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VOLUME 1, NUMBER 5

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(see page 51)

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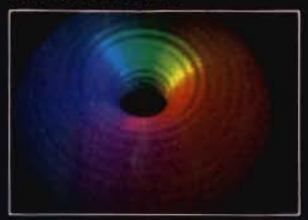

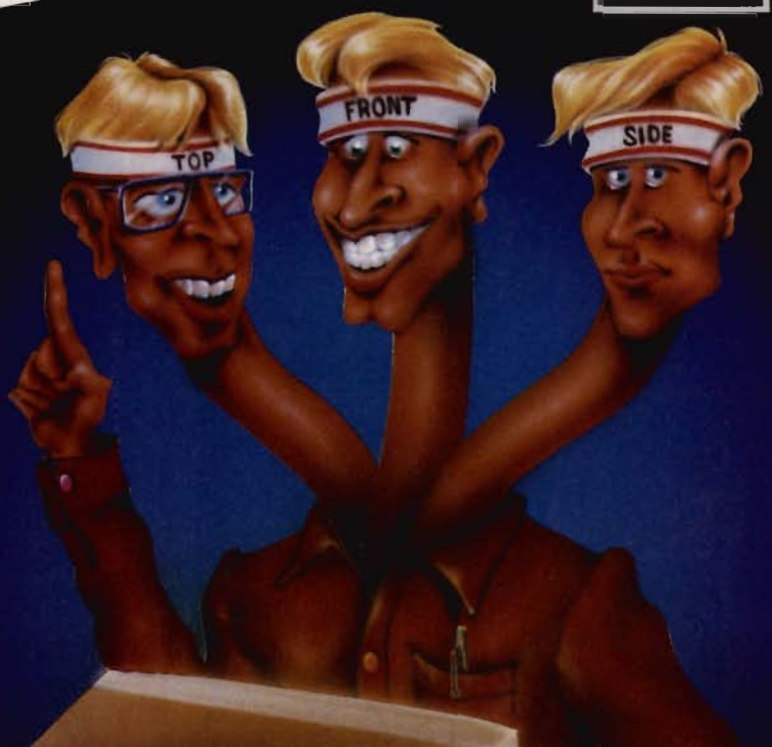

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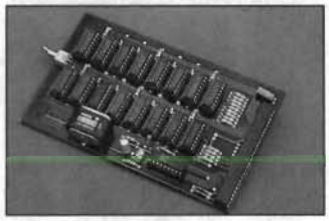

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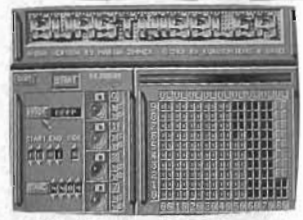

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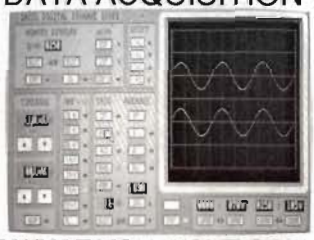

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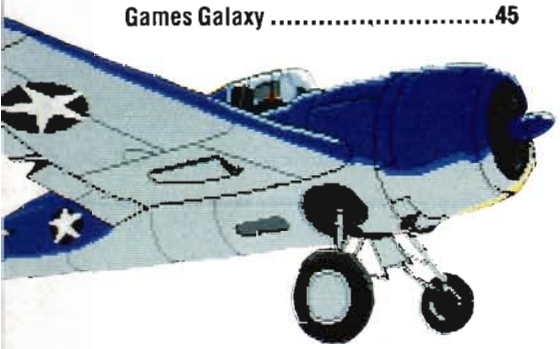

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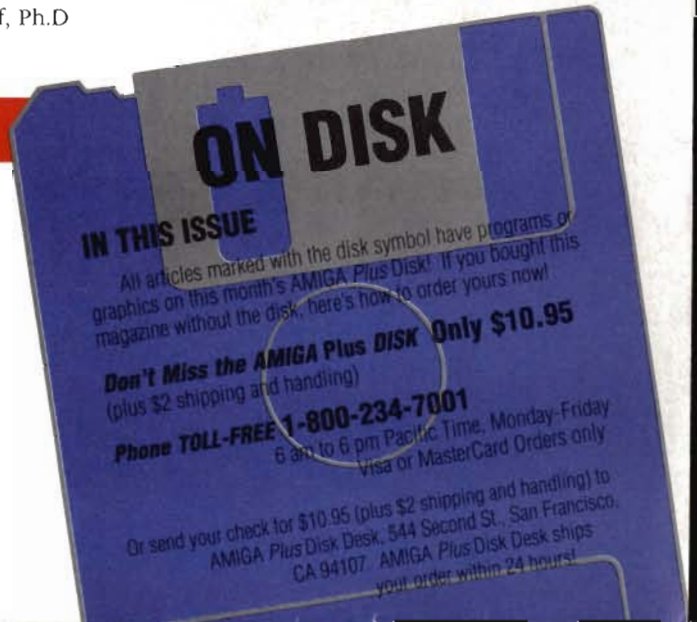

EDITORIAL

I skipped a desktop publishing update in the previous issue because of other news that needed to go into this space (Guy Wright and Gail Wellington as regular contributors, introduction of our +++++ product ratings). However, in that fourth issue of AMIGA *Plus* we did make the big jump into virtually 100% pre-press production on an Amiga system!

Starting with the October-November 1989 AMIGA *Plus*, we have been using our Amigas to typeset all text, produce most of the finished page layouts and process all in-house screenshots (some images even go directly to four-color separation film). All the text corrections are made on proof pages from our in-house PostScript laser printer, before we modem the files to a nearby typesetting service for final printout on a Linotronic 300 at 1,270 dots per inch.

Our primary desktop publishing workstation at AMIGA *Plus* currently consists of:

Amiga 2000 with Super Agnus chip
Commodore A2058 memory board with 8Mb
MicroBotics HardFrame SCSI controller
Seagate 45Mb hard drive
Viking Moniterm 19-inch gray-scale monitor
NEC LC890 SilentWriter PostScript laser printer
Polaroid Palette with American Liquid Light's Imprint interface
Sharp JX-450 Color Scanner with ASDG Twin-X interface
Supra 2400zi modem
Gold Disk Professional Page 1.2 and Transcript software

I don't have any high-drama catastrophes to report (yet) about the still-ongoing process of converting this professionally designed four-color magazine to absolute 100% Amiga desktop publishing. Instead, there continues to be a series of small, nagging problems for which we steadily grind out solutions one-by-one. Fortunately the new problems seem to be less crucial than those earlier ones.

For example, in the previous issue our two-em dashes (--) looked like two dash marks side-by-side, just as typed from an Amiga keyboard. This time around, the two-em dashes look properly like a single continuous line — because Technical Editor Arnie Cachelin wrote a ProPage macro that converts those standard two-dash keystrokes into three dashes kerned together extra-tightly. Arnie has also become quite a PostScript programmer in order to take care of some non-standard font manipulations which are presently unavailable from Professional Page. ■

Nat Friedland

Nat Friedland
Editor, AMIGA *Plus*

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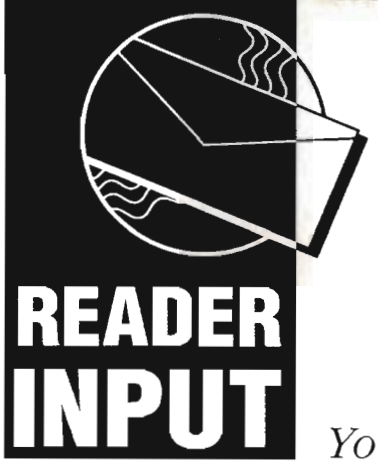

READER INPUT

Your Letters to AMIGA Plus

Colorful Publisher

The publisher's name for **Pure Color** was left out of the New Products section in AMIGA *Plus* # 4 . This collection of printer color-reference palettes comes from: Graphic Design Studio, 417 Transcontinental Drive, Metairie, LA 70001. (504) 455-0341. Current price is $24.95, including shipping.

What! Happened?

We were honored when our desktop organizer **Who! What! When! Where!** was reviewed in AMIGA *Plus* #3 by Michael Brown. However, we found a couple of errors that we'd like to clear up.

The author erroneously states that our manual-based copy protection scheme "pops up at random during a work session and can do so more than once." The look-up scheme occurs once every two weeks on the average and will only request a look-up once during a work session. You can even shrink the window down and re-open it without re-triggering the scheme.

We at the Bakery use copy-protected versions of WWWW ourselves. We found it unnecessary to make non-copy-protected versions for our office because the scheme runs too infrequently. Besides, we would never release a product we wouldn't want to buy ourselves, though we do offer purchasers of WWWW the opportunity to obtain their own non-copy-protected version.

The author also states that WWWW "must be run once a week to maintain accurate timing." This is not true. The accuracy of the time *never degrades*. Also, the background time must be updated once a month, not once a week. This is done automatically when WWWW is run.

Melissa Jordan Grey
President, Blue Ribbon Bakery
Atlanta, Georgia

A-Max SetPatch

Contrary to the misprint in my **A-Max** review appearing in AMIGA *Plus* #4, the A-Max Macintosh emulator from ReadySoft is *not* compatible with the most recent version of the AmigaDOS SetPatch program.

Matthew Leeds
Corte Madera, CA

HiSoft Floating Point

I was most interested in reading Dr. Daniel Wolf's articles in AMIGA *Plus* 2 and 3 regarding floating point operations. We had a good deal of experience with these when implementing the run-times for **HiSoft BASIC**, our compiler.

The original (Atari) version of the compiler used math routines purchased from Motorola in source form, both the FFP and 68881-emulation. When we began the Amiga version we were embarassed to discover that the interpreter thoroughly beat our compiler at all double-precision benchmarks! Fortunately we discovered the not-yet-released AmigaDOS 1.3 math libraries and switched to using them for double precision, producing an excellent improvement in performance. However, we left our FFP routines intact as they proved marginally faster than those in the Amiga libraries.

Andy Pennell
HiSoft
Greenfield, Bedford, UK

Digi-Tricks Too

I turned with some eagerness to your third issues's article "Digi-Tricks" by Julie Peterson. Her solution to the missing color in pictures digitized with NewTek's **Digi-View** was the first one I tried, too. Eventually I stumbled on a simpler method when I accidentally left the palette frozen (an option available on the Palette Screen) as I digitized a new image. The result was a reasonably rendered image using all the wrong colors. Experimenting further, I found that Digi-View will match any IFF image to any palette, with useful results.

For example, if your image has a lot of reds and is missing the brilliant blue in the subject's eyes, go to the palette, find two colors very close in value, and change one to the missing blue. Freeze the palette, then redisplay the image. Results can be startling.

Ward Martin
San Diego, CA

Copying Promise Spell-Checker

Thanks to a letter from C. Kirby of Albuquerque, NM, the + Editors discovered there was one mistake in our instructions for copying the "Promise" spell-checker (AMIGA *Plus* #4) by dragging its entire drawer icon to the icon of a hard disk or separate floppy. If you copy it that way, you will *still* need to double-click on the Assign-PROMISEHere icon in the drawer *before* you double-click on the Spellcheck icon which actually loads the program. ■

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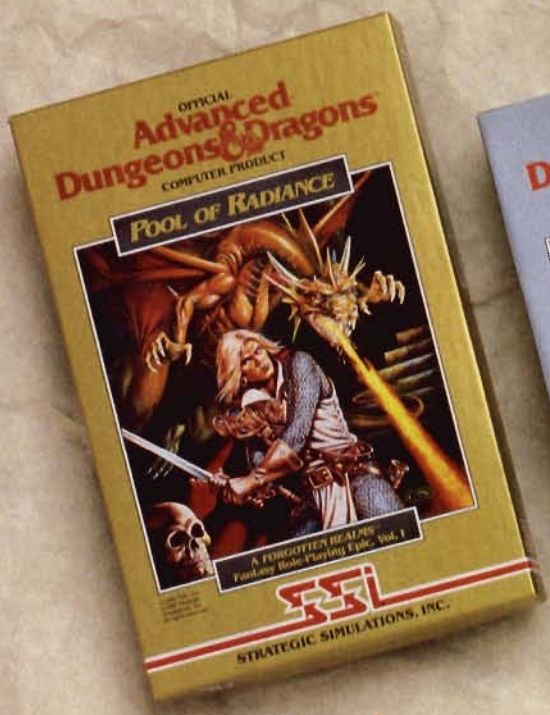

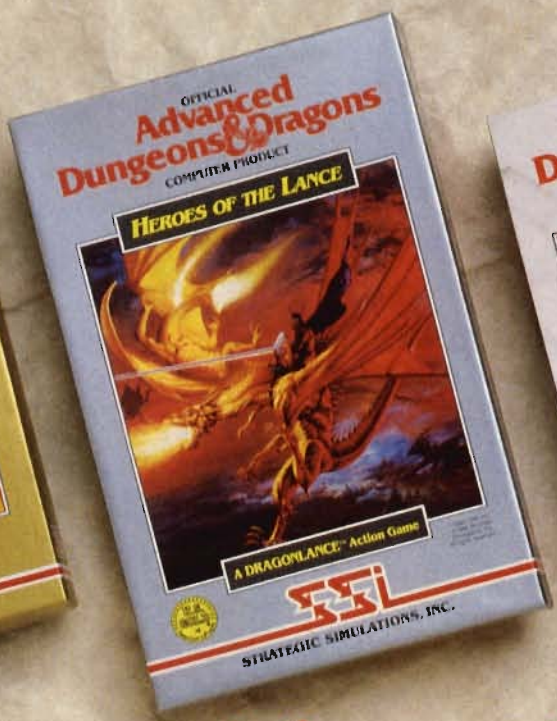

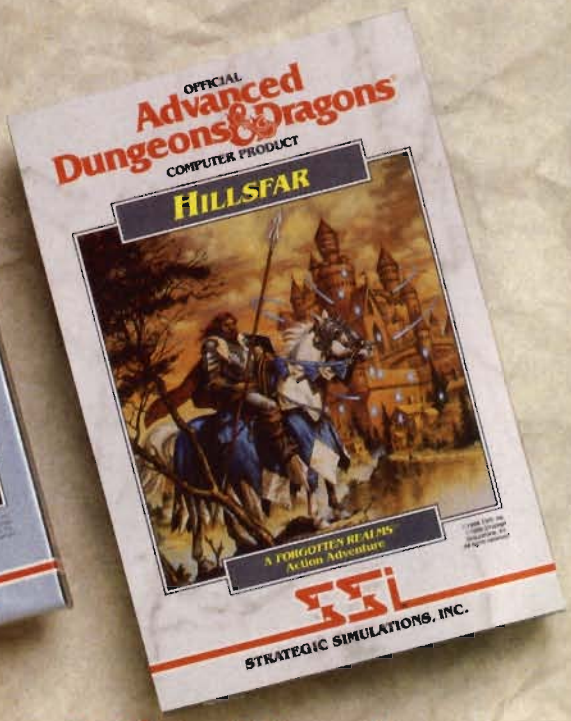

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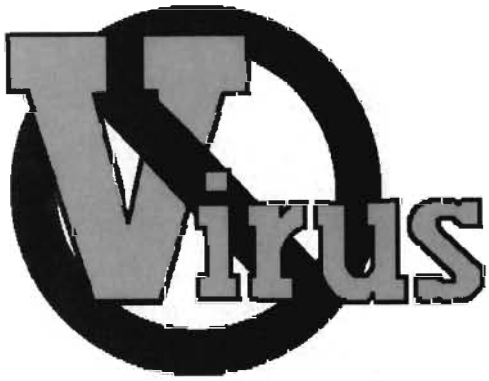

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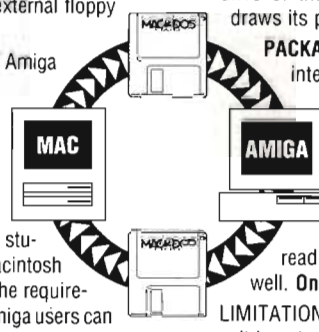

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Amiga users' technical questions answered here

By Arnie Cachelin and Aki Rimpilainen, AMIGA *Plus* Technical Staff

One-Drive Blues

Q: A lot of software is a real pain to use when you only have one drive and standard memory. The trouble comes when you are, say, pushing a graphics program to the limit. You start to do something and a Guru meditation number comes up – they save a whole 10 bytes in ROM by not displaying a message that you are out of memory. Why can't more programs calculate your memory requirements and then tell you in plain English that you can't fit?

Also, why don't more programs that use fonts include font style samples on the back of the package?

Bradley Lowery
Philadelphia, PA

A: *Anyone with only one drive knows that everything is difficult. For developers, making software work fast and brilliantly on a loaded 2500 while retaining most of its functionality in an A500 with 512K and one drive is truly rough. When I got my 512K A1000 I realized in a few days that I needed another disk drive more than ANY software. The Guru meditation numbers will be replaced by text in Workbench 1.4, but it should really include GOMF 3.0, the real "Guru Buster," with new computers. Most programs will not crash simply because they run out of memory, although it sure helps.*

As for font samples printed on software packages, the Amiga system is standardized so that any of the huge number of fonts available can be used in any program that supports fonts at all. If you buy packages of fonts, they usually do show you samples.

Kickstart ROM Upgrade

Q: I presently own an Amiga 1000 with 1.5 megabytes and 1.2 Kickstart in ROM. Is it worth it to me to upgrade my ROM to 1.3? I dread going back into the machine to change that ROM chip, and I've heard that some programs have troubles with 1.3.

Secondly, I recently ordered a hard disk for my Amiga and am concerned about speed and efficiency of use. How can I organize my directories and files to avoid the same sort of excruciatingly slow directory reads I get from my floppies?

William Eggemeyer
Rialto, CA

A: *The only reason to upgrade to the 1.3 ROM would be to allow your Amiga to automatically boot from your hard disk. If the hard disk controller you ordered can auto-boot, and you think this is useful – go for it. The Workbench 1.3 software works fine with 1.2 Kickstart, and any incompatibilities you have heard about are PROBABLY conflicts with Workbench 1.3, not the underlying Kickstart code.*

As for organizing your hard disk, we are still close enough to the floppy days that we love even the slowest and messiest hard drive. Nevertheless, certain things will help. We have heard that the new Fast Filing System (FFS) slows down if there are a lot of files in the root directory (dh0:), rather than a subdirectory. Try to keep all your logically related files in drawers. It is also useful to divide the partitions of your hard disk so that one is filled with Workbench and the applications you use regularly, and the other(s) have the data files and other stuff which will be deleted often. This way, your main application partition will not get fragmented from a lot of writing and deleting, and your data partition can be backed-up and reformatted more often to combat the slowdown caused by fragmentation.

Multi-Sync Flicker

Q: I am a 17-year-old C-64 user, and am working a summer job to buy an Amiga 2000. I'd like to know what monitors work with the flickerFixer board, or the new AmigaDOS 1.4. Also, can you add PC boards to an Amiga that has Commodore's AT Bridgeboard – for instance, a VGA graphics card?

Ronnie Stephens
McAllen, TX

A: *Most multi-sync monitors will work with MicroWay's flickerFixer video board. We've heard good things about the Mitsubishi DiamondScan, the Zenith Flatscreen and the NEC Multi-sync XL (Xtra Large) monitors. Since the new chip set and 1.4 operating system have not yet been released in final form, we can't say what will work and what won't, but it is a good bet that the very-flexible standard multi-sync monitors will be compatible.*

Yes, you can add PC boards to an Amiga running either the XT or newer AT Bridgeboard. To see VGA graphics, you would again need a multi-sync monitor. ■

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WB1: Graphics and Plotting - Several neat graphic and mathematical plotting routines are include; Plot - a 3D mathematical function plotter. Plots any user defined function, Scenery - This generates fractal landscapes, Surf - makes bezier surfaces of revolution. It produces awesome pictures of wine glasses and doorknobs, and other objects one could turn on a lathe And others
WB5: Fonts #1 - Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB6 - Fonts #2: Several fonts (over 30), some up to 56 pts.
FD5: Tactical Games - BattleForce(3.0); A game that simulates combat between two or more giant, robot-like machines. BullRun - a Civil war battle game, Metro - you play the role of a city planner. Very good Amiga version of Kingdom, Golden Empire, Etc. Very very habit forming.
FD6: Games! - This disk is chalked full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: Pacman - This disk contains several pacman type games including; PacMan87, MazMan and Zonix, also Connect_4 - A checker type game, CRobots - ("see-robots") is a game based on computer programming (excellent), Tiles - A very good solitaire game played with three layers of picture (difficult).
FD8: Games! - This disk is full of games, game hints and a few game editors (cheat programs) including: Antepenult - The best PD Ultima type going, GameEditors- Crystal Hammer, BardsTale, TV Sports Football, and FaeryTale, GameHints-These are: Zak McKracken, Shadow Gate, FaeryTale, Space Quest II, Dragon's Lair, and others.
FD9: Moria - a very well done port of an UNIX based character adventure game. This has great graphic controls, mulitple spells, similar to Larn and Hack. Play time several months!
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ALERT BOX

News Notes for the Amiga Community

Popular Photography Magazine Runs on Amiga Power

In the test lab and on editors' desktops

By Nat Friedland, AMIGA *Plus* Editor

It's not surprising to find a computer-specific magazine such as AMIGA *Plus* using Amigas for any jobs they can possibly handle. But it is a little surprising when you find heavy Amiga-ization in Popular Photography, a non-computer magazine owned by a typically PC-oriented large corporation.

As in most cases of offbeat innovation, there is a personal reason for Popular Photography operating 12 Amigas in its test lab and on editors' desks. That personal reason is the longstanding Amiga enthusiasm of Popular Photography Technical Director Lawrence White, who is well-known in Amiga publications as a reviewer of video and graphics products.

Just over a year ago when Popular Photography moved into new quarters, White was assigned to buy a set of computers for the editors. Ideally, these computers were supposed to be easily operated by the computer-wary, be adaptable for some graphics chart generation, and not cost an arm and a leg. White was able to show in dollars and cents that the Amiga would do a better job for less money than PC clones.

The Popular Photography test laboratory has a genlocked Amiga 2000 that displays and captures video camera viewfinder LED positions. Amiga graphics software is also used by White to create some of the colorful charts published in Popular Photography summing up the test results.

Senior Editor Elinor Stecker at her Popular Photography Amiga

Today, all editors at Popular Photography do their writing with WordPerfect on two-drive 1Mb Amiga 500s. Their stories go to a typesetting facility that uses the PC's XYWrite software. So the production department adds typographical coding and converts the files to PC format via Bridgeboard. Larry created special Workbench configurations and plenty of WP keyboard macros to simplify the operations.

Each editor's station also has a special utilities disk including an easy rolodex program and appointment calendar. As the editors learned more about the Amiga, some of them even began to take advantage of the computer's speech capabilities to create oral appointment reminders and cheery little pep-talks to help ease deadline pressure.

Amiga Aussie Style

Dispatch from our man in Sydney

By Eric Holroyd

These days, Australia is generally thought of as the sunny land of koala bears, Foster's Lager, Crocodile Dundee, new-wave rock and Mel Gib-

ALERT BOX

son. But "down under" is also the land of the Amiga.

Home computers have always been popular here in Oz, from the days of the Tandy TRS-80 and on through the Commodore 64. Commodore Australia says they sold more than 70,000 Amigas which, out of a world-wide total of about 1,000,000 sold, gives Oz 7% of world sales. All this in a country with a total population of just over 16 million! Apparently only Denmark exceeds the Australian figures for Amiga ownership per capita.

With that number of Amigas out there it's little wonder that there's a lot of user groups springing up. One of the largest is the Amiga Users Group of Victoria. This group has over 1,300 members and publishes its own magazine. You can write to editor Con Kolivas at P.O. Box 48, Boronia, Victoria 3155, Australia.

Not all Amiga users are gamesters, although games software sales by our retail shops and mail order houses are high. Instead, many Amiga users are more interested in the serious side of computing and are keen to learn about their machines. Quite a number of specialist businesses here are based on Amigas, particularly in the video and graphics fields. One company offers to professionally title your home videos while another will make your favorite Amiga pictures into color slides, glossy prints or even poster size enlargements. Yet others make Desktop Video presentations to order, or do general publishing work such as typesetting page layouts.

One of Australia's biggest TV soap operas is "Neighbours." It's shown each weekday evening in prime time and is also a huge success in Britain where it's shown daily in the afternoons. One of the main characters has just been scripted to get an Amiga and it will be interesting to see how he takes to it. Two other major TV shows offering Amiga as featured prizes are "Sale of the Century" and the long-running "Hey, Hey it's Saturday."

Also, Commodore Australia has signed contracts with the states of Victoria, New South Wales, Queensland and Northern Territory for the supply of Amigas to schools. This means that about 80% of the school population will have access to our favorite computer.

Midwest '89 AmiExpo

Chicago previews of coming products

By Guy Wright

This year's Chicago AmiExpo was slightly smaller than last year and was more of a forum for showing off and selling than unveiling new products.

The Zuma Group was broadcasting news about TV Text 2.0, tentatively titled **TV Text Professional**. ReadySoft hit warp seven with scenes from **Space Ace** (a sequel to Dragon's Lair) due out in November. Psygnosis, Sierra On-Line, Innerprise Software, and Mindscape all entertained visions about dozens of new games coming out this fall. Two new companies debuted software at the show. Fuller Computer Systems products was expanding the archives with **Project D**, a disk copier program, while Lee Software was trimming the fat with a whole series of diet programs.

Space Ace — Another spectacular arcade conversion from Don (Dragon's Lair) Bluth

On the hardware side, Advanced Gravis demonstrated their new Amiga **Mousestick** (due in September) a versatile input device that incorporates optical technology to create a mouse-joystick-trackball all in one unit. And Micro Momentum was blasting away with the **Uzzi Interface**, a rapid fire mouse/joystick adapter with adjustable fire rates. For the hard-core hardware hackers there was Great Valley Products burning up the bytes with their new 32 MHz, 68030 accelerator board, the **Impact A3000 Plus 1**. Interactive Video Systems showed their Trumpcard products with a shareware version of the A-Max hard disk support software. Digital Animation Productions displayed their hardwares including a transputer board, Eprom burners, Eprom cards and RAM boards. ■

UltraCard

Is It Amiga HyperCard... Or Still Mostly Hype?

REVIEW BY GUY WRIGHT, AMIGA *PLUS* CONTRIBUTING EDITOR

Reviewing UltraCard now is like reviewing a Disney theme park that hasn't been built yet. There is great potential, but all you can see are half-completed building facades, a street or two, and a ticket booth. If not for the fact that they are already selling tickets, you would turn around and say "let's come back when it is finished." Unfortunately, UltraCard is for sale right now and people are interested.

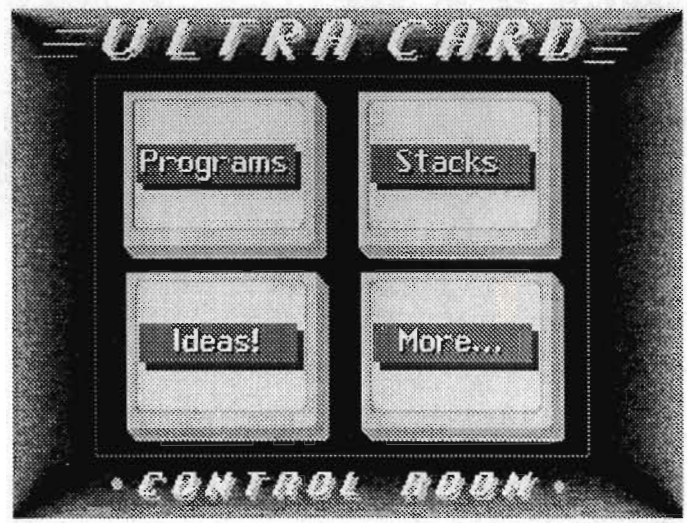
UltraCard is something to be interested in — or it will be someday. Billing itself as a "Multi-tasking/ Hypermedia/HyperText Information Construction Set" UltraCard is modeled after HyperCard, the very successful Hypermedia tool for the Macintosh. Like HyperCard, UltraCard lets you link text, graphics, and audio information in the same application. Unlike a straight player program or database that can handle these elements, UltraCard can be interactive.

The basic building block of the UltraCard system is the Frame. A frame can contain audio, graphics, or text. It can also contain hypertext links that jump to other frames, pass or receive information between frames, process information, even activate other programs. A collection of these frames is called a Stack. A stack can be nothing more than a player of a single frame or a collection of frames with links and branches, rigidly ordered or free-form.

The idea is that users can link together various elements in just about any way they choose without knowing programming, AmigaDOS, or reinventing the wheel. If you like the way a certain program does something, you can incorporate that program into a stack. If you want to use graphics from one place, sound from another, and interactive text from a third, UltraCard lets you join them all together with a single Workbench-like interface.

On the graphics side you can have any resolution the Amiga supports except HAM and overscan. You can even switch resolutions inside a Stack with a simple requester. You can use any graphic as a backdrop for an application and can customize the interface any way you choose. Graphics can also be multi-layered and selectable with a mouse click.

While setting up your application you can select areas that will be "hot" when the stack is run. For example,



This screen is your entry into Ultracard.

in a picture of zoo animals you might outline each animal so that when the user clicks on one, a text or audio frame is activated telling what the animal eats.

A calendar program and an address book come with UltraCard. They are only meant to be used as examples and therefore are nothing to write home about. It is hoped that people will be creating lots of stacks either for Public Domain or at a minimal cost. To this end UltraCard comes with a "player" of sorts called the Browser. It lets you use stacks, but you can't modify the information.

UltraTalk Scripting

While many of the functions and screens can be set up through menus, the heart of UltraCard is UltraTalk — the scripting language that binds it all together. Similar to many computer languages, in UltraTalk you can declare variables, do arithmetic, loops and string manipulations — as well as things that are unique to UltraCard. You can give CLI commands, pass and receive information between frames, and link external programs either directly or using ARexx scripts.

With UltraCard you should be able to customize an applications "front end" or user interface. All graphic, audio, and text handling can either be done through UltraCard or by linking to other programs. UltraCard is an adjustable framework that you should be able to build almost anything within. If you have the idea, the graphics and the connections, UltraCard should help you tie them all together.

