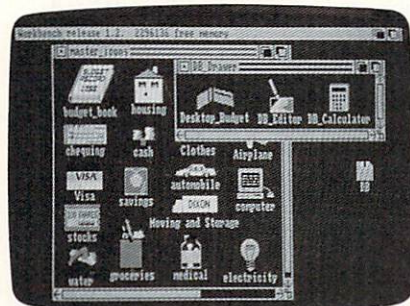
The Three Bears (Goldilocks)

Hilton-Android
\$29.95

Sixth in the talking Robot Readers series, *The Three Bears* is designed to help pre-school and primary-school children learn to read and increase their vocabulary. It is an interactive program that uses graphics and speech to entertain children while they learn.

Home Applications

While some software is tailored toward the at-home user, most nongame software is creativity or productivity oriented. Even though the Amiga is a great home-applications and small-business machine, the software in this area is limited. As the Amiga gains wider acceptance beyond games players, we should see new products in this category.



Desktop Budget from Gold Disk

Desktop Budget

Gold Disk
\$69.95

Home-office users simply point and click on the icons to access the accounting features in this program. *Desktop Budget* sets up monthly payments, reconciles end-of-the-month statements, and rolls over year-end figures. A full-function calculator helps in preparing the reports, which can be printed on a dot-matrix printer. There's also an icon editor for customizing the icons.

Tax Break

Oxxi
\$79.95

A tax-preparation and -planning program, *TaxBreak* contains standard IRS forms such as the 1040 and Schedules A, B, C, D, E, SE, 2106, and 2441. Line-by-line prompts and on-screen instructions help you enter the information. You can calculate your taxes with the pop-up calculator and test alternate tax strategies before you print the reports.

Tax Strategist 1988

Digital Dynamics
\$89.00

Worksheets and a cash-disbursement module help you calculate your 1988 taxes. The program includes Forms 1040, 2441, and 2106 as well as Schedules A, B, C, D, E, and SE. A version for filing California state taxes is also available for \$119.

Publishers' Names and Addresses

ACS Software
2135 E. Sunshine
Suite 106
Springfield, MO 65804

Aegis Development
2115 Pico Blvd.
Santa Monica, CA 90405

Antic Software
544 Second St.
San Francisco, CA 94107

ASDG
925 Stewart St.
Madison, WI 53713

Brown-Wagh Publishing
16795 Lark Ave.
Suite 210
Los Gatos, CA 95030

Centaur Software
14040 Tahiti Way
Suite 528
Marina Del Rey, CA 90292

Digital Dynamics
739 Navy St.
Santa Monica, CA 90405

Elan Design
P.O. Box 31725
San Francisco, CA 94131

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Express-Way Software
P.O. Box 10290
Columbia, MO 65205-4005

Free Spirit Software
58 Noble St.
Kutztown, PA 19530

Glacier Technologies
P.O. Box 1309
Vancouver, WA 98666

Gold Disk
P.O. Box 789, Streetsville
Mississauga, Ontario
Canada L5M 2C2

Graf Computing
1140 Post Rd.
Fairfield, CT 06430

Gramma Software
17730 15th Ave. NW
Suite 223
Seattle, WA 98155

Hilton Android
P.O. Box 7437
Huntington Beach, CA 92615

Impulse
6870 Shingle Creek Pkwy.
Suite 112
Minneapolis, MN 55430

Incognito Software
34518 Warren
Suite 149
Westland, MI 48185

Inovatronics
111311 Stemmons Frwy.
Suite 8
Dallas, TX 75229

Manx Software Systems
P.O. Box 55
Shrewsbury, NJ 07702

MichTron/MicroDeal
576 S. Telegraph
Pontiac, MI 48053

Mindware International
33 Alliance Blvd.
Unit 1
Barrie, Ontario
Canada L4M 5K2

New Horizons Software
P.O. Box 43167
Austin, TX 78745

NewTek
115 W. Crane St.
Topeka, KS 66603

New Wave Software
P.O. Box 438
St. Clair Shores, MI 48080

Oxxi
P.O. Box 90309
Long Beach, CA 90809-0309

Rainbows Edge Productions
4412 4th Ave.
Suite 2
Brooklyn, NY 11220

R & DL Productions
11-24 46th Ave. 2A
Long Island City, NY 11101

Soft-Logik Publishing
11131 F S. Towne Sq.
St. Louis, MO 63123

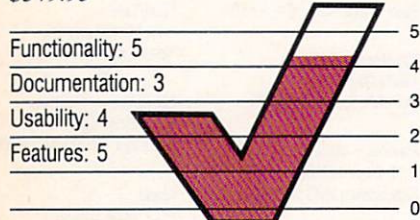
Software Visions
P.O. Box 3319
Framingham, MA 01701

Sound Quest
5 Glenenden Ave. E
Toronto, Canada M8Y 2L2

COMPUTE!'s Amiga Resource bases its review ratings on several self-explanatory criteria, using a scale of 1 (lowest) to 5 (highest). Obviously, not every software publisher places equal emphasis on each category. To accommodate this, we've derived an average overall rating, represented by the graphic check mark accompanying each review.

Superbase Professional 3.0

Precision Software
8404 Sterling St.
Suite A
Irving, TX 75063
\$349.95



Outside the Amiga's creative enclave—where you'll find stunning graphics, animation, video, sound, and games—sit endless rows of beige and gray PCs crunching away at, among other things, massive database-management projects. In the drudgery category of computing, database management reigns supreme, and PC compatibles rule the roost with programs like Ashton-Tate's *dBase III* and Borland's *Paradox*.

Can the Amiga compete in this macho computing arena? The answer is *Yes*—with *Superbase Professional*, from Precision Software, a pro-quality, fully relational database-management system (DBMS) that is both powerful and easy to use.

Superbase is a system based on increasingly powerful modules. *Super-*

base Personal is the entry-level program, with basic files and records, three ways to view your data, and query and reporting capabilities. *Superbase Personal 2* extends *Superbase Personal* to include a text editor and telecommunications functions.

Superbase Professional, reviewed here, adds a forms editor, Database Management Language, and *ARexx* compatibility. Each version can be upgraded to the next for the difference in price, making it easy to start out with the *Superbase* system and expand it as your needs and abilities grow. This is unusual in the heavy-duty DBMS market; there's no home version of *dBase III*, for example, and it's not likely there'll ever be one. There are also PC and Atari ST versions that run under the GEM OS shell; these are file-compatible with the Amiga version.

Superbase Professional is actually a collection of programs centered on the database manager and including a separate text editor, a forms editor, and a BASIC-like command language. The database manager can be completely operated with the mouse, menus, and requesters, making it very easy to learn. For browsing through records in a file, you use the VCR-like button controls along the bottom of the screen to go forward, reverse, fast forward, and so on. Records can be viewed in three ways: one at a time, with one field per line (Record View); one record at a time in a page format, with fields arranged by the user (Form View); or all records together in table form (Table View). Scroll bars let you see records that are too big to fit on the screen.

Superbase's search engine allows you to execute find operations (called *key lookups*) with several variables and parameters. You can also use filters based on pattern matching and relational, Boolean, and mathematical operators to display only records with fields that fit certain criteria, such as

containing a specified name or range of values. Filters and searches are completely user-definable by means of well-designed requesters. Record information can be edited at any time and saved in batches to disk (to cut down on the number of slow floppy saves you'll have to endure).

When you first set up a database file, you're asked to name the file, set an optional password, and define a data type for each field in the file. *Superbase Professional* can handle just about any kind of data your Amiga can. The program has its own internal data types, text strings, numeric type, and date/time, but it can access several kinds of external files, including ASCII text files, IFF picture files (for picture libraries, one of the best uses for *Superbase Professional*), IFF sound files, and raw sound samples. In addition, you can import *dBase III* and other database file formats as well as *Lotus .WKS* files.

A wide range of other field-data criteria are possible, such as whether the data is read-only, needs to be calculated or validated, or is a constant. Formulas, functions, and ternary operators can be attached to any field and automatically operate on the data you enter. All told, the number of possible variations of field and data types is staggering, but they are easy to handle because choices are presented in layers of requesters, so you need consider only those options you know you'll need.

Superbase Professional can certainly handle the big jobs. There's no limit to the number of fields in a record or the number of records in a file, and memory is the only constraint on the number of files that can be opened at one time. Text fields are limited to 255 characters in length, so you'll want to use external text fields for blocks of text longer than that. The text for these fields can be created in *Superbase's* built-in text editor. Each file must also have at least one index;

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999 indexes is the maximum.

Reporting, the heart of any database, is handled by *Superbase Professional's* query functions. Queries are constructed much like filters, with fast multiple sorts possible on multiple files. To format reports, you can use the Forms Editor, a separate form-layout program that multitasks with the database manager. Use the Forms Editor to design electronic analogs of the paper forms you use now—invoices, order and expense forms, and so on—with built-in calculations, updating, and data links among multiple files.

The Forms Editor takes an intuitive, point-and-click approach to form design, with manipulation of fields, buttons, and graphics merely a matter of dragging each object to its proper spot. If you've used a page-layout or CAD program, you should have no trouble mastering the Forms Editor; it is one of the nicest features of *Superbase Professional*, although I would have liked to see a file of master forms that could easily be customized for various uses. Mail-merge, label-printing, and telecommunications utilities are also included.

For advanced users, *Superbase Professional* includes Database Management Language, or DML, modeled closely (but not exactly) on BASIC. DML gives you programming access to all of *Superbase Professional's* menu and dialog commands. You can use DML to issue single commands for instant execution; as a simple macro language, to automate routine sequences of menu commands; or as a full-fledged programming tool with the ability to create your own menus and requesters for a fully customized database environment.

Superbase Professional also supports *ARexx*, the macro language developed by William S. Hawes. *ARexx*, which is becoming a kind of standard language interface for Amiga programs (other DBMSs, such as *Microfiche Filer Plus*, also support it), can be used to drive any compatible external program and device. For example, you could develop a *Superbase Professional* application that would access a picture database on a videodisc using *ARexx* to drive a compatible videodisc controller.

For serious *Superbase Professional*

developers, Precision offers two extended support programs. Official Superbase Information Network (OSIN) is a national online service (on American People/Link) providing technical support and ongoing discussions of current *Superbase* developments.

Precision's Official Superbase Application Developer (OSAD) program can help you design details of DBM applications using *Superbase Professional* and can assist you in marketing your product as well.

Superbase Professional still has a few rough edges. For example, directory handling is needlessly complex. Instead of being able to click on a button or type a pathname in a Load or Save file requester, as in most Amiga programs, you have to issue separate menu commands to read and change drives and directories. The Text Editor is a useful addition to the program, but it's hardly a high-powered word processor. It uses keyboard command equivalents that don't match those used in other Amiga text editors. You'll probably want to multitask your favorite word processor instead.

The documentation, while thorough and well-written, is poorly indexed. I'd like to see some online help as well, if only a list of keyboard commands for the Text Editor. And there's at least one minor bug lurking in *Superbase Professional*. I was able to crash the program in the Forms Editor

by opening an external text file supplied on the Forms Editor disk and then trying to close the file with the close-box gadget.

Another bother is the copy-protection scheme, which requires a dongle in the joystick port (game port 2) while you are running the program. If you lose the dongle and you haven't sent in your warranty registration card, you can kiss your *Superbase* work good-bye. I strongly recommend that you keep the dongle wired, taped, or Velcroed to your Amiga at all times. Better yet, send in your registration card and then buy the \$10 unprotected version. You have to wonder why Precision doesn't just eliminate the dongle and the extra steps, add \$10 to the price of the program, and remove copy protection altogether.

Dongle aside, *Superbase Professional* is the most powerful Amiga database available. The number of features offered is stunning. It can be adapted to nearly any data-management task, with a maximum of speed and a minimum of programming. If you're willing to put in the time, the onboard DML and *ARexx* compatibility give *Superbase Professional* unlimited flexibility for custom database-application building. In short, whatever you can do with the big-time PC databases, you can do with *Superbase Professional*.

—Steven Anzovin ▸

DeluxePaint III

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
\$149

Functionality: 5	5
Documentation: 5	4
Usability: 5	3
Features: 4	2
	1
	0

If a word in the Amiga community is magic, it's *DeluxePaint*. For a long time it was the Amiga's sole claim to respectability. "This is how Amiga software can (and will) be," was the product's implication.

Soon after Dan Silva finished *DeluxePaint*, *DeluxePaint II* was born. This incarnation became one of the driving forces behind the Amiga's acceptance in the artistic community at large, a community which had just been warmed up by the then-colorless

but graphically powerful Macintosh.

Knowing that *DeluxePaint II* was a good thing, Dan Silva and Electronic Arts went on to develop Apple IIGS and IBM PC versions of the program. In the meantime, other Amiga paint programs began showing up. Since going head-to-head against *DPaint II* would be a questionable strategy, most of the new competitors found their niche by exploiting the Amiga's powerful but difficult-to-program HAM graphics mode. *Digi-Paint*, *Photon Paint*, and EA's own *Deluxe PhotoLab* were among the challengers.

Still, *DPaint II* held its own. Its user interface and powerful features kept bringing users back. Rumors of a HAM-capable *DPaint III* kept popping up.

Dan Silva had his own ideas, though. *DPaint III* is not the HAM superprogram that some were expecting. Instead, *DPaint III* is *DPaint II* perfected—and more. It doesn't support HAM, but it does support EHB (Extra Half-Brite) mode, a special 64-color mode that is slightly less colorful

than HAM, but much easier to program. And best and most surprising of all, *DPaint III* features animation.

The manual is reminiscent of the *DPaint II* manual, but there are some appropriate changes. Most obvious is the cartoon in the bottom right corner

**Programmer Dan Silva
had his own ideas—
DeluxePaint III
features animation.**

of the manual's pages. Dan Silva pedals a unicycle while juggling the EA trademark of sphere, pyramid, and cube. To see the animation, riffle through the pages. Most useful is the first chapter, which is titled "What's New." This is the section in which *DPaint II* experts will spend most of their time. I don't want to repeat the chapter verbatim here, but I will give a rundown of some of the more exciting features. ▸

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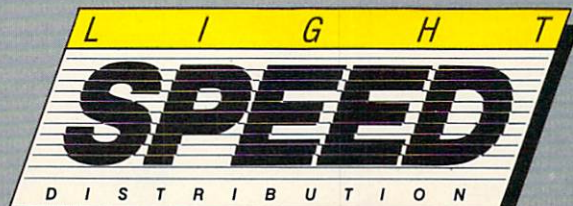
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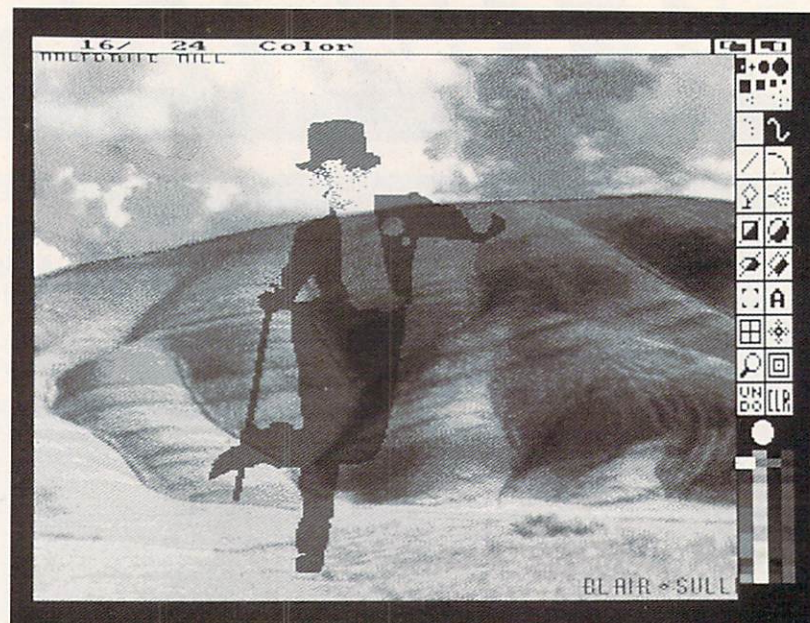
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First, of course, there's animation. An animation consists of several *DPaint* screens. Images are animated by flipping these frames. There are three ways to animate: by painting each frame, by moving a brush through 3-D space with the Move requester, and by painting with an animated brush as the frames flip by. Two new chapters explain animation in detail.

Second, *DPaint III* supports the EHB mode. While this mode is missing from the earliest Amiga 1000s (an upgrade chip is available from Commodore), it is an increasingly popular video mode that effectively doubles the number of colors that *DPaint* can handle. This mode works especially well with the tint brush mode, which makes it easy to colorize black-and-white images.

Third, *DPaint III* supports overscan mode, which is necessary for video work. While a television picture goes right off the edge of a screen in all directions, computer screens generally stop well short of the edges to en-



sure that all data is visible. The Amiga is built to allow for overscan screens, and *DeluxePaint* is one of several products that now support it.

