The Great Amiga Software Giveaway

A.X. Magazine's

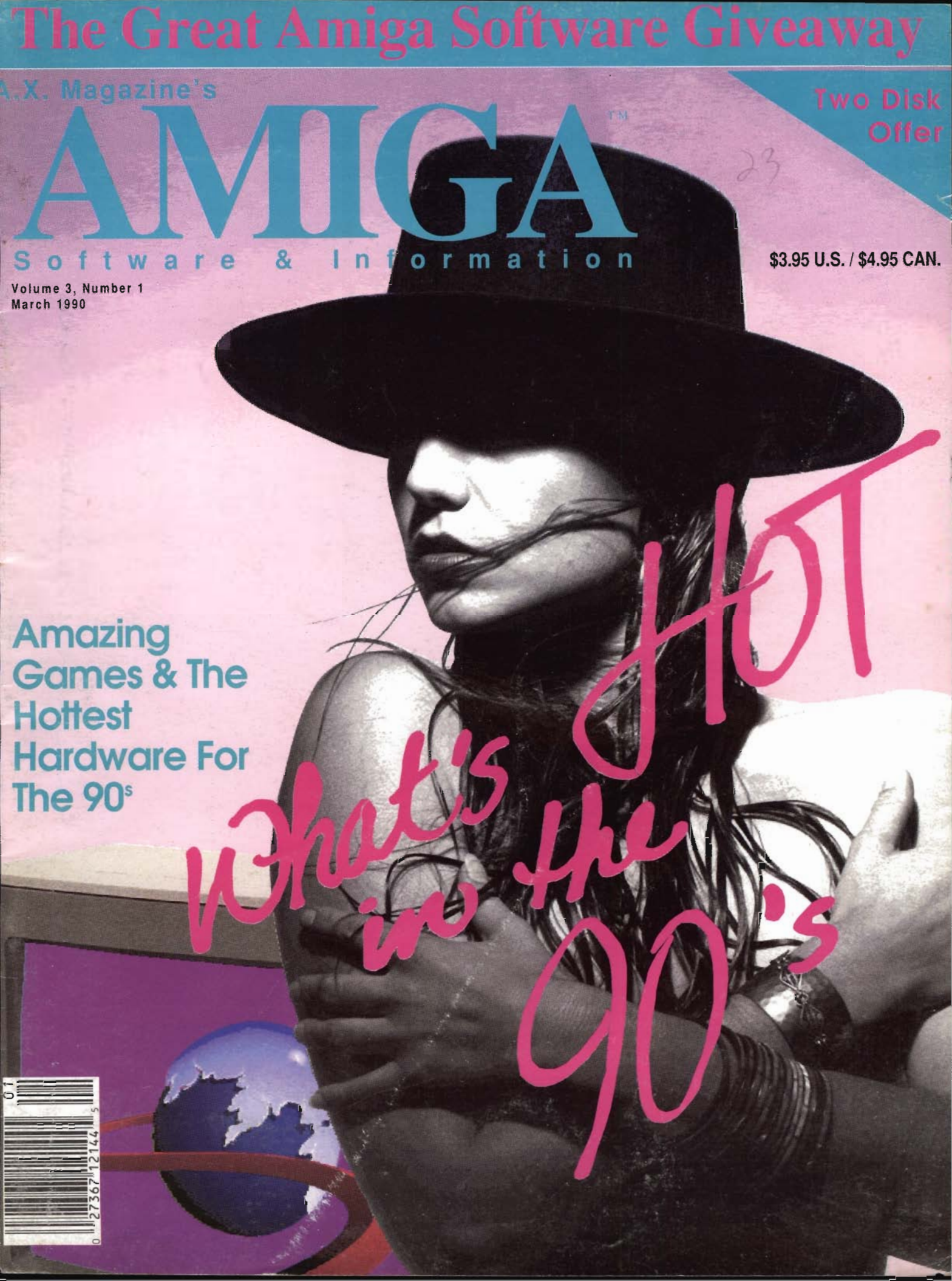
AMIGA™

Software & Information

Two Disk Offer

$3.95 U.S. / $4.95 CAN.

Volume 3, Number 1
March 1990



Amazing Games & The Hottest Hardware For The 90s

What's Hot in the 90's

Finally. An on-line service that doesn't nickel and dime you.

It's BIX's flat-fee service

BIX is short for BYTE Information Exchange. The on-line information service that's yours for an unheard-of flat fee of just $39 for three months*—an amount you could easily waste in just two to four hours with an *hourly rate,* on-line service. (Not to mention the fact that you'd be nickel-and-dimed for its monthly minimums.)

And BIX is strictly for pros; it contains no "fluff." As a subscriber, here's what you've got coming to you:

- ☐ *Amiga Exchange*—join the thousands of Amiga developers and enthusiasts in conferences covering software developments, using Amigas' libraries, hardware development, artistry tools, and Commodore's developer support conference.
- ☐ *Microbytes Daily*—up-to-the-minute industry news and new product information.
- ☐ Plus access to extensive software libraries, and the use of our electronic mail service—which allows binary attachments.

Subscribe to BIX right now—using your computer and modem

Set your telecommunications program for full duplex, 7 bits, even parity, 1 stop bit. Call BIX directly on our special registration number: 800-225-4129 (in Massachusetts, call 617-861-9767). Then hit the return key and respond as follows:

Prompt:	**You Enter:**
login (enter"bix"):	bix
Name?	bix.amiga

You can charge your BIX subscription to major credit cards, or have it billed to your company. You may also purchase unlimited off-peak access via Tymnet for just $20 per month, or $3 per off-peak hour, in the continental US.** For more information, and your local Tymnet access number, call 800-227-2983 (in NH and outside the US: 603-924-7681).

**Based on a $156 annual fee, billed quarterly. You may cancel at any time. If you prefer, you may subscribe for a 3-month trial at just $59.*

***No extra charge for 2400-baud access. Tymnet prices are subject to change. International networks access BIX at NUI 310690157800.*

BIX

One Phoenix Mill Lane
Peterborough, NH 03458
800-227-2983. In NH 603-924-7681.

Professional ScanLab

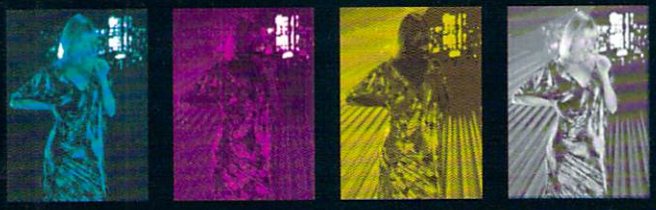
Professional Publishing Results

1.

16 million Color Scan

256 Grey Scale Scan

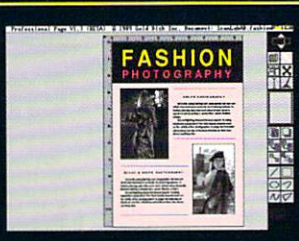
4-Color Separation

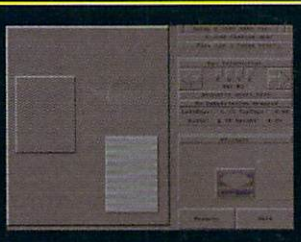


Able to control the SHARP JX-300, JX-450 and JX-600 color scanners, Professional ScanLab's pre-press capabilities include global color correction, brightness and contrast controls, the ability to process and convert between positive and negative images, and the ability to optimally choose smaller palettes based upon 256 grey or 16.7 million color scans.

Professional ScanLab will also produce excellent quality color separations embodying all 16.7 million colors and 256 grey scale images. On an Amiga 2500, these are produced six times faster than similar operations on the Mac II.

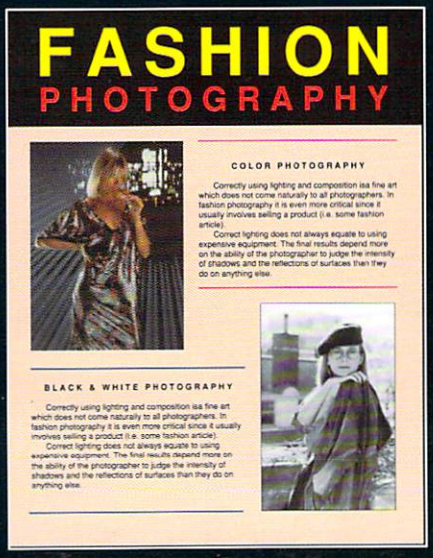
2.





Three easy steps take you from scanning both color and black&white photographs, transparencies, or other artwork, to your final full-color page. Scanned images from Professional ScanLab can be positioned, cropped, and scaled using Gold Disk's Professional Page (desktop publishing software). ASDG's ReSEP will strip out the 12 bit separations produced by Professional Page, and strip in 24 bit color separations or 8 bit grey scale images produced by Professional ScanLab.

3.



This entire Ad was created using only the products and methods described here!

After outputting the resulting PostScript file to an image setter such as the Linotronic 300, your reward is a professional quality four color process page. Produced easily, quickly, and inexpensively right in your own office or business.

Professional ScanLab is also perfect for other print applications such as Screen Printing on fabric, plastics, or metals.

Professional ScanLab. Professional Results...

ASDG Incorporated

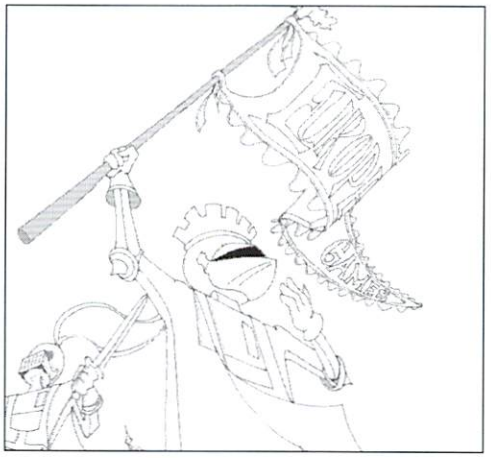
925 Stewart St.
Madison
WI 53713
(608) 273-6585

A.X. Magazine's
Volume 3, Number 1

CONTENTS

The Hottest Hardware For The 90s

Other Hot Stuff For The 90s



The European Invasion

Amiga Productivity

On Disk This Issue

TACL Demo
On disk this issue is a demo of TACL (The Adventure Construction Language). Included are two adventures: Jungle Rescue and Space Adventure. ON DISK

Animation
A Driving Tour. This animation was a framegrabbed animation with a slight twist. You have to see it to believe it. ON DISK

FloorPlan Demo
Thinking about designing your own house, or just an addition, or kitchen, or deck.... Try FloorPlan to help you design it. Working demo included. ON DISK

Game on Disk.

SteinSchlag
In the spirit of our European Game Invasion article, here's a little something from overseas. It's a German version of the ever popular TETRIS. ON DISK

GURU Interpreter
A handy little utility to reveal why the damn thing just died! Jot down the left-hand guru number in your alert and, after reboot, let GURU interpret it for you. ON DISK

MIPS
How many Millions of Instructions Per Second is your Amiga running at? How does your Amiga compare with the supercomputers? This program can tell you! ON DISK

Amiga Style Entertainment

InterComputing, Inc.

2100 N. Hwy 360, Suite 2101
Grand Prairie, TX 75050-1015

In business since 1984
Amiga support since 1985

We are a service oriented business offering discount prices
FAX: 1-214-660-3695
Customer Service & Order Status: 1-214-988-3500

COMPLETE PRODUCT LISTING AVAILABLE
Order line: **1-800-622-9177**

In Germany call; In Deutschland erreichen Sie uns unter **0202/755239**

MEMORY

• M501 A500	99.95
• Starboard 1MB	379.95
• Starboard 2MB	499.95
• 2MB A2000	379.95
• 4MB A2000	579.95
• 6MB A2000	749.95
• 8MB A2000	949.95

DISK DRIVES

• Master 3A	139.95
• Air Drive	149.95
• Cal. Access	139.95
• FDATA-10	119.95
• FDATA-20	249.95
• Unidrive	124.95
• Twindrive	249.95

HARD DRIVES

EXTERNAL	A500	A1000
20 MB	479.95	549.95
30 MB	599.95	649.95
45 MB	699.95	769.95
60 MB	849.95	899.95
80 MB	979.95	999.95

INTERNAL	
Hard Card 20 MB	549.95
Hard Card 32 MB	599.95
Hard Card 40MB	699.95
Hard Card 80MB	999.95
Hard Card 105MB	1099.95

2 MB MEMORY CARD
(For use with A500 & Hard Drive)
299.95

Create your own
Amiga 2000 Custom Package

Purchase an Amiga 2000 with

- Kickstart 1.3
- 1MB RAM
- Fat Agnus Chip
- 6 Month Warranty

1399.00

Add the peripherals of your choice at these *special low prices* and we will include

Free Installation

2nd Disk Drive	99.00
2MB Memory	349.00
4MB Memory	529.00
6MB Memory	699.00
8MB Memory	899.00
Multisync Monitor	540.00
RGB Analog Monitor	280.00
40MB Hardcard	690.00
80MB Hardcard	949.00
Internal Modem	110.00
Flicker Fixer	459.00

Peripheral prices pertain to purchase of Amiga 2000 computer and peripheral both.
Amiga is a registered trademark of Commodore-Amiga, Inc.

GVP 3001 Package

25 MHz 68030
25 MHz 68882
4 MB of 32-bit memory
2599.95

with 40 MB hard drive
2995.95

with 80 MB hard drive
3499.95

AMAX Package

AMAX, 128 ROM Set & 3.5"
Mac-compatible drive
439.95

Flicker Fixer
499.95

Flicker Fixer *plus*
Mitsubushi Multisync Monitor
999.95

SuperGen	699.95
SuperGen 2000	1499.95
AMTRAK Trackball	79.95

SOFTWARE?

Call for our **new** catalog

As always we have the most 'customer friendly' terms: S/H $3.95 in cont. USA; $30.00 min. order ; MASTERCARD & VISA with NO credit card fee; in Texas add 7% Sales Tax. $12.00 shipping to APO addresses. RMA# required on all returns. 18% restocking charge. All prices subject to change.

DR. OXIDE SLICES PRICES!

Comp-U-Save's cost-cutting clinician is at it again! This month Dr. Oxide, a bargain-basement surgeon if ever there was one, offers the industry's lowest prices on hardware and software, plus special deals on products available only through Comp-U-Save!

Call our BBS at (804) 587-8661 -24 Hours a day.

BUILD YOUR OWN HARD DRIVE KITS!

5¼" powered hard drive chassis with fan
3½" powered hard drive chassis with fan
only $120.00 each

500 SCSI interfaces w/passthru and software

$189.99 w/room for 2 megs

All you need is a SCSI hard drive and you're ready to Rock and Roll!

A1000 SCSI—$215.00

Call for SCSI hard drive prices

AMIGA PUBLIC DOMAIN

OVER 900 DISKS!

Largest Amiga PD Library in the World!

also C-64 & C-128 — Amiga PD — $4.00 each

Write for Free Catalogue

VIDEO/DESKTOP PUBLISHING

Video and desktop publishing packages are our specialty. Please call for advice on what package will suit your needs. From beginner to professional our staff can help you make the right decision on the hardware and software you need, at the right price to fit your budget.

M.A.S.T.

UNIDRIVE		**$125**
TWINDRIVE		**$239**
AMIG-A-TOSH		**$175**
AMIG-A-TOSH+		**$209**
MICROMEGS 512K		**$125**
MINIMEGS	**A500**	**A1000**
1 MEG	**$340**	**$375**
2 MEG	**$499**	**$535**
TINY TIGER II HD		**CALL**
INFINITY MACHINE		**CALL**

Amiga Hard Drives 500 - 1000 (add $75)

20 Meg—$475.00 32 Meg—$645.00 45 Meg—$720.00

Amiga External Drive $139.99

Only Uses Half the Power of 1010—with Pass thru

Amiga 2000 Internal Drive $95.00

Panasonic WV 1410 Video Camera

For Digitizers—$189.99 16 MM Lens—$25.99

Special 2400 Baud Modem w/cable—$129.99

A2000 HARD CARDS!

30 megabyte	**25 ms**	**$565.00**
40 megabyte	**11 ms**	**$640.00**
45 megabyte	**25 ms**	**$659.00**
80 megabyte	**11 ms**	**$975.00**

MEMORY BOARDS!

A2000	**8 meg board w/2 megs**	**$395**
A500	**2 meg board w/2 megs**	**$440**
A1000	**1.5 meg board w/1.5 megs**	**$375**

SONY DISKS **DS/DD 3.5"** **$.89**

***NEW! ADVANCED GRAVIS JOYSTICK $36.99**

NEW GRAVIS MOUSESTICK ***$79.99***

CHIPS — CHIPS — CHIPS . . . call!

★ We carry tons of hardware and software for the Amiga. Call for prices.

We welcome dealer inquiries on all our products.

MONTHLY HARDWARE SPECIALS

SYQUEST 44 MEG REMOVABLE - 5.25"
W/CARTRIDGE - 25 MS **$799**

PRORAM 1.8 MEG A500 OK **$125**
HURRICANE BOARDS *CALL*

Comp-U-Save

410 Maple Avenue, Westbury, NY 11590

In NY State (516) 997-6707 (Tech Support) **Outside NY State (800) 356-9997 (Orders Only)** **FAX (516) 334-3091**

A.X. Magazine's

AMIGA
Software & Information

More affectionately known as A.X. Magazine

Clyde R. Wallace - Publisher
Bonnifant Heeja Han - Publisher
Kirsten M. Dove - Assignment Editor
Jocelyn M. Brooks - News Editor
Sharon Fierstein - Production/Art Director
Ricki Choe - Art & Design
Glenn D. Sabin - National Advertising Director
Glen R. Deskin - Chief Operations & Technical Officer
John E. Neely - Distribution & Circulation
Dwin Craig - Advisor
Stephen Miller - Legal Advisor
Don M. Yi - General Manager

Authors, Artists and Contributors for this Issue
Rich Bielak, Mike Hubbartt, Steve King, Harv Laser, Dave Page, Jeff Pejsa, Rick I. Rock, Charles White

Special Thanks to
Mr. & Mrs. Nelson Moskowitz, Anna & Vince of Faces& Fashions Photography, Rita K. Smith, Spencer Whetstone, Kevin Karlin, Tysone Liotta, Frank Luncheon, Stephen Miller, Mark Niedzielski, Kim Schaefer, Scott Savelson, Chet Solace, Clyde R. Wallace Sr., Mal Hee Wallace

Scanning for this issue was provided by ASDG, Inc. and Professional Scanlab.

A.X. Magazine is published bi-monthly by A.X. Productions, 6820 Distribution Dr. Beltsville, MD 20705. Phone: (301)595-0950.

U.S. Subscription rate is $69.95 per year (for 6 issues). Subscriptions outside the United States please add $24.95 for shipping. Canadian subscriptions should inquire with our Canadian distributor.

Canadian Operations
CompuArt
4855 DeMaisoneuve
Montreal Quebec H3Z1M6
(514)483-2080

Corporate Offices
6820 Distribution Drive
Beltsville, MD 20705
(301)595-0950
FAX(301)595-0954

This Issue's Cover Photography

The photography for this issue's cover was shot in the studios of **Faces & Fashions Photography** of Silver Spring, Maryland. The photographer was Vince Jacobaldo, and the model pictured is AnnaMaria Vassallo.

The background colorization was added by A.X. Magazine, then typeset for placement on the cover.

Technical Support

If you have a problem operating part of your magazine, please give us a call for help. Technical support is being handled by NewAge Computers. When you call, state you are calling for A.X. Technical Support, and please have the issue number, and any other relevant information ready. 301-230-1296 (10am to 5pm EST)

MOD TUTORIAL

Tutorial Continued Writing a DRAW program in Modula II.

DRAW PROGRAM: COLOR FILLS

By Richie Bielak

INTRODUCTION

In this installment of the DRAW program we get back to the creation of new drawing tools. In particular we will add the ability to draw shapes filled with a solid color.

The modules FIGURES and FILL contain most of the code implementing the new tools. In addition small changes were necessary in the DRAWMENU and DRAW modules.

We begin our discussion with a look at the tool that is easiest to implement: "filled rectangle".

FILLED RECTANGLES

The procedure in Listing #1 implements the "FilledRectangle" tool. As in the "Rectangle" procedure, we use "GenericFigure" to draw the outline of the rectangle ("GenericFigure" was discussed in detail in the first installment of "Draw"). First the coordinates of the starting corner of the rectangle are saved in "StartX" and "StartY". Then "GenericFigure" is called to draw the outline. When "GenericFigure" is done the "x" and "y" parameters will contain the coordinates of the corner opposite the starting point. To fill the completed outline with current color the "RectFill" procedure is called. There is just one complication. "RectFill" requires coordinates of upper left hand corner and lower right hand corner as parameters. Any other combination does not work and will most likely cause a visit from the GURU!

The starting and ending points obtained above need not be the upper left and the lower right, as they depend on how the mouse was moved when the rectangle's outline was draw. Therefore, we have to figure out appropriate coordinates.

This turns out to be pretty easy, as the upper left hand corner has coordinates with smallest "x" and smallest "y"; and the lower right hand corner has largest "x" and largest "y" (keep in mind that the screen's coordinate system is "upside-down", with origin in upper left-hand corner and the positive axes extending down and to the right). Having figured out the coordinates of the correct corners we call "RectFill" to fill in the rectangle.

FLOOD FILL

The next tool we consider is "Fill". "Fill" is similar to the Paint Can tool from Deluxe Paint, except that we only implement solid color fills.

Color fill is accomplished simply by calling the "Flood" Amiga graphics routine. The call we use looks like this:

```
Flood (RPort^, 1, x, y);
```

The parameters are "RastPort" record, the fill mode and coordinates of the point where the fill will begin. There are two fill modes available: "0" and "1". Mode "1" is the "normal" fill mode. That is, pixels that are the same color as the pixel at (x,y) are changed to the new color. In mode "0" fill, pixels starting at (x,y) are changed until a boundary of

U L A

Creating the ability to draw shapes filled with a solid color.

the same color as the current pen is reached. In the DRAW program we use mode "1".

As it turns out, simply calling the "Flood" procedure does not work. The "RastPort" used by the fill has to be properly prepared. An initialized "TmpRas" structure has to be attached to the drawing "RastPort" and a temporary raster has to be allocated.

The three steps needed to set up a "TmpRas" are performed by the procedure "PrepareForFill" in the FILL module. First, a temporary bitmap area is allocated by the following call:

RasterAdr := AllocRaster (640, 200);

The two parameters specify the size of the drawing window. Sometimes a smaller bitmap can be used, but in our case the fill can happen anywhere, so we need a bitmap that covers the entire screen.

Next, the "TmpRas" structure is initialized:

InitTmpRas (TRast, RasterAdr, (640 DIV 8) * 200);

The first parameter to "InitiTmpRas" is the actual "TmpRas" record, the second is the address of the temporary bitmap allocated earlier, and the last is the size of the bitmap in bytes. The number 640 DIV 8 specifies the number of bytes used to represent pixels in one screen row. Multiplying this number by 200, the number of rows, yields the number of bytes in the bitmap.

Finally, the address of the newly initialized "TmpRas" record is placed in the appropriate field of the window's "RastPort" by the statement:

wp^.RPort^.TmpRas := ADR(TRast);

At this point the "Flood" procedure can be called.

The "FILL" module also provides a procedure, called "CleanUpAfterFill", to clean up after fill operations. The clean up involves "unhooking" the "TmpRas" and freeing the memory used for the temporary bitmap.

The complete code for the "Fill" tool is found in the procedure "ColorFill" in FILL module (see LISTING #2).

FILLED POLYGONS

To draw a polygon filled with a solid color we use the Area Draw routines provided in the AMIGA graphics kernel. In particular we will use the "AreaMove", "AreaDraw" and "AreaEnd" procedures. As with Flood fill, a "TmpRas" structure has to be attached to the drawing "RastPort". However, an "AreaInfo" structure is also required for area draw.

Part of the structure needed for area draw operations is a workspace that will hold information about each possible vertex drawn. This workspace has to be allocated before drawing begins, therefore we must pick a maximum number of vertices that can be drawn in a filled polygon. I chose 30 as the limit (see the "MaxPoints" constant in "FilledPolygon" procedure).

Again, the work to set up the "AreaInfo" structure is done by the "PrepareForFill" procedure. First, the workspace for the drawing operations is allocated. For each point to be drawn five bytes must be reserved, therefore the size of the workspace is five times the number of points. This allocation is done by the following code:

```
WorkSpaceSize := MaxPts * 5;

ALLOCATE(WorkSpacePtr,
WorkSpaceSize);
```

Note that we save the size of the workspace in the variable "WorkSpaceSize", so that we can release this memory when we are done.

Next the "AreaInfo" record is initialized and attached to the drawing window's "RastPort":

```
InitArea (AInfo, WorkSpacePtr, MaxPts);

wp^.RPort^.AreaInfo := ADR(AInfo);
```

To create a procedure that draws filled polygons, we have to modify the old polygon drawing procedure by adding the area draw operations.

The "AreaMove" call is used at the start to position the area-drawing pen at the correct point. Then after each line of the polygon is drawn we call "AreaDraw". Finally, when the polygon is complete we call the "AreaEnd" procedure which will draw the filled polygon.

Note that the drawing of a polygon terminates, either when the last vertex drawn is close enough to the starting one, or when 30 vertices are drawn.

The complete code for the "FilledPolygon" procedure is found in LISTING #3.

FILLED ELLIPSES

Having done all the hard work setting up for filled polygons, adding a "FilledEllipse" tool is very easy. We simply use the "AreaMove", "AreaEllipse" and "AreaEnd" procedures, combined with our old code for drawing ellipses. The only part of the "FilledEllipse" procedure that is not obvious is figuring out where the center of the ellipse lies, and starting area operations from that point by calling "AreaMove".

Complete code for "FilledEllipse" is found in LISTING #4.

SUMMARY

This completes the discussion of "filling" tools. Next time we will add a better tools menu to our program because as we add more tools they become more cumbersome to select.

LISTING #1: FilledRectangle PROCEDURE

```
PROCEDURE FilledRectangle (wp : WindowPtr; x, y : CARDINAL);
VAR
StartX, StartY : CARDINAL;
Xmin, Ymin, Xmax, Ymax : CARDINAL;
BEGIN
StartX := x; StartY := y;
GenericFigure (wp, x, y, DrawRect);

(* RectFill requires coordinates of opposite *)
(* corners. The upper left hand corner comes *)
(* first.                                    *)
IF StartX <= x THEN
Xmin := StartX; Xmax := x;
ELSE
Xmin := x; Xmax := StartX;
END;
IF StartY <= y THEN
Ymin := StartY; Ymax := y;
ELSE
Ymin := y; Ymax := StartY;
END;

RectFill (wp^.RPort^, Xmin, Ymin, Xmax, Ymax);
END FilledRectangle;
```

LISTING #2: ColorFill PROCEDURE

```
PROCEDURE ColorFill (wp : WindowPtr; x, y : CARDINAL);
BEGIN
IF PrepareForFill (wp, 0) THEN
Flood (wp^.RPort^, 1, x, y);
CleanUpAfterFill (wp);
END;
END ColorFill;
```

LISTING #3: FilledPolygon PROCEDURE

```
PROCEDURE FilledPolygon (wp : WindowPtr; x, y : CARDINAL);
CONST
MaxPts = 31;
VAR
startX, startY : CARDINAL;
PolyClosed    : BOOLEAN;
result        : INTEGER;
VertexCount   : CARDINAL;
BEGIN
IF PrepareForFill (wp, MaxPts) THEN
startX := x; startY := y;
PolyClosed := FALSE;
result := AreaMove (wp^.RPort^, x, y);
VertexCount := 1;
REPEAT
GenericFigure (wp, x, y, DrawLine);
result := AreaDraw (wp^.RPort^, x, y);
INC (VertexCount);

(* Check if we are done *)
PolyClosed := (AbsDiff(startX,x) < 5)
AND (AbsDiff(startY,y) < 5);

IF PolyClosed OR (VertexCount =
(MaxPts - 1)) THEN
result := AreaEnd (wp^.RPort^);
PolyClosed := TRUE;
END;
UNTIL PolyClosed;


CleanUpAfterFill (wp);
END;
END FilledPolygon;
```

LISTING #4: FilledEllipse PROCEDURE

```
PROCEDURE FilledEllipse (wp : WindowPtr; x, y : CARDINAL);
VAR
StartX, StartY, a, b, result : CARDINAL;
BEGIN

StartX := x; StartY := y;
GenericFigure (wp, x, y, DrawEll);
IF PrepareForFill (wp, 4) THEN
IF StartX < x THEN a := x-StartX ELSE
a := StartX-x; END;
IF StartY < y THEN b := y-StartY ELSE
b := StartY-y; END;
result := AreaMove (wp^.RPort^, StartX,
StartY);
result := AreaEllipse (wp^.RPort^,
(StartX + x) DIV 2, (StartY + y) DIV 2,
a DIV 2, b DIV 2);
result := AreaEnd (wp^.RPort^);
CleanUpAfterFill (wp);
END;
END FilledEllipse;
```

Interactive Gaming For The 90s

A look at what's here, and what's to come.

Entertainment for the 90s is going to be nothing less than hot. It seems, the new trend is towards fantastic animation, realism, and interactive movies.

There are games currently available that are already showing these trends.

One of the first interactive movies was Defender of The Crown by Cinemaware. It contained some of the best graphics and animation to be found on any game, and even better than many found today. Since then Cinemaware has continued to produce games based on the "Interactive Movie" concept where the player controls a characters role during the game as if in a movie.

Then came the eventual port of games like Dragon's Lair to the Amiga. If you have never seen Dragon's Lair in the arcades, it is literally a full length cartoon, movie that looks like something that came from Disney, except it didn't, it came from Don Bluth. While the cartoon, the player controls decision points during the movie. For instance, when the character Dirk, from Dragon's Lair comes upon a potion sitting on a table, the player either moves the joystick to the right, signaling Dirk to continue walking and ignore the drink, or moves the joystick forward telling Dirk to go ahead and drink the potion. Although the player controls the decisions, the player never actually has to control all the inbetween motions such as picking up the bottle, then putting it to Dirk's mouth, and drinking, et cetera. All these interum actions are preprogrammed once the player makes a decision.

One of the problems that originally plagued the first Dragon's Lair when it was ported to the Amiga was there was so much animation in the game, that the player spent most of his time waiting. In between short decision making sequences, the player could wait up to several minutes for the next scene to load. This became very frustrating, and ruined much of the interactive feel.

In later games, many of these problems were alleviated. As more and more programmers became familiar with the Amiga, and were able to push the limits of programming, routines were developed for loading animations from disk more quickly, and the animation became smoother. Space Ace, which followed Dragon's Lair, almost entirely elimintated all the long waits for disk loads, and now, just on the horizon is Dragon's Lair II, a sequel to the original. Although from a different comany, Dragon's Lair II claims to avoid all the pitfalls of the original.

Since programmers are becoming more adept at the Amiga, we can only expect, and are seeing, fast loading, smooth animation entertainment coming from the Amiga in the 90s.

Entertainment for the 90s is going to be nothing less than hot. It seems, the new trend is towards fantastic animation, realism, and interactive movies.

Sideshow

By Mike Hubbartt

A computer game that takes you back to those games of chance is *SideShow* by ActionWare, the company known for their *Capone*

When growing up in Oklahoma, every fall meant it was time for the fair. Our father usually took us kids in the early afternoon while the crowds were small, since the fair always drew such a large number of fun loving people. We loved our trials at the games of chance (or skill, as the vendors would have you believe), hoping for a large stuffed animal or the portable T.V., won by a skillful throw or shot by our father. Although he was a good shot, that corner in the bedroom waited for a T.V. until he bought one from the store. The daydreaming proved more fun than watching the TV, but I still would like to win one of those stuffed animals with my own skills.

A computer game that takes you back to those games of chance is *SideShow* by ActionWare, the company known for their *Capone* and *POW* products. Like *Capone* and *POW*, *SideShow* works with either the mouse or the Phasar Light Gun (also produced by ActionWare). *SideShow* is more like eight separate games rolled into one package than just one game with a single objective. You aren't playing for trinkets, but for a higher score, which will allow continued enjoyment of the local facilities. You must eat junk food to replenish energy (just like at a real fair); this food (popcorn and soda, of course) costs money which is earned by succeeding at the game booths.

There are two levels of play, designated by tickets selected at the start of the game, called children and adults. A child's ticket allows access to only five of the eight games: Balloons, Balls, Potpourri, Strength, and Clock Shoppe. The adult ticket allows you to play the first five games plus Haunted Hill, Dunk Tank, and Knives. These games are located at different booths; each game must be completed three times to close that booth down.