That is the way it is supposed to work. A sort of dream actualizer for non-programmers. Unfortunately, this theme park isn't finished yet. There are numerous problems with UltraCard from start to finish.

The manual, while written in simple language, is incomplete, filled with typos, misprinted pages, programming jargon, coined phrases and is just not very helpful. While on one level it is easy to read, the author assumes you already know about HyperCard, BASIC, C, Forth, CLI, AmigaDOS, startup-sequences, stacks, bitmaps and so on. You are supposed to take apart the tutorial stack within UltraCard to find out how things work. Perhaps most people had to learn programming by tearing apart other programs, but it is frustrating to be told, "here it is, you figure it out."

Learning UltraTalk is another exercise in frustration, because it combines all the worst elements of many programming languages — mixing terms and syntax while trying to incorporate completely new commands and ideas. Commands discussed in the manual are not in any particular order and nowhere is there a complete list of all the commands. There are also constant references to UltraTalk and UltraCard features that don't exist yet — such as a compiler, a BBS and libraries of stacks.

UltraCard might someday become the foundation for wonderful applications, but right now it's still a construction site.

Slow and Buggy

If you do manage to get a working stack finished and saved, you will have to contend with more problems. The biggest problem is speed. There is none. UltraCard is s-l-o-w-w-w-w. Even when scrolling through a simple text frame, it barely crawls along as you reach the bottom. Since there is no consistency about how UltraCard responds to user actions, it is hard to tell if a keypress or mouse click registered or the program just crashed.

Sometimes the cursor is a boing ball, sometimes a spinning boing ball, sometimes nothing. Sometimes the drive light is the only indication that a keypress or mouse click registered, sometimes the drive light takes a second or two or five or 20. When nothing happens, most people press the key a few times or click the mouse button again. But in UltraCard this means they will be waiting for awhile, as the program plods through each press or click until its buffers are cleared.

You can call up help screens at any time, but it is hard to return to where you were — and the information you just entered may not still be there. Requesters have no consistency and things just don't work the same way they do in Workbench. While this may not be important to some people, novice users of UltraCard stacks will quickly get confused.

The most unforgivable problem, however, is that UltraCard is full of bugs. It is very easy to crash the program from anywhere in UltraCard. I crashed it from within stacks and even in the Help menu! There are many one-way streets with no way to bail out until you reach the end. There is little error trapping, so even typos can crash your system.

Perhaps UltraCard will be a wonderful program someday. The potential is there and the people at Intuitive Technologies seem to be working extra hard to get everything fixed. If you are a programmer or developer who likes being part of something that's just getting off the ground, you might want to play around with UltraCard. If you are an end-user or just want to create some simple application stacks -- don't buy UltraCard yet. It just isn't ready for the general public. Eventually UltraCard might become the foundation for some wondrous applications, but right now it's just a construction site with more potholes than attractions. ■

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CIRCLE 005 ON READER SERVICE CARD

Holiday shopping recommendations from 14 opinionated Amiga pros

EXPERT CHOICES '89

BY GUY WRIGHT, AMIGA *PLUS* CONTRIBUTING EDITOR

If you have unlimited funds and the best Amiga store in the world just down the street, you might be able to find out which products are the best, which are just so-so, and which are the barkers. You will also need a lot of time and a fair amount of expertise. That's where Expert Choices '89 comes in.

Admittedly, the following list is by no means complete, objective, or perhaps even fair. You are getting the personal picks of knowledgeable, but individualistic, Amiga users who aren't as perfect as they may like to think. Our panelists might have some unfounded opinions or lapses of memory, or they could even be guilty of ignoring a product's bad points *if* they like its other features.

Still, for the most part these picks are pretty good products and you would probably be safe buying anything on the list. By the way, to save space we had to cut most of the duplicate picks by our experts. Also some categories, like games, are very subjective and perhaps should be considered favorites instead of bests. If you agree or disagree with the Expert Choices '89, by all means let AMIGA *Plus* know what your own picks are.

AMIGA *Plus* gathered together Amiga professionals from around the U.S. to tell us their picks for the best products. Our expert panel is:

Steve Ahlstrom - Head sysop of CompuServe's AmigaForum.

James Hill - Software services manager of American People Link.

Lewis Tilley - Art Professor Emeritus and Amiga journalist.

Ira Cord Rubnitz - Recording studio engineer and musician.

Curt Kass - Computer graphics de-

ILLUSTRATION BY ADRIAN DAY

signer at University of Wisconsin.

Rich Bielak - Systems programmer and Assistant VP of technical support.

Wolf Griffey - Former Marine jet pilot, Amiga software technician

Morton Kevelson - Senior electrical engineer at Consolidated Edison.

Mr. X - Author, programmer, and all-around Amiga whiz who must remain nameless here.

The AMIGA *Plus* staff:

Nat Friedland — editor

Arnie Cachelin — Technical Editor

Carolyn Cushman — Associate Editor

Aki Rimpilainen — Technical Assistant

And...yours truly, Guy Wright.

You'll find plenty of my humble opinions here, based on my 10 years in the computer industry and five years in the World of Amiga magazine editing.

Graphic Arts

WRIGHT - No surprises here. The entire Electronic Arts (EA) Deluxe Paint series started out at the top of the list and continues to stay there. There is no question that Deluxe Paint III is worth having. It is the paint program that all others are measured by. If Deluxe Paint weren't so good it would be boring to see its name on every top picks list.

TILLEY - Deluxe Paint I, II, and III are the all-time best products. The tools are easy to use and Deluxe Paint just about established the way to lay out the positioning of those tools.

KEVELSON - I like DigiPaint 3 (NewTek) for the same reasons as Deluxe Paint III -- except it can also do HAM. You have some unique abilities in HAM.

CACHELIN - I'm no artist, but Deluxe PhotoLab (EA) loads any picture and makes nice icons. For animation and rendering, the scripting abilities of PAGErender 3D (Mindware) lets you render mathematical objects and easily switch from proof resolution to final quality. It also has extra coordinate systems.

RUBNITZ - Photon Paint II (MicroIllusions) is an amazing creative tool. Great with the ProFonts from ProWrite. You don't need to be an artist. It's easy to use, has great tutorials, and a good manual.

WRIGHT - Sculpt-Animate 4D (Byte by Byte) is just the best for ray tracing. It may be complicated. It may be difficult. It may be any number of things, but if you want to do ray tracing then Sculpt-Animate 4D is the top of the line.

TILLEY - For 2-D animation, I like MovieSetter (Gold Disk) because it's easy to use. I would recommend it to beginners.

KEVELSON - Invision (Elan) with the Live! digitizer (A-Squared) gives you the type of control you need to do something special like setting up a complete performance. I like the special effects capabilities and good user interface. This combination is like playing an instrument.

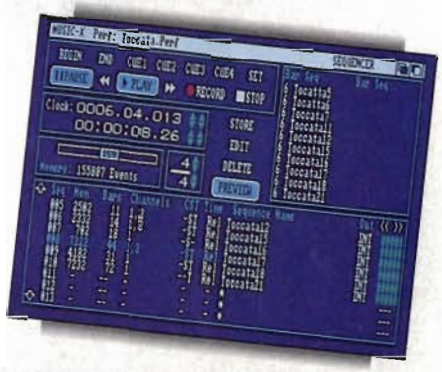
Deluxe Paint — The all-time choice.

Video

TILLEY - Digi-View (NewTek) - I haven't found anything that will give me a clearer image. It is still the leader in the field. A great one.

KEVELSON - Digi-View is low cost with a lot of return, for the dollars.

WRIGHT - ProGEN (Progressive Peripherals) is the best genlock under $500. For the price it has a reasonably good output. SuperGEN (Digital Creations) is the best genlock under $1,000. Very good output, simple to use, good price for pretty good quality. Best overall genlock is the Magni Systems 4004, nearly perfect output and lots of professional features — at a professional price. Frame Grabber, from Progressive Peripherals, delivers high quality real-time color images.



Music-X — The complete new MIDI package.

Music

RUBNITZ - Dr. T's and Sound Quest's editor/librarian software for the Roland D-50 synthesizer did an amazing job. Dr. T's KCS is still the best sequencer program all-around and editing features are nice. A little complex but I think it's a great program.

M (Intelligent Music) is great for people who can't write songs. Music X (MicroIllusions) is for people who don't have any other music programs. For the price it is incredible. Takes advantage of the Amiga interface, very colorful.

Passport's Master Tracks Pro version III looks really great. I'm waiting

for the MIDI transport. It's the sequencer I'll probably be using. I really like the interface.

KEVELSON - Audio Master II (Aegis) has a very good user interface, high playback rates, good controls, and good editing facilities.

RIMPILAINEN - Good old Sonix (Aegis) still does the composing and coordination of the music for my applications. Solid and functional. Audiomaster II (Aegis) and A.M.A.S (MichTron) is a combination of software and hardware that gives me the tools to edit and sample sounds of excellent quality.

FRIEDLAND - I can space out for hours with the Amiga hobbyist music programs. I use the Instant Music (EA) rock and jazz disks to accompany myself on electronic keyboards. Music Mouse (Aesthetic Engineering) lets you play amazingly professional sounds just by sliding the mouse around and changing simple keyboard settings. The default set-up makes you sound like instant George Winston.

Word Processing

WRIGHT - If we didn't put WordPerfect (WordPerfect Corp.) on the list there would be angry citizens trying to burn down the AMIGA *Plus* offices. If there is something you need from a word processor then WordPerfect probably has it, although it's not really graphic or Amiga-specific.

AHLSTROM - CygnusEd Professional (ASDG) is the best all-around text editor I've used.

RIMPILAINEN - ProWrite 2.5 (New Horizons) is simple to use, yet elegant and extensive. It makes beautiful graphic printouts and fills all my WP needs. DME (public domain) by Matthew Dillon should be mentioned as the number one text editor for any serious programmer.

TILLEY - With Scribble! (Micro-Systems Software) I very seldom ever lose anything. It is easy to learn and I can use keyboard shortcuts.

FRIEDLAND - Transcript (Gold Disk) is great for manipulating text at high speed. It's the ideal front-end for us at AMIGA *Plus*, I've never seen a word processor so hospitable to ASCII files from any source.

KASS - excellence! (Micro-Systems Software) has great multiple features -- thesaurus, fine interface, and the grammar checker is actually useful.

WRIGHT - excellence! is one of my favorites too. Yes, it is a little slow, but I'm no Speedy Gonzales typist. I particularly like the spell-check as you type and thesaurus features.

KEVELSON - Kind Words II (The Disc Company) is easy to use, the spell checker and thesaurus are helpful. I also like the "What you see is what you get" aspects.

MR. X - TxEd Plus (MicroSmiths) is fast, clean, multi-tasks, small, and does what it is supposed to do without getting in the way. It is a simple and clean little programming text editor.

Games

WRIGHT favorites (in no particular order):

Arkanoid (Discovery) is still near the top and should be incorporated into the Amiga Games Hall of Fame. Just a plain fun mix of arcade action with a smidgen of thought.

Tetris (Spectrum HoloByte) is simple and addicting. What else do you want from a game? Anyone can play this game within a few minutes. No complicated rules, just a neat game.

Shanghai (EA) is another one of those "just one more game before I quit" games that is hard to turn off. A classic.

Chessmaster 2000 (EA) is the best computer version of the best board game ever invented.

Battle Chess (Mediagenic) has chess graphics good enough to put this one on the list and it plays a pretty good game as well.

Menace (Psygnosis) is perhaps the best "if it moves, blast it" game ever put on an Amiga. If you don't have a rapid-fire joystick buy one, if you already have one get ready to buy another because you'll probably break the first.

Blood Money (Psygnosis) is the sequel to Menace. This game is a killer, plain and simple chaotic mayhem with one of the best title sequences on any product. Great sound, great graphics, great action.

Gettysburg (SSI/EA) is one of the

Battle Chess — See the pieces kill each other spectacularly.

best on any computer, this has to be the top of the line for war/strategy games.

CUSHMAN - Few games really grab me. But when they do, I get addicted. Three games in particular have that fatal attraction for me, all sharp and colorful strategy games — the falling squares of Tetris, playing God in Populous (EA), and the arcade classic Qix (Taito).

RUBNITZ - Barbarian (Psygnosis) - After a hard day at work, it is a really cathartic thing to pretend to be killing your boss. Graphics are superb.

Three Stooges (Cinemaware) - I'm a big ThreeStooges fan and love the digitized voices. Really the closest thing to being in a movie.

Alien Syndrome (Sega/Mindscape) - It could have had better looking aliens but it is very suspenseful.

GRIFFEY - FALCON (Spectrum HoloByte) is one of the top jet combat programs on the market. Great graphics, excellent simulated flight characteristics and a joy to tame. FALCON: Operation Counterstrike is not just an add-on disk, but a new and improved 12-mission disk with enchanced flight features. Like flying for points in a real world wargame.

Gunship (MicroProse) is the best helicopter simulator out there and every moment is great. If you think you have combat flying down to a science, try your hand at some rotary-wing time. Battlehawks 1942 (LucasFilm/EA) lets you repeat or change history. It's based on the great air-sea battles of WWII between the U.S. and Japan. Chose sides and aircraft, go to battle in some of the best looking graphics around and even put your action on camera to review how you did.

RIMPILAINEN - Lords of the Rising Sun (Cinemaware) is a bit of an overambitious Japanese Risk. I get a kick from moving armies on the map and then personally directing them to do battle. Bubble Bobble (Taito) is an entertaining and silly little game! Gauntlet II (Mindscape) is the most fun four players can have at the same time.

HILL - If I had to pick three games, two would be Sim City (Broderbund) and Populous (EA). I do have Dungeon Master (FTL) which is a pretty amazing game, it kept me going solid for a week and I haven't finished it yet — but I will one of these days.

MR. X - Dungeon Master is the best of the bunch. I like the real-time qualities. Blood Money (Psygnosis) is great because it's damn near impossible.

Superbase Professional — High-powered but friendly database.

Databases, Spreadsheets

RUBNITZ - Superbase Personal II (Precision) definitely is a great program.

WRIGHT - Superbase Professional (Precision) is unquestionably the best database available for the Amiga. It is extremely powerful and at the same time easy to set up and use. It might be overkill to buy Superbase just for a Christmas card list, but you wouldn't have any problems doing it.

DataRetrieve Professional (Abacus) is a bit of a dark horse, with a surprising number of features and a lot of power. Very easy to use, this database is quietly efficient. A very strong second and possibly a first.

MicroFiche Filer (Software Visions) is the easiest database in the world, or almost, anyway. Unless you want to inventory your warehouse of plumbing supplies, this is probably a good choice. Being limited to the amount of RAM you have could be a drawback for very large databases, but for keeping track of names, addresses, and moderate-sized lists MicroFiche Filer is an ideal choice.

As for spreadsheets, Plan/It (B.E.S.T.) first came out as MaxiPlan and continues fighting off the contenders. I have also heard good things about SuperPlan (Precision). B.E.S.T. software is still the best accounting software too.

Desktop Publishing

FRIEDLAND - If there was no such thing as Professional Page (Gold Disk), we would not be able to do the AMIGA *Plus* pre-press typesetting and layout on Amiga.

KASS - Professional Draw (Gold Disk) is a real gem of a program, extremely easy to use. For entry-level structured drawing it is still the only successful one out there. ASDG's Professonal ScanLab. It truly gives professional color scanning with the Sharp JX-450 scanner.

AHLSTROM - PageStream (SoftLogik) does what it does very well. It has great printer output, though lots of bugs are admittedly still around.

CACHELIN - Postscript (Adobe) is a gnarly language. The PixelScript interpreter (previously PrintScript, from Pixelations) lets any graphics printer use PostScript. It's slow but it works.

Telecommunications

AHLSTROM - Access (public domain) is a very powerful, all-around communications program. I also like Whap! (ATI) because it automates my CompuServe activities.

HILL - Baud Bandit (Progressive Peripherals) is the only commercial communications software I use. It's compact and easy to use, the interface makes sense, you can use the keyboard or mouse. On the public domain side I usually use something like one of the clones of Comm 1.34.

RIMPILAINEN - After using quite a few terminal programs, I picked Baud Bandit (Progressive Peripherals) to live on my hard disk. It's easy to use, supports ARexx, and does what I want it to do.

WRIGHT - A-Talk III (Oxxi) is

EXPERT CHOICES '89

what you should buy if you want to get on-line, get something off-line, upload, download, unload, know what you are doing or don't know what you are doing.

Online! (Micro-Systems Software) is a fairly solid program that continues to be a workhorse. I know people who have been using Online! for years.

Utilities

TILLEY - Who! What! When! Where! (Blue Ribbon Bakery) is an appointment calender and address book that's simple enough for me not to grow confused. I like programs that don't demand anything of me but to use them.

KEVELSON - Disk Master (Progressive) does the job as a directory utility. It's fast, has decent text display, and built-in IFF capabilities. All the controls I need are up front.

MR. X - DiskMaster (Progressive) is all-around generally useful. For me it almost replaces CLI and Workbench.

CACHELIN - Anyone who ever had their Amiga crash should buy GOMF 3.0 (Hypertek) immediately. ASDG's VD0: recoverable RAM disk is a must. Mach 2.5 by Brian Moats is too handy. It has hotkeys, popcli, mouse accelerator, sunmouse, etc.

WRIGHT - VirusX, Steve Tibbett's public domain program, is a life saver. It's on the first two AMIGA *Plus* Disks.

RIMPILAINEN - GOMF 3.0 (Hypertek) is an indispensable aid for any programmer. It keeps the Amiga alive while bugs try to overthrow the system. Saves a great deal of rebooting time! VirusX — no need for comment.

AHLSTROM - NimWatch (John Tobes Software Distillery) - Lots of software stomps on zero page. NimWatch looks for that and corrects it. Snipit is the next best thing to clipboard.

Programming Languages

AHLSTROM - Lattice C 5.02 (Lattice) is a complete system. It's integrated and the source level debugger, ansi support, everything is there.

CACHELIN - Devpac Assembler (MichTron) is just too fast. With the debugger it's more like interpreted assembler. I like Aztec C (Manx) because I can fit it all in vd0: or run without a Hard disk. It has a nice assembler.

MR. X - I use Lattice C 5.02. It produces fast and small code, I like the integrated environment, and it has a good debugger. I also like HiSoft BASIC (MichTron) for the same reasons.

RIMPILAINEN - Devpac compiles fast and directly produces executable code. Aztec C is a solid package with a great debugger.

BIELAK - Benchmark Modula II (Avant Garde) has a nice source level debugger that's much better than anything else. It has almost no bugs, very nice, mouse driven, no cryptic commands.

Okimate 20 — Affordable color printing for all.

Printers

TILLEY - Okimate 20 is inexpensive and yet satisfying. Not great output, but at the price it is very decent..

RUBNITZ - Xerox 4020. With the right paint program you can go nuts. Works really quick with 1.3.

KEVELSON - PaintJet from Hewlett Packard is reasonably priced for a color printer, resolution is the highest you will get, strong colors with good saturation and it is reasonably fast, reliable and long-lasting.

KASS - Star Micronics NX-1000 Rainbow - reliable, good price, available almost anywhere. Pretty high DPI value, graphics are quite reasonable. Very good entry level printer with very good letter quality.

The Xerox 4020 is the best overall full-featured printer, at the price it is a good value. I like the oversized pages, 9.5 X 14, and the font quality is very good. I am using the enhanced driver from GlassCanvas (an amazing driver for the Xerox 4020 printer that corrects the density and colors of the printer).

Hewlett Packard's Deskjet is absolutely the best B&W printing value,with laser quality work at Amiga prices. HP Paintjet has the best ease of use color printer over $1,000. Canon PJ 1080 - best for under $1,000 in the inkjet format. Inkjet is the best technology for color printing.

Hardware

WRIGHT - Uzzi Interface (Micro Momentum) is the best rapid-fire adapter. Nice long cord, effective. Every rabid game player should own one of these. SupraRam 2000 (Supra) memory upgrade board is easy to install, effective, and these days almost a necessity.

CACHELIN - Commodore's 1080/1084s monitor lets me easily switch between TV and Amiga during commercials or compiles. The price/quality/versatility ratio always impressed my IBM buddies.

AHLSTROM - Supra internal and external modems. The internal modem is nice because it frees up my serial port for another modem. Flicker Fixer (MicroWay) is the best thing after a hard disk. It is a bit pricey but it really makes the computer shine.

RUBNITZ - X-Spex 3-D Glasses (Haitex) is excellent technology. Not much software support, but worthwhile.

MR. X - The 2620, Commodore's 68020 accelerator, just because of the speed. ■ (Manufacturer Address/Phone List, page 97)

AMI.. Alignment System

Answer That Eternal Question, "Is My Floppy Drive On-Track?"

REVIEW BY STEVE KING

+++

AMI.. is easy to use and can diagnose just about any floppy drive problem, but don't expect it to be a total cure-all.

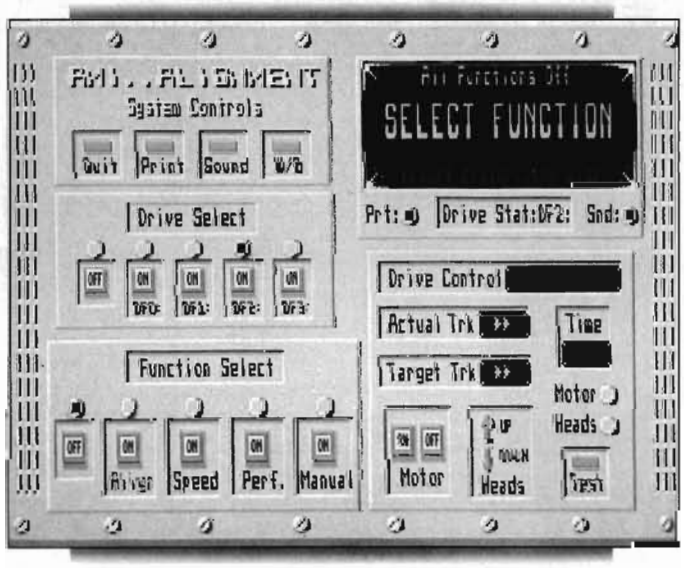
A disk drive is just like any other mechanical device. Sooner or later it will need a tune-up. That's where the **AMI.. Alignment System** comes in. AMI.. will analyze your floppy disk drives, report any problems and offer possible solutions. While this program is basically a straightforward utility, Free Spirit Software has created a superb graphic interface in the form of a control panel with buttons, switches and indicator lights.

AMI.. comes with a program disk, plus an alignment disk created on a master drive known to be correct. To perform some of the tests you will also need a scratch disk that will be erased in the testing process. All testing functions are controlled from the main panel which is divided into five sub-panels.

The System Controls section is where you activate printing and audio functions, bring your Workbench window to the front and quit the program. As throughout the program, you select your option by moving the mouse pointer over the appropriate switch and pressing the left mouse button.

Below the System Controls are the buttons for selecting as many as four floppy drives to test (df0: to df3:). To the right is the CRT Display sub-panel which shows text reports of current program status, program messages and test errors.

Next, the Manual Drive Control sub-panel not only provides visual information as to which track is being checked, but also lets you control the disk drive manually. From here you can position the drive head at any designated track as well as turn the drive on and off, merely by clicking on various buttons. Finally, the most important area is the Function Select sub-panel from which you activate the particular test you want to peform.



Ami.. Alignment System — Testing your floppies was never so flashy.

Three Tests

The AMI.. Alignment System performs three types of test on your drive -- alignment test, speed check and performance test. One side of a 3.5-inch Amiga disk contains 80 concentric circular "tracks" (or cylinders) running from the center to the outer

edge. Each track is divided into 11 sectors holding 512 bytes of data apiece. It is vital that the disk drive head — which reads and writes the data — is aligned to stop precisely over the center of each of these tracks. If alignment is off, then data will not be read correctly, if at all.

The AMI.. alignment test uses the specially calibrated alignment disk which must be inserted into the tested drive. The automatic test continually checks the innermost, outermost and center track and advises you whether the head is properly aligned.

If the alignment is not correct, the manual provides complete instructions on how to go about adjusting the alignment.

The second test checks the speed of the disk drive, which should be about 300 rpm. If the speed is off, data cannot be accessed properly and errors could result. Since the speed is controlled electronically, the program gives no instructions on how to fix it.

The final series of tests requires that a scratch disk be inserted in the drive. The tests will destroy any data on that disk, so make sure the disk is expendable. The first performance test checks for track integrity by writing each track to the disk and then checking to make sure the track is in the correct position. The second test checks the writing function by measuring the number of bytes per second that can be written to each track of the disk. If results vary from the normal 5,000 bytes per second, then you may have problems. The third test, similar to the second, checks the reading function. It determines how many bytes per second can be read by the drive (normally 12,000). In all three tests, a time value is also reported which should be consistent from track to track.

Summing Up

You are likely to find that dirty drive heads are most often the culprit when a floppy drive misbehaves, so you will probably also need to purchase a cleaning disk. While I found that AMI.. was easy to use, the only disk malfunction you can correct by yourself is alignment. If the test indicates other problems, you will usually need to take the drive in for service.■

AMI.. ALIGNMENT SYSTEM $49.95
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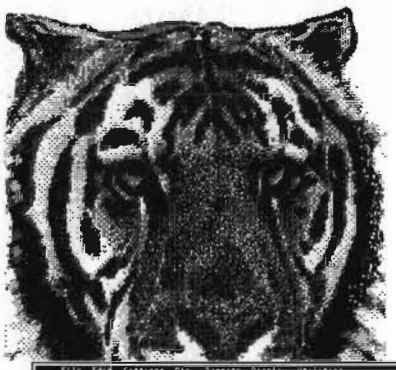

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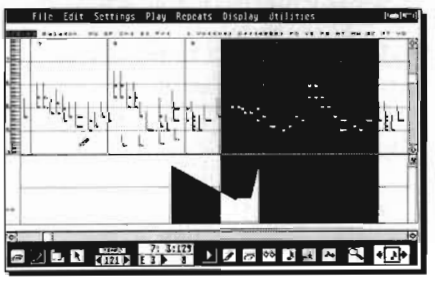

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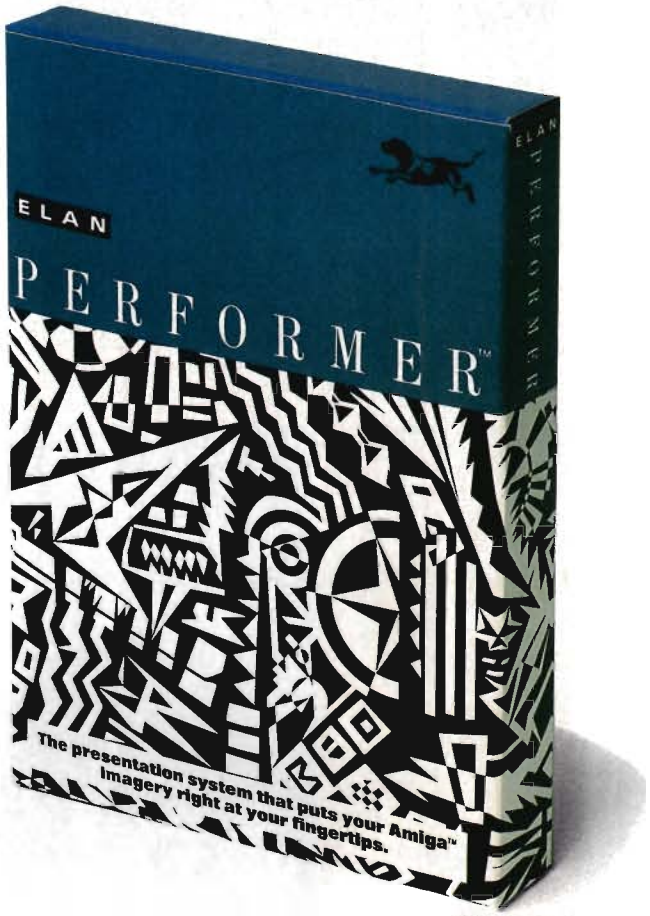

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Why Anti-Aliasing?

Smooth The Jagged Edges Of Your Artwork, Using A Simple Technique That's Often Misunderstood

BY JIM SACHS

As I travel around the country teaching Amiga graphics seminars, I find that the most valuable part of the lesson comes when students submit their work for critique in front of the class. Though generally quite good, almost all of this artwork could be greatly improved through a simple but apparently misunderstood technique, anti-aliasing.

Let's say we wanted to draw a white triangle on a black background (*Figure 1A*). Zooming in on the diagonal edge of the triangle (*Figure 1B*) you can observe the stair-step effect known as aliasing, the number-one enemy in trying to create realism on a computer screen. Popularly termed "jaggies," aliasing results from the limited screen resolution available on the computer. Since we are forced to draw with pixels (dots) of a certain size, diagonal lines must be jagged. Or must they?

We could switch to a higher screen resolution, say 640 x 400 pixels instead of the usual 320 x 200. This would give us much smaller pixels with which to fill in those stair-steps. This has three major drawbacks. First, instead of a palette of 32 colors on-screen (or even 64 in halfbrite mode), we would only have 16 colors available. Second, the amount of computer memory required just to display all those extra pixels increases, as does the amount of disk space required to save the picture. The need to process all this extra data may severely hamper or even disable many functions of your paint program. The dreaded screen flicker associated with the Amiga's interlace mode provides the final drawback of high resolution. So if you find hi-res too restrictive, as I usually do, you need another way to smooth out those jagged lines.