There are many other changes that make *DPaint* easier to use. For

example, the font menu has been replaced by a font selector. This keeps users with dozens of fonts from crashing the program.

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As was the case with *DPaint II*, this program can be loaded either all at once or piece by piece as you use various parts of the program. Although I've used *DPaint III* on a 512K machine, Electronic Arts states that you need at least one megabyte of memory to run the program. My experiences bear out their statement. While I have yet to crash the release version of the program on a one-megabyte machine, it takes little effort to crash it on a 512K machine. Take EA's advice: Don't buy *DPaint III* until you have one megabyte of memory.

The *DPaint III* package comes with a bootable main disk, the Art Disk, and the Animation Disk. The latter two are packed with samples of artwork, animations, and *animbrushes* (animated brushes which progress from one frame to the next each time they are stamped down onto the screen). The third disk also includes a player program that allows you to play back *DPaint III* animations without loading *DPaint*—good news for animators who want to distribute their



animations without illegally handing out copies of *DPaint*.

As a paint program, *DPaint III* is intuitive with powerful (if obscure) features that will take a while to master.

As an animation program, *DPaint*

III is a marvel. It extends paint-program features directly into animation. For example, *DPaint II*'s perspective option gains new utility in *DPaint III* as a tool that lets you create animated flips, spins, turns, and spirals.

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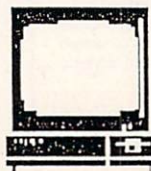
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Should *DeluxePaint II* owners upgrade to the new version? That depends. If you'd like to try your hand at animation, by all means buy the program. If your interests lie squarely in static art, consider whether the cost is worth double the number of available colors (in low resolution only) or overscan drawing.

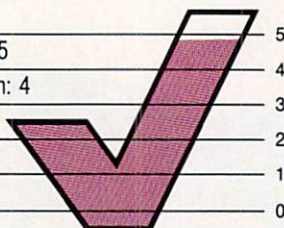
DeluxePaint III is wonderful. In my opinion, it's the greatest micro-computer program ever written. In fact, I toyed with the idea of giving the program a perfect rating. After all, it does exactly what it sets out to do. But *DPaint III* is not the perfect paint program. Buying *DPaint III* won't enable you to throw away all your other paint programs. It doesn't support HAM mode—a necessity for realistic imaging. It also doesn't support object-oriented drawing operations, as do most Macintosh paint programs. If we ever see a *DPaint IV* with those features, I'll be happy to give the program an across-the-board 5.0.

—Rhett Anderson

M

Intelligent Music
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\$200

Functionality: 5
Documentation: 4
Usability: 5
Features: 5



Close your eyes for a moment. Imagine a music program that's easy to use, that lets you quickly cycle through hundreds of musical combinations just by clicking a mouse. Imagine that, with this program, your computer takes an intelligent role in your music decisions. Imagine a program that doesn't require musical talent to master—only a good ear to know when something sounds interesting.

Now imagine that this easy-to-use

program creates musical compositions that sound as good as the music you hear on the radio—so good that many professional composers use it in their work, including Jan Hammer, Laurie Anderson, Wendy Carlos, Stanley Clarke, Mark Styles, Larry Fast, Steve Roach, Laurie Spiegel, Pete Townshend, Michael Hoenig, and Grover Jackson.

Finally, imagine that you can run this modern miracle on a one-megabyte Amiga. And that you don't need a MIDI keyboard to use it (but you can use one if you have it).

OK, you can open your eyes now. Welcome to *M*.

M is an unusual program. On the one hand, it's a program capable of a serious, even a scientific, exploration of music.

When it was released in 1987 on the Macintosh, MIT's *Computer Music Journal* called it the first professional-strength algorithmic composition program for a personal computer. (An algorithmic composition program is a computer program that



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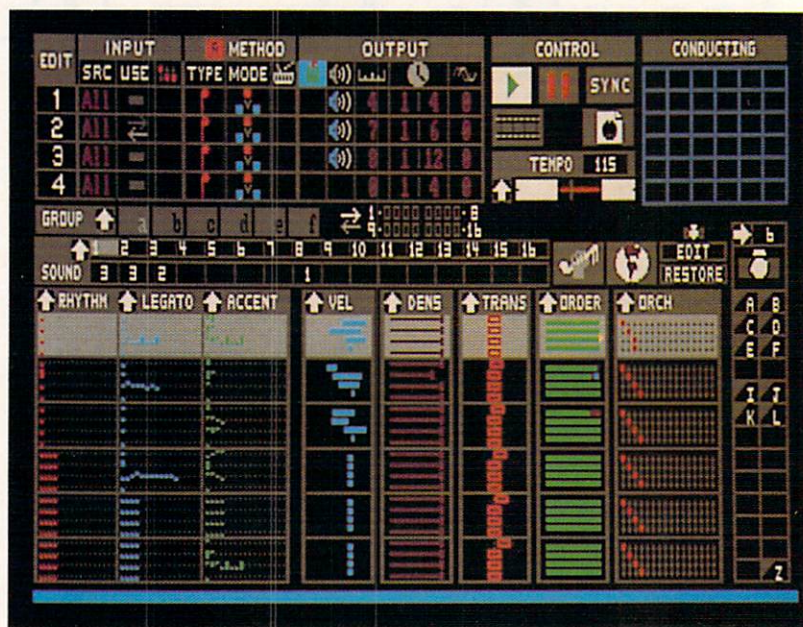


composes music with the help of its human operator.)

On the other hand, *M* is a program that a four-year-old can enjoy. A child can move the mouse, click on the various boxes, and immediately hear the distinct changes in the music. Given a little time, a child (or the child in all of us) could learn to compose music and develop an ear for musical patterns. That's the wonder of *M*. Intelligent Music is definitely onto something.

I've been using *M* on the Macintosh since late 1987, when it first came out. I downloaded a demo version from PAN (the Performing Arts Network) and immediately fell in love with it. The demo only whetted my appetite; I gladly paid for the real thing. When Intelligent Music ported the program over to the Amiga, I was eager to see how my old friend would like its new surroundings.

Happily, the Amiga version has almost all the features of the Macintosh version (for some reason, it doesn't have Time Distortion). Ac-



cording to Intelligent Music, it will even read Macintosh *M* files (which it converts internally) and standard Amiga MIDI files.

The Amiga version adds both multitasking (the Mac's MultiFinder

is—how should we put it?—still evolving) and internal sampled sounds (the Macintosh and PC versions work only with MIDI). Internal sounds open the program to a much larger audience than just MIDI owners.

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While *M* may seem complicated at first, once you learn its intuitive design, you should find it easy to use. You first enter a series of notes into each of the four independent channels (or Players) with either a MIDI keyboard or by pointing and clicking the mouse at the onscreen keyboard.

Then *M* really struts its stuff. It lets you alter your notes with eight sets of variables: Accent (loud/soft), Legato (long/short), Rhythm (now/late), Tempo (fast/slow), Transposition (consonant/dissonant), Note Order (original/random), Velocity (hard/weak), and Density (many/few). You can also control the combinations of instruments or sounds that play the notes. In short, *M* lets you vary your sequence of notes in just about any way imaginable.

Fortunately, *M* makes it very easy to try out musical combinations to find the ones you like. Most variables are represented on the screen with a column or row of six boxes (referred to as Variable Positions). Click once on a box, and that variable immedi-

ately affects your notes. Click twice on a box, and you bring up an Edit Window, which lets you reconfigure the variable's settings.

For example, choose one of the Note Order boxes and double-click to bring up its edit window. You'll see

Intelligent Music's M is capable of serious exploration of music.

four horizontal bars, one for each of the four Players. Each bar represents 100 units, or 100 percent of the note order. By using the mouse to slide the three numbers to the left, you can divide the bar among three kinds of note ordering: Original Order (where your notes are played exactly as you entered them), Cyclic Random (where your original notes are recomposed into a different order but are played back repeatedly in the new order), and Utterly Random (where each note is

arbitrarily selected from your original notes, and the order is completely nonrepetitive). You might set them as 42-percent Original Order, 37-percent Cyclic Random, and 21-percent Utterly Random—or any other combination that adds up to 100 percent.

You do this for each of the four players in the Note Order box, and then do the same for each of the other five Note Order boxes—setting each box with a slightly different set of numbers. *M* makes this process intuitive. You can play your notes while you adjust each box so that you hear how the new parameters affect your music. (We're talking about millions of possibilities among all the various combinations, so it makes sense to use your ears to narrow the possibilities into a more selective working environment.)

If you'd like to be more organized in your selection of the boxes, try the Conducting Grid, an area of the screen made up of a six-by-six set of squares. Each variable has a Conducting Arrow, which can be switched on or off

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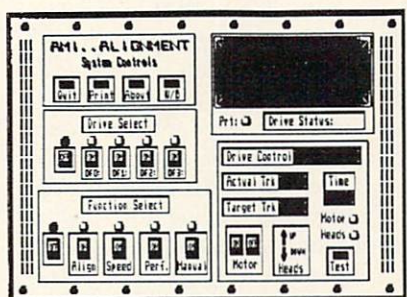


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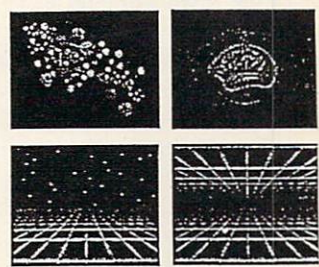
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and pointed up, down, left, or right.

As you move the cursor onto the grid, the cursor becomes a conducting baton. By moving the baton across the Conducting Grid, you can systematically move through the variables with a single motion, with each variable conducted according to the direction of its arrow.

Once you find a combination of variables that you especially like, you can take a Snapshot of the screen controls. With Snapshots, you can save and recall as many as 26 different combinations of variables. First, select the Blink Everything button. Then select one of the small white boxes below the camera icon and it will be filled with a letter to let you know it contains a Snapshot.

You don't need a MIDI keyboard to use *M*. The package includes an instruments disk with 23 IFF-8SVX sound samples. These include 12 percussion, 4 weird (CowMoo, Bark, Voice, and BangZoom), 3 string, 2 wind, and 2 synthesizer sounds, as well as some demo songs that show off

the capabilities of *M*. The Bonk demo file is especially well put together, with its intricate percussion patterns. Be sure to load the demo files. You really have to hear the program to know how powerful it is.

(You can order a demo disk of *M* for \$10 from Intelligent Music. The demo program has all the features of the regular program except that it can't save and you have to reboot after 10-40 minutes. It has six of the sound samples and two of the demo files.)

M's documentation is excellent. The tutorial should have you up and running in no time. You also receive a free membership to PAN (normally \$150), and a copy of RSG (a shareware program that lets you edit IFF-8SVX sound files). The program is copy-protected: Keywords are requested from the manual. You can receive a non-copy-protected version by signing a form and sending it to Intelligent Music along with an additional \$50.

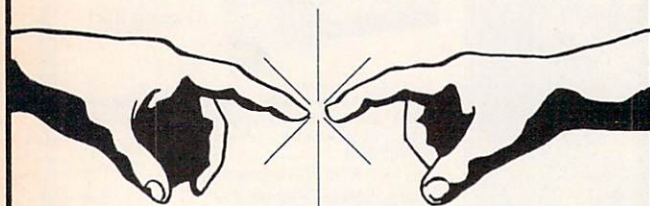
If you use *M* to compose music with MIDI keyboards, you'll find it's best suited to percussive-type sounds

that are not heavily sustained. Because it excels at manipulating notes, you should choose synthesizer voices that let you distinguish one note from another. I've been able to use *M* to create some intricate rhythm tracks and then import them into a sequencer program (via MIDI files). From there, I add additional MIDI tracks to create a full piece. I've found that *M* is a great way to get started when you need to break out of a musical rut.

I really like this program. It's fun. It's hard to keep from laughing when you conjure up a chorus of singing voices, one saying "bang-zoom" and another issuing a contented "moooo"—all in perfect syncopation. After an hour or two with *M*, you'll be convinced you've created a masterpiece. Why fight it? It's more fun than any game I've seen (including *Tetris*) and more productive than any music program you're likely to find.

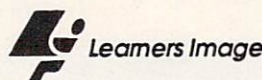
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MINI-REVIEWS

Mini-review contributors this month include Rhett Anderson, Ervin Bobo, Bill Chin, Keith Ferrell, Jim Fuchs, Steve Hudson, Randy Thompson, and Troy Tucker.

Hostage Rescue Mission

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
\$44.95

Playability: 5	5
Documentation: 3	4
Graphics: 5	3
Sound: 5	2
	1
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Terrorists have seized our embassy, taking hostages. Negotiation is out. Rescue rests upon the elite of the elite.

This Infogrames game, imported and enhanced by Mindscape, translates that tense scenario into a superb, violent, and likely-to-be-controversial interactive adventure. You assume the role of team leader, both placing exter-



nal snipers and guiding the rescue team through the embassy itself.

The game has three stages. First, the snipers must be placed. A map shows their target locations—but getting there is more than half the battle. The terrorists are playing spotlights over the very streets through which your men must move. And the terrorists have sharpshooters of their own.

Joystick-controlled movement is more than just convincing. Your three men run, jump and roll, dive through windows, and duck into darkened doorways—or, if you're not quick enough, crumple bullet-riddled to the sidewalk.

Snipers in place, Phase II puts you on the roof with another team of three. This is the rescue team. You must rappel down the building, break windows, and enter the embassy. Your snipers can cover you, but there are terrorists behind the windows.

The third stage is the toughest. You're inside the embassy, where you must take down the bad guys, save the hostages, and guide the rescued personnel to a safe room on the building's third floor.

Throughout the game you can cycle among your team members, using snipers to support rescue efforts, placing rescuers on different sides of the building, checking maps, and watching the ever-ticking clock.

Hostage Rescue Mission is gorgeous and believable. Joystick control is sensible, reflexive, and easily learned. Both the sound effects and the soundtrack add substantially to the excitement. A wide range of difficulty levels—some of which can be reached only by succeeding at simpler missions—ensures a long lifetime of play-

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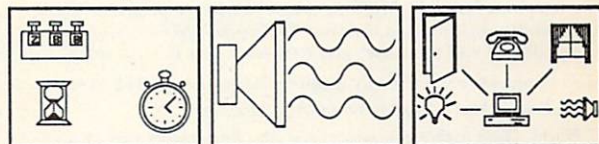
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3014 Alta Mere Dr., Ft. Worth, TX 76116 Phone: 817-244-4150

ability. Documentation is good, although it contains an error: The joystick goes in port 2, not port 1. The game relies on the documentation as copy protection.

This is an exceptionally violent game and, perhaps, an exploitative one. But it's also programmed and designed with a vengeance, suspenseful all the way.

—K.F.

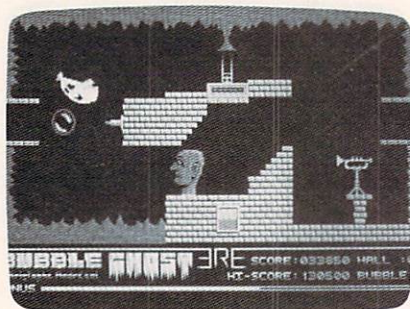
Bubble Ghost

Accolade
20813 Stevens Creek Blvd.
Cupertino, CA 95014
\$34.95

Playability: 4	5
Documentation: 3	4
Graphics: 4	3
Sound: 4	2
	1
	0



What, you ask, is a Bubble Ghost? And I reply that it is, quite obviously, a ghost who propels a bubble through the rooms and corridors of an eerie,



abandoned laboratory. Obviously.

Accepting that is like accepting the White Rabbit in *Alice in Wonderland*: Once it's done, all the delightful insanity assumes its logical place.

Briefly, a mad inventor has died and now haunts his former domain by blowing (well, how else would you do it?) a bubble through the 35 rooms. Unfortunately, the inventor seems to have been obsessed with sharp objects and twisting corridors, as well as candles that remain lit. Touch anything and the bubble bursts (as bubbles will do), sending you back to the beginning of the room.

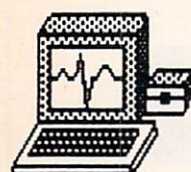
Fortunately, the Amiga version is easier than those for other computers. Move the ghost with the mouse, orient him by clicking on the left mouse button, and blow by pressing the space bar.

It isn't as easy as it sounds. Bubbles tend to drift, and this frequently causes a need for midcourse correction. Further, if you blow too long, the cute ghost turns red and points are subtracted from your score. Blow from too great a distance and your efforts are ineffective.

Scoring is based on the time used to negotiate a room, whether or not your ghost turns red, and how well you neutralize such hazards as candles and fans. Scores are posted to a Hall of Fame.

Delightfully insane, *Bubble Ghost* should provide hours of the blithering idiocy inherent in all good arcade games.

—E.B.