The Games

Balloons - shoot the balloons to find a hidden pattern; elude any rising balloons

Balls - shoot the green balls to gain points; dodge the red balls which subtract from your cumulative scores

Potpourri - hit moving targets as they attempt to cross the screen; hit some targets ONLY while flashing to prevent reduction in your score

Strength - shoot at weights on the bottom of three posts

Knives - throw knives to hit an apple or a hap-

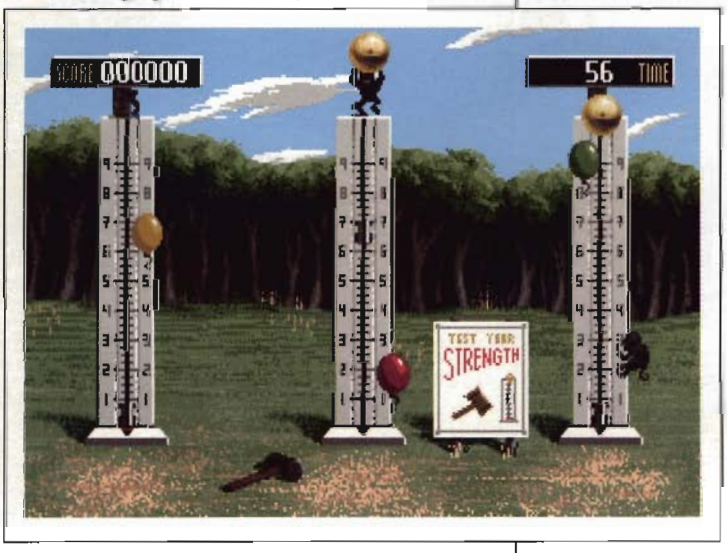
py face; don't hit the clown
Clock Shoppe - shoot at the clock's pendulum and weights; miss the clock's face
Haunted Hill - shoot at the many moving targets
Dunk Tank - throw balls at a target to dump some obnoxious person into a tank of water

Find one of the games you can do well enough to build up a lot of extra tokens. Use these tokens to try the different games you haven't yet mastered, so you don't get stuck playing the same booth over and over again. I found the Balls game to be easiest, since there are only two targets: red and green, with the green balls being the only ones you want to shoot. Haunted Hill is the most challenging game, since the targets appear everywhere and are quite fast.

Dunk Tank can be played with a new twist: import a digitized picture and paste it to the guy's body that's getting dumped. This is another of *SideShow's* strong points, and I hope that other players will enjoy this personalized option.

SideShow's graphics are very well done, and the sound effects serve to enhance the game play. The three game disks are not protected; Actionware uses a code wheel, so fortunate Amiga owners can install this program on their hard drives. The included caramel corn was a nice touch; how about extra bags (like expansion disks for some programs)? Speaking of extra disks, this program is also a good candidate for expansion, since new games in this same environment will please those who master the eight basic games.

I enjoyed the games initially, although I found some of the booth arcade sequences a little repetitious after awhile. This game will appeal to Phasar Gun owners since the target practice aspect of *SideShow* is one of its stronger attributes, but the gun is not needed to play any of the games. If you're not the kind of game player drawn to target shooting in the arcades, then this game may not appeal to you. Stop by your local software dealer and check it out, this may be the game you've been waiting to show to your non-computer oriented friends.



SideShow
Price: $44.95
From:
Actionware Corporation
38 W. 255 Deerpath Road
Batavia, Illinois 60510
1-708-879-8998

I enjoyed the games initially, although I found some of the booth arcade sequences a little repetitious after awhile.

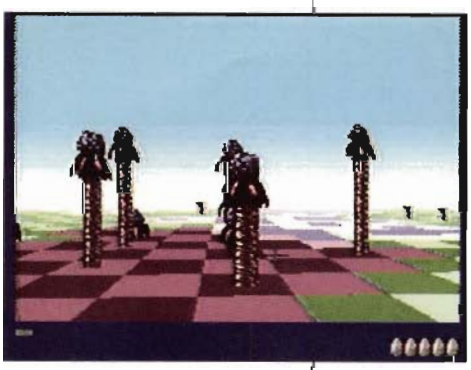
Archipelagos

By Mike Hubbartt

A hazard you encounter is radioactive contamination of the environment. Contact with contaminated ground only means certain death!

Fanfare is known for producing games with a different twist. Eye of Horus - which I think is quite well done and enjoy playing often, has an Egyptian legend as the theme. The game we are covering in this review is called Archipelagos, and like Eye of Horus, it has a different theme than most Amiga games I've seen.

The plot behind *Archipelagos*: in the far future, mankind has destroyed our planet (what a surprising revelation) with pollution and nuclear waste. The polar ice caps have melted, flooding the majority of land masses throughout the world, killing most land-bound mammals (including most of us humans), and leaving only small land masses called archipelagos for habitation. In an effort to reverse the accumulation of centuries of damage (who says we don't look to the future?) man kind has genetically-engineered plant hybrids to clean up the environment. For power sources, nuclear power plants were built on each archipelago.



Some of these genetically-manipulated environmental cleaners have mutated into things that are harmful. The nuclear power sources have leaked, killing off the few remaining humans and mammals left from the floods. Your job (a tough one to be sure) is to purify each archipelago, removing the pollution before preceding to the next one. You fly in a hoversphere over each archipelago. Drain away the radioactivity of each nuclear power source (called an Obelisk) by connecting (via land) nodes to it; deactivate the Obelisk before the 90 second self-destruct timer destroys the archipelago AND you.

A hazard you encounter is radioactive contamination of the environment. Avoid coming into contact with any ground that has been contaminated, or you will die. Decontaminate sections of the archipelago - infected sections of land appear as red or brown sections - after you have deactivated the obelisk.

The local plant life, which has been genetically altered by man, poses another hazard. Viral Trees pollute surrounding land, and must be removed - their toxin will kill you if it spreads to the area where you are working. Eco Eggs soak up toxic waste. Unfortunately, when an Eco Egg breaks, it spreads the accumulated waste all over the island, so these guys should be removed as quickly as possible.

B-900 Banshees are air cleaners. These cleaners view you as a source of pollution, so they will attempt to remove you. Not a good thing! Necromancers, something supernatural, erode away land (you have to connect nodes to the obelisk, so this is undesirable), but cannot cross water. Isolate Necromancers at any opportunity, or you may be part of a major meltdown!

I found the game's concept to be different and interesting at first, but it soon became monotonous. There wasn't enough variety to keep me playing it for very long. The graphics were ok, I liked the 3D perspective, and flying the hoversphere was easy. Although well executed, this game is a nice idea that fails to draw me back the way most good games do. I would definitely recommend trying this game at a dealer before laying out the cash.

Archipelagos
Price: $39.95
From: Fanfare/Logotron/Britannica
345 Fourth St.
San Francisco, CA 94107
1-415-546-1866

VTX Online

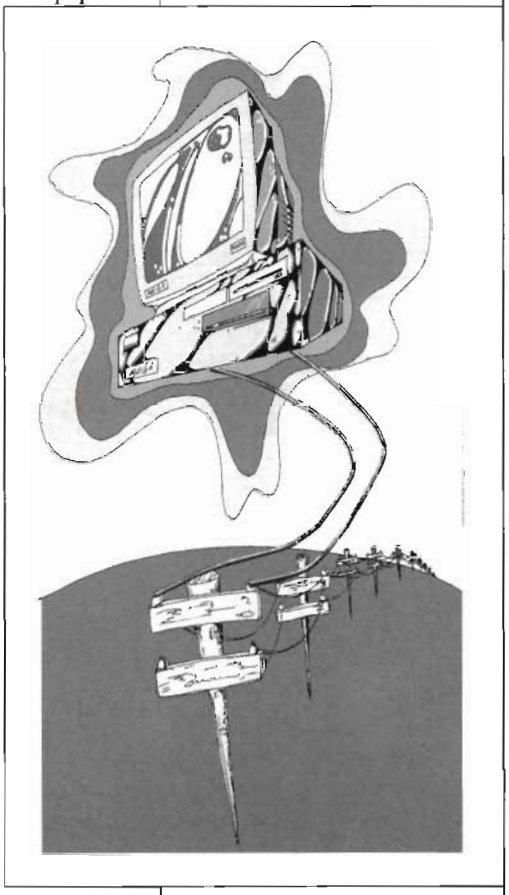
A New Communications Package Designed Primarily For CompuServe.

by Steve King

The personal computer has many uses, one of which is to function as a door to the outside world. With an inexpensive modem, you can link up to a myriad of global information services and local bulletin boards - most of which contain thousands of free programs for your Amiga. The key to this door is a telecommunications software package which allows you to dial these services, log on, and ultimately transfer those programs or other information to your own disks. The newest of these telecommunications programs is VTX On-Line by Michtron.

While there are a variety of such packages available (including several free programs on the boards), *VTX On-Line* was specifically designed to be used with CompuServe. The program is primarily configured to emulate the popular VT-100 terminal, but can easily be modified to suit your particular needs. Through either menu or keyboard control you can adjust almost any technical parameter that needs to be changed (such as baud rate, line feed, duplex, et cetera) and save that particular configuration to disk. You can even configure your Amiga to emulate the Tektronix 4014 terminal with zoom capabilities. There is also an option which permits smooth scrolling of incoming text. This is quite pleasing to the eye as well as very useful at modem rates that exceed 1200 baud, as it prevents the text from zipping by and off the screen before you have had the opportunity to read it.

You can link both a configuration and a script file to each phone number, using the built in phonebook facility. These files automatically set the parameters specific to an individual information service and log-on for you. Files for such popular services as CompuServe, BIX and GEnie are supplied on the program disk. If you want to access services for which there are not files provided, there are two ways to create additional custom scripts. The first is by typing the script on an ordinary word processor or text editor using simple, BASIC style commands and then saving that file to the Scripts drawer on your disk. The simpler method, however, is to manually log onto the system and then invoke the autoscript function which remembers the sequence of keystrokes you just entered. The program then writes its own script and saves it to disk.



VTX On-Line also has a capture buffer capability which "remembers" text (such as electronic mail) that the information systems send to your computer. This text is stored in the Amiga's Clipboard, an area of memory that many programs can access directly. With the Amiga's multi-tasking capability, you can easily run such a program simultaneously with *VTX* and switch back and forth from one to the other to edit and save text you have captured. That buffer, however, is rather small and cannot be enlarged or saved to disk by *VTX*; therefore, large amounts of text must be saved directly to a file on disk or in ram.

To upload or download computer programs (which are in binary and not text format), you must use the File Send/Receive function which allows you to select one of five popular transfer

Continued On Page 60

AMIGA NE

New software allows you to program an adventure from scratch.

Persian Gulf Inferno

Released in January, Persian Gulf Inferno is the first joint effort between the Parsec Development Team and Innerprise Software. In Persian Gulf Inferno, you are the only volunteer for a suicide mission against all odds. You race, dodge, and fight your way into a terrorist seized oil rig to rescue United Nations hostages, neutralize the terrorists and disarm their stolen nuclear warhead. The oil rig contains authentic weapons and explosives, as well as the hostages, who have valuable information to help you in your mission. In addition to an array of fanatical terrorists, you must contend with the constant countdown of the nuclear bomb.

Persian Gulf Inferno is written in 68000 assembler, so the game scrolls every frame in eight directions. Innerprise Software claims that Persian Gulf Inferno sports phenomenal 3D graphics, magnificent digitized sound effects, exceptionally smooth scrolling, and real-time game play. Persian Gulf Inferno sells for $39.95.

Innerprise Software, Inc.
128 Cockeysville Road
Hunt Valley, MD 21030
(301) 785-2266

The Adventure Construction Language

From Micro Momentum, Inc. T.A.C.L. (pronounced "tackle") is The Adventure Construction Language. T.A.C.L. is a text/graphics adventure construction language which handles all of the overhead normally associated with programming an adventure from scratch. T.A.C.L is designed for the non-programmer who is only interested in creating the adventure. T.A.C.L. allows for nearly any imaginable scenario, including time and dimension travel.

T.A.C.L. supports IFF graphics, sound, different text styles, and vector graphics. The program includes PADV, the adventure player that is freely-redistributable so that it can used with public domain adventures. It also includes VGED, a complete vector graphics editor that allows for many drawing with each adventure without taking up large amounts of disk space.

T.A.C.L handles all of the adventure overhead by including commands like SHOW, SCORE, RANDOM, LINK, MOVE, GO, NOTE, DIE, and WIN. Micro Momentum boasts that T.A.C.L. allows individuals to create commercial-quality adventure games which they will consider distributing. T.A.C.L. runs on all Amigas with 512K RAM and AmigaDos v1.2 or above. Two sample adventures created with T.A.C.L. can be found on Fred Fish Disk #300. The suggested retail price for T.A.C.L. is $99.95

Micro Momentum, Inc.
P.O. Box 372
Washington Depot, CT 06794
(203) 567-8150

32-Channel Configuration for the Amiga

At the National Association of Music Merchants trade show on January 19, 1990, Blue Ribbon Bakery and Checkpoint Technologies announced the completion of a cooperative effort to produce the first 32-channel configuration for the Commodore Amiga. In their joint effort, Blue Ribbon Bakery provided the software support, Bars&Pipes, and Checkpoint Technologies provided the hardware

WS

support, Serial Solution.

Bars&Pipes is the first icon-based object-oriented MIDI environment. It supports an unlimited number of tracks in which musical information flows through "pipes". Bars&Pipes is also the innovator of the "toolbox" concept, which allows musical information to be manipulated in these pipes before and/or after it is recorded into the MIDI sequence.

The Serial Solution is a two-port serial-expansion card for the Amiga 2000. Serial Solution can precisely support the MIDI baud rate and can be directly connected to all standard Amiga MIDI interfaces with no extra adapters or connectors. Other specifications of the Serial Solution include support of all common baud rates through 57.6 Kbaud, support of a variety of divices including printers, modems, sound samplers, and other serial devices, and an Amiga-compatible 25-pin serial port.

Bars&Pipes retails for $299.00; the Serial Solution for $199.00. An upgrade option from the Blue Ribbon Bakery is required to use the Serial Solution with Bars&Pipes.

Blue Ribbon Bakery
1248 Clairmont Road, Suite 3-D
Decatur, GA 30030
(404) 377-1514

Checkpoint Technologies
P.O. Box 2035
Manassas, VA 22110
(703) 330-5353

New Products From Virgin Mastertronic

Virgin Mastertronic International, Inc. has released and is releasing a number of new games and upgrades for the Amiga, including Artura, Rick Davis's World Trophy Soccer, Double Dragon II: The Revenge!, NY Warriers, and remastered versions of games from the Leisure Genus line.

In January, Virgin Mastertronic announced the release of Artura for the Amiga. Artura is an action adventure game in which the player is transported back in time to ancient Britain to become Artura, son of the Pendragon. Artura's mission is to rescue Nimue, the beautiful apprentice to Merdyn the Mage, and keeper of the secret of the ancient treasures lost long ago. The Amiga version of Artura retails for $39.99. (See review.)

Also released in January was the second of Mastertronic's "MegaGames" for Amiga, Rick Davis's World Trophy Soccer. MegaGames are computer games which are identical to the arcade versions. Rick Davis's world Trophy Soccer boasts one- and two- player modes, the same graphics for players and background and the same sound as the arcade version, World Trophy Soccer. MegaGames require one megabyte or more of memory and sells for $49.99.

Two more MegaGames, released at the end of January, are Double Dragon II: The Revenge! and NY Warriors. In Double Dragon
II: The Revenge!, the player finds himself battling more than twenty different foes and using weapons ranging from dynamite to shovels to his hands and feet. The retail price for Double Dragon II: The Revenge! is $39.99. The NY Warriors player finds himself battling terrorists who have taken over the World Trade Center. Bad guys include Ramboids, Rastas, Killer Klowns, and many others. The player, the commander of an elite strike force, is armed with bazookas, guided missiles, flame throwers and other weapons of destruction. NY Warriors sells for $49.99.

Virgin Mastertronic has recently remastered games from their Leisure Genus line because users have requested that the games be hard disk installable. Remastered games for the Amiga include
Clue, Monopoly, Scrabble (not yet released), and

A two-port serial-expansion card for the Amiga 2000.

Risk. Games from the Leisure Genus line sell for $39.99.

Virgin Mastertronic Inc.
18001 Cowan, Suites A & B
Irvine, CA 92714
(714) 833-8717

A new genlock, an IBM interface card, and more reliable power supplies.

AMIGA NE

Six New Products From Spirit

Spirit Technology has just announced six new products for the Amiga. Among them is the AX-S Expansion System, a hardware adaptor/interpreter that interfaces the Amiga Bus Structure/Expansion Port to the PC industry's PC/XT-AT Bus standards. Spirit stresses that while the AX-S Interface Board allows an Amiga with AmigaDOS to utilize the low cost cards available for PC/XT and AT systems, it is not a Bridge Board and does not turn the system into a slow PC.

AX-S connects Amiga's Bus/Expansion Port to a chassis which has a 200W power supply, ventilation fan, 7 plug-in slots, 6 PC/XT-AT Bus slots, one OCTABYTE MB RAM expansion slot, multiple peripheral drive bays, hard drive power connectors, and an optional power cord for A500. The AX-S Interpreter board, complete with DMA controllers, InterRupT controllers, Data buffers, and Amiga Bus to PC/XT-AT Bus buffer drivers, is included with the chassis motherboard. AX-S is projected to sell for $1,195.00 and will be shipping by mid-February.

Another of Spirit's new products is OCTABYTE, an internal 8MB memory design which plugs into an A2000 ZORRO slot or the 100-pin slot in the AX-S Expansion System. OCTABYTE is a fully socketed board, expandable from OK to 2, 4, 6, and 8MB with 1.0 Mbit x 1 DRAMS. OCTABYTE includes a software support disk with test and utility programs. OCTABYTE sells for $309.00 and begins shipping in mid-February.
A third new product, X-RAM is an external version of the 8MB memory design. It plugs into the 86-pin expansion port in an A500 or A1000. Like OCTABYTE, X-Ram is AutoConfigurable from 2MB to 8MB in 2MB increments, and has available OK. X-Ram is fully socketed, uses 1Meg x DRAMs, and comes with a software support disk with test and utility programs. X-RAM ships in mid-February and sells for $319.00 without power supply. The power supply sells for $21.00.

Spirit's new Interlok, a video genlock, includes advanced, reliable circuitry that locks the Amiga scan rate to NTSC or PAL broadcast synchronizing standards as well as the output video from typical low-cost VCRs. Interlok's features include looping video input, switchable 75 ohm/Hi Z, a front panel which includes program on/off, genlock on/off, LED power indicator and 0 to 100% fade overlay control slider, and a remote control option. Interlok outputs in NTSC or PAL plus filtered R.G.&B. Interlok also features Pgm out and KEY out. Interlok will ship in March with a projected price of $650.00.

Trapper is a 512 K RAM expansion for the A500. It is socketed and available with or without battery backed clock calendar. Trapper will be released in mid-March and will sell for $69.00.

Spirit provides what it calls "Power For All Reasons", the POW-R 200. POW-R 200 is a 200 watt power supply that can safely handle an A500 plus 4 hard drives. A 2 Amp AX utility outlet is included and the supply is selectable 110VAC/60Hz. DC outputs are +5v/+12v/-5v/-12v. POW-R 200 is fan cooled. The product begins shipping in early February and sells for $189.00.

Spirit Technology
220 West 2950 South
Salt Lake City, UT 84115
(801) 485-6957

WS

SupraModem 2400 Plus

The Supra Coropration is currently shipping the SupraModem 2400 Plus. The SupraModem 2400 Plus is an external modem which features MNP classes 2-5 and CCITT V.42bis protocols. MNP classes 2-5 and CCITT v.42bis are error correction ad data compression protocols that allow the user to comiunicate at fast rates with no errors. MNP lets the user communicate with any MNP modem at an average throughput of 4000 bps. CCITT V.42bis gives 8000 bps error-free throughput.

The SupraModem 2400 Plus allows users to set their terminals to 9600 baud and virtually forget about baud rate and communication protocols. The SupraModem 2400 Plus automatically determines what kind of modem is at the other end of the phone line and adjusts its rate and protocol for optimal communication with the other modem.

The SupraModem 2400 Plus features 100% Hayes compatability, asynchronous operation at 300, 1200, and 2400 bps, U.S. and international protocol compatability, and autoanswer/autodial. SupraModem 240 Plus requires a computer with an RS-232C interface, communications software, and a cable to connect the modem to the computer. The package, which includes the modem, operator's manual, quick-reference card, power adapter, and telephone cable, sells for $199.95.

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

Caché Leaves The Amiga

Cache Systems has temporarily withdrawn from the Amiga marketplace because the market was not as big as they had expected. The company is still in business for other computer systems and is still servicing their Amiga products, which include Hard Disc Subsystems and tape subsystems. Moreover, they are still making their products to fill their open orders, so Cache purchasers need not worry. Cache's decision to reenter the Amiga market is contingent upon Commodore's marketing.

Updated ExpressCopy

Express-Way Software Inc. has updated Express-Copy, a hard disk backup and file copy utility. Like the original version, ExpressCopy Version 1.10 is able to select files to copy based on Archive Bit, File DateStamp, Filename Pattern matching , and by Source Directory. Both versions also copy file from hard disk to floppy at up to 1 MB per minute, and can be used from both CLI and Workbench.

Improvements include the ability to exclude files from being copied by Filename Pattern matching and the capability of turning off the Overwrite Disk Requester. Backup disks are now filled to an average of 99% full, which reduces the number of backup disks needed to the bare minimum while still retaining standard DOS disks. Version 1.10 also insures that Icon files for Files and Directories are copied to the same disk so that the backup disks can be used normally from Workbench.

The list price for ExpressCopy is $44.95, and the Version 1.10 update is available to registered owners of ExpressCopy for $5.00.

Express-Way Software, Inc.
P.O. Box 10290
Columbia, MO 65205-4005
(314) 474-2984

Backup files from hard disk to floppy at up to 1 MB per minute.

AMIGA NE

Rumor has it that Liquid Light is working on a 16-bit graphics card.

Templicity 2.0

The Sterling Connection is now shipping Templicity 2.0. Templicity consists of over 100 ready-made spreadsheet templates for a wide range of personal and business needs. New templates for 1989 taxes with intactive forms 1040, A, B, C, D, E, F, SE, 2441, and 4562 are included. Tax templates are upgraded each year for $5.00. Other templates in the collection include personal financial planning, home office, real estate, advertising, management, sales, accounting, inventory, budgets, and household applications. The Sterling Connection recommends Templicity for individuals as well as businesses. The complete set of 100 templates sells for $34.95.

The Sterling Connection
Box 4850
Berkeley, CA 94704

16-Bit Graphics For The Amiga

Rumor has it that Liquid Light is working on a 16-bit graphics card. According to the grapevine, Liquid Light might already have working boards and will ship in the next few months. The project, however is hush-hush, so there is no official information available about a release date or price.

East Coast AmiExpo

The East Coast AmiEXPO will be held March 16-18 at the Sheraton Washington Hotel in Washington D.C. The show's organizers expect to entertain over 10,000 attendees, and feature over 120 companies and over fifty exhibiting manufacturers.

Seminar topics include professional video, graphics, beginning programming, animation, 3D modeling and rendering, and desktop publishing. Among the guest speakers will be Douglas Barney, Gail Wellington, and Jay Miner. As in years past, AmiEXPO will be holding the Amiga Art & Video Contest, which will feature two awards for the newly added Commercial Arts category. Admission is $15.00 for one day, $20.00 for two days, and $25.00 for three days.

Rumor has it that AmiExpo may feature an information kiosk that will illustrate the Amiga's multimedia abilities and demonstrate professional applications. Part of it's purpose is to show the superiority of the Amiga's multitasking abilities over Macintosh and IBM.

Also rumored is that there will be a Mandela suite. A person walks into a Mandela suite becomes part of a video game. The player is superimposed via video camera into the video game and can then interact with other characters and objects on the screen simply by moving his body. The player can also view himself on screen as he plays.

Although most companies try to be helpful and provide information, the nature of the industry and the AmiEXPO prevents many companies from being able to confirm what they will be showing at the show. Listed here are only some of the attractions expected at AmiEXPO.

Active Circuits, Inc.
Demonstrations: ImageLink conversion system; Bonsai digital signal processing board.
Announcements: support for Sony Erasable Optical Disk.

Dr. T's Music Software
Demonstrations: new versions of Keyboard Controlled Sequencer Level II v3.0; TIGER Cub 12-track sequencer; Phantom.

WS

Seminars: music and video production; introduction to multitasking programming environment.

Great Valley Products
Demonstrations: Impact A2000/8/0 8 megabyte SCSI ram controller; Impact 3001/4MB/33MHz accelerator board.

Impulse
Demonstrations: Vorec I voice recognition; Turbo Silver animation program.

California Freeware
Demonstrations: Shareware and Public Domain programs.

VidTech International
Demonstrations: ScanLock super VHS genlock.

Mindware International
Demonstrations: applications under TASS system; Digimate 3.0; Smooth Text Scroller; 3D Text Animator.

Soft Logik Corporation
Demonstrations: Page Stream v1.8; new font disks.
Announcing: minor additions to font catalog.

Very Vivid, Inc.
Demonstrations: Interactor animation program.

Xetec, Inc.
Demonstrations: family of fast track products
Announcements: new controller card for A2000 with 4 megabytes of memory; half card for A2000 that works with all hard drives, not just Xetec hard drives; joint venture with a major non-computer company (name not yet disclosed) to make an non-computer industry system.

Digital Animation Productions
Demonstrations: Transputor Board.

Hologramophone Research
Demonstrations: Pixound musical grafics player; Hyperchord dynamic rif sequencer.

Imptronics
Demonstrations: practical applications of UltraCard and UltraCard Plus.

Interactive Video Systems
Demonstrations: Trumpcard and Trumpcard 500 SCSI controllers.

Joe's First Company
Demonstrations: jointly prepared with Pulsar International line of structured graphics; PicMagic I font package; Living-Logos 4-D and Turbo Silver font package.

Free Spirit Software
Demonstrations: DragonScape adventure game; Dr. Ami diagnostic utility.

MicroDeal/Michtron
Demonstrations: Fast FAX Modem; Bermuda Project adventure game; Master Sound sound sampler; Viva authorizing language.

Supra Corporation
Announements: complete revision of Amiga 500 hard drives; Supra Modem 2400 Plus.

16 Million Colors

Active Circuits, Inc's ImageLink conversion and previewing system is capable of rendering 16 million color photorealistic animation directly to video tape. Designed for the professional graphics user, ImageLink can convert images between an infinite number of formats. ImageLink allows the user to input directly from popular ray-tracing packages and take advantage of frame buffers. ImageLink's suggested retail price is $299.00

Active Circuits, Inc.
106 Highway 71, Suite 101
Manasquan, NJ 08736
(201) 223-5999

New software can render 16 million color photo-realistic animation directly to video tape.

A Letter From The Publisher

Here at A.X. Magazine, we're sharpening our quills in preparation for the upcoming year.

Dear Reader,

We at Hahn-Wallace Publishing Group, Inc. want to extend our warmest thanks to you fo reading A.X. Magazine. Two years ago we knew that we were taking a gamble by attempting to produce a magazine that was written exclusively to inform its reader. Our primary objectives were to publish a magazine that had a high standard of integrity and that attempted to be as impartial as possible. By committing ourselves to this task we often suffered at the hands of our advertisers, many of whom angrily withdrew their ads when our evaluative articles were not to their liking.

But you readers responded, and that was what was important to us. Many of you wrote to us expressing your feelings that we were one of the very few magazines to "tell it like it is." This encouragement stoked our creative fires and inspired us to continue with what we were doing.

Because we held steady to our beliefs, the enthusiasm for A.X. began to bubble; we became known as the highest rated of Amiga magazines. Bookstores and computer dealers found that A.X. Magazine was so strong a seller that they couldn't keep the magazine in stock. A.X. became the magazine choice for the Amiga consumer. Today we are the Amiga magazine with the highest sellout rate.

As we now begin our third year of publishing, I'd like to guarantee that we will continue to adhere to the same philosophy of integrity and impartiality as we have in the past. We will challenge our imaginations to present the best material and information possible. We will push ourselves to produce a better magazine with each and every issue.

Once again, I'd like to express my gratitude, and I'd like to emphasize that if you have any suggestions or remarks that you would like to make about our magazine, please write and tell us. We do listen.

Best of luck with your Amiga,

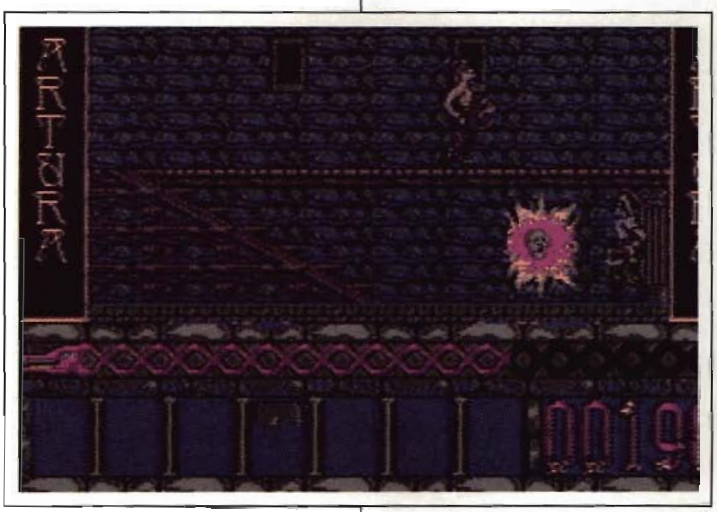
Bonnifant H. Han &
Clyde R. Wallace
Publishers

Artura

By Mike Hubbartt

Do you ever get the urge to go back in time to those days when problems were solved with swords and magic, instead of red tape and excessive paperwork? Do you enjoy reading books about King Arthur and his valiant Knights, or other medieval fantasies? If so, *Artura* could be the game you've been waiting for.

Travel back in time to ancient Britain. You are *Artura*, a warrior on a quest (naturally) to rescue the beautiful Nimue, an apprentice Mage with knowledge of ancient secrets. Your enemy is your evil (naturally) half-sister Morgause, who holds Nimue captive in her stronghold. Morgause has many minions that want nothing more than to end your life, so be prepared! These minions include warriors, ghouls, spiders, and rats.



Your weapons are throwing axes. Throw the axes (trigger to continue throwing) at enemies to the left or right, above or at an angle to you. This ability to throw an axe at a 45 degree angle to the left or right will rid you of approaching minions on a catwalk above you, which helps you retain your all-important health. You don't need to retrieve your weapons, just keep on throwing them at all approaching enemies. Some enemies need more than one shot to finish them off (warriors need three or four), so don't stop firing until the enemy is replaced by a specter (which signifies death). Your relative health is shown on the bottom of the screen, and decreases every time you are hit by an enemy.

Move through Morgause's stronghold by walking around, avoiding death at the hands of her forces, and moving up or down levels through pillared elevators. Some elevators move only one direction, while others move both up and down. Some maze areas are well protected by enemies, so it's smart to move quickly through each area to explore it before moving on to the next section of the maze. As you move through the maze, pick up any chunks of runes laying about. There are six runes that where stolen and destroyed by Morgause, and you must find all the chunks of each rune stone to be able to use it. You will need to find food stores, which are located in different areas around the mazes,to rejuvenate your health.

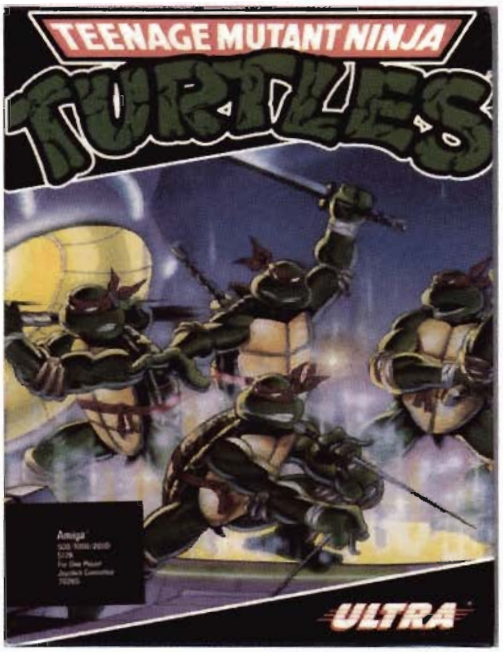
The manual is eight pages long, short unless you remember that *Artura* is an action/adventure game, and the game comes on a single 3 1/2" disk. The game has nicely-drawn graphics, for both the scenery and characters. This game both is simple to learn and easy to play. Arcadia incorporates both arcade and strategic aspects in *Artura*, although players too impatient for strategizing can go directly to the back of the manual for information dealing with the location of runes and food stores throughout Morgause's stronghold.