Blur the Jaggies

When you watch television, you are viewing an image of *less* horizon-

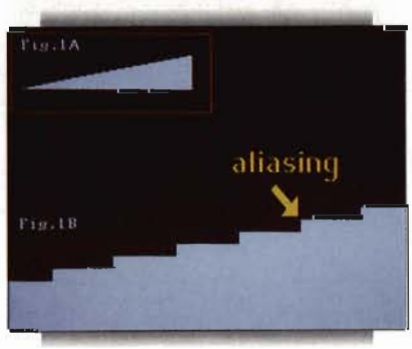

FIGURE 1A AND 1B

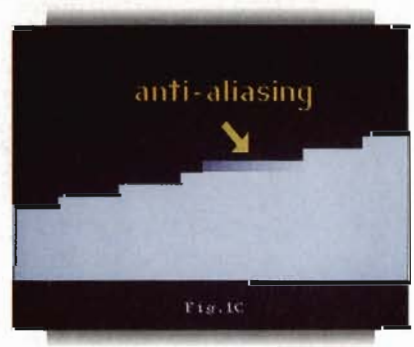

FIGURE 1C

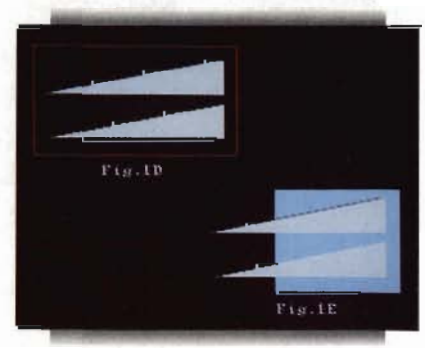

FIGURE 1D AND 1E

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tal resolution than the Amiga's low resolution display, yet you see no jaggies. If you look very closely at the TV screen, the reason becomes obvious. The picture's blurriness blends all the aliasing together. This blurring is known as anti-aliasing, and you can use the same principle to do manually what a TV camera does automatically.

FIGURE 2A

FIGURE 2B

Figure 1C shows the diagonal edge again, but now we've begun anti-aliasing. Starting back a short distance from the end of a step, we'll put in a row of pixels which come closer and closer to matching the background color. Obviously, the colors needed for proper anti-aliasing can take up a major portion of your palette. Here I've used ten shades of gray to blend the white image into the black background. To repeat this process for the rest of the stair-steps, just pick up the ten pixels of anti-aliasing as a brush, and paste an image of them on each step.

In *Figure 1D* we've reduced the image back to normal size and added the original triangle for comparison. The slightly blurred edge now masks the aliasing. If the diagonal edge had been closer to vertical than horizontal, the anti-aliasing would have been along vertical lines instead of horizontal.

Some Don'ts

Now that we've covered the basics, it's time for some important *don'ts*:

Don't over-use the technique. The goal is to produce artwork which is as sharp and crisp as possible. A little anti-aliasing goes a long way, and too many pixels of blending will produce lines that are thick and blurry.

Don't anti-alias lines with no pronounced "jaggies." Horizontal and vertical lines, and lines at 45 degree angles, won't need anti-aliasing. Some paint programs have a smoothing feature which really just blurs all the lines, whether they need it or not, so the most effective anti-aliasing is always done by hand.

Never anti-alias an object unless you are sure of the final background color. In *Figure 1E* the background has changed from black to light blue, and our blended edge now stands out like a sore thumb. Every one of these pixels would need to be changed to blend into the new background color. Be particularly cautious about anti-aliasing animated characters which will be moving across various background colors. Moving objects need much less smoothing anyway, since their movement tends to hide all but the grossest of jaggies.

Worth the Work

If you think that anti-aliasing sounds like a lot of work, you're right. Though the principle is very simple, it can be very time-consuming. An illustration that takes three days to draw can easily take another three to smooth out. The trick here is to carefully plan your work to minimize the need for anti-aliasing, *before* you start drawing. Lay out objects so the majority of their lines are horizontal, vertical, or 45 degrees. The disk in *Figure 2A* would need a great deal of attention to produce an acceptable piece of artwork. The disk in *Figure 2B*, aligned with the natural axis of the screen, needs no smoothing. Avoid perspective whenever possible. It can lead to a nightmare of anti-aliasing.

You will often need to give up those interesting camera angles in the interest of clarity. A straight-on front, side, rear or top view of an object usually works best on the computer. You can often give these seemingly dull layouts an amazing amount of depth with effective shading — but that's another lesson.

Figure 3A shows some typical mistakes found in the artwork submitted by students. The main problem is the angle at which the car is shown. None of the major lines flow with the natural axis of the screen. *Everything* would need to be smoothed, creating an overly blurry (possibly useless) image. The view should be rotated so that at least the beltline of the car, in this case near the lower edge, is abso-

FIGURE 3A

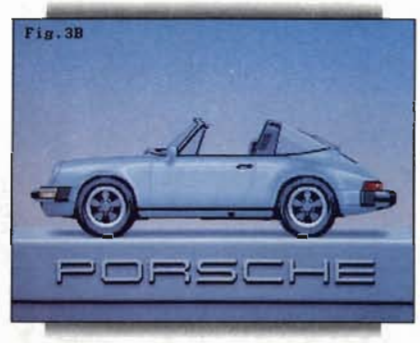

FIGURE 3B

lutely horizontal. If the beltline on the real car has a slight angle, think about cheating a little to make it horizontal. (This is called artistic license.)

The audience needs this one sharp, clear line to lock onto, then you can blur all the other lines as needed. Also, a surprising number of people leave an outline around their images, probably used as a fill boundary, but you will see very few objects with a black border around them in the real world.

Speaking of black, the average student will make all the panel lines of the car very black and very jagged. Anti-aliasing these black lines would make them far too thick. Instead, simply draw them as thin lines just one or two shades darker than the body color they are travelling across. Also, the different shades of the body color itself should be blended together, as the jaggies show up there too.

These errors have been corrected in *Figure 3B*, which shows that with the proper layout and the right amount of anti-aliasing, even a lo-res image can look surprisingly realistic.

Jim Sachs of Lake Arrowhead, California has been one of the foremost Amiga artists since the early days. Some of his best-known credits are the visuals for Cinemaware's Defender Of The Crown and many of the sample graphics included with Aegis software. His latest project is Painting With Light, an Amiga graphics teaching video with optional disk.

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Investor's Advantage

Amiga Help For Stock Market Players

REVIEW BY TYRONE SMITH, PHD

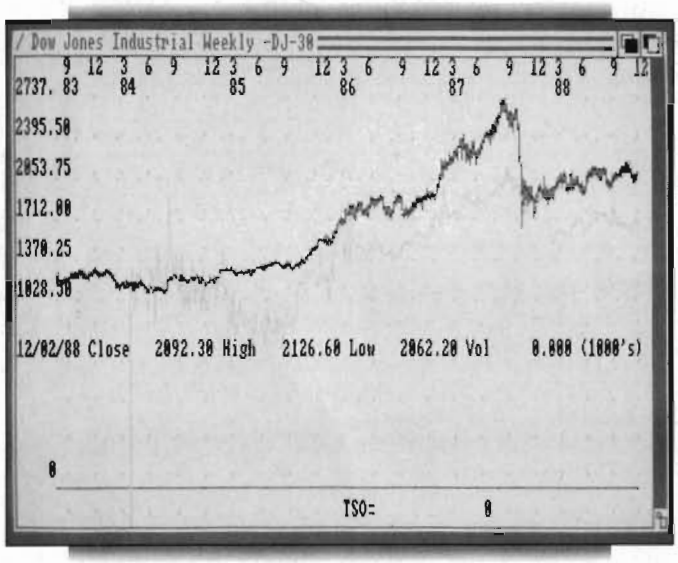
+++

Download the status of securities which interest you. Graphic charts are quite explanatory.

The Investor's Advantage (Version 2.04), from Software Advantage Consulting, enables you to automatically update your personal investment files for as many as 500 securities, with data from the Warner Computer Systems online communication service. Charges for this telecommunications service are a $48 initiation fee and $1.70 per minute in prime time or $.60 a minute during off-peak times.

The 62-page manual says that this updating process should take approximately 15-20 minutes of weekly connect time plus about 20-25 minutes for converting the data and merging it into your history files. The manual provides you with good introductory tips on what to look for in the securities charts. A bibliography for more detailed reading is also included.

You can save the data files to disk in an ASCII format for inclusion in other documents.



Investor's Advantage — Bullish on the Amiga

Graphics

The general market charts include the daily and weekly barometers. The daily market barometer is comprised of the Dow Jones Industrial Average (DJIA), advance-decline line, odd lot short ratio, put/call ratio and overbought/oversold ratio. The weekly barometer chart shows the DJIA, New York Stock Exchange Composite, new highs/new lows, specialist short ratio and the 20 most active indicators.

The print function is a screen dump which also prints the window borders. You can get your tracked equities printed out according to strength and/or price. For everything to line up correctly, you will need a printer wide enough to handle 132 columns.

Conclusions

Investor's Advantage is designed primarily for investors interested in tracking ongoing performance of their equities. It does a satisfactory job of organizing and presenting data for stock market technical analysis (chart shape trends).

The program is utilitarian, performing required functions without much elegance. But if you need this type of stock market software tool, you are probably more concerned about getting the information than the style in which it is provided. ■

Tyrone Smith, PhD, heads TRSL software developers in New Orleans and is the author of Project Master, distributed by Brown-Wagh.

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Transcript: An Editor's Editor

Blazing-Fast Workhorse of Amiga Word Processors

REVIEW BY JAY GROSS

++++

No pretense at being a fancy WYSIWYG page designer here. But if you need a rapid-fire, brute-power text processor with easy commands, Transcript delivers the goods for only $69.95 and throws in automatic integration with Professional Page desktop publisher.

This article was written with **Transcript.** Actually, after a few days of using the program I'm writing most everything in Transcript. At a list price of only $69.95, this program handles faster and better than higher-end Amiga word processors. The few features it doesn't have aren't worth what you'd give up in speed and responsiveness. Gold Disk has come up with a workhorse text editor upscaled to authors' and editors' real-world needs — including a good spelling checker, mail merge, macros, and multiple windows.

(*AMIGA* Plus *switched to Transcript as soon as it arrived. We particularly like the program's clean imports of ASCII files from just about any source. There's even a valuable command that* almost *always cleans up files having a RETURN at the end of every line.* — + EDITORS)

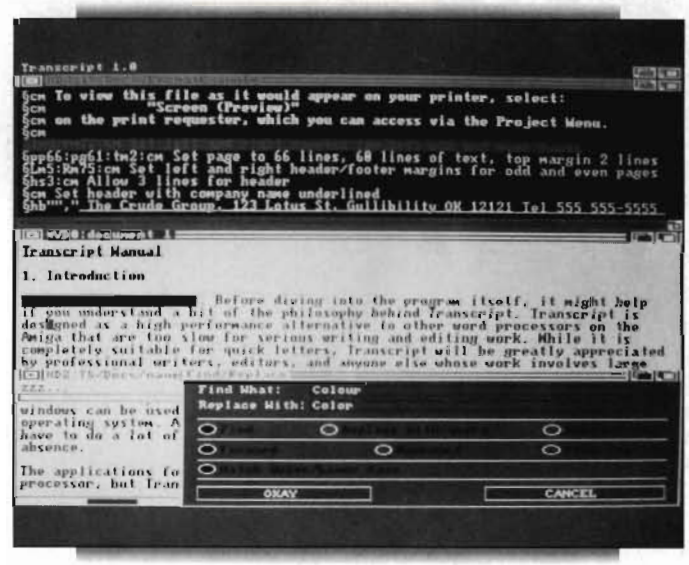
Transcript does display *italic*, **bold**, and underline onscreen. But if you want a fancy WYSIWYG display with graphics, buy ProWrite, excellence! or the new Pen Pal. Transcript doesn't show page breaks, headers and footers as you type, or keep columns justified. It'll do all that on output — even automatic hyphenation if you want — but it doesn't do this while you watch impatiently for *slow* screen updates. You can switch into preview mode if you really need to examine page layouts before printing.

Transcript doesn't impose the long learning curve that heavy-duty word processing programs are infamous for — although you'll definitely find yourself looking up seldom-used commands in Transcript's 80-page indexed manual now and then. The manual, though somewhat disorganized, provides adequate documentation.

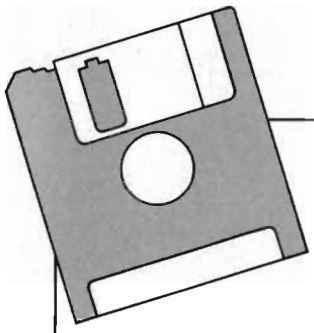
P-Page Prep & More

Nice as it is for general text entry, Transcript is also tailored to prepare documents for import into Gold Disk's Professional Page desktop publishing software. Professional Page recognizes incoming Transcript codes for typeface, size, styling, spacing and justification.

Even if Professional Page isn't your document's destination, Transcript offers a very productive writing environment on the Amiga. It has many more power features than you'd expect. For example, Transcript permits



Transcript — Brute-force word processing the easy way.



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as many open document windows as your RAM can support, with almost no system slowdown when several windows are going.

Just remember that if you try to load a document larger than memory, loading stops when memory gets full. Then if you Save the file, the original will be overwritten. "Are You Sure?" requesters used by other word processors may slow production, but they can also be lifesavers.

To get fancy text formatting, Transcript falls back on the old reliable embedded codes called "dot" commands back in the old days.

Transcript's keyboard macros are a late addition explained only in a README file on the program disk, not in the manual. Transcript macros are stored on the 10 Function Keys and each macro can have a maximum of 99 steps. You can switch different 10-macro files in and out anytime.

The Quibbles

There are some small quibbles. If you're working on a document to be printed to letterhead, you need to know where the pages break. Without a traditional row/column display, Transcript makes it difficult to determine where each page ends. You must use the Print Preview option over and over to accomplish what a simple line counter would do nicely.

After you highlight an area of text, the area stays brightly lit, even if it scrolls out of view or you start typing elsewhere. This can lead to confusion about the actual position of your active cursor. With such an otherwise streamlined program, it's annoying that you must press AMIGA-H every time you need to un-highlight text — which will probably be often, because the program's overall quickness carries through in the highlighting too. It would also make sense to have the DELETE key clear the highlighted region, as Professional Page does. Another improvement would be optional auto-replacement of the highlighted region with any text typed next (as in the AmigaBASIC editor, Professional Page, ProWrite, etc.).

And, not surprising in the first version of any product release, Transcript can be somewhat crash-prone. The program tends to get confused if you are saving files to different destinations while several windows are open. Save often and close any windows you don't really need. On the other hand, you must also remember not to click on the close gadget of your last Transcript window unless you really do want to quit the program.

Nifty Features

A staple of writing is search and replace, which Transcript knows as Find/Replace. Quick and fully featured, Transcript's Find/Replace tracks special characters such as RETURNS much better than most Amiga word processors.

Transcript is very clean about inserting files into a document. The mouse pointer kindly blinks off while you're typing, another neat touch. The program works fine on a high-resolution (640 X 400 or more) Workbench. You can change the colors of the screens or have Transcript open on its own custom screen. Transcript even accomodates itself happily to replacement system fonts (as with the FastFonts in AmigaDOS 1.3, making the title bar a bit bigger to adjust to a larger 11-point font.)

Transcript's indexing feature is as useful for serious writing as slicing is for bread. You mark the first incidence of words or phrases you want, then Print to Index to automatically create a document file containing the words marked, and the numbers of the pages on which those words appear. ■

Jay Gross is a full-time Amiga journalist and editor.

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Holiday Disk Feature:

Studio in

the Winter Woods

Clip-art For Your Own Xmas Animation And Cards

BY JOHN PIERCE

I live and work in a turn-of-the-century church building in a Northern Michigan valley called Wildwood. The church once served a thriving logging community. But the loggers and their families moved on as the timber supply dwindled. Today half a dozen homesteads remain. Not too many distractions, especially in the winter...

Much of my work now consists of Amiga-generated graphics for television commercials broadcast on Northern Michigan cable systems and local network affiliates. These graphics range from a few fully-animated 30 and 60 second spots to 5-10 second animated logo tags, or character-generated overlays.

I was always fascinated by film animation. I started as a professional photo illustrator in the early '60s, but some 20 years later a Commodore 64 introduced me to animated computer graphics. I ordered one of the first Amiga 1000s and have since added an Amiga 2000 with 2 megabytes of memory and a 30Mb hard disk.

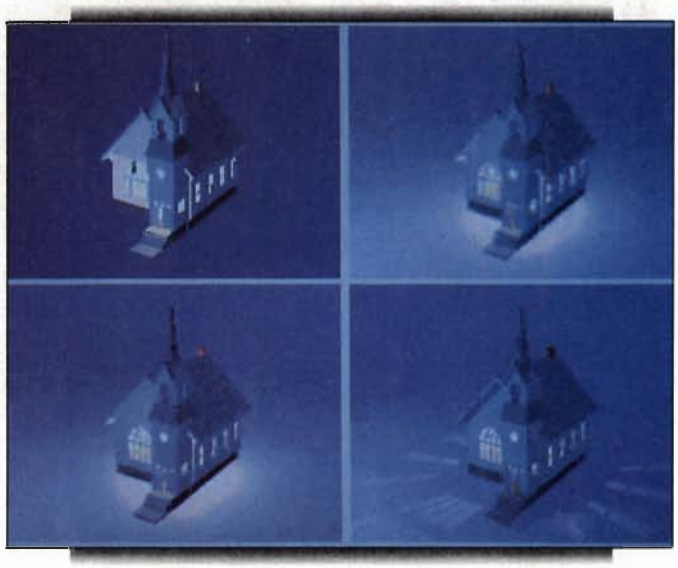
My initial production is now done on the Amiga 2000. Then I transport my Amiga 1000 and Super Gen genlock (Digital Creations) to a video studio and plug into their system for final production.

Ray-Tracing Addiction

When Eric Graham's Juggler came along, offering ray-traced photorealism, I couldn't resist. I sent a letter off to the New Mexico mountains and a few days later received my program. After writing a rather complex script of numerical coordinates and waiting a couple of hours for the rendering, I was rewarded with a photo-like rounded sphere casting a shadow on the ground.

Moth to a Flame

My Nightcombo animation — featured on this issue's AMIGA *Plus* Disk — opens on a snowy winter night scene with an aerial shot of the church where I live. The observer (camera view) swoops down through the front window, across the interior to my work area and into my monitor. There a moth flies into a candle flame and then circles it, revealing another dimension beyond the flame.



Four steps towards perfecting the inner lighting.

This early ray-tracing program was a far cry from Byte by Byte's **Sculpt-Animate 4D**, which now occupies most of my time. I've been working with this software for more than a year now, and it seems as if I learn something new each time I use it. I soon discovered that the limit was not my imagination, but rather RAM and rendering time. Ray tracing a single frame of a fairly simple animation could take several hours — 20 or 30 frames could take a week or more. I decided to develop some shortcuts.

I experimented with rendering individual ray-traced objects, using paint programs to merge objects and backgrounds for composite frames and then compressing the final animation using **PAGEflipper Plus F/X**. Each shortcut seemed to create its own set of problems which required additional shortcuts. Finally things started to come together. It was time to try an animation lasting more than a couple of seconds.

The first step, after sketching the storyboard, was to build the various elements with an object editor, in this case Sculpt-Animate 4D. I built the shell of the church first, next the roof, then the base and point of the steeple. I didn't attach these sections together, but instead named vertices for each. This made it possible to rework individual sections later, such as changing the roof color and heightening the steeple in relation to the size of the rest of the building. I then added the entrance and side windows, connecting the necessary faces to fill the walls. The front window, floor, foundation, steps, chimney and doors were named and added separately.

Adding the ground and a single exterior lamp was already taxing the memory of my system. The Sculpt 4D functions slowed considerably. An overscan photo-mode ray tracing took about seven hours. Adding the two interior lamps increased the rendering time by a couple of hours, not to mention a couple of days spent adjusting the exposure, ambient light and lamp brightness to achieve the feeling of light shining out the windows onto the snow. Even a small photo rendering would take a couple of hours. Using the auto exposure setting, I was unable to balance the lamps the way I wanted. Switching to manual exposure, I ended with these settings:

Exposure	700 percent
Exterior lamp	600 brightness
Entrance lamp	25 brightness
Church lamp	100 brightness

The distance of each lamp from its surroundings greatly affects the required setting. The interior lamps were colored yellow to simulate incandescent light.

Floor Plans & Scene Cuts

The camera observer feature of Sculpt-Animate 4D lets you control your viewpoint and apparent movement around objects or through a scene. However, adding more interior elements and moving the observer down and through this environment was out of the question because of the memory and time required. I decided to make the transition to my monitor with scene cuts rather than zooms.

I laid out a very basic floor plan, keeping it simple. The church has never been partitioned, so the high ceiling allowed me to build a sleeping loft in the back with the kitchen and bath facilities underneath. The raised altar section in the front remains.

I added very little detail to the floor plan. A few cubes were used to make my work area. I didn't feel that knobs and dials were necessary to tell the story. I plan to use the shell and basic interior for future animations, so more detail can be added when I need it.

The moth and candle went together quickly. The body of the moth was a sphere reshaped with the expand function. The wings were laid out flat and extruded as if cut from thick cardboard. Using the smooth function and dull surfaces resulted in

soft contours in the final moth rendering.

Satisfied with the construction and a test rendering for each object, I started laying out the take for each scene. When satisfied with the composition, motion paths and timing, I would save a wire frame version of each. Next I loaded all the frames into PageFlipper Plus F/X and compressed a wire-frame version of the entire animation.

Get the Pacing Right

It took me a while to get used to PAGEflipper Plus F/X, but now handling it is a breeze. The speed of execution is outstanding. Compressing animation files usually takes a few minutes, while changes in the script compress in a few seconds. Adjusting individual frame duration or multiple frame loops within the animation is a snap. Black and white title or text frames can be added to the wireframe test, and final pacing can be determined before rendering the color frames.

Time and memory constraints make pacing tricky. Besides the rendering time required, moving the observer and then compressing extensive changes from frame to frame greatly increases the amount of memory used. On the other hand, cutting from scene to scene and pausing too long on each can look static.

All too often, a lot of work results in only a few seconds of viewing time. One technique I use to stretch out my animation is to simulate fades and dissolves using the transparent function in **Digi-Paint 3**. Using a light blend and merging an image over the preceding image in stages from light to full blend over three or four frames can add several seconds to each cut. Blending objects on top of each other over several frames to make a composite image will also increase the viewing time.

Sooner or later something has to move. Having cut from the exterior overhead view to the front window to the floor plan, I used a short observer move to the work area and then, instead of continuing on into the monitor, I had the candle move to the observer. Moving an object, if it is small enough, requires much less memory to compress. The candle and the moth moves were rendered separately in Sculpt-Animate 4D with no sky.

The number of frames used depends on how smooth a move is acceptable. I usually find that I can tolerate a little jerkiness and get by with fewer frames. The observer move on the work area took seven frames, the candle move, 10; the moth dive, 10; the moth circle, 16; and flapping the wings, 3.

Digitized Backgrounds

I use a small copy-stand to digitize flat art and another table with a revolving top to animate objects in single-frame motion picture style. Over the years I have accumulated an extensive stock photo file, full of landscapes, seascapes, clouds, sunsets, you name it. Digitized images, enhanced with **Deluxe Paint** or Digi-Paint and animated with PAGEflipper provide a wealth of background materials.

My photo enlarger still serves a purpose. Removing the lens and mounting a black and white video camera pointed up from the easel, I place 2 X 2 or 4 X 5 negatives in the carrier and digitize backgrounds. Adjusting the enlarger height and the camera's lateral position allows for fairly precise cropping. The condensers spread the backlight evenly over the negative and Digi-View does the rest. I have an old 4 X 5 view camera with a Polaroid back. When I need additonal photo images, a negative Polaroid film-pack fills the bill.

The fill function in paint programs usually drops out a solid sky or backdrop in a digitized image. Merging images on top of one another can create some pretty impressive composites. I digitize most of my images in black & white and then color them with paint programs. I use **Pixmate** to sort the color register from high to low, and then use color spreads — light grey to dark blue for clouds, yellow to red for a sunset. Converting images to HAM mode with Pixmate and then remapping the overlays with

ON DISK:

Studio in the Woods
Clip-Art
Wire-frame animation, pictures, 3-D objects

Click open the Church drawer in this issue's AMIGA *Plus* Disk window. It contains all the files accompanying John Pierce's ray-trace animation article. To run the StudioANIM wire frame animation, double-click on its icon, then click on the the title frame to actually start the animation running. To exit, hold the left mouse button down. (The completely rendered animation was too big to fit on the disk.)

Two full-color pictures are included as clip-art for your Christmas cards, etc. To view Church or Candle, just double-click on its icon. Press the SPACEBAR to toggle the color cycling off or on.

NOTE: The original Church picture was in HAM overscan mode and about 111K long. To squeeze it onto this disk, we loaded it into Deluxe PhotoLab as a 32-color pic, saved it, loaded it into Deluxe Paint III and cut it out as a brush so that the black background wasn't included. Then we saved it in the lean, svelte 39K form on this disk. Because the colors in this night scene are mostly dark, the change in quality between HAM and 32-color mode was almost imperceptible. This would probably not be the case for pictures with a wider range of colors.

The Sculpt-Animate 4D objects from which the pictures and animation were rendered are in the files Church.scene and Candle.scene. To view these objects, or adapt them for your own 3-D images or animations, you must own Sculpt 4D (Byte by Byte) and load the files with the Load Scene menu option. ■

Digi-Paint or **Photon Paint** makes it possible to use any of the 4,096 colors available.

Matching Colors and Filling Holes

A problem arises when merging a Sculpt-Animate 4D object rendered with no sky over a background in a paint program. By default, the no-sky function puts a black background behind objects. Anti-aliased objects overlaid on lighter backgrounds often end up with a ragged black border that requires retouching. With darker backgrounds and moving objects this is less of a problem.

For lighter backgrounds, you can partially solve the problem with the solid sky mode in Sculpt 4D. Set the sky color to a value that comes as close as possible to the overall tone of the background to be used. Then use a paint program to fill the sky with the transparent zero color register.

This method is not foolproof. For some reason Sculpt 4D's "solid" sky ends up speckled and will not fill completely, again requiring retouching. The best remedy I've found is the blur function in Digi-Paint 3. The dark edges can be softened and blended into the background. In most cases the resulting edge helps to distinguish an object from its surroundings.

Another problem that crops up with no-sky rendering is transparent holes in the deeper shadows. This is easier to remedy. Simply increase the value of the ambient illumination, filling the shadows with a lighter tone.

PageFlipper requires a matched palette for all frames, but backgrounds and objects rendered separately will have different palettes. Using Digi-Paint 3, load the first major background of the animation with its own palette. Then switch to the alternate screen and load the rest of the animation elements using the existing palette.

Photon Paint requires each new element to be remapped. When putting together a frame sequence like the moth circling the flame, load the background, merge the moth over the top, save the frame and then use the undo function to remove the moth. Repeat this process for each subsequent moth position and you eliminate the need to reload the background each time — and make it easier to keep track of which frame you're working on.

Creating and combining the individual elements of an animation requires a lot of work. It can be a hassle, but merging individual elements this way lets you construct complex animations that require less memory and take less time than trying to ray trace everything in one setting. Besides, I enjoy working with the Amiga and would rather be involved in my own animation on a daily basis than have to look for something else to do while the computer has all the fun. ■

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Best D-50 Editor/Librarians

Dr. T's Caged Artist, Sound Quest D-50 Master

REVIEW BY IRA CORD RUBNITZ

Amiga plays beautiful MIDI music on today's most popular synthesizer!

An Editor/Librarian allows complete creative control over sound altering and storage of sounds for synths, samplers or signal processors. Being able to design aural landscapes and have over 1,500 sounds on one disk is both fascinating and rewarding. Among the many computer music software applications, an Editor/Librarian has the greatest potential for creativity and cost-effectiveness.

Today's most popular synthesizer is probably the Roland D-50 — 16-voice, polyphonic, stereo programmable and digital. The D-50's sounds consist of any of 100 PCM sampled attacks combined with a spectrum of synthesized tones and processing of all kinds — reverb, EQ, chorus, delay, panning, etc. When you realize that each Roland sound has 350 parameters and the D-50 can only contain 128 sounds onboard, the need for an Editor/Librarian becomes obvious. Two brilliant D-50 Editor/Librarians for the MIDI-interfaced Amiga are **Dr.T's D-50 Caged Artist** and **Sound Quest's D-50 Master.**

Dr. T's Caged Artist

Dr. T's D-50 Caged Artist Editor/Librarian is very logically laid out and very reliable. Instead of drop-down menus, the program provides onscreen functions selected with either the mouse or function keys. A short, well-written manual clearly explains set-up and start-up, also providing a quick tutorial for saving sounds.

Roland D-50 — Today's most widely used synthesizer.

The System Mode lets you see and change system parameters. The Bank Mode manipulates sounds the way a word processor manipulates text. You can select, load or save sounds and print data sheets. After some experimentation with swapping sounds, checking them out, and perhaps assembling them into libraries, the Bank Mode becomes essentially a database. In the Edit Mode comes the fun, creative process. Here, you can see and alter patch parameters manually or have the program randomly change sounds for you. You can alter seven components of the sound, making changes that are minute or drastic. Parameters such as low frequency oscillators, time variant filters, tone balance and reverb type accompany the graphic waveforms awaiting your mouse commands.

Different points on the waveform may be redrawn with the mouse. Parameter values can be selected and moved up or down the screen or on a huge slider. The right mouse button can be used to play the sound, with pitch and amplitude determined by the pointer's location on the screen. This makes for some very interesting and weird effects. Some wild times are ahead when you hold down the ALT and SHIFT keys for simultaneous pitchbend.

Besides comparing the original with the changed sound, copying tones to different patches for quick alterations, and endlessly experimenting with various components, Dr. T's Editor/Librarian lets you select which parameters you want to change. Then, each additional click of the mouse brings about a random change in the overall sound.

The first few sounds I created were like something out of an old Pink Floyd concert, yet subtle changes and lush, new sounds are easily derived as well. The effortless ability to create and store sounds with this program will please novice and advanced D-50 users alike.

Besides all this, Dr. T's Editor/Librarian includes 96 additional sounds on the disk which would cost more than the program itself if purchased as ROM cards at a music store.

It's effortless to create and store D-50 sounds with Dr. T's .

I found that I could save 24 banks of sounds on each disk. I recommend having at least 1Mb of memory if you're going to multi-task. Thanks to multi-tasking, I was able to change sounds on the Editor/Librarian while playing a song on Dr. T's KCS 1.6A, for another fine experience from the Doctor.