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Cardiac Arrest! is almost as fun to use as it is educational. There are varying degrees of difficulty, with over 45 patients — and none is ever the same twice. You can actually go "beyond ACLS" with hypothermia, hypocalcemia, hyperkalemia, and more. Yet the manual is so complete and well-organized that non-medical people use the simulator to "play doctor."

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Reach for the Stars, Third Edition

SSG
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(800) 245-4525
\$39.95

Playability: 5	5
Documentation: 2	4
Graphics: 3	3
Sound: 3	2
	1
	0

Your mighty star fleet streaks toward the enemy base at Altair. Has the enemy anticipated the invasion, or have you achieved total surprise?

Try to outguess your opponents in this game of galactic colonization, industrial and social development, and interstellar conquest for one to four players. The solitaire version is challenging, but games with two or three human players are the most fun.

A typical game averages five hours. Opponents must look away from the screen when you make your moves, ensuring total secrecy. The ul-

timate thrill comes from managing your planets and building your forces over several turns, then planning and executing a surprise attack on a worthy opponent.

The third edition of *Reach for the Stars* includes an entirely new advanced scenario with limited navigation and higher levels of industrialization. The graphics and sound features include twinkling stars and battle crescendos. The excellent interface lets you issue orders easily with pull-down menus. The computer players are extremely tough but don't have quite the same verve displayed by the second edition's infamous Killer Keating.

Reach for the Stars is a timeless classic that every war gamer must have. It's a game that I never tire of. Roger Keating and Ian Trout have written many war games, but this remains their favorite. It's easy to see why.

—B.C.

CygnusEd Professional

ASDG
925 Stewart St.
Madison, WI 53713
\$99.95

Functionality: 4	5
Documentation: 4	4
Usability: 5	3
Features: 5	2
	1
	0

I wouldn't want to write a letter with it. But *CygnusEd Professional* wasn't written to be a word processor; it's a tool for programmers who need to edit source code quickly and painlessly. It was written to be the fastest, most versatile text editor available on the Amiga—and I dare say it is.

The manual claims a screen output rate of 30,000 characters per second. All I know is that I have never scrolled through text this fast on any computer using any program. Besides offering full support of the mouse and pull-down menus, *CygnusEd Professional* supports customizable keyboard macros (allowing you to emulate your favorite editor), hot-key operation (the

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editor stays resident in memory, waiting for you to hit the hot key), multiple file editing, an *AREXX* language interface, columnar block cutting, the ability to recover unsaved files after a visit from the Guru, and more features than I could list here. It also supports word-wrap and file printing, although clumsily so (one of the reasons I wouldn't use it as a word processor).

What's the catch? Memory. *CygnusEd Professional* takes up a considerable amount of disk space and RAM in comparison to other text editors. But if size is of no concern, *CygnusEd Professional* is the most efficient and useful editor around. I wouldn't want to write a program without it.

—R.T.

Award Maker Plus

Baudville
5380 52nd St. NE
Grand Rapids, MI 49508
\$49.95

Functionality: 4	5
Documentation: 3	4
Usability: 4	3
Features: 5	2
	1
	0

A student wins first place at the science fair. An employee earns top honors for sales. Your fishing buddy catches a 12-pound bass. All are worthy accomplishments, but can you give them the recognition they deserve?

You can with *Award Maker Plus*, a feature-packed program from Baudville. It makes it easy to create dramatic awards and certificates on your Amiga from almost 300 predesigned award styles. Additional award-style libraries, including a comprehensive collection of sports awards, are also available.

Specify type styles on some awards or edit the built-in titles; all

award styles let you customize the block of body copy, select the desired border style, and specify a border color, providing you have a color printer. The manual even explains how to create color borders with a black-and-white printer.

Creating an award is easy. Begin by specifying the style number of the award you want from the enclosed catalog. The 286 different award forms are on the program disk, so no disk swapping is required.

With the basic style loaded, it's simply a matter of customization. An onscreen checklist walks you through the process and makes award design a snap. It clearly indicates where choices are required and a places a checkmark next to each item as you finish it. You can change your mind at any point prior to printing the award.

When you've finished your design, the completed award can be saved to disk for future use or modification. To make sure everything's right, preview your creation on the screen before you print it. If desired,

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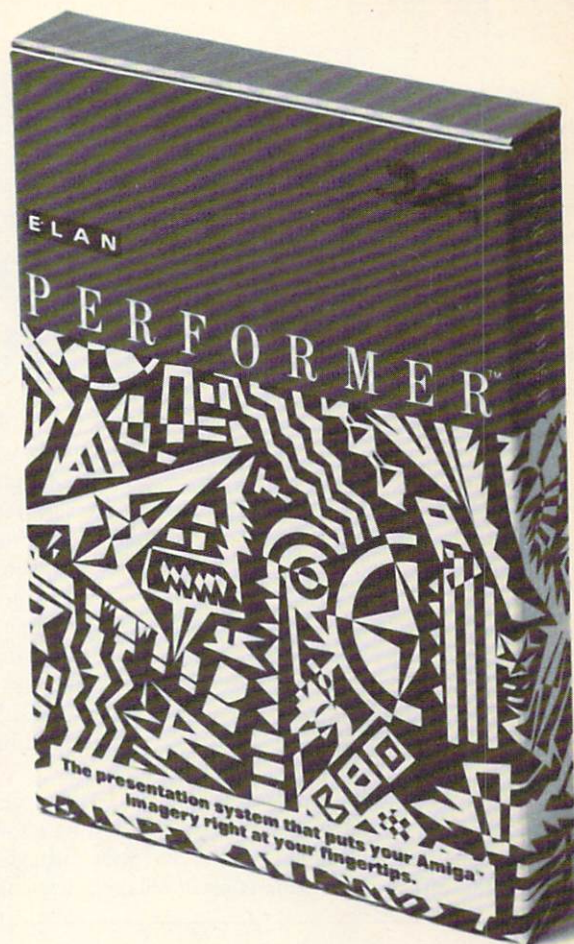
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you can even use the Name List feature to print multiple copies of an award with a different name on each certificate. This is a genuinely useful feature, say, if you coach a softball team.

Give *Award Maker* serious consideration when you need to give awards—and give one to yourself for picking a really practical piece of software.

—S.H.

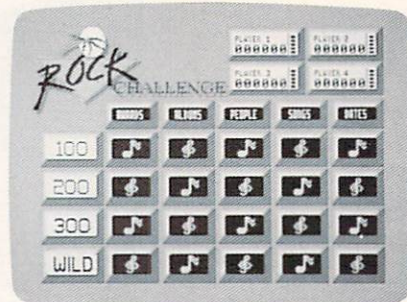
Rock Challenge

ReadySoft
P.O. Box 1222
Lewiston, NY 14092
\$39.95

Playability: 3
Documentation: 3
Graphics: 3
Sound: 3



Rock Challenge is a rock-and-roll trivia game that has attracted its fair share of lunchtime attention here at the COMPUTE! offices. The game is set



up as a sort of multiple-choice version of Jeopardy with five categories—Awards, Albums, People, Songs, and Dates. The game ends when any of the players first makes three correct guesses in each category.

Rock Challenge is designed to be played by one to four players, but I found it boring to play solo. The board features questions with different values—100, 200, and 300 points, plus a wild question worth a random amount.

The game does a pretty good job of testing knowledge of rock from the fifties through the eighties, but I do have a few complaints. First, I didn't

find the 300-point questions to be any more difficult than the 200- or 100-point questions. And occasionally, *Rock Challenge* gives an absolutely bizarre possible answer.

But worst of all, after only a few games, the same old questions start popping up. Compare this to the board game Trivial Pursuit, where you have to go through a whole box of cards before you can possibly get a question twice. The instructions don't say how many questions are in the game, but the disk is only three-fourths full.

Still, until you start getting repeats, *Rock Challenge* is fun.

—R.A.

Finally...



The Way To Use XCad!

Spring 1989 marked the first release of X-Shell. X-Shell is not a single program, but, as its name implies, it is a "shell". One purpose of a software shell is to surround a target program and replace its user interface with another, easier and more powerful presentation. The target program of X-Shell is X-Cad.

X-Shell lists for \$199. It is available from GRAFX or your local Amiga dealer.

X-Cad is a powerful 2D drafting program. X-Cad manages the Amiga's resources well, making it fast. Its vector handling tools are sophisticated. But, X-Cad is presented to the user more as a syntactic language than a drafting system. X-Shell fixes that.

X-Shell is the result of an effort by GRAFX Computing, and a professional architect, to make the use of X-Cad's as smooth, and productive as it can be. X-Shell is easier to learn than X-Cad or AutoCAD.

X-Shell uses a set of compact custom graphic menus that replace the X-Cad text menus. X-Shell provides a manual with over 100 pages describing the use of every button on every menu. It becomes easy to draft with precision using X-Shell. There is nothing else like it...

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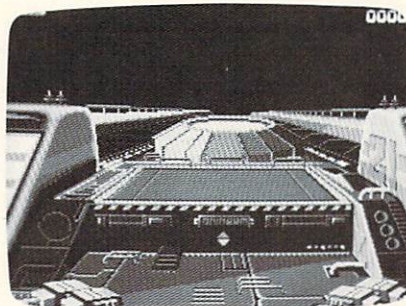
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Galactic Conqueror

Titus
20432 Corisco St.
Chatsworth, CA 91311
\$44.95

Playability: 3	5
Documentation: 3	4
Graphics: 4	3
Sound: 3	2
	1
	0



What happens when you try to elevate a mindless arcade game to a serious level? You get *Galactic Conqueror*—an interesting game, but at heart a standard shoot-'em-up.

Ignore the prequel that forms the bulk of the documentation. It contains such non sequiturs as the information that pilots for this mission were selected from the ranks of those who fought well in *Offshore Warriors*, which just happens to be another game published by Titus. Such coincidences are startling.

Forgetting all that, take the game for what it is worth—which amounts to quite a lot.

As you begin, a mother ship en-

ters the screen from overhead, much like the famous opening sequence of *Star Wars*, then pauses and releases your fighter. It is probably just another coincidence that the fighter vaguely resembles the famous X-wing fighters of some movie or other. It doesn't hurt to stick with a proven design.

But pay attention to the beautiful artwork on the mother ship and on your own craft. We can see graphics like this only on the Amiga, but sometimes it seems we don't see enough of them.

Your ship is always seen from outside and behind, and this leads to a startling development. Do a roll and

your ship remains stationary while the horizon is suddenly above you—as it would be if you were in the cockpit.

That horizon, by the way, is said to be the surface of a planet. What it really is is an alternating series of horizontal bars designed to give the feeling that your ship is getting somewhere.

After your trial, you'll return to the mother ship and check out a map of the galaxy. Red planets have been overrun by enemy hordes, while blue are far from any allies. Both need your services. When you move the crosshairs to select one, you're shown a close-up view of the planet as well as diagrams of the enemy ships guarding it.

Leave the mother ship again, and in moments you'll be fighting the same battle. The only thing that varies is the type of weapons hurled at you. Like the mother ship, the weapons are well done. I soon discovered, however, that holding down the joystick fire button gave continuous fire—and then I learned that my field of fire gave adequate cover to my ship. No need to

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go jinking all over the sky—stay still and let the rascals eat hot lasers.

Although it may at times seem too easy—and though the arbitrary scores are ridiculously high—*Galactic Conqueror* still fulfills what I perceive to be its purpose: to be a good-looking, good-sounding arcade shoot-'em-up.

—E.B.

Hole-in-One Miniature Golf

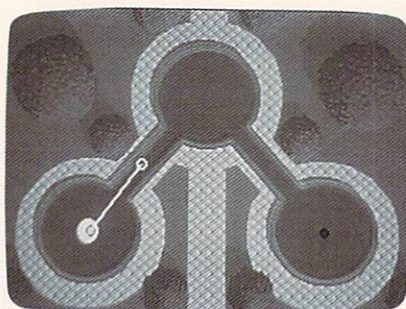
DigiTek Software
8910 N. Dale Mabry
Suite 37
Tampa, FL 33612
\$39.95

Playability: 5	5
Documentation: 3	4
Graphics: 4	3
Sound: 4	2
	1
	0



Whatever it is that makes golf and computers such a natural match reaches a state of perfection with *Hole-in-One Miniature Golf*, from DigiTek Software.

Hole-in-One starts with a straight-



forward tutorial designed to familiarize you with the way things work. Then it challenges you with four playing courses and 72 different holes. Up to four players can compete, making the program (like real miniature golf) a good bet for family fun. And with a digitized crowd cheering every hole in one, you'll always be fired up for another round.

The player interface, totally mouse-controlled, is a joy. It uses the mouse to position balls, line up shots, and specify how hard the ball is hit. Our six-year-old got the hang of it in about five minutes. "This is fun," she says.

Hole-in-One's screens show an overhead view of each hole. Where topography is a factor, as it frequently is, lighter colors represent higher ground. Some holes even let you see things from different angles through a contour window. Graphics? Typically Amiga. You'll love 'em.

During gameplay, an Expert option is available. Turning on Expert turns off an onscreen shot line, which otherwise helps you aim your shots. At first, you'll probably keep the shot line on the screen, but as your skill increases you'll find it more challenging with the shot bar turned off.

Expert or not, penalty strokes are assigned for sins such as landing in the water. And if you go more than three strokes over par, you not only get a penalty stroke, but you receive the dreaded *Over stroke limit* message, too.

Other features include Instant Replay, which lets you see and evaluate your previous shot, and if you're playing alone, Retry, which lets you back up and repeat shots—all the way back to the start of a hole, if you wish. Fi-

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Zynaps

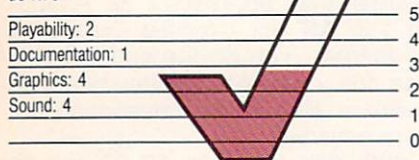
nally, if you dare, print out your scorecard and show it your friends.

Not much is missing from this game. It would be nice to have a course construction set so you could create your own courses, but that may be getting too far afield. After all, miniature golf is meant for fun-filled playing—and when it comes to playing, *Hole-in-One* is a hole in one.

—S.H.

Zynaps

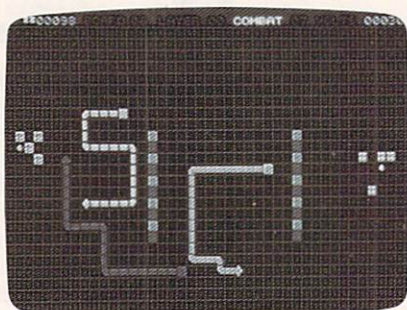
Scorpion
19 Harbor Dr.
Lake Hopatcong, NJ 07849
\$34.95



Zynaps is a one- or two-player arcade shoot-'em-up that takes place in an alien-infested solar system. Your mission is to seek out and destroy a hidden alien-base ship. Excellent graphics and eerie sound effects surround you in this hard-hitting space battle.

Right off the bat, you'll notice that *Zynaps* is an extremely difficult game to play. As you weave your craft through a treacherous alien landscape, you must avoid a constant barrage of enemy missiles, mines, and asteroids. Most games allow you to step down the skill level when things get a little too hot, but not *Zynaps*. There's only one skill level, and it's a monster. In my opinion, an arcade game should have multiple skill levels that appeal to all types of game players. As it is, novices may quickly become frustrated and decide they aren't cut out for saving the world.

The documentation is vague, but



Tracers

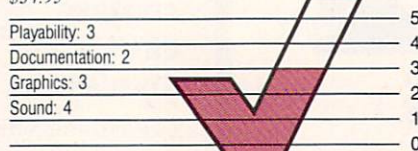
typical of most arcade games. A description of the enemy ships is provided, but no pictures are included. Weapon controls are explained, but not in a manner that I could understand. I felt as if I had been given a ship and ordered to save the world, but hadn't been told how to fly the ship or what the enemy looked like. If you don't know how to use your equipment, you quickly become target practice for the opposition. After I'd played the game and read the manual many times, I finally figured it all out.

Most of the ingredients for a successful arcade hit are found in *Zynaps*. The graphics and sound effects are excellent and gameplay is fast-paced, but an important factor was overlooked: the player. If you're a novice game player, you're going to have trouble playing the game. However, if you're a real hotshot arcade gamer, *Zynaps* will put you to the ultimate test.

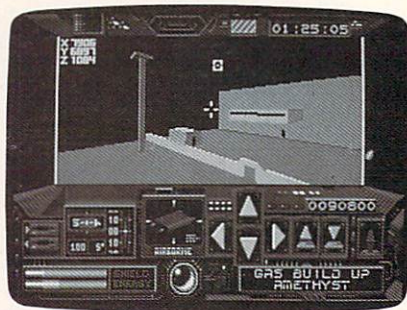
—T.T.

Tracers

MicroIllusions
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\$34.95



One of the nicer things about VCRs and cable TV is that you can eventually build a library of only your favorite sequences from certain movies: the final gunfight in *The Wild Bunch*, the intro scenes to any number of James Bond movies, the Light Cycle race from *Tron*. Or you can have an interactive version of the latter by purchasing a copy of *Tracers*. There is probably no



Space Station Oblivion

real debt owed to Disney Studios; I seem to recall a game, played with pen and paper, upon which both the movie sequence and the computer game are probably based.