This action/adventure game is easy to learn, yet fun since it takes so little concentration to stick to it. This is not a D&D game like *Hillsfar* from SSI, so don't expect it to have that kind of depth. I like this one when I come home from a frustrating day at work - I don't sit at work all day excited about coming home to play it, but it sure has taken the edges off a few rough days I've had. I had no real complaints about *Artura*, the disk access time was acceptable and the helpful information in the back of the manual may help you complete this game in less time than normal.

Artura
Price: $39.99
From: Virgin Mastertronic
18001 Cowan
Suites A & B
Irvine, CA 92714
1-714-833-8710

Do you ever get the urge to go back in time to those days when problems were solved with swords and magic instead of red tape and paper work.

The turtles are martial artists trained by Master Splinter, and each turtle has his own special weapon.



Teenage Mutant Ninja Turtles

By Mike Hubbartt

One of the biggest crazes to hit cartoons, both T.V. and print is about four turtles named Leonardo, Raphael, Michelangelo, and Donatello. These turtles (the Teenage Mutant Ninja Turtles - TMNT) are not artists like their namesakes, but Ninjitsu warriors out to combat the evil atrocities committed by the villain Shredder and his horde of nasties. Ultra has released a game for the Amiga based on these popular cartoon heroes.

The Turtles

First for the TMNT themselves. These turtles not only walk like humans, they talk like them too! Their favorite food, like most kids' is Pizza! They are befriended by the lovely human reporter, April O'Neal, and assisted by their mentor, Splinter, a former human Ninja mutated into a rat just as the turtles themselves were mutated from ordinary turtles into a more human-like semblance.

The turtles are martial artists trained by Master Splinter, and each turtle has his own special weapon: Leonardo uses the Katana Blade, Raphael likes the Sai, Michelangelo the Nunchukus, and Donatello prefers the Bo Staff. These weapons are each effective against different creatures the turtles encounter on their missions: first to rescue April from Shredder's minions. The other is to fight Shredder and obtain his Life Transformer Gun - which, although it could change Master Splinter back into a human, could also change the TMNT back into ordinary turtles!

The Shredder

The Shredder has a large force of evil characters on his side. The turtles had better keep an eye out for the Foot Clan Ninjitsu soldiers (karate warriors - cannon fodder of Shredder's army), Roof Leapers (ugly devils that walk on the ceilings), the Mouser (a mechanical beastie that chomps its way to turtle soup), the Fire Freak (a hot head that shoots fireballs), the Searchlight Mechanism (a helicopter-like creature with a searchlight), and the Roller Car (a steam roller used to flatten unwary turtles.

The toughest cronies of Shredder are Bebop and Rocksteady - part human and part animal- they are one tough pair of crooks. In addition to Bebop and Rocksteady, watch out for Big Mouser (a LOT tougher than his little brother), Mecaturtle (a mechanical turtle with blades for hands, the Technodrome Guardian (a mobile stronghold for Shredder), and Shredder himself (the toughest of the tough!).

The Game

Ok, enough of the preliminary information on the TMNT (old hat to those that faithfully follow the series), here's the scoop on the game itself. All four turtles are available for action, although only one at a time. Select your favorite turtle (I prefer Donatello since I have the best luck with his Bo Staff) and begin exploring either the city itself or go into the sewers to look for April. Your relative health is shown at the bottom of the screen; when health is depleted by attacks from Shredder's forces, a turtle is captured by

Shredder's minions. To rescue the captured turtle, touch his hand when you come across him (captured turtles can turn up anywhere).

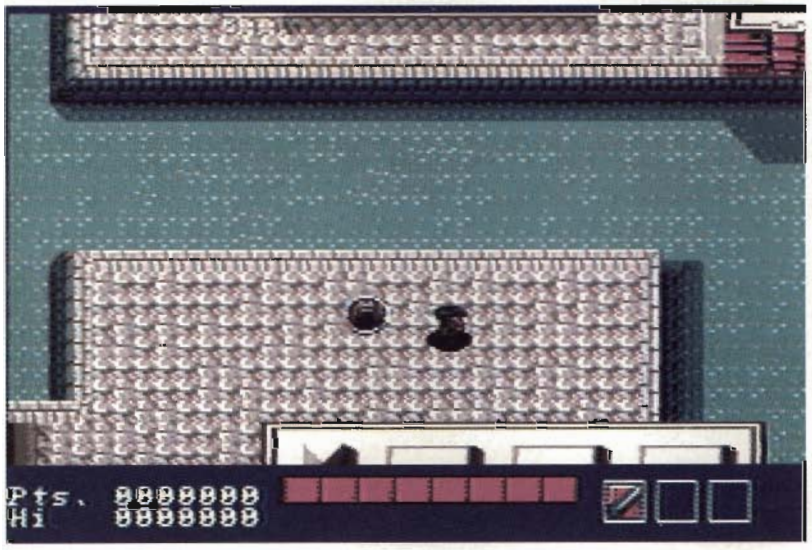
Move a turtle left, right, up, or down through the city or sewers with the joystick. Pressing the trigger quickly causes a turtle to strike with his weapon, while pressing and holding the trigger causes a turtle to jump. If the turtle is walking forward, pressing the trigger will help him leap a chasm (where assorted nasties may lurk). If the turtle is standing still in front of a barrier, press and hold the trigger and then move the joystick to the right to jump your turtle over the barrier.

Strike any encountered enemies with your turtle's weapon (the tougher villains will take more than one hit to finish them off). Wandering turtles may encounter and use additional weapons like the Anti-Foot Clan Missile, Shurikens (throwing stars), the Kiai, a Boomerang, Mr. Invincibility (who makes your turtle invincible for a short period of time , and a rope to cross buildings when you are at level 3 or 4 of the game. There are 6 levels in the game, each more dangerous than the previous. Pizza is the foodstuff for TMNT, so eat any pizza you come across to build up your turtle's depleted health. Believe me, you will take damage from the troops of Shredder, so eat pizza every time you encounter it.

Master Splinter has an information screen you access during game play. This screen will let you choose between the different turtles (which can be a real life-saver, since some weapons work better than others and a quick change at a fight scene can prevent a turtle's capture). This screen also displays messages from Splinter - tips along with words of encouragement - and a map of the current level with your relative position on it. The map even shows the locations of all underground passages and buildings.

I only had two complaints. The copy protection involves using those red pages with codes on them. These pages are difficult to read, even under the best of lighting conditions. My second complaint is the amount of disk accessing that occurs. I would have preferred to see the program take advantage of any expanded memory.

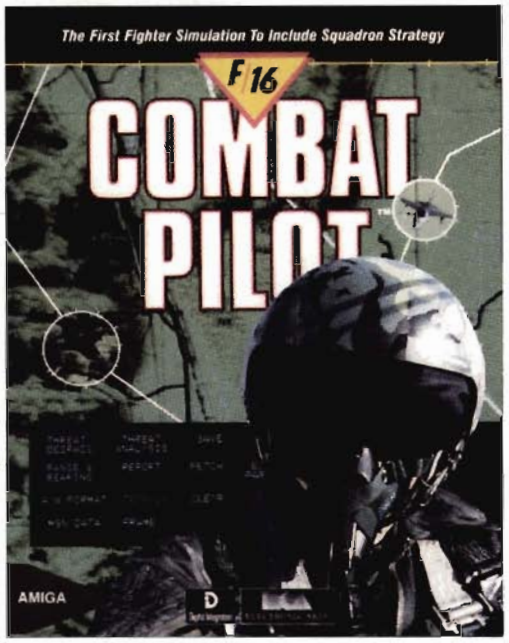
Overall, this is one fun and addictive game! Everyone I've seen play *TMNT* loved it, even non-gamers. The screen and character graphics are well done, and the characters move smoothly. Learning to jump and maneuver a turtle through the mazes takes very little time at all, and for amateurs Ultra provides one sewer that is very easy to get through. The manual is only 14 pages long, but it explains the game well enough. The game comes on two disks and doesn't require disk swapping in the internal drive - like some other games released lately. For arcade action that won't bore you quickly, take a look at this game, I think you'll like it as much as I did.



Teenage Mutant Ninja Turtles
Price: $39.95
From: Ultra Software Corp.
900 Deerfield Parkway
Buffalo Grove, IL 60089-4510
1-708-215-5111

Pizza is the foodstuff for TMNTs, so eat any pizza you come across to build up your turtle's depleted health.

The ARMAAM missed! The Threat Warning panel showed an alert that the bogey had fired an air-to-air missile my way!

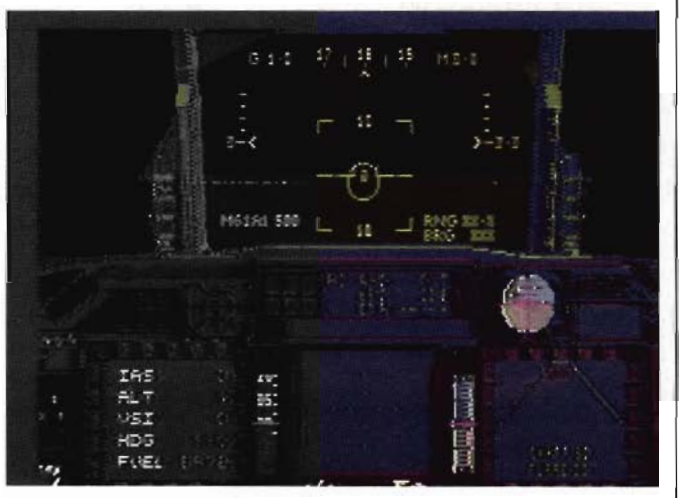


After flying patrol several hours, it was time to head back to base for a hot cup of coffee and a debriefing. While cruising at an altitude of 10,000 feet, the Radar Warning receiver picked up a radar source directly ahead. The Threat Warning panel showed the blip on my screen to be another aircraft's radar; I immediately lit the afterburners and began climbing for a better attack angle. My radar now showed the bogey CBDR (Constant Bearing Decreasing Range) to be inbound from just over 30 miles out. Where he'd been hiding from our early warning stations was beyond me, perhaps he had come in hugging the ground to stay hidden. I guess he had decided to confront me when he figured that my radar must have picked him up. No matter. It looked like he meant business, and I wasn't going to wait to be on the receiving end of a hot stick of dynamite.

When the Threat Warning panel showed the bogey was attempting to jam my radar, I brought up the weapons stores and selected an AMRAAM missile. It took all of 5 seconds to get Lock-On, and the AMRAAM was away. I hoped the missile's ECCM would find that bogey, but just to be safe I selected a SideWinder from stores and kept my eyes peeled. The ARMAAM missed! The Threat Warning panel showed an alert that the bogey had fired an air-to-air missile my way, so I dropped a flare and some chaff, fired off the SideWinder and executed an Immelmann to get the @#*! out of there. With an inbound missile on my tail, I dropped more chaff and a few more flares for safety, then broke hard right. The missile missed me by only a few feet!

I caught a flash out of the corner of my eye and noticed that the bogey was gone from my radar. He hadn't been as quick as I was. The SideWinder had locked in on his engine exhaust, and caught him completely off guard. I looked for signs of a opened 'chute, but he wasn't that lucky. Maybe next time I wouldn't be so lucky, but for now it was time to head back to base and file a report; the diplomats could take it from there.

The best thing about flight simulators is that you get to fly planes and jets, and have encounters where people don't really die. The Amiga has been out for quite a while now and has a fair number of flight/combat simulators available. Many Amiga owners have purchased one or more of the following: *Flight Simulator 2* and *Jet* from subLogic, *StarGlider*/*StarGlider 2* from Rainbird, *F/A-18 Interceptor* from Electronic Arts (EA), and *Falcon* from Spectrum Holobyte. The leader for the last year has been Spectrum Holobyte's *Falcon*, which has already undergone one revision and has an additional missions disk available. EA has released another Amiga flight simulator, called *F16* Combat Pilot, and this one looks like it could give *Falcon* a serious challenge as the best Amiga flight simulator.



F16 Combat Pilot puts you in the seat of an F16, one mean plane, meant for dogfighting, troop support, intelligence gathering, and striking targets deep within enemy-held territories. Your weapons include Durendal an-

Continued on page 71

INTO THE MUSICAL FUTURE...WITH *AMIGA*

by Glen Deskin

What's hot in the 90s for Amiga music software and hardware? What's hot in the music industry and how will it affect the Amiga?

WHAT'S AVAILABLE NOW?

For all those faithful would-be-composers/Amiga owners:
- who were brave enough to purchase this incredible machine that had tremendous potential, but very little software;
- who purchased the Amiga during the "MacDecade" (as far as the music industry is concerned);
- who stuck it out for years while all your friends were using those great sequencing programs, patch editors/librarians, and algorithmic composers;
- who struggled with Soundscape's *Pro Midi*;
- for all of you who never lost faith, never fear, the doctor is here!

Dr. T's Music Software that is. With their barrage of professional music software, they lead the pack with 35 (yes, that's thirty five!) packages for the Amiga, and a soon to be released SMPTE reader/generator called *Phantom* (scheduled for early March release, several animation companies, such as Elan Designs and Hash Enterprises, are already working to support it in their products). Some of the doctors other products include *Keyboard Controlled Sequencer v3.0*, *Level II* (an upgraded version of *KCS* with much more in depth editing and composition capabilities), *Tiger Cub* (sequencing, scoring, and graphic editing all in one package for the beginner), and numerous patch editor/librarian programs for just about every major synthesizer on the market.

And that's not all! Passport Designs, one of the big guns in Mac music software, has released their program *Master Tracks Pro* for the Amiga, as well as a device called *MIDI Transport*, a professional MIDI/SMPTE interface that reads and writes SMPTE time code, FSK sync (for syncing to tape decks), and sends and receives MIDI time code and regular MIDI in and out. Then there's *Music-X*, from MicroIllusions, which provides sequencing, graphic editing, patch editor/librarian, and MIDI mapper functions all in one package. Also, new from Blue Ribbon Bakery is *Bars&Pipes*, a sequencing program with an ingenious user interface that offers powerful music composition capabilities.

Sequencing and patch editing are just the tip of the iceberg however; there are programs available that allow you to edit samples from some of the leading keyboard samplers on the market. There are primarily two such programs available: *MIDI Sample Wrench*

Sequencing and patch editing are just the tip of the iceberg

Music For The 90s

What all this means is that the Amiga could very well be on the edge of becoming the leading computer of choice in the music industry.

from Dissidents and *Synthia Professional* from The Other Guys. Both programs allow you to dump 12-Bit or 16-Bit samples from any sampler that supports MIDI Sample Dump Standard and edit them graphically with the Amiga. They also offer some sound processing features such as EQ, compression, et cetera.

NEW APPLICATIONS

Sequencing with a computer may be new to some people, but the application has been around for a while. Some professional applications for the Amiga are just starting to surface. One of the biggest things to hit the market recently is from Interactive MicroSystems Inc. called the *MediaPhile* system, a video production system that can be applied to audio as well. The system consists of a controller and a set of applications that use *MediaPhile Programmer's Toolkit*. The controller reads infrared commands from the remote control units of video decks, laser disk players, compact disk players, or even digital audio tape (DAT) machines, and then stores them on computer disk. Commands can then be sent through the controller's transmitter using the *Programmer's Toolkit* library. Configured with two Sony *EV-S900 Hi 8mm* decks, the *MediaPhile system* can record 48 hours of digital stereo sound. Just think, if you could control several DAT decks at the same time, you could have an all digital multitrack recording system. Taking into account that you can get some DAT recorders for a little over $2000, it's a lot cheaper than most of the hard disk recording systems and digital multitrack tape decks available today that go for $40,000 - $300,000! (Gasp!)

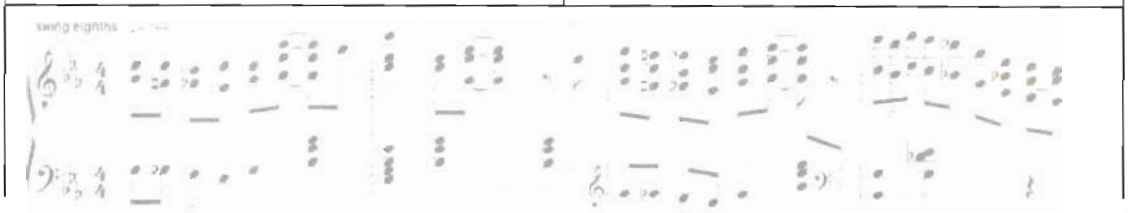
LOOKING AHEAD

For those of you who aren't familiar with DATs, let me explain. Digital audio tape is a relatively new development that has been the subject of very heated debate for the last year. DATs give you the same sound quality of a compact disk (16 bit at 44.1 Khz with a signal to noise ratio of 98db) plus the ability to record. They are slightly smaller than a regular cassette, and the decks are much faster than cassette decks for rewinding and fast forwarding. DATs also have an index imbedded in the digital information on the tape so that you can skip directly to a particular song, just like CD players. The major record companies are afraid that this will increase the number of illegal copies of commercial recordings since a DAT copy of a CD is equivalent to the original. A fifth or even 20th generation copy is as good as the original. When copying digitally, there is no sound degradation whatsoever, as is the case with regular cassettes.

DAT decks have been available overseas for quite some time, and in the U.S. through "gray market" dealers. These dealers justified the import and sale of DAT decks by hiking up the prices tremendously and selling them as "high end" professional audio gear, thereby putting them pretty much out of the reach of the general public. At one point, record companies threatened to sue any manufacturer who released a consumer DAT deck in the United States. A compromise has been reached just recently. All new CD's and prerecorded DAT's will have a type of copy protection, where the recording deck will automatically shut off if it sees the copy protection code. What does all this mean? It means that if every Joe Schmo could produce CD quality, multitracked recordings, copy them himself (remember, no sound degradation), and distribute them himself, who would need record companies?

WHAT'S IN STORE FOR THE AMIGA?

What all this means is that the Amiga could very well be on the edge of becoming the leading computer of choice in the music industry, not only for the home studio, but for



the professional studio as well. It won't be long before you see cards for the Amiga that allow direct to disk recording at a fraction of the price that current recording systems go for. And with the Amiga's ability to multitask (can you believe some people are just recognizing this ability and wondering why they bought another machine?), you will be able to edit all the synthesizer patches for your songs, sequence the songs, sync the Amiga to a digital multitrack recording system and record all the acoustic parts, master this all down to a DAT deck, then sync it up to the Amiga with SMPTE and do the soundtrack for the video (which you created using the Amiga's incredible graphics of course). And the best part is, you can do it all yourself by using an off-the-shelf Amiga as the brains of the entire operation. Truly awesome!

Companies Refrenced In This Article

Dr. T's Music Software
220 Boylston Street
Chestnut Hill, MA 02167
(617)244-6954

Passport Designs, Inc.
625 Miramontes Street
Half Moon Bay, CA 94109
(415)726-0280

Interactive MicroSystems, Inc.
80 Merrimack Street
P.O. Box 1446
Haverhill, MA 01831
(508)372-0400

MicroIllusions
17408 Chatsworth Street
Granada Hills, CA 91344
(818)360-3715

Blue Ribbon Bakery
1248 Clairmont Road
Suite 3D
Atlanta, GA 30030
(404)377-1514

Elan Design, Inc.
P.O. Box 31725
San Francisco, CA 94131
(415)359-7212

Hash Enterprises
2800 E. Evergreen
Vancouver, WA 98661
(206)693-7443

MicroBotics means Amiga™-Power!

Whichever Amiga you own –or plan to buy– we have the expansion you need

For the
Amiga 2000...

HardFrame/2000
Super Speed DMA SCSI Interface

If your application calls for super-speed uninterrupted access to your harddisk, HardFrame/2000 is your answer. This is a high-end, no holds barred SCSI interface that operates at bus speeds. AutoBooting and automounting directly to the new FastFileSystem (no OldFS needed!).With cable pinouts designed for compatibility with low cost Macintosh hard drives, one HardFrame/2000 can support up to seven devices. Word-length data transfer, FIFO buffering, true DMA, all mounted on a metal frame suitable for mounting standard SCSI 3.5" drives "hard-card" style (or, if you prefer, cable connected to a bay mounted or external disk). Available now. Suggested List price $329. Frameless version: $299.

SB2000 Adaptor Card
StarBoard2 Portability

Large numbers of MicroBotics StarBoard2 owners have moved over to the A2000. To protect their investment in our technology we've made available a simple, low-cost adaptor card that permits the installation of a "de-cased" StarBoard2 inside the Amiga 2000 (in the first 100-pin slot). When adapted to the 2000, StarBoard2 is still fully functional autoconfiguring memory plus you get access to all the StarBoard2 MultiFunction options or the new SCSI Module. Available now. Suggested list price: $69.95.

8-UP! (DIP)FastRAM
Maximum Memory in One Slot!

The FastRAM card that every Amiga owner will eventually come to –why limit yourself to the possibility of only two megabytes per slot when 8-UP! will take you all the way to the top of the autoconfiguration memory space of EIGHT MEGABYTES ! 8-UP! uses commonly available 1 megabit-by-1, conventional DIP-style DRAM in standard sockets You can install two, four, six or eight ful megabytes on one card! This flexibility is especially important to BridgeCard and 2620 users who need the 6 meg size to max their systems. And you can install the memory chips yourself for minimum cost (8-UP! is the most cost effective 8 megabyte board sold). 8-UP! is a power efficient (less than an amp), zero wait state, autoconfiguring design. 8-UP! is also available in a SIMM-using version. Suggested list prices start at $239 (0k).

For the
Amiga 500...

M501 Memory+Clock
Half a Meg at a Great Price!

As we are all coming to realize, a 1-megabyte Amiga (at least) is a necessity not an option. When you add the inboard 512k memory and clock module to your A500, make it a MicroBotics-brand, plug compatible work-alike. It uses the exact same kind of memory and the exact same clock and battery. And note that just like Commodore and unlike some third-party expansions, we use a long-lived rechargeable Ni-cad battery by Varta– which you'll never have to replace! Set the MicroBotics clock using the same software (on your WorkBench disk) as you use for the Commodore clock. M501 has a suggested list price of $129.95. Also available in a new, 0k, socketed version (includes clock) for only $54.95.

MicroBotics,Inc.

Great Products Since the Amiga Was Born!

811 Alpha Drive, Suite 335
Richardson, Texas 75081
(214) 437-5330

SOLD ONLY THROUGH YOUR AMIGA DEALER
Tell your dealer he can quick-order from MicroBotics directly – no minimum quantity –show him this ad!

StarBoard2/500
Two Megs; a Choice of Modules

The premier memory expansion for the A1000 is now available on the A500. In a sleek, redesigned case with an independent power supply strong enough to power StarBoard2 and another A1000-style StarBoard2, all the power and flexibility of this great expansion device is available to you. Up to 2 megabytes of autoconfiguring, zero-wait state FastRAM, MultiFunction or SCSI module capability for either math chip/StickyDisk functions or fast SCSI harddisk interfacing. StarBoard2/500 also has a unique LED diagnostic/confidence light to indicate the powered up state of your Amiga and your expansion memory. Another A1000 style StarBoard2 can be connected to the expansion bus pass-UP (it exits through the top of the case) for a total of FOUR megabytes of memory and two modules. Suggested list price $339 and up.

For the
Amiga 1000...

StarBoard2
The Expansion Product of Choice

The superb memory expansion for the Amiga 1000, still going strong! Up to 2 megabytes of zero-wait state, autoconfiguring FastRAM in a sleek, all steel Amiga-colored case plus the capability to accept either one of two daughterboard modules: the original MultiFunction Module or the brand new SCSI Module. StarBoard2 is powered by the bus (up to two StarBoard2's can be supported by the A1000) and passes it on. Available now; suggested list price $339 and up.

MultiFunction Module
High Tech at Low Cost

This "daughterboard" installs on any StarBoard2 (all three Amiga models). It features a socket and software to support the Motorola 68881 Math Chip as an I/O device (MicroBotics pioneered this approach on the Amiga –now directly supported in the math libraries in the new AmigaDOS1.3). StickyDisk gives you the most "bullet-proof" rebootable ram disk –its hardware write protection turns the whole device into a solid state, superspeed disk. alternately, parity checking of StarBoard2 memory can be enabled when extra parity RAM is installed. Finally, the MultiFunction Module carries an easy to use battery-backed clock to set your system time on start-up. Available now; suggested list price $90.00

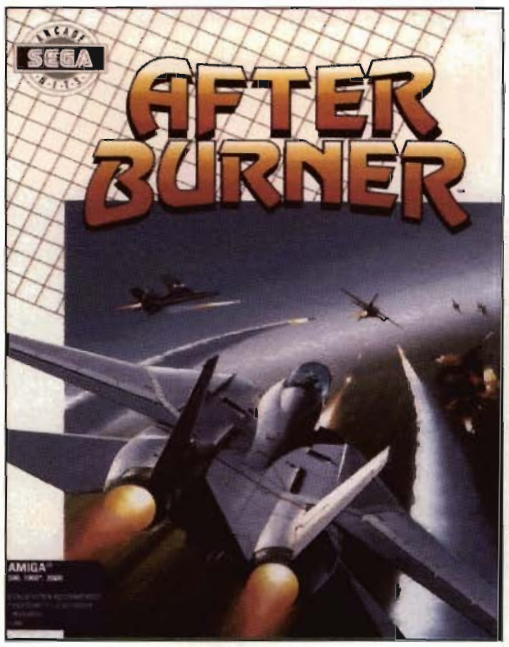
StarDrive Module
Speedy, Low-cost SCSI Interface

As an alternative to the MultiFunction Module, all models of StarBoard2 can accept this new hard disk interface. StarDrive affords you cost-effective, pseudo-DMA access to Macintosh compatible SCSI drives and other third-party SCSI devices. Fast, easy to install including driver software and disk diagnostics. StarDrive also has a battery backed clock to set your system time on boot-up. Available now. Suggested list price: $129.95

MouseTime
The Port Saving Clock

The easiest-to-use, most cost effective implementation of a battery-backed mouse port clock for the A1000. MouseTime passes the port through for joysticks or other devices. Complete with WorkBench software. Available now. Suggested list of $39.95.

Don't expect to spend many hours figuring out strategies - quick reflexes make it here.



Video arcades have been big for over a decade. Not limited to just the young, people in their twenties and even thirties can be found lurking around modern arcades found in many major U.S. shopping malls. Arcade games have come and gone - some of the more popular ones are ported over to game machines like Atari and Nintendo, and others are ported to computers like the Amiga. Direct translation of the arcade version, without losing speed or other important characteristics, is highly desirable yet rarely achieved.

There are few games in an arcade that I can walk past without playing at least one game, but the game that is my true weakness is *After Burner*, from Sega. The arcade version uses a control yoke that shakes out of control when you take a hit - this is the only feature I found missing from the arcade version in the Amiga version, and I think I can live with that minor aberration.

This game is a fast-paced arcade shoot 'em up. Don't expect to spend many hours figuring out strategies - quick reflexes make it here. You are flying an F-14 Tom Cat against a horde of flying nasties; the games starts as you take off from the deck of an aircraft carrier. You fly straight ahead, using the joystick to move up or down, or to execute a 360 degree roll. Your weapons are a Vulcan 20mm cannon and air-to-air missiles. Be sure to lock the missiles on to a target before firing, or they simply spin off into the air without damaging anything.

To avoid incoming enemy fire while you are flying, dodge up or down, or execute a 360 degree roll. I use a 360 degree roll whenever there are more than three enemy planes on the screen at the same time -- and that's fairly often. The tips section of the foldout included with the game says that rolling will help you to avoid the majority of enemy fire. Enemy planes can attack from either the front or from the rear, so don't let your guard down for even a moment. (I've lost a plane to an attack from behind more than once!) The best tip I can give you is to keep your plane moving all over the screen in order to avoid any surprises. There are enemy kamikaze planes that will give you a hard time -- they spin while approaching and they are intent on crashing into you more than merely firing a missile your way. As the levels increase, so do the number and toughness of the encountered enemies. The refueling is simple enough -- simply dock with another plane in the air and receive more fuel and missiles.

This game is as close as I can imagine to a direct translation of the arcade version. The graphics are so close to the original arcade version, that I haven't seen any differences yet! For pure shoot 'em up fun, this game is hard to beat. There isn't an owners manual included with this program (which comes on a single diskette), just a small folder that has loading instructions and a few tips. I liked it, but I will still enjoy playing the arcade version at every opportunity. If you are curious as to whether or not you'd like this game, check it out at a nearby arcade or at a local Amiga dealer - its price is expensive when you consider it's a rather simple game.

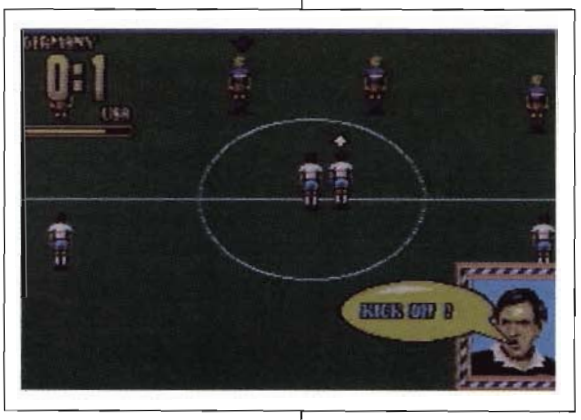
After Burner
Price: $49.95
From: Mindscape, Inc
3444 Dundee Rd
Northbrook, IL 60062
1-312-480-7667

Rick Davis's World Trophy Soccer

By Mike Hubbartt

Finesse, rather than brute force, is an important aspect of soccer.

Soccer is one of the most popular games in the world today. Eleven players for each team are on the field; the objective, to score a goal, is achieved by moving the ball down the field past defenders, and then kicking the ball past a goalie and into the opponent's goal. Finesse, rather than brute force, is an important aspect of soccer. A well executed play is carefully planned out, and the ball is passed around the field until a player has a good chance at scoring. In the U.S., soccer has been more popular in schools than at a professional level.



The World Cup is the world soccer championship, and many national teams strive to make the playoffs for this prestigious title. Countries from all over the world compete with each other in contests that are viewed by millions. Although soccer has not really caught on in the U.S., the 1994 World Cup tournament will be held here for the first time.

World Trophy Soccer (WTS) is another Melbourne House product, and the one Megabyte version is a direct port of the arcade version. A 512k Amiga version is in the works, although it is not ready as of now. The present version needs at least one Megabyte, and needs one and a half Megabytes if used on Amigas with hard drives. The controls for *WTS* are simple and easy to learn; either one or two people can play.

WTS has the full ensemble of plays used in a live game, including free kicks, goal kicks, corner kick, and throw ins. Whenever I am losing to the computer, I trip the opponent, which results in a foul and a free kick, but this stops his run on my goal (to try to get the ball back, eh?). The view you see of the game is from overhead until you shoot at the goal - then your view is from directly behind the goalie.

Before attempting to save a game to disk, I put the write protect tab on. When the game tried to save itself to the disk and couldn't, the program kept asking me to remove the write protect tab and wouldn't let me cancel the save option. This was a minor oversight, but it forced me to reboot to get back to the game and I think it needs to be corrected in a revision.

Aside from this complaint, and the awkward memory requirements, I enjoyed playing *WTS*. The screens scroll smoothly and the players are easy to control. The graphics are the best I've seen from Melbourne House, and hope their future products also look this good. Because you switch control from one player to another, be prepared to plan plays out ahead of time so they are executed smoothly.