Sound Quest D-50 Master

Sound Quest's Editor/Librarian is another excellent program and its latest release (1.12) is very functional and not at all crash-prone. Completely menu-driven, the Sound Quest Editor/Librarian shares many features with Dr. T's, including bank storage, thorough editing and system setups. The manual is not written as clearly or as humorously as Dr. T's, but there are several very useful Help! windows at the top of screens. Click on them and guidelines are displayed for whatever you're trying to do.

The mouse control for auditioning sounds is handy. The Sound Quest Editor/Librarian lets you choose chord or sequence, as opposed to note or gliss in Dr. T's. You can also control pitch, velocity, the number of notes played, and tempo. When editing, colors change to show what parameters you've altered, several buffers are used to temporarily save and compare altered sounds, and "locks" are used to allow linkage of parts of the sounds for simultaneous editing or bulk copying.

The patches included with the Sound Quest Editor/Librarian are mostly mediocre variations on familiar sounds. However, the program really shines at making entirely new sounds quickly and easily. Patch Slide will combine any two sounds and generate an entirely new bank of 64 incrementally changing sounds. This can be a great tool if you like one sound, but wish it were a hair closer to a different sound.

I found Patch Slide useful, but after experimenting preferred the more drastic approach — Patch Mix and Patch Blend. Patch Mix takes two sounds and makes a new bank (in about 15 seconds) where each new sound is a random mix of the old. I got some astounding results mixing Glass Voices with Shakuhachi Flute and Atari 1040 ST3 with Air Siren Alarm. Patch Blend takes two sounds, and creates 64 new sounds in fixed combinations. These are tremendous tools for going where no sound has gone before — at warp speed.

The Variations Window provides yet another way to entangle sounds. Here you control 13 sliders to alter the internal transformation of one sound. I had a lot of fun changing the mellow, majestic Andreas Vollenweider Harp into a blaring ARP 2600 synthesizer. While using the Patch Slide, Mix, and Blend were relatively straightforward, the Variations method was very tricky and the manual was certainly no help. Fortunately, Sound Quest and Dr. T's both offer superb customer support.

A great feature on the Sound Quest Editor/Librarian is a utility called Quicksend. This cute little icon lets you transfer System Exclusive data directly from a disk to MIDI. For example, with a data disk containing D-50 sound banks and Quicksend, I can load these banks merely by enabling the D-50 and pointing and clicking on the icon of a particular bank of sounds.

I got astounding results mixing Glass Voices with Shakuhachi Flute.

Summing up

Many people I've talked to found Sound Quest's package easier to learn and quicker to use. Personally, I find them both easy to use, and your preference will depend on the functions you utilize most often. Dr. T's lets you create great sounds manually or randomly, yet I found the Sound Quest method to be simpler and quicker. If you use MIDI on the Amiga with the Roland D-50 synthesizer, either software package will *more* than justify the cost of your system and give you countless hours of creative fun. ■

Ira Cord Rubnitz is a professional recording engineer in Los Angeles.

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Games Galaxy

Falcon: Operation Counterstrike, Prospector in the Mazes of XOR, Blood Money, Battlehawks 1942, Capone, Space Harrier, Qix,

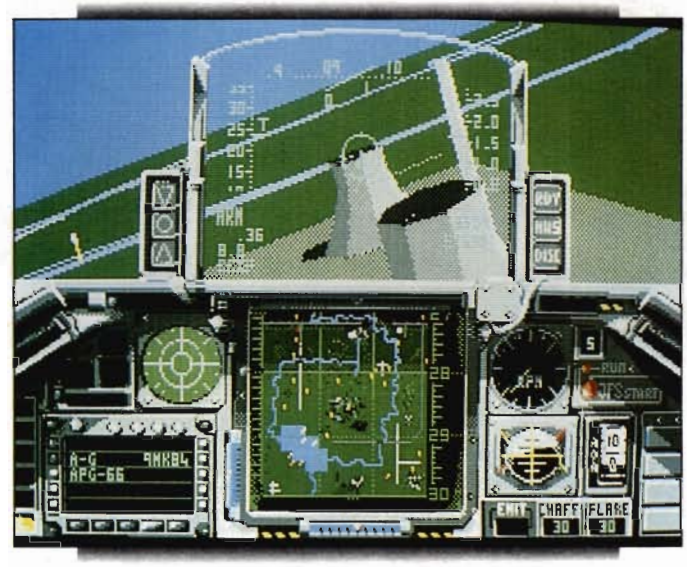
FALCON — OPERATION: COUNTERSTRIKE

++++

Not just an add-on mission disk. Here's a dramatic upgrade of the Amiga's best combat flight simulator.

Spectrum HoloByte asked FALCON frequent fliers to write in and say what new toys they wanted, and **Operation: Counterstrike** is the result. This hot mission disk is a whole new world. Colors are now richer, with really solid graphics and a totally redesigned landscape. The mission framework is really somewhat like the war game scenarios I flew back in the Marines. Both the F-16A and the Enemy Forces have been upgraded. Landing parameters have been loosened so that nuggets and old jocks alike can get back to the club more often — even with slightly damaged ships. Improved flight controls handle easier, and an on/off auto level for minor banking inputs has been added (works great for those ground-target runs). Radar and HUD have been updated. For MIG killers, an auto-view mode switches the cockpit view for best look.

This new disk replaces the original Disk 1 (you will also need Disk 2 from the original FALCON). Now, instead of the one-shot missions flown before, you have 12 connected missions. You are the pilot of a F-16A Fighting Falcon, based at an airfield close to enemy territory. You're flying one hot jet, backed up by a ground crew that can warn you of targets and conditions. But the enemy can overrun your base and capture you, and they'll keep trying until their supplies are gone.



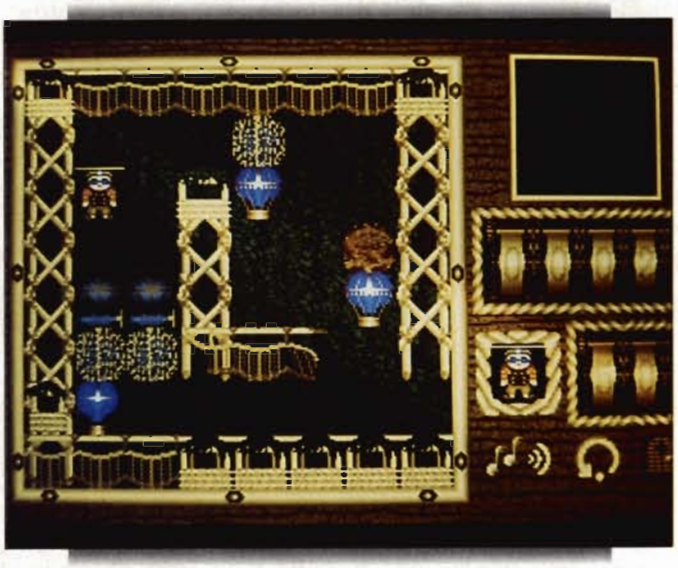
FALCON - Operation: Counterstrike offers 12 enhanced missions.

Your main objectives are to reduce the enemy's ability to attack your base, and to strike deep into their territory to knock out their manufacturing bases and resupply efforts. First you must keep the ground forces away from your base by stopping the tanks and landing craft that bring them to shore. Then you can get to work stopping their trains and trucks. The missions, with names like Rolling Thunder, Water Sports and Wild Weasel, all lead up to the job of finally stopping the other guy.

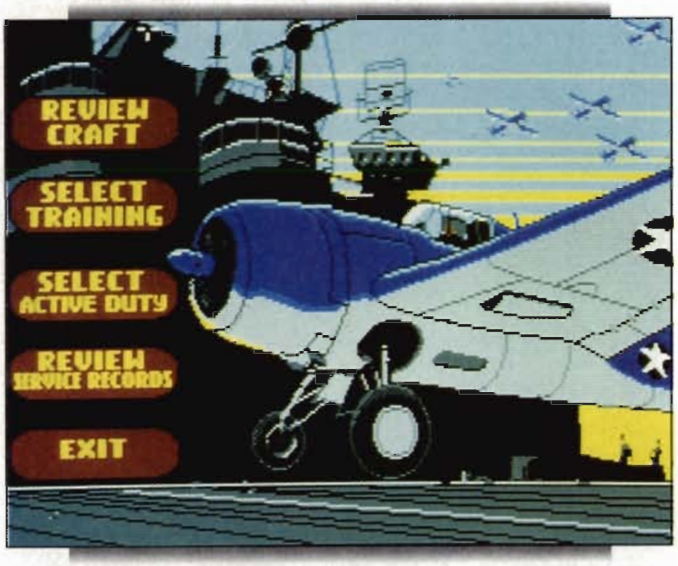
With your airbase now protected by SAM sites, you can land without MIG harrassment. The MIGs have been updated, so your main opponent is now a MIG-29a Fulcrum, considered equal to the F-16 in a close fight. The other nasty suprise is the T-80 tanks, which will keep appearing on your side of the fence until you stop the supply at the source.

More than a wargame, FALCON is a superb flight simulator. Spectrum HoloByte has put a lot into this new

mission disk, to keep FALCON top of the line and up-to-date, just like its namesake fighter. — WOLF GRIFFEY



Prospector in the Mazes of XOR— Slickest labyrinth around.



Battlehawks 1942 — Zap the Zeros and kill the Kamikazes.

PROSPECTOR IN THE MAZES OF XOR

+++1/2

A puzzle-solver's paradise, Prospector offers some of the most detailed, tricky and graphically splendid mazes this reviewer's ever seen.

If you like brain-teasers, **Prospector in the Mazes of Xor** provides some truly challenging puzzles. Finding your way through these mazes takes tricky maneuvering of rocks, zeppelins, balls and bombs as you collect your quota of balloons. Sometimes the puzzles are simple matters of moving various objects out of the way without irrevocably blocking either a balloon or your way out. Other times you'll have to roll balls, drop rocks, free the blimps or otherwise maneuver things so the dynamite blows a hole at just the right spot.

Though definitely a one-player game, Prospector makes things a little easier by giving you two heroes to control, chubby Herb and his reptile pal, Pip. Sometimes Herb has the best position in a maze, sometimes Pip does. You switch between these brave prospectors by pressing the RETURN key. In the tougher mazes, solving a puzzle can require serious teamwork between the two.

With no timer to beat, you can take as long as necessary to figure out these challenging puzzles, though many will need repeated tries (and some deaths) before you finally find the solution. The superb graphics and animation, with all the varied and colorful mazes, add to the fun — and if you manage, somehow, to finish the 30 mazes included on disk, you can create your own mazes with the construction set. With look-up-the-word copy protection, you can copy Prospector, or put it on your hard drive. The game even multi-tasks. -- CAROLYN CUSHMAN

BATTLEHAWKS 1942

++++

Rewrite history with this solid WWII air combat simulation, full of entertaining features and historical detail.

Altitude 14,000 feet, airspeed 210 mph. A burst of .30 caliber to the rear and one Zeke gone. I'm over the smoking flattop. Time to finish it off. Reduce speed, camera on, push over, get on target. Two thousand feet, release warhead and pull up. Was it a hit? I'll find out back in the wardroom, or maybe I'll just stop the flight for a moment and see what the camera caught...

It's **Battlehawks 1942**, from Lucasfilm Games, an air combat simulation I recommend highly. With rich colors, solid graphics, useful background sounds and a few twists that would alone make the program worthwhile, this game is just plain enjoyable.

Set during the early WWII naval air battles between America and Japan, Battlehawks lets you become a pilot for either side and then choose your battle, mission and aircraft. There are 12 planes to fly, including three models of Grumman Wildcats and two Mitsubishi Type 0 planes (known as Zeros, or Zekes). Dive-bombers are represented by the Douglas Dauntless SBD-2/-3 and the Aichi Model 11/12 Val. Finally there are the Nakajima Model 11/12 Kate and the Grumman TBF-1 Avenger torpedo bombers.

You have your choice of Training Missions or Active Duty. Missions include fighter intercept, fighter escort, dive-boming and torpedo-bombing. In Active Duty you choose from four battles — Coral Sea, Midway, the Eastern Solomons, and the Santa Cruz Islands. This is your chance to change history — you can sink a ship that got away, or save one that was sunk.

In this game your buddies will automatically help you fight off enemy planes. Or you can come to the aid of a buddy and get an assist credit on the kill. Also, the Replay feature lets you turn on the camera and record the action around the plane, for later viewing. The impressive 128-page manual tells you not only how to play the game, but gives you photos and capsule profiles on the period, battles, tactics, planes and ships.

— WOLF GRIFFEY

BLOOD MONEY

++++

The distinctive Psygnosis style reaches new peaks of graphics, sound and playability with the challenging and cartoonish Blood Money.

Alien safari survival is the theme of **Blood Money**. In this typically high-detailed Psygnosis graphic adventure, you are a Venusian Accountancy student seeking one last thrill before exams — and you find more adventure than you bargained for.

You control your vehicle (which changes on each of the planets) through a scrolling screen of meanies, blasting them while trying to stay alive. Many enemies drop coins after being shot, which can be collected to buy some very useful items like weapons. If you save up, you can even buy an extra life. Of course, you wouldn't want to go on a safari alone, so Blood Money gives you the option to play with a friend. But while a friend is often helpful, you will unfortunately have to share some of the money.

Planets three and four are initially too expensive for you. The problem with this — in fact it's the only problem I can see with the game — is that levels three and four can't be played until you pass one or two. And it's very hard to pass the first level.

Blood Money — Space safari runs amok.

Capone — Spare the innocent bystanders as you battle the Mob.

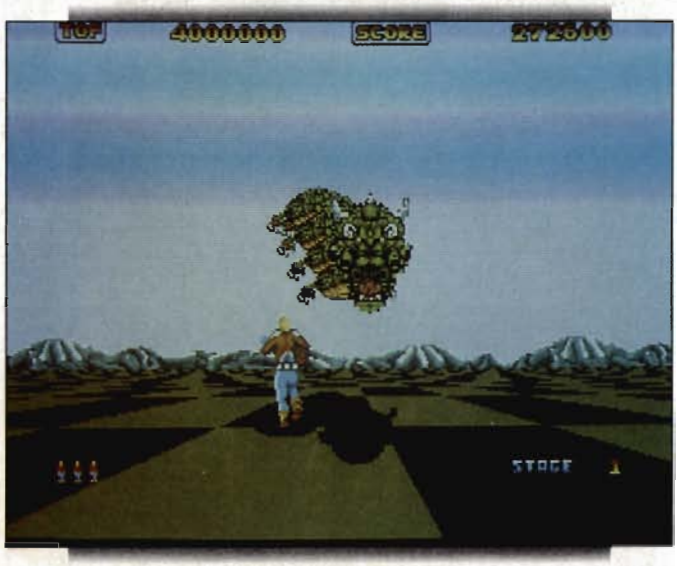
After loading Blood Money with the first disk, you insert the second disk in drive one and press the fire button. This is a definite plus for single-drive users because the second drive is never used and this is the only time you must switch disks.

On the title screen, there is an undocumented option called Patient or

Impatient. Patient/Impatient controls the graphic effects of the screens between games. You can have the high scores, options and other screens appear one tile at a time or just flash on.

Blood Money is filled with a megabyte of crisp, bit-mapped graphics and 400K of amazing sound — including rap-style intro music. Every bit of that memory space is used well.

QIX — Artistry kills a computer virus.



Space Harrier — Run for your life at the Monster Rally.

The animation is very smooth and there is plenty of detail in each frame. The shadows and reflections give the game a strong illusion of realism while maintaining a humorous cartoon-look. — J. DOUGLAS ARNOLD

CAPONE

+++

Take down the mob in ultimate style in this shoot-'em-up action light gun (or mouse) game.

Capone puts you in Chicago during Prohibition where you shoot gangsters and destroy the Al Capone Mob. Another shoot-'em-up? You bet, but the graphics and action are quite captivating. You'll find gangsters at every turn, hiding in buildings, behind walls and even popping up behind crates of dynamite. You'd better aim carefully and watch out for innocent bystanders. Hit an innocent person (or animal) and *you* lose a life. In some sequences the screen scrolls horizontally to display more of the city.

The stylish sound effects (bullets, windows shattering, TNT explosions, etc.) add to the intensity. The mobsters get tougher, faster and more numerous as you blast your way through successive screens, or experienced players can choose to start out at higher levels.

Even better, instead of the mouse you can use the new **Light Phaser** gun with Capone (or with Actionware's Rambo-style P.O.W. game). This sleek light gun plugs into a joystick port and is designed to shoot successfully up to 15 feet away from the screen. I found the sights somewhat inaccurate, but the gun can be used well enough without them. Play the game a few times and you can just pick the light gun up and start blasting away at targets. Actionware also introduced a **Dual Gun Interface** which connects two light guns to one joystick port, so two shooters can play at the same time. (This interface is *not* compatible with the Amiga 1000.) Invite a friend over and prepare to blast away in "Dirty Harry" style! — JEFFERY SCOTT HALL

SPACE HARRIER

+++ 1/2

You're racing at top speed as you blast some of the strangest vermin around.

If you enjoyed the coin-op version of Sega's **Space Harrier** you won't be disappointed by this quick, smooth Amiga rendering. You are an astral exterminator, flying your jetpack through the grid-like 3-D terrain of the Land of Dragons and killing alien invaders. You start by battling flying boulders and dodging large bushes.

Soon the Mukadense will attack, part insect and part helicopter, firing as they skip past. Make it to the end of the wave and you meet the first evil serpent.

In the first wave you can destroy everything you see, but now the vermin get tougher and the obstacles increase. Some of the bad guys have set movements, but it's hard to both study their patterns and avoid being hit. In stage two you meet the Idas, giant masks that gang up and shoot back at you. My favorite obstacle is the giant broccoli. You can't kill it, and it won't go away.

Speed is what makes Space Harrier impressive. The graphics fly past so fast that it can take a while to figure out exactly what's happening. If you're quick and a good shot you might be able to get through this game in a weekend. — R.F. NOYES

QIX

++++

Arcade classic comes to the Amiga with a new viral twist.

Astoundingly simple in concept, **Qix** is a true classic among arcade games. The new scenario labels the swirling Qix a computer virus. You must neutralize this virus by rapidly drawing boxes onscreen to trap the fast-moving Qix — while avoiding the deadly touch of the Fuses, Sparx and Spritz.

You'll need fast thinking, good reflexes and a tough, responsive joystick to make it very far. You must draw fast to avoid the Qix's deadly touch, and your fast-cornering capability becomes crucial. The more zigs and zags you put in the lines you draw, the longer you can distract the line-following Sparx. Your points increase if you draw in Slow mode by holding down the joystick trigger — but the danger increases too.

Finally trapping the elusive Qix requires concentration. The more screen you can take over in the process, the higher your score. Some players compete to see how much screen they can cover, rather than by score or by levels. I actually saw one player cover 98% of the screen (that Qix was boxed in *tight*). At upper levels, there are more Qix to avoid and you must take over more of the

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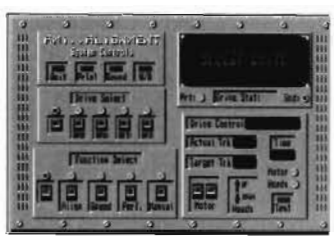

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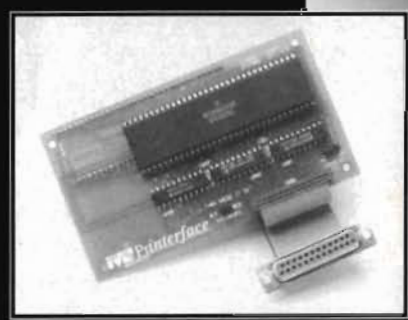

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Using Your AMIGA *Plus* Disk

Every article in this magazine with a Disk Symbol on its first page has something on the AMIGA Plus Disk. Most programs on this FULL disk can be run just by double-clicking on their icons from the Workbench.

To use the AMIGA *Plus* Disk, first make a copy and store the original in a safe place. Then boot your Amiga with your standard Workbench (version 1.2 or higher) and insert your copied AMIGA *Plus* Disk in any drive. Double-click on the AMIGA *Plus* icon to see the disk contents — including the Instructions scroll, which you can read by double-clicking on the scroll icon.

AMIGAhawk

We created this flashy scrolling game with Accolade' s Shoot-Em-Up Construction Kit. Playing is simple — just plug in your joystick and blast everything that moves, while dodging hostile fire. To load, double-click the AMIGAhawk icon. Don't worry when the screen informs you that a certain file can't be found.. (We didn't have room to include all the title screens on this disk.) To exit from AMIGAhawk, click both mouse buttons simultaneously , then click on the upper left corner of the title screen. IF YOU HAVE ONLY 512K memory you may need to drag the AMIGAhawk icon out of its drawer, leave it right on the Workbench screen, then close all other open windows before loading. If AMIGAhawk still doesn't work, reboot and try again.

TypeAttack

This is David Alves' slick cross between a typing tutor and an "alien invaders" game. Just double-click on the TypeAttack icon in the drawer of the same name. After the glitzy title screens are done, select a rank (level of difficulty) and begin defending your cities by pressing the key which matches the character on the falling bomb. 512K AMIGA USERS may need to follow the AMIGAhawk procedure described above, to load this large-scale game.

Gone With The Windows

Gone With The Windows is a cute and useful utility which uses a ScrollingPopUpMenu to list all those windows cluttering up your Workbench screen. Double-click on the Gone With The Windows icon to start the program. Then move your mouse over the sunlight (or starlight) gadget and hold the left button down. A menu will pop up with the titles of windows in it. Move over a title and release the mouse button to move that window to the front (or back). If more than four windows are open, the list will scroll as you move the mouse towards the arrow gadgets on the menu. To really see this thing in action, clutter your Workbench screen with as many windows as you can stomach. Open all the drawers on the AMIGA *Plus* disk, the RAMdisk, your Workbench disk, etc. The (portable) Lattice C source code for this program is in the Programming drawer.

Church Drawer

The Church drawer contains the files accompanying John Pierce' s Church-In-The-Woods ray-trace animation article. To run the StudioANIM wireframe animation, double-click on its icon, then click on the the title frame to actually start the animation running. To exit, hold the left mouse button down. Two additional pictures are included for clip-art in your Christmas cards, etc. To view Church or Candle, just double-click on its icon. Also, the files Church.scene and Candle.scene are the Sculpt-Animate 4D objects from which the pictures and animation were rendered (moth sold separately). To use these objects, you must own Sculpt 4D (Byte by Byte) and load the files with the Load Scene menu option.

Programming Drawer

This drawer contains ReadPrint, a useful IconX script which will display any file and offer you the option of printing it. To do this, click on the ReadPrint icon, then hold down the SHIFT key and double-click the text' s icon. The drawer also holds ICON, our utility for modifying Workbench icons. This powerful program must be run from the CLI. (*Be Careful* not to trash any of your good icons while experimenting.) The C source code for ICON is also in this Drawer.

In addition, the Programming drawer contains the files for Daniel Wolf 's HAM assembly language article. Just double-click on the Spectrum icon to watch 528 colors on a HAM screen. Spectrum will end all by itself after a while, so be patient.

Finally , the C source code for Gone With The Windows is also found in this drawer along with Circus.Script, the PAGErender 3D animation-generating script left out of the TASS drawer on the previous AMIGA *Plus* disk.

All programs on this issue's disk are Copyright 1989 by AMIGA *Plus* unless specifically credited on the disk as "redistributable utilities." In order to speed up disk access, the entire disk has been processed with M.V. Micro's Blitz A Disk (B.A.D.), distributed by Centaur Software.

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Pen Pal

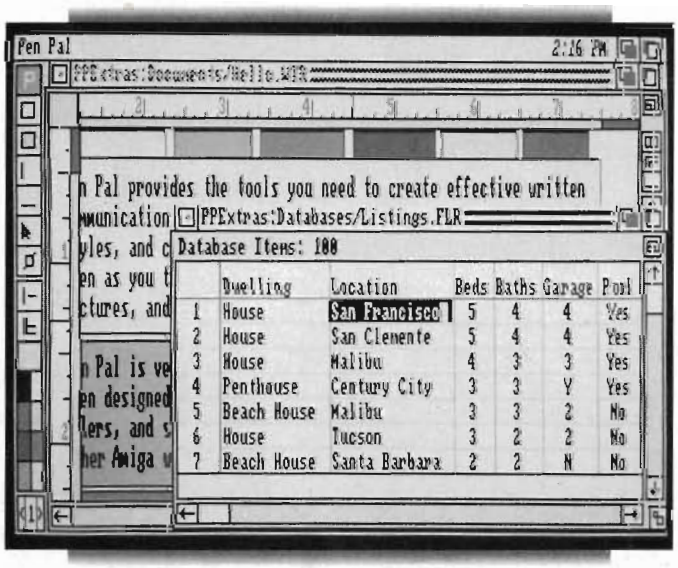
Word Processor With Lots of Flash And Flair

REVIEW BY STEVE KING

+++1/2

Can a graphic word processor, a forms designer and a database live together happily ever after? Pen Pal gives it a good try.

An easy-to-use combination of a graphic word processor and a database, **Pen Pal** clearly aims at those users who don't need (or want) to hassle with a complex program.



Pen Pal — Super graphics, online writing help, even a database.

Pen Pal's initial screen looks like both a desktop publishing and a paint program. A graphic toolbox stretches down the left side of the screen. Horizontal and vertical rulers border the document window. Clicking the mouse pointer on these rulers sets the headers, footers, margins and tab stops.

The typing area is rather small compared to most word processors, only displaying about 3 1/2 inches of the page at any time. With the large default 11-point font size used by Pen Pal only 14 lines appear, or you can get about 21 lines with a 7-point font.

You have the option of using any available Amiga font. In fact, Pen Pal is so flexible that you can easily change typestyles and sizes from word to word, or even from letter to letter.

Pen Pal contains all the basic, necessary and usual tools you would expect to find in any word processor. You can use the mouse to place the cursor as well as to highlight an area of text to cut, copy, or move. For global operations the Select All menu item automatically highlights all the text in your document. Other menu items insert page numbers and the date.

Pen Pal's spelling checker first checks the 1,500-word dictionary of common words. If the word is not found it then checks your own custom User Dictionary (if you choose to make one), finally resorting to the main dictionary of 100,000 words.

Forms & Graphics

If you have a color printer, Pen Pal gives you a choice of eight different colors to work with, all easily changed using the Define Colors menu option. Pen Pal also integrates graphic images with text. Standard IFF images generated by paint programs and digitizers can be imported, cropped and placed anywhere on the page. A special requester gives you significant control over the image, including the ability to maintain proportions when changing its size and selecting the picture's background color. A simple click of the mouse directs text to flow around the image in one of four different ways.

Using the graphic toolbox you can also draw simple lines or filled and unfilled rectangles in any of the eight colors. Once you have drawn and placed these objects, you can easily move and re-size them with the mouse. Different objects can be grouped together and moved as one, and can also be layered.

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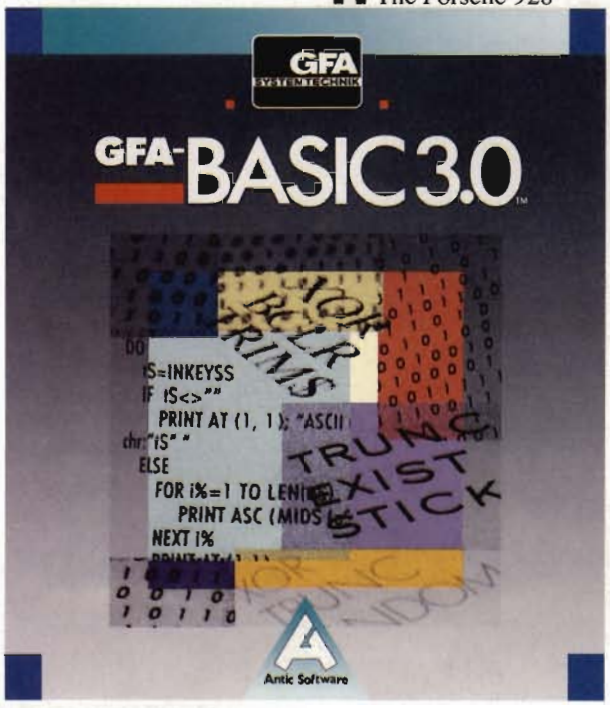

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tion quite easy. You can design your own forms using the graphic toolbox and different fonts, or you can import a form drawn up in a paint program. You designate certain parts of the form as "fill-in areas" by enclosing them with brackets. Then you can automatically type into a fill-in area and skip to the next by pressing the RETURN, TAB or ARROW keys.

Traditionally, if you wanted to print graphic images, you had to accept the graphic text as well, even though graphic text is never as clear or as smooth as the printer's built-in fonts. With Pen Pal you have a choice of printing your text as a graphic (which you must do if you are using Amiga font styles of different sizes), or printing your document using the printer fonts. In this latter mode, any graphic images on the page will still print out as graphics, right along with your printer-font text! This provides both higher quality text and speedier printing. If you design your document using eight-point type, the text and graphics will even align perfectly.

Statistics & Database

Probably one of the most unusual features of Pen Pal is the Statistics option. The program scans your entire document and then displays a window which tells you the number of words, sentences, paragraphs, characters and spaces in the document. It also provides statistics on the number of characters per word, the number of words per sentence and the number of sentences per paragraph. Finally, it analyzes the reading difficulty of your document, by level of education.

In addition to all these word processing features, Pen Pal also contains a full-featured database capable of storing as much information, or records, as memory and disk capacity allow.

As in all databases, you must first define the different fields (types of data) you wish to store before you actually enter any information. A record consists of a group of such fields pertaining to a single subject. For example, in a database of addresses each address is contained in a record. That record will contain several fields, each containing a piece of information such as name, street address, city, state or ZIP code.

Pen Pal allows eight types of fields, including dollar amounts, time or a simple Yes/No. Fields can be hidden from view and the data in each can be aligned in any of three ways. You also have the ability to total and subtotal columns of numerical data. Unlike most other databases, however, you don't have to set a maximum length for any field.

Once you finish defining your database, the program displays the database window, which closely re-

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sembles a spreadsheet program. The fields are displayed in columns, the records in rows. The rows contain a cell for each field. You enter data directly into the cells and can easily increase the width of any column by dragging the column line with the mouse pointer. If you don't like the order of the fields, simply select Redefine from the menu and move the fields.