Briefly, you move across a grid a cursor that leaves behind a trail of its own color. Your opponent (human or computer) is moving the other cursor and is likewise leaving a trail.

Like walls, these trails cannot be crossed—they can't even be contacted. The game's object (as you've probably guessed) is to box in your opponent while you try to avoid being boxed in by him or her—or yourself.

Dressed up with a musical score (which, thankfully, can be toggled off), hazards on the grid, multiple levels, and several variations on the basic game, *Tracers* is a nice package of arcade thrills.

Don't think it's easy. Your wrist and your joystick will be severely tested—as will be your mind if you read the insipid prequel to the documentation.

—E.B.

Space Station Oblivion

Epyx
600 Galveston Dr.
Redwood City, CA 94063
\$19.95



Never mind all the prehistory. On this planet were built 18 platform colonies, with no regard for the fact that the planet must vent deadly gases. To keep the planet from exploding, you must visit each of the sites and bore vent holes. >

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LANGUAGES

- ❑ **#9 FORTH** - Two versions of the FORTH programming language.
- ❑ **#50 XLISP** - A version of LISP, the artificial intelligence language. Includes documentation.

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- ❑ **#4 Communications** - Starterm and Aterm are both included. Both run from Workbench or CLI and are comparable to communications packages selling for \$50+. Full control of baud rates, phone directory, all protocols, auto chop of files, and many other extras. Works well with the Avatec 1200 modem and others. Source code included.
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- ❑ **#132 Videomaker Utilities** - This disk is packed with utilities to make your desktop videos easier to produce and more professional looking.

- ❑ **#133 DOS Helper** - A program designed to help you with the AmigaDOS commands. Can be activated from icon of the CLI. Supports multitasking, so that you can refer to it when you need it. As usual, there are other good programs included on the disk.
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- ❑ **#146 Calendar** - A very good personal calendar for birthdays, holidays, meetings, bills and other events. Excellent graphics. Calendar program also has a diary. Other programs include some graphics and Checkbook.
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SOUND/MUSIC

- ❑ **#18 Future Sound Demo** - Another great sound demo of digitized sound. Includes the wicked witch of Oz, breaking dishes, sea gulls, car crash, ducks, others.
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- ❑ **#67 DPSlide8** - Over 30 slides of all sorts on this self-running slideshow.
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- ❑ **#95 DigaSlide11** - Another in the great series of slideshows with great artwork. Self-running with over 25 pictures.
- ❑ **#108B Juggler** - Famous demo that shows the beautiful graphics of the Amiga and just how powerful this program is. It is easier to run than 108A, but only has the one demo on it.

GAMES

- ❑ **#38 Basic GrabBag2** - Around 25 programs of various types. Many of these are must-haves. At less than \$20 each, you can't go wrong!
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- ❑ **#124 Milestone** - A great computer version of Miles Bourne by the author of Monopoly for the Amiga, David Addison.
- ❑ **#125 Othello** - A great 3-D version of this popular game.
- ❑ **#128 Space Games** - Cosmoroids (like asteroids) and Gravity Wars highlight this disk just full of games.
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- ❑ **#147 Jackland/Graphics** - Adventure clue game. Also some great pictures (graphics), a useful utility called Quickbase, and a fun program called Thingies which you will enjoy!!!
- ❑ **#148 Boulder Dash** - Very popular game with excellent graphics and has several challenging levels. This disk is full- It has Othello, Life3 and many useful utilities.
- ❑ **#151 4 in a Row** - A fun, but challenging game you play against the computer. There is an excellent Demo "MandFXP-D3", a utility or 2 and the fun TARGET - A weirdo thingy.

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You'll have to race through the landscapes, teleport when you can, drill when you think you must.

Mouse skills are less important than problem-solving abilities: On this planet, not everything is what it seems. Perhaps I should also warn you that the puzzles are so deep the game has already inspired a clues book, available from the publisher.

—E.B.

Rebel Charge at Chickamauga

SSI
1046 N. Rengstorff Ave.
Mountain View, CA 94043
\$59.95

Playability: 4	5
Documentation: 4	4
Graphics: 3	3
Sound: 3	2
	1
	0

It used to be said that SSI games were too slow, were too detailed, and tried to accomplish too much. It was also said that SSI games needed a little more horsepower than an 8-bit computer could deliver. With the introduction of the Amiga version of *Rebel Charge at Chickamauga*, these criticisms no longer apply.

Gone are the days of sleeping while waiting for a computer-controlled opponent to move. This game plays fast. The game has no pull-down menus, but commands can be given by clicking on a gadget with the mouse

pointer or typing the keyboard equivalent. And don't worry about the game being too complex—you can choose to play according to beginner, intermediate, or advanced rules.

Rebel Charge is so realistic that you can almost smell the gunpowder. Each unit involved in the historical battle is recreated, from artillery brigades to infantry divisions, complete with their commanders. Further enhancing the simulation, SSI's documentation includes a historical summary of how the battle actually progressed.

The Amiga version of *Rebel Charge* has many nice touches—for example, routed units or units forced to retreat do so with a digitized Monty-Pythonish cry of *Run away!* Making full use of the Amiga's beautiful graphics, *Rebel Charge at Chickamauga* is a challenging and enjoyable game.

—J.F.

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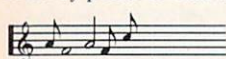
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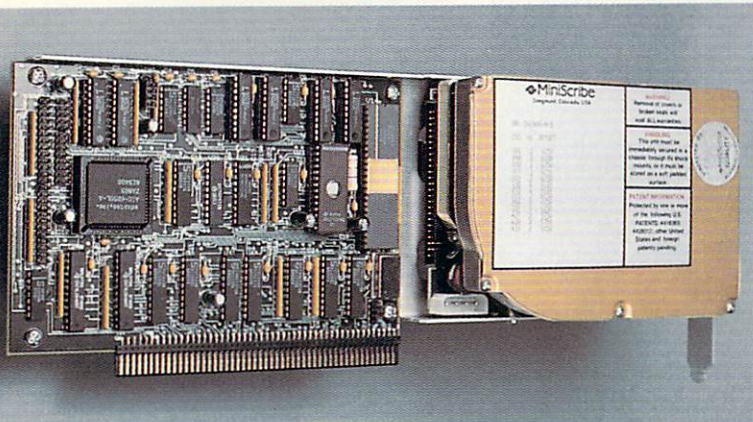
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Platoon

Platoon

Data East
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\$44.95

Playability: 4
Documentation: 3
Graphics: 3
Sound: 3



Obviously, *Platoon* is based on the Oscar-winning movie about the Vietnam War. Since movies do not generally translate well to computer games, I can forgive *Platoon* for taking liberties with the plot while at the same time admitting that essential elements are here.

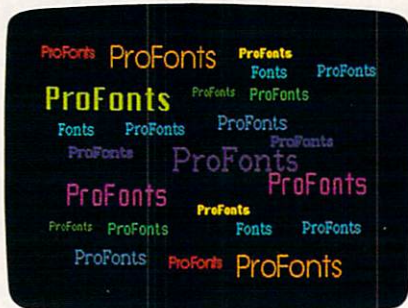
Divided into six sections, *Platoon* begins with a patrol through the jungle. Next you encounter the village and must find the entrance to the tunnels; an excursion through the tunnels follows. If you find the exit, you'll be in a foxhole and ready for the night ambush that comprises section 4.

Back to the jungle now, where Sgt. Elias (the Good Sergeant) will die with arms outstretched to heaven while you concentrate on evacuating the area before the air strike.

Now to another foxhole, where Sgt. Barnes (the Bad Sergeant) tries to kill you. You must use grenades to take his bunker from him before another air strike commences.

In each scenario, you are in constant danger, with enemy soldiers popping up all over the place. In turn, you'll fight all five men of the platoon, each of whom has four lives; try to collect ammo and supplies left lying around; and worry about the morale factor. Each of these factors figures into your eventual score, which is posted to a Hall of Fame.

As a translation of a movie, *Pla-*



ProFonts

toon works about as well as these things usually do, and better than most. We can also respect Data East for not making the game as bloody as some others might have done.

—E.B.

ProFonts

New Horizons Software
P.O. Box 43167
Austin, TX 78745
\$34.95 each

Functionality: 4
Documentation: 5
Usability: 5
Features: 3



ProFonts Volume I: Professional and *ProFonts Volume II: Decorative* are complements to New Horizons' *ProWrite* word processor. Included on the disks are several Amiga bitmapped fonts, many in several different sizes. Volume I consists of straightforward high-quality fonts for serious work. Volume II features fancier fonts that are useful for headlines.

Since these fonts are standard Amiga fonts (they are *not* PostScript fonts), they also work well in paint programs and other word processors.

The documentation goes above and beyond the call of duty, including a description of Amiga fonts, how to best use fonts with *ProWrite*, and so on. Also included are sheets that show how each of the fonts look. That's important when you have fonts named Gold, Platinum, Quartz, and so on.

The fonts are very attractive. Someone spent a lot of time on them.

A bonus on each disk is System Mover, a program that allows you to easily move or delete fonts. This program is so handy that you'll want to drag it into your System folder.

—R.A.



Aussie Joker Poker

Aussie Joker Poker

Joker Software
P.O. Box 22380
Gilroy, CA 95021
\$49.95

Playability: 3
Documentation: 3
Graphics: 4
Sound: 3



I've often wondered why anyone would go to the trouble of inventing a new card game when so many of the old ones are so hard to master. With *Aussie Joker Poker*, you also have to wonder if all those people named *Dun-dee* really sit around playing this game while throwing shrimp on the barbie.

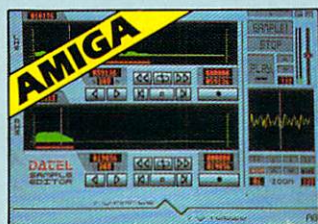
If you can imagine it, the game combines elements of both blackjack and draw poker. You're dealt five cards from a deck that contains only the denominations 10 through ace. Hold on to those you think will best serve your hand and draw new ones to replace the ones you've discarded.

Now you're in the blackjack phase: If the cards you've drawn don't improve your hand, you've busted. If they do improve it, you're given a point score which you may either keep or risk on another draw. Bust three times and you're out, at which point your accumulated score is matched against those of the other players to determine the winner.

If it all sounds terrifically easy, be advised that it requires different strategies from those used in most card games you've played; and, like other games, it may be beyond absolute mastery. But you'll keep trying.

—E.B.

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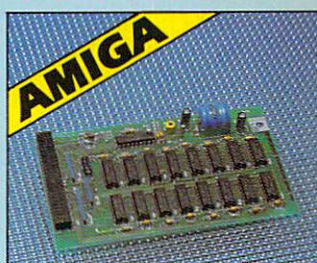


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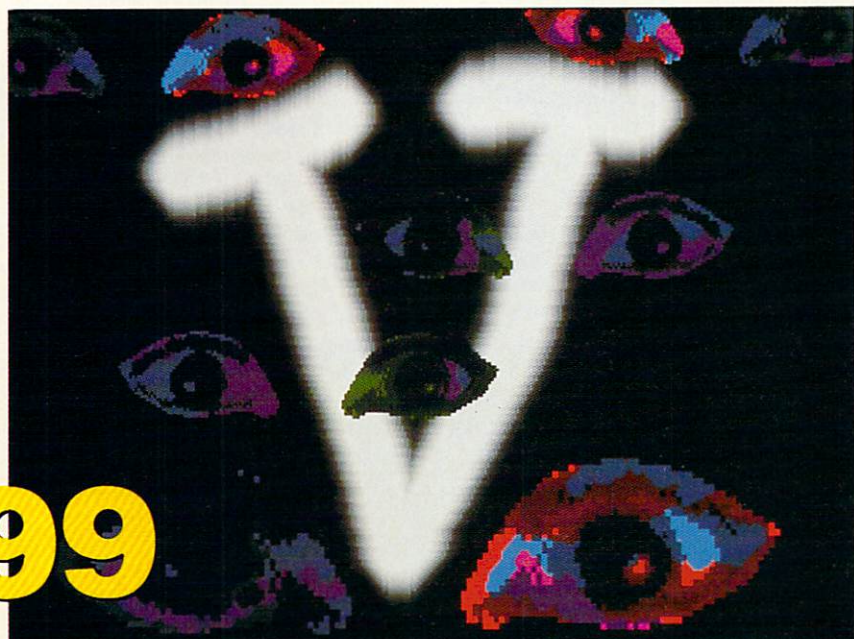


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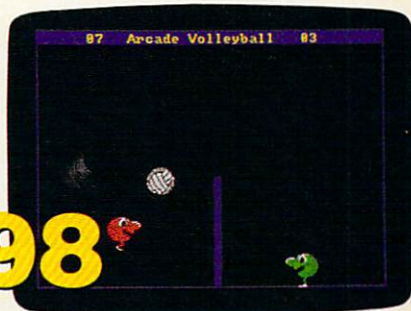
ON DISK

Your Guide to This
Issue's Programs

Amiga Resource
Volume 1, Number 3
Fall 1989



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Arcade Volleyball

Rhett Anderson & David Hensley, Jr.
Amiga version by Rhett Anderson,
Tim Midkiff, and Randy Thompson

"Arcade Volleyball" is a one- or two-player arcade-style game with colorful graphics, smooth animation, and sound. You control a high-jumping, if short of stature, expert volleyball player. It won't be long before you'll be executing topnotch serves, sets, and spikes.

Arcade Volleyball is written in *Lattice C 5.0*, but you don't need *Lattice C* to run the program. Simply boot your computer with the *Resource Disk*, double-click the disk icon, open the Volleyball drawer that looks like a folder, and then double-click the icon labeled *ArcadeVolleyball*. To copy the program to another disk, such as a hard disk, you must copy the entire Volleyball folder, not just the program file.

Arcade Volleyball uses stereo sound. If you don't have both the left and right Amiga audio channels connected to an audio output device, you will not be able to hear all of the game's sounds. Arcade Volleyball sounds best when your Amiga is connected to a stereo amplifier or a stereo monitor such as the 1084S or the new 1084SD.

Your Serve

When the program starts, the program will go into demo mode and you'll see this menu:

Human vs. Human
Human vs. Computer
Computer vs. Human
Computer vs. Computer
Quit

The option **Human vs. Human** is highlighted. To make a selection, use the joystick plugged into port 2. Move the stick forward and backward to move the highlight bar up and down. When the desired option is selected, press the fire button.

In two-player mode (**Human vs. Human**), the joystick in port 2 controls the player on the right, and the joystick in port 1 controls the player on the left (the player on the left must unplug the mouse to connect his or her joystick).

There are two one-player options: **Human vs. Computer** and **Computer vs. Human**. In the first, the computer controls the player on the right. If you select **Computer vs. Human**, the computer controls the player on the left. In both cases, you use the joystick plugged into port 2.

You'll find that the left and right com-

puter players are not identical; each one plays volleyball a bit differently. Try **Computer vs. Computer** to see which one you'd rather challenge. They're both very good players, and although they may not always get the ball over the net, they never let it hit the ground. (Only a few of us at **COMPUTE!** can consistently defeat the computer players.)

Select the **Quit** option to exit the game.

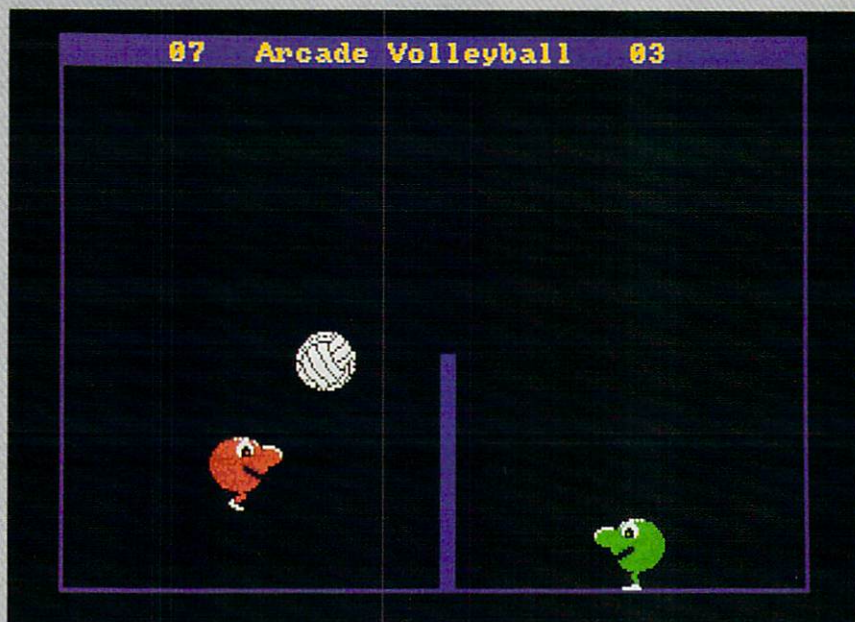
The Big Serve

In the center of the court, you'll see the volleyball net. Above the court is the status line, where the score for each player is

the left. If you hit the ball with the right side of your head, it goes right. If you hit the ball with the top of your head, the ball continues with the same horizontal velocity.