Computer Mart

BEST BUY
SUPRA 2400 MODEM
$119.00
HAYES COMPATIBLE
300/1200/2400 BAUD

SOFTWARE

3-DEMON	68.00
3D FANCY FONTS	48.00
AAARGH	21.00
AC BASIC	135.00
AC FORTRAN	198.00
AEGIS DRAW 2000	168.00
AMIKIT	24.00
ANALYTIC ART	38.00
ANALYZE 2.0	62.00
ANDROMEDA MISSION	25.00
ANIMAGIC	63.00
ANIMATE 3D	95.00
ANIMATOR APPRENTICE	187.00
AQUAVENTURE	24.00
ARCHITECTURAL DESIGN	22.00
AREXX	30.00
ARKANOID	25.00
ASSEMPRO	69.00
ATALK III	60.00
ATREDES BBS PRO.	90.00
ATREDES TERMINAL	30.00
B.A.D.	30.00
BARD'S TALE II	37.00
BATTLE CHESS	30.00
BAUD BANDIT	30.00
BBS-PC	92.00
BENCHMARK MODULA 2	138.00
BENCHMARK LIBRARIES	69.00
BEYOND DARK CASTLE	21.00
BLITZ. ON THE ARDENNE	37.00
BLOOD MONEY	24.00
BREACH	28.00
BRIDGE 5.0	22.00
BUBBLE BOBBLE	26.00
BUBBLE GHOST	25.00
BUTCHER 2.0	23.00
CALIFORNIA GAMES	27.00
CALLIGRAPHER	74.00
CAPE 68K ASSEMBLER	59.00
CAPONE	35.00
CAPTAIN BLOOD	31.00
CARMEN SAN DIEGO	27.00
CARRIER COMMAND	28.00
CENTERFOLD SQUARES	20.00
CHESSMASTER 2000	31.00
CHRONOQUEST	24.00
CITY DESK 2.0	120.00
CLUE	24.00
COMICSETTER	66.00
COMICSETTER DATA DISKS	22.00
CRITICS CHOICE	150.00
CYGNUS ED PRO	60.00
DARK CASTLES	28.00
DATARETRIEVE	53.00
DEATH BRINGER	24.00
DECIMAL DUNGEON	32.00
DELUXE HELP DISKS	22.00
DELUXE MUSIC 2.0	69.00
DELUXE PAINT III	95.00
DELUXE PHOTO LAB	98.00
DELUXE PRINT II	57.00
DELUXE PRODUCTIONS	138.00
DELUXE VIDEO 1.2	86.00
DEMON'S WINTER	27.00
DESIGN 3D	60.00
DESKTOP BUDGET	42.00
DESTROYER	27.00
DEVPAK ASSEMBLER	60.00
DIGI PAINT 3.0	66.00
DIGIWORKS 3D	78.00
DIRECTOR	44.00
DIRECTOR TOOLKIT	28.00
DISCOVERY DATA DISKS	14.00
DISCOVERY MATH	28.00
DISC. SPELL	28.00
DISC. TRIVIA	28.00
DISK MASTER	48.00
DISK MECHANIC	55.00
DOS TO DOS	32.00
DOUGS MATH AQUARIUM	51.00
DOWNHILL CHALLENGE	21.00
DR. T'S SOFTWARE	CALL
DRAGON'S LAIR	39.00
DRUM STUDIO	30.00
DUNGEON MASTER	24.00
DYNAMIC DRUMS	51.00
DYNAMIC STUDIO	138.00
EARL WEAVER BASEBALL	35.00
EMPIRE	35.00
EMPIRE STRIKES BACK	24.00
ENCHANTER	21.00
EUROPEAN SCENERY DISK	18.00
EXCELLENCE	174.00
EXPRESS PAINT 3.0	78.00
FA INTERCEPTOR	35.00
FACC II	24.00
FAERY TALE ADVENTURE	35.00
FAERY TALE HINT BOOK	10.00
FALCON	30.00
FAMILY TREE	30.00
FANTAVISION	38.00
FEDERATION	30.00
FERRARI FORMULA I	35.00
FINE PRINT	30.00
FIRE POWER	16.00
FIRST LETTERS & WORDS	35.00
FIRST SHAPES	35.00
FLIGHT PATH 737	19.00
FLIGHT SIMULATOR II	36.00
FLIPSIDE	38.00
FLOW	65.00
FORMS IN FLIGHT II	72.00
FORTRESS UNDERGROUND	19.00
FRACTION ACTION	32.00
GETTISBURG	42.00
GIZMOS 2.0	44.00
GNOME RANGER	14.00
GOLD RUNNER	28.00
GOLD SPELL II	29.00
GOLDEN PATH	32.00
GOMF 3.0	24.00
GOMF 3.0 W/ BUTTON	51.00
GRABBIT	21.00
GRADE MANAGER	52.00
GRAND PRIX CIRCUIT	28.00
GRAPHIC STUDIO	38.00
GREAT STATES II	25.00
GRID START	19.00
GAUNTLET II	35.00
HACKER II	28.00
HARDBALL	28.00
HARRIER COMBAT SIM.	35.00
HARRIER MISSION	19.00
HEROES OF THE LANCE	26.00
HITCHHIKERS GUIDE	21.00
HOLE-IN-ONE MIN. GOLF	22.00
HOLLYWOOD POKER	22.00
HONEYMOONERS	25.00
HUMAN DESIGN	22.00
HUNT FOR RED OCTOBER	35.00
HYBRIS	24.00
INDOOR SPORTS	35.00
INOVATOOLS #1	55.00
INSANITY FIGHT	28.00
INTELLITYPE	35.00
INTERCHANGE	32.00
INTERFONT	72.00
INTERNATIONAL SOCCER	24.00
INTROCAD	51.00
INVESTOR'S ADVANTAGE	66.00
JACK NICHOLAS GOLF	30.00
JET	36.00
JET SET UTILITIES	24.00
JEWELS OF DARKNESS	21.00
JIGSAW	30.00
JINXTER	28.00
JOE BLADE	21.00
KAMPFGRUPPE	39.00
KARATE KID II	28.00
KARATE KING	19.00
KARTING GRAND PRIX	19.00
KINDERAMA	32.00
KINDWORDS	63.00
KING OF CHICAGO	35.00
KINGDOMS OF ENGLAND	30.00
KRISTAL	30.00
LANCELOT	26.00
LAS VEGAS	19.00
LATTICE C 5.0	204.00
LAZERSCRIPT	29.00
LEADER BOARD DUAL PACK	21.00
LEATHER GODDESSES	26.00
LIGHTS, CAMERA, ACTION	51.00
LINKWORD LANGUAGES	19.00
LION'S FONTS	54.00
LRDS OF THE RISING SUN	31.00
LOTTERY MAGIC	18.00
LURKING HORROR	28.00
M	155.00
MAGELLAN	117.00
MAGIC JOHNSON BASK.	30.00
MANIC INVADERS	19.00
MARBLE MADNESS	35.00
MASTER TYPE	28.00
MATH MAGICIAN	28.00
MATH TALK	35.00
MATH TALK FRACTIONS	35.00
MATH WIZARD	32.00
MAVIS BEACON TYPING	35.00
MAXIPLAN 500	94.00
MAXIPLAN PLUS	126.00
MEAN 18	28.00
MENACE	28.00
MICROBOT DESIGN DISK	22.00
MICROFICHE FILER PLUS	108.00
MICROLAWYER	38.00
MIDI MAGIC	92.00
MIMETICS UTILITIES 1	40.00
MINI PUTT	24.00
MISSION CON-BAT	29.00
MISSION ELEVATOR	32.00
MODELER 3D	88.00
MOEBIUS	41.00
MONEY MENTOR	61.00
MONOPOLY	24.00
MOVIE CLIPS	21.00
MOVIESETTER	63.00
MULTI-FORTH	56.00
MUSIC MOUSE	50.00
MUSIC STUDENT	35.00
NEUROMANCER	27.00
OBLITERATOR	28.00
OF THE FLESH	24.00
ONE ON ONE	14.00
ONLINE PLATINUM	60.00
OPERATION WOLF	24.00
OPTICKS	120.00
ORGANIZE	63.00
OUTRUN	29.00
PAPER BOY	30.00
PAGE STREAM	138.00
PAGEFLIPPER + F/X	94.00
PALADIN	28.00
PEN PAL	90.00
PERFECT SCORE	55.00
PERSECUTORS	13.00
PHANTASIE III	28.00
PHASAR 3.0	56.00
PHOTON CELL ANIMATOR	104.00
PHOTON PAINT 2.0	90.00
PHO. PAINT SURFACE DISK	18.00
PIONEER PLAGUE	24.00
PIXELSCRIPT	90.00
PIXMATE	44.00
PLATOON	28.00
POPULOUS	36.00
PORT OF CALL	32.00
POWER WINDOWS 2.5	62.00
PRINTMASTER +	32.00
PRISON	24.00
PRO ASM	66.00
PRO BOARD	355.00
PRO NET	355.00
PRO SOUND DESIGNER	98.00
PRO VIDEO PLUS	179.00
PRO. DATARETRIEVE	195.00
PROFESSIONAL PAGE 1.3	227.00
PROJECT D	32.00
PROWRITE 2.0	78.00
QIX	21.00
QUADRALIENS	18.00
QUARTERBACK	48.00
QUESTRON II	32.00
RAMPAGE	24.00
RAW COPY	36.00
RISK	24.00
ROAD RAIDERS	24.00
ROADWAR 2000	28.00
ROADWAR EUROPA	31.00
ROCKET RANGER	35.00
ROGER RABBIT	27.00
ROMANTIC ENCOUNTER	28.00
RUSH'N ATTACK	28.00
SARGON III	35.00
SCRIBBLE PLATINUM	90.00
SCULPT 3DXL	99.00
SCULPT/ANIMATE 4D JR	99.00
SEX VIXENS	24.00
SHANGHAI	28.00
SILENT SERVICE	28.00
SINBAD & FALCON	35.00
SKY CHASE	27.00
SLAYGON	28.00
SONIX	49.00
SOUND OUEST	CALL
SOURCE LEVEL DEBUGGER	56.00
SPACE STATION OBLIVION	29.00
SPEEDBALL	24.00
SPELLER BEE	35.00
STARGLIDER II	28.00
STELLAR CONFLICT	28.00
STELLARYX	24.00
STREET CAT	27.00
STRIP POKER II	24.00
STUDIO MAGIC	63.00
SUB BATTLE	27.00
SUPERBACK	48.00
SUPERBASE PERSONAL 2	87.00
SUPERBASE PRO	207.00
SUPERPLAN	99.00
SUPERSTAR ICE HOCKEY	35.00
SWORD OF SODAN	30.00
SYNTHIA	69.00
TARGIS	24.00
TAX BREAK	48.00
TECNOCOP	29.00
TELEGAMES	22.00
TELEWARS	28.00
TERRORPODS	28.00
TEST DRIVE II	27.00
TEXTPRO	53.00
THE ACCOUNTANT	190.00
THE THREE STOOGES	35.00
THE WORKS PLATINUM	178.00
THEXDER	26.00
THUNDERBLADE	30.00
TIME AND MAGIK	26.00
TITAN	27.00
TRACER	22.00
TURBO SILVER	115.00
TV SPORTS FOOTBALL	29.00
ULTIMA IV	41.00
UNINVITED	35.00
UNIV. MILITARY SIM.	30.00
V.I.P.	30.00
VIDEO EFFECTS 3D	130.00
VIDEO TITLER	88.00
VORTEX	24.00
WAYNE GRETZKY HOCKEY	30.00
WORDPERFECT	145.00
WORLD CLASS LEADER BD	28.00
WORLD TROPHY SOCCER	30.00
X-CAD DESIGNER	90.00

Supra Corporation *Expansion Products*

SupraRam 2000 2 Meg	356.00
SupraDrive 2000 40Q	667.00
SupraDrive 2000 80Q	959.00
SupraDrive 2000 105Q	1056.00
SupraDrive 500 20 Meg	480.00
SupraDrive 500 30 Meg	618.00
SupraDrive 500 45 Meg	720.00
SupraDrive A500 Ram 2 Meg	275.00

Super Special
A501 CLONE
$119.00
512K MEMORY
With Clock/ Calendar

HARDWARE

8 UP 0K	179.00
8 UP W/2 MEG	489.00
8 UP W/4 MEG	CALL
8 UP W/6 MEG	CALL
8 UP W/8 MEG	CALL
ADAPTEC 4000	126.00
ADAPTEC 4070	170.00
AIR DRIVE EXT.	149.00
AIR DRIVE INT.	139.95
AMIGEN GENLOCK	156.00
APRODRAW 12 X 12	480.00
C LTD REPLMNT KYBD	98.00
C LTD HARD DRIVES	CALL
CALIFORNIA ACCESS	139.00
C LTD K RONOS SCSI	CALL
C LTD SCSI 500	156.00
C LTD SCSI 1000	280.00
C LTD SCSI 2000	119.00
CM 20 MEG A500/A1000	639.00
CM 20 MEG A2000	539.00
CM 40 MEG A500/A1000	799.00
CM 40 MEG A2000	749.00
CM 65 MEG A500/A1000	879.00
CM 65 MEG A2000	799.00
CM 85 MEG A500/A1000	950.00
CS-1 COPY STAND	62.00
CVIEW 1	35.00
CVIEW 2	35.00
DELUXE MIDI INTFCE	63.00
DIGI-DROID	62.00
DIGI-VIEW 3.0	139.00
DIGI-VIEW GOLD	139.00
ECE MIDI	50.00
EPYX 500 XJ JOYSTK	14.00
ERGOSTICK JOYSTK	18.00
FLICKER FIXER	510.00
FLICKER MASTER	12.00
FRAMEGRABBER	529.00
FUTURE SOUND	136.00
FUTURE SOUND 500	99.00
GEN ONE GENLOCK	699.00
GO 64	24.00
GO 64 INTERFACE CABLE	15.00
GVP 68030 BOARD	CALL
GVP 68030 W/68882	CALL
GVP 68030 W/4 MEG	CALL
GVP 20 MEG HARDCARD	575.00
GVP 30 MEG HARDCARD	698.00
GVP 45 MEG HARDCARD	816.00
GVP IMPACT A500	CALL
GVP A500 RAM MODULE	66.00
GVP SCSI/RAM A2000 0K 1M	294.00
GVP SCSI/RAM A2000 0K 2M	324.00
GVP SCSI/RAM A2000 2M	564.00
HARDFRAME 2000	257.00
HD-6A HARD DRIVE CASE	125.00
INBOARD 0K A1000	216.00
INBOARD 512K A1000	299.00
INBOARD 1 MEG A1000	349.00
INBOARD 1.5 MEG A1000	439.00
INBOARD 0K A500	239.00
INBOARD 1 MEG A500	349.00
INBOARD 2 MEG A500	489.00
MEGABOARD 2000 1 MEG	359.00
MEGABOARD 2000 2 MEG	479.00
MIDI GOLD A500	58.00
MIDI INSIDER A2000	65.00
MIDI STAR	216.00
MODEM CABLE A1000	15.00
MODEM CABLE A500/A2000	15.00
MOUSE MASTER	27.00
MOUSE PADS	9.00
NEC PINWRITER 2200	379.00
PERFECT SOUND	66.00
PERFECT VISION	189.00
PRO GEN GENLOCK	384.00
PRORAM 8 MEG W/2 MEG	489.00
SCSI CABLES	25.00
SEAGATE ST 157N 48 MEG	371.00
SEAGATE ST251N 40 MEG	440.00
SEAGATE ST277N 65 MEG	510.00
SEAGATE ST138N 30 MEG	336.00
SEAGATE ST296N 85 MEG	545.00
SPIRIT TECH. A500 512K 0K	44.00
SI COLOR SPLITTER	90.00
STARBOARD II 0K	260.00
STARBOARD II 512K	360.00
STARBOARD II 1 MEG	355.00
STARBOARD II 2 MEG	510.00
SUPER GENLOCK	699.00
SUPRA 2400 MODEM	129.00
SUPRARAM 2000 2 MEG	356.00
SUPRADRIVE 2000 30 MEG	502.00
SUPRADRIVE 2000 40Q	667.00
SUPRADRIVE 2000 80Q	959.00
TIMESAVER	55.00
VD-1 FRAMEGRABBER	920.00
VI-2000RF	78.00
VI-500RF	78.00
WV-1410 W/LENS,CABLE	238.00
X-SPECS 3D	94.00

NEW C Ltd B502 Expansion Provides 2 Meg in A501 Slot
CALL

Spirit Technology
A500 & A1000 Memory Expanison

Inboard 512K	$299.00
Inboard 1 meg	$349.00
Inboard 1.5 meg	$439.00
Inboard 2 Meg A500	$489.00

CALIFORNIA ACCESS CA-880
NEW LOW PRICE
$139.00

FEDERAL EXPRESS
Standard Air
Available on Request

Computer Mart
105 Lynn St.
Nacogdoches, TX 75961
INFORMATION: 409-560-2826

SHIPPING INFO: Software ranges are $2.10/item (Max 8.00) UPS Ground or $4.00/item (Max 14.00) UPS 2nd Day Air. Call for Hardware shipping info. REFUND & RETURN POLICY: Defective merchandise under warranty will be repaired or replaced. Returned product must be in original packaging. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Money back guarantees must be handled directly with the manufacturer. All returns must have an RA #. Call 409-560-2826 for an RA. Returned products are subject to a 20% restocking fee. Prices subject to change without notice. Delivery subject to availability.

VISA MasterCard DISCOVER

The program can be installed on a hard drive, although I didn't see the need since it comes on a single disk and the disk accessing during game play was not excessive. The manual is only 13 pages, but it presents a brief note on soccer to provide an interesting background for players. The program lets you select the level of play (from 1 to 5) and the length of each game.

The joystick handles well, and overall I liked what I saw. The view from behind the goalie was a nice touch. The goalie moves easily, although you should be careful to avoid committing to a block until you see the opponent kick the ball. Finally, the Amiga has a way for me to play soccer without all the injuries I normally acquire while playing on Saturday afternoons (although I miss the cold beer after the games).

World Trophy Soccer
Price: $49.99
From:

Melbourne House
18001 Cowan, Suites A & B
Irvine, CA 92714
1-714-833-8710

Benchmark Debugger

By Richie Bielak

Better than *RAID* for catching those pesky Modula II bugs!

REVIEW OF BENCHMARK SOURCE-LEVEL DEBUGGER

INTRODUCTION

When *Benchmark Modula-2* was released two and a half years ago, it set a new standard for the Amiga programming environment. Since then many other products have tried to emulate the *Benchmark* package, with various levels of success. With the release of the *Source Level Debugger* to complement *Benchmark's* tools, Avant-Garde Software has once again leapt ahead of the competition.

WHAT IS A DEBUGGER?

A debugger allows the programmer to tightly control execution of a program in order to find and fix errors. The term "debugger" stems from the fact that programming errors are innocently called "bugs", and a "de-bugger" is used to remove them.

Two main tasks that any debugger should accomplish are control of program execution and display of data. To control execution of the program "breakpoints" can be set to suspend the program, and while the program is stopped variables can be examined.

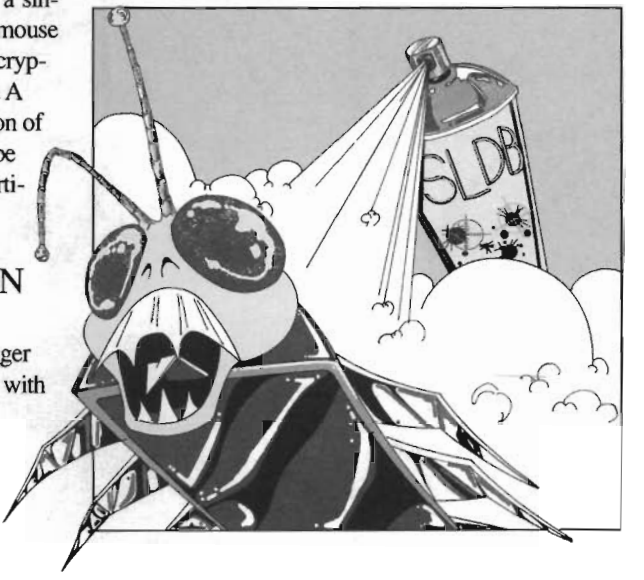
Debuggers, such as *METASCOPE*, allow the programmer to examine the machine code instructions and display program data in various formats. Unfortunately, seeing the machine instructions of your program is not that useful if the program was written using a high-level language, such as *Modula-2*.

This is where a Source Level Debugger (SLD) steps in. A SLD shows the program being debugged in its "native" language. The programmer can stop execution at any statement and examine the program variables in formats that make sense in the given language.

BENCHMARK DEBUGGER

The *Benchmark Source Level Debugger* is a tool for debugging programs compiled using the *Benchmark Modula-2* compiler. It shows the *Modula-2* source of the program being tested, and it displays program variables in *Modula-2* format. The *Benchmark* debugger can also be used at the level of machine instructions, should it become necessary.

Benchmark's SLD is controlled using menus, the mouse, and function keys. Most of the actions can be accomplished with a single key stroke or mouse operation. There is no cryptic command interface. A more detailed discussion of the user interface will be presented later in the article.



INSTALLATION

The *Benchmark* debugger comes on a single disk with a small manual (about 150 pages). In addition to the debugger, the disk contains an

Installation of the debugger is straight forward.

updated version of *Benchmark's Modula-2* compiler, some tools to help run the debugger on a 512K machine, example debugger configuration files and a simple tutorial.

Installation of the debugger is straight forward. All you need to do is copy the appropriate executables (Me and M2DEBUG) into your executable directory (usually "C:"). Additionally, you may want to copy one of the sample configuration files into the "S:" directory on your system. Finally, you must copy PDM.SBM and PDM.OBM files into the directory holding all the *Modula-2* symbol and object files ("PDM" stands for Post-Morted Debugger). These files will be needed in case you want to include the Post-Mortem debugger in your program.

On my system the installation of *Benchmark's* debugger took about two minutes (this included making the obligatory backup copy of the debugger disk). I suspect that on a system with less memory and no hard disk the installation will be a little more complicated. However, the README.DOC file on the distribution disk provides a number of suggestions on how to run the debugger on a small system (ie. 512K).

PROGRAM PREPARATION

Before a program can be run under the control of the debugger it must be compiled and linked in a specific manner. First, the program is compiled with the "-g" option, which forces the compiler to generate a symbol reference file. The name of the reference file is the same as the compiled module, except that it ends with ".RFM".

If your compilations are done from the *Benchmark* editor, you have to specify the "-g" option when the compiler is loaded. This means, that the compiler will have to be loaded "manually" (ie. you will have to select the LOAD COMPILER from the "Modula-2" menu), so that you can specify appropriate compiler arguments. If you compile from CLI then simply add "-g" to the command invoking the compiler.

Once all the modules are compiled, the program has to be linked. Since the executable must contain special debugging information, the link command also has to be somewhat different. If you do your links from within the *Benchmark* editor, then you will have to set up a special EMACS symbol in your ".emacs" file. This symbol is set by the following line: "(set-m2-link-gen-sym T F F)". On the other hand, if you link from CLI, then only the "-g" option has to be added to the linker command.

Note that not all modules need be compiled with the "-g" option on, but only those that you actually want to debug. You may want to be selective as to which modules the ".RFM" files are created in order to save disk space. However, make sure that the main module is always compiled with the debugger option turned on.

Finally, when your program is prepared you can start the debugging session by typing the following command: M2DEBUG YourProgram (note: *Benchmark* debugger runs only from CLI). At this point you can begin issuing debugger commands.

WINDOWS

The *Benchmark* SLD provides many different windows that show information about the program being debugged. The windows most commonly used in all debugging sessions are: source window, symbolic data window, procedure call chain window, breakpoint list window and module list window. In addition, for low-level debugging, *Benchmark* SLD provides windows that show disassembled code (i.e. machine instructions), values of machine registers, and contents of any memory locations. Finally, a window to display contents of directories and a window to show various system lists are also provided (see Figure #1 for a display of some of the *Benchmark* windows).

Every type of window in the SLD has a standard set of gadgets attached. These include the standard system gadgets, vertical and horizontal scrolling gadgets, and a "destination gadget". The destination gadget, which is placed in the upper right-hand corner (below the "back/front window" gadget), is used to specify the destination window for certain commands. For example, to display the sources to a particular module in the source window, you select the specific module in the "Module List" window, and then click the destination gadget on source window where the module's source will be displayed.

Benchmark debugger allows any number of windows to be opened concurrently. The actual limits are forced by the amount of memory available on your Amiga. Of course, the more memory the better!

EXECUTION CONTROL

A program under the *Benchmark* debugger can be executed several different ways. It can run at "full-speed" until a breakpoint, it can be "single stepped", or it can run in slower "step" mode.

Running full-speed until a breakpoint is reached is the usual way to debug a program. Normally, a breakpoint is set in a module where the error is suspected and the remainder of the program is executed normally. When the breakpoint occurs, execution stops and you can examine program variables in more detail to determine the cause of the error.

Single stepping a program by statement or by machine instruction is very useful when the bug is more difficult to find. While single stepping it is possible to carefully observe how the values of variables change and how the control flows through the code.

Benchmark has two types of single step commands: "Step-In" and "Step-Over". These behave differently when a procedure call is encountered. "Step-In" steps through the statements of the called procedure (provided that the procedure comes from a module compiled with "-g" option), whereas "Step-Over" executes the code of the procedure at full speed and stops on the first statement following the procedure call.

Lastly the program can be run in the "step" mode. In this mode *Benchmark* debugger executes the program one statement (or instruction) at a time and it updates all windows appropriately after each step. Running in this mode gives the programmer an idea how control flows and how variables are changing. If the program is running in "step" and breakpoints are set, the program will stop at a each breakpoint.

To show where the statement to be executed next is, and where the breakpoints are, Benchmark debugger highlights the appropriate statements in the source or assembler windows. Different colors are used to distinguish between the current statement and breakpoint positions.

BREAKPOINTS

Three types of breakpoints can be set: permanent breakpoint, temporary breakpoint and counted breakpoint. A permanent breakpoint remains in effect until it is manually removed, whereas, a temporary breakpoint is removed once the execution flow reaches it.

A counted breakpoint has a count associated with it. Each time execution reaches the breakpoint, the debugger will decrement the count by one, but will not suspend the program until the count reaches zero. These types of breakpoints are useful when you need to examine the value of a variable just before the end of a loop that went "around" a few hundred times.

Setting breakpoints in the program is very easy. Simply click twice on the statement (or instruction) on which the program is to stop. A breakpoint can also be set by selecting the statement with the mouse, and then choosing the SET command from the BREAKPOINT menu. Breakpoints are removed in a similar manner: by selecting existing breakpoints from the source window as targets for a menu command.

EXAMINING DATA

To see the values of a program's variables you can open a "Symbolic Data Window". By default, the data window only shows the variables that are in the current scope. That is, local variables and parameters are shown within an executed procedure, or global module variables are shown when within a main module. The following information is displayed about each variable: current value, name, and type. See Figure #2 for a sample debugger display of data windows. How the value of each variable is shown depends on the variable's type.

For simple variables, the actual value is displayed in the appropriate format (ie. INTEGERs are shown as integers, REALs as floating point numbers, et cetera). If the variable is an array then only its size appears in the data window. By clicking on the variable name, the data window changes to display the individual elements of the array. Similarly, if a variable is of a record type, only the size of the record is shown at first. Clicking on the variable name causes the debugger to display the fields of the record.

For pointer variables, the actual address value contained in the pointer is shown. By clicking on the variable name, you can examine the object pointed to, if the pointer is not nil.

Finally, for SET types the debugger initially shows the bit pattern (in hex) contained in the set variable. By clicking on the variable name the display changes to show all the symbolic names of possible set members. The members that are actually contained in the set are shown in a different color.

The data window shows the variables in the current scope of execution. In some cases, it is necessary to examine variables from a procedure or a module different from the current one. This is easily accomplished by selecting the procedure in question from the "Procedure call-chain" window, or the module from the "Module" window, and then clicking on the destination gadget of the data window.

Although, the "Symbolic Data" gives shows enough information for most debugging sessions, in some cases you need to dump the contents of memory in order to find more stubborn bugs. For this *Benchmark* SLD provides a "Memory"

Continued on page 69

ON DISK

This Issue

A.X. Magazine Issue 3.1

Here is a sampling of what to look for on this issue's companion disk set.

Steinschlag

In the spirit of our European Game Invasion article, here's a little something from overseas. It's a German version of the ever popular TETRIS. For those of you who can't read German, here's how you play:

-Plug a joystick into port 2 of your Amiga
-Click on the Steinschlag icon to run the game
-Moving the joystick left or right move the falling block left or right
-Pressing the fire button rotates the block
-Pull down on the joystock to make the blocks fall faster after you
rotate and move it where you want.

In case you are not familiar with TETRIS, the object is to make the blocks completely fill a horizontal row so that the row will move down off the screen. If you fail to fill the rows and make them disappear, they will pile up on you and you won't have any room left to let any others drop.

Have fun!

Please send flames, bug reports and especially a list of features you would like to have included in the next version to

Peter Händel
Bismarckstraße 7a
4800 Bielefeld 1
West Germany

T.A.C.L. Demo

Welcome to The Adventure Construction Language! T.A.C.L. offers control and flexibility in adventure game design (both Text AND Graphic) through its use of a real, compiled language. It is a language designed specifically for adventure games by automatically handling and managing ALL of the low- and system- level magic that makes adventure games work. This allows you to let your creativity loose without worrying about HOW the game is going to work! Using T.A.C.L., you can create as large or as small a game as you want.

Included on this Issue's disk set are two sample adventure games to give you a feel for what the compiler can do. Includede is also a ZOO'ed listing of the language that created the game. The ZOO'ed file, must be unZOO'ed. To do this, contact the developer, and they will be glad to give you more information.

To run the adventures, just click their icons, and you are off and running.

GURU, version 1.0 by

Mike Haas
3867 La Colina Rd.
El Sobrante, CA. 94803

A handy little utility to reveal why your Amiga just died. If you have ever wondered what those strange GURU meditation numbers meant, this will do the job! Just jot down the left-hand guru number in your alert and, after reboot, let GURU interpret it for you.

Usage from CLI: guru <Number>

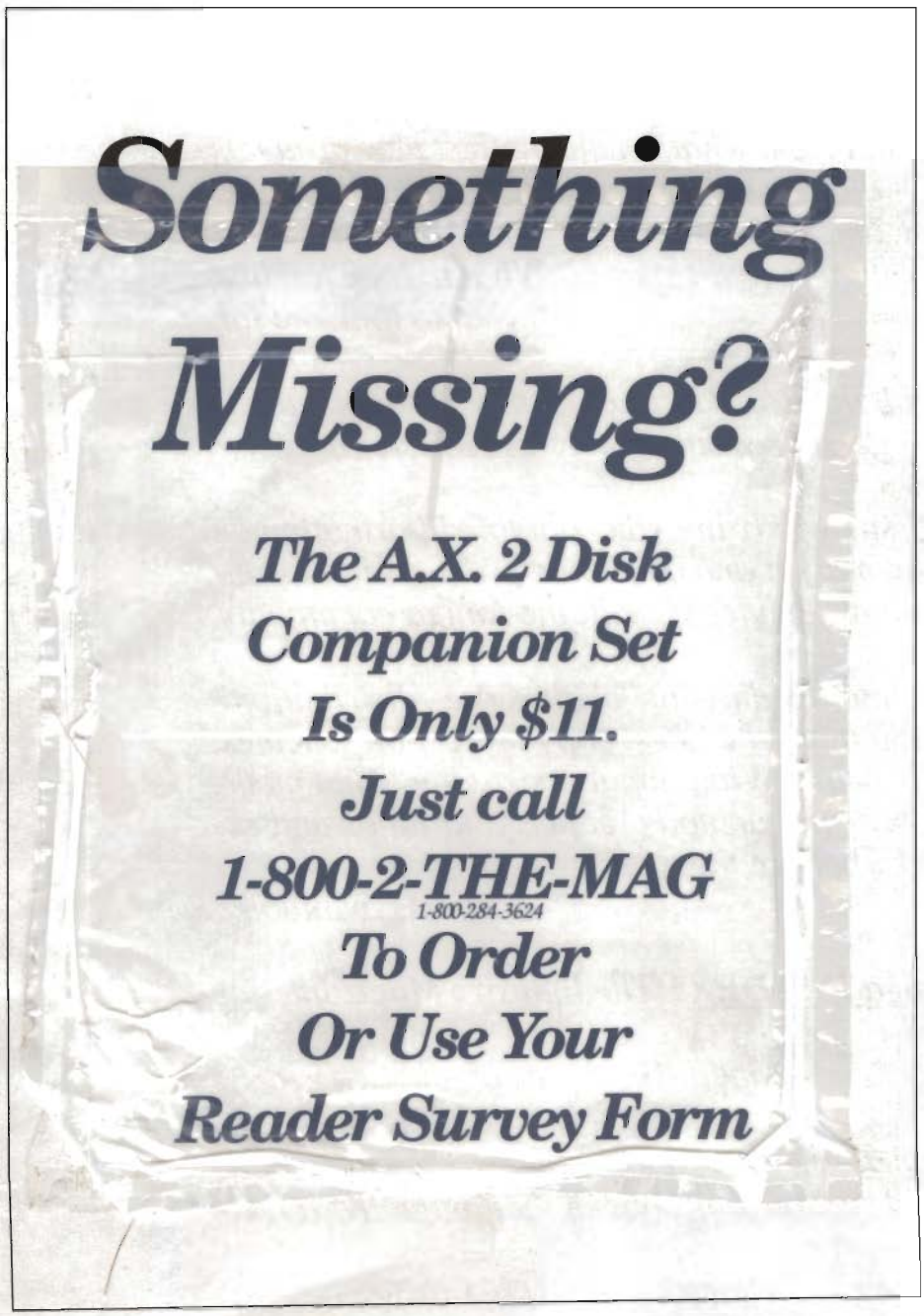
Examples:
1> guru 3
Alert Type: 68000 Trap
General Cause: Address error
1>
1> guru 8401000b
Alert Type: DEADEND
Generated by: Intuition Library
General Cause: Insufficient memory
Specific Cause: Open window, no memory
1>

Continued On Page 45

The A.X. Magazine Two Disk Set

DISK INSTRUCTIONS

1. At the Workbench prompt, boot from your favorite Workbench disk. It is important that your Workbench disk be relatively complete.
2. After your insert the A.X. Disk, an A.X. disk icon will appear. Double click that disk icon to expose the magazine icons.
3. From here, everything is point and click. Double click the disk icons to expose more icons. Other animations and items can be started from their icons also.
4. Be sure to read any available instructions Icons before trying to start programs.