When you finish entering data, you can save it in Pen Pal or ASCII format. You can sort your data in a number of ways, including multiple field sorts. For example, you could sort a database of addresses by city, and then by last name within each city. Searching the database for specific data or ranges of data is quite simple. Enter the information you want included (or excluded) into the Search requester, and the program will produce a list of records that meet your specifications. Using both the search and sort features, you can print a columnar report. Other options print mailing labels from the database, and form letters which merge in data from the database.

Summing Up

Despite the apparent complexity of the program, it is really quite simple to use. The manual is over 200 pages long and contains detailed instructions for each feature, complete with illustrations of screens and requesters and step-by-step tutorials. Online help provides a short summary of most of the features and gives manual page references.

Pen Pal comes on two non-protected disks and installs easily on a hard drive with the utility program provided. Though a powerful, multitasking program, Pen Pal lacks some of the bells and whistles required by heavy business users. The word processor can be sluggish, particularly when inserting text towards the beginning or middle of your document. (*At AMIGA* Plus *we also found the program to be somewhat crash-prone. Save often.* — + EDITORS) Pen Pal lacks many features I would have liked to see, such as macros, block indenting, and the ability to enter database information on forms generated by the program rather than in the cells.

Still, all of these additional features would have raised the price of the package beyond the current $149.95. Average home users and students will find Pen Pal totally suitable — as well as easy and fun to use. ■

PEN PAL $149.95
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Gone With The WINDows

Frankly my dear, we think that Scarlett O'Hara, a neat and proper Southern Belle, would have loved Gone With The Windows. This unique Scrolling Pop-Up Menu utility brings you instant command of all those confusing layers of windows that hide so much of your Workbench screen. Also, C programmers will find many creative ways to adapt the source code into their own programs. Gone With The Windows is featured on this issue's AMIGA Plus Disk and you don't need C to run the program.

If you are anything like us, when you work at your Amiga you tend to jump around between many programs and projects. Naturally this tends to turn your Workbench screen into a crowded, confusing mess. You wind up with layer upon layer of overlapping windows which always seem to be hiding that exact window you need to find next.

We got sick and tired of clicking endlessly on the front/back gadgets of our stacks of windows. So we invented a Scrolling Pop-Up Menu that makes it easy for you to quickly find any window on your Workbench and move it to the front or back of your pile.

To run this program and end your Workbench clutter forever, just double-click on the Gone With The Windows icon in the main window of this issue's AMIGA *Plus* Disk.

Gone With The Windows appears as a fairly small window filled by two unusual menu/gadgets which are controlled entirely with the left mouse button. Click anywhere on either the sunshine-gadget (move to front) or the moonlight-gadget (move to back) and you'll get a smaller menu window that automatically centers itself under your mouse pointer.

This program handles a *variable* number of menu items, displaying a section of its list between two arrows at the top and bottom of the menu window. To display more menu items, just hold down the left mouse button and move the mouse pointer to the up arrow or the down arrow. To select a displayed item from the menu, simply highlight your choice by moving the mouse pointer over it and then lift the left mouse button to activate the selection.

Programming GWTW

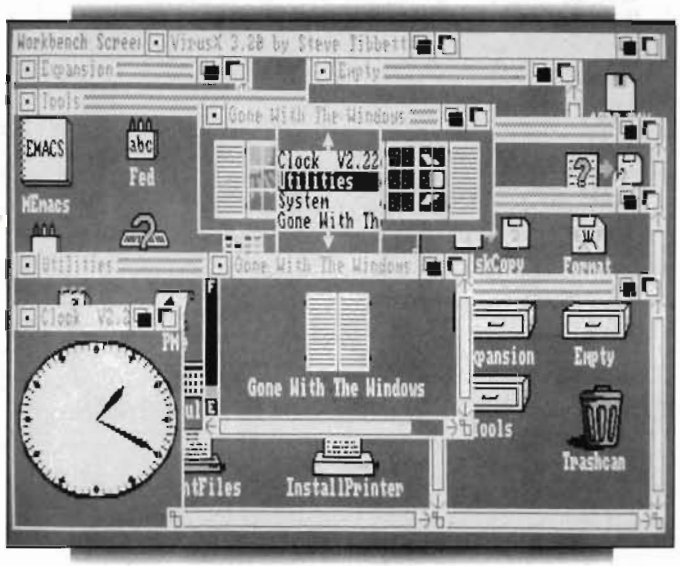
Owners of Lattice C or Aztec C can recompile and link the Lattice C 5.02 source code for Gone With The Windows, which is in the Programming drawer of this issue's AMIGA *Plus*

Disk.

Our exclusive story about the making of Gone With The Windows begins with two definitions...

A "linked list" is composed of a group of data items, each of which carries all of its own information and one extra field which indicates which item follows.

A "pointer" is an identifier that states the memory address where an object resides. Pointers are used to tie linked list items together.



Gone With The Windows (top center) means no more messy Workbenches like this.

For example, item A is at location 400 in memory and item B is at location 800. To point at B, the number 800 is stored in item A as its pointer to B. If you start by looking at the first item in a list, you can traverse the list easily by following the pointers through it.

To best handle a list of items of variable length, use a linked list. The Amiga's Exec and Intuition libraries make extensive use of linked lists. Exec uses linked lists to keep track of tasks that are waiting to run, such as messages that are being sent between tasks, or free memory that has not been allocated. Intuition uses linked lists to keep track of the gadgets in a window, the windows in a screen, and the screens within Intuition.

To illustrate linked lists, let's use Intuition's windows, since our program will be working with these anyway. The Intuition window data structure looks like this:

```
struct Window {
struct Window *NextWindow;
SHORT LeftEdge, TopEdge;
SHORT Width, Height;
SHORT MouseY, MouseX;
SHORT MinWidth, MinHeight;
USHORT MaxWidth, MaxHeight;
ULONG Flags;
struct Menu *MenuStrip;
UBYTE *Title;
...more stuff };
```

Of interest is the very first field, NextWindow. This holds a pointer to the address of the next window in the screen. If there is no next window, this is left blank. Using this field, all of the windows in a screen are arranged in a linked list.

You can access a Window in the list easily by following the pointers. The next routine finds the nth window in a screen's window list, having been passed a pointer to the top of the list and an index into it:

```
struct Window
*findwindow(window,index)
struct Window *window;
int index;
{
for (;index;index--)
window = window->NextWindow;
return(window);
}
```

In order to traverse the window list, the findwindow routine should know where in the Window structure the NextWindow field is kept. It is no coincidence that NextWindow is the first field.

List Handlers

This brings us to one very useful property of linked lists. One set of list handling routines can handle all kinds of linked lists — as long as the lists keep their pointers to the next item in the same place. The standard way to do this is to place the pointer to the next item first in a list item structure.

Intuition Gadget, Menu, and Screen structures all keep a pointer to the next item in the list in the very first field, as does the Window structure. This means that the findwindow routine, designed for windows lists, will return the nth item in a Gadget, Menu, or Screen list as it works with a Window list.

If several different data types share the same convention for pointing to the next in a list, one set of list handling routines can be used to process them all. These include routines to access an item in the list, count the number of items in the list, insert and remove items from the list — and create a Scrolling Pop-Up Menu of the list!

The Scrolling Pop-Up Menu routine displays any linked list that uses the first field of each item to point to the next item. The Scrolling Menu routines have their own internal definition of a linked list structure:

```
struct ListNode {
struct ListNode *next;
};
```

A ListNode has one field, "next," which points to the next item in the list. Other than that, the ListNode contains no data fields of its own. However, as long as we are working with lists that also designate a pointer to the next item as the very first field, this is all we need.

Parameters

In order to invoke the menu, a program calls the routine ScrollingPopUpMenu() (which displays the

Continued On Page 91

AMIGA IN DANGER!

Time is running out for real solutions to the resolution and palette barriers...

BY RICK RODRIGUEZ

Amiga graphics are losing their lead to million-color Mac IIs and PCs. Can Imagelink and frame buffers bridge the gap in time?

By virtue of its remarkable design, the four-year-old Amiga still holds up admirably against newer competitors. Only in one area is the Amiga starting to show its age. Unfortunately, that area has previously been the computer's strongest suit — graphics.

When the Amiga was unveiled in 1985, 640 x 400 was very high resolution for a computer and 4,096 colors onscreen at one time was almost unimaginable. But today in the MS-DOS world, VGA displays make 640 x 480 screens a common sight. Also, PCs and Mac IIs can now have as many as 16.7 million colors onscreen at once — although few screens have the 16.7 million pixels on which to display them.

Loyal Amiga users will quickly point out that these features require costly add-on boards for the PC or Mac II, while the Amiga gives you everything straight out of the box. Certainly this is important for most casual users. But higher prices aren't necessarily the main factor for professional computer graphic artists.

Actually, street prices for similarly configured Mac IIs, PCs and Amigas are not very far apart. The savings on an Amiga system may not be justifiable if an artist or video producer needs to produce state-of-the-art work without any compromises.

One reason that the Amiga still thrives is the significant amount of high-quality graphics and animation software that have been developed. Macs and PCs just don't do some of the things that an Amiga can handle -- particularly in video. But even this lead dwindles as Apple, IBM and its major developers jump on the desktop video bandwagon.

Commodore recently announced that Workbench 1.4 will support the Enhanced Chip Set's new resolutions of up to 1,008 x 800. Unfortunately, this display will be limited to grayscale. Will all serious graphics users be forced to abandon the Amiga for higher resolution and expanded palette? Commodore has only a limited time in which to make a decisive move regarding more colors, or it will see the niche markets the Amiga virtually created slip from its grasp.

Hardware to the Rescue

The ideal solution to resolution and color barriers imposed by the current design is a new, improved Amiga. Meanwhile, to help current users eke a few more pixels out of their machines, Commodore and several third party developers have announced promising hardware and software enhancements.

Commodore's **A2360 High Resolution Color Graphics Card** was developed by the University of Lowell, Mass. and uses the Texas Instruments TMS34010 graphics processor to display 256 colors from a 24-bit palette in a resolution of 1,200 x 800. However, Commodore has not yet indicated when the card will be released or

how much it will cost.

Two Amiga 24-bit frame buffers currently exist. Mimetics' **Frame Buffer** and Impulse's **VD1** both offer an approximate resolution of 700 x 500, displaying up to 16.7 million colors at once (on a huge screen). Both units aim at users who want to generate 24-bit images with 3-D programs like Sculpt-Animate 3D or Turbo Silver and record them to video. Unfortunately, neither box provides an RGB output. Instead, users must settle for an inferior composite signal which requires significant correction to record correctly. Recently Amiga developers agreed on an IFF standard for 24-bit images, but neither buffer has yet been upgraded to display the standard files.

This holiday season should see the release of Newtek's long-awaited **Video Toaster** and Digital Creations' **V-Machine**. Although both units are touted as much more than "mere" frame buffers, the capacity to display true color (24-bit) is central to both units' operation. The Toaster will offer four output options, including NTSC-170A composite, S-VHS outputs and RGB. The V-Machine's Living Color Frame Buffer has similar specs. Both companies also plan to introduce paint and animation software for their respective products.

Also promised soon is the **Video Graphics Transputer** from Digital Animation Productions. This machine is a lot more than a mere graphics display card. Actually a 32-bit parallel processing tower, the transputer can crunch numbers at an amazing rate and promises to ray-trace in a few seconds. Central to the transputer is a graphics display that offers 24-bit color in resolutions up to 8,000 x 8,000. Mere mortals will be pleased with its lowest resolution of 512 x 512. Several Amiga software houses are currently considering porting their applications to the transputer.

Targa Solution

But what if you can't wait for promises to be fulfilled, and you want a proven, time-tested solution? Active Circuits' **Imagelink** software can provide a vital link between a Bridgeboard-equipped Amiga 2000 and the top-of-the-line PC graphics display cards.

In the PC graphics community, Truevision has set the standard for high resolution display cards with its Targa and Vista family of products. The Targa 16, 24 or 32 are the boards most often found in PCs running professional-quality graphics or animation software. Last year, Truevision gave the Mac II a big push by releasing the NuVista series of boards for that computer.

Will serious graphics users be forced to abandon the Amiga for higher resolution and more colors?

With the A2000, a Bridgeboard and a Targa board, you might assume that the Amiga's many products could speak directly to that display card. Unfortunately, both the PC and Mac II have a distinct advantage over the Amiga when it comes to operating with graphics display cards. The PCs are display independent, which essentially means that they don't limit the user to any specific resolution or number of colors. That's why you see the confusing proliferation of PC displays such as CGA, EGA, VGA, etc. Because the Amiga has specific graphics chips and a blitter to help speed animation, its display modes are very restricted. The PC side of an A2000 can communicate directly to the graphics card, but Amiga applications are locked out.

Imagelink

Imagelink attempts to remedy the situation by translating between the Amiga and the display card. The software currently supports IFF ILBM, DigiView RGB, PICT, Sculpt RGB, Sculpt Direct, Turbo Silver RGBN and RGB8, TGA and Targa Direct files.

Operation of the software can be as simple as selecting the input format of the file and the desired output format. Sculpt-Animate 4D users have the added benefit of directly rendering to a Targa board with Sculpt and Targa direct modules. Targa TGA and Macintosh PICT file compatibility also opens the door to many high-end production devices, like slide and film recorders.

Imagelink works equally well with either an XT or AT-compatible Bridgeboard. It includes a 5 1/4-inch disk to turn the Bridgeboard into a dedicated file server for an installed Targa board. The main limitation in using the Amiga to generate Targa graphics is the difference in rendered resolution. The Targa 16's display is relatively square at 512 x 480. Because most software does not allow the user to select the output ratio, Imagelink must scale the image to the correct proportions. Version 2.0 of Imagelink makes this a simple, interactive process, but the ideal situation would be to start out with the same aspect ratio you end with.

With Imagelink, Active Circuits is probably the first company to exploit the dual potential of the A2000 with a product that simultaneously uses the Amiga and PC sides of the machine. Octree Software recently licensed Imagelink's Targa Direct module for its new Broadcast Renderer version of Caligari. Once users render a scene, they click on a gadget which activates the Targa and calls up its display, along with TIPS, the Targa paint program.

Clearly, Imagelink is not the solution for everyone. Running the Targa board on a 386-based machine not only allows you to edit your graphics directly, it also enables you to run the application itself at the higher resolution. But for Amiga graphics professionals who are looking for an immediate solution to break the Amiga's color and resolution barriers, the software is a welcome arrival. ■

Rick Rodriguez is program manager of Dynamic Cablevision in Miami, which won the 1989 ACE award for best local news program on cable TV — due in no small part to Amiga video effects.

HARD COPY OUTPUT

Get More From Your Amiga Printing

Column by Curt Kass

Citizen 124

Jack Aliff of Honolulu, HI and Andrew Jung of San Diego, CA wrote in to ask about setting up and using the 24-pin **Citizen Tribute 124** dot matrix printer. According to Citizen, this printer connects to any Amiga with a parallel cable, and will work with the 1.3 Preferences driver Toshiba_P351C.

The Tribute 124 is factory-set to emulate the Toshiba 1340, 341, and 351 in black and white and the P351C for color printing with the optional color kit. The $79 Tribute 124 color kit consists of a color ribbon and a motor to move the ribbon up and down to position the correct color for the impact pins.

Okimate 20

Cecilia Cosentini of Brooklyn, NY, wrote asking for advice on Okidata's **Okimate 20** or, as she nicknamed it, the "Okidoki." Okidata has been producing the Okimate 20 since 1985. Amiga 1000 owners found a driver for this printer in their Preferences. Okimate and its Amiga Plug 'n Print module are typically priced under $200.

A heat transfer ribbon printer, the Okimate 20 prints using 24 separate heat elements on its print head. The heat elements melt the wax-like substance coating the ribbon onto the printer paper. For black and white printing, you can use either a black ribbon or a thermal paper.

For color printing, the Okimate 20 uses a ribbon colored in alternating 8 1/2 inch segments, with three colors. Each pass of the print head uses one 8 1/2 inch section, no matter how large the screen image printed, and full color printing requires three pass-

COLOR PRINTOUT COMPARISON From Top: Canon PJ1080 ink jet, 2 minutes and 30 seconds; Okimate 20 thermal transfer, 4 minutes; Star Micronics NX-1000 Rainbow nine-pin dot-matrix, 10 minutes and 25 seconds.

es, one for each color. Repeated passes over successive color sections layer the colors, producing many different shades, in a fashion similar to color process printing. All three colors combine to produce a near-black. Many bands of color, each slightly under 3/16 of an inch high, make up the final printout. A color ribbon cartridge produces an average of about 15 screen printouts.

The faint white lines visible between each band of color can be controlled somewhat by the user. One trick is to set the paper release to the Open position when printing. Amiga users can use dip switch number 5 on the Plug 'n Print module to produce an overlap on each print head pass. Try this dip switch in the on and off position to see which you prefer. Keeping your print head clean will keep your printouts brighter and less likely to show blotches of white along with the pass lines. Clean the head as you would any tape cassette equipment, using rubbing alcohol and a cotton swab.

Still available, the Okimate 20 continues to be the lowest cost useful color printer for our Amiga.

Xerox 4020 UpDate

Gorilla by Greg Johnson (as seen in AMIGA *Plus* #3) will live forever, but not so the **Xerox 4020** it was printed on. For present owners of the recently discontinued 4020, an interesting new driver from GlassCanvas Productions is **Enhanced Xerox 4020 Printer Driver for Amiga**. This driver eliminates dark printouts, which have been a problem with the 4020.

The GlassCanvas Xerox 4020 driver gives you a closer match to the monitor display, when brightness and contrast controls are set to the middle positions. The most noticeable differences between screen colors and the enhanced printouts were in the pure purple.

The enhanced driver worked admirably with the color charts of my Palette Printer software and the color charts included on the enhanced driver disk. Muddy, featureless hues gained usable, stepped values. Density settings from 1 to 7 are all active and will vary the results from a pastel look at number 1 to a very dark value using number 7.

Printing with the GlassCanvas Enhanced Driver is 12% slower than the 1.3 Preferences driver, but the results are well worth the wait.

Canon PJ1080A

Another ink jet printer I like for printing Amiga graphics is the **Canon PJ1080A**. Designed for color graphics, this printer is below average for NLQ text printing. A low-resolution printer at 83 X 84 dpi, the Canon makes up for this with a solid reliable performance and uncanny ability to apparently never run out of ink. Well, it does run out eventually, but it took me over a year and several hundred printouts to empty my first set of cartridges.

The 1.3 Preferences driver for the "Canon_PJ-1080A" (3940 bytes) works well, except for the F-S dither setting which I have found non-operative. Two other drivers for the Canon work in all three dither settings, they are "canon_pj1080a" (8688 bytes) and "Canon_PJ1080APhase4" (4356 bytes).

Canon offers full service and technical support for the PJ1080A, which is still being manufactured. Nonetheless, the PJ1080A is hard to find and not likely to show up in your local computer store. However, some mail order houses do carry the PJ1080A and supplies. At $519, its price is right in line with its 83 X 84 dpi when compared to the Xerox 4020 (120 dpi) or HP PaintJet (180 dpi) at average costs of $1150.

Ink Jet Refills

Two independent ink jet refill companies offer a fine alternative to printer manufacturers' "official" inks.

inky dink, by Software Sensations, comes in yellow, magenta, cyan and black. The ink produces a deep black and rich velvet color output and is available direct from Software Sensations in three sizes — 17cc for $11.95, 34cc for $22.95, and 62cc for $39.95.

Jet Technology's yellow, true magenta, cyan, and ultra-black come in two sizes, 5 ml for $5.50, and 60 ml for $40. Jet Technology inks produce a rich black and mildly fluorescent color print. The company also offers the **BiFunnel Adapter**, which makes it possible to use Maxwell cartridges to refill Canon PJ1080A ink pack cartridges, at $5 per set of five. The Radio Shack CGP-220 and Quadram QuadJet use the same cartridges.

New From Pixelations

Better PostScript output from *any* graphics printer is now available from Pixelations with **PixelScript 1.1**, an upgrade from their PrintScript software — which was reviewed in AMIGA *Plus* #3. New features include an easy Icon and Menu interface, improved speed and a preview display of your file onscreen before printing. ■

Curt Kass is an artist/designer in the Graphic Arts Department of the University of Wisconsin at Milwaukee. He is the developer of Palette Printer color proofing software for the Amiga.

MANUFACTURER INFORMATION

Enhanced Xerox 4020 Driver $24.95 plus $4.50 shipping
GlassCanvas Productions, P.O. Box 6171, Boston, MA 02114.
CIRCLE 274 ON READER SERVICE CARD

Software Sensations, 1441 S. Robertson Boulevard, Los Angeles, CA 90035. (213) 277-8272.
CIRCLE 275 ON READER SERVICE CARD

Jet Technology, 16 Pembroke Road, Weston, MA 02193. (617) 239-8383.
CIRCLE 276 ON READER SERVICE CARD

Pixelations, P.O. Box 547, Northboro, MA 01532. (508) 393-7866.
CIRCLE 277 ON READER SERVICE CARD

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TYPE ATTACK

PROGRAM BY DAVID ALVES
ARTICLE BY CAROLYN CUSHMAN, AMIGA *PLUS* ASSOCIATE EDITOR

Space blaster turns typing tutor in this flashy, entertaining keyboard drill game.

The aliens threaten Earth with their deadly missiles, and only you, Russ Lightspeed of the United Type Defense, can stop them from destroying the six cities under your protection. As each missile falls, your computer superimposes a secret code over the missile's image on your screen. Type that code in time and you'll destroy the missile.

Smoothly detailed, colorful graphics give TypeAttack a touch of arcade-style class. Digitized sounds add to the fun, with a crisp typewriter sound for the keys, background music with a thumping beat and some just plain weird sound effects for the author's credits. TypeAttack programmer David Alves is a professional Amiga software developer from San Jose. His game is not only slick, entertaining and educational, it is also something of a parody of bombastic arcade shoot-'em-ups.

TypeAttack educates as it entertains. The code displayed on each missile consists of a single letter or number. To work up through the ranks from Private to General, a player must acquire a thorough knowledge of the keyboard. Or you can combine the Numbers Only option with the Amiga's numeric keypad to brush up on your 10-key skills.

With its one-character-at-a-time approach, TypeAttack won't teach you everything you need to know about typing. But it will reinforce a beginning touch typist's feel for key locations, or help non-typists learn the keyboard.

Learn to type, or die.

Getting Started

The game itself includes all the instructions you need to play. Simply double-click on the TypeAttack icon in the TypeAttack drawer to get started. From then on, all controls are operated through the keyboard. You'll be able to choose between reading the instructions or going straight to the game.

You can pass up a promotion, but a really bad performance guarantees automatic demotion. The speed at the highest levels will challenge the reflexes even of skilled typists — when you're a General, those pesky missiles zip down the screen almost faster than the eye can focus. ■

Thanks for the Memories!

Amiga 8Mb Expansion Cards: MicroBotics 8-Up! (DIP), SupraRAM 2000, Commodore A2058

REVIEW BY ARNIE CACHELIN, AMIGA *PLUS* TECHNICAL EDITOR

As most Amiga users soon realize — When it comes to using a multi-tasking computer with sophisticated graphics and sound, "memory makes the world go 'round." Or, to translate another well-known saying into computerese, "You can never be too rich, too thin, or have too much RAM."

RAM Upgrade Considerations

The Amiga is capable of using as much as nine megabytes (9Mb) of RAM. But few users actually own this much memory. For one thing, an Amiga 2000 expansion board filled with the maximum 8Mb of RAM chips costs about as much as a whole Amiga 2000.

The latest real unit for expansion memory is the megabyte. Some of us can remember the days when kilobytes were enough and upgrading a 64K computer to 128K was an incredible thrill. One megabyte equals 1,024 (2^{10}) kilobytes, one kilobyte equals 1,024 bytes, one byte equals eight bits. The actual memory chips used in Amiga expansion hardware are called DRAMs, or Dynamic Random Access Memory chips. They are commonly one of two sizes — 256Kx1 or 1Mbx1. These numbers tell how many *bits* the chip holds, either 256 kilobits or 1 megabit. The x1 (by one) tells us that the chips are 1 bit wide, that they are like a single, large stack of bits — 1 bit wide by 256*1024 or 1024*1024 deep.

MicroBotics provides the ultimate RAM-expansion test software.

To put in a mega*byte* of RAM, you must put eight 1Mb chips next to each other. But the Amiga uses a "bus" that is 16 bits wide. This means all the data it stores and retrieves is moved in 16-bit (2 byte) chunks known as "words." Since it wants a whole word at once, you must install 16 1Mb chips side by side — which adds two megabytes, not one! Similarly, 256Kx1 chips are added in increments of 16, yielding 512K expansion increments.

Since the Amiga doesn't have any empty sockets to plug these RAM chips into, a PIC (plug-in card) circuit board with these sockets and some control hardware is necessary. The three boards reviewed here can hold as much as 8Mb and are usually available — at different prices — with

all, some, or no RAM installed.

The price of DRAMs fluctuates, so vendors often prefer not to stock too many memory chips. Many consumers believe they can get a better price if they buy their DRAMs separately. (We paid $16 apiece for the 1Mb chips we used in this test.) While it may be cheaper to get the chips and install them yourself, it can be a particularly tedious process. In addition, DRAMs and many other electronic components on your memory board are sensitive to the static electricity which we generate by just moving about, and can be killed if proper precautions aren't taken.

Finally, when you buy the memory board already populated, it has presumably been tested at the factory. If you have just finished coaxing 64 DRAMs into their sockets, plugged in the board, turned on your Amiga, and something doesn't work, you suddenly have quite a job ahead of you.

A common feature on peripheral cards are the small black plastic connectors, known as "jumper blocks," which join pins on the board to tell it specific information about its configuration. On RAM cards, these jumpers determine such things as how much memory the board recognizes, and whether or not it will "autoconfigure." Often abbreviated as "autoconfig," this term means that the upgrade board automatically adds its memory to the Amiga's memory pool when you boot up. It may seem silly to have extra memory and not automatically add it when you boot, but some diagnostic software requires such a setting to test the RAM.

COMMODORE A2058

The **Commodore A2058 RAM Expansion Card** is a board which can be configured for 2, 4, or 8 megs, depending on the positions of its two jumpers. It is sold with a minimum of 2Mb onboard. The fourth jumper setting disables autoconfiguration, in which case the Amiga doesn't need to read how much memory is installed anyway. This board is a single PIC (Plug-In Card), so it cannot be configured at 6 megs. (See Dave Owen's *Memory Expansion Architecture* article accompanying this review.) Six-megabyte configuration would not re-

Memory Expansion Architecture

Technical Notes For Experienced Amiga Users

BY DAVE OWEN

An Amiga memory expansion board is technically a type of "Plug-In Card" (PIC) with a RAM size that is a power of two — 2, 4, and 8 megabytes (Mb) of memory. Only a board with *two* built-in PICs can run 6Mb. (See Arnie Cachelin's expansion boards review accompanying this article.)

PICs can be assigned at two memory addresses — the 512K area starting at 0xE80000 and the 8192K area starting at 0x200000. PICs are assigned one at a time into expansion memory, at the first address that will accommodate them. 0xE80000 to 0xEFFFFF is searched first, then 0x200000 to 0x9FFFFF — see the Memory Map with this article. PICs are configured in the order that they appear on the bus.

By default, PICs first appear in a 64K region at 0xE80000. The system software then configures them and puts the PIC at its final address. After a board is assigned its address, the next board is enabled at 0xE80000, etc.

During power on, all PICs are assigned addresses. Memory boards are linked into the free list. ROM tags are processed. All ROM-resident modules are initialized (graphics, trackdisk, etc.).

In the booting process, the BindDrivers program attaches device drivers to boards (HDDISK.device, NETWORK.device, etc.). Applications can bring in code for special-purpose hardware such as the Live! digitizer from A-Squared.

Board Configuration

Every type of PIC has a unique identifier consisting of a manufacturer code and a product number. Commodore assigns a unique manufacturer code to every hardware developer.

First a developer designs a hardware add-on and writes a suitable device driver, making an .info file for the driver with a PRODUCT Tool Type entry with the board identification. Both of these files are put into the SYS:Expansion directory.

The developer then picks a product code and gives every board a 24-bit device identifier. This identifer is used by the BindDriver program to locate each driver for each PIC. Each device identifies the amount of expansion memory needed. A specifier now requires address space that must be linked into the system memory pool.

A provision exists to allow hardware that does not obey the expansion architecture. This hardware lives at 0xDC0000. Examples are a battery-backed clock, or a memory-mapped 68881 floating point math co-processor chip. Special memory resides at 0xC00000. If memory is found here during boot-up sequences, it is linked into the memory pool. ExecBase will automatically relocate to

ally be an issue, except that Commodore's A2088 BridgeBoard and A2620 accelerator card take over a 2Mb section from the Amiga's fast RAM address space. Therefore an Amiga 2000 with either of these boards installed can only use 6Mb of fast RAM instead of 8Mb — it could use the A2058 as a 2Mb or 4Mb upgrade, but not 8Mb.

The RAM test software included with the A2058 is on a bare-bones Workbench disk that boots right into the test. This is the most common arrangement, because when you need the RAM test most, you don't need any of the frills and custom goodies on your own Workbench disk.

Five tests are performed on your RAM board — a unique longword address test and refresh, plus four 16-bit tests which write patterns of all 1s or 0s or alternating 1's and 0's. If any test fails, the program will show which test and which bit failed. It then displays its Failed Bit IC Designator Map which tells which chip corresponds to which bit in each 2 meg address range of 16 chips.

MICROBOTICS-UP! (DIP)

The **MicroBotics 8-UP!** was the first RAM board to put 2 PICs on one card. This makes it possible for the board to be configured at 6 megabytes — 4Mb in PIC A and 2Mb in PIC Z. This configuration is accomplished by setting the 6 jumper blocks according to the table in the four-page instruction booklet (the Commodore booklet was five times as long, but had German, French, Italian and Spanish sections, in case English wasn't confusing enough). The jumper settings not only tell your Amiga how much RAM is in PICs A and Z, but also whether to autoconfig each PIC. 8-UP! hardware also features custom RAM controller logic with "sparse" or "hidden" refresh technology for effective zero-wait state performance and low (.8 amp) power consumption.