As in real volleyball, you can receive points only during your serve. However, *Arcade Volleyball* differs from real volleyball in several ways. First, the court is entirely surrounded by walls; there's no need to worry about hitting the ball out of bounds. Also, you can legally hit the ball as many as three times in a row. Remember, the serve doesn't have to travel over the net on the first hit.

The first player with 15 points wins the



kept. An asterisk beside the score shows which player has the serve.

To start the game, you and your opponent volley for the serve, with no points awarded. When the game is first run, the player on the left begins the volley. Position your player under the floating volleyball and press the joystick button to serve. You have three chances to get the ball over the net. If you fail, you lose the serve.

The controls are easy to learn. You can run either left or right by moving the joystick left or right. To jump, press the joystick's fire button. The players in *Arcade Volleyball* are very gifted; they can move left and right while in the air.

Use Your Head

You can hit the ball while you're on the ground or in the air. If you hit the ball while you're standing on the ground, the ball's speed stays the same. If you jump to hit the ball, the ball speeds up. You're free to bounce the ball off the ceiling or the wall behind you. If you hit the ball with the left side of your head, the ball tends to go to

game. As with real volleyball, however, you must win by 2 points, so the game can go beyond 15 points. When a player wins, the program returns you to the menu.

If you want to return to the menu before the game is finished, press the **ESC**

SPECS

Arcade Volleyball
PROGRAM SIZE: 20,892 bytes
SUPPORT FILES
HIT.SAMPLE: 2,498
LOSS.SAMPLE: 11,346
POINT.SAMPLE: 3,636
MINIMUM CONFIGURATION
512K RAM
AmigaDOS 1.2
ENVIRONMENT
Workbench
Double-click icon
CLI
CD VOLLEYBALL
RUN ARCADEVOLLEYBALL

ON DISK

key. You may freeze the game with the space bar and resume play with the Return key. If the keyboard seems unresponsive, use the mouse to click within the volleyball court before you press a key.

Over, Into, and Under the Net

When you play Arcade Volleyball, your prime concern is to get the ball over the net. If the ball hits the top of the net, it can either continue over the net or bounce back to your side. Either way, the ball's velocity decreases. If the ball goes over the net, hits the opponent's wall, and bounces back to your side, you have three more chances to get the ball over the net.

If the ball goes into the net, it rebounds to you. Don't lose your composure; try to make the shot.

If the ball hits the floor on your side of the court, you lose your serve—or your opponent scores a point, if he, she, or it served. Also, be sure to keep the ball from going under the net. This is considered the same as hitting the floor.

V The Versatile Picture Viewer

Tim Midkiff

There are many ways to create images on the Amiga. You can use a paint program like *Deluxe Paint II* or *Photon Paint*. Or you can use a screen-grabber program like *GrabIt* to steal screens from any friendly (multitasking) program. Or you can download images from bulletin boards and commercial services like CompuServe and GEnie.

"V" is a program that lets you view these pictures quickly and easily. It works with just about any standard IFF graphics file, including hi-res and lo-res (respectively, 640 and 320 pixels horizontally), interlace and noninterlace (respectively, 400 and 200 pixels vertically), standard, HAM, and EHB modes. V even supports brushes and over-scan pictures.

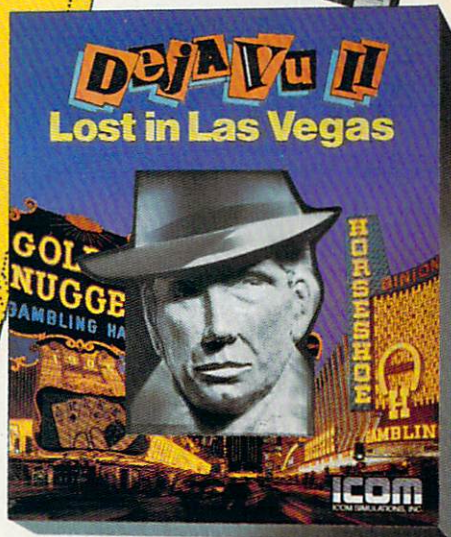
Using the Program

V was written using *M2Amiga*, the Modula-2 compiler from Interface Technologies. The source code—for interested program-



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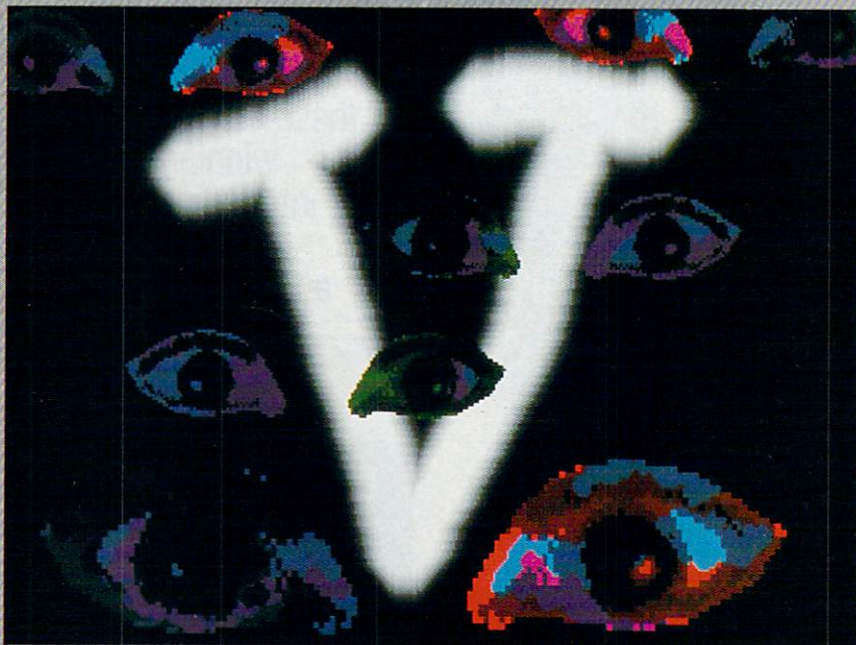
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mers—is found on the *Amiga Resource* disk. The main program file is called *V.MOD*. To compile the program, you'll need the support files *ARPFileSelect.MOD* and *ARPFileSelect.DEF*.

The program itself is located in the root directory of the disk. To use it from the CLI,

left mouse button). The picture will be displayed. You can view a series of pictures by clicking on the icon of the first, shift-clicking on the rest, and then shift-double-clicking on *V*.

For easier viewing, click on the picture's icon from the Workbench. Then use



just type *V filename*, where *filename* is the full path specification of the file. When you've finished looking at the picture, click the left mouse button.

For example, type *V RAM: BIRD* to view an IFF picture called *BIRD* located in the ramdisk. If you've added the directory to the system path with the *PATH* command, you need specify only the filename.

To use *V* from the Workbench, click on the icon of the picture you wish to view. Then shift and double-click on the *V* icon (hold down *SHIFT* while double-clicking the

the Workbench menu selection *Info* to change the default tool of the picture. Set the default tool to *:V* and click on the *SAVE* gadget. From then on, whenever you double-click on the picture's icon, *V* will display it.

If you have *arp.library* in your *LIBS* directory, you can simply type *V* from the CLI or double-click on *V*'s icon from the Workbench; there's no need to specify which file you wish to view. *V* will bring up the *ARP* file requester. Click on the right mouse button (or click on the *DRIVES* gadget) to view all the devices connected to your Amiga. Use the left mouse button to select a file. *V* will display the file. Click the mouse button to return to the file selector. You can view as many pictures as you like. When you've finished, select *CANCEL* from the file requester to leave *V*.

The cursor keys can be used to move the image on the screen. This is especially useful when you are viewing overscan images. Note that in hi-res overscan mode, some pictures may flicker in certain positions. This is due to hardware constraints of the Amiga. If this occurs, use the cursor keys to move the picture into a position where it appears stable. For pictures which do not fit on the screen, you can hold down *SHIFT* as you press the cursor keys. This enables you to move the picture beyond normal screen limits.

DD: The Dynamic Directory Command

Dale McBane

Of all the commands in the *c* (command) directory, *dir* is probably the most frequently used. Type *DIR* from a CLI or Shell window to list all of the directories and files in the current directory. The *dir* command can also take an argument which is a directory or device name. For instance, *DIR C:* lists all the commands in the *c* device (which is normally assigned to the *c* directory of your boot disk). Many options are available with *dir*, but it's not ideal. For instance, it doesn't show the size of the files it lists. The *list* command does include the file sizes, but it doesn't alphabetize the list. Also, both the *dir* and the *list* commands are wasteful in their display—a decent-sized directory will cause filenames to scroll right off the top of the screen.

"DD" is a replacement directory command that includes the best features of *dir* and *list*. It also breaks new ground. It splits up directories from files and lists them separately. *DD* prints the directories in color so that you can easily distinguish them from the files. Each file is printed along with its size.

DD also conforms to fit your window. Do you have a tall, narrow window? *DD* will fit the files into it. A short, wide window? No problem—*DD* will oblige.

If the entire directory will not fit in the window, *DD* will pause with the message (*MORE*). Press any key to continue the listing.

Finally, *DD* will display a status line. This line is packed with handy information. It lists the number of bytes in the directory, the percentage of the disk that has been used, and the total number of bytes available on the disk.

At Your Service

DD is a CLI program only—it cannot be used from the Workbench. You'll find it in the *c* directory of this issue's companion disk. *DD* has been compiled under version 5.02 of *Lattice C*.

If you're looking for space on your Workbench disk, you can replace *list* and *dir* with *DD*. This will net you a savings of 8612 bytes. If you use a hard drive or if you have plenty of spare room on your boot

SPECS

V

PROGRAM SIZE: 18,028 bytes
SUPPORT FILES: *arp.library* (optional)
MINIMUM CONFIGURATION
256K RAM
AmigaDOS 1.2
ENVIRONMENT
Workbench
Shift-click picture(s), and then shift-double-click icon
Workbench with *arp.library*
Double-click icon
CLI
RUN *V filename(s)*
CLI with *arp.library*
RUN *V*

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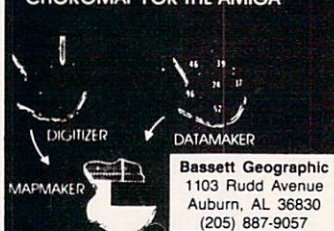
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disk, you may want to keep `dir` and `list` in addition to `DD`.

To get a listing of the current directory, type `DD`. Alternatively, you can give `DD` a directory name, device name, or filename.

global optimizer. The `-cs` option ensures that there will be only one copy of identical strings, `-ms` causes the compiler to optimize for size at the expense of speed (you'll always be waiting for the disk drive, anyway),

ply load it into Advanced Laser Chess and start playing.

Customizer requires a copy of Advanced Laser Chess. If you do not own a copy of the Summer 1988 issue, you can use the Back Issue coupon on page 101 to order it.

Getting Started

Advanced Laser Chess Customizer is in the `ALCCustomizer` folder on the *Resource Disk*. Double-click on the program's icon to get started. If you're using the CLI, type `RUN ALCCUSTOM`.

You're presented with the standard Advanced Laser Chess grid. To the left of the grid you'll find the *selection column*, which holds the ten different pieces used in Advanced Laser Chess. To place a piece on the grid, you must first select one of the pieces in the selection column. This is done by pointing to the desired piece and pressing the left or right mouse button. If the left button is pressed, the piece will simply be highlighted, indicating the current "working" piece. If the right button is pressed, the piece will be rotated. Next, to place the selected piece on the grid, simply point to where you want it and press the left mouse button.

If you wish to rotate a piece that is on the grid, select it by pointing to the piece and pressing the left mouse button; then press the right mouse button to rotate it. Press the left mouse button again to deselect the piece. To move a piece on the grid, first select it and then point to where you want it and press the left mouse button. You can remove a piece from the grid by pointing at the piece and pressing the right mouse button.

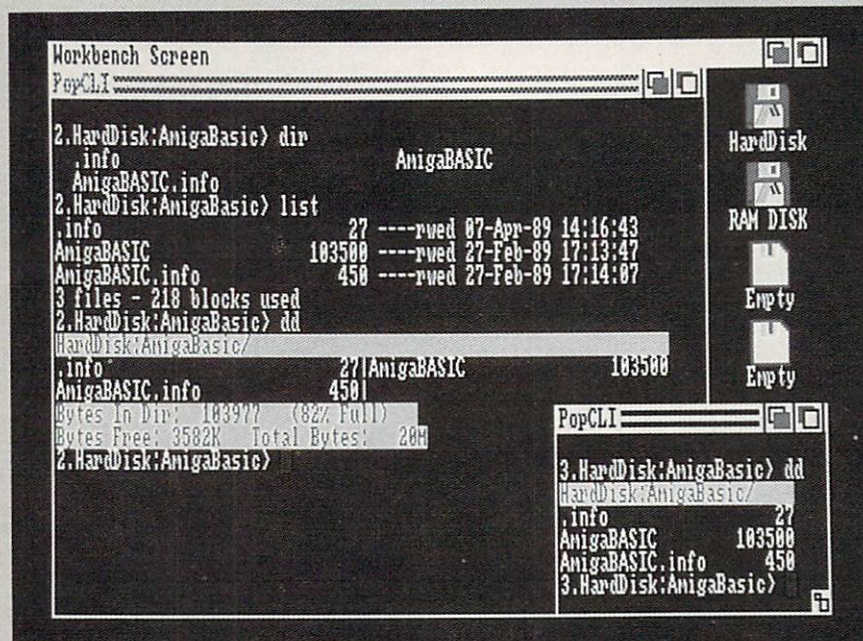
Each of the grid gates may be moved up or down. To do this, simply press the left mouse button on the square of the grid gate. It will change positions accordingly. The displacement mechanism may also be manipulated in the same manner. Note that it is not possible to place pieces on the grid gates or the displacement mechanism.

You may have as many king pieces as you like on the grid, but only one needs to be eliminated to end a game of Advanced Laser Chess. Therefore, if one player is much better than another, you can handicap the better player with several kings.

The Icons

To the right of the grid, you'll notice a column of icons. The top icon, as you will recognize from Advanced Laser Chess, is used to save or load a game.

The second and third icons are used for mirroring the current board setup. The second icon (containing the vertical line) represents the vertical mirror function; the third icon represents the horizontal mirror function. Advanced Laser Chess is usually



`DD` is a powerful addition to your command directory. Take a close look at the screen shot to see the differences between `dir`, `list`, and `DD`.

Under the Hood

Interested programmers can find the source code to `DD` on the *Amiga Resource Disk*. `DD` was written using several ANSI conventions and will not compile under the current version of *Manx C*. The code is well documented, so converting it should not be a problem.

To compile `DD`, enter the following command from the CLI:

```
lc -L+LIB:cres.o -O -cs -ms -b -r -v DD.c
```

These options were chosen to make `DD` as compact as possible without sacrificing reliability. The `-L` option links `DD` with Lattice's resident library. The `-O` option calls the

`-b` causes the compiler to generate code with base relative addressing for data, `-r` causes it to use PC-relative addressing for subroutine calls, and `-v` turns off stack-checking code for subroutine calls.

Advanced Laser Chess Customizer

Mike Duppong

"Advanced Laser Chess," found in the Summer 1988 issue of *COMPUTE!'s Amiga Resource*, is a fascinating futuristic chess game. If you're an Advanced Laser Chess player, you no longer have to play the same game over and over. "Advanced Laser Chess Customizer" allows you to put together any situation or setup you desire and save it. Need a few extra lasers? A spare one-way mirror? Two or more kings? Design your setup with Customizer; then sim-

SPECS

DD: The Dynamic Directory Command

DD
PROGRAM SIZE: 10,132 bytes
MINIMUM CONFIGURATION
256K RAM
AmigaDOS 1.2
ENVIRONMENT
CLI
DD [directory]

played with one player's pieces on the left side and the other's on the right. If you wish to play the game this way, you may set up all of your pieces on the left or right side of the middle column and then click on the horizontal mirror icon. All of the pieces will be rotated accordingly and be placed on the opposite side of the middle column.

If you'd rather play with one player's pieces at the bottom and the other's at the top of the screen, you'll find the vertical mirror function handy. Arrange all of your pieces above or below the middle row and then click on the vertical mirror icon.

Both mirror functions will give you an alert and abort if pieces exist on both sides of the grid—one side must be kept clear of all pieces for the mirror functions to work. Pieces in the center column (for the horizontal mirror function) or row (for the vertical mirror function) will be left as they are.