BAD DISK?
So you think you have a bad disk. Don't worry. Simply send your original disk back to us, and we will promptly replace it.

WHAT DOES A BAD DISK LOOK LIKE?
If you encounter a message saying that one of your disks has a "Read/Write Error", then you probably have one. Or, if your Amiga suggests using DiskDoctor to fix it.

WHAT SHOULD YOU DO?
Thats easy. Simply send that disk to us, with a small note as to the problem you encountered, and we will gladly send you a new disk.

Please send your bad disk to:

A.X. Magazine - Bad Disks Urgent
6006 Greenbelt Road Suite 189
Greentbelt, MD 20770

TECHNICAL SUPPORT
Technical support is being provided by NewAge computers. When you call, please say you are calling for A.X. technical support. Also please have the issue number, and any other relevant information ready.
1-301-220-1296

Amiga INSIDER

A MAGAZINE FOR THE AMIGA INDUSTRY

Amiga developers, dealers and distributors, now there is a centralized Amiga industry magazine:
The Amiga INSIDER.

Dealers, what's going on insider Commodore, what are the new products available, and what are the hottest new products coming soon? Of all the similar products, which should you use shelf space for, and which shouldn't you bother carrying? Are you wasting valuable retail space? What to look for, and what to look out for.

How do you deal with the Post-Holidays slump? What methods do successful dealers use to sell products?

Developers, each issue will bring you valuable information on how to manufacture, market and distribute products in this unusual marketplace we call the Amiga community.

How do you break into the difficult "chain store" distribution? Do ports pay off? What are the latest copy protection schemes, and do they actually help? What about packaging, what methods, or packaging schemes actually reduce your labor and expenses? And what are the most cost effective packaging methods available?

***The Amiga INSIDER**: The Industry Magazine For The Amiga.*
And the best part of all... it's FREE!

If you are a qualified Amiga developer, dealer or distributor, give us a call and secure your copy of the Amiga INSIDER!

Call (301)439-1151 (9-5pm) E.S.T.

SUBSCRIBE & SAVE

☐ ***Yes! Start my charter subscription to A.X. Magazine!***
☐ ***I don't want to subscribe now, but please enter me in the FREE PROTEXT SWEEPSTAKES!***

MAGAZINE ONLY	MAGAZINE WITH DISKS
☐ *One year (6 issues) $14.95* *Save 37% off the cover price.*	☐ *One year (6 issues) $69.95* *Save 22% off the cover price.*
☐ *Two year (12 issues) $24.95* *Save over 47% off the cover price*	☐ *Two year (12 issues) $99.95* *Save over 44% off the cover price.*

☐ ***Please send me this issue's companion disks. • $11.00 plus $1.50 P&H***

CANADA & MEXICO $22.45 (Mag only) / $79.95 (Mag w/ Disks), FOREIGN SURFACE $29.95 / $84.95, FOREIGN AIRMAIL $47.95 / $102.95 (U.S. funds drawn on U.S. bank). Prepayment is required on all foreign surface & foreign airmail order, all prices are one year only.

BACK ISSUES $9.95+ Shipping & handling			
	☐ ISSUE 1.1	☐ SPECIAL ISSUE 1.2	☐ ISSUE 2.3
	☐ ISSUE 1.2	☐ SPECIAL ISSUE 1.3	☐ ISSUE 2.4
	☐ ISSUE 1.3	☐ ISSUE 2.1	☐ ISSUE 2.5
	☐ ISSUE 1.4	☐ ISSUE 2.2	☐ ISSUE 2.6

PD DISK	
PD 2.6	$3.95
PD 3.1	$2.50

☐ **Payment enclosed $** _____ ☐ **Please bill me.**
☐ **Mastercard** ☐ **Visa** **Acct#** _____ **Exp.** _____

Signature _____
Name _____
Address _____
City _____ State _____ Zip _____

For direct ordering, call TOLL FREE 1-800-2-THE-MAG weekdays 9:00 a.m. - 5:00 p.m. E.S.T. In Maryland, call 1-301-595-5194. For credit card orders only. Please allow 6-8 weeks for processing your subscription. Please make checks payable to A.X. Productions.

PLEASE TELL US ABOUT YOURSELF:

1. What computer do you currently own or use?
   a. Amiga 500 b. Amiga 1000 c. Amiga 2000
   d. Amiga 2500 e. do not currently use one.
2. Where do you use your Amiga?
   a. home b. business c. both
3. What is your income?
   a. under 30K b. 31K-40K c. 41K-50K
   d. 51K-60K e. 61K-70K f. 71K+
4. What is your age group?
   a. under 18 b. 18-24 c. 25-45 d. over 45
5. How long have you owned your Amiga?
   a. NEW b. 1/2 yr c. 1 yr d. 2 yrs e. 2 yrs+
6. What areas of hardware/software do you plan to purchase?
   a. games / entertainment b. graphics
   c. music d. productivity
7. How much do you plan to spend on hardware / software?
   1 yr_____ 2 yrs_____
8. How many other people see your copy of A.X. magazine?
   _____
9. Would you like to see more advertising to show what products are available in the Amiga markeplace?
   yes no
10. Do the product reviews in A.X. Magazine influence your buying decisions?
    yes no
11. Would you buy A.X. Magazine again? Why or why not?
    _____
    _____
12. What other Amiga magazines do you subscribe to?
    _____
    _____
13. Do you own a modem? yes no
14. What are you most interested in?_____
    _____
15. What are you least interested in?_____
    _____
16. Is there a topic you would like to see covered in the futture? _____

Name

Address

Place Stamp Here.

The Post Office will not deliver mail without postage.

A.X. Magazine

6820 DISTRIBUTION DRIVE
BELTSVILLE, MD 20705

Fold into thirds with this side on the outside.

WE VALUE YOUR OPINION, SO PLEASE GIVE US ANY SUGGESTIONS BELOW.

This is a very simple program I wrote in C to get a feel of the relative cpu performance between different amiga cpu configurations. All it does is perform a given number of integer additions within a for-loop. The final result is specified in MIPS or Million Instructions Per Second. Here are some of the results I got for 10,000,000 loops (i.e. mips 10000000):
Usage from CLI: mips [number of loops]

Driving Tour Animation

This exclusive animation was created with the FrameGrabber. It is a full running movie of a human car. Which you must see to believe... and it was done on an Amiga!

To run this animation, just double-click on the icon, and give it a few moments to load. One megabyte of memory is required to see the entire animation. The animation WILL run on a 512k machine, although you will not be able to see the entire animation.

ON PD DISK

QuicPref 1.01

Copyright (C) 1989 David N. Junod

QuicPref is a printer preferences utility. Run this program from its icon. It is a faster, pop up way to set your printer preferences, mainly for graphics printouts. You can adjust all the regular preferences settings including all the graphics settings. So while working in programs such as Deluxe Paint, you don'e have to go back and forth to workbench to change your preferences, just QuicPref the changes.

SID Directory Utility

SID is a directory utility for the Commodore Amiga. If you are like most people, then you are ready to plunge immediately into the program. Because of this, there are three separate documents:

SID.MiniDocs
Quickly describes the hidden buttons and features that are ESSENTIAL to the operation of SID. PLEASE READ THIS BEFORE USING SID! It should take you less than a minute.
SID.Docs
Describes in rapid-fire fashion the many features found in SID. Read this to discover more about SID after you've had a chance to play with it.
SID.ConfigDocs
Describes in detail the setup, operation, and maintenance of the SID configuration file. You can completely customize SID to your needs and environment with the configuration file. Because the configuration changes as SID changes (which is quite often), this is a separate document.

Overall, SID is one of the most powerful directory utilities available anywhere, even in the commercial domain, and is an absolute MUST HAVE to make full, and efficient use of your AMIGA.

The PARANOIDS
The Asylum Escape Game

Copyright 1978 Richard Anderson
Copyright 1989 Gary Teachout
Paranoids is a traditional board game played by drawing cards, rolling dice and moving pieces around the board. Each player

On This Issue's PD Disk

has six pieces four patients and two doctors. The object of the game is to get all of your patients out of the asylum. Your doctors are for protecting your patients and making trouble for your opponents pieces. The agressive stratigies that work for many other board games don't work as well as cautious stratigies.

Gary Teachout
10532 66 place, W
Everett, Wa, 98204

A Personal Accounts Program

written by Bob Dufford, S.J.

Overview

Pass-the-Bucks (PTB) is a program that helps you keep track of where money comes from and where it goes. It can help you monitor budgets, reconcile bank and credit card statements, and watch the growth (or, ouch!, decline) of your financial net worth.

Hardware For The 90s

The 90s. What will it bring? The thought of what incredible things are to come is exciting itself. But to have a perspective of where we are going, consider from where we've come.

As little as 10 years ago, most of us were using slow, dinosaur-like, clunky computers that made metallic clacking noises when we typed on the keyboards. And these throwback, throwaways were not cheap, literally thousands and thousands of dollars for a 4.77mhz metal box that did little else than replace typewriters. Many were still using computers the size of refrigerators, and floppy-disks the size of pizzas.

Where are we now? We are using slimlined, small machines that fit easily on our desk, or under our arm, and run four to five times faster than those original clunkers. Our floppy-disks are less than half the size as before, and hold five times as much. Our keyboards are "ergonomically" designed to make our fingers happy, and mice have invaded our desks. On our desktop, we can publish magazines, create T.V. quality animation and graphics, compose music, and play PacMan, all at the same time. Amazing? Amazing is not the word, wait till you see what's to come.

Now that we are in the 90s, we have small glimpses of the things to come, and in this issue, we discuss some of those "things".

Consider, sitting back, ignoring your keyboard, and speaking instructions to your Amiga. Remind you of *2001 A Space Oddysey?* Then, casually reaching over for your cordless mouse to click an icon. And those simple actions access a 25mhz computer, with a 500 Megabyte removable disk drive. It's not the future it's now. And it's getting worse.

Everything is getting more and more sophisticated, and it's not slowing down, it's getting faster. The more technology we have, the more power we have to develop more technology.

So consider input devices. Your Amiga can listen to your voice and respond (VorecOne), mice are now cordless. What's next? Will it be the Head-Mouse, or a retinal mouse? They are on the way.

Think about those poor folk who used to telecommunicate over telephone lines at a 300 Baud (bits per second) sloth's pace [At 300 Baud you could send a 50k file in about 25 minutes, if you were lucky.] Then came 1200 Baud and 2400 followed quickly. Now we are exceeding 9600 Baud, and quickly approaching a reliable 19,200 Baud [That same 50k file would take about 1 minute if not less.] Mind boggling? Wait a couple years. Already here is an analog transmission system that can send a HAM picture in just under 15 seconds. When that gets perfected... watch out, our phone lines will be smoking, if they aren't smoldering already.

Hard disk drives have gotten bigger, faster and more reliable. Now they are becoming removable. When one 44 Meg. drive fills up, pop it out, and pop in another. Now consider a 300 Megabyte diskette. What's next? Speed is the task of the 90s. Watch that 300 Megabyte diskette fly at speeds approaching the speed of memory itself.

And in the general computer realm, things are a little scarier. Just recently, at John's Hopkins University in Baltimore, Maryland, outside in the hallway could be heard the babblings of a baby teaching itself how to speak. The only problem was that it wasn't a baby, but a computer! And before long, it was speaking with the vocabulary of a human 7 year old. In another university in England, a computer watched people walking in and out of an office. By itself, before long, the computer taught itself how to recognize the people in the office. These self-programming computers are an approaching reality. The computers just mentioned are a reality now, and the desktop versions are not far away.

Scientists are perfecting holographic and organic memory, molecular circuits, and fiber-optic data busses and computers. Supercomputers of yesteryear are sitting on our desks today, and today's supercomputers are just around the corner, materializing in things called transputers.
Amazing is not the word. Ours will be a *wondrous* future.

Now that we are in the 90s, we have small glimpses of the things to come, and in this issue, we discuss some of those "things".

Sextimates

Everything you wanted to know, now you can figure it out.

A new twist on trivia that you are sure to enjoy. If you dare risk addiction.

by ACTIONWORKS®

THE AMIGA MUSICIAN

by Glen Deskin

"Standard MIDI Files"

As you may have already realized, the computer industry as a whole has been leaning towards standardized guidelines between software packages for the same machine, and even for working between different machines. Many of you already know about one such standard on the Amiga: the IFF picture file standard that allows graphics created in one program to be loaded into and manipulated by another program. This standard also applies to IFF sound files; for example, files created with Aegis' *Audiomaster*, can then be used in Dr. T's *Keyboard Controlled Sequencer*. A new file standard that is taking the music industry by storm is the MIDI file standard, more commonly referred to as "SMF" for "Standard MIDI files."

WHAT ARE STANDARD MIDI FILES?

For too long, people using sequencers to create music (both the stand alone and the computer-based types) were handicapped by the fact that once their music was sequenced on one machine, there was no way to transfer files from that sequencer to another except to play the sequence live into the other unit. Even when you had two sequencing programs for the same computer, they usually saved their files in custom data formats that could not be read by other programs. This created frustrating problems unless you were lucky enough to own two computers or two sequencers.

Many people want to use more than one program or sequencer because certain sequencers may offer particular features that aren't found on another. Graphic editing, for instance, or a greater clocks-per-quarter-note resolution for precision timing. Or perhaps you are collaborating with a partner whose computer of choice is a Macintosh, while yours is an Amiga (of course!). Trading files was just about impossible.

That was until recently, when Dave Oppenheim, of Opcode Systems, developed Standard MIDI Files. Approved at the end of 1988 by the MIDI Manufacturers Association (MMA), SMF not only allows the transfer of sequences, but it also allows System Exclusive messages, such as synthesizer patches that share a common file format. Since SMF was adopted by the MMA you can be assured that most, if not all, MIDI programs will support this standard.

SUPPORTING SMF

Since most programs still use their own file format to save data, they usually use one of two common ways to implement SMF. Programs that tend to use up a lot of memory for the main program itself usually have a utility program included in the package that converts MIDI files to and from the program's own data format. Amiga programs that use this method are Dr. T's *KCS* and MicroIllusions' *Music-X*. The other method of utilizing SMF is to have what is known in SMF terms as "Importing" and "Exporting", which are menu items or functions. This built-in function may use more memory space, so many developers therefore choose to include a utility program for implementing SMF.

USES FOR SMF

Standard MIDI files can be very useful because they can be used to transfer strings between different sequencing programs. For instance, what if you have a friend that lives across the country who has a different computer; you simply convert your file to SMF and upload it to him! Or what if you are working on your own album and you create all your sequences on your Amiga, but the studio where you want to record has a Mac? No problem! Convert them to SMF and upload them or use a program like MAC-2-DOS to convert the disks so they can be read directly by the studio's Macintosh. I have done this myself, and I had no problems whatsoever loading his converted sequences into my Amiga and *KCS*. You can also use SMF, if for instance, you have three different sequencing or scoring programs that you like. One might be good for editing, one better for real time recording, and the other for programming variations. Thanks to Standard MIDI Files, the only barrier now is your creativity!

For too long, people using sequencers to create music (both the stand alone and the computer-based types) were handicapped.

Storage For The 90s:
Removable Media

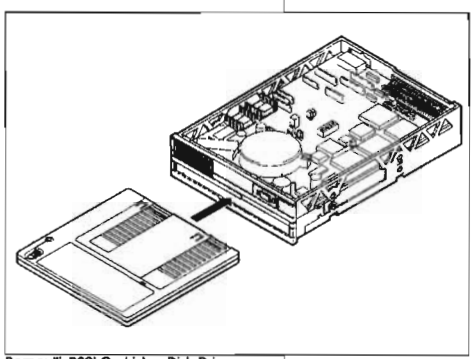
by Rick I. Rock

If you don't already know, you might be wondering: what leads a user into this kind of excess?

Can we ever have enough? First it consumes our pockets, then our briefcases, ruthlessly moving into our living quarters and garages in its relentless pursuit of open space.

This all too familiar scenario has touched us all, especially in times of change and growth. Our inability to judge accurately our future needs and potentials looms large as a major obstacle to our progress. Especially in the field of computer graphics.

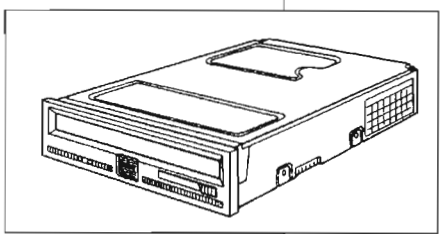
"A picture is worth a thousand words," remember that old adage? Well, one day I (with the help of an unnamed accomplice and an Amiga) set out to test this claim. In our pursuit, we discovered that a black and white bitmap was worth at least 6000 words of ASCII text in postscript. At that moment, as I faced the grim realization that I needed not only speed, but also capacity; I hung the "for sale" sign 'round my 20mg hard disk drive.



Bernoulli B20I Cartridge Disk Drive

Since then I have been from 800k floppy, through removable 20 and 44mb cartridge drives, to 150mb streaming tape devices. If you don't already know, you might be wondering: what leads a user into this kind of excess? Quite simply, it's need. Once you've embarked down the road of computer graphics there is no turning back. Just a constant trek toward faster processing and larger megabytes.

It is not my intention to scare the uninitiated out of his or her checkbook, but simply to share knowledge which many were kind enough to share with me on my route to hard drive happiness.



Syquest SQ44 Cartridge Disk Drive

Of course, in keeping with the length of this article we must narrow our field of coverage to one current area of interest, removable cartridge media.

New advances in magnetic data storage promises to answer the needs of heavy graphics users, and to provide back-ups of existing hard drives with speed and flexibility.

If you are currently into desktop publishing, and are considering getting involved in color separation and image scanning, I would strongly suggest that you re-evaluate your hard storage requirements. To give an example: in the process of scanning, color separating and out-putting post script to disk for one 11"x17" scanned image it would not be unusual to consume an entire 44MB cartridge. Of course, the amount of storage necessary is directly related to a multitude of factors: the size, the bit per pixel,the dot per inch resolution of a particular image, et cetera. Rest assured that you'll need the space which a removable system provides. But don't think that this removable drive will let you off the hook with regards to an internal hard drive. Having a removable hard disk as your boot disk would be akin to having one floppy drive. Not only would every cartridge have to have a boot portion, but you would have to be constantly replacing the disk which you had booted up with. One removable HD is not a solution, it's a problem. Whether you choose a Bernoulli or a Syquest removable, you'll need an internal HD to boot you Amiga.

Although they are quite different in construction, Bernoulli and Syquest are the two contenders for the Amiga removable hard drive market. Bernoulli is based on floppy technology and Syquest is a conventional hard disk.

Because the Bernoulli is constructed from floppy technology, it is very rugged and dependable. Its capacity to sustain high impact makes it a good choice if you plan to ship it often or to use it in a hostile environment, such as one that is dusty, humid or extreme in temperature, like my office. However, its life expectancy is less than a hard disk, somewhere in the area of 15-20 years, as opposed to 30 years. Don't ask me how anyone knows these life expectancies, seeing as these gizmos have only been around for four or five years. The Bernoulli comes in 20 and 44MB formats and has a 40ms (millisecond) access time. The 20mb version is priced around $1300 retail, with cartridges costing about $100. The 44MB version runs about $1800, and cartridges cost approximately $135. Bernoulli has been in the cartridge business

longer than the competition, and has a very good reputation, especially in the Mac environment.

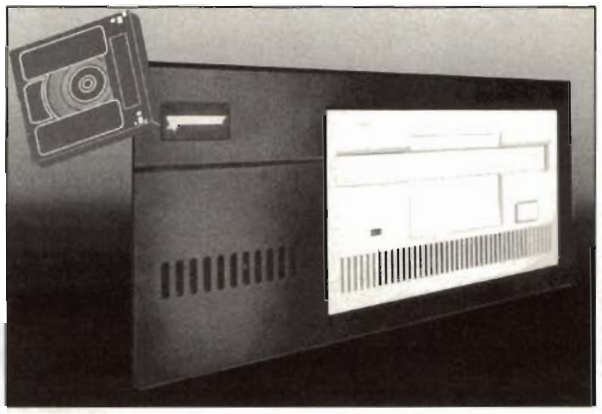
The Syquest is a hard disk, as you can plainly see through its smoked plexiglass case, but don't be tempted to slide back that little shutter to get a better look, as this could be very hazardous to the health of your data! In fact, with each disk you get a specially molded plastic case that you are warned to store you disk in whenever it is not in the drive. But this shouldn't be a problem, after all, computer users are known for their neat and orderly working areas, right?

I can remember hearing a horror story about a software developer who dropped one of these Syquest babies full of data...unbacked-up data at that. When he put the disk in the drive, the data was gone! Where did the data go? Oh well, easy come, easy go. So, you might ask, what was the first thing I did when I got my new Syquest cartridge home? I hit the ejection button for the first time, and my new cartridge shot uncontrollably out of the drive like toast from hell, rocketed through my fumbling hands and legs, and crashed onto the hardwood floor. Oh, why didn't I carpet this room? Well, when I re-installed the disk into the drive, guess what? It worked! and with no loss of data. No kids, don't try this at home, I just got lucky.

The Syquest is currently available in 44MB capacity, has an access time of 25ms, and is the most popular choice of Amiga users, due in large part to the efforts of GVP (Great Valley Products) and to the unit's relatively low cost per byte. The Syquest sells for $1300 with disks costing $140. This device will back up about 40mb in approximately 20 minutes, compared to the Bernoulli which takes 20 minutes to back up about 20MB. Many users swear by the Syquest, despite the necessary kid glove handling and the CuisineArt-like sound emanated from some models during disk change. I have occasionally experienced some annoying SCSI read/write errors, which could be system related or indicate a need for re-alignment of the drive itself. If the latter is the case, the GVP policy, fortunately, is to swap out a new unit for the faulty one, which they return to the manufacturer.

None of the above prices include the interface, which can run anywhere from $150 to $300, depending on what is on the board. Some of these controllers come with RAM and even a hard disk bolted right onto the printed circuit board (hence the name "hard card"). Both Bernoulli and Syquest are SCSI devices (small computer systems interface); this means they adhere to the SCSI standards for compatibility with hard disk controllers. This does not mean that disks formatted on one system are interchangeable with the other. This is an important consideration for the user who might be out-putting large postscript files at a local service bureau or for the video user who is dumping to tape at a friend's studio; what removable device are they using?

Somewhere in the writing of boot block and mountlist information, compatibility ends. This task is handled via EPROMS on the boards, which, like everything else in computer land, are subject to revision. Hence, the boards wear the scars of change in the form of little pieces of paper work stuck to them with the dot matrix brand of yet another revision. Take careful note of these revision numbers, and call the manufacturer before you purchase any upgrade to a removable disk, especially if it is used. Be sure that you have the corresponding installation disk to the EPROMS revision number. Although your local dealer may handled your installation, sooner or later you are going to need that installation disk!

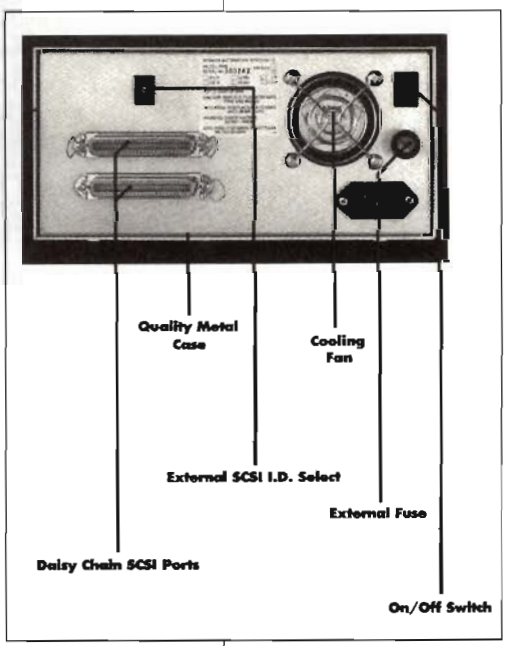


DynaTek ROS600 Optical Disk Drive (front)

If you happen to be the owner of a compatible SCSI controller, some of your concerns should be whether or not the EPROMS are provided with the drive, and if so, what version. EPROMS can cost up to $70 per set of two.

When deciding on a system, you should carefully consider its compatibility needs, the commitment of the developer to the product, and the service and knowledgeability available through your local dealer.

Regardless of how careful you are, you are bound to be plagued by the old "what's around the bend" syndrome. Well, here's what! How would you like to be the proud owner of a Dynatek 600MB Magneto-Optical removable re-writable optical drive? Sounds simple, huh? And it's not just around the bend, it's available today from Comspec. And all for the paultry sum of $4,800; should one disk not be enough for your storage needs, extra disks are available for only $300. Average seek time is a respectable 500ms. This refrigerator is no sloth.



DynaTek ROS600 Optical Disk Drive (rear)

With Or Without You

Hard Drives: are they really worth it?

By Mike Hubbartt

Talk about the ultimate techie toy! A hard drive, providing mass storage for computer programs and data, is probably the most desired and least obtained.

Talk about the ultimate techie toy! A hard drive, providing mass storage for computer programs and data, is probably the most desired and least obtained addition to an Amiga owner's setup. Hard drives were in the $800 to $1000 price range for the past few years, but finally are dropping down to the price range of $600 to $700 - far more competitive when compared to other computer formats. I was lucky enough to recently acquire a 20 Megabyte hard drive, and I'll report the differences of using this Amiga configuration to a standard dual floppy drive setup.

The hard drive tested was *The Vault (TV)*, from Progressive Peripherals & Software. *TV* arrived preformatted with the 1.3 FFS installed (for faster data transfer), needing very little time and effort for set up. To install *TV* on an *Amiga 500*, remove the left side terminal cover and connect the single cable to the exposed terminal strip.

TV works on either an *Amiga 500* or *1000*, and even uses the same cable. Two disks are included: one containing the setup program and the other with CLImate (a file manipulation program). The setup program performs formatting of the hard drive, copies over any needed files, and even builds a boot disk. This feature is nice since *TV* does not autoboot - one of its disappointing qualities.

I found the connecting cable to be much too short, barely reaching the Amiga from a ledge 4 inches above the keyboard. Other hard drives connect directly to the left side of the *Amiga 500* without a connecting cable of any kind. These are the only faults I found while working with TV! Not bad, eh?

It took me 15 minutes to completely prepare the hard drive, although the manual says it can take up to an hour. The programs I used for comparing the speed of a floppy disk system to a hard drive system were: *Word Perfect V 4.1.9 (WP), Word Perfect Library (WP Library), Transcript, Distant Suns (DS), Magic Johnson's Basketball,* and *UltraCard (UC).* A hard drive stores files in its memory much like people store records in a filing cabinet. I put *DS* and *Transcript* in the Utilities drawer. *Word Perfect* has an installation routine that makes a drawer and copies over all necessary files; it leaves you with the task of inserting a disk whenever prompted by the setup program. I copied the *WP Library* files into the *WP* drawer, which seems the easiest method to locate the files whenever needed. I filed *Magic Johnson's Basketball* in the main directory for dh0 since I run it from the CLI (without the point and click icons of Workbench). I filed UltraCard in its own drawer.

Word Perfect

To give you an idea of the difference in speeds between a hard disk and a floppy disk based system, lets look at saving a *WP* text file. I used a 1300 word text file, and the saving times (indicated by the drive activity lights on the front of both drives) were:

hard drive save time - 2 seconds;
floppy drive save time - 16 seconds.

Big difference, huh? I used seconds for comparison because they make more sense to novices or casual users than the benchmarks used by techies. The saved file was loaded and saved 10 times to both destinations, and values were averaged for these results. These results are NOT benchmarks, only indicators of the relative differences in saving speeds between hard disks and floppy disks.

Another benefit of using a hard drive with *Word Perfect (WP)*, is that you avoid disk swapping. *Word Perfect* takes up four disks for the program modules; that doesn't even include the data disk! Swapping disks in the floppy drive(s) can be time consuming and awkward. With a hard drive, you can copy all the *WP* program files into a single drawer and make a subdirectory to hold any text files you wish to save. Point and click, that's all there is to it. No more swapping disks. I keep all my files on a backup floppy disk, load files from the hard disk when I want to edit, since hard drive file loading time is much faster than from floppies, and save the resulting file to both a backup floppy disk and to the hard drive. The Spelling checker runs faster from the hard drive than from floppies, although running it from memory is still the fastest method.

Word Perfect Library

As with the *WP* word processor, I copied all pertinent *WP Library* files to the *WP* drawer, keeping all four Library programs together in the same area as my word processor (very handy compared to a desk cluttered with many floppies). The Print disk is already in this drawer, so I no longer need to hunt it down when printing out a hardcopy of the calendar - an advantage to using *WP Library* on a hard drive. Another advantage I found was the improved loading speeds of the overlays used with the various programs. The hard drive didn't make as much improvement with *WP Library* as it did with *WP* itself. I wouldn't recommend the purchase of a hard drive for these smaller programs that usually don't need more than one or two drives

Scanning & Digitizing

90's STYLE

BRINGING IN THE OUTSIDE WORLD

By Harv Laser

If it's an artistic computer you want, the Amiga is IT. With its excellent price-performance ratio, speed, multitasking, and plethora of video modes, the Amiga has to be considered the best electronic pal an artist ever had. If you've been an Amiga owner for any length of time you've certainly been wowed by all the wonderful pictures and animations you've seen in magazines, at trade shows, at user group meetings, or those you've downloaded (if you own a modem) from online sources or swapped with friends.

But let's face it... most of us can't draw a stick man, much less spaceships, glossy logos or beautiful women!

The beauty of the Amiga is that there are so many other ways to get real-world imagery INTO the computer besides moving around a mouse in a paint program. Think of the visuals that surround you every day - television, video tapes, books, magazines, and of course the real world around you. With the right software and hardware virtually any image can be put on your Amiga screen for you to savor, manipulate, re-touch, enhance, and save for posterity.

This article is a brief overview of three popular products which can do exactly those things.

Graphics software and hardware for the Amiga have come a long way in the four years or so that our favorite computer has existed, and there are more choices now than ever before. It's beyond the scope of this essay to try to cover ALL the possibilities, but these three products stand out as being top notch in quality, as well as affordable to most of the people who want or need them. One of them has been around for a long time, one is a couple years old, and one has just hit the market. Few people will buy all three products, but no doubt some of you will at least one. Each has its strong and weak points and you won't be unhappy if you purchase any one of them, provided you have prior knowledge of what each product can and cannot do.