The new 8-UP! board we tested uses standard DIP (Dual In-line Package) chips. The 8-UP! used to be available only in a SIMM (Surface-mount In-line Memory Module) version, using 1Mb or 256K snap-in modules which come with the individual

this address and free up Fast RAM for higher-priority purposes.

Drivers

The BindDrivers program finds each driver and links it into the system. In addition, the BindDrivers program may be run repeatedly without ill effect. Devices will not be configured twice, so BindDrivers may be run after a new driver is installed. You don't need to reboot after installing a driver.

The expansion.library configures the expansion board into the system. It puts each board in its own address space, and links memory boards into the free memory pool. This is done by the expansion.library's ConfigChain entry point. This code is intended to be run early in system startup, before any other code is around.

Later, after AmigaDOS is running, the BindDrivers program should be run. This program searches the directory SYS:Expansion for Workbench ICON files. If it finds one with a Tool Types variable PRODUCT, it parses the rest of the line and looks for an unconfigured board that matches the description.

Easy Payoff

The system described above makes it easy for any Amiga user to install a new driver. You connect the new hardware to your Amiga, drag the icon for the PIC's driver into the expansion drawer, and either re-boot or run the BindDrivers program from CLI. Everything becomes automatic the next time you boot. ■

AMIGA MEMORY MAP

HEX Value	Memory	Comments
0x00 00 00	1024K	"Slow" RAM. Accessible to co-processor hardware. See article on Super Agnus chip in AMIGA Plus #3
0x08 00 00	1024K	Future video RAM. Coming in Amiga 3000?
0x20 00 00	8192K	"Fast" RAM. Add-on RAM boards usually go here. Insider boards for the A1000 generally went to system memory (see 0xC0 00 00).
0xA0 00 00	1984K	Reserved.
0xBF 00 00	52K	Unused.
0xBF D0 00	8K	Access to the 8520 controller chips. The Amiga uses reconfigurable input/output chips rather then disk controllers, serial cards, and printer interfaces.
0xBF F0 00	4K	Unused.
0xC0 00 00	1024K	"System" RAM. During the boot procedure this location is checked. If present, Exec is relocated to this location to release additional slow RAM to the co-processors.
0xD0 00 00	768K	
0xDC 00 00	252K	Non-PIC locations; e.g., battery-backed clock, math co-processor.
0xDF F0 00	4K	Co-processor locations.
0xE0 00 00	512K	Reserved.
0xE8 00 00	512K	Expansion slot decoding. The subject of this article.
0xF0 00 00	512K	Reserved.
0xF8 00 00	256K	System ROM. The A1000 writes ROM information from disk to a "write control store" at 0xFB 00 00 from boot ROM logic contained at 0xF8 00 00. ROMs, therefore, have been limited to 256K in size.
0xFB 00 00	256K	System ROM.

DRAMs already mounted in place. Although SIMMs are more expensive than the standard DIP chips, they are easier to install and less static-sensitive. In addition, the board could be loaded with 256K SIMMs in one PIC and 1Mb SIMMs in the other, for real oddball memory sizes. MicroBotics also sells 2Mb PopSIMMs modules ($89.95 for four) in case you have some DIP chips you want to use in SIMM sockets.

The RAM testing software included with 8-UP! is outstanding. Written by Rick Stevens and Willy Langeveld, this program is the most comprehensive expansion RAM test I have seen. Although you can boot from the test disk, this is not necessary because the program will reboot after software-disabling the autoconfiguration of all the devices on the Amiga's bus. You can cancel this reboot, or plunge ahead and see all the expansion cards in your Amiga listed with their manufacturer and product ID codes, the address and size, and a description telling whether the PIC is a "peripheral" or RAM. The exception is the MicroBotics board itself which displays its name instead of ID codes.

After clicking on one or more of these entries and selecting OK, the test screen comes up. Here the user clicks on one of the following gadgets for the five tests available:

MSCAN	Write and immediate read
RSCAN	Delayed read (tests refresh)
MARCH	Write and delayed read
FLOAT	Bitwise r/w (very slow and very thorough)
DTADD	Address tracking

Holding down any of these test gadgets will display a description of the test. The tests can be specified individually or *en masse* with the ALL button, and can be run from one to 128 times or continuously. Other gadgets allow you to log the error messages to a file, set the program to beep on errors, set the maximum number of errors before the test aborts or abort on the first error, and even save your preferred settings to disk.

The test can also be run with the AUTO option to test all RAM PICs available. If there is a problem in the first section of RAM which prevents the Amiga from booting, the autoconfig can be disabled. In this case, the PIC selection list will not know whether the board is RAM or a peripheral, and will ask for confirmation before beginning the test. In addition, the software checks the PIC size. If the PIC is 64K or smaller, the device is assumed *not* to be RAM, and the test won't touch it. This test worked on the A2058 in all its possible configurations including the autoconfig-disabled mode and the full 8Mb mode with a bad chip (which the A2058 RAM test couldn't manage). The test refused to recognize *any* PICs when ASDG's Twin-X GPIB (our Sharp JX450 Scanner interface) was installed.

Another interesting feature of the MicroBotics test software is that it lets you do "dry runs" without actually testing anything or re-booting. It can even generate spurious errors to give the user a feel for finding bad bits in hex WORDs — ADDRESS 60001c write: aaaa read: aeaa. Since I already had my fill of real errors while tracking down the single bad DRAM in the batch we were installing, I saw no reason to test this feature.

SUPRARAM 2000

The **SupraRAM 2000** has features similar to the 8-UP! board. It has 2 PICs so that it can be configured at 2,4,6, or 8 megabytes, uses sparse refresh and can be autoconfigure-disabled via a jumper block setting. The autoconfigure mode for this board is set by a single jumper block which is either in the Run position or the Test position. This scheme is easier to understand than the 8-UP! configuration, since the positions are clearly marked on the board. It is less flexible because both PICs must be either autoconfig or not — they can't be set individually.

Similarly the two jumpers that set the amount of RAM in the board trade flexibility for ease of use. One of the jumper blocks has two positions labeled 2/4-6/8 and the other says 2/6-4/8. Together these two jumpers uniquely specify how much RAM is on board, the user installs the RAM in 16-chip-wide banks from top to bottom and sets the jumper to twice the number of banks filled. There is no choice about how much RAM goes in which PIC. In most cases, this will prove much easier since the jumper positions are marked on the board, and most users won't care exactly how their RAM is addressed, as long as it's there!

The new Supra RAM test software comes on a bootable disk which doesn't start into the test automatically. You must open the disk and double-click on the RAMTest icon. This is handy for hard disk installation. To run the RAM test, the autoconfig jumper must be set in the test position. The test then goes through an exhaustive series of test patterns — address tests with 0000 and FFFF patterns, alternate bit tests with permutations of 5555 AAAA, and rolling bit tests with a single 1-bit advancing through a test word of zeros, then a single 0-bit advancing through a word of ones. Unlike the MicroBotics software, this test cannot check other memory boards. ■

MANUFACTURER INFORMATION

COMMODORE A2058 $799, 2Mb
Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380. (215) 436-4200.
CIRCLE 275 ON READER SERVICE CARD

MICROBOTICS 8-UP (DIP) $531.80, 2Mb
MicroBotics, 811 Alpha Drive, Suite 335, Richardson, TX 75081. (214) 437-5330.
CIRCLE 276 ON READER SERVICE CARD

SUPRARAM 2000 $499, 2Mb
Supra Corporation, 1133 Commercial Way, Albany, OR 97321. (503) 926-9370.
CIRCLE 277 ON READER SERVICE CARD

CONTEST

ON DISK

Enjoy the fast-action arcade game on this issue's disk!
Win prizes with Accolade's slick new game creation tool

Shoot-'Em-Up CONSTRUCTION KIT

Non-programming game aficionados who dream about creating their own flashy arcade classics can do it now — and win valuable software prizes too — using the remarkable Avantage (Accolade) Shoot 'Em Up Construction Kit. This issue's AMIGA Plus Disk features AMIGAHawk, a full-featured scrolling game that shows how professional the Construction Kit results can be.

Phenomenally bargain-priced by Accolade at $19.95, **Shoot'Em Up Construction** Kit is a complete system for building your own glossy action games, with dozens of moving objects and high-detail backgrounds. Design choices functionally grouped on menus give you near-effortless control over the creation of every game element — sprites, objects (animated sprites), background blocks, map, IFF sounds, attacker strength and player options.

No coding of any kind is ever necessary. You create your games by simply pointing and clicking your mouse — until it's time to switch to your joystick and start playtesting. Then you can save your finished product as a stand-alone game to be played by your friends who don't own the Construction Kit.

Creating the AMIGAhawk starship.

AMIGA *Plus* Technical Assistant Aki Rimpilainen needed only about eight enjoyable hours to make the slick, professional AMIGAHawk game featured on this issue's disk. He "remodeled" it from SpaceHawk — a vertically scrolling game that is the flashiest of the three demos included in the Shoot 'Em Up package. Our AMIGAHawk conversion hurtles your

spacecraft above a seemingly endless series of scrolling screens, where you blast countless waves of deadly monsters — including hordes of smiley-faced Macs and other "enemy" computer logos. Your goal is to survive all the way to the Hall of Shiny Amigas.

AMIGAHawk and its support files were originally big enough to require 220K of disk space. We were able to reduce this somewhat by omitting optional title screens. To load the game, double-click on the AMIGAHawk icon in the AMIGA *Plus* Disk window. Don't worry when you see messages that a certain file is missing.

Still, if your Amiga has only 512K memory you'll probably need to clear all unnecessary windows from the Workbench in order to make it run. In fact, *before* double-clicking on the AMIGAHawk icon, 512K users ought to drag the icon onto the Workbench and close the AMIGA *Plus* window!

AMIGA Plus Shoot 'Em Up Contest

As soon as we saw how much fun it is to create outstanding games with the Shoot 'Em Up Construction Kit, we decided to put together a contest for AMIGA *Plus* readers.

Grand Prize is — *every* Amiga title currently available from Accolade Software and Antic Software. You'll get hits including Accolade's Test Drive, Mean 18, Grand Prix Circuit, and HardBall; plus Antic's Zoetrope, GFA BASIC, Phasar, and 3-D Design Disk series.

Three runner-up winners will each get their choice of any three titles from the Accolade catalog *plus* any three titles from the Antic catalog!

Winners will be announced in the AMIGA *Plus* June/July 1990 issue. The Grand Prize game will be featured on that issue's disk, and runner-up winners will be included on subsequent AMIGA *Plus* Disks. Contest winners will be selected by the AMIGA *Plus* staff, on the basis of originality of game concept, graphics, playability and entertainment value.

The rules couldn't be simpler. Create brilliant, original games with Shoot 'Em Up Construction Kit and send them on disk to: Shoot 'Em Contest, AMIGA *Plus*, 544 Second Street, San Francisco, CA 94107.

Entries must be received no later than February 6, 1990. On the disk label, be sure to *legibly* print your name, address, phone number and game title(s). You can enter as often as you wish. All entries become the property of Antic Publishing, Inc. and will not be returned. ■

SHOOT'EM UP CONSTRUCTION KIT $19.95
Avantage (Accolade), 550 S. Winchester Boulevard, Suite 200, San Jose, CA 95128. (408) 296-8400.
Joystick required, copy-protected.
CIRCLE 254 ON READER SERVICE CARD

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CIRCLE 049 ON READER SERVICE CARD

ON DISK

Everything You Ever Wanted To Know About Icons

The Five Icon Types, Info Windows, Default Tool Box... And More

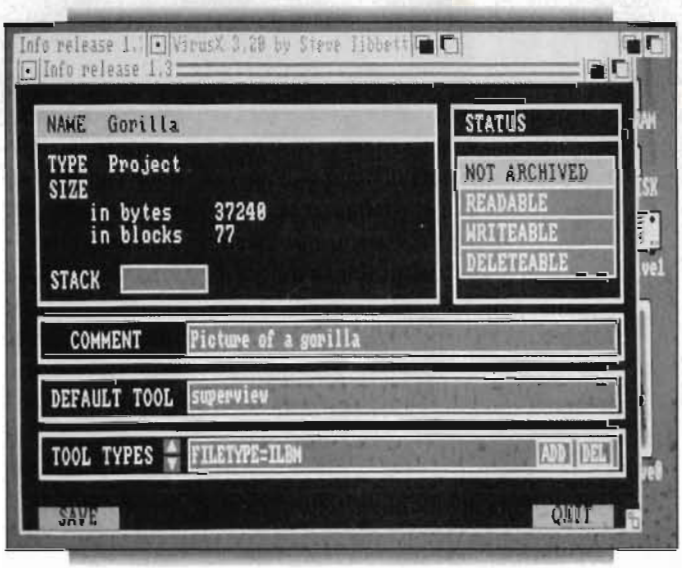
BY GEORGE CHRISTENSEN AND ROB GRIFFITH

Understanding how to use icons and the Info Window will allow you to customize your Workbench and do all kinds of fun and amazing things by simply clicking a mouse button!

There are five types of Amiga icons. Three types represent directories and can be loosely lumped together. The first is a Disk Type icon representing a root directory such as a floppy disk like DF0: or DF1:, RAM:, a hard disk partition, or some other storage device. Contained within a root directory are subdirectories. An icon representing a subdirectory is called a Drawer Type icon. A special subdirectory is the Trashcan which is represented by a Garbage Type icon and can discard files. If you click on a Trashcan icon once with the left mouse button, then hold down the right mouse button — hereafter called the *menu button* — and drag the cursor to the top of the screen to a menu called "Disk," and then down to a menu item called "Empty Trash," anything in the Trashcan will be deleted.

Tool Type icons represent programs. Project Type icons represent data files. An example of a program represented by a Tool Type icon would be Deluxe Paint. An example of Project Type icons would be Pictures, Brushes or Animations saved from Deluxe Paint. Data files are often associated with specific programs. For example, a picture file might be associated with Deluxe Paint, or a music performance file might be associated with Music-X.

Instead of opening a program and then loading data into it by using a "Load" requestor, it is often possible just to click on a data file icon (a Project Type icon) and automatically load the associated program. For example, rather than clicking on the icon for the text editing program called Transcript and then, when the program comes onscreen, loading a text file that you saved earlier, you can just click on the icon of your text file and



Workbench Info Window brings you icon power-editing.

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CIRCLE 009 ON READER SERVICE CARD

Transcript will come onto the screen automatically with your text already loaded! That's user friendly! Below, we will explain how to set up your Project Icons to do this.

Info Windows

A feature of the Workbench called the "Info Window" allows you to customize icons to your own needs. If your press the menu button (the right mouse button, remember?) while in the Workbench, you will notice three menus at the top of the screen called Workbench, Disk and Special. If you hold down the menu button and drag the cursor over the word "Workbench," a menu appears. The fifth item in the menu is called Info. This will be ghosted until you select an icon. The way to select an icon is to move the cursor over the icon, and then click once (not twice) with the left mouse button. This should cause the icon to be highlighted (change colors or even change shape.)

Then, hold down the menu button and drag the cursor to the Workbench menu, and then down to the Info item. When you lift the menu button, an Info Window should appear for the icon you have selected.

At the top of the Info Window is a Title/Drag bar which says some variation of "Info release 1.3." In the window are four or five boxes containing information and requesters, and two requesters at the bottom which allow you to save any changes you have made, or to close the window without saving. It also has the standard Sizing Gadget, Close Gadget and Front and Back Gadgets.

Info Windows for all five icon types have a Name Box in the upper left hand corner. This box tells the name and type of the icon. If it is a Drawer Type icon or Garbage Type icon, this is the only information in the Name Box.

The Info Windows of Disk Type, Tool Type, and Project Type icons also contain information about the size of the file or directory the icon repre-

SECRETS OF IconX

By Arnie Cachelin, AMIGA *Plus* Technical Editor

IconX is a small program which comes with Workbench 1.3 (and on this issue's AMIGA *Plus* disk.) It will execute an AmigaDOS script file when its icon is double-clicked. Besides the IconX program itself, all you need is a script file, and an icon for it. Let's step through a simple example using the Notepad program in the Utilities drawer on a standard Workbench disk.

You can actually make the script file on any text editor or word processor that will save files in a pure ASCII text format without special codes for fonts, bolds, etc. (If you do the script with Notepad, don't use any of its special formatting features either.) An advantage of using Notepad instead of the CLI editor Ed is that Notepad creates an icon for our script automatically.

For our simple example, we will create a script to list all the files on whatever disk is in drive df1:. When we are done, you will have an icon which, when double-clicked, displays a directory listing of a disk drive. Okay, fire up Notepad (or whatever) and let's do it.

On the first line we will give a little data about what we're up to. Type:

```
ECHO "Listing DF1: type <space> to pause scrolling, <backspace> to restart"
```

On the next line, type:

```
DIR DF1: ALL
```

This will list all the files and directories on the disk in DF1:. You can substitute any file device in place of DF1: — such as DF2:, RAM:, etc.

For the last line, type:

```
INFO DF1:
```

This will tell you how full the disk is. Now save your file — use SaveAs to save it to RAM:ListDF1 — and open the RAMdisk. You should see the ListDF1 icon there. Click once on it, and select INFO from the Workbench menu to open the Info Window. Now change the Default Tool from SYS:Utilities/Notepad to c:IconX (assuming IconX is in the C: directory on your boot disk). Press RETURN and click on the save button. When you double-click on the ListDF1 icon now you should see a window titled IconX pop up, and your directory listing will scroll through it.

If all this worked, you can see there are some further steps required before this script is truly useful. First, the window was too small to view many files at once. Our message about stopping the scrolling may have even scrolled off before you had a chance to read it. We can fix this by adding some more specific information about the kind of window we would like in the Tool Types box of the Info window.

Click on the Tool Types ADD button so you can enter the following Tool Type:

```
WINDOW=con:0/10/640/188/ListDF1
```

Make sure WINDOW is all uppercase and press RETURN when you are done typing. This Tool Type makes a window titled ListDF1 at 0,10 with a width of 640 pixels and a height of 188 pixels.

A second problem is that the win-▶

sents. Info Windows for Tool Types and Project Types tell the size of the files in bytes and blocks. Without going into detail, a block is just a way of organizing chunks of information on a disk or other storage device. An Amiga block usually consists of 488 bytes or 512 bytes. The Info Window for Disk Type icons tells the number of blocks on the disk, the number actually used, the number still free, and the number of bytes per block.

The Name Box of Tool Type and Project Type icons have one additional feature, a Stack requester. The Stack is the amount of buffer memory that the program and/or data need in order to function properly. Buffer memory is RAM that's reserved for this program and/or data. It's called a stack because the data is organized in memory like a stack of cards. If you ignore the Stack requester, you get a default Stack of 4K.

Status Box

To the right of the Name Box is the Status Box, consisting of information or requesters about four key aspects of Amiga directories and files. First, has the file or directory been archived or not? Archiving is the process of backing up the directories and files from a hard disk onto tape or some other storage medium. Ideally, when you back up your hard disk, the files and directories which are already archived will not need to be archived again.

Second, is the directory or file readable? You may want to make a file unreadable as a loose form of security.

Third, is the directory or file writable? You may have a file that you don't want altered. You may want this file to be unwritable.

Finally, is a file or directory deletable? An undeletable file is more difficult to destroy by chance or by vandalism.

Disk Type icons have no requesters in their Status Box. Instead, the words "Read/Write" appear in the

dow closes as soon as it has finished the INFO command, leaving little time to read its output. Tool Types to the rescue once again! Just add this to your icon's Tool Types list:

```
DELAY=500
```

This will add a delay of about 10 seconds before the window closes. After adding these two Tool Types, click on the SAVE button.

Now that your script and icon are ready to go, you may want to copy them onto a disk for later use, or to edit the file for more advanced uses. Beware of using Notepad to edit your script now, because it will re-save the icon without the changes we just made. If you want to avoid re-typing the Tool data in the Info Window, you must switch to the CLI — either by using Ed to edit the script without over-writing the icon, or by COPYing the icon to another name (such as COPY myscript.info TO RAM: Tmp.info) and then copying it back after every edit.

To learn about a better CLI alternative, see the box explaining the special ICON program featured on this issue's AMIGA *Plus* Disk.

Advanced Icon Scripts

More advanced DOS scripts use features of the EXECUTE command, such as conditional (IF) and interactive (ASK) execution, or command line arguments which IconX doesn't directly support. In order to use these scripts by clicking on icons, the .KEY command must appear on the first line of the script — so that IconX will open up a new CLI and run the script using EXECUTE. This makes all the AmigaDOS commands available to IconX scripts. To see these new features in action, let's try another example:

ReadPrint, our second example script, takes a single text file that has an icon (such as the Instructions on the AMIGA *Plus* Disk), displays the file contents and then offers an option to print that file. The script below is on this issue's AMIGA *Plus* Disk, in the programming drawer.

```
.key filename
; anything after a semi-colon (;) is a
;comment!
ECHO "ReadPrint -- An IconX
     example script"
IF <filename> EQ "" ;  Check
;whether any filename was given
ECHO "No file given!"
SKIP outtahere
ENDIF                ; if filename was not
;EQual to "" skip to here
IF NOT EXISTS <filename>  ; Now
;see if the file is there
ECHO "Sorry, File not found..."
SKIP outtahere
ENDIF
ECHO "Viewing <filename>"
ECHO " type {space} to pause
     scrolling {backspace} to restart"
TYPE <filename>     ; Send the text
;to our window
ASK "Would you like to send
     <filename> to the printer? (Y/N)"
IF WARN  ; If "Y" or "y" was entered
ECHO "Printing <filename>
COPY <filename> PRT:
ENDIF
LAB outtahere
ECHO "I'm gone pal."
```

The text file is chosen by Reverse Extended Selection. (Click on the ReadPrint icon, then double-click on the text icon with the SHIFT key held down.) When you use Reverse Extended Selection, the Workbench puts together a command line like "EXECUTE ReadPrint textfile." The normal Extended Selection scheme is reversed because these are all Project type icons, not Tool icons. The Workbench wants to run the Default Tool program of the first icon selected, using that project and then all the projects listed after. ■

box if the disk is not copy protected. If the disk copy protection tab is open, the words "Read Only" appear instead.

Subdirectories and files can be read from, written to, archived, and deleted. So, in the Status Box for Drawer, Garbage, Tool, and Project Type icons, there are four requesters. These requesters allow you to determine whether a directory or file can be written to, read from, or deleted, and whether it has been archived.

Below the Name and Status Boxes is the Comment Box. This is not found in Disk Type icons. However, Tool, Project, Drawer and Garbage Type icons have a requester which allows you to document the icon with a comment of up to 89 characters.

Load From Data

Below the Comment Box is an incredibly useful box called the Default Tool Box. This is found only in Disk Type and Project Type icons. We previously mentioned how it is possible to open a program with selected data already loaded. The Default Tool Box is the feature which allows you to do this.

If you have both Deluxe Paint and Photon Paint, you might try a little experiment. Load Deluxe Paint, and create an image. Save this image on a separate disk. Then close Deluxe Paint, and click twice on the icon of the image you saved. Deluxe Paint will open with your image already loaded.

Now, close Deluxe Paint, click once on your image's icon and open its Info Window as discussed above. In the Default Tool Box you will find some variation of the words "DeluxePaintIII:DPaint." Replace these words with the words "Photon Paint: PhotonPaint." Now, close your Info Window, and replace the disk containing Deluxe Paint with a disk containing Photon Paint. (But leave in the disk with your image.) When you click twice on your image's icon now, instead of Deluxe Paint, Photon Paint should start up with your image already loaded!

Diskcopy

In the Default Tool Box for Disk Type icons, the words "SYS:System/Diskcopy" appear. This allows you to drag a disk icon on top of another disk icon to copy the disk. If you use another disk copying utility program, you might try putting its name in the Default Tool Box instead.

Below the Default Tool Box is the Tool Types Box. Tool Types are parameters or features you usually determine through the CLI — window size, custom screens, anything you might type on a CLI line. The meaning of different Tool Types depends on the program you are running, so you experiment with them at your own risk! For example, in the Info Window for the Notepad icon, the Tool Type "WINDOW" allows you to determine how big the Notepad window will be and where it will sit on the screen. Another use of a Tool Type might be to tell the program where to look for data files. In the Info Window of Music-X's icon, for example, there is a Tool Type called PERFDIR which tells the program where to look for performances. ■

George Christensen and Rob Griffith can be found at Computer Showcase, San Francisco's all-Amiga store.

ON DISK:

ICON— The Program
Instant power over virtually all icon elements

By Aki Rimpilainen, AMIGA *Plus* Technical Assistant

The special ICON program we created for this issue's AMIGA *Plus* Disk can effortlessly change nearly all icon fields. Now you won't need to tediously search for all your icons through drawers of drawers and manipulate them one by one with the Workbench Info Window. ICON gives you a convenient way to modify a number of icon files quickly. Imagine that you have dozens of picture files with icons calling for the wrong paint program. That's a case for ICON.

CAUTION: You must be somewhat familiar with CLI or Shell to fully utilize this program. But if you know your way around Workbench without getting lost and if you dare to use the COPY command, you should be able to use ICON. It resides with its C source code in the Programming drawer of this AMIGA Plus disk.

To start the program from CLI, type: ICON — ironically, this program has no icon of its own. You'll see a short help screen. The ICON program commands will be explained in the article below.

The simplest use of ICON is to get information about an icon. To do this you must first type the command name ICON followed by the name of the icon file. You don't need to type the suffix .info because it is used only by icon files. For example, to examine the icon INSTRUCTIONS.info on your AMIGA *Plus* Disk, type:

```
1> Icon AmigaPlus5:INSTRUCTIONS
```

The screen now displays key facts about your icon — name, Type, Default Tool, Tool Types, image mode, coordinates, and stack size. Most of these fields can be changed with the ICON program. First, we'll change the icon to call a word processor instead of the generic text viewer More. To do this we need to place the name of the word processor in the Default Tool field with the following command:

```
1> Icon Amigaplus5:INSTRUCTIONS
D Transcript:Transcript
```

Double-clicking on the INSTRUCTIONS icon now calls the Transcript word processor with the text file loaded. Naturally, you can change the Default Tool field to call any appropriate application.

You can also swap your icon type from Project to Tool, or vice versa. Furthermore, you can create an icon of either of these types from Disk, Drawer, or Trashcan ▶

icons. This option is useful if you have a pretty icon you'd like to use for your own files — but it is of the wrong type. For instance, you want to use the Notepad icon (Notepad is the text editor residing in your standard Workbench disk's Utilities drawer) for your text files. To do this, first copy the file Notepad.info from your Workbench disk to another disk or directory (so you don't change your original icon) and then change the ToolType with the command:

```
1> Icon df1:Notepad T PROJECT
```

Now you have a Project-type icon almost ready to be used! Just use ICON's D option to define a correct Default Tool (a word processor), and then rename your copy of Notepad.info with the name of your text file and the suffix .info. For example, if you have a file called Text.doc, rename the newly created Notepad.info to Text.doc.info. Also, you can reverse this process by typing:

```
1> Icon df1:Notepad T TOOL
```

However, if you change your icon type, you might also need to modify its stack size. This is done with ICON's S option, which sets the stacksize with the value following the option. To get a stack of 5,000 bytes for the Notepad icon , you'd use the following line:

```
1> Icon df1:Notepad S 5000
```

Now let's take a look at the Tool Types array, which is mostly used by programs to pass parameters from the icon file to the main program. ICON has two commands for manipulating this array --- R will redefine it entirely, and A is for adding more Tool Types. These commands are followed by your new list of entries, separated with spaces. Finally, when your list is complete, terminate it with END. To test these options, double-click on Notepad icon, create a short text file, and save it on to a disk with the name Testfile.doc. Then use ICON to display the information for this file. You should see lines similar to this on the Tool Types section:

```
Tool Types  :
FILETYPE=notepad|text
FONT=topaz. 8
WINDOW=100, 10,300,100
```

These are the settings Notepad uses when you double-click on the Testfile icon. We'll change the second line to load a different font by using the R command:

```
1> Icon df0:Testfile.doc R
FILETYPE=notepad|text
FONT=garnet.9 END
```

Oops! We forgot the last line of the Tool Types array. Don't panic, you don't need to retype the whole command. Just add the remaining Tool Type with ICON's A option:

```
1> Info Testfile.doc A "WINDOW=
100, 10,300,100" END
```

We must surround the last entry with quotes, because it has a blank space between the numbers. Without them, ICON would add two new ToolTypes — WINDOW=100, and 10,300,100. After these changes, double-clicking on the Testfile.doc icon loads Notepad and your text with a new font.

For programmers, ICON has an option C, which takes an icon you specify and produces a C language listing of all related structures in the DiskObject (programming term for icons). This file can later be INCLUDEd in a custom program to create a desired icon file. However, only Tool icons and Project icons are supported. After typing option C, you must specify a name for the include file to be created. For example, to create a listing from Shell.info with the output going to file Data.h, type:

```
1> Icon SYS:System/Shell C Data.h
```

ICON supports both uppercase and lowercase commands. However "T" and "t" will both mean changing an icon type. But with PROJECT, TOOL, or END, the entire word must be either all lowercase, or all uppercase.

Also, you can perform multiple operations with one command:

```
1> Icon AmigaPlus5:INSTRUCTIONS
C Cdata.h D Transcript:Transcript
S 2000
```

This line will create a C language include file (Cdata.h), place Transcript as the Default Tool, and define a stack of 2,000 bytes. Be careful with options R or A, because missing END might result in an icon with too many, and wrong, "garbage" Tool Types.

Finally, if an error occurs, none of your changes made will be saved! You can type (with no arguments) the command: ICON. This will display a short Help message, and you can try again.

DiskObject Structure

What makes the ICON program possible is the Amiga's DiskObject structure. The following structure is an icon:

```
struct DiskObject {
UWORD         do_Magic;
UWORD         do_Version
struct Gadget  do_Gadget;
UBYTE         do_Type;
char          *do_DefaultTool;
char          **do_ToolTypes;
LONG          do_CurrentX;
LONG          do_CurrentY;
struct DrawerData  do_DrawerData;
char          *do_ToolWindow;
LONG          do_StackSize;
}
```

This icon structure has five special library functions associated with it — GetDiskObject and Get-Icon, PutDiskObject and PutIcon and FreeDiskObject. GetDiskObject allocates memory for the diskobject structure itself and its strings,and initializes this structure with information from an icon it reads from disk. PutDiskObject writes a diskobject to disk, creating an icon. FreeDiskObject frees the memory used by the diskobject and by the array of strings used for the Tool Types entries of a Project Type icon, among others. If you use GetIcon, you must allocate the memory for the diskobject structure and a FreeList structure yourself, then free this by hand.