There is a limit to the number of bombs and beam splitters that you may place on the board. No more than four of each may ever exist on the grid. You will get an alert message if you try to place more than this number on the board. The mirror functions also check to make sure that you do not create more than four of each of these pieces.

Below the mirror icons is the pass icon. Click on this if you wish to change the color of the pieces you are working with.

The restart icon is used to clear the entire contents of the grid. A requester appears, asking you for confirmation of the restart function.

The quit icon ends the program. A requester will appear asking you for confirmation of this function.

New Games

Some example setups are included on the disk, in the drawer named SETUPS. You may load these either into the Customizer to examine or change them or directly into Advanced Laser Chess so you can start playing.

There is a limitation in Advanced Laser Chess that might even be called a bug. There are certain cases in the game in which the laser gets stuck in a loop between two objects, say a one-way mirror and a fully mirrored octagon.

In cases like these, the program will keep moving the laser until it is "exhausted"; that is, it will move the laser between the objects a predetermined number of times and then will consider that beam finished. This number is represented by the definition MAXLSRTRAV in the ADVLASER.H header file; it is currently set at 165 (a multiple of the grid dimensions). Therefore, the laser could conceivably move through every square on the board once before Advanced Laser Chess aborts it.

The MAXTRAV.ALC file in the SETUPS drawer demonstrates this limit. As you can see, the laser is permitted to move through every square on the board and is deflected upward at the last instant. In firing the laser, you will be able to see the beam simply terminating in midair.

The number of squares the laser is permitted to move may be altered by changing the MAXLSRTRAV definition and recompiling, but 165 is a good value to use; if this number is made too large, it will take longer for beams to be considered aborted—you'll experience a greater delay when firing the laser in some circumstances. If it is made too short, the laser might not reach its target.

Another example of this limitation is demonstrated by the file HYPER.ALC; in this case, a laser beam is injected into a network of adjacent hypergons with no way out. Ideally, the laser would bounce off every one of the hypergons in every direction, but, because of this limitation, the laser is aborted before this can happen. Some of the hypergons will deflect a beam in the same direction more than once, which also subtracts from the number of hypergons being hit.

In a normal game the current definition of MAXLSRTRAV should be adequate and no changes should be necessary. ▶

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ON DISK

I would like to see any spectacular board setups you create or to hear any suggestions you may have. You may locate me on Delphi (MOCKO) or GEnie (MMD) or write to me in care of this magazine.

SPECS

Advanced Laser Chess Customizer

PROGRAM SIZE: 23,964 bytes

SUPPORT FILES

ALC_PIECES.PIC: 19,304

SETUPS/

DEFAULT.ALC: 1,350

MAXTRAV.ALC: 1,350

HYPER.ALC: 1,350

DIAG.ALC: 1,350

MINIMUM CONFIGURATION

512K RAM

AmigaDOS 1.2

"Advanced Laser Chess" (Summer 1989)

ENVIRONMENT

Workbench

Double-click icon

CLI

CD ALCCUSTOM

RUN ALCCUSTOMIZER

Out's menu by holding down the right mouse button. You'll see the four types of games: Human vs. Human, Human vs. Computer, Computer vs. Human, and Computer vs. Computer. There's also a Quit menu item which exits the game.

After you've selected a game, you and your opponent (human or computer) each receive a rack of four tiles. Each tile is designated by one of four images (Earth, raindrops, a tornado, or a flame) and one of five colors (red, yellow, green, blue, or violet). Players alternate turns in Block Out; player 1 always moves first.

When it's your turn, move the mouse pointer to one of your four tiles and press the mouse button to select the tile. Now choose one of the 13 gray chutes in which to place your tile by moving the mouse to the appropriate chute and clicking the mouse button. The tile falls to the bottom of the chute. You can stack tiles as many as eight levels high. After you've made your move, the points you've scored are added to your current score and displayed at the top of the screen. A new tile then appears in your rack.

Ways to Score

When you drop a tile next to or on top of a tile that has the same color but a different image, you're awarded 15 points. If the tile is of the same image but a different color, you get 25 points. If the tiles match in both image and color, you score 40 points. Since dropped tiles can touch other tiles in three directions (left, right, and down), the maximum score per play is 120 points. When all the chutes are filled, the player with the highest score is the winner.

SPECS

Block Out

PROGRAM SIZE: 14,464 bytes

SUPPORT FILES

BlockBack: 57,904

Blocks: 5,954

MINIMUM CONFIGURATION

512K RAM

AmigaDOS 1.2

ENVIRONMENT

Workbench

Double-click icon

CLI

CD BLOCKOUT

RUN BLOCKOUT

Block Out

Jason Wellington

Amiga version by Tim Midkiff

Start with the four elements of the ancient world—air, earth, fire, and water. Combine each element with five different colors—red, yellow, green, blue, and violet. What do you have? The makings of "Block Out," an addictive strategy game that's so easy to learn, everyone in the family will want to play.

In Block Out, players compete for points as they build a wall of tiles. You get points for placing blocks of the same color or shape next to each other. You get more points if both the color and the shape match.

Getting Started

You'll find Block Out in the BlockOut folder of the Resource companion disk. To play, double-click on the BlockOut icon. If you're using the CLI, type CD BLOCKOUT and then RUN BLOCKOUT.

To start the game, pull down Block

68000 DISASSEMBLY



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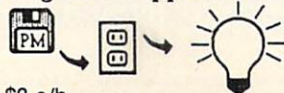
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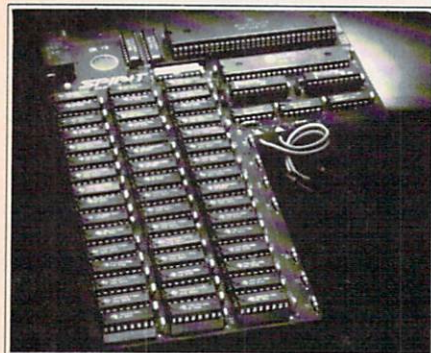
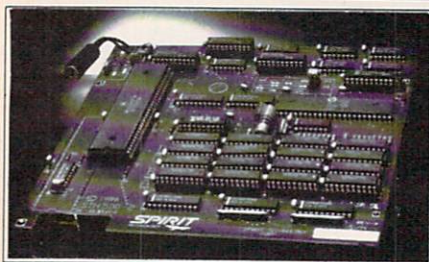
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HOW TO USE THE DISK

Every issue of *Amiga Resource* has a companion disk that features the exclusive programs we offer each issue, as well as the "Best of the Boards" program and the "Art Gallery" screens. You can get this disk in three ways. First, you may buy *Resource* with the disk in a poly-bag at your bookstore or computer dealer. Second, you may subscribe to the magazine with the disk. Third, you may order single copies of this disk (see the back-issues/disk-order ad elsewhere). If you experience a problem with the disk, even after you've read the programs' documentation, please contact us at (919) 275-9809 between 9:00 a.m. and 4:30 p.m. Eastern standard time, Monday through Friday.

To use the disk, insert it into your disk drive and then turn on your computer. (Amiga 1000 owners must boot with Kickstart first.) You may boot with your own Workbench disk, but the icons will not be as colorful as they are when you boot with the magazine disk.

You run programs by double-clicking their icons. Some programs may be found within drawers (icons that resemble file folders). Please look into each drawer on the disk. We recommend that you read the "On Disk" section of the magazine prior to running any of our programs. If you wish to move a program that is in a drawer to another disk, be sure to copy the entire drawer so that you can be sure that you copy all the support files that the program may need.

Most programs on the disk are accessible through the Workbench environment. Some programs, however, are designed to work only in the CLI environment. Such programs do not have icons and are not visible from the Workbench. Since the magazine disk may be too full to include many CLI commands, you will have to boot with your own disk to access the CLI and work with these programs.

Artwork from "Amiga Art Gallery" may be found in the ArtGallery drawer. To view a picture, double-click its icon. When the painting appears onscreen, simply click the mouse once to return to the Workbench.

Our disk is not copy-protected. We encourage you to make a backup of the disk as soon as possible. With the exception of the program in our

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We suggest that you write-protect the disk by sliding the write-protect tab to the open position. This will cause programs that attempt to write to the disk to fail. You can slide the write-protect tab to the closed position to allow writing, but there may not be enough room on the disk for any more files. If this is true, copy the offending program to another disk to use it.

On Disk This Issue

"V" is the picture viewer used on the *Resource Disk*. Since you can click on many different pictures before shift-double-clicking on V, we find it the most convenient of all IFF viewers. You can see V in operation by double-clicking on any of the "Art Gallery" pictures. Since V is so handy, you may want to drag it onto your own art disks. V is most useful with the ARP file requester, so be sure to copy arp.library to your boot disk's libs directory (use *Browser*, *ClickDOS*, or the CLI).

"DD" is for CLI buffs. You'll find it in the *Resource Disk's* c directory. It's a small, quick, and informative replacement for the DIR command. Copy it to the c directory of your boot disk.

Source code for the programs can be found in the Source directory. We regret that we did not have the space to put the source code for "Advanced Laser Chess Customizer" on the disk.

"Best of the Boards" and "Ask Rob Peck" feature programs which have documentation on the disk—*Browser*, *ClickDOS*, and *WBRUN*. To read the doc files, double-click on ClickDOS (found in the ClickDOS folder, which is found in the BestOfTheBoards folder). Click on the DF0: gadget. Select a document file (you can move through the directories with the << and >> gadgets). To read an article,

select it and click on the type gadget. Finally, select Screen. *WBRUN.doc* is located in Source/AskRobPeck, *ClickDOS.doc* is found in BestOfTheBoards/ClickDOS, and *Browser.doc* is found in BestOfTheBoards/Browser. ▲

On Disk Directory

```
ALCCustom (dir)
.info
ALCCustomizer.info
default.alc
hyper.alc
c (dir)
AddBuffers
ColorBench
EndCLI
RUSHBACKGROUND
WBRUN
system (dir)
diskcopy
l (dir)
Disk-Validator
devs (dir)
randrive.device
s (dir)
startup-sequence
BlockOut (dir)
.info
BlockOut
Blocks
BestOfTheBoards (dir)
Browser (dir)
.info
Browser.doc
ClickDOS (dir)
doarc
ClickFigure
Dsa.doc
spool
.info
ClickDOS.info
Source (dir)
AskRobPeck (dir)
runbackground.c
WBRUN.doc
V (dir)
ARPPFileRequest.def
V.mod
BlockOut (dir)
BlockOut.mod
LoadILBM.mod
DD (dir)
dd.c
Volleyball (dir)
ArcadeVolleyball.c
libs (dir)
arp.library
info.library
ArtGallery (dir)
.info
Flamingo.info
MagicFingers.info
Tower.info
Volleyball (dir)
samples (dir)
bit.sample
point.sample
.info
ArcadeVolleyball.info
ALCCustom.info
BestOfTheBoards.info
Disk.info
V.info
ALCCustomizer
alc_pieces.pic
diag.alc
maxtrav.alc
CD
CD
LoadWB
Wait
Ram-Handler
system-configuration
BlockBack
BlockOut.info
Browser
Browser.info
.info
DOS.info
DOS.info
Browser.info
WBRUN.c
WBRUN.MakeFile
ARPPFileRequest.mod
LoadILBM.def
icon.library
version.library
Flamingo
MagicFingers
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loss.sample
ArcadeVolleyball
ArtGallery.info
BlockOut.info
V
Volleyball.info
```

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From 6502 to 68000

If you program in machine language, chances are that you learned on a Commodore 64, 8-bit Atari, Apple II, or other 6502-based microcomputer. Now that you own an Amiga, however, you'd probably like to try your hand at programming the 68000.

Since the 68000 is far more complex than the 6502, there's a lot you'll have to learn before you can tackle the Amiga's complex operating system. To make it easier, I'm going to describe the 68000 in terms that are already familiar to the experienced 6502 programmer. Instead of examining basic concepts such as bits, bytes, and registers, we'll look at some of the basic differences in what each processor can do, try to compare some of the instructions, and finally cover some fundamental differences found in 6502 and 68000 assemblers. What I *won't* attempt is a one-by-one explanation of all the 68000 instructions. There are more than a few books devoted to that—one of my favorites being *680x0 Programming by Example*, by Stan Kelly-Bootle (Howard W. Sams & Co., 1988).

More Registers

The most obvious difference between the 68000 and 6502 is in the number of hardware registers. The 68000 has quite a few more registers to deal with, and they're organized differently (see Table 1).

Instead of one accumulator, the 68000 has eight data registers referred to as D0-D7. And the 6502's index registers, X and Y, are replaced with seven address registers referred to as A0-A6 (there is an eighth address register, A7, that serves as the stack pointer). Even with more than three times the registers available, the 68000 instruction set is actually quite easy to deal with. In fact, once you get used to the extra registers, it's hard to program without them.

Memory Organization

The 6502 can address 64 kilobytes of memory through its 16-bit program

counter. The 68000 family of microprocessors, with their 32-bit program counters, are capable of addressing four gigabytes of memory on some models (68020 and 68030), but the standard 68000 really has only 24 address lines leaving the chip, which limits it to 16 megabytes of address space. This is still 256 times the memory capacity of the 6502. The 68000 sees this memory much as the 6502 does—as an array of bytes numbered from 0 to the upper limit—but, on the 68000, the upper limit is higher.

The 68000 does not designate any particular area of memory for the stack or page 0. The stack may be anywhere in RAM and is not limited to 256 bytes; it may be any size as long as it does not conflict with other programs. As for zero-page addressing

modes—such as LDA (\$FB),Y—they are unnecessary because this kind of addressing can be accomplished with address registers on the 68000. On most 68000 implementations, however, the lowest 1024 bytes of memory are tied up for use as *exception* and *interrupt* vectors.

One really significant difference in the 68000 is that multibyte elements such as *words* (two-byte values) and *long words* (four-byte values) are stored and retrieved with the higher-value bytes first, followed by the lower-value bytes. This means that storing a word with a value of \$1234 at address \$0440 results in a \$12 at location \$0440 and a \$34 at location \$0441. This is the opposite of the 6502's standard low byte/high byte method of storing 16-bit numbers.

Table 1: Registers

Here's a brief comparison of the registers found in the 6502 and the 68000. The number of each type of register appears in square brackets ([]).

6502	68000
[1] 8-bit accumulator (A)	[8] 8-/16-/32-bit data registers (D0-D7)
[2] 8-bit index registers (X and Y)	[7] 32-bit address registers (A0-A6)
[1] 16-bit program counter (PC)	[1] 32-bit program counter (PC)
[1] 8-bit stack pointer (S)	[2] 32-bit stack pointers (SP or A7)*
[1] 8-bit status register (SR)	[1] 8-/16-bit condition code register (CCR)

*Address register A7 is the stack pointer. A7 actually consists of two registers, but only one is active at any one time.

Table 2: Addressing Modes

This table compares the addressing modes of the 6502 and 68000 instruction set, using the standard names given to these modes.

6502	68000
Memory-immediate	Immediate data addressing
Memory-direct	Absolute addressing
Implied	Implied
Accumulator	Data register direct
Preindexed indirect	Address register indirect with displacement and index*
Postindexed indirect	Address register indirect with displacement and index*
Indexed addressing	Address register indirect with displacement*
Indirect addressing	Address register indirect*
Relative addressing	Program counter relative addressing
(no equivalent)	Address register direct
(no equivalent)	Program counter relative with displacement
(no equivalent)	Program counter relative with displacement and index
(no equivalent)	Address register indirect with postincrement
(no equivalent)	Address register indirect with predecrement

*Not the exact equivalent

Because the 68000 is a true 16-bit chip, all of its instructions occupy 16 bits (two bytes) and multiples of 16 bits. And these instructions *must* start on an even memory address (address \$08F2, for example; not \$08F1 or \$08F3). Your assembler should keep you from breaking this rule. Word and long-word values must also start on an even address in order to be accessed as a unit. Otherwise, they will be treated as separate, unrelated bytes. Alas, this last rule is far too easy to violate if you're not careful.

See Table 2 for a comparison of the two microprocessors' various addressing modes.

Syntax

The 68000 assembly language looks quite different from 6502 assembly language. The mnemonics—groups of letters used to represent machine language instructions—may be more than three characters in length, and most allow a *size specifier* that indicates whether to use the instruction on byte, word, or long-word data items. To enter a size specifier, you type a period directly after the instruction and follow it with a single letter that specifies the desired data size—*B* for byte, *W* for word, and *L* for long word. Similarly, branch instructions may appear with a *.S* extension to specify short branches (a branch that uses an 8-bit displacement to jump as much as 127 bytes forward or as much as 128 bytes backward).

Many instructions on the 68000 require two operands, separated by a comma. The first is referred to as the *source* operand; the second, as the *destination* operand. Other microprocessors that use two operands, such as the 8086, have this order reversed. On the 68000, however, the order is always Source, Destination. For example, `MOVEQ.L #0,D1` stores a 0 in data register 1. Parentheses and commas play a big part in 68000 operands, separating the various items and allowing the assembler to determine the proper addressing mode.