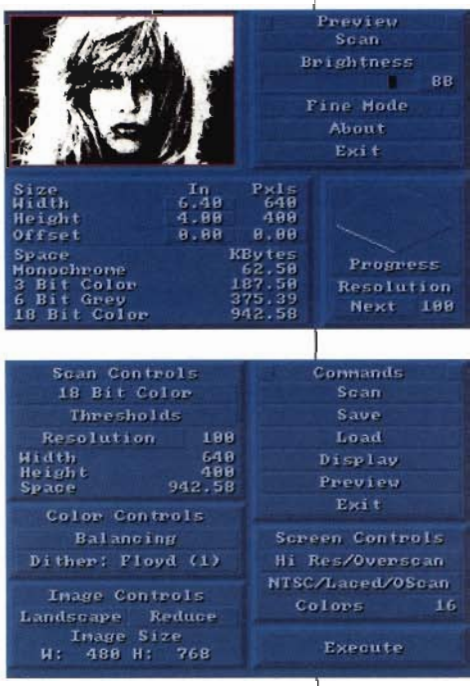
DigiView
NewTek, Inc.
DigiView 4.0 hardware & software - $199.95
(software: not copy protected)
Panasonic WV1410 camera - $304.95
Camera Stand with lamp holders - $74.95
DigiDroid - $79.95
DigiPaint 3 - $99.95

DigiView is the granddaddy of Amiga hardware scanners/digitizers. Although its manufacturer, NewTek, Inc., doesn't like to quote sales figures, it's rumored that more Amiga owners own *DigiView* setups than just about any other third party peripheral, with the possible exception of printers. You probably know at least a few *DigiView* owners yourself.

A complete *DigiView* system is comprised of many parts:
- the *DigiView* package itself, which consists of a small black "dongle" which plugs into the Amiga's parallel port and has a jack to receive video signal from a camera. The dongle requires no external power supply.
- the latest version of the *DigiView* software

There are so many other ways to get real-world imagery IN-TO the computer besides moving around a mouse in a paint program.

- some kind of black & white "security"-type video camera
- a tripod or platform to which the camera is securely attached
- a pair of lamps which should be rigidly affixed to the same platform
- a flat work area or stand onto which the camera is focused
- a color wheel which is connected to the camera so that it covers the lens
- optionally, a "*DigiDroid*" which is a little motor that connects to the color wheel to automate the turning of the wheel during the digitizing process



Above (TOP) ScanLab 100's "Preview" screen.
Above (BOT) ScanLab 100's "Fine" screen controls.
Below. Sample scan (HAM, Interlaced) scanned with ScanLab 100 and the JX-100 scanner.

DigiView works like this: flat subject matter, such as a magazine page or piece of artwork, is placed on the work area below the camera. The camera is adjusted for height. which controls image size, and focus. The camera's signal feeds to the *DigiView* unit which is controlled by its software. If you wish to digitize in color, you tell the software to make three "scans" of the artwork - red, green, and blue - each time turning the color wheel which covers the lens to the appropriate colored "gel," or you can let the *DigiDroid* turn it automatically. The *DigiView* software assembles the three separate signals into one color picture and then offers you many controls to tweak the mode of resolution (all standard Amiga modes are available, in any number of colors, with overscan if desired), color saturation, brightness, contrast, sharpness, individual palette colors, and so on. This is all done interactively AFTER the subject has been digitized. When you're satisfied with the final image you save it to disk.

Your saved files can either be standard IFF format pictures in any mode or the files can be saved in *DigiView's* own "DV21" format. The latter allows you to bring that file back into the *DigiView* software later and the software will act on it as though you had just digitized it.

With version 4.0 of their *DigiView* software, NewTek has increased its versatility by adding what they call "Dynamic" modes. Dynamic HiRes enable the use of all 4096 possible colors in high resolution. Dynamic HAM diddles the HAM color palette to eliminate any vestiges of "fringing." The downside of these new modes is that as of this writing there are no existing paint, animation, or publishing programs which can accept and correctly display, or allow you to paint on, "Dynamic" mode pictures. For now, all you can do is create them, save them, and admire them. Further, because of the intensive computing power required to display the Dynamic pictures, multitasking is turned off during their display, and resolving to Dynamic HiRes can be a painfully slow process on a stock Amiga with a 68000 CPU. An '020 or '030 speed-up card will greatly aid the process, as will more RAM. (NewTek also supplies a freely-redistributable display program called *Dyna-Show,* so you need not run the larger *DigiView* software just to see these new-mode pictures.)

DigiView 4.0 has also been enhanced so that if you have sufficient memory you can run NewTek's HAM paint program, *DigiPaint 3*, at the same time and *DigiView 4.0* can send its digitized images directly into *DigiPaint 3's* screen for even more processing and manipulation.

Drawbacks

A question frequently asked by potential *DigiView* buyers is "Can I hook my color video camera/VCR/television tuner/LaserDisc player/et cetera to the DigiView and digitize from those sources?" Not without additional hardware. *DigiView* performs a "slow scan" process that is not designed to deal directly with input from color NTSC video sources like those mentioned. To do that requires the purchase of an additional piece of hardware known as a "color splitter" which separates a color NTSC signal into its red, green and blue components. SunRize Industries manufacturers a relatively inexpensive color splitter and other fancier units are forthcoming.

It takes a lot of practice to develop good DigiViewing techniques. The complete system also takes up as much tabletop real estate as a second computer would. To be safe, you must power down your Amiga each time you install or remove *DigiView* from your parallel port or else install it onto a parallel port A/B switchbox. (This warning applies to ANY additional hardware you connect to your Amiga).

If you buy a complete *DigiView* package (*DigiView 4.0*, b&w camera, camera stand, lamps, and optionally a *Digi-Droid* and *DigiPaint 3*) you can expect to pay between $600-$700. For your money you'll have a proven and capable scanning system which will likely become a permanent installation near your Amiga and provide many hours of pleasure.

FrameGrabber
Progressive Peripherals & Software
Color model - $699.95
256 grayscale model - $724.95
2.0 enhancement software for color model - $99.95
(software: not copy protected)

While *DigiView* is designed to slow-scan from a black & white camera and can take NTSC color video signal with additional hardware, *FrameGrabber* is just the opposite. This unit was created to quickly grab NTSC color video imagery from color video cameras, single-frame cameras, video tape decks, Laserdisc players, or television tuners.

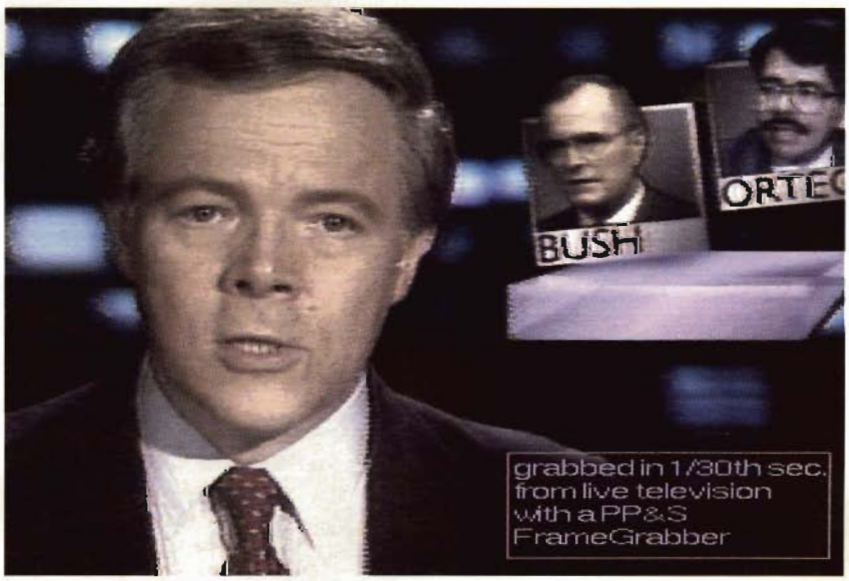
FrameGrabber is a live video digitizer that will work with any model Amiga since it doesn't attach to the bus. No internal "card" version is available. The *FrameGrabber* hardware is housed in a black metal box about the size of a hardbound book; the box takes monitor output from your Amiga and sends it back into your monitor through two cables. Then with another cable it attaches to your parallel port. It sits in the monitor "loop" so you can toggle between real-time live incoming imagery and your normal Amiga display instantly with the tap of one key. The *FrameGrabber* hardware talks to the parallel port so it can "download" captured imagery from the *FrameGrabber's* own 96K of RAM to your Amiga for processing by the *FrameGrabber* software.

On the front of the *FrameGrabber* is an NTSC input jack, a standard RCA female plug just like you'd find on the back of your hi-fi receiver or VCR. Into this plug you connect your NTSC video source.

You run the *FrameGrabber* software on your Amiga in order to trigger the *FrameGrabber's* circuitry. You watch the images on your Amiga monitor coming from your NTSC source via the *FrameGrabber.* This can be single-frame or live/moving imagery. When you see something you want to grab you hit one key and *FrameGrabber* grabs whatever you were seeing on your monitor (1/30th sec. for color, 1/60th sec. for B&W) and downloads it to the Amiga via the parallel port. The *FrameGrabber* software then massages it into whatever resolution/color/size you had previously selected, and displays it on your screen. This process can take a couple of seconds to about a half minute, depending on what resolution mode you're using. You can then save that image to disk as an IFF file and later import it into dozens of Amiga graphic-oriented software titles - paint programs, ray-tracers, desktop publishing, word processors, animation - whatever you have.

FrameGrabber's software can create animations in standard .ANIM format by capturing consecutive frames either manually or via a built in variable timer in the *FrameGrabber* software. The time interval can be set anywhere from one second to 99 hours between frames. Real-time "live" animations in color are tricky since *FrameGrabber* simply cannot grab and process frames fast enough; additional software, such as PP&S' own *Animation Station,* can help put all the pieces together later.

Above (TOP) Some of FrameGrabbers requestors.
Above (BOT) FrameGrabbed live from VHS video tape.
Below. FrameGrabbed from live from Cable TV.



Due to the amount of RAM in the *FrameGrabber* the only mode in which you can capture overscan pictures is low-resolution, with or without interlace.The *FrameGrabber* software, however, does work in low, medium, interlace, and high res, and from 2 color to 4096 HAM or 16 shades of gray. Besides IFF pictures and brushes and palettes, it can also save and load files in the *DigiView* 21-bit format, in its own 24-bit format, as separate RGB files (meaning you can slow-scan digitize with a *FrameGrabber* and a black and white camera and colored filters for results as good as *DigiView*), and in a couple other formats.

Given enough RAM, *FrameGrabber's* software multitasks wonderfully, and since the *FrameGrabber* is in your monitor "loop" there's no need to go through the nuisance of using extra cables, plugging and unplugging or using two monitors if your NTSC input device is a camera which requires focusing. You focus your camera right on your Amiga's screen. You can FrameGrab from running videotape or laser discs or live video cameras or television.

The *FrameGrabber's* software enables you to toggle from your Amiga display to the *FrameGrabber's* live display instantly, so even if you're not digitizing you can amuse yourself and watch television on your Amiga's monitor while you're downloading from a BBS! The only downside to this practice is that the *FrameGrabber* must be powered at all times when you use your monitor - the *FrameGrabber* has no on/off power switch. However, if you're not using its software, you'll never even know the *FrameGrabber* is there. It's completely transparent to all your other software and hardware - no need to disconnect it when it's not in use.

You might ask "But it uses the parallel port! What about my printer?" No problem - just get one of those little Centronics A/B switchboxes and you can have the *FrameGrabber* and your printer connected to your Amiga at the same time (although naturally you can only use one or the other at a time).

Below. A self-portrait, the Jx-100 scanned its own brochure.

Progressive Peripherals has recently released a new "2.0" enhanced version of the *FrameGrabber* software which offers many new features such as 256 levels of two kinds of dithering, a histographic display with sharpening and softening gadgets, weighted and autozoning control for the grabbed image for better white balance, image oversampling, built-in animation special effects, much better control over brightness, contrast and the color palette, "delta" control to make dull grabs more visually attractive by computing a "wilder" palette for them and much more.

This new 2.0 software is written in assembly language so it's very fast, and in many hours of usage I've never been able to make it crash. Unfortunately, the list price of the *FrameGrabber* includes only the older 1.0 software - 2.0 is an optional purchase.

Targeted more at the professional/scientific community's special applications, PP&S also makes a second *FrameGrabber* model which offers 256 shades of gray rather than color, comes with its own special version of the 2.0 software, and has four NTSC video inputs rather than just one.

Drawbacks

FrameGrabber relies on a strong and steady "sync" signal coming from your video source. This means copy-protected VHS tapes are out. A home-grade video tape deck is a veritable fountain of potential images, but quality varies wildly and is usually determined by the price of the deck. Shielded "BNC" type cable between the video source and the *FrameGrabber* is a must... try to use long runs of regular audio cables and you'll be grabbing noise and other garbage due to signal loss. The best results are obtained from source hardware which can output rock solid and steady signals such as the new Canon *Xapshot* single-frame video camera, or a high quality digital tape deck.

FrameGrabber is a semi-permanent installation. It takes roughly twenty minutes to hook everything together, but this procedure is well documented and illustrated in the unit's manual.

A *FrameGrabber*, including its large external power supply, will set you back about the same amount of cash as a complete *DigiView* system. The 2.0 software is highly recommended, although I think it should really be included in the price of the basic unit. If you've ever yearned to get live color video images into your Amiga, *FrameGrabber* is what you want.

Sharp JX-100 and *ScanLab 100*
$995 (includes hardware, software, and interface)
Hardware by Sharp Electronics Corp.
Software by ASDG Inc.
(software: not copy protected)

This incredible new color scanner was just released as this article was being written. I've had only a couple of days to play with it, but in that short time I am totally impressed! This is one magnificent new gizmo, and if you have about a thousand

Continued On Page 76.

Fighter Bomber

by Dave Page

Fighter Bomber is the latest entry into the Amiga flight simulator market; a market in which there is really no longer any shortage of programs. However, each program to be released has its own particular strengths and weaknesses. *Fighter Bomber,* from Activision, is no different; but it is one of the better flight simulators available.

Fighter Bomber, as its name implies, is a combat simulator which puts you in the cockpit of some of the world's most advanced warplanes. Unlike most combat simulators, *Fighter Bomber* gives you a choice of several different aircraft from around the world. You can fly an F111, an F-4 Phantom, an F15/E Eagle, or many others; the flight characteristics do change depending on the aircraft you pick. Once you have chosen you pilot name and aircraft type, a log will be maintained for your pilot and you will be restricted to that aircraft selection until you restart a new pilot in the same log spot. Once you're ready to start flying, you may choose between 'free flight' or the first combat mission in the list of pre-configured missions on the disk. It is a good idea to start with 'free flight' so that you can get a feel for the performance of the aircraft you have selected. Although "free flight' is basically a practice mode, there are enemy aircraft in the vicinity and they will shoot you down if they get the chance.

When you're ready for combat, you start with the first built in mission. You must start here and progress through the list of pre-configured missions in sequence. Each flight assignment has a target objective for you to destroy, as well as annoying enemy aircraft to distract you from you main goal. Before you take off there is a mission text message which describes your objectives. Also available is reconnaissance of any area on the map or specific information about the target itself. Both will give you a 3-D scan of the area as if by remote camera on location. The next step is to arm your aircraft with the appropriate weapons for the mission. There is a variety of air-to-ground weapons from which to chose; but selection of air-to-air weapons is limited to your canon (machine gun) and Sidewinder missiles.

Once you are armed, you're ready for take off. The graphics show the usual 3-D world with fairly simplistic artwork that represents buildings, ground terrain, cities, rivers, et cetera. There are also many other views to chose from, both in and out of the cockpit. The satellite view from directly above doubles as a map view when you zoom all the way out. You complete a mission only after you have destroyed the primary target, have kept yourself from being shot down, and have landed successfully back at base.

There are many nice touches in this program. The sound effects are above average, the screen update speed is very good on a stock Amiga, and the flight characteristics are among the most accurate I've seen. There are also some special highlights not often found in other programs. For instance, you can dock and refuel from an airborne tanker plane. There is a replica of Mt. Rushmore, in the 3-D world, which you can fly around. There are at least two swing-wing aircraft which you can fly; when you get to the right air-speed the wings actually move back to their swept position. When you crash you are given an outside view of you plane as the pieces come apart and smoke rises from you last location.

The program comes on two disks, of which the second must remain write enabled in order to maintain a log of the pilots. A fairly short pamphlet manual is included, which spends more time on aircraft and weapon description then on game operation, but the keyboard reference explains most of the rest. The game loaded reliably and uses both on- disk copy protection, as well as the 'look-up-the-word' method.

A drawback that I find rather disappointing is that the program will not run on a 68020 or 68030 based Amiga. If there is one type of game that needs as much computer power as it can get it's flight simulators. The packaging indicates that this game comes from Europe, which might explain why it doesn't run on accelerators since they are less common in Europe than in the U.S. Another minor complaint is that there is a complete set of different aircraft which you select as the enemy aircraft but which you cannot select as your own to fly. These include other American, as well as European and Russian, aircraft.

Overall I can recommend this game for flight simulator enthusiasts. It ranks among the top simulators available for the Amiga. Although, at a list price of $59.95, it is somewhat expensive for a flight simulator.

Fighter Bomber, from Activision, is one of the better flight simulators. available.

Choosing an '030' Accelerator Board

by Dave Page

What everybody is talking about are the new 68030 boards: how much faster they are, how they are the state of the art.

So you've decided you're going to go for it. You're tired of waiting for ray-traced pictures which take all night, or animations which take all week. Yes, it's definitely time to speed up your Amiga with an accelerator board. You could get a board with a 68020 CPU and a 68881 math co-processor, but what everybody is talking about is the new 68030 boards: how much faster they are, how they're the state of the art. But of the ones available, how do you choose, what are the differences, and do those differences really matter?

As of this writing, there are three manufacturers making 68030 accelerator boards for the Commodore Amiga A2000. They are, Great Valley Products (GVP), Imtronics, and Commodore Business Machines (CBM). I have had a chance to put each of these through its paces in a variety of ways. In addition to the usual benchmark type programs, I used several off the shelf programs and common computer tasks to determine the overall performance of each board. Rather than using this space to simply list performance numbers, I'll spend some time on each board with an overall performance comparison, as well as a discussion of some of the advantages and disadvantages of each.

GVP: *Impact A2501/A3001*

Great Valley Products was the first to provide a 68030 accelerator for the Amiga. Their product, the *Impact A2501* (16Mhz) or *A3001* (25Mhz). is an asynchronous design, which means that, within the limits of its chips, it can run at any clock speed and is independent of the Amiga's own oscillator crystal. The board has a socket for an optional 68882 math co-processor, and there is an optional daughter board for up to 8MB of 32bit wide RAM in 4MB increments. The most common configuration, by far, includes the 68882 and 4MB of RAM.

The RAM that GVP uses, nibble mode 1X8 simm modules of 80ns chips, allows full use of the 030's burst mode and effective zero wait state operation. This type of RAM, however, is more expensive than some of the other alternatives.

Using a variety of benchmark programs, the 25Mhz A3001 board with 4MB of 32bit RAM turns out to be between 8 and 11 times faster than a standard 2000 and about 2.5 times faster than a 2500. These comparisons do not take into account the math co-processor which, for those programs which use it, can mean increases in speed from 3 to 20 times compared to a 2000.

GVP provides a jumper for hardware switching between 68030 modes and 68000 modes. As a bonus, the GVP '030' boards include an 'AT' type hard drive interface which is located directly on the 32bit bus of the board and uses 'AT' type drives available from Quantum. This provides very fast hard drive performance, as well as minimal slot usage, for a very powerful Amiga system.

Imtronics: *Hurricane 2800*

Second on the scene was the board from Imtronics, the *Hurricane 2800*. which is a 28 Mhz synchronous design which derives its clock speed from the Amiga's on board crystal. The only practical drawback to this method is that it can present problems for those who use genlocks as the timing of the Amiga; the timing will then be under the control of the genlock and thus may affect the operation of the accelerator. The optional math co-processor can be run using a separate crystal.

Imtronics also provides a daughter board for expansion up to 16MB of 32 bit RAM. This RAM does not auto-configure, as do most Amiga expansion products, and therefore requires the use of the ADDMEM program to tell the operating system to add the RAM to the list. This also means that the RAM cannot be used by devices which use Direct Memory Access (DMA) to transfer data directly to RAM. Tests indicate an increase in speed of about 10 times over a standard 2000. The board does provide software switching between 68030 and 68000 operation.

Commodore: *A2630*

The latest entry into the 68030 arena is from Commodore themselves. Released as the *A2500/30*, it is a complete computer starting with an *A2000* and adding their new *2091* SCSI hard drive controller and *A2630* 68030/68882 accelerator card. The new machine runs at 25Mhz using an

asynchronous design and comes complete with 2MB of 32bit 1 wait state RAM. *A2000* owners can buy the *A2630* card separately for around $2000. The *A2630* includes a 68882 math co-processor also running at 25Mhz. This is the only one of the three boards with special shielding over the 68030 and 68882 to reduce radio frequency interference from these chips. Most tests showed that this board was only a few percentage points slower than GVP's.

Conclusions

Overall, the GVP design is clearly the best. It is the only accelerator board that achieves zero wait states, and the only one to take advantage of the 68030's burst mode which can make a big difference on long repetitive tasks. GVP's board is also the most expensive of the three, but not by much when you consider the respective amounts of RAM. Also the *A3001* (25Mhz) version of the GVP board has been recently upgraded to 28Mhz standard.

I cannot recommend the Imtronics product for several reasons. First, the *Hurricane* products have been several produced and marketed by several owners over the last couple of years; that alone would make me a wary buyer. Second, in operation the board seemed the most unreliable of the three, being more prone to crashing. Third, the non-auto-configure, non-DMAable RAM design is likely to cause more problems then it solves.

If you can't afford the GVP board then Commodore's own *A2630* is not a bad choice. Although it does not have zero wait state and does take advantage of the 030's burst mode, in practical use it is not noticeably slower. The minimal difference in processing time is only noticeable when using programs to measure speed or when performing large ray-traces.

Hard Drives - Continued From Page 52

for both the program and data storage disks, unless a program is meant to be used in conjunction with another program (like *WP Library* with *WP*).

Transcript

Transcript is Gold Disk's word processor/text editor. The program itself is small and self-contained, so a hard drive is unnecessary to improve any performance other than loading and saving more quickly. One benefit of using any word processor on a hard drive is the ease of loading and saving text files. I load a file for editing from the hard drive (faster than bringing it in from a floppy), then save it to both the hard drive and to a backup floppy disk (just in case). I removed *Transcript* from the hard drive, since it is such a small program and is easily loaded from a floppy.

UltraCard

UltraCard lets you build free-standing applications to display information using windows, menus, and gadgets. *UC*, due to the complex tasks it performs, spends a lot of time accessing the information from disks when floppies are used, so a hard drive makes a considerable improvement in the use of *UC*. I store both *UC* program disks in a separate drawer, and can see a speedup of program operation of five to seven times! This isn't the place to do a *UC* review, so I'll summarize it by saying that any serious *UC* owner should see the program run on a hard drive.

Conclusions

The Vault made a major difference when using *Word Perfect*, *UltraCard*, or *Distant Suns*, since the programs are large and require a considerable amount of disk accessing while each program runs. Not having to swap disks is a necessary convenience for any professional application. The performance of *WP Library*, *Transcript*, and *Magic Johnson's Basketball* did not improve enough to justify the purchase of a hard drive. The only real benefits of installing a game on the hard drive, is the convenience of quick access to the game, and the improved speed in loading in segments of code for the larger games. But you don't buy a hard disk for just one program, you use it for its overall effect on all programs and procedures.

I am still testing *The Vault*, trying out other programs like *excellence!!*, *MicroFiche Filer +*, *the Manx C compiler*, and *Deluxe Music Construction Set*. My overall appraisal of using a hard drive is WOW! I never really knew what I was missing; a hard drive improves the Amiga as much as either extra memory or a 68020 board. New programs are so easy to install on systems with a hard drive, usually just requiring the user to click on an icon that handles the entire procedure by itself! I used to turn on my Amiga and walk away for a coke while it booted up, but a hard drive gets it up and running so fast that I don't get the chance to leave the room. Friends without computer experience that stop over notice how easy it makes a computer to use. Although I can make it with or without a hard drive, I don't want to since I've seen how much help they are. Ask a local dealer for a demo of *Word Perfect*, *Distant Suns* (fully expanded with all five disks), or *Ultra Card* with and without a hard drive, and you'll see what a difference it makes!

The Vault
Price: $599.95 (20 Meg Version)
From: Progressive Peripherals and Software
464 Kalamath Street
Denver, CO 80204
1-303-825-4144

I used to turn on my Amiga and walk away for a coke while it booted up, but a hard drive gets it up and running so fast that I don't get the chance to leave the room.

Even though *VTX* is quite user-friendly, it does suffer from some significant design flaws.

protocols: X-Modem, Y-Modem, ASCII, Kermit and CompuServe B. (Unfortunately, the newer, faster Z-Modem protocol is not supported by VTX.) In testing the program, I encountered significant difficulty in downloading programs from local bulletin boards, even though both the program and bulletin board were using Y-Modem.

Perhaps the most unique and useful feature of *VTX* is its ability to display RLE and GIF graphics as they are being downloaded to your disk. RLE (Run Length Encoding) Graphics are two color graphics measuring 256 x 192 pixels which CompuServe widely uses for weather maps. GIF (Graphic Interchange Format) Graphics are images generated by all types of computers (PC, MacIntosh, ST, Apple) in different resolutions, and which have been converted to a standardized format promoted by Compuserve. Once downloaded to your Amiga, you can use a GIF to IFF converter program (also available on the services) to transform files to the Amiga IFF standard. Using special conversion routines, *VTX* can display in real-time. Michtron also provides a GIF slide show utility on the program disk, so you can display the files at any time --even when *VTX* is not running.

Even though *VTX* is quite user-friendly, it does suffer from some significant design flaws. Unlike most telecommunications packages, there is no facility to "hang up" the modem quickly. I had to physically turn off my modem to hang up the line. While the phonebook file is not lengthy, the program does not load it into memory and every time you want to dial a number, the program must access the disk and load the phonebook again. On several occasions I encountered numerous errors while downloading files and despite my repeated attempts to abort the process (by clicking on the abort gadget), nothing happened and I either had to manually disconnect or wait until the program unsuccessfully downloaded the entire file.

Along the same vein, the cancel button for script files did not seem to work properly; the small window containing the cancel button never disappeared from the screen and blocked my view of the incoming text. At one point, I had three of those windows on the screen at the same time. There is also no way to manually enter a number and dial it; you must call up the address book, make the entry, and then dial. The most annoying feature is that when the program begins it tells the computer that from that point on, whenever the computer needs any fonts, to look to the program disk (which contains its own special fonts for the program). Unfortunately, when the program terminates, it fails to reassign the fonts to the system disk so you must manually go into the CLI and reassign the font directory.

The program comes with one non-copy protected disk and a manual which although thorough, fails to provide the novice user with sufficient "hand-holding" to really enable him to use the program effectively. The program does have a good on-line help facility which is activated by pressing the "HELP" key (at which point the pointer turns into a "?") and clicking on any menu item activates HELP.

In all fairness, I should mention that VTX worked flawlessly with CompuServe despite the fact that I had to fiddle with the furnished script file to enable it to work correctly with my local access number. For those users who are primarily looking for a link to CompuServe, there is no doubt that this is the program for you. But if you intend to communicate with local bulletin boards, I would recommend you evaluate other available telecommunications packages - particularly if this is your first foray into the world of telecomputing.

Amiga Voice Recognition

by Charles White

Soon after the Amiga first appeared, there were great expectations about new and interesting things that this wonderful computer could do.

Then, when the first sound digitizers hit the market, we marveled at the ability to digitize our own voices, or music from the radio, and later to have the Amiga play them back with crystal clarity. But, all the while, many half-consciously wondered why the Amiga couldn't understand us when we spoke out loud to it, but never did we believe that one day the Amiga would actually hear us. But now that the 90s are here we must again be amazed: our Amigas can listen to us, and understand!

Impulse, the people who brought us the *TurboSilver* ray tracing software, has brought us a new marvel: *VorecOne*. *VorecOne* is a voice recognition program that can actually listen to your voice through a small microphone, and perform chores accordingly!

The hardware component is a simple sound digitizer which attaches to your joystick port (second mouse port). Impulse includes a microphone, inclusive with a vestigial connector to turn on and off tape recorders. The microphone seems cheap, but Impulse assures that it is the perfect microphone for the system. This microphone picks up little background noise, so the Amiga hears only your voice, and doesn't have to deal with the background noise.

The software component of *VorecOne* is epic in itself. Just about everything you could want is there: AREXX support, a programming language, intuition level support, CLI support, mouse support and more. But why would you want all these things in a voice recognition program?

Basically, *VorecOne* learns commands much the way you would teach a bird commands. You speak the command a few times until *VorecOne* learns how to distinguish the command word from other words. Then you assign tasks to each command. As for the tasks: they can be from simple to utterly complex.

The number of tasks *VorecOne* can perform are almost endless since the program supports so many levels of the Amiga (CLI, AREXX, mouse, et cetera), and since you have so much programming flexibility.

CLI support allows you to perform any number of CLI commands simply by speaking the command. An example scenario might go like this:

I say to *VorecOne*: "New CLI Please."

The Amiga replies "Ok, here is a CLI shell window for you to work in," then opens a CLI window for me.

I say: "Thank you."

The Amiga replies "You're welcome."

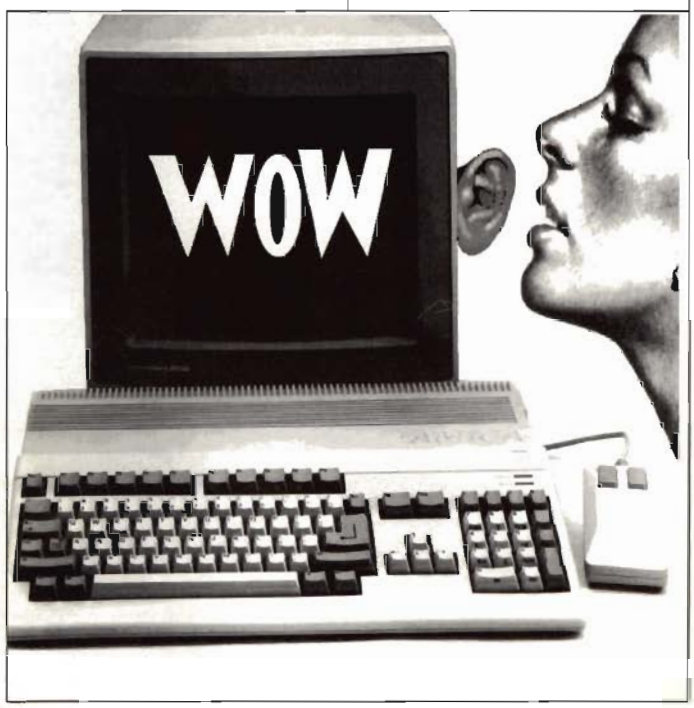
I say: "Directory DF0:, please."

The Amiga replies "Surely," and promptly reads the internal disk drive, and lists it to the CLI window.

Seeing something interesting as it flies by on the screen, I say: "Directory DF0:" again.

While the directory is listing this time, I say

Now that the 90s are here we must again be amazed: our Amigas can listen to us, and understand!



With this sort of Intuition level support, you can program *VorecOne* to control almost any program!

"STOP!", and the Amiga stops the directory listing part way. I see a file that I copied onto that disk last week, and wonder how big it is.

Needing more space on my CLI window, I say: "Open CLI big, please."

And the Amiga opens the CLI window to its full height.

Now I say: "List DF0: please."

And the Amiga begins listing the files on DF0: along with their sizes. Sure enough, there's my file, and 200k large, to boot.

Having had enough of CLI for now, I say "Ok, enough CLI."

And the Amiga says: "Fine." and closes the CLI window for me.

How does the Amiga do it you ask. Easily.

I trained *VorecOne* to understand some simple CLI commands, then used the Keyboard functions to attach a corresponding function to each voice command.

"New CLI Please" instructs *VorecOne* to open a new CLI window with the NewSHELL command, and speak through the Amiga voice saying "Ok, here is a CLI shell window for you to work in."

Speaking "Directory" and "List" commands send a "DIR <Space>" or "LIST <space>", respectively, to the CLI through the keyboard. Then whether I say, "DF0", "DF1" or "Harddrive", *VorecOne* sends "DF0: <RETURN>", "DF1: <RETURN>", or "MAIN: <RETURN>" respectively.

"STOP!" has *VorecOne* send a Control-C to stop things midway.

In addition, *VorecOne* can send control characters, press function keys, alt characters, shift, Left-Amiga, Right-Amiga and anything else you can think of, including holding down a key to repeat, and more. "OPEN CLI BIG" has *VorecOne* move the mouse down to the RESIZE gadget, and drag the window open to its full size.

Well, how did *VorecOne* move the mouse? Easily.