The do_Magic and do_Version elements hold constants which the Workbench uses to recognize the icons. The gadget structure do_Gadget holds the icon's image(s), while the do_Type specifies the icon type — WBDRAWER, WBDISK, WBTOOL, WBPROJECT, WBGARBAGE, or WBKICK. The do_DefaultTool string and the array of strings do_ToolTypes hold the respective character strings. The do_CurrentX and do_CurrentY elements hold the icon position. If the value NO_ICON_POSITION is used here, the Workbench will place the icon in an open spot. The DrawerData structure is used by Drawer, Disk and Garbage type icons to hold size and position info about the drawer window (in a NewWindow structure). The do_ToolWindow points to a default I/O window specification which the tool will open. The do_StackSize holds the stack size needed by the program in question. These last two elements are only used by Tool type icons. ■

Focus Video

Real-time video effects and animation breakthrough

REVIEW BY JOEL TESSLER

++++

Now you can modify a batch of image frames simultaneously in real-time — no more tedious one-frame-at-a-time video animations.

FIGURE 1

FIGURE 2

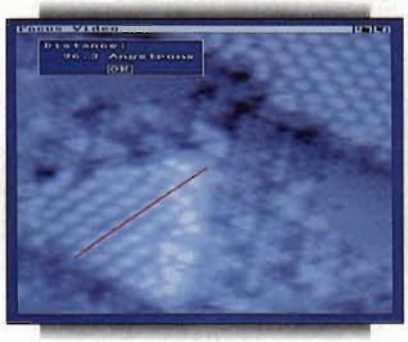

FIGURE 3

FIGURE 4

In 1985, when A-Squared first introduced their Live! framegrabber ($450 for the A2000), the hardware represented a true breakthrough in the Amiga's ability to work with video in real-time. Previously, real-time digitizing of video sequences had been available only to the high-end elite. Elan Design's Invision added an arsenal of Live! special effects. Now Eric Gullechsen and Pat Gelband of Nova Research have broken new ground with software that's significantly different from anything else that works with framegrabbers such as the Live! board.

With **Focus Video**, Amiga users can now do very sophisticated image processing, animation and special effects for a fraction of the costs needed with other computers. Focus Video lets you capture and modify a *group* of image frames simultaneously. There's no slow, tedious one-frame-at-a-time operations.

Focus Video also supports hardcopy output. Files can be printed or saved as PostScript grayscale or .ps files, PostScript color separations (CMYK) and Sun Rasterfiles.

Focus Video can fit itself into many application needs. Aside from graphics and animation, the software is capable of some exotic scientific work. Its Calibrate and Distance commands in the Tools menu proved to be just the right stuff for a group at Stanford University, where scientists are using Focus Video to measure distances on images from their scanning tunneling electron microscope! Other possible applications include remote sensing, industrial inspection, publication and motion analysis.

If you require 640 x 400 overscan or high resolution 16-color frame grabs, Focus Video may not be for you, but if you already own a Live! board you ought to be smiling by now. Actually, Live! is only supposed to be necessary for time-lapse multiple images. Most Focus Video functions should work on any IFF image. But I found I got my best results with this software when I used it to originate images in conjunction with Live!

Focus Examples

To give you a better idea of all that

Focus Video does, I will describe how I used it to create some high-tech baseball cards. I grabbed a photo using a videocamera and the 32-frame averaging option from the Live! menu. I then used the Contrast adjustments to make the image as clear as possible, and stored the image in the hold buffer for safety.

In *Figure 1* I was trying for a pencil sketch look, which I achieved by using the Erode Filter twice. Now the image was too bright and the edging needed more enhancement, so I used the Hold menu's Subtract option to take care of the brightness and soften the edges. Next, I used one of the default convolution masks (Convolve Sharpen) located in the Filter menu and then used Negative from the Colors menu.

After clearing the screen and restoring the image from the Hold buffer I created *Figure 2* in one clean step. Invoking the Pseudocolor command in the Colors menu, I simply adjusted the slider gadget to obtain the desired effect.

After this Focus session, I constructed still pictures in Deluxe Paint III and then loaded the images into Photon Paint II for final framing. I also put together an animation, using the 32-frame averaging option to digitize the AMIGA *Plus* logo directly off the magazine cover. Processing this image with the 3-D Bas Relief filtering option produced the embossed effect in *Figure 3*. Then I loaded the image into DPaint III to create both a 20-frame animation and a 600-frame animation (*Figure 4*). The 3-D Bas Relief look combines with the scrolling AMIGA *Plus* background for a subtle but rich scene.

Focus Tour

The Focus Video main screen includes a Load4 option for loading four separate picture files at once into a single four-way screen — all you have to do is type in the filenames. The Export feature is primarily geared towards desktop publishing and supports four-color or gray-scale PostScript, TIFF 24, or Sun Rasterfile format. Some other options include: invert, mirror, registration marks, frequency (lines per inch), spot, screen angles, and undercolor.

The Live! menu controls the incoming video signal as it makes its 15 frames-per-second journey to the Live! board. Selecting Live! BW displays the signal in black & white at the default resolution of 320 x 400, a useful preview mode for seeing what the video looks like before you start making any changes.

The unique Average option lets you combine and average frames as they are being captured in groups of 4, 8, 16, or 32 frames. By using this technique, fluctuations in the video signal are effectively smoothed out. In addition, the differences between bright and dark areas are enhanced, which results in a sharper, cleaner image and significantly improved overall contrast. Best results are achieved with a static image on a camera stand. However, some very interesting motion blur effects come from capturing live video in the 4-frame or 8-frame averaging mode. Beyond 8-frame averaging, images tend to be a bit too busy.

Into Action

In the Live! Menu, the Animation option brings up a self-contained submenu that looks much like a VCR control panel, with options like Record, Stop, Frame, Delay, Live, and Play. By choosing Live! you immediately see the real-time video coming in. Now by selecting Record, the incoming video frames are recorded into RAM. Clicking the left mouse button on Stop completes the operation. The function panel now operates like a VCR playback system for reviewing your captured frames. Animations previously saved may also be loaded.

The real power of Animation doesn't become apparent until combined with some of the image processing tools available in the Filter, Colors, and Hold menus. With a little experimentation you can produce many eye-catching effects. For instance, try using the Erode option from the Filter menu five times on the first frame, three times on the second frame, and one time on the third frame. The resulting sequence would show an outlined blur resolving itself into a focused image.

Another use for Animation is side-by-side comparisons. By capturing four frames of the same image a different process could be performed on each frame. These four frames could then be loaded into one four-way screen using the Load4 option.

Beyond Framegrabbing

Most of the image-processing functions can be found in the Filter, Colors, and Hold modules. Among the many options in the Filter menu you can Sharpen an image to emphasize edging, or use Median and Smooth for significant reduction in noise. From the Color module you can tune colors with Palette or change colors on the fly with Pseudocoloring. Other options include Brighter, Darker, Negative and Gradient.

The Hold menu can manipulate and combine images in a variety of ways. For instance, an image can be Stored in the hold buffer and combined with another image loaded from your drive. At this point you could choose to Combine the two images, or use the Boolean operations — Min, Max, And, Or, Xor. The many combinations available in the Hold menu can be used with any of the options available in Color and Filter. ■

Joel Tessler uses the Amiga to create 40-foot graphic displays at Miami Stadium. His '89 Super Bowl work was spotlighted in the first issue of AMIGA Plus.

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ON DISK

Getting Started With HAM Graphics

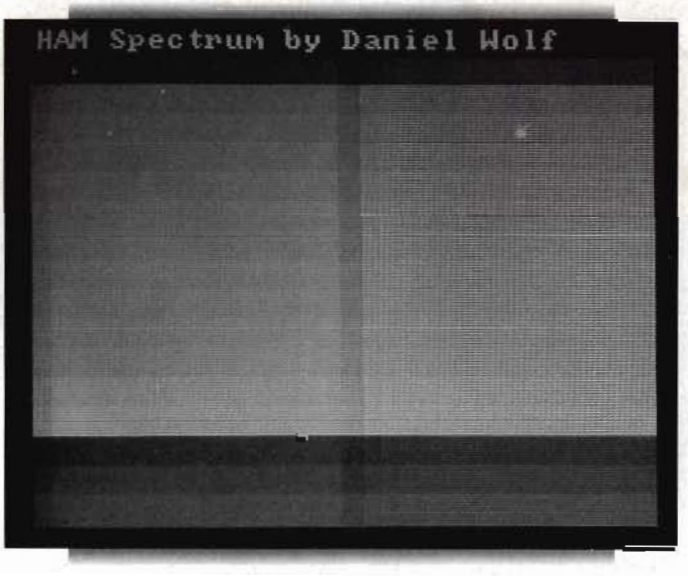
You can put 4,096 colors onscreen at once

BY DANIEL WOLF, PHD

Introducing the assembly language techniques for using 6 bit-planes to program the Amiga's smoothest color shading.

Bit-plane techniques permit a picture to be made up of layers of arrays of on/off bits. With only one bit-plane, each pixel can be either black or white (or any two convenient colors, such as green/white or amber/white). That's the typical appearance of many computer screens. With two bit-planes, each pixel corresponds to two bits stacked upon one another. The picture can be organized in four colors.

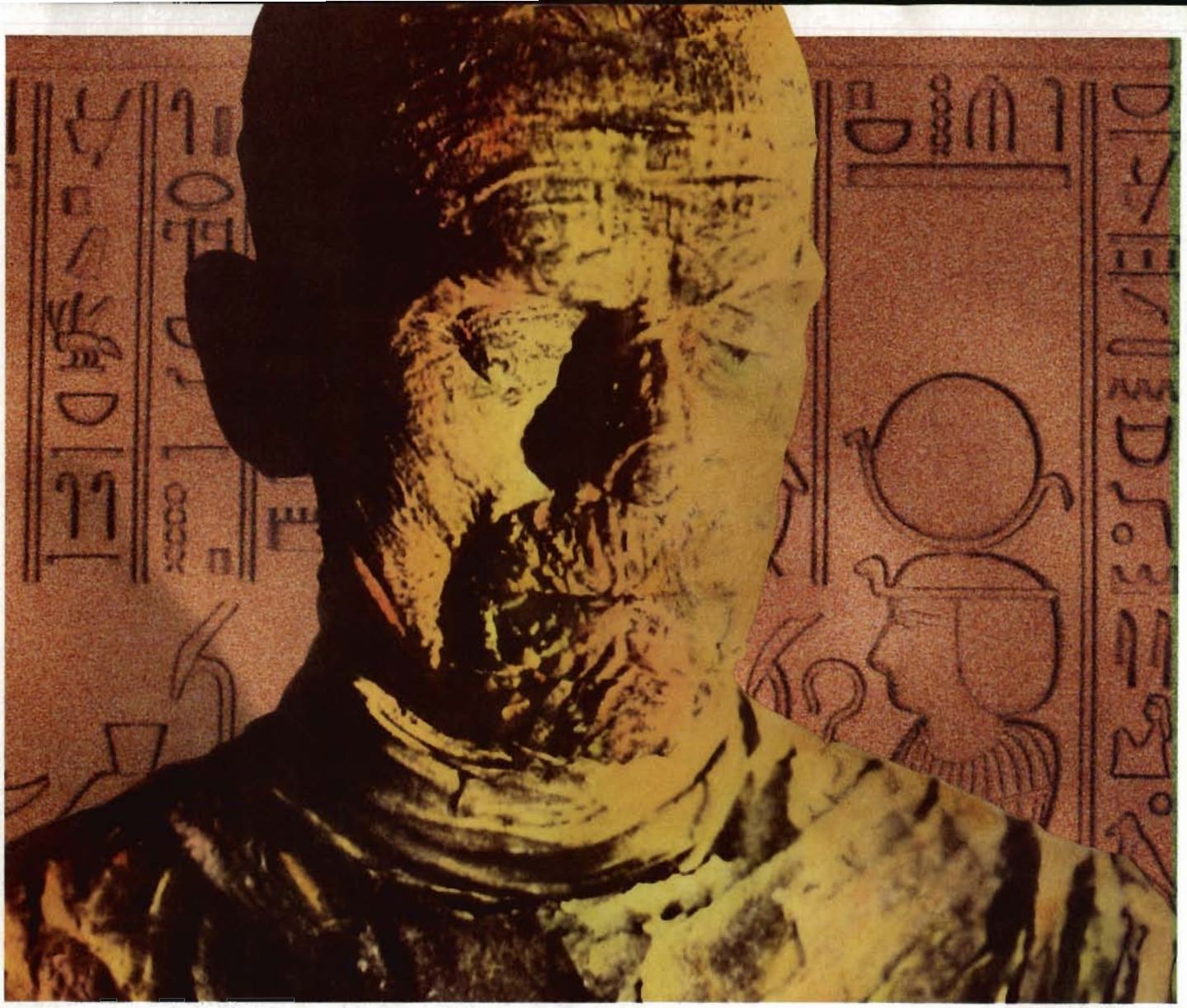
The Amiga always gets its color information from bit-planes. You can have either high or low resolution screens (640 or 320 bits wide) with 1 to 4 bit-planes. Each bit-plane doubles the number of available colors. With the low resolution screens you can also work with 5 bit-planes. As in the C64, the reason for restricting the 5 bit-plane Amiga screens to low resolution is time limitation. The video circuitry of the Amiga simply can't keep up with reading 5 different bits for color information as fast as the video beam sweeps across a high resolution screen.



Spectrum — 528 HAM colors onscreen cycling continuously.

Moreover, the Amiga data bus to memory is shared between the processor and the video chip. The processor gets the time "in between" pixels. It's a great idea for synchronizing a computer to video and one reason that the Amiga is an ideal low-cost graphics system. Amiga video uses sophisticated bit-plane bus-sharing circuitry and its color graphics are similar to those on much more expensive systems. The Amiga's blitter video chip draws lines and other shapes with hardware, not programming. Its job is simplified by the separation of bit-planes in memory. A colored line can be drawn by setting the correct bits in one bit-plane and copying that bit-plane to others.

With bit-planes, each colored pixel gets its color value from a 1 to 5 bit number, representing the binary number obtained from the on/off bits in the planes making up an image. Each bit-plane is a separate area of memory set aside to represent video pixels. On the Amiga, of course, all



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video bit-planes must reside in Chip RAM. That's the only part of memory the video chip can see. Each video dot's bits are located at exactly the same position in the bit-planes. If a programmer knows where each bit-plane's memory array starts, it is easy to manipulate the individual bits corresponding to a single dot's color value. With a little programming skill you can turn individual bits in memory on and off to affect a dot's color.

Here's HAM

Legend has it that HAM was not even in the original specifications of Amiga video chips. After the chips were designed, some clever Amiga engineers noticed you could use this additional graphics mode...

HAM stands for Hold And Modify, which doesn't tell you much. The advantage of HAM is that you can use all 4,096 colors available in the Amiga simultaneously on a low resolution (320 width) screen.

HAM also has two disadvantages. The straightforward bit-plane story I just told you goes out the window. Also, your free "random access" choice of colors for each and every pixel is compromised. The color of a dot is now partially controlled by neighboring dots to the left.

HAM is a graphics method unique to the Amiga. When we work with HAM we still work with bit-planes. But the simple layering of bits from different planes to make up a pixel color isn't so simple now. I'm only going to discuss HAM using 6 bit-planes — the maximum. The 6 bit-plane HAM methods are the most robust and complete, so they should more than get you started. For 5 bit-plane HAM, I refer you to the "Amiga Hardware Reference Manual" published by Addison Wesley.

Hold And Modify

The 6 bit-planes used in a HAM graphics screen are divided into two groups. There are 4 regular bit-planes which behave just like any 4 bit-plane Amiga low resolution screen. The 2 additional bit-planes control the behavior of colors derived from the first 4. Were you to ignore the 2 HAM-specific color control bit-planes, you could draw on a HAM screen just like a 16-color screen. You can use the ReadPixel and WritePixel routines in the Graphics library to demonstrate that. The magic of HAM really comes from use of the 2 color control bit-planes. Their bits control the Holding And Modifying of colors. Let's look a little deeper into HAM color control in the Amiga.

On a 16-color (4 bit-plane) screen each pixel's combination of 4 bits is used as a number from 0 to 15 to select which of 16 colors appears at an individual dot on the video monitor. The group of 16 colors is called a palette and each of them can be selected from among the Amiga's full set of 4,096 colors. The full set of colors is really a set of 12-bit numbers — 0 to 4,095 decimal, 000000000000 to 111111111111 in binary.

In each 12-bit number there are 4 bits each corresponding to the amount of red, green, and blue in that color. The 000000000000 color corresponds to black, the 000011110000 color corresponds to a bright green. The 4 bit-planes can't specify a 12-bit color, so the palette holds 16 choices out of the 4,096 12-bit colors. The LOADRGB4 routine in the Graphics Library will build this palette from an array containing the 16 12-bit color definitions.

You have these same palette options with a 6 bit-plane HAM screen. But the 2 additional color control bit-planes give the whole operation a twist. There are 4 combinations of 2 bits at each pixel in the 2 extra bit-planes. They can accomplish four functions at each pixel:

1. 00 means "Treat the dot like an ordinary 4 bit-plane dot."

2. 01 means "Hold the 12-bit color of the dot immediately to the left of this dot and use the other 4 bit-plane bits to make a new 4-bit blue value in the 12-bit color at this dot."

3. 10 means "Hold the 12-bit color of the dot immediately to the left of this dot and use the other 4 bit-plane bits to make a new 4-bit red value in the 12-bit color at this dot.

4. 11 means "Hold the 12-bit color of the dot immediately to the left of this dot and use the other 4 bit-plane bits to make a new 4-bit green value in the 12-bit color at this dot."

Now you're starting to see why HAM is a rather strange beast. It's a hybrid of simple bit-plane color control and full 12-bit color control. You are limited to changing only the 4 red bits, or the 4 blue bits, or the 4 green bits of a 12-bit color as you move from left to right across the width of the screen.

If you used HAM paint programs, you can now comprehend why you sometimes get odd one-pixel or two-pixel wide borders where you didn't expect them. It's impossible, using HAM, to draw a white vertical bar right next to a black one unless white and black are two of the colors in your 16-color palette.

If it's fine shading of colors you're after, HAM gives you much more control than any other graphics mode. An arbitrary color change from one 12-bit color to another can take up to three pixels along a horizontal line. If you're using the HAM color control bits in the 2 extra bit-planes you can change first the red, then the green, then the blue color values in three successive pixels drawn along a horizontal line. I should mention that it's perfectly okay to have no colors at all in your color palette (all black, for example) and just use the HAM control planes to manage all the coloring. The 16-color palette makes things much easier.

Two Dot Example

We'll assume that a nice pure red is color 1 in our 16-color palette. Let's say we use the WritePixel routine to plot a single dot of this pure red

color at position 160,100 in the center of a HAM screen. A typical code fragment looks like

Figure 1

```
;we opened a window earlier and saved its pointer in a long word
;named WINDOW, we also opened the graphics library
MOVE.L WINDOW,A0        ;get the window structure's pointer
MOVE.L WINDOW.RASTPORT(A0),A1   ;find the RASTPORT for this
window
MOVEQ JAM1,D0           ;get set for simple pixel drawing
MOVE.L GFXBASE,A6       ;pointer to the graphics library
JSR _LVOSETDRMD(A6)     ;set the draw mode
MOVE.L WINDOW,A0
MOVE.L WINDOW.RASTPORT(A0),A1
MOVEQ #1,D0         ;choose color #1
JSR _LVOSETAPEN(A6)     ;set the drawing pen to color #1
MOVE.L WINDOW,A0
MOVE.L WINDOW.RASTPORT(A0),A1
MOVE.W #160,D0          ;x = 160
MOVE.W #100,D1          ;y = 100
JSR _LVOWRITEPIXEL(A6)      ;now plot the color #1 dot there
JSR _LVOWRITEPIXEL(A6)
```

All these examples apply to a non-interlaced screen (320 x 200). The pixels at the right of the one we plotted will all be affected by its color unless we similarly plot actual palette colors at each of the dots up to the right hand edge of the screen. Now that we've got one non-HAM dot to work with, we can exercise it as we move to the right. The critical part of the code fragment which follows is the color value we place in D0 before we call the SetAPen routine. For this example, just imagine that the red dot we plotted is the 12-bit color value of 111100000000 — bright red with no green or blue. It is simply the 12-bit color value chosen as color 1 in our 16-color palette for this screen and window.

With a nice red dot in the middle, we can make the next pixel to the right become any color which differs in the red, green, or blue value. We could make the next color a nice bright yellow by Holding the red part And Modifying the green to make 111111110000. We could make a nice bright purple by Holding the red And Modifying the blue to make 111100001111. We *cannot* make white (111111111111) at the next pixel this way. To make white we need two pixels of this kind of Hold And Modify operation. The code fragment for making the next pixel yellow:

Figure 2

```
MOVE.L WINDOW,A0
MOVE.L WINDOW.RASTPORT(A0),A1
MOVEQ #$3F,D0           ;see following text for explanation
JSR _LVOSETAPEN(A6)
MOVE.L WINDOW,A0
MOVE.L WINDOW.RASTPORT(A0),A1
MOVE.L #161,D0          ;x = 161 just to right of last pixel
MOVE.L #100,D1
```

The important thing to notice is the value of $3F used for the drawing pen color. The 3 corresponds to the 2 bits for the color control bit-planes. The 3 commands that this pixel Hold the color of its left neighbor And Modify its green value with the other four bits. Those four bits are all ones (1111 = $F). The F part of the drawing pen color turns on all 4 bits of the green for this pixel. What was a 111100000000 color value at 160,100 becomes a 111111110000 color value at 161,100. The upper nibble of the drawing color controls the 2-color control HAM bit-planes. The lower nibble gives the bits which modify the color of the pixel to the immediate left.

Now that we have a bright yellow pixel to work with, we can make the next pixel white by modifying the blue value to 1111. Use a value of $1F as the drawing pen color. The 1 specifies "modify blue" and the F turns all 4 blue bits on. The result is a pixel at 162,100 with a 12-bit color value of 111111111111 (white!).

If we want the pixel at 162,100 simply pure green, then use $20. That will order HAM to change the red (upper nibble is 2) value to (lower nibble value) 0. That leaves the 12-bit color value at 000011110000. Once you have a pixel of known 12-bit color, you can use the drawing pen color to modify its red, green, or blue portions as you move to the right across the screen. That is pretty good color control, albeit complicated.

If the upper nibble of the drawing pen color is set to 0, you are simply drawing with a palette color (the lower nibble sets which one of the 16 palette colors). There are four choices of the upper nibble value — 0,1,2, or 3. Those four choices tell HAM which kind of color modification you want: none, blue, red, or green. The lower nibble's 4 bits are either a palette color (1 of 16) or the exact bit combination used to modify the neighbor's 12-bit color value.

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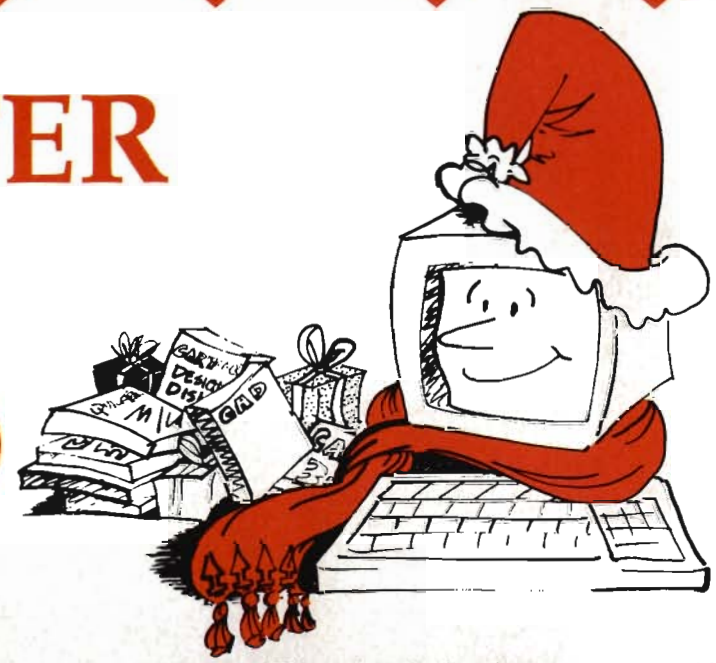

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The neighbor to the left is unaffected by all this. That left neighbor just has a lot to say about the dot you are drawing when you use 1, 2, or 3 as the upper nibble of the drawing pen color. If you choose your 16-color palette wisely you can get quite a variety of the Amiga's 4,096 colors all onto one HAM screen. You can't always exactly choose neighboring 12-bit color values, but you can come close.

More HAM Details

HAM graphics have two other important features. The leftmost pixel on any line of a HAM screen starts with a 12-bit color value of 000000000000 (pure black) unless you do something about it. It is usually wise to plot some palette color value at the leftmost (x = 0) position on every line, so you have control over other colors along the line. You are also limited to low resolution (320 pixels wide) screens. Of course you might try slightly wider screens with overscan, but the high resolution 640 pixel screens are out of the question. Frankly I think 320-wide screens with hundreds of colors look nicer than 640-wide screens, which are admittedly sharper but limited to 16 colors. Smoothness of color transitions in HAM screens makes them appear sharp despite the 320 pixel width limitation.

In my code examples above I stressed radical color changes in adjacent pixels. You needn't change all four bits of a pixel's red, green, or blue values at once. When you change the color values a little at a time you get the most out of HAM — very smooth shading. You can also take advantage of a pixel color's mixing effect on colors further than one pixel away.

HAM Streaks and FAST Tricks

Because the Hold And Modify technique makes pixels partially dependent on the colors of pixels to their left, HAM has the potential to make a complete mess of horizontal streaks on the screen. After you finish a HAM graphic construction, just opening a window on the HAM screen will make it appear rather strange as the colors of the window's borders stretch their influence to the right. The same applies to menus and any other graphics which land on top of a HAM screen.

If you are drawing a horizontal line on a HAM screen you can use this effect. Simply plot a red dot, for example, by using color 1 from the palette we assumed, then draw successive dots to its right with, say, $30. That'll leave the red color unchanged since the upper nibble of 3 says to change the green value, but the lower nibble has a 0 for the green value. You might use the streak effect in creative ways.

The Graphics Library has a DRAW routine to draw lines from one point to another. You might plot a pure red pixel using a palette color, then DRAW a horizontal line to its right with $30 as the drawing pen color. That would leave a red horizontal line. Later on you can re-plot that one red pixel with a different palette color and the color of the whole line will immediately change. The blitter chip does pretty fast line drawing, but not that fast!

Game HAM

Game artists can take advantage of this HAM property and do some really slick animation by simply changing the palette colors of individual pixels. Imagine if you use this technique with a palette color of black to start with. Later on you can plot one pixel of a real palette color and make an entire line appear, change colors, and then disappear by returning to black. Sounds like just the thing for an arcade game "laser shot." ■

Daniel Wolf, PhD is co-author of the COMPUTE! Books "Amiga Machine Language Programming Guide" and an independent software developer in Santa Maria, California.

ON DISK:

Spectrum 528

On this issue's AMIGA Plus Disk, you'll find Spectrum, a program that opens a HAM screen with a borderless "backdrop" window that provides a rastport in which to draw.

The disk includes the Spectrum.asm source code — plus the stand-alone Spectrum program which you can run by simply double-clicking on its icon in the Programming drawer. Naturally, Spectrum can be run from the CLI as well.

In this HAM demonstration program, one of the vertical strips is at the far left of the screen and the other is near the center. Each little rectangle in the strips is colored by a single palette color. For the palette I used all 16 possible shades of green.

To the right of each little rectangle in the vertical strips there's a horizontal strip of rectangles shaded solely with HAM-processed colors. Each horizontal strip has all 16 red-modified or blue-modified colors.

Since a rectangle in green (from the palette) is immediately left-adjacent to each horizontal strip of HAM-processed rectangles, the horizontal strips take on mixtures of red and green or blue and green. A total of 512 HAM-processed rectangles adjacent to rectangles of 16 palette colors gives a total of 528 color shades.

Color cycling the palette alone makes all the other 512 rectangles change colors at once. The program has a few subroutines that draw all the rectangles with the RECTFILL routine from the Graphics Library. Also note how HAM is set up in the NEWSCREEN structure in the VIEWMODES slot. I made some rectangles overlap, but only to make the coding simple.

Populous

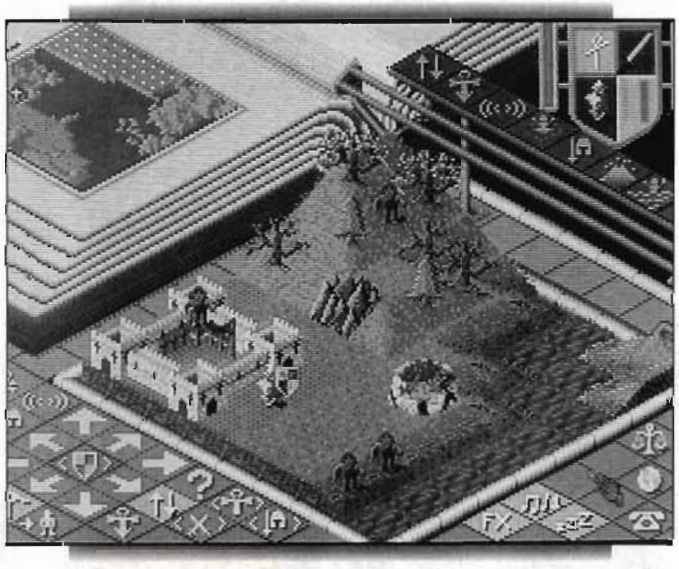
Smite thine enemies with the wrath of God

REVIEW BY CAROLYN CUSHMAN

++++1/2

Does the urge to play God grab you from time to time? Does Armageddon appeal to you? If so, Populous is for you — just about the most fascinating and addictive game for the Amiga yet.