See Tables 3 and 4 for a comparison of 6502 and 68000 instructions.

Assembling and Linking

Memory differences, combined with the Amiga's ability to multitask, add things to an Amiga assembler that

Table 3: Instructions—6502 to 68000

The following table provides 68000 equivalents for each of the 6502 instructions. Since the two chips have differences in their indirect-addressing capabilities, none of the 6502's base-page and indexed modes are listed here. The lowercase letter *n* represents a register number (the letter combination Dn, for example, represents any register D0–D7).

6502	68000	68000 Comments
ADC #34	ADDX.B #34,Dn	Functional differences in flags
AND \$4046	AND.B \$4046,Dn	
ASL A	ASL.B Dn	
BCC label	BCC.S label	Can also perform long branches
BCS label	BCS.S label	
BEQ label	BEQ.S label	
BIT \$4049	BTST.B Dn,\$4049	
BMI label	BMI.S label	
BNE label	BNE.S label	
BPL label	BPL.S label	
BRK	TRAP #0	One of eight possible traps
BVC label	BVC.S label	
BVS label	BVS.S label	
CLC	ANDI.B #\$FE,CCR	Carry flag is bit #0
CLD	(no equivalent)	No decimal flag
CLI	ANDI.W #\$FF,CCR	A privileged instruction
CLV	ANDI.B #\$FD,CCR	Overflow flag is bit #1
CMP #20	CMPI.B #20,Dn	
CPX #0	CMPA.W #0,An	No byte-length (.B) equivalent
CPY \$404E	CMPA.W \$404E,An	Requires an even address
DEC \$4049	SUBQ.B #1,\$4049	Can decrement by 1–8
DEX	SUBQ.L #1,An	Can decrement by 1–8
DEY	SUBQ.L #1,An	Can decrement by 1–8
EOR \$FF	EOR.B #\$FF,Dn	
INC \$4049	ADDQ.B #1,\$4049	Can increment by 1–8
INX	ADDQ.L #1,An	Can increment by 1–8
INY	ADDQ.L #1,An	Can increment by 1–8
JMP \$4600	JMP \$4600	Must jump to an even address
JSR \$4800	JSR \$4800	Must jump to an even address
LDA #'A'	MOVEQ #'A',Dn	Affects entire 32-bit register
LDX \$24	MOVE.W \$24,An	No byte-length equivalent
LDY \$4080	MOVE.W \$4080,An	No byte-length equivalent
LSR A	LSR.B Dn	
NOP	NOP	
ORA #4	ORL.B #4,Dn	
PHA	MOVE.B Dn, -(SP)	
PHP	MOVE.W CCR, -(SP)	
PLA	MOVE.B (SP)+, Dn	
PLP	MOVE.W (SP)+, CCR	
ROL A	ROL.B #1,Dn	Can rotate 1–8 times
ROR A	ROR.B #1,Dn	Can rotate 1–8 times
RTI	RTE	
RTS	RTS	
SBC #1	SUBX.B #1,Dn	
SEC	ORL.B #1,CCR	
SED	(no equivalent)	No decimal flag
SEI	ORL.W #0700,SR	A privileged instruction
STA \$2034	MOVE.B Dn,\$2034	
STX \$2034	MOVE.W An,\$2034	No byte-length equivalent
STY \$20	MOVE.W An,\$20	No byte-length equivalent
TAX	MOVEA.W Dn,An	Does not affect flags
TAY	MOVEA.W Dn,An	Does not affect flags
TSX	MOVEA.L SP,An	Does not affect flags
TXA	MOVE.W An,Dn	No byte-length equivalent
TXS	MOVEA.L An,SP	Does not affect flags
TYA	MOVE.W An,Dn	

6502 programmers have never had to deal with. In order to multitask, for example, Amiga programs must have the ability to load and run at any address. Although the 68000 has addressing modes capable of producing truly relocatable code, you needn't restrict

yourself to these modes to create a multitasking program. The Amiga takes care of this with its relocatable loader.

Amiga assemblers create object files with empty address references. Information is added to these files so

Table 4: Instructions—68000 to 6502

This table shows how some of the more common 68000 instructions are accomplished in 6502. As you can see, it usually takes several 6502 instructions to do the job of just one 68000 instruction. This table is by no means a complete list—many 68000 instructions simply cannot be duplicated by the 6502.

68000	6502
ABCD.B D0,D1	SED CLC ADC \$1234
ABCD.B -(A0),-(A1)	SED CLC DEX LDA (\$1234,X) ADC (\$2345,X) STA (\$2345,X)
BCHG.B #2,\$1234	LDA \$1234 EOR #\$04 STA \$1234
BCLR.B #0,\$2345	LDA \$2345 AND #\$FE STA \$2345
BSET.B #7,\$4567	LDA \$4567 ORA #\$80 STA \$4567
CLR.L \$1234	LDA #0 STA \$1234 STA \$1235 STA \$1236 STA \$1237
DBRA D0,label	SEC LDA \$1235 SBC #1 STA \$1235 LDA \$1234 SBC #0 STA \$1234 BCS label
MOVE.W \$1234,\$12AE	LDA \$1234 STA \$12AE LDA \$1235 STA \$12AF
NEG.B \$2345	SEC LDA #0 SBC \$1234 STA \$1234
NOT.B \$1234	LDA \$1234 EOR #\$FF STA \$1234
PEA \$0400	LDA #0 PHA LDA #4 PHA
SEQ \$2400	BEQ L1 LDA #\$FF STA \$2400 BNE L2 L1 LDA #0 STA \$2400 L2 ...

that, after linking, the loader—which is responsible for getting programs into memory—can plug the appropriate values into the empty address references before it runs the program. These references, called *hunk_reloc* (hunk relocation) references, are made up of offsets to the desired memory location. When a program is loaded, missing address references are calculated by adding the offsets to the address of the location at which the code is actually loaded. So, when the program is ready to execute, each previously incomplete instruction will reference an absolute location.

Using the assembler's SECTION identifier, you can break your Amiga programs into separate, self-contained units. By segmenting your code, you allow the Amiga to *scatter load* it by section—it doesn't have to load it into one contiguous area of RAM. This makes it easier for the computer to run a program under low-memory conditions. Different sections can refer to each other's routines and memory locations, even if they're separated in memory. You don't have to segment your program. On large programming projects, however, this is often the only practical way to build a program.

To make a portion of a segment visible to others, you use the XDEF (eXternal DEFINition) directive followed by the label name. The assembler handles these labels by adding the name and its offset (distance in bytes from the start of the section) to the end of the section in the assembler's output file (which is called a *hunk* when it is all packaged together correctly).

When you need to call a routine or access data located in another module, you use an XREF (eXternal REFerence) directive followed by the label name, at some point prior to using the label (usually these are grouped at the top of the source-code file). You may now use these labels as operands within your code.

The linker—a utility new to most 6502 programmers—goes through the object files created by the assembler and matches all external definitions with the corresponding external references. (Somewhere, there has to be a definition for every reference. If the linker can't find one, you'll receive an error message.) All the references are

adjusted and turned into hunk relocation references for the loader to use. The linker finishes the job by copying the code and data contents of all the object files (there may be several) into one output file, adding in the newly generated hunk relocations and passing any old ones through, and finally stripping out the external references and (maybe) the external definition information (this may be left in so that debuggers can access the symbol information in a completed program).

Because we can build our programs in pieces, it's possible to create a collection of preassembled routines that you can feed to the linker. This saves you the time of reassembling a routine each time you use it. When these preassembled routines, called *linking libraries*, are fed to the linker, the linker searches the library and pulls out only the routines that you've referenced in your program.

The Amiga is capable of addressing data and program code differently. Although these two potentially separate address spaces are combined on the Amiga, the concept of data sections and code sections has been carried through in the tools and practices used in programming the Amiga. In fact, there are three types of memory hunks: CODE (sometimes referred to as TEXT), DATA, and BSS (Bulk Storage Space). DATA sections are used to hold preinitialized memory locations, while BSS is simply a section of memory set aside for your program to use. Unlike DATA memory, there's no guarantee as to what BSS memory will contain when the program is first run. You see, BSS memory is not part of the program on disk; it's allocated when the program is run.

Try It

The best way to learn programming—or almost anything, for that matter—is through actual practice. Although I have not explained the actual building of a 68000 program, I think you'll find that the many articles and books that deal with Amiga assembly language will make a little more sense now. ▲

By day, Wesley Howe is the director of engineering at a North Carolina cellular phone company; by night he is an avid 68000 programmer. Wesley is the author of the popular Amiga assembler *CAPE 68k* and *Inovatools II*, both available from Inovatronics.

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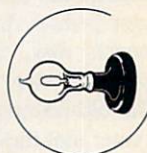
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BEST OF THE BOARDS

Sheldon Leemon

ClickDOS and Browser



The Amiga's point-and-click Workbench interface was designed to allow beginners to perform a few simple functions such as running a program, formatting a disk, or copying a file. Few of us, however, remain beginners forever. After a while, most Amiga owners discover that there are a lot of things that the Workbench just can't do.

For one thing, the Workbench performs its operations only on files that have icons (graphic images that represent filing-system objects). Unfortunately, not all files and directories have icons. If you want to install a new font or a new printer driver on your Workbench disk, for example, you'll probably have to resort to the CLI, the old-fashioned command interpreter that the Workbench was supposed to have made unnecessary.

Another complaint that some users have with the Workbench is that it's not extensible—there's no way to add functions to its rather limited repertoire. A really powerful operating environment should let you customize it to meet your requirements.

Amiga programmers who weren't satisfied with either the Workbench or the CLI didn't just complain—they did something about it. The first attempt at a new operating environment that found a wide audience was Chris Nicotra's *DirUtil* program. That program featured a file requester that would allow you to view the entire contents of a disk and select any file or directory, plus some gadget buttons that would let you perform functions like copying or deleting.

The idea behind *DirUtil* took the Amiga community by storm, and soon dozens of variants were being developed (including Nicotra's commercial *CLIMATE* program). Some added a second file window, for a "target" directory. Some would let you execute a program, just like the Workbench. Others added features that would let you view a graphics file, hear a sound file, edit a text file, and decompress a packed .ARC or .ZOO file. Soon, variations sprung up that allowed the user to define his or her own button functions. Today, there are at least a dozen operating environments that are offered as shareware, each with

its own devoted following. To give you some idea of the range of Workbench alternatives available, we've included two such programs on this issue's companion disk.

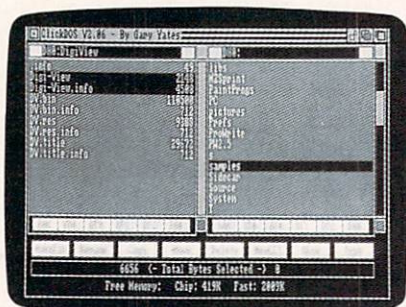
The first is Gary Yates' *ClickDOS*, a *DirUtil* variant. Rather than taking the scatter-shot approach of some of these programs, *ClickDOS* aims at performing a small number of functions in an orderly manner. It has only eight function buttons, and it doesn't waste a lot of buttons on file and directory selection the way some other versions do. Instead, file selection is handled with the mouse and with some special gadgets like the Parent and Child gadgets, which move you forward and backward in the directory chain, and Select All/Exclude All gadgets.

Although *ClickDOS* has two directory windows, it doesn't use these as the traditional Source and Destination directories. Any selected file may be copied or moved from one window to the other. In fact, it's possible to copy files both ways in a single operation!

Although the *ClickDOS* window doesn't have the standard sizing gadget, it has an "iconify" gadget that reduces it to a tiny window on the Workbench screen. In this state, the program takes up very little memory and therefore can be left running all the time. This makes it particularly handy for single-drive owners, who are often frustrated with trying to copy or delete files that have no icons because the files they want to work with are on one disk, while the CLI programs used to work with them are on another. With *ClickDOS* in memory, these operations require much less disk swapping. Copying

a single file from one disk to another becomes as easy as copying the file to the RAM disk, changing disks, and then moving the file from the RAM back to DF0:.

ClickDOS does have a couple of minor drawbacks. Its disk-selection buttons are "hard-wired" with a fixed selection of six names. Some programs determine which disks you have attached and then fill in the buttons automatically. Still, you can select your own set of names by editing the .dosrc file (which must go in the s: directory). Although *ClickDOS* doesn't need external programs to view text or graphics files, it does use an external Spool program as a



Try Gary Yates' excellent program *ClickDOS*. It offers a powerful way for Workbench users to move up to a more powerful environment.

print spooler for printing files. The location of this program may be specified in the .dosrc file. But despite these small inconveniences, *ClickDOS* offers an easy way for Workbench users to move up to a more powerful environment, and it's well worth the \$15 registration fee that Gary requests.

Unlike *ClickDOS*, Peter da Silva's *Browser* program is definitely not another variation on *DirUtil*. Although he bills it as a "programmer's Workbench," that's a bit deceiving because it can easily be used by nonprogrammers as well. Those familiar with the Macintosh and GEM operating environments know that they allow you to replace the icons in windows with text listings of filenames. *Browser* creates just this kind of environment on the Amiga.

The initial *Browser* window lists all of the disk volumes and logical volumes in a window. Double-clicking on the name of one of these volumes opens a window that displays its contents as a list of names. The names in this list may be manipulated in much the same way that the icons in a *Workbench* window may be. You can select a file by single-clicking on its name, and you can select multiple items by holding down the shift key while you click. Once you've selected an item, you may rename it, delete it, or duplicate it by using menu items, just as you do with the *Workbench*.

You can also copy items just by dragging them to another window, although the dragging is represented by the mouse pointer changing to a crosshairs pointer, as in Workbench 1.0, rather than by moving an image of the item itself, as in the current Workbench. *Browser* even lets you execute a program by double-clicking on its name. If the program has an icon, it's launched just as if it has been run from the Workbench. If the program doesn't have an icon, *Browser* puts up a string requester with the name of the program and allows you to type in command parameters. Then the program is run from the CLI.

If *Browser* merely duplicated the Workbench functions with text instead of pictures, it would still be a significant achievement, as it would extend Workbench functions to files that have no icons. But the program doesn't stop there. It adds many convenient new features such as allowing you to select files by pattern matching rather than by clicking on all of the names. It provides a rescan menu item that lets you update a file window rather than making you close it and then open it again the way Workbench does. It can display file sizes as well as names in the window. And a menu item allows you to create new

directories within any window.

Perhaps *Browser's* greatest advantage over the Workbench is that it allows you to add applications that can be run from its menu bar. This can be done interactively by highlighting a program and selecting the Workbench-tool or the CLI-tool menu item (depending on whether the program is normally run from the Workbench or the CLI) or by means of a text file called *s:Browser.inittab*, which allows you to add several new applications to the menu bar automatically when you start the *Browser* program. For hard drive owners particularly, this is a powerful and addictive feature that makes it easy to launch any of your favorite programs without having to open up a lot of subdirectory windows.

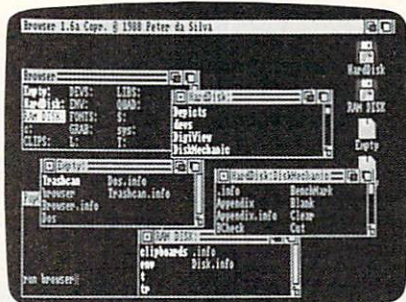
There are some other programs (both shareware and commercial) that let you add programs to the Workbench menu itself, but since the Workbench has no real provision for this, these programs may not work with future versions of the operating system. *Browser* provides the same functionality that these programs do, and in a way that is consistent with the rules of Amiga programming.

Some improvements that I would like to see in *Browser* might include keyboard equivalents for menu operations (something that *Workbench* could also use), and more choice in window sizing. As things stand, *Browser* opens up a very small window for new directories, regardless of how many or how few files it contains. I'd like to see the window open to a larger size if the directory had a lot of stuff in it.

Also, *Browser* windows have a minimum width that is kind of large—I'd like to be able to make them narrower.

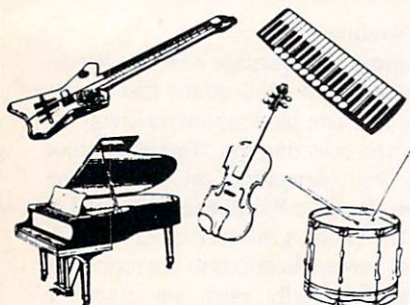
But again, these are relatively minor points. *Browser* is an interesting alternative to the Workbench that you should definitely explore (and of course, if you find it useful, by all means send Peter da Silva the recommended \$30 donation). If, as rumored, the designers of the next Workbench version plan to extend its functionality so that it operates on files without icons, there are many interesting concepts in *Browser* that they would do well to incorporate.