That brings up another of *VorecOne*'s abilities: controlling the mouse. There are functions to move the mouse to certain locations, click once, double click, click and hold, click right, drag, release, and more. In the "OPEN CLI BIG" example, I simply used the MOVE MOUSE command to the resize gadget, then followed with the LEFT BUTTON DOWN command, moved the mouse to the lower right corner of the screen with the MOVE MOUSE command again, then gave the LEFT BUTTON UP command to release the window. So you can control virtually any kind of mouse functions through spoken commands with *VorecOne*.

But, you may ask, how do I figure out where to put the mouse, and won't it get to be laborious after a while. Considerately, Impulse has included a utility with *VorecOne* called IntuiHelp. IH is a small utility that runs in the background to aid in programming Intuition level functions. IntuiHelp has a small display which tells you the exact positions of the mouse in X,Y coordinates. In addition, IH will call out (with the Amiga voice) any gadgets you happen to drag the mouse over. To understand this, consider this example. You want to push the current window back using the push, pull gadgets in the upper right corner of the window; you could use IH to figure out the mouse coordinates of the gadgets, then use the MOVE MOUSE command. But you don't always know where the window will be, you may have moved the window. Using IH, as you pass the mouse over the push/pull gadgets, IH will tell you that the push gadget is gadget number one. So instead of using the MOVE MOUSE and BUTTON CLICK commands, simply use the GADGET 1 command, and gadget number one will be clicked as if you had done it using the mouse.

With this sort of Intuition level support, you can program *VorecOne* to control almost any program, including Deluxe Paint, WordPerfect, games and more. The only prerequisite is that the program be multi-tasking, since *VorecOne* must be able to run in the background.

HOW HARD IS IT TO PROGRAM *VorecOne* ?

For basic programming (including all of the examples I mentioned), *VorecOne* is very easy to program. Most of the commands are very straight forward, such as:

SAY "Hello there."
Commands the Amiga to say the words "Hello there".

SOUND "DF0:Speck"
Plays the digitized sound of Spock, from DF0:.

The Mouse Loses Its Tail

by George Laux

Can you ever believe there was ever a time when computers were completely keyboard controlled?

Can you believe that there was ever a time when personal computers were completely keyboard controlled. No special input devices were used, or even dreamed of...except, of course, joysticks for those game machines. Now we have mice, digitizing pads, video and sound digitizers, touch screens, light pens and more. The 90s are sure to bring even more developments in periphials and input devices. The latest new example is *The Cordless Mouse* by Practical Solutions.

The Cordless Mouse comes well documented and is easy to install. After all, how hard could it be to hook up a mouse, especially if it's wireless? The unit consists of a receiver, which isn't cordless, and a mouse, which is. You plug the receiver's cable into your Amiga's regular mouse port, and position the receiver somewhere convenient. The package even comes with double-sided tape so you can anchor the receiver somewhere out of the way, like on the bottom of a low shelf over your work surface, or on the side of your terminal. The receiver does have to be positioned carefully, so that it can pick up the signals from the mouse.

Because the mouse has no cord, it needs an independent power source: batteries. There is a button on the left vertical side of the mouse which you click to turn it on. In order to save battery life, *The Cordless Mouse* turns itself off if it is left unattended for more than about ten minutes.

That's it! Now *The Cordless Mouse* works just like any other, except without the tug of the cord. The mouse will work up to five feet away, and at an angle of up to 45 degrees to either side, but not up and down. This large range of maneuverability is also supposed to prevent tangled cables; I've never had tangled cables, so I can't verify this claim.

The sensitivity and response of this mouse really are great. In fact, the only complaint around my office has been that it's too sensitive. Some people, especially the artists, feel *The Wireless Mouse* is so responsive that it's hard to control. You move the mouse a few inches to one side and stop, but the arrow on the screen keeps going, right past the icon or area you were trying to select.

I didn't find this to be such a problem, especially after I got used to using the new mouse. When you move it just the same way as a standard mouse, it does tend to shoot right past the object you're after. But after a brief period of adjustment I found the pointer no harder to control with *The Wireless Mouse* than with any other mouse. In fact, I found it easier to use because there is no cord to pull my mouse's nose to the right when I'm trying to aim it to the left. It is true, however, that you do have to make smaller, slower movements with this mouse than with others.

When I first saw how the mouse worked, by transmitting an infrared radio signal from the hand held device to the receiver, I was concerned that the receiver would not pick up the signal whenever the mouse got turned too far to one side. To my surprise I found the opposite to be true; you can move the mouse to almost any position and the receiver will still tune into the signal the mouse is sending, as long as they're on a parallel plane.

The Wireless Mouse is a cute little gadget; it works well, but then again, so does the mouse that came with my Amiga. The retail price of $129.95 does make it seem somewhat unnecessary; but some of my favorite things are unnecessary. It's certainly a more affordable toy than a lot of the hardware out there, but it doesn't really do anything I can't do without it.

Even though this particular mouse may not be THE input device of the future, it is indicative of what will be happening in the 90s. The 90s will show a shift towards more convenient and efficient input devices. And as technology and time progress, prices will come down.

Of course, no product is perfect, and yes, even *VorecOne* has its problems.

KEYSEQ "DIR"
Types DIR to the keyboard, followed by a return ("").

MOUSE 120,200
Moves the mouse to coordinates x=120, y=200.

LDOWN
Clicks and holds down the left mouse button.

As you can see, the commands are not at all difficult.

HOW SOPHISTICATED CAN IT GET?

Because *VorecOne* comes complete with a simple, but flexible programming language, the possibilities become endless. Consider:

```
SAY "Type a file name ?"
$str = $INPUT ()
$len = $LENGTH ($str)
SAY "You typed a " + $STRING($len)
+ " character file name."
$start = $POSITION (":", $str)
IF $start == -1
$device = ""
ELSEIF $start == 0
$device = ":"
ELSE
$device = $extract ($str, 0, $start)
ENDIF
$start = $start + 1
$dir = $extract ($str,$start,$len-$start)
$start = 0
LABEL loop
$next = $POSITION ("/",$dir,$start)
IF $next != -1
$start = $next + 1
POPTO loop
ENDIF
$file = $EXTRACT
   ($dir,$start,$LENGTH($dir)-$start)
$dir = $EXTRACT ($dir,0,$start-1)
```

In addition to string functions such as those shown above, *VorecOne* includes numerical data types and variables, mathematical expressions, bitwise operations, logical operations, and more. All this means that *VorecOne* can easily do almost anything you can think of.

PROBLEMS & COMPLICATIONS

Of course, no product is perfect, and yes, even *VorecOne* has its problems.

First there are the basic limitations which involve memory and multi-tasking. Since *VorecOne* must always run in the background, you will notice some slow-down in your other programs. *VorecOne* was also tested on an Amiga 2500 with a 68020/68881 and a 68030 machine. *VorecOne* worked fine, although the slow-down was obviously not as noticeable.

Because *VorecOne* must sit in memory, it uses up memory space. Therefore, very intricate and involved functions with large vocabularies will eat up some extra memory. Consequently, don't plan to do a great deal of multi-tasking without expanded memory. Impulse tries to circumvent this problem by offering a chain-type command that will load a separate set of vocabulary and instructions on command. After all, while you're working in WordPerfect, *VorecOne* doesn't need to have all the Deluxe Paint commands loaded in memory. So you can issue a command like "I think I'll work in *DPaint* now", then *VorecOne* can purge the WordPerfect commands from memory, and load in the *Deluxe Paint* commands.

Another situation that could cause problems is *VorecOne*'s inability to sometimes distinguish between two commands. It appears that *VorecOne* learns words by analyzing the change in voice inflection while you speak the word. Unfortunately, some words show similar changes in inflection, and therefore, *VorecOne* will sometimes insist that they are the same. One way around this problem is to use alternative words with the same meaning, or longer phrases. For example, instead of saying "Stop", try "Ok, I think I'll quit now" as an alternative. Impulse offers another function in the *VorecOne* software to help alleviate this problem: Sublevels. With Sublevels, you can have a command drop you into a "Sublevel" of different commands. For instance, while writing in *WordPerfect*, I have separate sets of commands for different functions. An example is: while typing, I can say the command, "Check this word's spelling." and up pops the spelling menu. At the same time, *VorecOne* drops into a sublevel of spelling commands. So if it hears the command "Replace" it knows to replace the word, as opposed to replacing a file.

One last problem is that you must be familiar with CLI to make *VorecOne* work. Although the disk has an icon for *VorecOne*, the icon will only give you a software error when you click on it. Next to the icon is a README which basically tells you that basically, you must use CLI, and that there are some libraries and device drivers that must be copied to your normal disk or harddrive. Also, there is no installation icon, which means...CLI.

Other than the problems just mentioned, *VorecOne* seems to work without a glitch; I can easily recommend it for the 90s. If it sounds like science fiction, but it's not...it's *VorecOne*.

Omni-Play Basketball Expansion Disks

By Mike Hubbartt

We first reviewed a new Amiga basketball simulation from SportTime called *Omni-Play Basketball (OPB)*, in AX issue 2.6. There are now two expansion disks for *OPB* to evaluate: the *Side-View* and *College League* modules. Lets make a short review on *OPB* before jumping into these additional disk.

Omni-Play Basketball allows you to play a complete season in a league with your own team - the players can be drafted or traded with other clubs to improve your team. You control each of the five men on the court individually. Send some or all players to training camp once a year to improve their attributes. Your players are mortal - they show wear from exhaustion (it takes a lot of energy to run up and down the court for any length of time) and injury, so use players from the bench as substitutes to keep your team strong the entire game. *OPB* shows only half the court at a time, and switches when a team heads down the court to their opponent's side. Use standard basketball plays like the pick-and-roll to free up a man for a quick score. Control the game from either a player's or a coach's perspective. Send in players or execute plays according to your game plan (are you another Pat Reilly?). This simulation has the detail to game features that will enthrall b-ball Amiga fans for an entire off season. This game is played from either a floppy or a hard drive setup.

Side-View Module

This optional module lets you view the game from the sidelines - the best possible perspective! Anyone that attends basketball games in person will appreciate being able to see the entire court action, instead of only one end. Win or lose, most of us go to games to see the action from BOTH teams, and not just the big name stars from our own team.

The change of perspective isn't the only feature added to *OPB* with this module. Instead of having control over all five players, the computer now controls all but your team's center. Your four computer-controlled players will pass and shoot the ball themselves until you call for a pass, allowing you to set up a play of your choice. Select general offensive/defensive strategy, which the computer implements, while you retain control of the center's moves. Your instructions (to general strategy) include: work the clock, quick shot, (or mix these two styles for offense); play man-to-man, double team, or mix these styles for defense.

This module also adds a few things to *OPB*, like the high-risk bounce pass (high risk because it is fairly simple to steal). In addition to the normal halftime show, cheerleaders have been added. What sporting event would be complete without cheerleaders? The final addition to this expansion disk set, is the inclusion of update files to update errors and add improvements to the original OPB game. I thought this module was a nice addition to the *OPB* simulation, and it demonstrates how well planned out this program was, to allow expansion modules after the game itself was initially released.

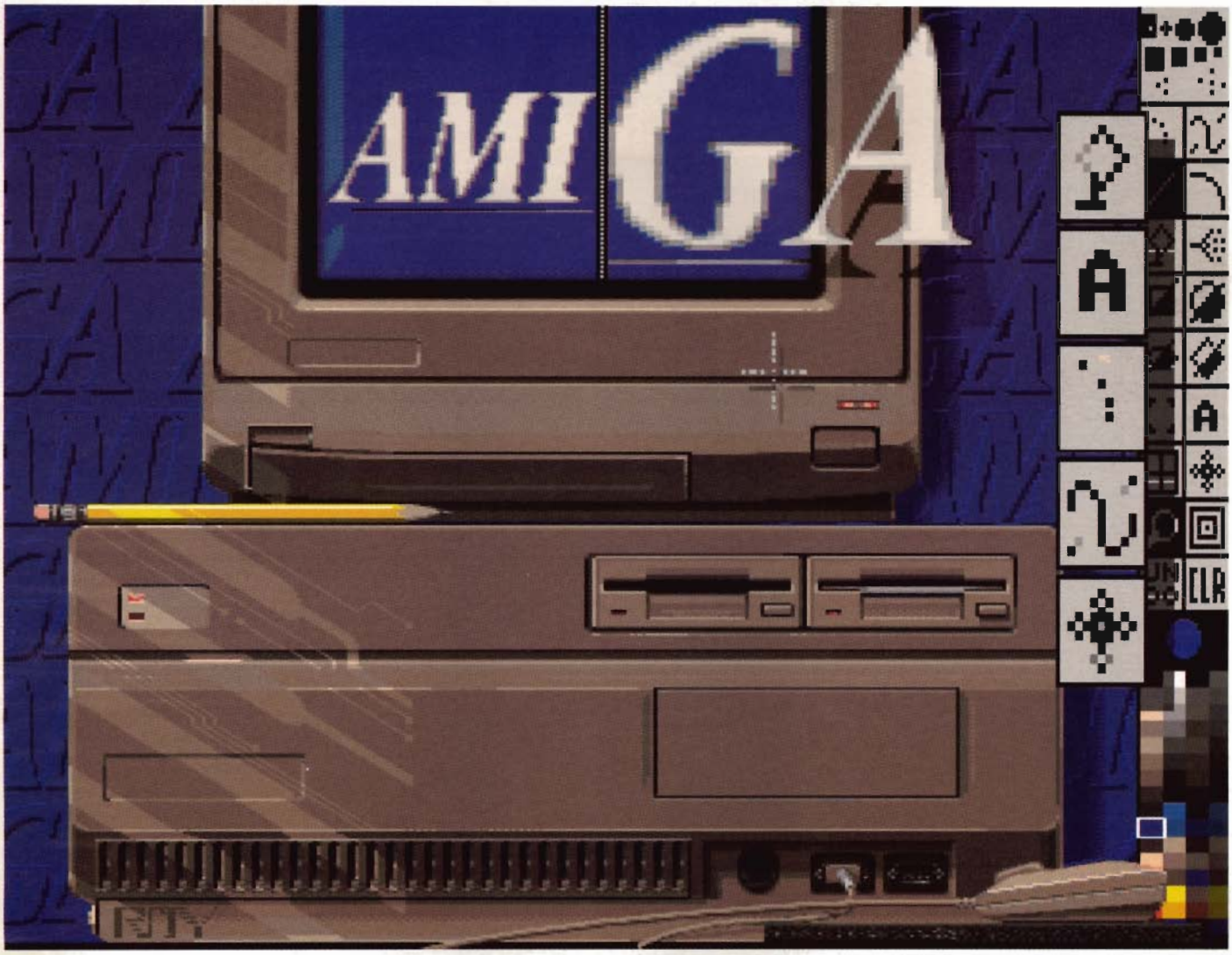
College League Module

Instead of only using the SBA league players and teams included with *OPB*, use 64 college teams! Many basketball fans prefer college over pro, perhaps because it is more exciting to watch or because it is the old alma mater. You have a 64 team tournament with this module - the stakes are the national championship title! This module is only for playoffs, since all 64 teams have made it to this stage, so you are playing for all the marbles. There are four regions, each with sixteen ranked teams. The teams within a region play for the regional championship; the regional winners then play for the national title. The best reason I can see for this module is expanding the depth of *OPB*. I enjoyed this module, but did not get as much out of it as I did from the side-view mod-

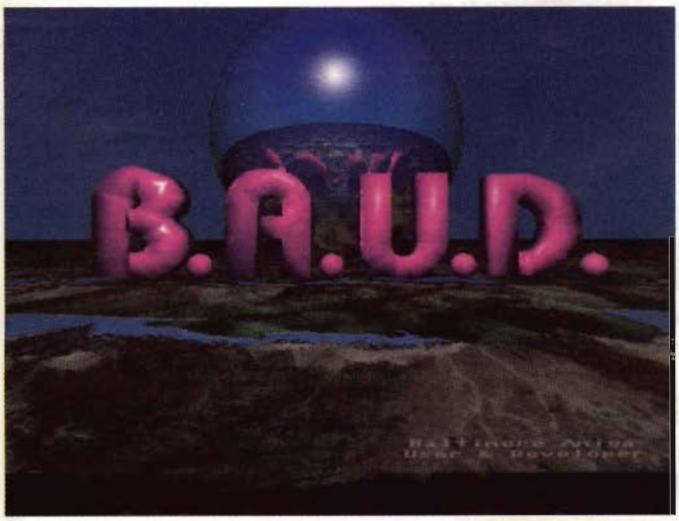
Omni-Play Basketball allows you to play a complete season with your own team, the players can then be drafted or traded with other clubs.

A.X. Magazine's Reader Gallery

Ice Star by Mike Malloy is also featured on this issues cover. Mike Malloy is from North Hollywood, California.



Amiga Paint by Christopher Roy originally appeared on the cover of Issue 2.5 of A.X. Magazine. The version of this picture that appeared in that issue, you may have noticed some strange highlights that appeared around the edges of the image, and computer. These were not from the artist's original artwork, but rather an artifact caused by Professional Page's inability to deal with halfbright images correctly.



BAUD Ray Trace by Ken Goecke

If you have a picture or animation representing your user group, please feel free to send them to us for publication. We will be glad to advertise your user group for you here.

window. This window can dump the contents of any memory location in a number of formats, including formats shown as real numbers or as binaries.

CONFIGURATION

A very nice feature of the *Benchmark* debugger is the ability to easily create and save the debugger configuration. Typical elements of a configuration include the choice of the debugger screen type and colors, and the number and type of windows to be opened by default.

Benchmark debugger can be run on the Workbench or on a custom screen. For example, I have configured my debugger to run on a custom hires/interlace screen, and to open one source and one data window on startup.

Selection of screens, windows, and colors are all done by choosing various options from the appropriate menus. Once the debugger has been configured to your liking, the set up can be saved to a configuration file by choosing "Save Configuration" from the "Project" menu. The configuration file, named "M2DEBUG.CONFIG", can be placed in the "S:" directory, so it will be used for every debugging session. Alternatively, separate configuration files can be created for each program you debug. The debugger will use these files, as long as they are found in the default directory when the debugger is first invoked.

LIMITATIONS

The *Benchmark* debugger does have a few limitations, mostly due to the Amiga system. First, the debugger cannot be used to debug any system code that can be invoked from many tasks concurrently. Similarly, interrupt routines cannot be directly debugged. If you must work on such code, a good way - as suggested by the *Benchmark* SLD manual - is to debug your code in a simulated environment under debugger control. Once the code is working properly, then it can be inserted into the actual system library or the interrupt handler.

The second limitation involves exception handlers. Some programs have a special routine that is called on when the main program crashes (ie. encounters an exception). Now the debugger adds its own exception handler to the debugged program, to "catch" exceptions and breakpoints. Therefore, when debugging a program with a user written exception handler, you must be very careful not to mess up the debugger's handler. I've done it and met the Guru!

Finally, since the debugger is always invoked from CLI it is not possible to debug Workbench specific startup code directly using the Benchmark SLD. Instead you have to insert a TRAP instruction into the start of the program and use the Post Morted Debugger to load the SLD, after the program in question is started from Workbench.

DOCUMENTATION

The manual for the *Benchmark* SLD is about 150 pages long. The first four chapters are devoted to an introduction of the debugger, installation, and a tutorial. The remaining chapters (5 through 19) describe in detail the functions of each window, the execution control, the memory operations and the configuration options. A single appendix contains the error messages issued by the debugger.

Although the manual is complete, I was not happy with its organization. There is no subject index, making it difficult to use the manual for reference.

The *Benchmark* debugger's user interface is very clear and most of the commands are self evident from the menus, therefore in most cases there is no need to look at the manual. In the few cases when the documentation is necessary, the *Benchmark* manual is not very helpful. This is especially true for operations that involve interaction between different windows. For example, it took me much too long to figure out how to display sources of another module in the Source window before starting program execution.

Since the user interface is very visual, the manual would be much improved if it contained some illustrations. A single picture would explain where the "destination" gadget is much better than lines of text. Similarly, some of the less intuitive operations would be easier to understand if described with text and pictures.

PROBLEMS

Although *Benchmark* SLD is a very good product, it still has a few minor problems. From the section above, you can see that I did not like the *Benchmark* manual. However, the manual does contain all the information needed to use the debugger, it is just poorly organized.

The first easily noticeable, annoying feature of the debugger is the file requesters, which allow only one file name to be typed in. No files, directories or devices are shown. Considering the fact that the ARP File Re-

A somewhat annoying characteristic is that the debugger does not properly handle TAB characters within the source files.

quester is widely available and that the *Benchmark* editor has a nice file requester, I do not understand why the debugger only provides such primitive file requesters.

It is possible to use the debugger's directory window to look for files and then transfer that information into a file requester, but this method is not obvious and non-standard.

The second somewhat annoying characteristic is that the debugger does not properly handle TAB characters within the source files. The presence of TABs messes up the source window display. A program to de-tab your sources is provided with the debugger package, but that is a poor solution. Considering the fact the *Benchmark* editor allows TABs to be inserted into the source files, I was surprised to find out that the debugger could not handle TABs properly. Although, this is a small problem, it stands out in an otherwise polished product.

Another problem that is more difficult to get around is early termination of a debugging session. This is done by selecting HALT from the COMMANDs menu. Unfortunately, any resources that have been allocated by the program will not be released (ie. windows/screens will remain opened, memory will remain allocated). It should be possible to provide termination procedures for each module which could be called by the debugger when the program was halted. This way appropriate clean-up could be done. The few times that I have tried to HALT my program I crashed my machine.

My final complaint is about features not implemented. In particular, I would like to see conditional breakpoints and watch-points. A conditional breakpoint would be created by adding a boolean expression to a breakpoint. The program would be suspended at the breakpoint if the expression was true. *Benchmark's* counted breakpoints are "a poor man's" conditional breakpoints.

A watch-point on a variable is a breakpoint that occurs when the value of the variable changes. Since the debugger must examine the value of the variable after every statement, watch points are not efficient to implement. However, in many cases they make the debugging tasks much easier.

SUMMARY

Despite the few problems discussed above, the *Benchmark Source Level Debugger* is the best runtime debugger I have seen. The mouse driven user interface is very intuitive, easy, and fun to use. This is a polished product and that fits very well into the rest of the *Benchmark* programming environment.

As I use the *Benchmark* debugger, I discover more things that it can do. It is impossible to describe all of them in this article, but I hope that you can get an idea of what working with the *Benchmark* debugger is like.

In my opinion the *Benchmark Modula-2* compiler, editor and debugger comprise the best Amiga programming environment to date. I don't see why any programmer would want to use another package, unless he prefers to struggle with his programming environment to writing new code!

F16 - Continued from page 28

tirunway missiles, Sidewinder heat seeking missiles, AMRAAM missiles, Maverick air-to-ground missiles, HARM air-to-ground anti-radiation missiles, and a cannon for close range firing in dogfights. Your enemies are Russian Mig 27s (the Flogger), Mig 29s (the Fulcrum), and Mig 31s (the Foxhound). Each Mig has different capabilities, so know thy enemy!

You start *F16* in the squadron room. Make your selections with the mouse from the figures (not menu items) in the room. Click on the Pilot to get a quick start into *F16*, which lets you get a feel for the program before you start flight training. Click on the open window to see a demonstration of *F16*, while clicking on the filing cabinet brings up the pilot's log. The pilot log has name, call sign, squadron, flying hours, kill record and ratio, mission effectiveness, and your pilot rating. Recall a saved game by clicking on the flight case by the pilot. The two posters on the wall let you examine both aircraft and weapons data.

Newcomers to flight simulators will be relieved that *F16* has a training mode to get you started. No need to be an experienced computer pilot to enjoy this program, simply start flight training. Learn how to take off and land (pretty important features -- for computer or real-world flying) before attempting any of the missions. Learn to look around - *F16* lets you look in all four directions (front, left, right, and behind), which can be a real lifesaver when a bogey sneaks up behind you in a dogfight. Now is the time to become familiar with all the F16 instruments, don't skip this mode and believe "you'll do ok" without learning the instrument panel and all the warnings it provides. The Threat Warning Panel warns if you have been picked up on radar, and if a air-to-air missile has been fired at you -- kind of important information to know if you want to stay alive.

As for instruments, the F16 is loaded with them. Your fighter has instruments up front, on the left and right cockpit panels, and on the HUD (Heads Up Display). For detailed descriptions of the instrument panels, see **Box 1.**

You have six missions in *F16* . To stop enemy aircraft from intruding where they don't belong - in our airspace! To check out enemy weapons and tactical information for your own forces. To provide ground support for your forces against enemy tanks. To attack enemy targets such as airstrips, bases, and early warning facilities. After these missions, fight the big one - its you against a full force invasion! In the last mission, you also deploy other fighters on various support missions. This sixth mission will occupy you for a long time, since it is quite indepth. I have been working on the sixth mission and have saved it four times now, since I rarely have the needed hours to devote to completing a simulation.

F16 Negative Points

The disk is copy protected and the program also uses manual protection, so the program can't be installed on a hard drive - a negative feature that affects only a small percentage of Amiga owners, although I am included in that minority. Why not just use the manual-based form of copy protection so we can use our hard drives, which load programs much faster than floppy drives?

I did like the way EA lets you use a blank disk to store pilot data, which eases my mind that the master disk may itself be corrupted during a save to disk operation. I did not like the fact that this program doesn't support two disk drives, which means I have to swap the pilot data disk with the main program disk in df0.

The documentation did not mention if this program will have additional expansion disks. *F/A-18 Interceptor* did not, although I feel that enhancements are needed to prolong interest in a flight simulator. Expansion disks let a person use the same flight simulator for different missions, which means they don't need to learn another program's interface to try new missions. Both subLOGIC and Spectrum Holobyte have expansion disks, and it looks like their simulators will be around longer than those without expansion capabilities.

The simulator allows two people to play, although it is only via a null modem cable and NOT over a modem! How many Amiga owners that like flight simulators have two Amigas in the same room (or house even)? I'm sure there are a few, but this seems to limit any benefit the option provides. I don't know many people that will pack up their systems and cart then over to someone else's house to fly *F16* for a couple of hours.

F16 Positive Points

Authentic is the best word to describe this simulation. Pull too many Gees and you'll black out - a nice REALISTIC touch. All the instruments add a high degree of reality to *F16*

Newcomers to flight simulators will be relieved that *F16* has a training mode to get you started.

Combat Pilot, as well as lengthening the playability of the program. The Threat Warning Panel is a life-saver, since it warns of air-to-air or ground-to-air missile detection, enemy ECM, and tracking by enemy aircraft and early warning radar. You won't master the complete instrument setup in 15 or 20 minutes, unless you've spent a lot of time in a real plane. The instruments on all four sides of the pilot make this simulator three steps better than EA's *F/A-18* Interceptor--which used an over-simplified instrument panel.

The background scrolls smoothly when viewed from any direction. The joystick response is excellent! The missions were well thought out and fun; the first five missions each have a single objective, and the sixth has MANY different objectives. These missions will occupy a lot of your time on the Amiga!

The autopilot landing option was an great idea! Certain earlier simulations (*F/A-18* for example) made it mandatory to learn how to land before starting a mission, which could lead to frustration when certain manuals did not explain the proper landing procedures!

The manual, although only 44 pages long, covers the F16 and all its weapons in-depth, and is well organized and indexed. The included foldout is called the F16 Kneepad (the command summary card). This kneepad lists all flight control options and the respective keyboard keys, the front cockpit view with the instruments listed (both front panel and HUD) and a copy of the combat zone map. I keep this kneepad out for quick reference anytime I'm flying, even though I've been using this simulator for a while -- just for emergency needs, you know.

Conclusions

Overall, I liked *F16 Combat Pilot*. The objections I raised will not affect everyone. This program is loaded with many positive features, and it will entertain many people for many months to come. An update that addresses a few of the complaints would be nice, but I will still fly *F16* even without an update. This simulator is fun!

F16 Combat Pilot
From: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
1-415-571-7171

F16 Flight Controls

The **left panel** shows a hand on the throttle and your accelerator for the F16.

The **right cockpit panel** contains the Failure Status Panel which includes:
Failure of Fly-By-Wire - indicates reduction of agility
Undercarriage Failure - monitors landing gear
Radar Failure - shows loss of all modes of radar
Communications Transceiver - shows loss of ground assisted landing Navigational Aids Failure - alerts to loss of navigational aids
Lantirn - warns of loss night vision/targeting pod
HUD Failure - indicates no weapons' targeting information
ECM Jammer Failure - makes it easier for radar tracking
Oxygen Systems Failure - keeps you under 8000 feet
Radar Warning Failure - inability to know if radar has scanned you
Weapon Failure - checks weapons' status display
ILS - failure of autolanding option
Mechanical compass - backup if the HUD goes down

The **front panel** instruments consist of:
Three multifunction displays - Air-To-Air Radar (Track-While-Scan, Single-Target-Track, and Air Combat Scan Modes), and Air-To-Ground Radar (Ground-Target-Ranging and Ground-Target-Track modes)
Moving Map Display
Weapons Status Board
Digital Artificial Horizon
Primary Flight Data
Zoom Thermal Image
Instrument Landing System
Radar Warning Receiver - passively detects radar transmissions
Attitude Direction Indicator - shows pitch and roll
Angle of Attack Indicator - indicates the angle between the wings and airflow
Vertical Speed Indicator - shows rate of climb/descent
Engine RPM - digital
Fuel Gauge - accounts for both internal and external tanks
Up Front Control Panel - shows the CNI Datalink and Waypoint
System Control Functions - ATARS, LANTIRN, Radar, et cetera
UHF Communications
Threat Warning Panel
Radar Jammer

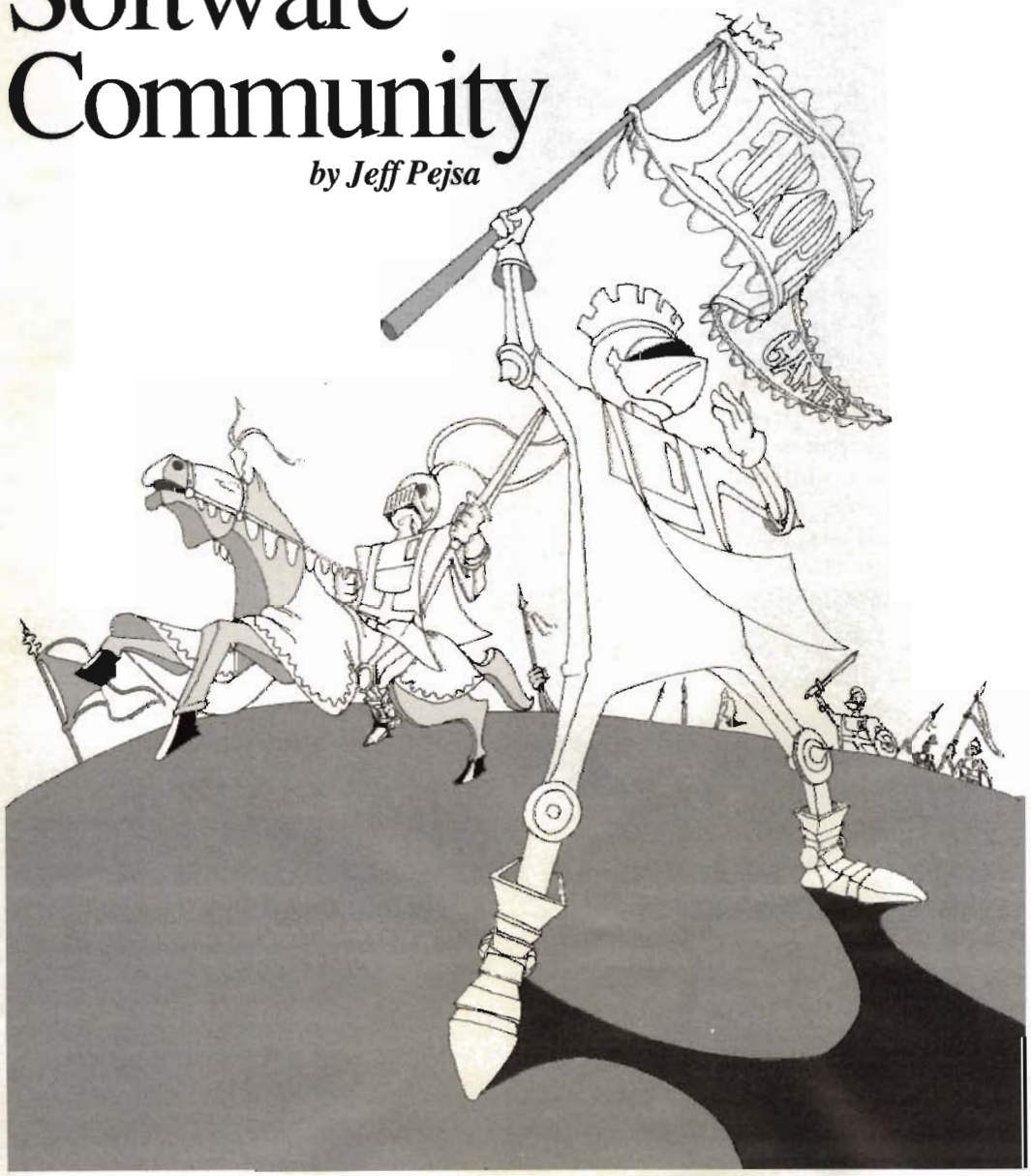
The **Front Panel Warning Lights** are:
Alert, Engine, Fire, Ext, Undercarriage, Jettison, Wheel and Air Brakes, Eject Handle

The **HUD** shows:
Aircraft Heading
Airspeed - In knots and in Mach
Altitude
Flight Path Ladder
Number of Gees
Range/Bearing - Relative to target/weapon currently selected
Aiming Indicator - Reticle

The British Are Coming! And So Is The Rest Of The European Software Community

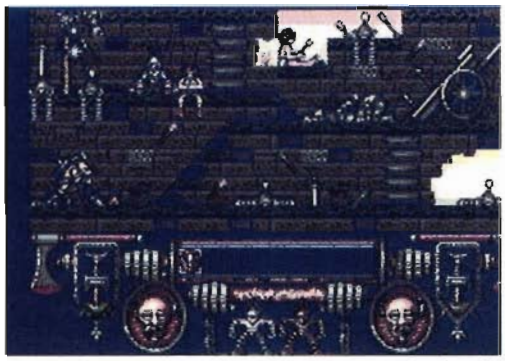
by Jeff Pejsa

The Europeans are coming! The Europeans are coming! Yes, in case you've been asleep for the last year, the European software invasion has taken the U.S. Amiga software market by storm. The principal invasion area has been entertainment. What started as a trickle, has broadened into a veritable flood of European Amiga games.
Let's take a brief look at some of the more interesting ones.