Play God in **Populous**, the hot new world-building game from Electronic Arts. On hundreds of worlds, Good battles Evil for total control — and as one of the deities involved you have at your disposal earthquakes, floods, deadly swamps, volcanos, zealous knights, and even Armageddon.



God in action on a Populous world.

With a simple point-and-click on the world's surface, you raise or lower land so your people can build and multiply. The more worshippers you have, the more godly manna power you develop.

The specific tactics required vary with the type of terrain, the number of people you have, and the actions you are allowed to take. On some worlds, you have the full range of disastrous Divine Interventions at hand — on others you may be limited to just one or two. Your opponent may have different limitations, and you must plan accordingly. If Evil can only flood, you'd better build on hills.

There are three ways to play. You can set up a Custom game, play in single-player Conquest mode, or two players can start their religious wars via modem or null-modem cable.

The ingenious layout of the playscreen suggests that God is playing a tabletop game, with all the little pieces set out, ready to be controlled with a click of the mouse. In one corner, the Book of Worlds lies open, showing a large map of the current world. Click on an interesting point on the map and you move there on the Closeup Map, a larger page at the center of the screen. Here you can watch your people and their settlements, and build new land.

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(*As we went to press, EA released a $29.95* ***Promised Lands*** *disk of hilarious additional worlds to conquer -- including a hacker world, silly world, Lego world and Wild West world.* -- + EDITORS)

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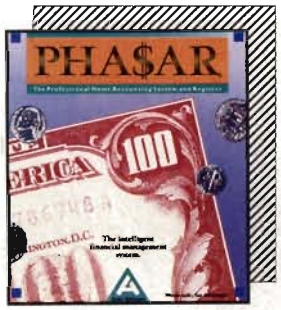

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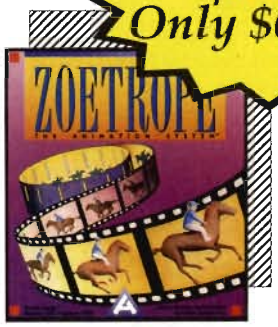

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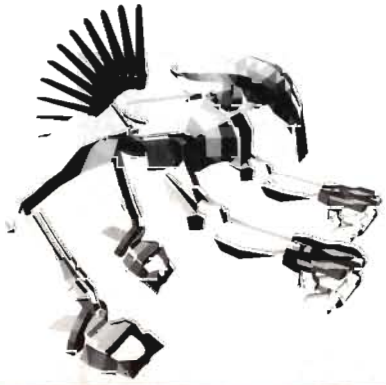

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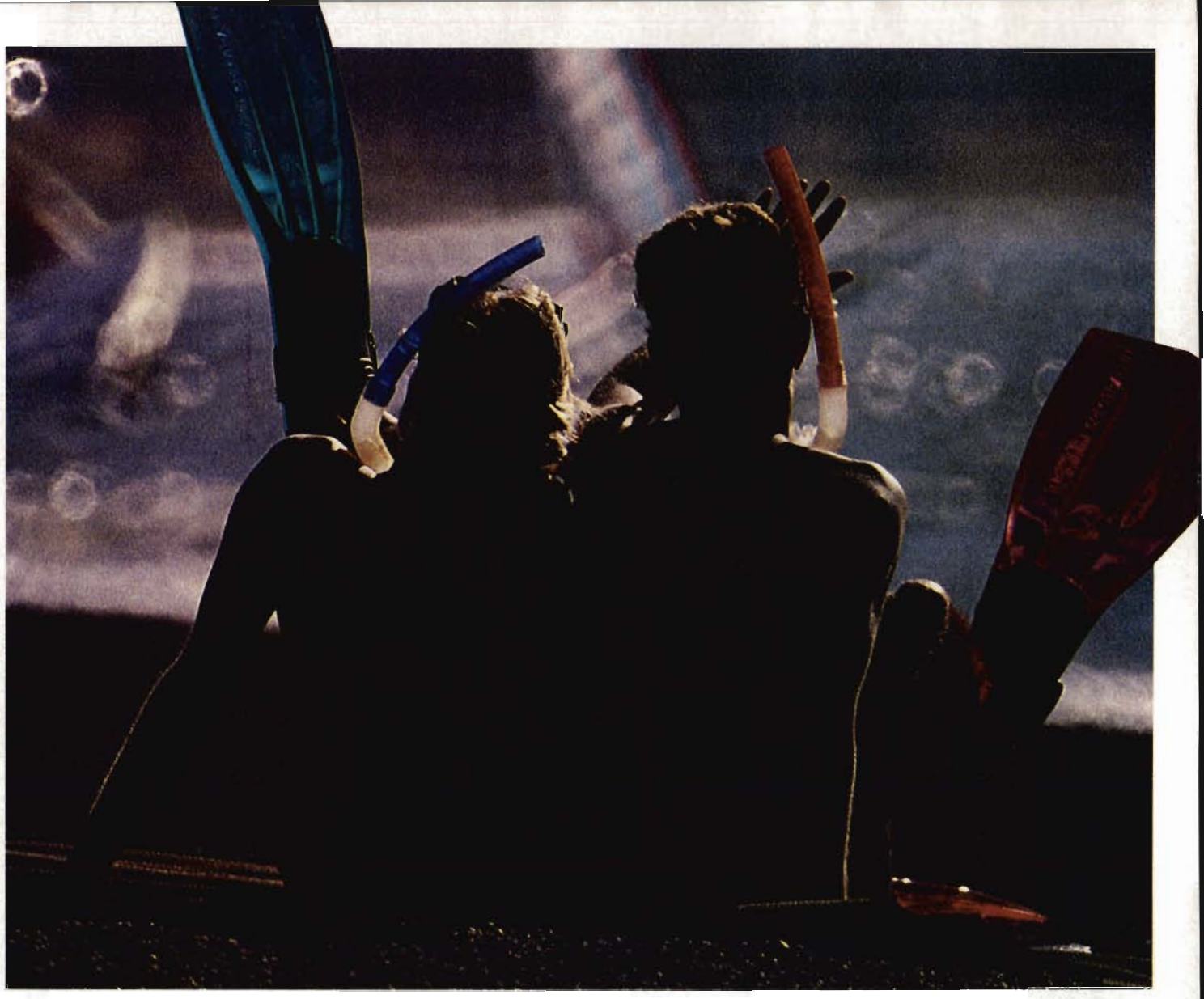

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Gone With The WINDows

Continued From Page 58

menu and lets the user select an item from the list) and passes it several parameters:

Screen — the screen in which the menu is displayed. For Gone With The Windows, this is the Workbench screen.

List — the linked list to be displayed. For Gone With The Windows, this is the list of Workbench windows.

Displayroutine — a pointer to a subroutine (that you provide) which will draw a given list item at given coordinates. This way, ScrollingPopUpMenu() can display the items in the menu without knowing what they are.

Itemheight — the height given to each item when displaying the list.

Itemwidth — the width given each item.

Count — the number of items to display at a time. The rest will be hidden above and below the arrows.

ScrollingPopUpMenu() takes this information, opens a window, and displays a menu in the window. The width of the window is simply Itemwidth. The height is Itemheight * Count (which gives the height of the viewed section of the list) plus the height of the two arrows for top and bottom. The routine calculates the position of the window by looking at the current position of the mouse, which is stored in the screen structure. It positions the window so that the mouse will be in the center of it and sets the window's screen pointer to point at the passed screen.

Intuition Messages

Intuition communicates with a window by sending it messages. These messages notify the window whenever the user has clicked on a gadget, selected a menu, put a disk in a drive, and more. The window identifies which kind of messages it wishes to receive by setting IDCMP flags.

For this window, we need to listen for three types of messages: MOUSEBUTTONS, MOUSEMOVE, and INTUITICKS. MOUSEBUTTONS lets us know every time a mouse button is clicked in the window; MOUSEMOVE lets us know whenever the mouse is moving, so we can follow it; and INTUITICKS is a clock signal that awakens us at a regular interval.

ScrollingPopUpMenus opens the window and draws arrows at the top and bottom. The list is displayed in the middle by calling the routine draw_list() which fills in the area with white (pen 1) and calls the supplied Displayroutine for each item it displays. A second routine, complement_item(), is called to highlight the menu item currently under the mouse. Complement_item() simply draws a rectangle over the item in COMPLEMENT mode, inverting all of the colors. Later, to deselect that item, complement_item() will be called a second time to invert the colors back to normal. Then, ScrollingPopUpMenus() waits for Intuition messages. Here is how it responds to each type:

One set of list handling routines can work on all types of linked lists.

MOUSEMOVE — Read the position of the mouse and determine one of four scenarios:

1. The mouse is outside the window. Close the window down and leave, returning a NULL, or 0, pointer.
2. The mouse is over one of the arrows. If it just moved there from a highlighted item, deselect that item with the routine complement_item().
3. The mouse is over the same item it was over last time. Do nothing.
4. The mouse has moved over a new item. Select that item with the routine complement_item(). If it just moved there from a highlighted item, deselect that item with the routine complement_item().

MOUSEBUTTONS — The user has clicked on a mouse button. Close the window and return the currently selected item, if such exists, or NULL for none selected (the mouse must be over an arrow.)

INTUITICKS — This message is only of importance if the mouse goes over one of the arrows. There is a variable, "topdisplay," that points to the first item in the list displayed in the menu. If the mouse is over the up arrow, topdisplay changes to point to the item preceding it in the list and redrawing the list by, scrolling it down one with a new item at the top. If the mouse is over the down arrow, the reverse is true.

Opening Trick

One slight programming problem still exists, though. When Intuition opens the window for the Scrolling Pop-Up Menu, it waits for any mouse button that is down to be released. Unfortunately, we'd like the menu to appear when the mouse is pressed down and not wait for it to be released. So, Intuition needs to be tricked into believing that the mouse has been released so it will open the window immediately.

We can accomplish this by inserting a mouse-button-up event in the Amiga's input device stream. The input device handles input events coming from the keyboard, mouse, AmigaDOS and an internal timer. It merges them and passes them on to Intuition. Additionally it provides a mechanism for external programs to read events from the input stream (hotkey programs that intercept keystrokes do this) and insert events into the input stream, which is what we are interested in.

As it turns out, inserting an event in the input stream is quite simple. Open the input device (using standard protocol), send it a message with a false button up, and close the device. Communication with devices is done via message passing. So, the first thing to do is open a message port using the command CreatePort().

```
struct MsgPort *ioport;
ioport = (struct MsgPort *)
CreatePort ("let's fool intuition",0);
```

CreatePort() creates a message port with the name "let's fool intuition," in-

serts it in the list of message ports, and returns a pointer to it. If it is unable to allocate the port, 0 is returned. Then, we need a message to send to the input device. Use the command CreateStdIO() to create it:

```
struct IOStdReq *ioreq;
ioreq = (struct IOStdReq *)
CreateStdIO(ioport);
```

CreateStdIO() allocates the memory for a new I/O request message and initializes it. It inserts the supplied message port in the message as the reply port, so the device will know where to return the message. If CreateStdIO is unable to create an IOStdReq message, it returns 0.

We can use the I/O request message in conjunction with the OpenDevice() command to open the input device:

```
OpenDevice("input.device",0,ioreq,0);
```

If OpenDevice is not successful, it returns an error number, otherwise it returns 0 and initializes the message to talk with the input device. Now, we are ready to send our phony message.

The I/O request message is a generic type used for all cases of communicating with devices. It doesn't have a place to put parameters that are specific to a particular device. The input device needs to know about mouse movement, keystrokes, etc., so it has its own structure, InputEvent, which is pointed at by the I/O request message. Here's how we set it up:

```
struct InputEvent event;
event.ie_Class =
IECLASS_RAWMOUSE;
event.ie_Code =
IECODE_LBUTTON|
IECODE_UP_PREFIX;
event.ie_X = 0;
event.ie_Y = 0;
```

By the way, putting values in the ie_X and ie_Y fields make the mouse pointer jump around. The ie_Class field is set to IECLASS_RAWMOUSE to indicate this is a mouse event and ie_Code is set with the proper flags to indicate the specific action is the left mouse button being released.

Finally, set the IO request message to write a command, make it point at the InputEvent, and send the message with the DoIO() command:

```
ioreq->io_Command =
IND_WRITEEVENT;
ioreq->io_Length = sizeof (struct
InputEvent);
ioreq->io_Data = (APTR) &event;
DoIO(ioreq);
```

That sends the phony mouse-button-up message. All that remains is to clean up:

```
CloseDevice(ioreq);
DeleteStdIO(ioreq);
DeletePort(ioport);
```

Gone With The Windows

Gone With The Windows is a simple program. Most of its work is actually done by ScrollingPopUpMenu. Gone With The Windows just opens a window with two gadgets, one to bring a window to the front, the second to send a window to the back. When either of these gadgets is clicked on, ScrollingPopUpMenu() is called:

```
selectwindow = (struct Window *)
ScrollingPopUpMenu(
window->WScreen,
window->WScreen->FirstWindow,
draw_window_title,8,100,4);
```

The variable "window" points to the Gone With The Windows window. The variable "selectwindow" is a window pointer that receives the window selected by the user.

For the screen parameter we are passing the Workbench screen, accessed by the expression window> WScreen. The second parameter is the list from which to select. In this case, it is a list of windows. Since this window list belongs to the screen that the Gone With The Windows window is in, we can simply access the window list from our window with: "window->WScreen->FirstWindow".

In order to display the title of a window in the scrolling menu, a routine is provided:

```
void
draw_window_title(rastport,window,y)
struct RastPort *rastport;
struct Window *window;
short y;
{    if (window->Title)
{ SetAPen(rastport,2);
Move(rastport,2,y+6);
Text (rastport,window->Title,
strlen(window->Title));    }
}
```

This routine is passed to ScrollingPopUpMenu() as the Displayroutine parameter. When the Scrolling Menus routine draw_list() draws the visible menu options, it calls this routine and hands it a pointer to the RastPort (the graphic object to draw into) of the popup window, the item to draw, and the vertical position in the RastPort at which to draw. Notice that the item to draw is actually a pointer to a window, not some generic list item. The Scrolling Menu routine thinks it is dealing with just a generic list structure, but our drawing routine knows that this is in fact a window.

Finally, the three last numbers passed to ScrollingPopUpMenu() are the height of each item (8, since it is text,) the width of the item (100 to display about 12 letters of each window title) and the number of items to display at one time (4, so it's easy to have more items than there is room for and thereby show off the scrolling.)

Now that the user has selected a window with ScrollingPopUpMenu(), one of two actions can take place. If the gadget that was clicked on was the window to front gadget, WindowToFront(selectwindow) is called. If the gadget that was clicked on was the window to back gadget, WindowToBack(selectwindow) is called. ■

Melissa Jordan Grey is president of Blue Ribbon Bakery, which publishes Todor Fay's newest Amiga programs, Who! What! When! Where! and Bars & Pipes.

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ART

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HARDWARE

M.A.S.T. Peripherals Memory and Storage Technology (M.A.S.T.) has plenty of exciting peripherals. The **Enhanced Unidrive** is a super-slimline floppy drive with many useful features, including an LED track counter, read/write indicator, pass thru, low power usage, and a built-in virus deterrent that protects track 00 from unauthorized writes. ($179) For Amiga/Mac cross-users, **AMIG-a-TOSH** is M.A.S.T.'s Macintosh-compatible floppy drive, guaranteed to work with the A-MAX Macintosh emulator. ($229)

Flick-Off eliminates that annoying interlace flicker on your multisync monitor, even in HAM, and includes several software options, such as Shrink Mode, which lets you display two non-interlaced screens at once. Flick-Off plugs into the Denise socket, so it works on the A500, A1000 and A2000 -- without taking up a video slot. ($399)

The Infinity Machine is a high-speed, autobooting SCSI interface for your A500 and A1000 and M.A.S.T.'s Tiny Tiger hard disk. With an optional 68030 CPU (16-50 mHz) and up to 8 megs of optional 32-bit memory, you can give your Amiga amazing processing power and speed. (Call for price.)

Mac-2-Dos

Read and write Macintosh disks on your Amiga, using **Mac-2-Dos** custom conversion and transfer software, a hardware interface, and a Mac-compatible 3.5-inch floppy drive. Conversion options include MacPaint to and from IFF, Mac ASCII to and from Amiga ASCII, and resolution choices to simplify working with incompatible screen resolutions. If you purchase a Mac drive with Mac-2-Dos, a special driver will be included that lets the Mac drive read and write AmigaDOS disks. (Software & interface $99.94, with disk drive $349.95)

flickerFixer Genlock Ease

Now you can use the flickerFixer on your Amiga 2000 without unplugging your genlock first. This enhancement module from MicroWay allows the flickerFixer to be used in Amiga 2000s and 2500s with external NTSC genlocks such as Ami-Gen and SuperGen. ($50)

Han-D-Scan

A high-resolution handheld scanner, **Han-D-Scan** from C Ltd. features scanning resolutions of 100, 200, 300 and even 400 dpi, up to 16 levels of grey scaling, three different dithering modes, and includes the Diamond graphics/paint program by Impulse!. The image size has a maximum width of 4.13 inches, with length limited only by available memory. (1.5 meg recommended, $399.95)

CMI Units

Free up the built-in ports of your Amiga with the **MultiPort Board** from Creative Microsystems Incorporated. The board has a DB9 RS-232C port, an 8-pin mini-DIN RS-422 port (Apple/MAC compatible), and a DB25 parallel printer port, with serial/parallel device drivers. Options include a fast SCSI interface with autoboot, and you can add on a 2Mb SupraRAM expansion board for the A500 and A1000. With the MultiPort Board and the CMI-net Utilities software you can hook your Amiga into a Macintosh network. (MPB 2000 $249.95, MPB 1000 and 500 299.95; Add $50 for SCSI interface. CMI-net Utilities $79.95)

Still in the works from CMI is a professional, broadcast-quality frame buffer card for the A2000, planned to retail under $2,000.

GAMES

Aquablast & Thundercats

In Elite's **Aquablast**, your machine-gun-armed boat speeds you along a complex series of waterways on a high-speed chase to save the world from enemy poisons. **Thundercats** puts you in the role of the popular TV/toy characters. As Lion-o, you battle to recover the stolen Eye of Thundera from the evil Mumm-ra. ($34.95 each)

F40 Pursuit Simulator

Speed down the road or take off cross country in your Ferrari **F40 Pursuit Simulator** in this hot car-chase game from Titus. If you can read a map, avoid the police, and control those crazy 360-degree spinouts, you just might finish the course on time. ($44.95)

F-40 Pursuit Simulator puts a high-priced Ferrari into your Amiga.

Jigsaw!

From Britannica Software, this "Ultimate Electronic Puzzle" lets you import graphic images and turn them into puzzles. With plenty of dazzling pictures to choose from, and four levels of difficulty, **Jigsaw!** will entertain the whole family. ($39.95)

Dozen From Psygnosis

Through February, 1990, Psygnosis and their Psyclapse label have 12 new titles on the way for the Amiga. From Psyclapse, at $34.95 each, come **Stryx, Never Mind, Matrix Marauders, Killing Game Show, Flash Dragon** and **Firestone**. Upcoming from Psygnosis are **Shadow of the Beast** and **Aquaventura** ($49.95 each) plus **Barbarian II, Infestation, Carthage,** and **Gore**. ($39.95 each)

Planet of Lust

Brad Stallion, hero of Sex Vixens from Space, returns in this latest adult graphic adventure from Free Spirit Software. As Brad, you must save the Pleasure Planet of the Galaxy from the dread Dr. D. and his force field. ($39.95)

Rambo III

Based on the hit film, Taito's **Rambo III** sends you on a desperate mission to free Colonel Trautman from the Soviet commandos holding him captive near the Afghanistan border. ($34.95)

Omega

Create the supreme cybertank and test it in the field in this Strategic Design Simulation from Origin. For a real programming challenge, you can even use the **Omega** Cybertank Command Language to give your tank artificial intelligence. ($49.95)

Space Ace

From ReadySoft, who brought you Dragon's Lair, **Space Ace** takes you on a science fiction adventure with more breath-taking graphics and animation from Don Bluth. As the hero Ace, you must rescue your girlfriend and save Earth -- while avoiding the dreaded Infanto Ray that turns grown men into babies. ($59.95)

Space Ace — A grateful Kimberly is rescued at last!

SimCity Terrain Editor

Make your own cities for use with SimCity with this terrain editor from Maxis (Broderbund.) With a modified random terrain editor and a controlled painting mode you can recreate cities from the present and past, from maps, or invent your own. ($19.95)

Xenophobe, Weird Dreams

These two games from Medalist International's MicroPlay label will send you out of this world. **Xenophobe** takes you to outer space for a fast and often amusing shoot-'em-up translated from the arcade classic. In **Weird Dreams** you enter the subconscious mind of a patient undergoing surgery. Each level presents new puzzles and bizarre creatures to battle in arcade style-- carnivorous rosebushes, a giant cotton candy machine, a psychopathic lawn mower. (Joystick required, $39.95 each)

Keith Van Eron's Pro Soccer

Named after the all-star goalkeeper, this Pro Soccer simulation from Medalist International presents all the features found in the actual sport. The comprehensive manual includes some soccer history and playing tips from Keith Van Eron. ($44.95)

Paperboy

Dodge cars, bikes, cats and outraged housewives as you deliver your papers (and smash the windows of non-subscribers) in Mindscape's new adaptation of this arcade hit. ($49.95)

Professional Football Simulation

As the new head coach you've got a tough job ahead, with thousands of plays to choose from, a 45-player roster, League standings and stats, and variable weather to take into account. You can play via modem, take on the computer's artificial intelligence, or enter Microsearch's organized league play for a chance to win a free trip to the Super Bowl. ($34.95)

Project Neptune

Join super-spy "Rip" Steel in this high-action undersea adventure from Epyx. Strategy and speed both come into play in **Project Neptune** as you track down and destroy the enemy's underground network with your one-man attack sub and other high-tech gear. ($34.95)

APPLICATIONS

ProText

Popular in England where journalists rave about it, **ProText** from MichTron combines the features of a word processor, text editor, and a command line interpreter (CLI). Features include spell checking, mail merge, macros, footnotes and automatic page formatting. ProText includes a command mode that lets you run some programs without leaving the editor. ($199.95)

CrossDOS

An MS-DOS File System for your Amiga, CONSUL*TRON*'s **CrossDOS** provides transparent MS-DOS disk access from virtually any utility or application. Using data and text from IBM PC or Atari ST disks and files becomes as simple as using

your Amiga files. An easy installation program is included. ($30 + $3 s&h)

ProWrite 2.5

Notable among the new features in this upgraded word processor is its ability to print near-letter-quality text and pictures with one pass through the printer. Other new **ProWrite 2.5** features include user-adjustable page sizes, automatic date insertion, faster text entry and much faster spell checking -- spelling may be checked as text is entered. ($124.95, upgrade $20 from 2.0, $30 from 1.1 or 1.0)

ExpressCopy 1.10

In this latest release, Express-Way's hard disk backup and file copy utility now copies files much more intelligently -- and fills backup disks at least 99 per cent full. ($44.95, update $5)

MagDex & PubDex

Selectronics introduces two new Amiga references, a pair of memory-resident database indexes. **MagDex** contains indexes to 11 Amiga magazines. **PubDex** indexes more than 3700 public domain programs for the Amiga, including all of Fred Fish's first 200 disks. (1Mb required, $10 each.)

Saxon Publisher

In addition to standard desktop publishing capabilities, this professional program from Saxon Industries produces four-color separations, bitmapped textures on text and structured drawings, text sizes over 8000 points, and includes full structured drawing and EPS support.

X-CAD Designer

An exceptionally fast, two-dimensional CAD program, **X-CAD Designer** from CAD Vision International outspeeds not only other Amiga CAD programs, but even AutoCAD running on a Compaq Deskpro 386. X-CAD can read/write AutoCAD DXF files, write IFF files, and read Aegis Draw Plus files -- and is compatible with Gold Disk's Professional Page. Also in the works is the more powerful X-CAD Professional, scheduled for release in late 1989. (1Mb required, $149.95)

Digital Landscape

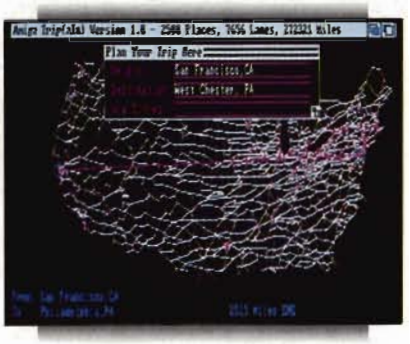
Create 3-D wireframe, color-coded maps of the continental U.S. with **Digital Landscape** from Digiscape Software. You can use the data provided on two elevation disks, or enter data yourself from topological maps. (3 disks plus manual $124.95)

KJV Bible

Easy Script now brings the entire King James Version of the Bible, from Genesis to Revelations, to the Amiga. The **KVJ Bible** comes on seven disks, complete with Concordance and a shareware reader that allows case-independent word searches at the click of a button. ($25)

Trip

A travel-planner from Sky Shepard Software, **Trip** finds the best route between two U.S. cities via interstates and major highways, and then gives you an itinerary complete with mileage, directions, nearby cities and estimated travel times. ($49.95 with Atlas and travel guide, $39.95 without.)



Trip— Your Amiga navigator.

Opticomp

From Optimum Comparative Technologies (OCT), the **Opticomp** system uses the new Inferred-Structure Technology (IST) to let structural physicians see below the patient's skin without invasive radiation-based scanning, showing soft tissue problems invisible to X-Rays. Sold as a complete turnkey package, The Opticomp system consists of an Amiga 2500, high-resolution color monitor, high-resolution printer, custom digital signal processor, camera, custom lights, booth, and installation and operation manuals. ($9,995. Other configurations available on request.)

CygnusEd Professional 2.0

A major upgrade to ASDG's award-winning text editor, **CygnusEd Professional 2.0** includes such new features as an unlimited undo/redo, faster macros, expanded ARexx support and a turbo search and replace that's 100 times faster than before. Special support for Modula 2 helps programmers quickly find and correct syntax errors. ($99.50, upgrades $16.00)

PROGRAMMING

JGoodies_1

JForth users can now save their applications in smaller, stand-alone versions with the new Clone facility in **JForth Professional 2.0** from Delta Research. ($179.95) For programming examples, the freely redistributable **JGoodies_1** disk is now available, full of useful and entertaining programs including a fast Mandelbrot generator, a text editor, simulations of evolving insects, and several useful utilities and tools. ($5)

Amiga Graphics Inside & Out

Learn to program graphics in AmigaBASIC with this new book from Abacus. The book includes a complete overview of the graphic system and explanations of AmigaBASIC commands, along with discussions on animation and graphics programming in C. ($34.95, optional disk $14.95)

MIDI

Two for Dr. T

A universal editor/librarian from Caged Artist Bob Melvin, **X-oR** features support for over 50 instruments, intelligent patch randomization, MIDI merging with Solo and Rechannelize modes and a comprehensive, easily sorted database for your sound collections. ($299)
Combining piano-roll notation with point-and-click computer graphics, **Tiger** (The Interactive Graphic EditoR) makes composition easier by treating groups of notes as graphic objects. Tiger plays and edits KCS or standard MIDI files. ($149)

Pixound, Hyperchord

From Hologramophone Research comes **Pixound**, which uses MIDI or the Amiga internal voices to translate your screen graphics into sounds, each note or chord determined by the RGB values of the pixels. You can play images from your favorite paint programs with the mouse, and save your performance through MIDI recording. ($49)

HR's **Hyperchord** Music Exploration Kit consists of four interrelated programs, centered around the dynamic riff sequencer, Hyperchord, which lets you design varied sequences of up to 40 notes (riffs) -- and play them in real time, in varied modes. Add to Hyperchord's 60 preset modes with Mode Maker, or use Rhythm Maker to create 39 custom rhythms. Holistic Window serves as a unique graphic tool for understanding inner sound. ($129) ■

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Aegis Development, 2115 Pico Blvd., Santa Monica, CA 90405. (213) 392-9972.
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Aesthetic Engineering, 175 Duane Street, New York, NY 10013. (212) 925-7049.
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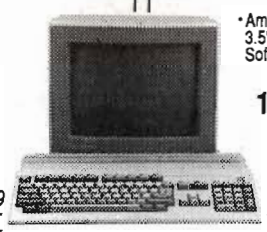

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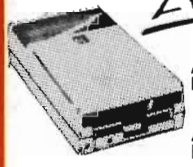

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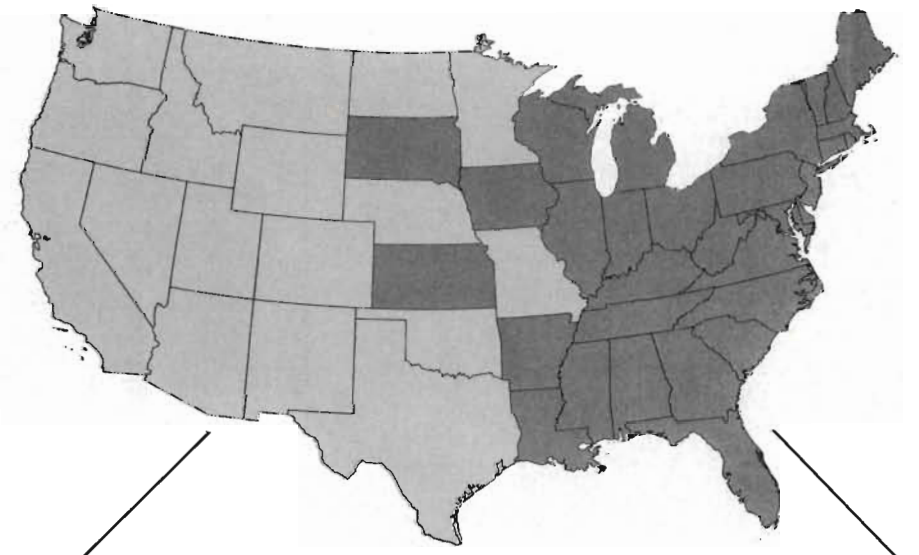

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Run time	1.6	4.9
BSPREAD		
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