You can find both *ClickDOS* and *Browser* on this issue's companion disk, in the BestOfTheBoards folder. Both programs can be run from the Workbench. Just double-click on them to get started. You can copy them onto your own disks by dragging their icons. To read or print out the documentation for the programs, refer to "How to Use the Disk," which can be found elsewhere in this issue. ▲



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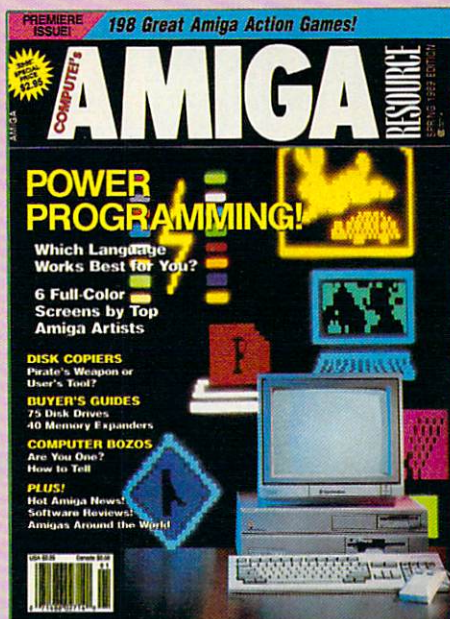
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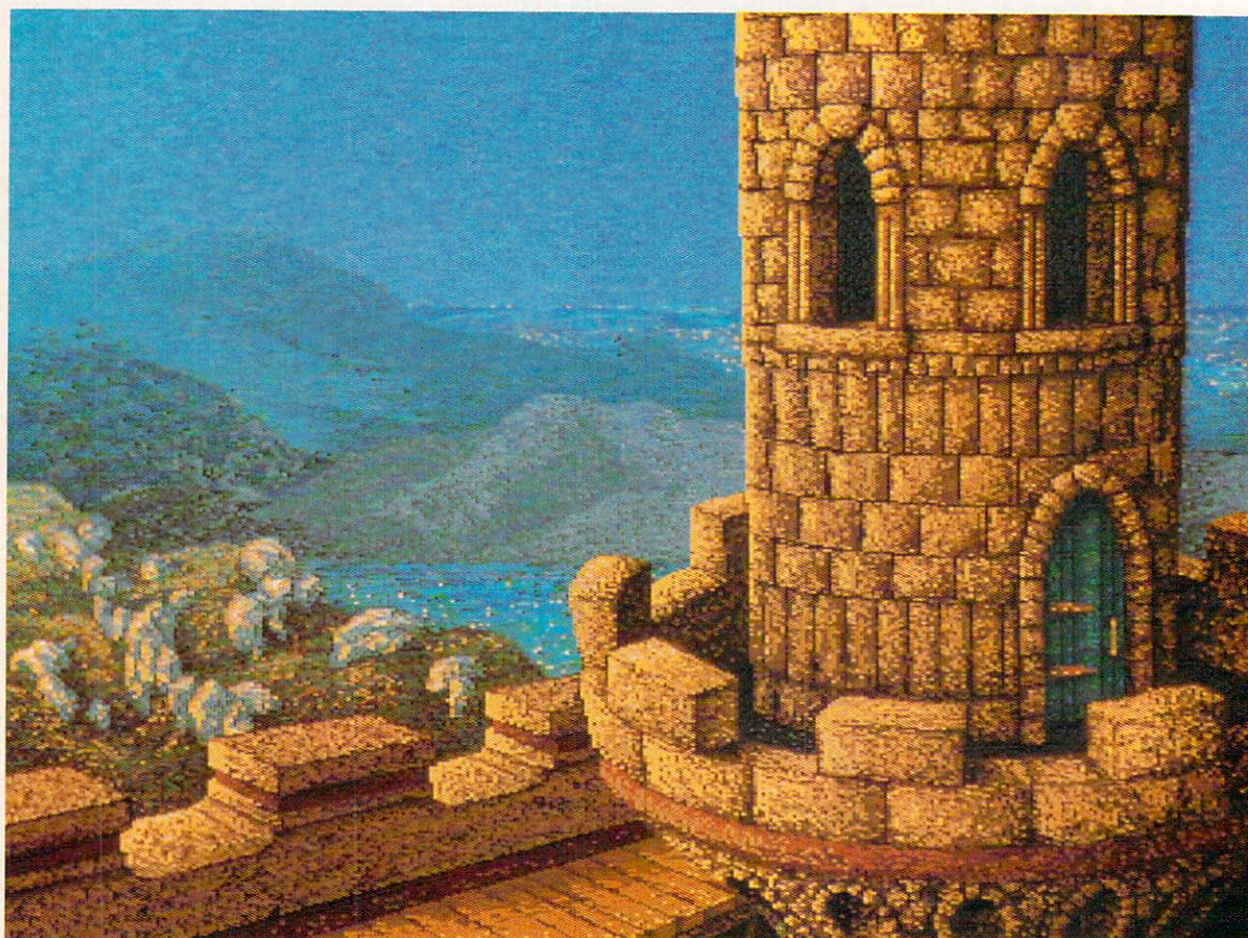
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Welcome to "Amiga Art Gallery." On these pages, in each and every issue of *COMPUTE!'s Amiga Resource*, you'll find the best Amiga artwork around. The pictures in this issue may also be found on the magazine's accompanying disk.

Tower

Brad Schenck

Thousand Oaks, CA

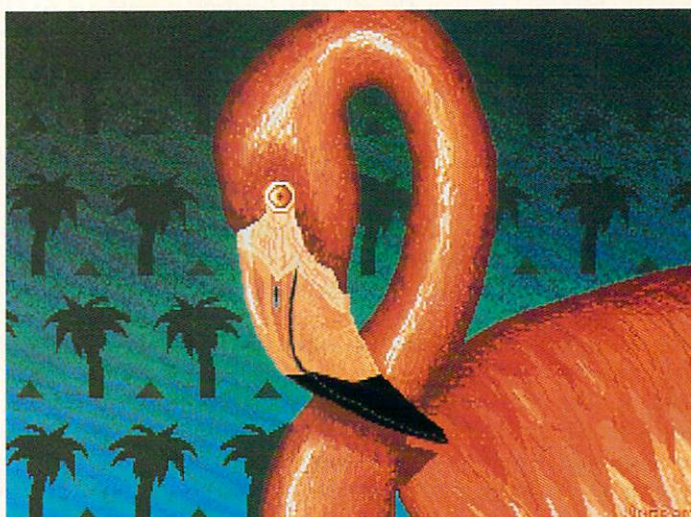
Brad Schenck is the winner of the 1988 Badge Killer Demo contest, and his work has appeared in numerous publications. His picture *Tower* was created on an Amiga 500 using *Digi-Paint* in interlace HAM mode.

Flamingo

Susan C. Ingram

Reseda, CA

"Flamingo was created using *DeluxePaint II*, a program that has seriously improved my creative potential and still knocks me out every time I use it. Inspiration for subject matter ranges from my own photographs to imaginings that evolve into pictures as I paint them. What I really love about painting on the Amiga is having the flexibility to try things out, to be able to move things around and experiment with color, form, and composition. It's incredibly powerful in that respect."



Magic Fingers

Glenn B. Stevens

Melbourne, FL

A professional photographer, photo-journalist, writer, Marine Corps combat correspondent, graphic designer, and public-relations executive, Glenn Stevens has turned his attention to computer art, utilizing an Amiga 2000. In regard to his drawing, Mr. Stevens explains, "Magic Fingers is a detail from a larger print. The hands seemed to convey a sense of talent and expression; so the emphasis was placed on them. The subject matter was captured with Digi-View and then the sharpness was exaggerated to create the effect of pointilism. Spotlighting was done with *Digi-Paint*."

If you'd like to see your art in these pages, send it to us on disk at the following address. We pay \$100 for each piece of art we accept. Rejected submissions are returned only to artists who enclose a self-addressed, stamped envelope.

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TAKING SIDES

Rhett Anderson vs. Randy Thompson

An Amiga in Every Office

NO THANKS! Commodore has had a long history of trying to market the Amiga as an "everything machine." Commodore didn't sell any computers with this fuzzy idea. Instead, the Amiga sold itself.

Think about the Amiga owners you know. Did Commodore's marketing wizards put Amigas into their homes? No. Luckily for Commodore, buyers were brainy enough to see the potential of the machine.

Now, if we believe some of what we hear, Commodore is focusing on the business market. Smooth move, guys. Wake up and smell the PC clones, which are streaming into unsuspecting American households at a sickening pace. Forget the office. Why send soldiers to a foreign country when there's a war at home? Stick with what you know.

The Amiga isn't cut out to be a business computer. Not that the hardware is lacking—it's the software that's behind. Are the major software vendors going to sacrifice their time (already split between Macs and PCs) to develop

Amiga products? Not on your life. It's a Catch-22. Which comes first, the computers or the software?

The marketing division isn't the only part of Commodore that's flipping out. Commodore is spending its valuable R & D money developing computers unaffordable for all but the most well-heeled of home computer users. Let's get the Amiga into more homes. We're all interested

in the new high-end Amigas (hooray for the 2500), but I'd rather see lower-priced, higher-performance Amigas.

Commodore, who are you trying to compete with? IBM and clones? Good luck. An AT can be had for less than a grand. And PCs have the kind of software that business people actually like. Against Apple? Forget it. Apple has cash that won't quit. It updates its computers almost as quickly as it updates its software—every six months. Commodore could never keep up.

Even if Commodore *could* get the Amiga into offices, it would be bad news. Take a look at the Mac crowd. Not so long ago they were rebels, promoting "the computer for the rest of us." Today they're dull three-piece-suit types. And the Macintosh magazines argue about which database is best. Only extinction could be a worse fate for the Amiga.

Looking over at Mr. Thompson's side, we read, "Amiga. Business computer. Amiga. Business computer." Sorry, I'm afraid I'll never get used to it. You see, Commodore no longer makes office typewriters, hand-held calculators, or PETs. They make home computers. And the Amiga fits in the home even better than the 64.

I'LL TAKE TWO! Amiga. Business computer. Amiga. Business computer.

Say it enough times and you'll get used to it. After all, Commodore's full name is Commodore Business Machines (CBM. IBM. CBM. IBM), a company whose financial foundation was built on office typewriters, hand-held calculators, and the Personal Electronic Transactor (that's PET to you and me). Marketed as "the business computer that's providing solutions," the PET was Commodore's first entry into the personal computer market.

Now we have the Amiga, a great computer with a terrible identity crisis: Is it a game machine or a computer? Recent Commodore ads call it "a computer that works like the mind of a musician." *Say what?* I don't know about your Amiga, but mine has nothing in common with Jimi Hendrix's gray matter.

Instead of confusing analogies, Commodore needs to state the facts, and one of these facts is that *the Amiga is a powerful business computer.*

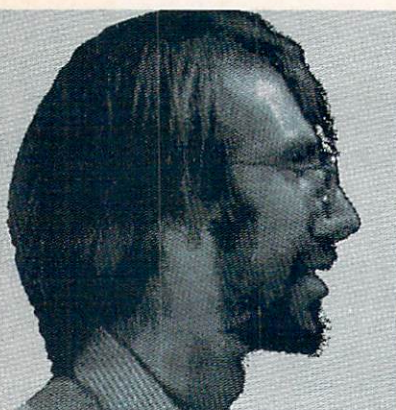
If the Amiga is accepted into the business world, you'll get more product support and Commodore will get more money to develop better, less expensive machines. (Amiga 2000s in the office equals cheaper 500s for the home.)

Commodore's main focus should always be on what makes that Amiga unique—graphics, sound, multitasking, and so on—but let's not pigeonhole the computer as a graphics tool or game machine. We need to tell the public what this computer can do—not keep it a secret.

Look at the specs: 68000 16-/32-bit CPU; up to 9MB of RAM; 94-key keyboard with separate numeric keypad; 880K floppy drives; multitasking operating system; built-in RS-232 serial port and Centronics parallel port. . . . Does this sound like a game machine to you?

Apple yuppies consider the Amiga too inexpensive to be a "real" computer. IBM PC executives worry about its appearance (it doesn't look enough like a large gray breadbox). But despite its low cost and sleek shape, the Amiga is a powerful computer for work as well as for play.

Looking over at Mr. Anderson's side, we see his usual paranoid rationale: PC clones are infiltrating unsuspecting American households, Commodore is flipping out (probably from sniffing too many PCs), we're all in danger of becoming dull three-piece-suit types, and extinction is the Amiga's next best alternative. Calm down, Mr. Anderson—business computers are not the invention of subversive communist sympathizers. We're not *all* out to get you. ▲



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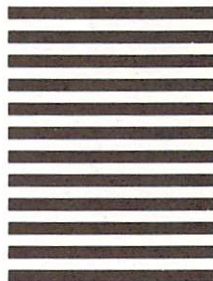
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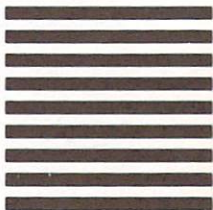
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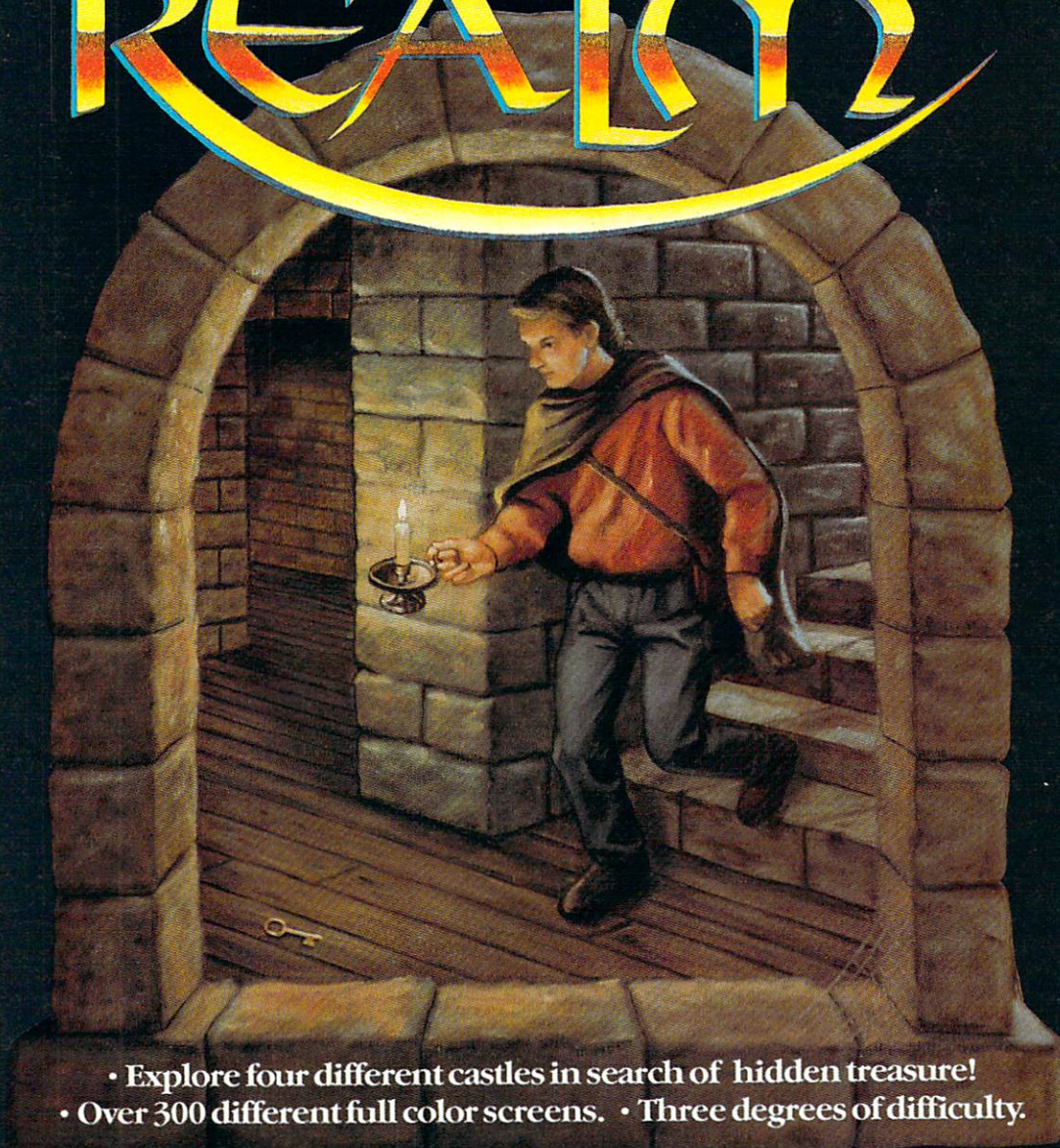
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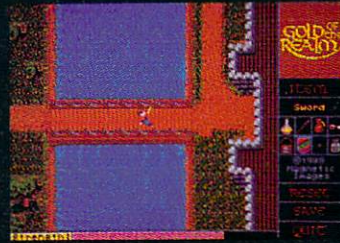


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