Battles with knights on horses, warriors on boars, and men in medieval catapults gives you the opportunity to fight in many different capacities.

Typically, the European software selection has consisted of shoot'em-ups and arcade action games. A good example is Hewson's Onslaught. In Onslaught, you rule your own kingdom with the objective of destroying other kingdoms in your quest for world supremacy. You fight an incredible variety of enemies with an equal variety of weapons. When you slay an opponent, you have the option of taking his weapon and leaving your old one behind. Battles with knights on horses, warriors on boars, and men in medieval catapults gives you the opportunity to fight in many different capacities.



Onslought

A rising giant in the European games market is UBI Soft, who recently released an action packed shoot'em-up called *Twin Worlds*. In *Twin Worlds*, you begin as a finely drawn elf-like creature on a ledge where you immediately begin to battle winged and land based creatures. Not only do you battle them on the surface, but with a quick hit to the joystick while standing in front of a cave, you are transported to a subterranean world where even more creatures await you. The combination of fine graphics, sounds, and game variety make this action game well worthwhile.

TwinWorlds

Another fine shoot'em-up is Ocean Software's *Cabal*, which is similar to Actionware's *P.O.W.* because the object is to hack and destroy legions of enemies in hand-to-hand combat, as well as battling enemy tanks and submarines. Superior *Cabal* fighters will be able to upgrade their single action shooters to superior weaponry, such as grenades. The graphics and sound are both excellent. If you enjoy battling soldiers and armies, then *Cabal* will fit the bill.

Cabal

Clearly one of the best shoot'em-up games, despite, or maybe due to, being a European import, is Pysgnosis' *Menace*. You begin your fight in a small craft descending into a living and breathing cave that becomes alive with every conceivable type of enemy. There are jellyfish-like creatures, standard spaceship enemies, amoebas, man-eating plants, centipedes, and many others, all waiting for you! *Menace* really requires patience and perseverance. The endless waves of enemies are merciless and provide one of the truly ultimate video challenges.

Traditionally, the European software market has been considered to be strewn with nothing but shoot'em-ups like *Menace*, *Twin Worlds*, and *Onslaught*. However, European graphic adventure games are beginning to make their mark. Two games in this category are particularly noteworthy. Both by Infogrames, *Drakkhen* and *North & South* prove that the Europeans are ready to compete in the graphic adventure market.

Nort & South

North and South re-enacts the American Civil War. The game combines strategy and arcade features into one comprehensive game. The strategic-minded person will enjoy the battle preparation and execution. The arcade-minded chap will yearn for the super arcade battle field. Included with the game are options for starting the game in any one

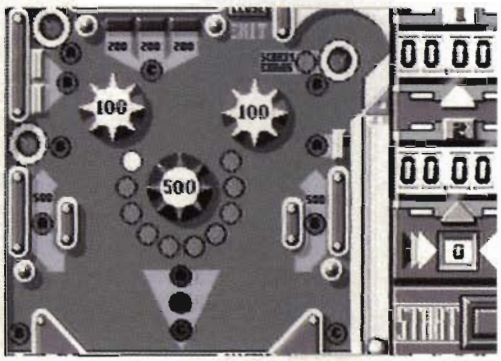
of several years during which the war was waged, as well as for three different levels of difficulty. Of special note is the disaster mode. Here, Mother Nature can play havoc with the troops by unleashing vicious storms at random. With all these game facets, as well as stunning graphics and multiplayer options, *North & South* is a definite must.

Infogrames newest release is *Drakkhen*. If you are familiar with *Dungeon Master*, then you will have the general idea of how *Drakkhen* is played. Simply put, this game is a graphic adventure which enables the player to manipulate and change different role playing characters in his quest to prevent the Old World from crumbling under the evil *Drakkhen* monsters. The usual facets of graphic adventure games are present in this game, including the icon control of weapons, status display, and fighting tools. What makes *Drakkhen* standout is the life-like monsters you encounter. These are not the blocky, small creatures many adventures present you with; these monsters are half the size of the screen with fire-breathing weaponry! If you want an adventure challenge with the appeal of finely detailed graphics, check out Infogrames' *Drakkhen*.

Drakkhen

In addition to the shoot'em-up and graphic adventure games, the Europeans also are dabbling in sporting games. First up is UBI Soft's *Pro Tennis Tour*. In this tennis game, you may select either the one-player-against-the-computer option, or play against a friend. The rules of tennis are closely replicated in the gameplay. You start *Pro Tennis Tour* ranked 64th in the world. Your mission is to win tennis matches and climb the ladder of success. You can start in one of the four grand-slam tennis events immediately, or you can work on your service and returns in the various practice modes. The game is quite challenging. The key to success is being able to approach the net and make sharp returns. After you have mastered your net game success will follow. However, moving to the top of the ranks is not easy. To attain the number one ranking in the world requires winning all the grand slam events (French Open, Wimbeldon, Australian Open, and the U.S. Open), and even then you might not be good enough. If you are looking for a challenging sporting game, then UBI Soft's *Pro Tennis Tour* is the game to net.

Loriciel's recently released a classic pinball game for the Amiga. Their pinball game will bring back memories of those quarters spent shooting the marbles up against the glass and whacking the flippers on the side of the machine. In Loriciel's *Pinball*, you will have the opportunity to reminisce in style, as well as skill and technique. This pinball game recreates the look and feel of the old style pinball games. If you want a bit of nostalgia, take a long look at this game.



Pinball

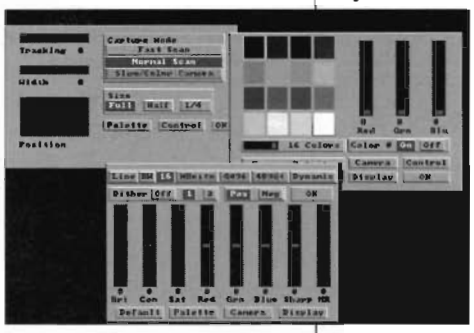
I've mentioned just a few of the European games exploding on the U.S. Amiga market. From the classic shoot'em-ups to the graphic adventures to the sporting games, the European games cover the gambit. Are these all the games out there? No they aren't! For all those that are already out, there are as many new ones being developed. Promising games close to release at this writing include the classic arcade game Ghouls 'N' Ghosts, The Untouchables, and F-29 Retaliator. These new developments will ensure that the U.S. market will continue to feel the presence of the European programmers for some time to come.

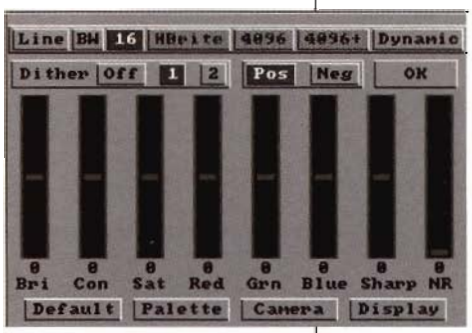
These are not the blocky, small creatures many adventures present you with; these monsters are half the size of the screen with fire-breathing weaponry!

Scanning & Digitizing Continued From Page 56

bucks burning a hole in your pocket and plenty of RAM in your Amiga, I cannot imagine a neater toy to buy!

With practice, the *JX-100* is closer to *DigiView* than *FrameGrabber*. The Sharp scanner's purpose in life is to allow you to grab from flat imagery (books, magazines, photographs, et cetera.) in very high resolution, and to that end it works wonderfully. Unlike the *DigiView* or *FrameGrabber*, the *JX-100* has no facility whatsoever to accept any kind of external video source. It is strictly a two dimensional flat-object scanner.





Above (TOP) Some of Digiview 4.0's requestors.
Above (BOT) Digiview 4.0's control panel.
Below. An image digitized by Digiview and Digiview 4.0 software.

The JX-100 was not designed as an Amiga-specific product. It's a "generic" computer-driven scanner which requires either Amiga, color Macintosh, or IBM-clone software (under "windows") running on its host computer. The same *JX-100* can, of course, be hooked to any of these three flavors of computer with the proper cable interface and software. For the Amiga the product is accompanied by ASDG's *ScanLab 100* software package which is included in the purchase price of the scanner.

The *JX-100* connects to the Amiga 500 or 2000's standard serial port. Hooking it up to an Amiga 1000 will require a serial port "gender bender." The *JX-100* talks to the serial port at 115,000 baud, roughly floppy drive speed. The external brick power supply and the scanner itself have nice long cables and installation should take no more than 5 minutes. Unlike *DigiView*, the *JX-100* takes up very little desk space. Picture a loaf of bread sliced into thirds the long way. The *JX-100* is about the size of one of those thirds.

The scanner isn't really meant to be "hand-held" - rather you simply lay your artwork on any flat surface and then lay the scanner on top of it. The four pound mass of the *JX-100* will flatten down the subject matter nicely. The *JX-100* has a 4" x 6.4" window area covered on both sides by clear acrylic plastic, making it simple to center the scanner over the subject matter; it's in this area that the actual scanning head shuttles back and forth over, but never touches, your artwork. Operation is whisper-quiet. We're talking very high quality Japanese electronics here and Sharp has a reputation for making excellent stuff!

External room lighting has no effect on the quality of the scan since the scan head is very close to the subject and has its own built-in long-life illumination. Because the scanner rests directly atop your artwork and always at the same distance, there's no focusing required, or even possible. The *JX-100* is a completely sealed unit. Nice and neat.

On the Amiga side of things, ASDG's *ScanLab 100* software is sublime. The working interface is gorgeous and controls every aspect of scanner operation and image processing. The boys at ASDG have truly knocked themselves out on this piece of software and it shows. Hard drive installation is a breeze. Click one icon. Boom! the software's installed.

Run *ScanLab 100* and it immediately looks for the scanner. If there's a problem, check your cable connections, otherwise *ScanLab* will tell you it found the scanner and that it's ready to go to work. A quick preview-mode scan is the first thing to do. This establishes the orientation of your subject matter and gives you the ability to modify the overall brightness of the scan and to mouse-drag a box around the preview scan if you wish to not scan the entire area of the JX-100's window. In the Preview screen you also set which mode of resolution you wish to work with. The *JX-100* can scan in 50, 100, or 200 dpi (dots per inch) modes. The higher the dot density of the scan, the more RAM the scan will require.

Before we go any further it's time for a warning: *ScanLab 100* can be very memory intensive in the higher resolution modes. You will need more than one MEG to be able to use *ScanLab 100* at all. To fully utilize 200 dpi mode you will need more than four MEG of RAM. The 100 dpi mode offers a

good compromise between memory conservation, speed, and high quality of the final imagery, and for all-around work, 100 dpi will probably become the most often-used scanning mode.

Once you're satisfied with the quick scanned preview, move on to the Fine scan screen. Choose the "scan" button and the *JX-100* quietly goes to work, scanning the image area you chose in the preview mode, in your selected resolution. The actual fine scan process can take anywhere from a few seconds to close to ten minutes, depending on your choice of modes and the size of the scan. While the scan takes place your Amiga is dedicated to the scanner... you can't flip screens, access disk drives or do anything else. A mouse click will abort a scan-in-progress if you change your mind or need to change something. This is a modest price to pay for the quality you'll receive.

When the scanner has finished, *ScanLab 100* offers a wide range of image processing controls and features though a number of pop-up windows filled with sliders and buttons. The *ScanLab 100's* user interface is beautifully designed and a pleasure to work with. Most operations happen very quickly despite the intensive math computations required for this kind of image processing power. On an 020/030 accelerated Amiga they're even faster.

A scanned image can be manipulated and massaged into virtually any Amiga mode of color and resolution including Low, Medium, Interlace, Overscan, High resolutionin NTSC or PAL video standards, and in color ranges including 2, 4, 8, 16, 32, 64 (EHB), 4096 (HAM) colors, plus two new display modes developed by ASDG called AHAM and ARES which are analogous to NewTek's new Dynamic modes in their *DigiView 4.0* software. AHAM and ARES require additional computing time but the results are nothing less than astounding. Like *DigiView's* Dynamic modes, you can look at AHAM and ARES pictures, but as of yet no paint programs can handle their new formats.

The scanning process itself can be accomplished in monochrome (2 color), or 6-bit gray scale, 3-bit color, or the astounding 18-bit color mode. From this brief description you should now understand that this hardware/software combo is incredibly powerful and there are virtually no limitation to it or on to your creative abilities except for the size of the *JX-100's* scanning area itself.

My favorite *ScanLab 100* mode so far is actually dithered 16-color high resolution. This product simply delivers the best looking high resolution pictures I've ever seen on an Amiga screen. Period. High resolution 16 color has been scorned by many Amigans simply because they prefer the wide range of colors available in other modes, especially HAM. Well I'm here to tell you that *ScanLab 100* changes all of that, and in a big way; finally making 16 color a truly useful mode in which to work with almost photographic-quality results.

Like *DigiView* and *FrameGrabber*, *ScanLab 100* can save off your masterpieces as IFF picture files and as compressed 18-bit scans which can later be loaded back in and manipulated as though they had been freshly scanned. (For all three of these products, these "raw" format files can take up quite a bit of disk space - in very high resolutions it's even possible to create a file larger than a floppy disk can hold.)

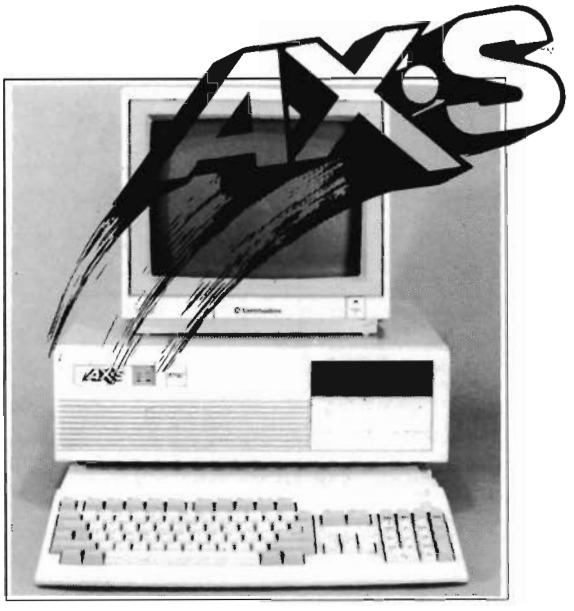
More Samples:
Top Digiview 4.0
Middle Framegrabber
Bottom ScanLab

Drawbacks

I can think of very few negatives to the *JX-100/ScanLab 100* combo package. The thousand dollar entry fee will put off more people than anything else. The scanner's smallish window area isn't so much a negative as is the price; but that's the price you pay for this much high technology in such a small, compact and portable package. If you truly need to scan larger page sizes and you can afford it, Sharp has bigger desktop-sized scanners available including the *JX-450* which operates in concert with ADSG's *Professional ScanLab* software and *Twin-X* interface board. With this big brother model you can scan an area up to 11"x17" at 300 dpi, but we're also talking about an outlay of over $7000 for the pleasure.

The *JX-100* should be seriously considered by anyone who has tried out *DigiView* and can pop a couple hundred dollars more. The scanner is high quality equipment and the software is magnificent. The scanner is easily transported and comes with a soft carrying case.

All three of these products, *DigiView*, *FrameGrabber*, and *JX-100/ScanLab 100* are backed by well-established manufacturers. All three can "deliver the goods." Shop, test, and compare.



Extraordinary Expansion Power For AMIGA!

Here's access ("AX-S™") to all the plug-in expansion boards you could ever need.

IMAGINE THE POSSIBILITIES!

Think what a powerhouse your A500 or A1000 would be with such devices as 3 hard drives, a tape backup, a FAX card, an internal modem, a multiple serial port, and A/D converter and 8MB of RAM memory right at your fingertips ALL RUNNING FROM AMIGADOS.

WHAT IS "AX-S™?"

AX-S™ is a hardware interface... an adaptor... an "interpreter"... AX-S™ interfaces the Amiga Bus Structure/Expansion Port to the PC industry's PC/XT-AT bus standards. This system allows your Amiga to use the hundreds of low cost plug-in expansion boards that virtually flood the PC/XT-AT marketplace.

Following is a brief list of typical easy, plug-in boards that are tested, proven PC/XT-AT designs available now, in discount stores and mail order houses.

Multiple Serial Port, (4)	$ 79
Hard Drive controller, 8/16 bit, MFM/RLL	$55/$110
Modem card, 2400 baud	$ 99
Networking board	$159
Handscanner	$171
A/D converters	$199
FAX card, 9600 baud	$389
CD data cartridge/drive	$350
Hard Drive, 40MB complete system	$359
Hard Drive, 80MB complete system	$575
Tape Backup, 40MB complete system	$299

AX-S™ connects Amiga's Bus/Expansion port to a chassis with a heavy duty 200W power supply, ventilation fan, 7 plug-in expansion slots, 6 PC/XT-AT bus slots and one OCTABYTE™ RAM expansion slot, multiple peripheral drive bays, hard drive power connectors and an optional power cord for the Amiga 500.

In addition, complete installation instructions are included plus Driver Software for some plug-in PC/XT-AT cards on disk.

Special Note For Amiga Software Developers:

Spirit Technology will make available the Copywrited "AX-S™ Resource Library" disk to enable developers to write drivers between Amiga and PC/XT-AT hardware devices. For more information on AX-S™ look for Spirit AXS.DOC on Compuserve, People Link and Genie Networks. To order the AX-S™ Resource Library disk call or write us at Spirit.

SUPERIOR EXPANSION HARDWARE!

Spirit Technology is in its third year of producing the finest quality Amiga hardware. Tens of thousands of Spirit expansion products are in use throughout the world. Spirit is committed to continued development of additional, superior Amiga peripherals.

NEW!
"OCTABYTE™" 8MB RAM Expansion

- A2000 or AX-S™ plug-in board.
- Autoconfig, expandable, 2, 4, 6 and 8MB.
- Smart DRAM Controller gives 0 wait-state plus unique refresh for lower power consumption.
- Fully socketed, uses 1 Mx1 DRAMS.
- Software support disk includes RAM test.

NEW!
"X-RAM™"8MB RAM Expansion for A500 & A1000

- Same features and specs as OCTABYTE™ (above).
- Easy expansion port plug-in with low profile external chassis and external power supply.

NEW!
"INTERLOK™" Video GENLOCK For All AMIGAS

INTERLOK™ includes advanced video circuitry that locks Amiga's scan rate to NTSC or PAL broadcast synchronizing standards... and is also able to lock to sync pluses that output directly from typical low-cost VCR's. It is virtually computer-crash proof (caused by fast forward/rewind).

- Input, looping video, switchable, 75 ohm/Hi Z.
- Outputs, NTSC or PAL plus filtered R.G.& B.
- Pgm. out: 1.0vpp, <1,0% diff. gain, <0.2% diff phase /75 ohm.
- Key out (Amiga color 0).
- Front panel includes program on/off, genlock on/off and 0 to 100% fade control slider.
- Front panel & controls remoteable to 25 ft.

Internal 1.5MB RAM EXPANSION for A1000

- Battery backed clock/calendar.
- Autoconfig, expandable, 0.5, 1.0 and 1.5MB.
- Dynamic Ram Controller for 0 wait state.
- Fully socketed, uses 256x1 DRAMS.
- Software support disk includes RAM test.

Internal 2 Meg RAM EXPANSION for A500

- Autoconfig, expandable, 0.5, 1.0 and 2.0MB.
- Simple plug-in installation, no jumpers.
- Dynamic Ram Controller for 0 wait state.
- Fully socketed, uses 256x4 DRAMS.
- Software support disk includes RAM test.

NEW!
"TRAPPER™" 512K Memory Expansion For A500

- Easy plug-in installation into the "trapdoor" expansion slot.
- Includes battery backed clock/calendar.
- Available 0K with 256x4 or 256x1 board versions.

Hard Drive Adaptors, ST-506...

- The low cost solution to mass storage.
- In chassis with passthru for A500 and A1000.
- As Hard Card or drive bay installation, A2000.
- Autoboot and Driver Software.
- Easy to use, mouse driven low level format utility with bad track remapping and park.

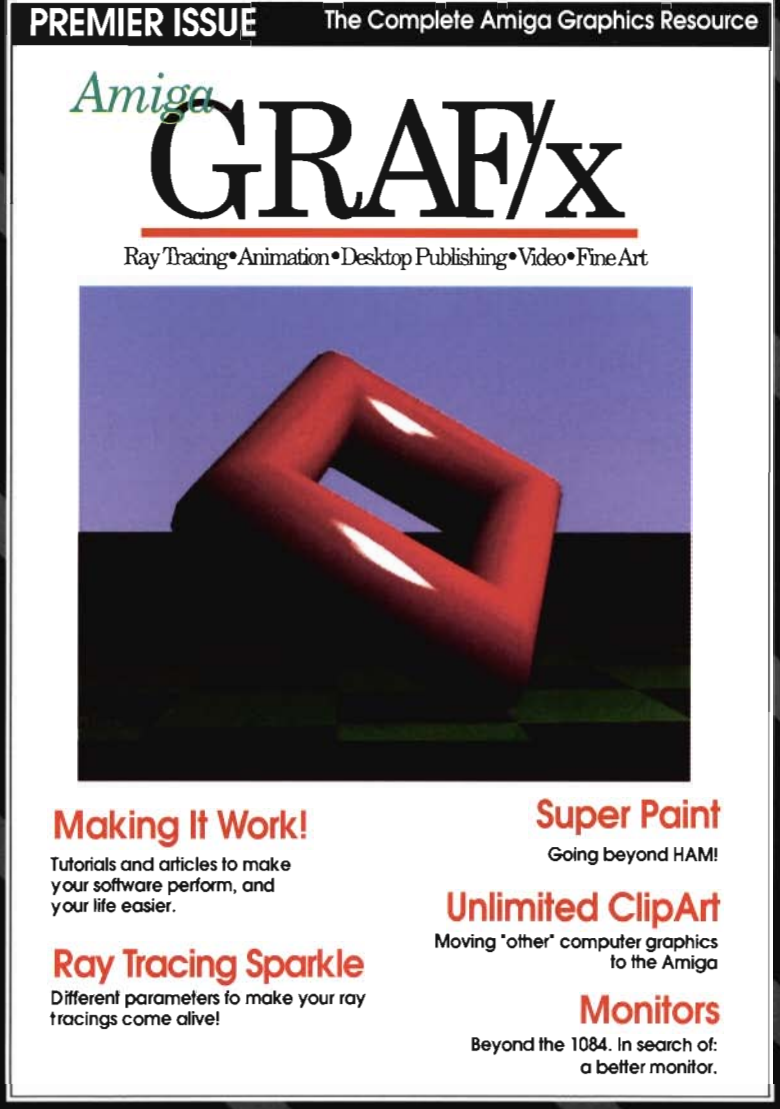
"MIDI-STAR™" Professional MIDI Interface.

- 2 INs, 6 OUT/OFF/THRU ports.
- Switch control and LED status indicators.

GET THE SPIRIT! CALL TOLL FREE 1-800-433-7572

SPIRIT™ TECHNOLOGY

Corporate Office: 220 West 2950 South, Salt Lake City, Utah 84115 Phone: (801) 485-4233 FAX: (801) 485-6957 USA Sales: Phone: (918) 834-2509
Canada: Phone: (416) 823-4821 • United Kingdom: Phone: 44-253-734218 • France: Phone: 33-56-37-4378 • Australia: Phone: 61-3-369-7020



The Complete Amiga Graphics Resource

For a graphics computer as powerful as the Amiga, you need a magazine that can help you reach its full potential.

Whether you are interested in Ray Tracing, Animation, Desktop Publishing, Video or Fine Art, GRAF/x can provide you with the ideas and information to make your Amiga sing, dance and perform up to its full potential.

Each issue you will get timely news features, product announcements, reviews, tutorials, and a solid editorial content. GRAF/x also offers a companion disk set with fonts, objects, clipart, artwork, animations, and so much more.

Subscription rate ~~$19.95~~ for 6 issues.
Special Charter Rate $14.95

Don't wait! Subscribe now and save 37% off of the cover price. Subscribe by using the order form, or for immediate service call toll free 1-800-284-3624.

UNBEATABLE VALUE!

SCSI Hard Disk Controller and 8MB FAST RAM Expansion In a Single A2000 Slot

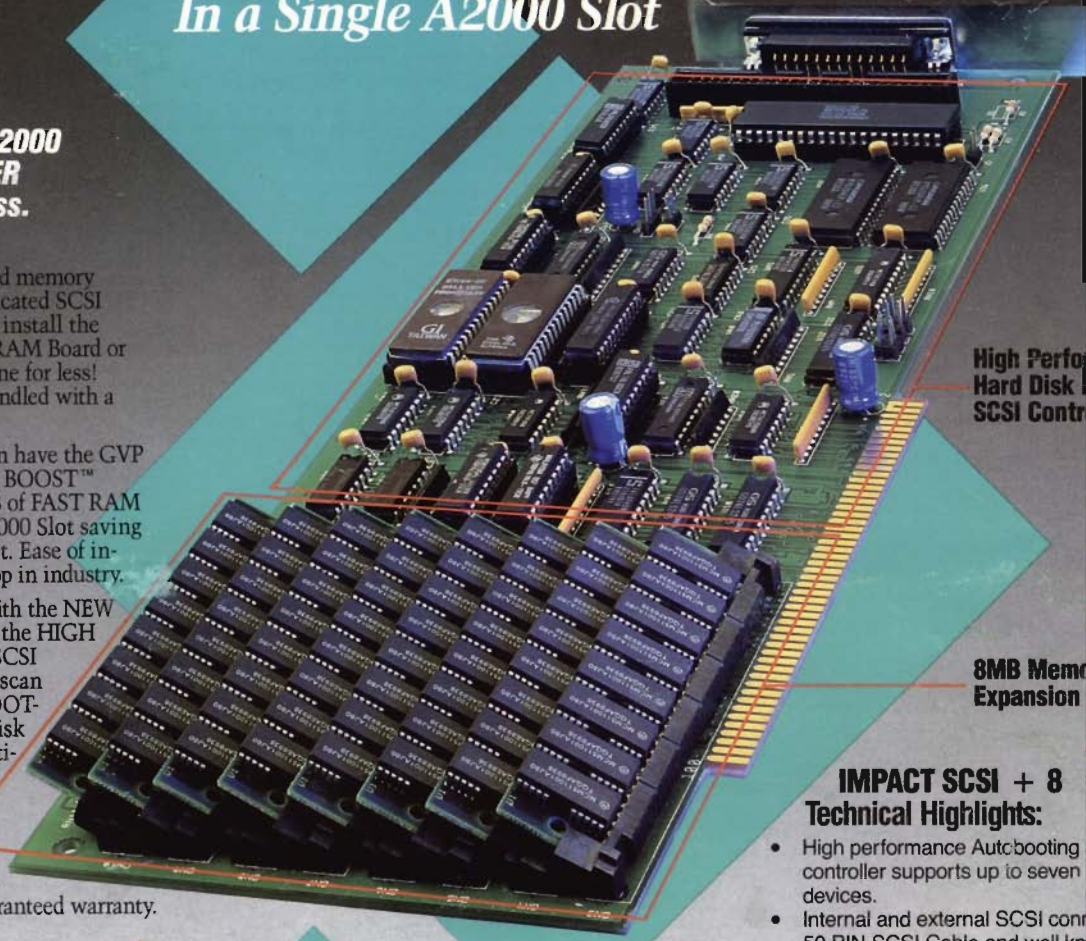
The NEW IMPACT™ A2000 SCSI + 8 CONTROLLER gives you more for less. Compare:

PRICE Why buy a dedicated memory expansion board or a dedicated SCSI Controller when you can install the IMPACT SCSI + 8 as a RAM Board or SCSI Controller All-in-One for less! Save even more when bundled with a GVP Hard Disk Drive.

EFFICIENCY Now you can have the GVP HIGH PERFORMANCE BOOST™ SCSI Controller and 8MB of FAST RAM Expansion in a single A2000 Slot saving you a valuable A2000 slot. Ease of installation is regarded as top in industry.

PERFORMANCE Now with the NEW GVP BOOST, experience the HIGH PERFORMANCE GVP SCSI Controller with full Overscan support, FAST AUTOBOOTING directly off a hard disk FAST FILE SYSTEM partition. Proven track record with over 10,000 GVP hard disk controllers installed!

QUALITY Backed by GVP's unique full one year guaranteed warranty.



IMPACT SCSI + 8 Technical Highlights:

- High performance Autobooting controller supports up to seven devices.
- Internal and external SCSI con 50 PIN SCSI Cable and well kn easy-to-use GVP installation so comes standard.
- DMA to/from drive to onboard 1 SRAM buffer provides high performance not affected by ov or blitter DMA.
- Now FASTER Data Transfers w GVP BOOST Advanced Driver Software Kit installed.

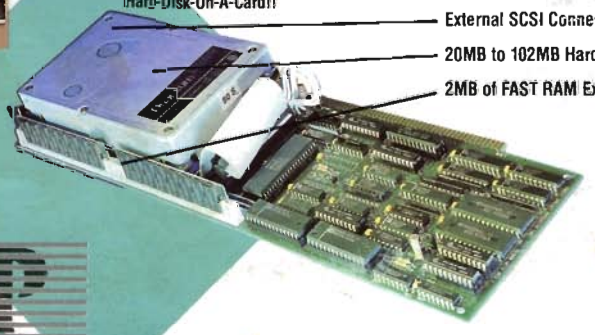
NEW!

IMPACT XC
GVP IMPACT XC is designed to take one full-height or 2 half-height 5.25" hard or floppy disk drives. Internal 45 watt switching power supply.

IMPACT SQ 44*
44MB Removable Hard Drive. Autobooting/Auto Disk-Change Features Free.

IMPACT WT 150*
150 MB Streaming Tape Backup. TAPESTORE™ software makes backups simple, fast, interesting and exciting. Tapestore is included with all IMPACT WT 150 orders Free.

IMPACT-HARD-DISK-CARD + 2
Now we have added 2MB of Zero-Wailstate FAST RAM Expansion to our best-selling iHard-Disk-On-A-Card!!



*GVP SCSI host adapter required

GVP

GREAT VALLEY PRODUCTS INC.
225 Plank Ave., Paoli, PA 19301

For more information, or for your nearest GVP dealer, call today. Dealer inquiries welcome.

Tel. (215) 889-9411 • FAX (215) 889-9416 • BBS (215) 889-4994